NURSING

Theory

Vocational Education

HIGHER SECONDARY - SECOND YEAR

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Untouchability is a sin
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CONTENT

1. MICROBIOLOGY

Microbiology is the study of microorganisms. These organisms are so small that they can be seen only with the help of a microscope. These include bacteria, viruses, protozoa, fungi and Rickettsiae.

Viruses do not have a cell structure. Other microscopic organisms are made up of cells. Microbiology plays an important part in everyday life. For example, bread cannot be made without using yeasts for leavening it. Microbiology finds a wide range of applications in agriculture and industry as well.

Microorganisms play important role in sewage treatment. They also decompose dead organic matter and return useful minerals present in them back to the ecosystem. At the sametime some microorganisms are harmful to us. They are responsible for many diseases in human and animals. There are other microorganisms that spoil the food.

1.1. CLASSIFICATION OF MICRO ORGANISMS

There are four main groups of micro organisms

1. Bacteria
2. Virus
3. Protozoa
4. Fungi

1.1.1. Bacteria

Bacteria are heterogeneous and belong to both animal and plant kingdom. It include cocci, bacilli, spirella and spirochaetes.

Types

Strepto Cocci : They are round shaped organisms arranged in chain. They are grampositive, non-motile, highly pathogenic and do not grow in ordinary media. They grow in blood and serum media.

Staphylo Cocci : Saphylo Cocci are arranged in clusters like grapes. They are grampositive and violet in colour when stained. They are non-motile and non-spore forming organisms. There are two types of pathogenic staphylococci.

Staphylo coccus albus and

Staphylo coccus aureus

Diplococci

Diplococci are arranged in pairs and they are gram-negative organisms. Examples of diplo cocci are Neisseria gonococci and Neisseria meningo cocci. They grow in special culture media of heated blood. Preumococci are also arranged in pairs. They are gram-positive and found in nasopharynx.

Bacillus

Bacilli are rodshaped organisms. These are gram positive and gram-negative organisms. Gram-positive bacilli are corynebacterium diptheriae. Clostridium tetani and bacillus anthracis and mycobacterium tuberculosis.

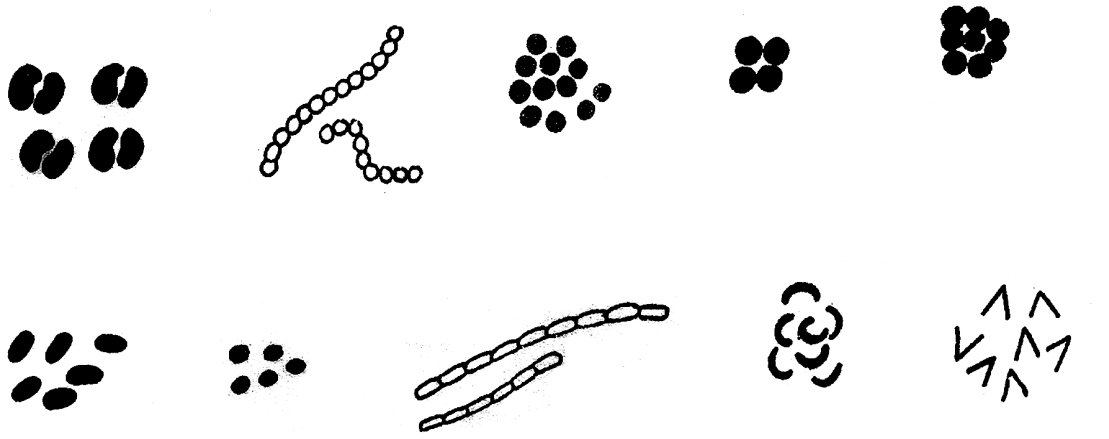


Fig. 1.1 - Bacillus

1.1.2. Viruses

Viruses are smaller than bacteria. It can pass through the finest filters. They cannot be seen through an ordinary microscope, but only through an electron microscope. Common viral infections are common cold, measles chicken pox, small pox, rabies and poliomyelitis.

1.1.3. Protozoa

Protozoa are microscopic organisms and they consists of single cells while helminthes are multicellular macroscopic organisms.

1.1.4. Fungi

A group of diverse, widespread unicellular and multicellular organisms, lacking chlorophyll and usually bearing spores and often filaments.

1.2. INFECTION AND ITS TRANSMISSION

1.2.1. Entry of infection into human body

Micro organisms may enter the body in one of the three ways.

i. Digestive tract – Swallowed in food or water

ii. Respiratory tract – breathed in with air.

iii. Skin and mucus membranes – through a wound, weakened surface or injection.

1.2.2. Organisms leave the body of an infected person in the following ways

i. Excreta – Faeces and urine ii. Coughing sneezing and sputum.

iii. Pus and wound discharges iv. Blood. Eg. Mosquitobites and injection needle

Each type of organisms has its own special path for leaving an infected person and going into a healthy person.

a) Faeco oral route b) Faeces to skin

c) Airborne – droplet infection

a) **Faecal to oral route :** Faeces may contain

i. Intestinal parasites or ova of worms.

ii. Amoeba Causing dysentery

iii. Bacteria causing cholera, typhoid fever or dysentery.

iv. Viruses of Polio or hepatitis.

From the faeces, the organisms may get into drinking water. Flies and dirty hands act as carriers and spread infection by oral route. Children may suck the dirty fingers and organisms enter the body.

Faecal to oral route infection can be prevented by means of

i. Hand washing before preparing or eating food.

ii. Eating only clean food, kept free from flies.

iii. Getting rid of flies and breeding places.

iv. Protecting the water supply and drinking boiled water.

v. Use of latrines or covering of the faeces with earth.

vi. Proper hand washing with soap after defection.

b) **Faeces to skin :**

Hookworm ova passed in faeces hatch into larvae on the ground. Then the larvae can bite through the skin, usually through barefoot and grow into adult worms in the intestines. Hookworm disease can be prevented if people use latrines and wear slippers.

The tetanus bacillus lives in the intestines of man and animals and is present in cowdung and soil. It enters into the body through a wound or a newborn baby's umbilical cord. The best way to prevent tetanus is by immunization with tetanus toxoid.

c) **Droplet infection (Airborne) :**

When a person with infection such as a common cold or tuberculosis, coughs, sneezes or eventalks, with his breath organisms are thrown into the air in very small drops of sputum. The droplets may dry up, leaving an infections dust on cloths, floors and furniture. When another person breathes in or inhales the infection affects the later.

The diseases which are spread by droplet infections are diphtheria, mumps, measles, chickenpox, smallpox, whooping cough, pneumonia and upper respiratory infections. Droplet infection is difficult to prevent.

Prevention of droplet infections is

i. Breathe fresh air and avoid crowded places.

ii. Have sufficient nutritious food.

iii. Cover the nose and mouth when coughing.

iv. Persons with tuberculosis should take proper treatment.

v. Those with measles, chickenpox, diphtheria etc. should be isolated.

vi. Immunizations especially to protect children.

1.2.3. Method used for identification of microbes

Microbes are considered as unseen enemies of man. They can be seen only under microscope. To identify the specific microbes, the following methods are done.

1. Smear
2. Fixing
3. Hanging drop preparation
4. Staining
5. Culture
6. Animal innoculation

1.2.4. Microscope

Microscope is the instrument, which is used to magnify objects and structure, which are too small to see by the naked eye. Since the science of microbiology is concerned with the micro organisms, we can appreciate that microscope is the most essential piece of equipment in the laboratory to identify bacteria. There are varieties of microscopes of which three are most important.

i. The compound optical microscope, which is used for routine bacteriological examinations.

ii. The dark field microscope, which is used to identify spirochaetes. Eg. Trepenoma Pallidum.

iii. The electron microscope is the most powerful microscope used to magnify the object by 1,00,000 times. This is used in the identification of viruses.

Fig. 1.2 - Microscope

1.3. IMMUNITY

Immunity is the power to resist and overcome infection caused by particular organism.

1.3.1. Factors influencing the immune status of individuals

a) Racial : Some races are susceptible or immune to certain diseases. For example, Hebrews are more resistant to tuberculosis than other people.

b) Species : Some of the species of animals have resistance to certain diseases. Eg. Lower animals never get measles or typhoid fever while man is susceptible to get these diseases. Birds do not get infection with certain kind of tubercle bacilli, which affects cattle or man.

c) Individual : Some people have a store natural resistance or immunity to certain disease. This is known as individual immunity.

1.3.2. Types of immunity

a) Natural Immunity : Natural immunity results after acquiring certain diseases like measles or chicken pox and usually lasts a life time.

b) Artificial Immunity : Artificial immunity follows the receipt of a vaccine such as polio vaccine.

c) Active immunity : Non-virulent microorganisms are injected as antigens and the body produces antibodies against the antigen.

d) Passive immunity : Immuno globulins or antibodies are injected as a vaccine to neutralize the antigen.

e) Acquired immunity : Acquired immunity may be natural or artificial.

i) Acquired artificial immunity : Immunity which is acquired artificially by introducing vaccine and toxoid (active) and serum (passive) is known as acquired artificial immunity.

ii) Acquired natural active immunity : People who suffered from disease will have immunity against that particular disease. Eg. Smallpox.This is known as acquired natural active immunity.

iii) Acquired natural passive immunity : The child gets antibodies from its mother through placenta and breast milk and has immunity for sometime against certain disease.

1.3.3. Types of Immunization

Active immunization : It implies administration of antigenic preparation in order to stimulate production of antibodies within the tissues of the individual. This is known as active immunity. The material used for producing active immunity are vaccines Eg. BCG.

Passive immunization : Sera containing specific antibodies are directly injected to produce passive immunity. Eg. Anti-toxin sera in diphtheria (prepared from horse serum) and tetanus immunoglobulins.

Vaccines may consist of

a) Live, virulent organism in sub lethal doses Eg. Cholera vaccine, anti.-rabies vaccine.

b) Live attenuated organisms. Eg. Vaccine for smallpox, tuberculosis (BCG) and yellow fever.

c) Dead organisms Eg. Vaccines of typhoid, cholera and plague.

d) Toxins of organisms, such as toxoids. Eg. Vaccines for diphtheria, tetanus and scarlet fever.

1.4 CONTROL AND DESTRUCTION OF MICRO ORGANISMS

Terminology

Asepsis : Freedom from infection or prevention of contact with micro-organisms.

Antiseptic : An agent that will inhibit the growth and development of micro-organisms without necessarily killing them.

Autoclaving : It is the process of sterilisation of articles by steam under pressure using an apparatus called autoclave.

Bacteriocide : An agent that has the power to kill micro-organisms.

Contamination : Contamination means the act of soiling or making dirty or impure by contact.

Disinfection : It means destroying of all the pathogenic organisms.

Concurrent disinfection : It is the immediate disinfection of all contaminated articles and bodily discharges during the course of disease.

Terminal disinfection : It means the disinfections of the patients unit with all the articles used by the patient on his discharge, death or release from isolation.

Disinfectant : An agent which kills pathogenic organisms.

Droplet infection : It is the infection of the individual by means of fine particles of Salaiva and mucus that are expelled from the mouth and nose of another person during coughing, sneezing or speaking.

Infection : The entry and development of a disease producing agent in the body.

Immunization : It is the act of creating immunity artificially against a particular disease.

Isolation : It is the separation of infected person from non infected persons for the period of communicability under conditions which will prevent the transmission of infection to others.

Sepsis : It is the infection of the body by pus forming bacteria.

Sterilization : It is the destruction of all the micro-organisms both pathogenic and non pathogenic including their spores.

1.4.1. Destruction of microbes

There are three main reasons for destroying removing or inhibiting the micro-organisms.

a) To prevent infection and transmission of disease.

b) To prevent decomposition and spoil of food and

c) To prevent contamination of material used in pure culture.

1.4.2. Sterilization

It is a process of killing or completely removing all micro-organisms, both pathogenic and non-pathogenic. Terms Sterile or Sterility etc are also used in relation to the state of being completely free from any living organisms.

Methods of disinfection

a) Natural : sunlight and air

b) Physical : Dry, heat, moist heat and radiation.

c) Chemical : Liquids, solids and gases.

a) Natural method

This method is used for contaminated linen and bed pans. Direct sunlight will have an effect an acid fast micro organisms. Place the linen and bed pans after washing in direct sunlight for six hours for two consecutive days.

b) Physical method : i. Dryheat ii. Moist heat iii. Radiation

i) Dryheat : Sterilizing of glassware including syringes is often done in a hot air oven at 160^{o}c for one hour. Spores as well as organisms are killed. Rubber articles will not with stand this heat. This method is not efficient where heat has to penetrate as in dressings, towels and gowns.

ii) Moist heat : • Boiling • Autoclaving

Boiling : This method is suitable for enamel, metal, glass and rubber ware. Bowl sterilizers are used for larger articles and instrument sterilization for smaller articles.

- See that the articles are quite clean and completely immersed in clean water.
- When the water boils, start timings. If more articles are added. The sterilization time must begin again.
- Boil for 5 minutes.
- Boiling will not kill spores.
- Remove articles with sterile cheatle or other lifting forceps and place them an a sterile surface.

Autoclaving (steam under pressure) : Autoclaving is the best, safest and effective method of sterilization. It destroys the spore forming micro organisms. It must be used in all surgical procedures, for sterilizing syringes and needles, dressing materials and all type of articles. In this method, high temperature, pressure and humidity is used to destroy the bacterial life.

For effective sterilization, the steam in the autoclave should be at 15 lbs/inch^2 (1.05 kg/cm^2). Pressure at 121 degree C or 250 to 255 of temperature. This pressure and temperature should be maintained for 30 minutes.

Autoclave is a double walled metal chamber with an air airtight door. There are usually two gauges, one to show pressure of steam in the outer chamber and the other in the inner chamber. There is a safety valve from which the steam escapes, and if the pressure is too high there is no risk of explosion. There is also an exhaust valve from which the steam escapes from the inner chamber. There are also valves present which hold the steam in the outer chamber to set it into the inner chamber. Some autoclaves are fitted with a thermometer within the chamber.

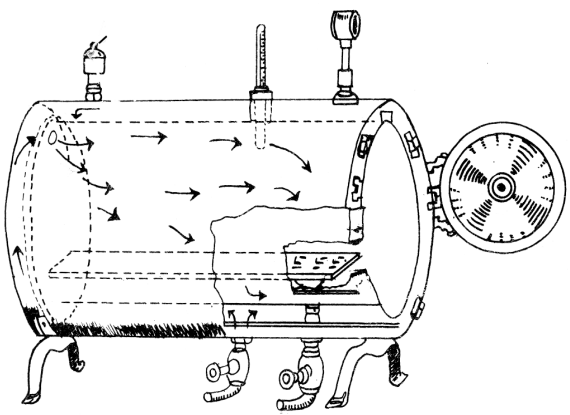


Fig. 1.3 Autoclaving (steam under pressure)

The articles to be sterilized are placed on the way in the inner chamber of the autoclave and heating is started beneath the autoclave till the chamber is filled with saturated steam. The articles are exposed to a pressure of 15lbs steam at 121^{0}C for 30 minutes.

Preparing articles for disinfection (Sterilization) : A convenient method often used is to prepare sets of the instrument, swabs, sponges, dressings, towels and the surfaces needed for each type of operation or sterile procedures.

- These sets are packed into drums, bundles or on trays, labeled and kept ready for sterilizing.
- The articles should be carefully arranged so that those needs first are on top.
- They must be loosely packed for steam to penetrate.
- Drums and bins must have the perforations opened.
- Bundles should have a double wrapper of close woven cloth or of paper

iii) Radiation : Ultra-violet light sterilization is effective for disinfecting working surfaces. Ultra-violet rays reduce the number of air borne bacteria. It is expensive. Gamma rays have the greater power of penetration and are used for the sterilization of plastic items. Eg. Disposal syringes and needles, catheters, sharp instruments like hypodermic needles scalp blades.

c) Chemical method : There are many chemical agents available in the market which is used as antiseptic and disinfectants and they exhibit antimicrobial activity but the mode of their action differs greatly. Some act by denaturing proteins, some by destroying enzymes, some by oxidation or reduction etc.

Examples for chemical compounds

- Phenol and cresol compounds.
- Halogens (Iodine and Chloride compounds)
- Aldehydes
- Alkalies
- Hydrogen peroxide
- Alcohols
- Dyes
- Acids
- Potassium permanganate

1.5. COLLECTION OF SPECIMEN

1.5.1. Types of specimen collected

Swabs : It is usually collected in a sterile test tube. Care should be taken so as to prevent contaminations of specimen.

Throat swab for cultures : These should be taken only with a view of the throat, in a good light and using a tongue depressor materials should be taken only from the infected area.

Sputum : It should be collected in a sterile container having wide mouth. Sputum should be collected directly after a cough and sent immediately to the laborators.

Urine : Urine specimen for chemical and microscopic examinations can be collected in a clean container or test tube, but for culture it should be collected in a sterile test tube.

Faeces : Fresh stools should be collected for bacteriological examination.

Blood : It should be collected in a sterile container. The nurse should assist while collecting other specimens like cerebrospinal fluid etc. when assisting the physician, she should adopt aseptic precautions so as to avoid contamination of specimen.

1.5.2. Collection of clinical specimens

General Guidelines

- Collect specimens for culture before antimicrobial therapy is stated.
- As far as possible try to collect uncontaminated sample in a sterile wide mouthed container. Do not spill material so that it sticks outside the container.
- Avoid direct contact with infected material, specially from suspected cases of AIDS and Hepatitis.
- Label with name, age, sex, ward and bed No. of patient, date and time of collection. Mention biohazard on specimen collected from patient suffering from AIDS and Hepatitis.

- Despatch samples promptly to the laboratory or store adequately in a cool place.
- Avoid contact with air when collecting specimens for culture of anaerobic organisms.

Transportation of specimen

Name of the Patient…….. Age: ……

Bed No: …… Ward No: ……

OP.No: …… I.P.No: ……

Name of the specimen…….……

Nature of the test done……

Date of Collection……Signature……

The specimens are to be sent to the laboratory with a requisition from duly filled and signed. Specimens are to be sent immediately after they are collected. If there is delay in sending the specimen, it should be kept in a refrigerator.

SUMMARY

- Microbiology is the study of microorganisms.
- There are four main groups of microorganisms namely bacteria, virus, protozoa, fungi.
- The various types of bacteria include cocci, bacilli, spirilla and spirochaetes.
- Strepto cocci are round shaped organisms arranged in chain.
- Staphylococci are arranged in cluster like groups.
- Diplococci are arranged in pairs and they are gram-negative organisms.
- Bacilli are rod shaped organisms.
- Viruses are smaller than bacteria.
- Protozoa are microscopic organisms and they consist of single cells.
- Fungi are group of diverse, wide spread unicellular and multicellular organisms, lacking Chlorophyll, and usually bearing spores and often filaments.
- Micro organisms may enter the body through digestive tract , respiratory tract, skin and mucus membranes.
- Micro-organisms leave the body of an infected person through excreta, coughing, sneezing, sputum, pus, wound discharges and blood.
- The diseases transmitted through feaces to skin are hookworm infestation & tetanus.
- The diseases which are spread by droplet infections are diphtheria, mumps, measles, chickenpox, smallpox, whooping cough, pneumonia and upper respiratory infections.
- The various methods of identifications of microbes are smear, fixing, hanging drop preparation, staining, culture, and animal inoculation
- Microscope is the instrument, which is used to magnify objects and structure which are too small to see by the naked eye.
- The various types of specimen collected are swabs, sputum, urine, faeces and blood.

- While collecting clinical specimens, collect uncontaminated sample in a sterile wide mouthed container.
- The specimens collected should be sent immediately after they are collected.
- The specimens are to be sent to the laboratory with a requisition form duly filled and signed.
- Immunity is the power to resist and overcome infection caused by particular organisms.
- The types of immunity are natural immunity, artificial immunity, active immunity, passive immunity and acquired immunity.
- Sterilization is the process of killing or completely removing all micro organisms, both pathogenic and non-pathogenic.
- Natural method of sterilization is used for contaminated linen and bed pans.
- The various physical methods of sterilization are dry heat, moist heat and radiation.
- Dry heat is used to sterilize glassware.
- Boiling is suitable for sterilizing enamel, metal, glass and rubber ware.
- Autoclaving is the best, safest and effective method of sterilization it destroys the spore forming micro organisms.
- For effective sterilization, the steam in the autoclave should be at 15lbs/inch.^{2} pressure at 121^{0}c this pressure and temperature should be maintained for 30 minutes.
- Ultra-violet light sterilization is effective for disinfecting working surfaces.
- Chemical agents act by denaturing proteins, or by destroying enzymes or by oxidation or reduction.

QUESTIONS

I. Choose the correct answer

1. Coryne bacterium diptheriae is a
   (a) cocci (b) bacilli (c) spirilia (d) spirochete.
2. Poliomyelitis is transmitted through
   (a) faecal to oral route (b) faces to skin
   (c) droplet infection (d) all of the above.
3. Virus can be identified by using
   (a) compound optical microscope (b) dark field microscope
   (c) electron microscope (d) none of the above
4. The power to resist and overcome infection caused by particular organisms is
   (a) immunity (b) sterilization (c) disinfection (d) specimen
5. BCG vaccine consists of
   (a) live, virulent organisms (b) live attenuated organisms
   (c) dead organisms (d) toxoids

6. Freedom from infection is

   a) Antiseptic b) Autoclaving c) Asepsis d) Bacteriocide

7. Hot air over works at

   a) 160°C b) 121°C c) 130°C d) 140°C

8. Autoclaving should be done for

   a) 15 minutes b) 20 minutes c) 25 minutes d) 30 minutes

9. Disposable syringes are sterilized through

   a) ultra-violet sterilization b) Dry heat c) Autoclaving d) radiation

10. Alcohols are example for

    a) physical agents b) chemical agent c) Natural agent d) All of the above

II. Fill up the blanks

1. _____ is the study of micro-organism.
2. _____ arranged in pairs.
3. _____ is the process of killing or completely removing all micro-organisms, both pathogenic and non-pathogenic.
4. _____ is used to sterilize glassware.
5. Working surfaces are disinfected by _____

III. Write short notes

1. Classification of microorganism
2. Microscope
3. Various types of specimens collected.
4. Types of immunity.

IV. Write briefly

1. Infection and its transmission.
2. Physical methods of sterilization.
3. Autoclaving

V. Write in detail

1. Immunity
2. Collection of specimen.

2. ENVIRONMENTAL SANITATION & HEALTH

The environment in which people live influences their health. A healthy population is dependent on a healthy environment. Poor environmental quality is responsible for upto 25% of all preventable ill health. Serious environmental health problems are shared by both developed & developing countries, affecting hundreds of millions of people who suffer from respiratory and other diseases caused or extrapolated by biological and chemical agents, both indoors and outdoors, and hundreds of millions who are exposed to unnecessary chemical and physical hazards in their home, workplace, or wider environment.

2.1. DEFINITION OF ENVIRONMENTAL SANITATION

According to WHO, environmental sanitation means, "The control of all those factors in man's environment which exercise or may exercise a deleterious effect on his physical development, health and survival.

22. IMPORTANCE OF ENVIRONMENTAL HEALTH

- Prevention of disease and promotion of health of individuals and communicates.
- Air quality
- Radiation protection
- Hazardous waste management
- Noise control
- Vector control
- Food protection
- Solid waste management
- Water quality
- Housing quality

2.3. COMPONENTS OF PHYSICAL ENVIRONMENT

The important components of the physical environment are:

- Water
- Housing
- Arthro pods
- Air
- Noise
- Waste and their disposal
- Light

2.4. WATER:

Water is essential for all metabolic functions of life. Water is fundamental for life and health. Everyone should have access to safe water and secure drinking water and sanitation facilities. Much of the ill health in India and other developing countries are largely due to lack of drinking water. It has been estimated that more than 50 percent of illness in India could be cut down by the provision of safe drinking water alone.

2.4.1 Sources of Water

There are 3 main sources of water

a) Rain

b) Surface water
   - Artificial lakes
   - Rivers, streams
   - Ponds and tanks

c) Ground water
   - Wells
   - Springs

a) Rain: Rain is the prime source of water. It is the purest water in nature. Physically, it is clear, bright, sparkling chemically, it is a very soft water and contains only traces of dissolved solids. Bacteriologically it is free from harmful pathogenic bacteria. But, rain water becomes impure, as it passes through the atmosphere and reaches the ground. It picks up impurities such as dust, soot, gases, and even bacteria. To be used a source of drinking water, therefore rain water needs to be carefully collected and stored.

b) Surface water: When rain water reaches the surface it is called "Surface water" many Indian town and cities depend upon surface water source. These are artificial lakes, rivers and tanks.

Artificial Lakes: These are lakes usually constructed in up-land areas for the storage of rain water. These are also called "Impounding resources". The area draining into reservoir is called catchment area. To keep the catchment area free from sources of pollution such as grazing of cattle & human publications.

Rivers, Streams: It is an important source of water supply. The drawback of river water is always polluted, never safe for drinking unless it is purified. The sources of pollution of river water are many surface washings, sewage, industrial & trade wastes & drainage from agricultural areas.

Ponds and Tanks: Tanks are a source of water supply in some Indian villages. It is newer safe for drinking & domestic purposes, because all the filth of the surrounding areas is washed directly into them during rainy season, the people themselves by washing, bathing and defecating near the tank.

c) Ground water: When rain water sinks into the ground it becomes ground water.

Advantages of ground water are:

- Free from pathogenic organisms
- No treatment
- It is constant even during summer

Disadvantages of ground water

- The water is harder than surface water
- It requires pumping

Sources of ground water: Wells and Springs

Wells: The wells are two kinds

a) Shallow wells

b) Deep wells

- Sanitary well
- Tube well

a) Shallow wells: A shallow well is one which taps the subsoil water, that is, water from above the first impervious layer.

The well may be less than 10 feet (3meters) but sometimes it may be more than 30 to 50 feet (10 to 15 meters) deep. The shallow well water is never safe for drinking, unless the water is purified or the well made sanitary. Liable to contamination from drains, cesspools, latrines, and soakage pits in the neighbourhood. Care to be taken to prevent from sources of pollution.

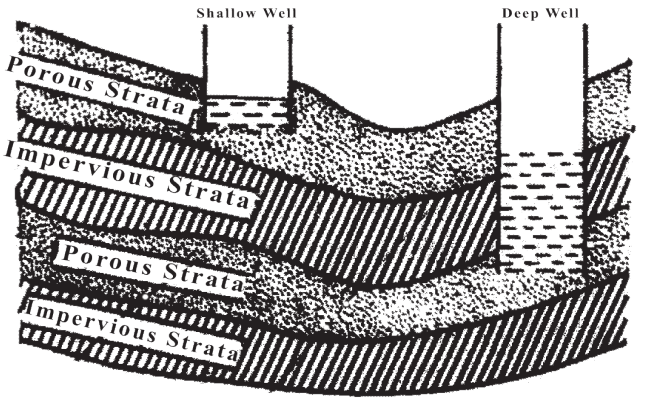


Fig. 2.1 - Shallow well and Deep well

b) Deep wells: A deep well is one which penetrates the first impervious layer &taps the water lying beneath the impervious layer. Deep wells supply pure water than shallow wells. Deep well can also become a health hazard, if it is open, poorly constructed and not protected against contamination.

Sanitary well:

A sanitary well may be defined as a well which is

i. Properly located ii. Well constructed iii. Protected against contamination

The following criteria have been laid down for the construction of sanitary wells

Location: There should be no source of pollution or contamination within a radius of at least 50 feet (15 meters) . The well should be located at a higher level with respect to a nearby source of pollution such as a latrine.

Lining: The sides of the well should be built of bricks or stones upto a depth at least 6meter (20 feet) and lined with cement to prevent seepage of sub-soil water from the sides of the well.

Parapet wall: There should be a parapet wall upto a height of at least 70 to 75 cms (28 inches) from the ground level. The parapet wall should be lined with cement both inside & outside it will prevent entry of surface washings into the well.

Platform: There should be a cement concrete platform round the well extending of atleast 1metre (3 feet) in all direction.

Drain: There should be a pucca drain to carry off spilled water to a soakage pit or a public drain.

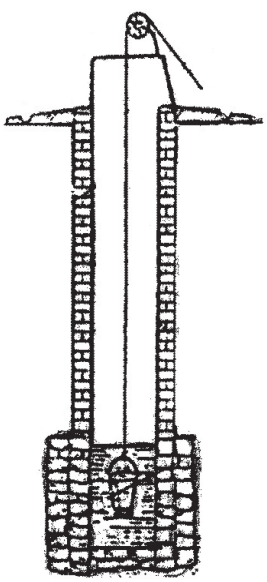


Fig. 2.2 - Sanitary well

Covering: The well should be covered by a cement concrete cover or by some other means. This prevents pollution from outside being introduced directly into the well through the open top, open wells are insanitary.

Hand pump: The well should be fitted with a hand pump for lifting the water in a sanitary manner. The use of rope bucket should be discouraged, as it tends to introduce pollution into the well.

Quality: The quality of water should be tested in a laboratory to ensure that the water is fit for drinking.

Health Education: People should not be permitted to bath or wash clothes near the well. This requires health education in the proper use of the well.

Tube wells: A tube well consists of a pipe sunk into the water bearing stratum. It is filled with a screen at the bottom and a hand pump at the top.

Tube wells may be of 2 types

- Shallow tube well
- Deep tube well

Shallow tube well: It taps the subsoil water. Care to be taken to prevent from sources of pollution.

Deep tube well: A deep tube well taps the water from below the first impervious layer.

Springs: A spring is merely ground water that appears at the surface, due to certain favorable formation of the layers of the ground. Four kinds of springs have been described.

i. Shallow springs
ii. Deep springs
iii. Mineral springs
iv. Hot or thermal springs

2.4.2 Uses of water in prevention and Treatment of illnesses

1. Drink plenty of water

- To treat diarrhea and dehydration
- For fever
- For minor urinary infection
- For constipation.
- For cough, bronchitis, asthma, whooping cough.

In summer, to prevent heat stroke heat exhaustion, drink plenty of water

2. Breathe hot water vapor to ease cough (inhalation)
3. Sniff salt water for stuffed up nose.
4. Gargle with hot salt water for sore throat and tonsillitis.
5. Wash hand and boil drinking water to prevent diarrhoea, worms and gut infection.
6. Wash hand well with soap and water to prevent infection including tetanus.
7. Bath often to prevent skin infection. In summer bath many times a day in cold water to avoid heat stroke.
8. Scrub with soap and water for pimples, sores, impetigo, and ringworm.
9. Hot soak or hot compresses for infected wounds, abscesses, boils, piles or and fissure.
10. Soak hand or foot in cold water in the case of minor burns.
11. Soak body with cool water for very high fever or heat stroke.
12. Cold compresses to forehead for fever, and for irritation of the skin.
13. Flood eye with cool water at once in case of strong chemical or foreign body in the eye.

2.4.3 Purification of Water

Purification of water is of the greatest importance in community health. It may be considered under the following headings.

1. Purification of water on a large scale 2. Purification of water on a medium scale

3. Purification of water on a small scale

1. Purification of water on a large scale:

The purpose of water treatment is to produce water that is safe and wholesome. The method of treatment to be employed depends upon the nature of raw water, and the desired standard of water quality. For example ground water (eg: wells and springs) may need no treatment. The components of a typical water purification system comprise one or more of the following measure.

1. Storage 2. Filtration 3. Disinfection

A) Storage: Storage provides a reserve of water from which further pollution is excluded. This is natural purification and we may look at it from three points of view

a. Physical : By storage, the quality of water improves. 90 percent of the suspended impurities settle down in 24hrs by gravity. The water become clearer. This allows penetration of light, and reduces the work of the filters.

b. Chemical: The aerobic bacteria oxidize the organic matter present in the water with the acid of dissolved oxygen. As a result, the content of free ammonia is reduced and a rise in nitrate occurs.

c. Biological: The pathogenic organisms gradually die out. This is one of the greatest benefits of storage. The optimum period of storage of river water is considered to be about 10-14 days. If the water is stored for long periods, there is like hood of development of vegetable growth such as algae which impart a bad smell & colour to water.

B) Filtration: Filtration is the second stage in the purification of water, and quite an important stage because 98-99 percent of the bacteria are removed by filtration, apart from other impurities. Two types of filters which are commonly used are:

a. Slow sand or Biological Filter. b. Rapid sand or Mechanical Filter.

a) Slow sand or biological filter: The raw water is first stored in storage and settlement tanks for 1 to 2 days. During this short period of storage, natural purification takes place. 90 percent of the suspended impurities settle down by gravity. Along with the suspended impurities, the bacteria are also removed and the quality of raw water improves by removal of turbidity & bacteria. The water becomes much clearer in appearance.

The next step is filtration. The clarified water from the storage tanks is now admitted into the slow sand filters.

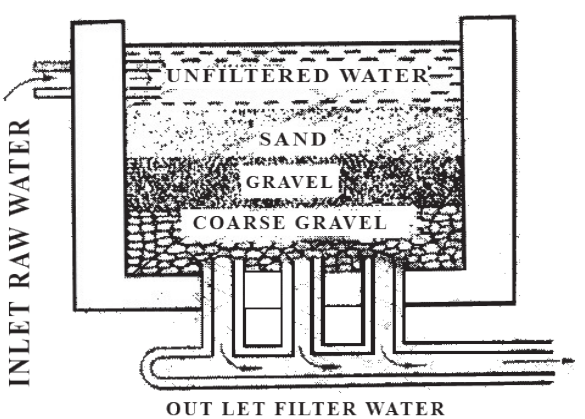


Fig. 2.3 - Slow sand or Biological Filter

The filter bed consists of - from top to bottom.

1.4 meters of standing water 1.2 meters of graded sand

0.4 meters of graded gravel

Sand is the main filtering medium. The sand bed has a thickness of 1.2 meter. The sand is 'graded' which means the finer sand at the top and the coarser sand at the bottom. At the bottom of the bed are perforated pipe which collect the filtered water.

Several mechanisms are involved in the purification of water by the sand filter:

1. Mechanical Straining
2. Sedimentation
3. Absorption
4. Oxidation of impurities
5. Bacterial action

The greatest part in water purification is played by the zoogleal layer or, vital layer, which forms at the top of the sand beds. This is a slimy or gelatinous layer 1 consists of numerous forms of plant & animal like. i.e., algae, plankton, diatoms, protozoa and bacteria. It takes 2 to 3 days for their layer to form on a new sand bed & when fully formed, it even extends 2 to 3 cms, into the top layer of sand bed. The vital layer is called the 'heart' of slow sand filter. It removes bacteria, and purifies water to an extent of over 98 percent.

The rate of filtration in slow sand filter is about 2 to 3 million gallons per acre of filtering surface per day or 2 gallons per square foot (96 liters per square meters) per hour.

As the vital layer increases-in-thickness, the rate of filtration slows down because of the resistance offered by the vital layers. This loss of efficiency over a period of days and weeks is called loss of head.

The vital layer is peeled off along with the top 2 to 3 cms of sand. This process is called scrapping the filter or cleaning the filter, which is carried out periodically whenever the loss of head is more than 4 feet (1.25 metres) . When the thickness of the sand bed is reduced to about 30 to 40 cms due to repeated scrapping, the plant is closed down, and a new bed is constructed. This is a drawback with the slow sand filter, that the bed needs reconstruction periodically.

b) Rapid Sand or Mechanical Filter: Rapid sand filters were first installed 1885 in U.S.A. Rapid sand filters are of 2 kinds 1. The gravity type (eg) patersons filter and 2. The pressure type (eg) candys filter. The following steps are involved in the purification of water by rapid sand filters.

i. Coagulation: The raw water is first tested with a chemical coagulation & colour. The dose of alum added varies from 5 to 40 mg, per litre, depending upon the amount of turbidity in the water.

ii. Mixing: After the addition of alum, the water is subjected to violent agitation in a mixing chamber for a few minutes.

iii. Flocculation: The water is then passed into the flocculation chamber, where it is slowly agitated for 30 minutes. These results in the formation of a copios, thicks participate of aluminum hydroxide.

iv. Sedimentation: The coagulated water is now led into sedimentation tanks, where it is kept for 2 to 6 hour. The precipitate of aluminium hydroxide along with impurities settles down, and the water now looks much clearer in appearance.

v. Filtration: The clarified water is subjected to rapid sand filtration, which purifies water to an extent of over 99 percent.

In the rapid sand filter, just as in the slow sand filter, the filtering medium is sand, which rests on a bed of gravel. The filtered water is collected by perforated pipes. As filtration proceeds, a slimy layer forms on the sand bed comparable to the zoogleal or vital layer in the slow sand filter. As a result of filtration the filter bed becomes dirty due to accumulation of suspended impurities. At this stage the filters are subjected to a washing process called "back washing".

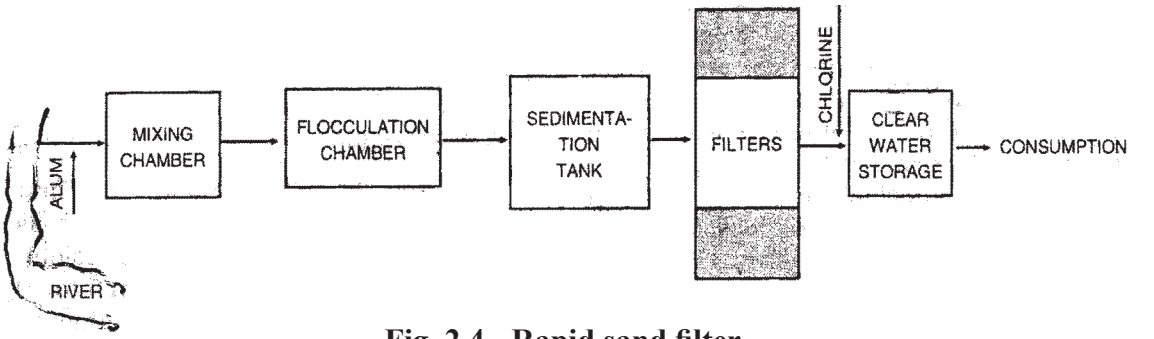


Fig. 2.4 - Rapid sand filter

This is done by reversing the flow of water when the impurities are dislodged & removed with wash water. The entire process of washing takes about 15 minutes, and the filters are ready for use again.

C) Disinfection : Chlorination: By adding sufficient bleaching powder to water, it is disinfected and made safe to drink. This is called chlorination. Wells should chlorinated weekly and other water sources whenever there is an epidemic of water-borne diseases.

The principle of chlorination is to add sufficient bleaching powder to ensure that the water contains 0.5 parts of chlorine per million parts of water after 30 minutes of contact, 0.1ml of orthotoludine reagent is added to 1ml of the water in a test tube, and the yellow colour matched to find out the amount of chlorine (0-T test) .

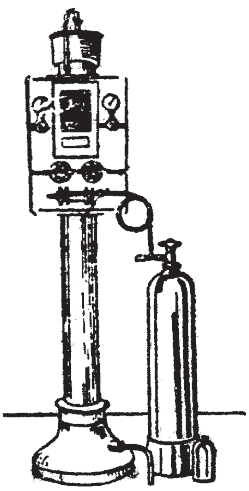


Fig. 2.5 - Chlorination

To chlorinate a well you will need:

i. A bucket with rope or chain.

ii. Bleaching powder in an air-tight container.

iii. Container for measuring

iv. Particulars about diameter of the well, depth of water & chlorine content of the bleaching powder you have.

v. Notebook for recording, to calculate for example in a well 4 feet diameter and water 10 feet deep, when chlorine content is 20%,

Calculate as follows:

4×4 ×10×5 (Constant figure) = 800 gallon of water in well.

$$\frac{800 \times 14 \text{ (constant fig)}}{20 \text{ (\% of chlorine)}} = 560 \text{ gr } 37 \text{ grams of bleaching powder needed.}$$

Next, fix the rope or chain to the bucket, mix the calculated amount of bleaching powder into the well and shake it about in the water. Take care not to disturb the bottom of the well.

2. Purification on medium scale: This is needed when water is obtained from wells, springs and tanks. Disinfection is done by chlorination line (CaO+CaOCl2) . It is a cheap, reliable, easy to use & safe disinfecting agent. Bleaching powder is rendered relatively stable if it is mixed with quick Lime or calcium oxide. The usual ratio is 4:1. This mixture is known as stabilized bleech & does not allow chlorine content to fall below 33% storage should be done in a cool, dark, dry place in a tight container.

To disinfect a well or tank, find the quantity of water, then add bleaching powder at the rate of 2.5 gm to 1000 liters of water. This gives about 0.7mg of applied chlorine per liter.

The required quantity of bleaching powder is placed in an enameled bucket (the galvanized bucket gets corroded) . Not more than 100gm should be kept in a bucket at a time. The powder is made into a thin paste by adding a little water. Then more water is added to make the bucket three fourth full. After stirring well, it is allowed to rest for 10 minutes for the lime to settle down. The supernatant is transferred to another bucket which is then lowered into the well up to some depth below the surface water. The bucket is then jerkingly moved up and down and around so as to effect good mixing.

At least half an hour should be allowed before water is drawn from the well after adding bleaching powder. It is to do chlorination at night.

3. Purification on Small scale: - (Domestic level)

This can be done by following methods

1. Boiling 2. Chemicals

A) Boiling: This is a simple & effective method, boiling for 5 to 10 minutes kills most organisms. It also removes temporary hardness.

B) Chemicals

a. Bleaching powder: Make a bottle of strong solution by adding 25gm in 1litre of water keep the bottle top tightly screwed down. Use in the strength of 1ml to 5 litres of water, and let it stand for half an hour before using.

b. Chlorine tablets: This can be used for rapid chlorination while on tour, in camps or in the household. There are several types. One halazone tablet is needed for one litre of water.

c. Iodine: This can be used for emergency purposes. Two drops of 2% solution of iodine in alcohol are sufficient to disinfect 1litre water. Even tincture iodine can be used if necessary (1 drop in a litre water).

d. Potassium Permanganate: It may be used by adding an amount just sufficient to give pink color. This is an expensive and unreliable method. It may be effective against vibrio cholera, but not against other organisms.

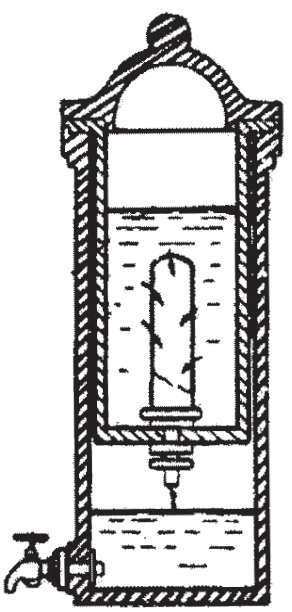


Fig. 2.6 - Berkefeld Filter

e. Alum: Alum is not a germicide it removes only turbidity.

f. Domestic Filters: Water, for drinking purposes can be purified by domestic filter. One such filter is the berkefeld filter.

The filter consists of a central elongated tube known as the filter candle. The filter candle is made of kieselgurh or infusorial earth, and has millions of minute, invisible pores. These pores hold pack the impurities including bacteria. Thus the action of the filter is purely mechanical. The filter candle is purely mechanical. The filter candle is likely to get clogged by impurities. Therefore, it must be cleaned from time to time, at least once a week.

2.5. AIR

Air forms the most immediate environment of man with which he is in constant contact throughout his life. The importance of clean air for man's health is thus self evident. Even from a symbolic point of view, it is well to keep in mind that while a man consumes 1.2kg of solid food and drinks 1.8 kg of liquids, he breathes as much 14kg of air per day.

2.5.1Air atmosphere : a) External atmosphere, i.e., air space outside the room

b) Internal atmosphere, i.e, air space inside the room of a building.

2.5.2 Agents affect the atmosphere

1. Physical agents

a) Temperature b) Humidity c) Wind velocity d) Pressure of atmospheric air

2. Chemical agents : Dust, soot, smoke, other organic and inorganic particles eliminating from houses, factories and vehicles, etc.

3. Biological Agents : Bacteria and viruses etc

2.5.3 Factors affecting atmospheric environment

1. Meteorological variables:

a) Degree of sunshine b) Atmospheric pressure

c) Humidity d) Rainfall

e) Air temperature

Good climate and pleasant weather are soothing and health promoting.

2. Geographical conditions:

1. Distance from the equator. 2. Distance from the sea & high above sea level.

3. Nature of soil (rocky, sandy, loamy or clayey) and

4. Terrain (plain or hilly)

The above factors modify the climate by bringing about changes in temperature, rainfall, humidity direction and velocity of winds and atmospheric pressure.

3. Human Activities and industries:

Household activities and industries add noise, radiation smoke, soot and various types of dusts to the atmosphere which may become detrimental to healthy living.

2.5.4. Agents of atmosphere:

Physical agents in Atmosphere

- Temperature
- Sunshine
- Humidity
- Rain
- Air motion
- Atmospheric pressure

Chemical agents in atmosphere

- Gases and vapors such as carbon monoxide, sulphur dioxide, ammonia, organic sulphides, aldehydes, acetones and aromatic hydrocarbons.
- Fumes of lead and other chemicals with particles at site 1 micron or above.
- Dusts suspended in the air such as grit, soot, earth, sand, fibres etc.
- Radio active dusts and isotopes.
- Smoke, which is an aerosol with particle size below 0.5 micron. It consists of
  a. Unburnt carbon, CO, CO_2, NH_3
  b. Pyroligneous acid and acetic acid in wood smoke.
  c. Hydro carbons, napthalene, paraffin.

2.5.5 Air Pollution

The phenomenon called pollution inescapable consequences of the man and his activities

Sources of Air pollution:

1. Industrial processes in different industries: Various chemicals are emitted into air as in fertilizer, paper, cement, steel and insecticide factories and oil refineries.
2. Combustion: Burning of coal, oil and other fuels in houses and in factories adds smoke, dust and sulphur dioxide to air.
3. Motor Vehicles: Through their exhausts, they add to air carbon monoxide, hydrocarbons, formaldehyde, nitrogen oxides, lead etc.
4. Miscellaneous : Plants, yeast, moulds and animals emit various allergenic materials insecticide sprays in agriculture also add to air pollution.

Effects of air pollution on health :

- Sudden air pollution is associated with immediate increase in general morbidity.
- Conjunctivitis, dermatitis, chronic bronchitis and lung cancer are due to irritants and carcinogens in smoke and other pollutants.
- Dusts cause pneumoconiosis.

Prevention and control of pollution : The WHO has listed the following five general principle for control of pollution

1. Containment : Preventing the pollutants from escaping into air from the source of production.
2. Replacement: Changing the existing techniques to those producing less amount of pollutants.

3. Dilution: Diluting the concentration of pollutants in the air to such a level that they can be removed by natural means, such foliage.
4. Legislation: Enacting suitable laws aimed at prevention of pollution.
5. International action**:** The WHO has established two international pollution monitoring centres at Washington and London, three regional centres at Tokyo, Moscow and Nagpur and 20 laboratories in different countries.

Practical measures :

a) Modification of industrial process to minimize air pollution by harmful chemicals.

b) Use of electricity & natural gas in place of wood, coal & oil in houses and factors whenever possible.

c) Use of alternative sources of energy (Solar or wind energy etc) in place of conventional sources involving burning of fuel.

d) Traffic management and reduction of pollution from vehicles by proper turning of the engine.

e) Health education of public about harmful effects of smoke & about methods of control (such as by proper burning of fuel, provision of chimneys, proper ventilation, etc) .

f) Legal measures to control emission of smoke and other pollutants (such as Indian Factories Act) .

g) Establishment of 'green belts' between industrial & residential areas.

h) Issue of metrological warning so that temporary steps may be taken during periods of high atmospheric stagnation

2.6. VENTILATION

Ventilation implies exchange of vitiated air inside the room which is hot, humid and stagnant with atmospheric air outside the room which is cool, dry and morning.

The aim of ventilation is to ensure air supply inside the work place or living room in such way that it is free from harmful agents and is conducive to comfort, efficiency and health.

2.6.1 .Uses of Ventilation:-

a) Smells and odors from the room removed.

b) Bacterial contamination of air in the room is reduced.

c) Chemical composition of air inside the room is maintained constant.

d) The physical conditions of temperature, humidity and movement of room air are maintained constant.

2.6.2. Ill effects in unventilated room

Discomfort felt in a closed or congested room because of chemical changes in the air, such as decrease of oxygen and increase of carbon dioxide, water vapour, bad odour and organic poisons eliminating from human beings.

2.6.3 The ill effects in a congested room

- Discomfort
- Restlessness
- Nausea, Vomiting
- Irritability
- Giddiness
- Fainting

2.6.4. Ventilation standards:

Two types of ventilation standards have been described as follows:

Cubic space per person: 3000 cubic feet space should be available per person.

Floor Area: The optimum floor space should be 5 to 10 sq meter per person. Ordinary ventilation results in three air exchanges per hour, i.e, the room air is completely replaced by fresh air every 20 minutes. Recommended standards of floor space per person in India are as follows.

Adults:

a) Residential	5 sq.m.
b) Factory (as per factories act, 1948)	5 sq.m.
c) General Hospital	10 sq.m.
d) Infectious disease hospital	15 sq.m.
e) Schools - space per child	0.8 sq.m.

2.6.5. Methods of ventilation or air exchange in room

These may be natural or artificial

1. Natural ventilation

Wind: This refers to movement of air across the room when doors and windows are open.

Temperature: This refers to movement of masses of air of unequal temperatures. Warm air rises up and goes through ventilators while cool air enters from below through the opening near the floor.

2. Artificial ventilation: The following methods are used for these purposes

i. Extraction of vacuum system: Exhaust fans are installed near the roof with the blades facing outwards.

ii. Plenum or propulsion system: Fresh air is introduced in the room, often near the floor, through ducts or blowers. The commonly used air coolers or desert coolers are based upon this principle.

iii. Combined extraction & propulsion system: This is used is congested halls and theatres where all natural inlets and outlets are closed.

iv. Air conditioning: Their aim is to ensure proper air flow, humidity and temperature. The air is first filtered and then saturated with water vapour. After removing excess moisture, air is brought to the desired temperature. The difference between the air conditioned air and the outside air is usually maintained at 5 to 8C.

2.7. WASTES & THEIR DISPOSAL

2.7.1 Introduction

Refuse is discarded waste matter. Excreta mean human urine and faeces. Improper disposal of these wastes is an important cause of ill health in the community.

2.7.2 Types of wastes

1. Dry refuse or solid waste

This includes all unwanted (or) discarded waste material arising from houses & streets & from commercial, industrial & agricultural activities of man.

It includes public & domestic refuse

1 Garbage, kitchen waste, leftover food.

2. Rubbish, waste paper, broken glass, bottles and tins, bits of metal, plastic and rags.

3. Ashes from burning wood, charcoal and cow dung fuel.

4. Animal dung.

5. Street sweepings

6. Fallen leaves

7. Dead animals

2. Wet refuse (or) liquid waste (sullage water) in a rural community consists of:

a. Waste water from houses; after bathing, washing clothes, utensils, vegetables etc.

b. Waste from public wells & washing places.

c. Waste from cattle sheds & market places

d. Waste from cottage industries such as dyeing and weaving.

3. Excreta:

It implies faeces. The sullage water containing night soil is called sewage.

2.7.3 Waste and health

1. Hazards of refuse left lying around are:

* Breeding of flies & other insects and rats.
* Encouraging of dogs & crows.
* Growth of bacteria, and spread of infection by means of flies, dust & contamination of water supply.
* Unpleasant sights & smells
* Danger of falls (e.g.) due to fruit skins on paths.
* Piles of refuse may be a fire hazard.

2. Hazards of liquid waste left as pools of stagnant water are:

* Mosquito breeding
* Risk of polluting water supplies

* Dampness of houses, and danger to foundations of buildings
* Bad smells

3. Improper disposal of human excreta lead to spread of disease in the following ways:

* Flies can convey germs & worm ova from faeces to food.
* Drinking water may be contaminated by infected faeces.
* Food may be contaminated by inadequate hand-washing after defaecation.
* Vegetable & fruits may be contaminated with worm ova in soil or manure, and eaten raw without being washed or cooked.
* Wounds or cracks in the skin may get infected with tetanus from the faeces of man or animals in soil.

a. Bacterial diseases: Cholera, Typhoid and Paratyphoid fevers, Bacillary Dysentery.

b. Parasitic diseases: Amoebiasis, intestinal worms such as hookworm, round worm & tapeworm.

c. Virus diseases: poliomyelitis & infections hepatitis.

2.7.4 Refuse Disposal

2.7.4.1 Methods of Refuse Disposal

1. Open dumping: A simple method of refuse disposal is by dumping in low lying areas, where in course of time; refuse gradually shrinks and decomposes in manure. But open dumping is not a good method of refuse disposal because the refuse, since open, attracts flies and rodents besides being a nuisance where this method is employed.

2. Sanitary filling (or) controlled tipping: This is by far the best method of refuse disposal. The refuse is buried in trenches or pits, 3 feet deep for periods varying from 3 to 6 months. During this period, the refuse is slowly broken down into simpler chemical substances and converted into manure by bacterial action. At the end of 3-6 months the pits are dug open and the manure is brought to surface. The pits are refused. There is no fly nuisance or nuisance from rodents. Controlled tipping is the best method of choice for refuse disposal.

3. Burning: Hospital refuse which is likely to be more infectious than the street refuse is best disposed of by burning. The burning operation is usually carried out in 'incinerators'. Although burning is a good method of refuse disposal, its chief drawback is that the refuse is a loss to the community in terms of manure.

4. Composting: Refuse along with human excreta is disposed of by a method known 'composting'. Pits or trenches are dug 3 feet (1 metre) deep. Then alternate layers of refuse and night soil are spread in the trenches in the proportion of 6" (15cm) and 2" (5cm) thickness of refuse and night soil respectively. The top layer should be of refuse. When the contents reached above the ground level, the pits are covered with earth and compacted**.**

As a result of bacterial action, intense heat is generated within the compost fits. At this temperature the pathogenic & other organisms are killed. The pits gradually cool down. At the

end of 4-6 months, decomposition is complete, and the resulting product is manure which is highly valued for agricultural purposes. This method of refuse and night soil disposal is also known "hot fermentation process".

2.7.4.2 Excreta Disposal: Human excreta is a source of infection. It is an important cause of environmental pollution. Every society has a responsibility for its safe removal & disposal so that it does not constitute a threat to public health.

The health hazards of improper excreta disposal are

1. Soil pollution,
2. Water pollution,
3. Contamination of foods
4. Propagation of flies.

The resulting diseases are typhoid and paratyphoid fever, dysenteries, diarrheas, cholera, Hookworm diseases, ascariasis, viral, hepatitis and similar other intestinal infections and parasitic infestations.

2.7.4.3 Methods of excreta Disposal

There are a number of methods of excreta disposal

A) Service type latrine

B) Non service type (sanitary latrine)

a) Bore hole latrine b) Dug well or pit latrine c) Water seal type of laterine

A.I. type R.C.A type

d. Septic tank

C. Latrine suitable for camps and temporary use

* Shallow french latrine
* Deep french latrine
* Pit latrine
* Bore hole latrine

A) Service type latrine: This type needs someone to collect and empty the buckets of nigh soil (excreta) . It is not recommended except in case of sickness, when a commode or bedpan is needed.

B) Non service type (sanitary latrine) : This is one which does not cause nuisance due to sight or smell, the excreta is not left exposed, and it does not pollute the soil or any water source.

a) Bore hole latrine:

In India it was introduced in 1930s by Rockfeller foundation in campaigns of hookworm control. The latrine consists of a circular hole 30-40cms. (12-16 inches) in diameter dug vertically into the ground to a depth of 6 metres (20 feet) . A concrete slab with a central opening and foot rests is placed over the hole a suitable enclosure is put up to provide privacy.

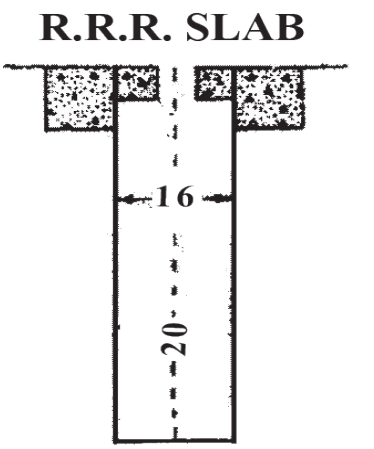


Fig. 2.7 - Bore hole latrine

For a family of 5 or 6 people, it serves well for a period of over a year. When the contents of the borehole reaches within eyesight the bore hole is closed with earth and a new latrine is constructed and similarly used. The excreta in the bore hole are purified by the anaerobic soil bacteria. It should not be constructed within a range of 15 metres (50 feet) from a source of water supply.

The advantages of bore hole latrine

1. No need for the services of a sweeper for daily removal of night soil.
2. Unsuitable for fly breeding.
3. No water or soil pollution.

Disadvantages of bore hole latrine

1. The boreholes fill up rapidly.
2. A special instrument AUGER is required digging the bore hole.

b. Dug well latrine: Here the pit is larger having a diameter of 75cms. (30 inches) . The depth may be 3-3.5 meters (10feet 12 feet or more) .

Advantages of this type of latrine

1. Easy to construct, no need special instrument (Auger)
2. It has longer life because of its greater cubic capacity.
3. It is purified by anaerobic excreta

c. Water seal type of latrine: These are also known as 'hand flushed latrines'. They are cheap and sanitary several designs of water seal latrines have been evolved but 2 have gained recognition for wider use. These are:

1. The PARI - Planning Research and Action Institute at lucknow.
2. RCA type - Research Cum Action.

The R.C.A latrine has been accepted as a suitable design for wide adoption in the country.

The essential features of RCA Latrine

1. Location: The latrine should not be located within a range of 15 metres (50 feet) from a source of water supply. The latrine should not be constructed in areas subject to flooding during rainy season.
2. Squatting plate: The squatting plate or slab is made of cement concrete. It is generally 3 feet (1metre) square with a thickness of about 2 inches (5cm).

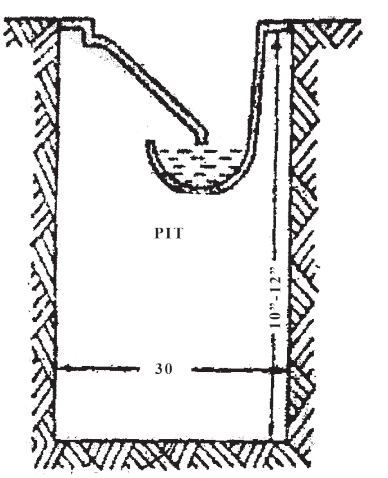


Fig. 2.8 - Water seal latrine

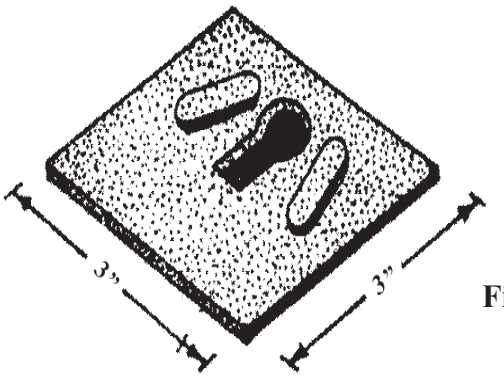


Fig. 2.9 - Squatting Plate

3. Pan: The pans receive the night soil, urine and wash water. The inner surface of the pan must have a smooth finish to percent night soil sticking to the sides.

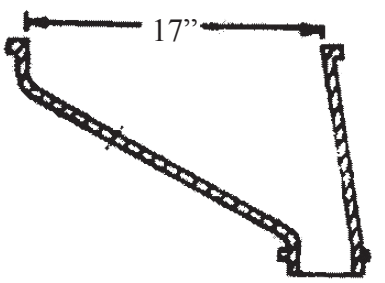


Fig. 2.10 - RCA Latrine Pan

4. Trap: It is bent type about 3 inches (7.5cm) in diameter, and is placed below the pan. It retains water, and seals off the latrine pit from the external environment. The water seal perform 2 important functions.

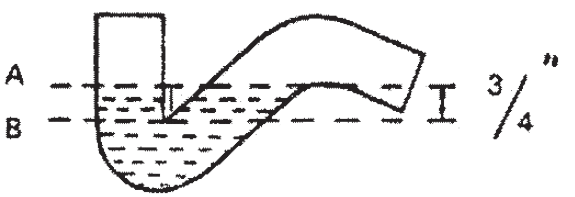


Fig. 2.11 - Trap

a. Prevents the escape of foul gases b. It prevents the access by flies

5. Connecting pipe: It is 3 feet (1metre) long and 3 inches (7.5 cm) in diameter. It connects the latrine to the pit.

6. Pit or Dug well: The pit (or) dug well is usually 30 inches (75cm) in diameter and 10 to 12 (3 to 4 metres) feet deep, and the pit is covered. When the pit fills up, a second pit is dug near the former, and the direction of the connecting pipe is changed.

7. Superstructure: The desired type of enclosure and superstructure is provided for privacy and shelter from sun and rain.

8. Maintenance: The life of a latrine depends upon the care in its usages and maintenance. The squatting plate should be washed frequently, and kept dry and clean. After use, the latrine, should be flushed with adequate quantity of water. Disinfectants such as soap water & phenol should not be thrown into the pit.

d. Septic tank: Septic tank is a sanitary installation for the purification of human excreta. It consists of a water tight tank built of bricks and cement.

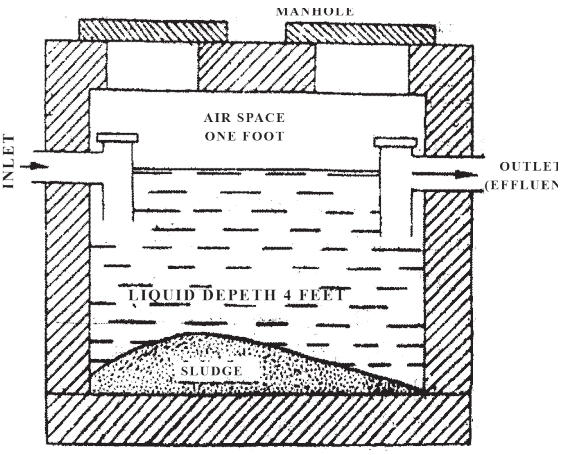


Fig. 2.12 - Septictank

Design features

1. Capacity: The capacity of a septic tank depends upon the number of users. 90-145 litre or 20-30 gallons per user is recommended.
2. Length: The length of a septic tank is more than its breadth in the proportion of 2:1.
3. Depth: The depth of the tank is 5-7 feet (1:5-2 metres) ; but the liquid depth is only 1.2m (4 feet) .
4. Air space: There should be a minimum air space of one foot. (30 cm)
5. In let - and out let: The septic tank has an inlet and as outlet.
6. Cover: Manhole is placed on the top.
7. Retention period: The septic tank is designed to allow a retention period of 23 inch.

C) Latrines suitable for camps & Temporary use:

a) Shallow trench latrine: Shallow trench latrines are best suited for temporary camps & fairs & festivals. A shallow trench 30cms, one foot wide and 90-150cms. (3-5feet) deep is dug with ordinary tools.

The users are instructed to cover faeces with earth after defecation. Water for anal washing should be provided when the trench is 1/3 full, it should be covered with earth and compacted. If necessary a new trench of a similar description may he dug. The excreta is purified by aerobic bacteria.

b. Deep trench latrine: The trench is deeper i.e, 6-8 feet (1.8-2.5m) . This type of latrine is intended for camps of longer duration. The excreta are purified by anaerobic bacteria.

2.7.5 Sewage System

Sewage system involves carriage of sewage, (all liquid wastes and human excreta) through a system of drains and sewers from the point of origin (houses, institutions and factors) to the point of disposal with the help of water.

1. House Drainage : It includes sanitary installation that receive that liquid wastes in the house and are connected with the house drain. They are

a) Latrine, which in this system called water closet b) Bathrooms

c) Washbasins d) Sinks e) Storm or rain water pipe

Water closet: It has following parts:

Pan - it may sitting or squatting in type

Trap - It is a U shaped pipe connecting the pan with the soil pipe. It prevent escape of gases from the soil pipe into the privy.

Flush - It holds about 14 litres of water for flushing.

Bathroom: Water is drained through a square or circular hole covered by a perforated iron plate.

Wash basin: Below the wash basin there is a U-shaped trap. The drain pipe opens into the gulley trap of the bathroom.

Sink: It receives kitchen waste water which contains garbage, silt and ahes.

Rain water pipes system: Three types of pipes are usually seen on the outer wall of sanitary blocks in the building. The largest storm or rain water pipes which drain rain water from the roof into the gulley trap.

2.7.6 Sewage Disposal

Sewage may be defined as water from a community containing solid and liquid excreta, derived from houses, street washings, factories & industries. It resembles dirty water with an unpleasant smell.

1. Treatment of sewage: It may be divided into 4 parts.

a. Preliminary treatment: Separation of heavy suspended and floating matter.

b. Primary sedimentation and decomposition of organic matter into simple forms by anaerobic bacteria action.

c. Secondary: Stabilization or mineralization of end products by aerobic bacterial action. Stabilization means complete breakdown of organic matter to simpler substances so that no further decomposition takes place.

d. Final distinction or destruction of pathogenic organism

a. Preliminary treatment

i. Screening: The sewage first passed through a metal screen. This will remove all floating objects such pieces of wood, garbage, rags, etc.

ii. Grit chamber: Next passed through a long narrow elongated chamber known as the grit chamber by these heavier solids such as sand and gravel settle down.

iii. Primary treatment: The sewage is now admitted into a huge tank known as the primary sedimentation. Sewage spends about 6 to 8hrs in the primary sedimentation tank. During this period 50 to 70 percent of organic matter settles down under the influence of gravity. The solids that settle down into a tank called 'Sludge digester.'

iii. Secondary treatment

a. Trickling filter method: The trickling filter or percolating filter is a bed of stones, 4.8 feet deep and 6-100 feet in diameter. The effluent from the primary sedimentation tank is sprinkled

by a mechanical device over the bed of stones. As the effluent flows down through the bed of stones it gets purified by the action of aerobic bacteria. These organisms form a slimy growth known as 'zoogleal layer'. This biological growth or zoogleal layer is mainly responsible for the purification of sewage.

iv. Final treatment of disinfection of sewage.

a. Chlorination: Chlorine or bleaching powder is added in a proportion of 2.5ppm.

2.7.7 Sullage Disposal

In towns and cities, sullage water is disposed of either in the sewer system of by the surface drainage system. The proper arrangement for disposal of sullage water is needed to avoid haphazard water collections with the attendant problems of fly and mosquito breeding as also of nuisance of sight & smell.

i. Soak Pit : The soak pit is a cheap, simple and sanitary method of disposing sullage water. The soak pit also act as a device for recharging of ground water.

The steps in constructing as improved soak pit as suggested by the later are given below:

1. Choose a proper site which should be away from a house wall atleast 10m distant from any well.
2. Dig a pit about 1metre long, broad 9cm deep.
3. Divide the depth of the pit into 4 equal parts. Fill the lower most part with stones or bricks the size of coconut. Fill the second part stones or bricks the six of a big apple. The third part is to be filled with stones of the size of an average lemon. The fourth or uppermost part is for the inlet chamber.
4. The inlet chamber is constructed as follows.
   a. At the centre, lay the foundation of the chamber, in the form of 4 bricks arranged laid with a gap of 5cm between the bricks, leaving a central space of 12.5×12.5 cm.
   b. Lay over these bricks a second layer of bricks without leaving any space between the joints.
   c. If necessary, similarly lay a third or fourth layer of bricks.
5. Take a 1sq m gunny cloth with the hole in the centre about the size of the inlet chamber.
6. Cover the gunny cloth with a similar sized polythene sheet having a similar hole in the centre.
7. Cover a polythene sheet with soil & fill the pit. Compact the soil properly the soak pit is now ready.
8. Make a pucca drain 7cm wide 110 cm deep from the water outlet to the soak pit inlet.
9. Provide a trap near the middle of the drain to check the entry of suspended solid wastes from entering the pit.
10. Cover the trap and the inlet chamber of the pit with a flat stone.

2.8. HOUSING

Housing as an environment means the building or structure in which we live, work, rest and play they may be private building, residential houses or public building (club school, theatre, workshop, facotry etc) They should be so constructed and laid out as to promote physical mental and social well being.

For physical well-being the house must provide enough space inside and outside to promote health by good light and ventilation and to prevent respiratory infections. It must be constructed on firm and dry soil with sub soil water at a depth more than 3 metres.

For mental well-being the house should afford enough privacy and safety against theft. It should be situated at a place away from excessive noise and offensive odours.

For social well-being the size and construction of the house and the amenities provided should be compatible with human dignity and social respectability; and the neighbourhood should be congenital.

2.8.1 Criteria for healthful housing

An expert committee of the WHO recommended following criteria for health full housing

1. Healthful housing provides physical protection and shelter.
2. Provides adequately for cooking, eating, washing and excretory functions.
3. Is designed, constructed maintained and used in a manner such as to prevent the spread of communicable diseases.
4. Provides for protection from hazards of exposure to noise and pollution.
5. Is free from unsafe physical arrangements due to construction or maintenance, and from toxic or harmful materials and
6. Encourages personal and community development, promotes social relationships, reflects a regard for ecological principles, and by these means promotes mental health.

2.8.2. Housing standards

The minimum standards for housing are as below

1. Site:

a. The site should be elevated from its surroundings so that it is not subject to flooding during rains.

b. The site should have an independent access to a street of adequate width.

c. It should be away from the breeding places of mosquitoes and flies.

d. It should be away from nuisances such as dust, smoke, smell, excessive noise and traffic.

e. It should be in pleasing surroundings.

f. The soil should be dry and safe for founding the structure and should be well drained.

2. Set back: For proper lighting and ventilation, there should be an open space all round the house this is called “set back”. In rural areas it is recommended that the built areas should not

exceed one third of the total area; in urban areas where land is costly, the built up area may be upto two-thirds. The set back should be such that there is no obstruction to lighting and ventilation.

3. Floor: The floor should be pucca and satisfy the following criteria

a. It should be impermeable so that it can be easily washed and kept clean and dry.

b. The floor must be smooth and free from cracks and crevices to prevent the breeding of insects and harbourage of dust.

c. The floor should be damp-proof

d. The height of the plinth should be 2 to 3 feet.

4. Walls : The walls should be

a. reasonably strong

b. Should have a low heat capacity

c. Weather resistant

d. Unsuitable for harbourage of rats and vermin

e. Not easily damaged

f. Smooth

5. Roof : The height of the roof should not be less than 10 feet in the absence of air conditioning for comfort. The roof should have a low heat transmittance coefficient.

6. Rooms : The number of living rooms should not be less than two, at least one of which can be closed for security. The other may be open on one side if that side, is a private courtyard. The number and area of rooms should be increased according to size of family.

7. Floor area: The floor area of a living room should be at least 120sq.ft occupancy by more than one person and at least 100 sq.ft for occupancy by a single person.

8. Cubic Space: Unless means are provided for mechanical replacement of air the height of rooms should be such as to give an air space of at least 500 cu.ft per capita, preferably 1,000 cu.ft.

9. Windows :

a. Every living room should be provided with at least 2 windows and at least one of them should open directly on to an open space.

b. The windows should be placed at a height of not more than 3 feet above the ground in living rooms.

c. Window area should be 1/5th of the floor area. Doors and window combined should have 2/5th the floor are.

10. Lighting: The day light factor should exceed 1 percent over half the floor area.

11. Kitchen: Every dwelling house must have a separate kitchen. The kitchen must be protected against dust and smoke, adequately lighted provided with arrangements for storing food, fuel and provisions; provided with water supply; provided with a sink for

washing utensils and fitted with arrangement for proper drainage the floor of the kitchen must be impervious.

12. Privacy: A sanitary privacy is a MUST in every house, belonging exclusively to it and readily accessible. In the more developed areas of the world, the majority of dwelling units are equipped with water carriage system.
13. Garbage and Refuse: These should be removed from the dwelling at least daily and disposed off in a sanitary manner.
14. Bathing and Washing: The house should have facilities for bathing and washing belonging exclusively to it and providing proper privacy.
15. Water supply: The house should have a safe and adequate water supply available at all times.

2.8.3 Rural housing

In rural areas, the "approved" standards may be lower than in towns. The following minimum standards have been suggested,

a. There should be at least two living rooms
b. Ample verandah space may be provided
c. The built up area should not exceed one-third of the total area
d. There should be a separate kitchen with a paved sink or plat form for washing utensils
e. The house should be provided with a sanitary latrine.
f. The windows should be atleast 10 percent of the floor area.

7. There should be a sanitary well or a tube well within a quarter of a mile for the house.
8. It is insanitary to keep cattle and live stock in dwelling houses. Cattle sheds should be atleast 25 feet away from dwelling houses.
9. There should be adequate arrangement for the disposal of waste water, refuse and garbage.

2.8.4 Housing and Health

Housing is part of the total environment of man and being a part, it is to some extent responsible for the status of man's health and well being. A strong relationship can be established between poor housing and the following conditions.

1. Respiratory infections: Common cold, tuberculosis, influenza, diphtheria, bronchitis, measles, whooping cough, etc.
2. Skin infections : Scabies, ringworm, impetigo, leprosy.
3. Rat Infestation: Plague
4. Arthropods: Houseflies, mosquitoes, fleas and bugs.
5. Accidents : A substantial proportion of house accidents are caused by some defect in the home and its environment.

6. Morbidity and mortality: High morbidity and mortality rates are observed where housing conditions are sub-standard.

7. Psychosocial effects: These effects must not be over looked. The sense of isolation felt by persons living in the upper floor of high buildings is now well known to have harmful effects. Often, also people living in densely populated urban areas feel a similar sense of isolation which may lead to neurosis and behavior disorders.

2.9. NOISE

Noise is often as "unwanted sound", but this definition as "unwanted sound", is subjective because of the fact that one man's sound may be another man's noise. Perhaps a better definition of noise is : "wrong sound, in a wrong place, at the wrong time". Man is living in an increasingly noisy environment the 20th century has been described as the "century of noise". Noise has become a very important "stress factor" in the environment of man, the term "noise pollution" has been recently coined to signify the vast cacophony of sounds that are being produced in the modern life, leading to health hazards.

2.9.1 Sources of noise

The sources of noise are many and varied. These are automobiles, factories, industries, air-craft etc. Noise levels are particularly acute near railway junctions, traffic round-about, bus terminuses and airport. Use of pressure horns, recreational noises of loudspeakers with full volume during festivals particularly at night are other sources of noise production. The domestic noise from the radios, transistors, T.V sets-all add to the quantum of noise in daily life.

2.9.2 Properties of noise: Noise has two important properties:

Acceptable noise levels are as given in table:

Residential	Bed room	25
	Living room	40
Commercial	Office	35-45
	Conference	40-45
	Restaurants	40-60
Industrial	Workshop	40-60
	Laboratory	40-50
Educationsl	Class room	30-40
	Library	35-40
Hospitals	Wards	20-35

1. Loudness' or intensity: Loudness or intensity depends upon the amplitude of the vibrations which initiated the noise. The loudness of noise is measured in decibels (d B) . Normal conversation produces a noise of 60-65dB, whispering 20-30dB, heavy street traffic 60-80dB, and boiler factories about 120dB. A daily exposure up to 85dB is about the limit people can tolerate without substantial damage to their hearing.

It has been observed that the human ear responds in a non-uniform way to different sound-pressure levels, that is, it responds not to the real loudness of a sound, but to the perceived intensity.

2. Frequency : The frequency is denoted as Hertz (Hz) . One hz is equal to one wave per second. The human ear can hear frequences from about 20 to 20,000 HZ,but the range is reduced with age and other subjective factors. The range of vibrations below 20HZ are infra- audible; and those above 20,000Hz is ultra sonic.

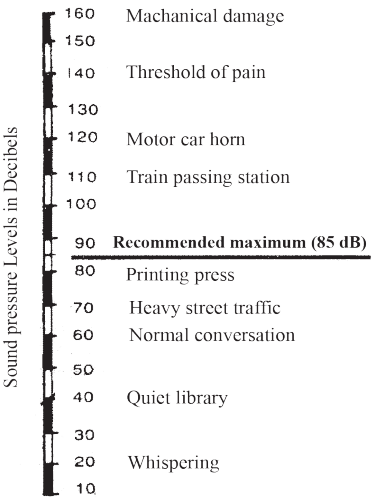


Fig. 2.13 - Noise

2.9.3 Sound levels of some noises

Instruments used in studies on noise: The basic instruments used in studies on noise are:

i. Sound level meter: The sound level meter measures the intensity of sound in dB (or) dB(A).

ii. Octave Band Frequency Analyzer : It measures noise in octave bands. The resulting plot shows the "Sound Spectrum" and indicates the characteristics of the noise, whether it is mainly high-pitched, low-pitched or of variable pitch.

Source of noise	Sound level (dB)
Whisper	10
Speech, 2-3 people	73
Speech on Radio	80
Music on radio	85
Children shouting	79
Children crying	80
Vaccum cleaner	76
Piano	86
Jet take off	150

iii. Audiometer : This measures the hearing ability. The zeroline at the top in the audiogram represent normal hearing. Noise - induced hearing loss shows a characteristic dip in the curve at the 4000 Hz frequency.

2.9.4 Effects of noise exposure

The effects of noise exposure are of two types,

1. Auditory effects

a. Auditory fatigue: It appears in the 90 dB region and greatest at 4000Hz. It may be associated with side effect such as whistling and buzzing in the ears.

b. Deafness: The most serious pathological effect is deafness or hearing loss. The victim is generally unaware of it in early stages. The hearing loss may be temporary or permanent.

2. Non-auditory effects

a. Interference with speech: Noise interferes with speech communication. In every day life, the frequencies causing most disturbances to speech communication lie in the 300-500Hz range. Such frequencies are commonly present in noise produced by road and air traffic. For good speech intelligibility, it is considered that the speech sound level must exceed the speech interference level by approximately 12 of dB.

b. Annoyance: This is primarily a psychological response. Neurotic people are more sensitive to noise than balanced people. Workmen exposed to higher intensity of noise in occupational capacities were often irritated, short tempered and impatient and more likely to resort to agitation and disrupt production.

c. Efficiency: When mental concentration is to be undertaken a low level of noise is always desired. Reduction in noise has been found to increase work output.

d. Physiological changes: A number of temporary physiological changes occur in the human body as a direct rise of noise exposure. These are a rise in blood pressure, a rise in intracranial pressure, an increase in heart rate and breathing and increase in sweating. General symptoms such as giddiness nausea and fatigue may also occur. Noise interferes with sleep. Noise is also said to cause visual disturbance. It is said to cause a narrowing of pupils, affect color perception and reduce night vision.

2.9.5 Control of noise

A variety of approaches may be needed to control noise. These include

1. Careful planning of cities : In planning cities the following measures should be taken to reduce noise, (a) division of the city into zones with seperation of areas concerned with industry and transport. (b) the seperation of residential areas from the main street by means of wide green belts. House fronts should lie not less than 15 metre from the road and the intervening space should be thickly planted with trees and bushes. (c) Widening of main streets to reduce the level of noise penetration into dwellings.

2. Control of Vehicles: Heavy vehicles should not be routed into narrow streets. Vehicular traffic on residential streets should be reduced. Indiscriminate blowing of the horn and use of pressure horn should be prohibited.

3. To improve acoustic insulation of building: From the acoustic stand point the best arrangement is construction of detached buildings rather than a single large building or one that is continuous. Installations that produce noise or disturb the occupants within dwellings should be prohibited. Buildings should be sound-proof where necessary.

4. Industries and Railways: Control of noise at source is possible in industries. Special areas must be earmarked, outside residential areas, for industries, for railways, marshalling yards and similar installations. When these demands cannot be met, protective green belt must be laid down between the installations and residential areas.

5. Protection of exposed persons: Hearing protection is recommended for all workers who are consistently exposed to noise louder than 85 decibels in the frequency bands above 150Hz. Workers must be regularly rotated from noisy areas to comparatively quiet posts in factories. Periodical audiogram check-ups and use of player ear muffs are also essential as the situation demands.

6. Legislation: Many states have adopted legislation providing for controls which are applicable to a wide variety of sources. Workers have the right to claim compensation if they have suffered loss of ability 15 understand speech.

7. Education: No noise abatement programme can succeed without people's participation. Therefore, their education through all available media is needed to highlight the importance of noise as a community hazard.

2.10. Light

Good lighting is essential for efficient vision. If the lighting conditions are not ideal, the visual apparatus is part to strain which may lead to general fatigue and loss of efficiency.

2.10.1 Requirement of good lighting

For efficient vision, the following light factors are essential.

1. Sufficiency: The lighting should be sufficient to enable to eye to discern the details of the object as well as the surroundings without eye strain. An illumination of 15 to 20 foot satisfactory vision. The illumination requirements vary from as little as 5 foot candles in stair way and considers to 100 foot candles in some industries.

2. Distributions: The distribution of light should be uniform having the same intensity, over the whole field of work. If there are contrast differences in light, it will strain the eyes and affect adversely the visual acuity. Proper dispersal of light, without the productions of shadows is therefore necessary for efficient vision.

3. Absence of Glare: Glare is excessive control. The best example of glare is the automobile headlights at night; the same lights during day light would not cause glare owing to the absence of excessive contrast glare may be a direct glare from a light source or reflected glare from sources such as table tops and polished furniture. Glare causes annoyance. The eye cannot tolerate glare because it causes acute discomfort and reduces critical vision.

4. Absence of sharp shadows: Slight shadows are inevitable, but sharp and contrasting shadows are disturbing. Like glare, shadows cause confusion to the eye and therefore should not be present in the field of vision.

5. Steadiness: The source of light should be constant. It should not flicker because flickering causes eye strain and may lead to accident.
6. Colour of light: The colour of light is not very important so long as the intensity is adequate. Since natural light has a soothing effect on the eye, the artifical light should as far as possible approximate the day light colour.
7. Surroundings: When a black object is viewed against a dark background, recognition is difficult. High levels of illumination will be required where there is little colour contrast. For efficient vision colour schemes in rooms are important. Ceilings and roof should have a reflection factor of 80 percent, wall 50 to 60 percent; furniture 30 to 40 percent. There should not be much reflection from the floor, not more than 15 to 20 percent. Contrasting colours are often used to prevent accidents e.g., culverts, bridges etc.

2.10.2 Lighting Standards

Measurement of light: Light contains all visible waves is perceived as white. Ther are four measures in measurement of lights.

1. Luminous intensity: It refers to the "power" of a light source considered as a point radiating in all direction, this is measured as candles or candles power.
2. Luminous flux: It is the flow of light related to a unit of solid angle measured in lumens.
3. Illumination or luminance: It is the amount of light reaching a surface measured in lux per unit area.
4. Brightness or luminance: It is the amount of light reflected from a surface measured in lamberts.

2.10.3 Natural lighting

Natural lighting is derived partly from the visibility and partly from reflection. Natural lighting depends upon the time of the day, season, and weather and atmosphere pollution. Since natural light is accompanied by radiant heat, all attempts should be made to exclude radiant heat while admitting day light.

Suggestions for improving daylight illuminations: The following general principles are taken into consideration in planning for the best utilization of day light.

1. Orientation: Buildings are oriented towards north or south for uniform illumination. This is particularly important in respect of schools, factors and laboratories where uniform lighting is required in all the rooms. When a building faces east and west window shades are provided to protect against the direct penetration of sunlight.
2. Removal of obstructions: Removal of obstructive items either wholly or partially is likely to give the most effective single improvement in lighting.
3. Windows: Windows should be properly planned, as the natural lighting within any room is influenced by the amount of visible sky, the size, shape and arrangement of the window openings. A tall window gives greater penetration of light; a broad window gives greater diffusions of light.
4. Interior of the rooms: In order to obtain the full benefit of the natural illumination, the ceiling should be white; the upper portions of the walls light tinted; and lower portions somewhat darker so as to give comfortable contrast to the eyes.

2.10.4 Artificial Lighting

Day light may not meet the requirement of illumination during all hours, and especially during cloudy days. It should be supplemented by artificial illumination for adequate illumination. Artificial lighting should be as close as possible to daylight in composition. There are five systems of artificial lighting.

1. Direct lighting: In direct lighting, 99 to 100 percent of the light is projected directly towards the working area. Direct lighting is efficient, economical, but tends to cast sharp shadows. It should not fall into the eye.
2. Semi-direct lighting: Here 10 to 40 percent of the light is projected upwards so that it is reflected back on the object by the ceiling.
3. Indirect lighting: Light does not strike a surface directly, because 90 to 100 percent of the light is projected towards the ceiling and walls. Thus gives a general illumination the whole room but not of any object.
4. Semi-indirect: Here, 60 to 90 percent of the light is directed upwards and the rest downwards.
5. Direct indirect: Here, light is distributed equally. No one system can be recommended to the exclusion of others.

2.10.5 Methods of artificial illumination

1. Filament lamps: These are widely used. The electric current heats up the tungsten filament and the light emitted depends upon the temperature. The hotter filaments produce the bluer light. Accumulation of dust on the bulbs reduces illumination by 30 to 40 percent. The bulbs and shades therefore should be cleaned frequently.
2. Fluorescent lamps: Fluorescent lamps are economical in the use of electric current; they are cool and efficient; the light emitted stimulates natural light. The lamps consist of a glass tube filled with mercury vapour and an electrode fitted at each end. The inside of the tube is coated with fluorescent chemicals, which absorb particularly all the ultraviolet radiation and remit the radiation in the visible range.

2.10.6 Lighting standards

Recommended illumination by the Illuminating Engineer Society

Visual Task	Illumination (lux)
Casual reading	100
General office work	400
Fine assembly	900
Very severe tasks	1300 - 2000
Watch making	2000 - 3000

2.10.7. Biological effects of light

Considerable attention has recently been focused on the biologic effects of light. The observation that daylight could cause the in vitro degradation of bilirubin is now being used as

a therapeutic measure in premature infants with hyper bilirubinemia. Other biologic effects of light include effect on biologic rhythms of body temperature, physical activity, the stimulation of melanin synthesis, the activation of precursors of vitaminD, adreno cortical secretion and food consumption.

2.11. Arthropods

Arthopods comprise the most numerous and varied of the living things in the environment of man. Some of them are man's allies helping in the fertilization of flowers, but the majority of arthropods, in general are either of no use to man or are his most dangerous enemies. They destroy man's crops and his food reserves; and some which live close to man act as vectors and carriers of disease. A study of the arthopods of medical importance is known as medical entomology which is an important branch of preventive medicine.

2.11.1 Arthropods of medical importance

The arthropods of medical importance are

1. Mosquitoes :
   - * Anopheles
   - * Culex
2. Flies
   - * House flies
   - * Sand flies
   - * Teste flies
   - * Black flies
3. Human lice:
   - * Head and body lice
   - * Crab lice
4. Fleas
   - * Rat fleas
   - * Sand fleas
5. Reduviid bugs
6. Ticks
   - * Hard ticks
   - * Soft ticks
7. Mites (Chiggers)
   - * Leptotrombidiam mites
   - * Trombiculid mites
   - * Itch mite
8. Cyclops
9. Rodents

2.11.2 Arthropod - Borne diseases

Arthropod - borne diseases constitute a major health problem in India. The arthropod responsible for much ill-health and deaths are listed below:

Transmission of arthropod borne diseases

Three types of transmission cycles are involved in the spread of arthropod - borne disease:

Arthropod	Diseases transmitted
1. Mosquito	Malaria, filaria, Japanese eneephalitis, Dengue fever and dengue harmorrhagic fever
2. Housefly	Typhoid fever, Diarrboea, dysentry, cholera, gastro enteritis amoebiasis, helminthic infestations, poliomylitis, conjunctivitis, trachoma etc.
3. Sandfly	Kala-azar, sandfly fever etc
4. Tsetse fly	Sleeping sickness
5. Louse	Pediculosis, Epidemic typhus, trench fever
6. Rat flea	Bubonic plague, endemic typhus, chiggerosis.
7. Black fly	Onchocerciasis
8. Reduviid bug	Chagas disease
9. Hard tick	Tick typhus, viral encephalitis, viral fevers, tick paralysis.
10. Soft tick	Q fever, relapsing fever
11. Trombiculid mite	Scrub typhus, ricketlsial pox
12. Itech mite	Scabies
13. Cyclops	Guinea Worm disease, fish tape worm
14. Cockroaches	Enteric pathogens

1. Direct contact: In this method of spread, the arthropods are directly transferred from man to man through close contact, e.g., scabies and pediculosis.
2. Mechanical transmission: The disease agent is transmitted mechanically by the arthropod. The transmission of diarrhoea, dysentery, typhoid, food poisoning and trachoma by the house fly are examples of mechanical transmission of the disease agent by the vector.
3. Biological transmission: When the disease agent multiplies or undergoes some developmental change with or without multiplication in the arthropod host, it is called biological transmission. This may be of three types.

a. Propagative: When the disease agent undergoes no cyclical change, but multiplies in the body of the vector, transmission is said to be propagative e.g., plague bacilli in rat fleas.

b. Cyclo propagative: The disease agent undergoes cyclical change, and multiplies in the body of the arthropod, e.g., malaria parasite in anopheline mosquito.

c. Cyclo-development: When the disease agent undergoes cyclical change but does not multiply in the body of the arthropod, e.g., filarial parasite in culex mosquito and guinea worm embryo in cyclops.

2.11.3 Principles of arthropod control

The general principles of arthropod control are:

a) Environmental control b) Chemical control

c) Biological control d) Genetic control

a) Environmental control: This offers the best approach to the control of arthropods because the results are likely to be permanent. Examples of environmental manipulation are:

* Elimination of breeding places (Source reduction)
* Filling and drainage operation
* Carefully planned water management
* Provision of piped water supply
* Proper disposal of refuse and other wastes
* Cleanliness in and around houses etc

b) Chemical Control: A wide range of insecticides belonging to the organochlorine organophosphorus and carbamate groups of compounds are available for vector control. As, these compounds produce environmental contamination, it is now considered essential to replace gradually the highly persistent compounds such as DDT with compounds which are readily "bio degradable" and less toxic to man and animals such as methoxy chlor, abate and smell.

c) Biological control: To minimize environmental pollution with toxic chemicals, great emphasis is now being placed on biological control. The case of larvivorous fish especially gambusia is well known in mosquito control. Fungi of the genus coelomomies are also known to be pathogenic to mosquito.

d) Genetic control: The WHO/ICMR Research unit at New Delhi has contributed massively to the techniques of genetic control massively of mosquitoes. Techniques such as sterile male techniques cytoplasmic incompatibiltiy and chromosal translocations have been found to be effective in small field trials.

5. Newer methods

New and innovative methods are being sought for pest control. These are

a) Insect growth regulators b) Chemosterilants c) Sex attractants or pheromones

2.11.4. Control of Mosquitoes:

The various mosquito control measures may be classified as

i. Anti larval measures ii. Anti-adult measures iii. Measures for personal protection

2.11.4.1 Anti-larval Measures

i. Elimination of breeding places: Since mosquitoes breed in water elimination or abolition of their breeding places (e.g : cespools, drains, polluted water collections) ensures mosquito control. Such breeding places can be eliminated by filling and drainage. This method of control is also known as "Source reduction".

ii. Application of Oil: When oil is applied on water, it has a tendency to spread and form a thin film. It also lowers the surface tension places of when oil is sprayed on breeding places of mosquitoes; it kills mosquito larvae and pupae partly by its drowning action acid partly by its toxic action. When the surface tension is lowered, the larval and pupae are drowned in water, and they are cut off from air supply.

The oils commonly used are crude oil, kerosene oil and petrol. About 10 to 15 gallons of oil would be required to spray one acre of water surface. (110 to 170 liters per hectare). Oil is generally applied once a week.

iii. Paris Green: Paris green or copper aceto-arsenile is a greenish crystalline powder. It contains the poison arsenious oxide". Paris green is effective in killing only the anopheline mosquitoes. It is sprayed on breeding places as 2% dust (ie 2kgs of Paris green and 8 kgs of diluents such as fine road dust or soapstone powder) . The dusting is done by a hand blower or notary blower. The recommended dose it 1.25kgs of paris green dust per hectare of water surface.

iv. Synthetic Insecticides: These are DDT, BHC, Abate, Malathion, etc. Use of these insecticides for control of mosquito larvae is not flavored because the larvae tend to become quickly resistant.

v. Biological control: Certain types of fish readily feed on mosquito larvae. The best known are yambusia. Fish of Barbados fish. In certain situations fish can be employed for control of mosquito larva.

2.11.4.2. Anti Adult Measures:

Community health workers are often faced with the problem of control of adult mosquitoes. Many of these mosquitoes are of nuisance value, although some convey diseases the various measures at our disposal for the control of adult mosquito are

Residual insecticides: DDT, BHC, luidane, Malathion and OMS-33 are currently recommended for control of adult mosquitoes. There insecticides may be sprayed with ordinary stimsup pump on better still with a compression pressure sprayer.

Toxicants suitable against Malaria Vectors as residual spray applications

2.11.5 Control of Housefly

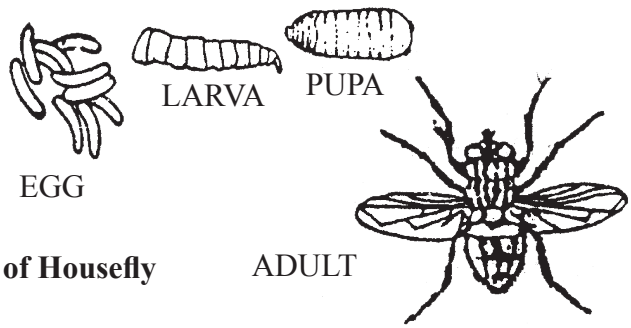


Fig. 2.14 - Life cycle of Housefly

1. Improvement of environmental Sanitation: The fly cannot be controlled unless an improvement in environment sanitation is effects. When environmental sanitation is defective, the fly breeds profusely. The following sanitation measures are essential for fly control.

i. Stopping open air defecation

ii. Provision sanitary latrines

iii. Proper disposal of human and animal excreta in sanitary manner

iv. Proper storage of garbage and kitchen wastes and their sanitary disposal

v. General improvement of sanitation

2. Use of Insecticides: Modern insecticides such as DDT, BHC have now become ineffective in controlling house flies. Largely because the fly has developed resistance of insecticides. If the fly is susceptible, DDT (5%) or malathion (5%) can be used at the rate of 4 litres per 100sqm of area.

3. Fly papers: These are sticky papers prepared by smearing a hot mixture of resin and castor oil. The flies lighting on the sticky paper are trapped. Only a slight reduction of flies may be expected from the use of fly papers.

4. Protection Against flies: Screening of houses, hospitals, fish and meat markets and all other similar establishment by wire mesh will give considerable relief from house flies but screening is expensive for general use.

5. Health education: No fly control campaign can succeed without the willing cooperation of the people. People must be motivated with a device to get rid of flies through health education.

2.11.6 Head & Body Lice

1. Insecticides:

a. Head Louse : The head louse can be quickly controlled by the application of 1% DDT dust. The powder is applied to the hair and after 24hours, the hair is washed. A second application may be repeats after 1 week. Alternatively 0.2% lindance (Gamma BHC) dissolved in coconut oil can be used.

b. Body lice: Application of DDT dust is the treatment of choice. The powder is blown in to inner surface of clothing from all openings. This procedure is called delousing. If the lice are resistance to DDT, percent malathion or lindane may be used.

2. Personal Hygiene: A daily bath with soap & water is essential to limit louse infestation. Women with long hair should wash and clean their hair frequently. Clothing towels and sheets should be washed in hot waters & soap and pressed with hot iron. Autoclaving of clothes & adding is steam sterilizers may be required for body louse control.

2.11.7 Rat Fleas

2.11.7.1 Control of fleas

1. Insecticides

* Fleas are quickly controlled by spraying to percent DDT dust or 5 percent malathion dust.

* The dust must also be blown into rat holes with the help of dust blowers.

2. Control of Rats

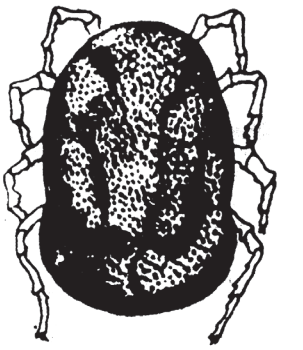
When the rats are controlled, fleas are also controlled.

2.11.8 Ticks

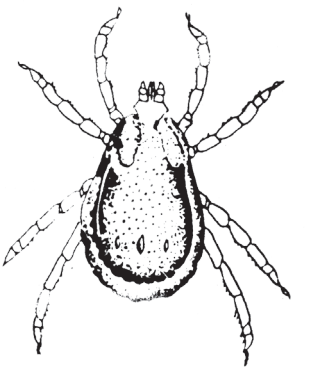
2.11.8.1 Control of Ticks

1. Insecticides: Ticks may be controlled by spraying DDT, lindane or malathion of the rate of 1 to 2 lbs per acre of tick- infested area animals like dogs and cattle and their premises should also be treated like wise.
2. Sanitation: Cracks and crevices in ground, particularly near buildings should be filled up.
3. Protection of workers:

* Exposed workers should wear protecting clothing.
* At the end of days work, they should examine themselves for ticks and remove promptly any ticks found on their person.



(a) Soft Tick



(b) Hard Tick

Fig. 2.15

2.11.9 Itch Mite

2.11.9.1 Control of Itch mite

Scabies is best controlled by treating all members of the affected family. The patient is first given a good scrub with soap and water, and then one of the following medicaments may be applied.

* Benzyl benzoate (25% emulsion)
* Sulphur ointment 2 to 10 percent
* Benzene hexachloride (0.5% in coconut oil)
* Advice the client to take daily bath
* Advice them cut short the nails
* Wearing clean cloth is important
* Advice the family members should not sleep together
* Advise the client use separate soap and towel
* The clothes should be washed and put it in direct sunlight

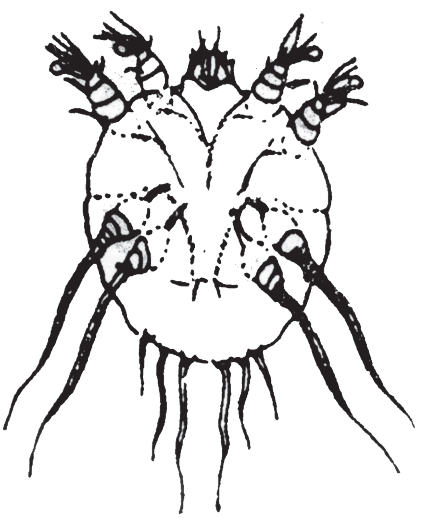


Fig. 2.16 - Itch Mite

2.11.10 Rodents

2.11.10.1 Control of Rodents

1. Trapping

- Trapping is an ancient device for capturing rats.
- The captured rats must be destroyed; this is usually done by immersing the trap in water.
- Trapping causes a temporary reduction in the number of rats.

- To be effective, it must be done on a community basis
- Rats by nature are suspicious animals; they soon become trap wise and avoid traps.

2. Rat poisons or rodenticides: Barium carbonate: Baits are prepared by mixing 4 parts of wheat or rice flour; and one part of Barium carbonate. The mixture is made into small round marbles with water. The poisoned baits are placed near rat holes, and along rat runs. On eating the pills, the rats are killed in 10-48 hours.
3. Zinc phosphide: This is used in the ratio of 1 part of zinc phosphide to 10 parts of wheat flour. These pills are very poisonous. Rats are killed in about 3 hours. Great precaution must be taken in preparing these buits; rubber gloves must be used. the left-over pills must be used. The left-over pills must be collected in the morning and kept away till further use.
4. Fumigation: Cyanogas (Calcium cyanide) is extensively used for the fumigation of rat burrows. About 2 ounces (55gms) of the chemical is pumped into each rat burrow using a special "foot pump". The chemical on contact with moisture gives off hydrogen cyanide gas which kills both rats and rat fleas. Trained personnel are required to carry out fumigation.
5. Improvement of sanitation: Rat requires three things - food, water and shelter; if these are denied, rats will naturally be eliminated. In other words, improvement of environmental sanitation is essential for the permanent control of rats and mice. These measures mainly comprise.

Proper storage of food stuffs

- Construction of rat proof buildings, godowns and warehouses.
- Proper collection and disposal of garbage
- Elimination of rat burrows by blocking them with concrete

2.11.11 Cyclops

2.11.11.1Control of cyclops

1. Physical :

a. Straining : Straining of water through a piece of fine cloth is sufficient to remove cyclops.

b. Boiling: Cyclops is readily killed by heat at 60 deg c. The physical methods are useful for individual prophylaxis.

2. Chemical

a. Chlorine: Chlorine destroys cyclops and larvae of guinea-worm in a strength of 5ppm. The excess chlorine needs to be removed by dechlorinating agents.

b. Lime : Lime at a dosage of 4 gram per gallon of water is found to be very efficient for killing cyclops.

c. Abate: The organophosphorus insecticide, Abate has been found effective in killing Cyclops at a concentration of 1mg/litre. This indicates that abate is potentially useful in the chemical control of the gained worm infection.

3. Biological: Certain kinds of small fish, (e.g) barbell fish and gambusion fish have been found to feed on Cyclops. The most satisfactory and permanent method of controlling cyclops in drinking water is to provide piped water supply or tube of sanitary wells should receive attention in rural areas.

Summary

- Environmental sanitation means "the control of all those factors in man's environment.
- Importance of environmental sanitation is prevention of diseases and promotion of health of individuals and communications.
- Water is essential for all metabolic functions of life.
- The sources of water are (i) rain (ii) surface water (iii) Ground water.
- The wells are 2 kinds (i) shallow well (ii) Deep well
- Sanitary well defined as "Properly located well constructed, protected against contamination.
- There are 3 methods of water purification (i) Water purification on large scale (ii) Water purification of medium (iii) Water purification on small scale.
- One person breathes 14 kg of air per day.
- Ventilation means exchange of vitiated air inside the room.
- The optimum floor space per person in India is 5 to 10 square meter
- There are 2 types of ventilation:

  i. Natural ventilation ii. Artificial ventilation
- Types of wastes are

  i. Dry refuse ii. Wet refuse iii. Excreta
- Methods of refuse disposal are

  i. Open dumping ii. Sanitary filling iii. Burning iv. Composting
- Types of latrine are

  i) Service type ii) Non service type

  iii) Latrine suitable for camps & temporary use.
- The latrine should be located within a range of 15 metres from the source of water supply.
- The sewage system can be divided into 3 parts

  i. House drainage ii. Drains & Sewers iii. Sewege treatment & disposal
- The secondary treatment for sewage disposal is trickling filter method.
- The soak pit is a cheap, simple, sanitary method of sullage disposing sullage.
- The two methods of artificial illumination are filament lamps fluorescent lamps.
- A study of the arthropods of medical importance is known as medical entomology.

- The arthropods of medical importance are mosquitoes, flies, human lice fleas, reduvid bugs, ticks, nuts and cyclops.
- Three types of transmission cycle involved in the spread of arthropod borne diseases are direct contact mechanical transmission, biological transmission.
- The general principles of arthropod control are; environmental control, chemical control, biological control, genetic control.
- Housing means the building or structure in which we live work, rest and play.
- The minimum standards for housing are site, set back, floor, walls, roof, rooms, floor area, cubic space, windows, lighting, kitchen, privy, garbage and refuse, bathing & washing, water supply.
- Poor housing will lead to respiratory infections, skin infections rat infestations, arthropods, accidents, morbidity &mortality and psychosocial effects.
- Noise is often defined as “unwanted sound”,
- The 20th century has been described as the “Century of Noise”
- The properties of noise are Loudness or intensity and frequency.
- The instruments used in studies on noise are sound level meter. Octave band frequency analyzer, audiometer.
- The effects of noise exposure are of two types: auditory effect and non-auditory effects.
- The various approaches used for control of noise are: careful planning of cities, control of Vehicles, acoustic insulation of building, industries and railways, protection of exposed persons, legislation and education.
- Good lighting is essential for efficient vision
- The light factors needed for efficient vision are sufficient distribution, absence of glare absence of sharp, shadows, steadiness, color of light and surrounding
- The four measures used in measurement of light are luminous intensity, luminous flux, illuminance and luminance.
- Natural light is derived partly from the visible sky and party from reflection.
- Day light if needed should be supplemented by artificial illumination for adequate illumination.

QUESTIONS

I. Choose the correct answer

1. Rivers and streams are comes under

a) Surface water b) Ground water c) Rain water d) well water

2. The water best for drinking is

a) Surface water b) Rain water c) Ground water d) well water

3. Amount of chlorine to be added for 1 litre of water is

a) 15 gms b) 20 gms c) 25 gms d) 30 gms

4. Sources of air pollution

a) Industrial b) Motor vehicles

c) All the above d) none of the above

5. Effect of air pollution

a) Chronic bronchitis b) Diabetes Mellitus c) Hyper tension d) headache

6. The ill effects of unventilated room

a) Increased blood pressure b) Increased respiratory rate

c) Nausea & Vomiting d) diarrhea

7. The optimum floor space is

a) 1-2 sq m/person b) 2-5 sq m/person

c) 5-10 sq m/person d) 10-15 sq m/person

8. The best method of refuse disposal

a) Open dumping b) Controlled tipping

c) Burning d) all of the above

9. The sanitary methods of latrine is

a) R.C.A. Type latrine b) Shallow trench latrine

c) Deep trench latrine d) all of the above

10. The methods of sewage disposal

a) Controlled tipping b) Composting

c) Trickling filter method d) all of the above

11. The acceptable noise level in a class room is

a) 35-45dB b) 40-45dB c) 30-40dB d) 20-30 dB

12. The window should be of the floor are

a) 1/5th b) 2/5th c) 1/3th d) all of the above

13. The disease caused due to itch mite is

a) Scabies b) Malaria

c) pediculosis d) all of the above

14. The reflection factor for wall is

a) 80 percent b) 50 percent

c) 40 percent d) all of the above

15. The skin infection caused due to poor housing **is**

a) Diphtheria b) Scabies

c) Plague d) all of the above

II. Fill in the blanks

1. The 20th century has been described as the _____.
2. The loudness is measured in _____.
3. The range of vibrations above 20,000Hz is _____
4. The hearing ability is measured using _____
5. The floor area of a living room should be at least _____ for occupancy by more than two persons.
6. The cattle sheds should be at least _____ away from dwelling houses.
7. The study of the arthropod of medical importance is known as _____
8. The basic minimum illumination for satisfactory vision is _____ candle.
9. Brightness is measured in _____
10. The recommended illuminates for casual reading is _____ lux
11. Rapid sand filter was introduced in the year of _____
12. Dry refuse otherwise called as _____
13. Sullage water containing night soil is called as _____
14. The depth of the septic tank is _____
15. The latrine should be located with in the range of _____

III. Write short notes (5 marks)

1. Control of noise
2. Criteria for healthful housing
3. Principles of arthropod control
4. Transmission of arthropod borne diseases.
5. Requirements of good lighting
6. Prevention and control of air pollution

7. Methods of ventilation
8. Types of wastes & ill effects to health
9. Non service type of latrine
10. Methods of refuse disposal
11. Scabies control

IV. Write briefly on (10 marks)

1. Housing standards
2. Purification of water
3. Treatment of sewage
4. House drainage
5. Agents affect the atmosphere

V. Write in detail (20 marks)

1. Noise
2. Housing
3. Light
4. Arthropods
5. Sanitary latrine
6. Sewage Disposal
7. Ventilation
8. Air pollution
9. Water purification on large scale and small scale
10. Sources of water

3. COMMUNICABLE DISEASES

Communicable disease is an illness caused due to a specific infectious agent or its toxic products capable of being directly or indirectly transmitted from man to man, animal to animal or from environment to man or animal. These diseases are grouped as water-borne, air borne, vector borne, fomite – borne diseases etc. The mode of transmission may be through oro- faecal route, parasites, air, vectors, animals and by direct contact.

3.1. TERMINOLOGY

Infection : The entry and development or multiplication of an infectious agent in the body of man or animals.

Contamination : The presence of infections agent on a body surface, also on or in clothes, beddings, toys, surgical instruments or dressings or other inanimate articles or substances including water, milk and food.

Infestation : For persons or animals the lodgment, development and reproduction or arthropods on the surface of the body or in the clothing (e.g) ice, itch mite.

Host : A person or other animal including birds and arthropods that affords subsistence or lodgment to an infectious agent under natural condition.

Communicable diseases : An illness due to specific infections agent or its toxic products capable of being directly or indirectly transmitted from man to man, animal to animal or from the environment to man or animal.

Epidemic : The unusual occurrence or sudden outbreak of disease in a community or region.

Endemic : It refers to the constant presence of a disease or infections agent within a given geographic area or population group.

Sporadic : The word sporadic means scattered about. The diseases are so few and separated widely in space.

Pandemic : An epidemic usually affecting a large proportion of the population, occurring over a wide geographic area such as a section of a nation.

Zoonosis : An infection or infections disease transmissible under natural conditions from vertebrate animals to man.

Eradication : Termination of all transmission of infection by extermination of infections agent through surveillance and containment.

Carriers : A carrier is defined as “an infected person or animal that harbours a specific infections agent in the absence of clinical manifestation but potentially source of infection.

3.2. DISEASES TRANSMITTED THROUGH WATER

3.2.1. Typhoid fever : Typhoid fever is an acute infections disease caused by Salmonella typhi.

Mode of transmission : Faeco oral route or urine oro route.

Incubation period : 10 days to 15 days and with a range of 5 days to 3 weeks.

Clinical manifestations

- Continuous fever for 3 to 4 weeks associated with chills and high fever. The fever ascends in a step ladder fashion.
- During the prodormal stage there is malaise, headache, cough and sore throat, often with abdominal pain, constipation, especially in early stage or pea soup diarrhoea.
- Urine and stool culture is positive for salmonella.
- In the later phase spleenomegaly, abdominal distension and tenderness, relative bradycardia, dicrotic pulse.
- The rash (rose spots) commonly appears during the second week of disease.

Complications : Complications occur in about 30 percent of untreated cases. Intestinal haemorrhage is manifested by a sudden drop in temperature and signs of shock followed by dark or fresh blood in the stool. Intestinal perforation is most likely to occur in the third week.

Less frequent complications are urinary retention, pneumonia, thrombophlebitis, myocarditis, psychosis, cholecystitis, Nephritis and osteomyelitis.

Treatment

The drugs of choice for treatment of typhoid fever are chloramphenicol, ampicillin, amoxicillin and trimethoprim – sulfamethoxazole can be given in divided doses according to physician's level.

Plenty of water to be given and bland and easily digestible diet to be given.

Control Measures

1. Control of reservoir
2. Control of sanitation
3. Immunization

1. Control of reservoir

i. Early Diagnosis : Stools are important investigations in the diagnosis of cases.

ii. Notification : This should be done where such notification is mandatory.

iii. Isolation : Since typhoid fever is infectious and has a prolonged course, cases should be isolated till three bacteriologically negative stools and urine reports.

iv. Disinfection : Stools and urine are the sole sources of infection. They should be received in closed containers and disinfected with 5% cresol for at least 2 hours.

All soiled clothes and linen should be soaked in 2% chlorine solution and steam sterilized.

All health care providers should disinfect their hands, follow-up examination of stools and urine should be done for typhoid 3 to 4 months.

Carriers should be identified by cultured and serological examination. All carriers should be given an intensive course of ampicillin or amoxicillin (4-6 gms/day) together with probenecid (2g/day) for 6 weeks. The carriers should be kept under surveillance. They should be prevented from handling food, milk or water for others. Health education regarding washing of hands with soap, after defecation or urination and before preparing food is an essential.

2. Control of sanitation

Protection and purification of drinking water supplies, improvement of basic sanitation and promotion of food hygiene.

3. Immunization

Polysaccharide is given in single dose subcutaneous or intra muscular. Protection reach 28 days after infection.

Live oral Ty21 a vaccine capsule is administered on days 1, 3 and 5 irrespective of age, one hour before a meal with cold or lukewarm milk or water. Protection commences 2 weeks after taking the last capsule and lasts for atleast 3 years.

3.2.2. Cholera : Cholera is an acute infections disease caused by cholera vibrio (Vibrio cholerae)

Mode of transmission: Oro-faecal route.

Incubation period: Few hours to 5 days

Clinical manifestations

- Sudden onset of severe diarrhoea otherwise known as rice water stools.
- Vomiting
- Skin pale
- Extremities are cold.
- Blood pressure is low.
- Muscular cramps
- Eyes are sunken
- Husky voice
- Pulse rapid and feabile.
- Urine output is reduced or stopped.

In Children – Fever, convulsions or coma, loss of muscular tone.

Treatment

- Replacement of fluids and Electrolytes.
- Antibiotics : Tetracycline or ceptardine 250 mg – 500 mg QDS od.orally or parently as prescribed by the physician.
- Antidiarrhoeals
- Nutrition : Rice conjee, buttermilk etc.
- If the child is breastfed ask the mother to continue breast feeding.

Control measures

1. Verification of the diagnosis : All cases of diarrhea should be investigated even on the slightest suspicion for specific diagnosis of cholera, it is important to identify V. Cholera in the stools of the patient.
2. Notification : Cholera is a notifiable disease locally, nationally and internationally. Health workers at all levels should be trained to identify and notify cases immediately to the local health authority.

3. Early case finding : An aggressive search for case (mild, moderate, severe) should be made in the community to be able to initiate prompt treatment.

4. Establishment of treatment centres : It is necessary to establish easily accessible treatment facilities in the community. The mildly dehydrated patients should be treated at home with oral rehydration fluid. Severely dehydrated patients, requiring intravenous fluids, should be transferred to the nearest treatment centre to hospital. Where health services are poor and cholera is endemic or threatening mobile teams should be established at the district level.

5. Rehydration therapy : The rehydration may be oral or intravenous

6. Adjuncts to therapy : Antibiotics should be given as soon as the vomiting has stopped which is usually after 3 to 4 hours of oral rehydration.

The antibiotics for children

a) Tetracycline 12.5 mg 1 kg QID x 3 days

b) Trimethroprim TMP 5 mg/kg Bd x 3 days

c) Sulfamethoxazole and smx 25 mg/kg

Adults

a) Doxycycline 300 mg stat

b) Tetracycline 500 mg QID x 3 days.

c) Trimethroprime TMP 160 mgbd x 3 days

d) Sulfamethoxazole smx 600 mg

e) Fulrazolidone 100 mg QID x 3 days for pregnant women.

7. Epidemiological investigations

Epidemiological studies must be undertaken to define the extent of the outbreak and identify the modes of transmission.

8. Sanitation measures

a) Water Control: All steps must be taken to provide properly treated or otherwise safe water to the community for all purposes (drinking, washing, cooking) .

b) Excreta Disposal: Provision of simple, cheap and effective excreta disposal system is vital during epidemics of cholera .Health education messages should stress the proper use of such facilities.

c) Food sanitation : Steps to be taken to improve food sanitation, particularly sale of foods under hygienic conditions. Health education regarding eating cooked hot food, and of proper individual food handling techniques.

d) Disinfection : Both concurrent and terminal disinfection to be done. Most effective disinfectant is coal tar and bleaching powder clothes and personal items to be disinfected with dettol solution.

9. Chemoprophylaxis : Tetracycline is the drug of choice. It has to be given over a 3 day period in a twice daily dose.

10. Vaccination : Parentral vaccine : Serotypes of V.cholerae 01 per ml, so that each milliliter of the vaccine contains a total of 12,000 million vibrios.

Oral Vaccine : A vaccine consisting of killed whole cell v.cholerae 01 in combination with a recombinant B-sub unit of cholera toxin (we/rBs) given orally in two dose schedule 10-14 days apart.

11. Health Education

- The effectiveness of simplicity of oral rehydration therapy
- The benefits of early reporting for prompt treatment.
- Food hygiene practices
- Hand washing after defecation and before eating.
- The Benefits of cooked hot food and safe drinking water.

During the year 1980-81, strategy of the National cholera control programme was undergone changes and it is termed as Diarrhoeal Diseases control programme. Oral Rehydration solution is promoted as first line of treatment.

3.2.3. Hepatitis A : Hepatitis A is a systematic disorder that primarily affects the liver.

Causative organism – Heptatitis A virus, a entero virus.

Mode of Transmission – Faecal oral route and direct contact.

Incubation period – 15 to 50 days usually 28 days.

Clinical manifestation: Fever, malaise, severe anorexia, nausea and vomiting, pain in right hypochondric region, passing dark colour urine and pale stool.

Treatment : The patient has to be provided with adequate rest. Bland diet should be provided.

Control and preventive measures

a) Control of reservoir : control of reservoir is difficult because of the following factors

   (a) Faecal shedding of the virus is at its heigh during the incubation period and early phase of illness.

   (b) The occurance of large number of subclinical cases.

   (c) Absence of specific treatment.

   (d) Low socio economic profile of the population.

The use of 0.5 percent sodium hypochlorite has been strongly recommended as an effective disinfectant.

b) Control of transmission : The best means of reducing the spread of infection is by promoting simple measures of personal and community hygiene (eg) hand washing before eating and after toilet.

- Sanitary disposal of excreta.

Purification of community water supplies by flocculation, filtration and adequate chlorination.

c) Control of susceptible population : A well established procedure is the use of normal immunoglobulin prepared from pooled plasma of healthy donors (gamma globulin) to induce passive immunity.

d) Vaccines: Several inactivated or live attenuated vaccines against hepatitis A have been developed, but only 4 inactivated hepatitis A vaccines are currently available. The vaccines are given parenterally as a 2 dose series 6-18 months apart.

3.2.4. Acute Diarrhoeal Diseases :

Diarrhoea is an acute or chronic intestinal disturbance characterized by passing of more than three bulk motions in a day or 24 hours.

Causative organism

Bacteria : Escherichia coli, Shigella, salmonella etc.,

Virus : Rota virus, adenovirus etc.

Parasites : Entameoba hystolytica, Giardia lamblin etc.,

Mode of transmission

- Faeco – oral route
- Direct transmission

Incubation period : Few hours

Clinical manifestation

- Stools loose and fluid in consistency, greenish or yellow green in colour, may contain mucus or blood.
- Vomiting
- Fever
- Poor skin turgor, dry skin and dry mouth
- Sunken fontanelles in children.
- Sunken eyes
- Tachycardia
- Hypotension
- Irritable and restlessness
- Pallor
- Rapid respiration

Fig. 3.1 - Mode of Transmission

Sudden collapse if not treated properly

Treatment: Oral rehydration therapy: Give home available liquids like rice water, oral rehydration solution packet to be dissolved in one litre of drinking water and stir with clean

spon, till it dissolves. Give ¼ to ½ cup after every loose motion to a child less than 2 years of age and 100-200 ml if the child is above 2 years. The solution should be consumed within 24 hours and should not be heated or boiled.

Appropriate feeding

a) Coconut water
b) Rice water
c) Dhal water
d) Mashed banana
e) Water tea
f) Breakfast feeding to be continued.

Appropriate drugs:

a) Bacterial infection : Ampicillin, chloramphenicol
b) Symptomatic treatment for fever, vomiting etc.
c) Protozol infection – metronidazole.
d) Intravenous infusion to severly dehydrated clients.

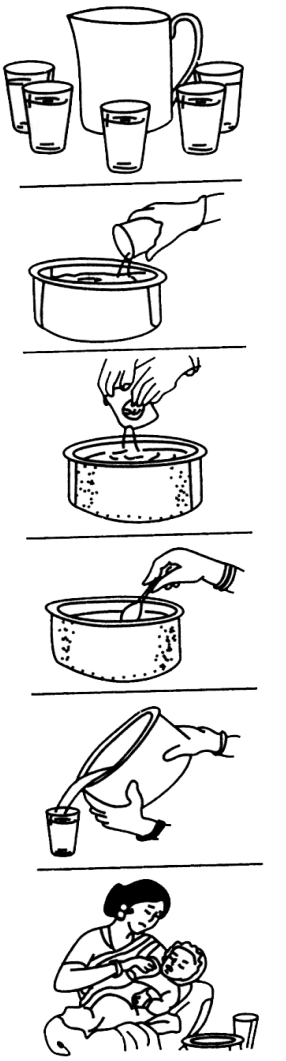


Fig. 3.2 - Preparations of ORS

3.2.5. Poliomyelitis : Poliomyelitis is an acute viral infection caused by polioviruses. It is a crippling disease.

Causative organism : Three types of polioviruses (Type I, II, III)

Incubation period : The usual range of incubation period is 7 to 21 days. It may vary from 3 to 35 days.

Mode of Transmission : Faeco – oral route : Through contaminated water, food, fingers etc.

Droplet infection : Coughing and sneezing an important route of transmission during the acute stage.

Clinical manifestations

a) Respiratory – Coryza, sore throat or cough.
b) GI Tract – Vomiting, diarrhea or constipation.
c) Constitutional – Fever, headache, drowsiness, restlessness, irritability and sweating.
d) Pains – Spontaneous or provided by movement of back, neck, limbs.
e) Hyperparesthesia
f) Nuchal and spinal rigidity
g) Tachycardia
h) Excessive perspiration
i) Paralysis

Treatment : Milk analgesics and sedatives to relieve pain and induce sleep.

For constipation – Mild laxatives

Antibiotics to prevent respiratory complication.

If respiratory failure occurs , treat with artificial respirators.

Control measures

i) Sanitation : Measures to reduce transmission emphasize the traditional improved water supply, improved excreta disposal and improved domestic and food hygiene. Simple hygienic measures like hand washing with soap before preparing food, before eating, before feeding a child, after defecation, after cleaning a child who has defecated and after disposing off a child's stool should be promoted.

ii) Health education : Environmental sanitation measures require educational support to ensure their proper use and maintenance of such facilities. An important part of health workers job is, to help prevent diarrhea by convincing and helping community members to adopt and maintain certain preventive practices such as breast-feeding, improved weaning clean drinking water, use of plenty of water for hygiene, use of latrine, disposal of stools of young children etc.

iii) Immunization : Immunization against measles is a potential intervention for diarrhea control.

iv) Fly control : Flies breeding in association with human or animal faeces should be controlled.

Poliomyelitis preventive measures : Immunization is the sole effective means of preventing, poliomyelitis. Both killed and attenuated vaccines are available and both are safe and effective when used correctly. It is essential to immunize all infants by 6 months of age to protect them against polio.

Two types of vaccines are used

1. Inactivated (salt) polio vaccine (IPV) 2) Oral (Sabin) polio vaccine (OPV)

3.2.6. Food Poisoning : Food poisoning is an acute gastro enteritis caused by the ingestion of living bacteria or their toxins. (e.g) Salmonella, staphylococcal, clostridium, botulinum.

Incubation period : One hour to 24 hours.

Clinical manifestation: Vomiting, nausea, retching, abdominal tenderness, dehydration, hyperthermia, head ache, tachycardia, frequent stools may contain mucus and blood, undigested food particles and offensive in nature.

Treatment : Fluid replacement with oral rehydration solution and intravenous fluids if necessary. Antibiotics as prescribed by the physician. Easily digestable, bland liquid diet.

Control measures

i) Food sanitation

Meat inspection : The food animals must be free from infection.

ii) Personal hygiene : A high standard of personal hygiene among individuals engaged in the handling, preparation and cooking of food is needed.

iii) Food handlers: Those suffering from infected wounds, boils, diarrhea, dysentery, throat infection etc., should be excluded from food handling. The medical inspection of food handlers is required.

iv. Food handling techniques : The handling of ready to eat foods with bare hands should be reduced to a maximum.

v. Health education : Food handlers should be educated in matters of clean habits and personal hygiene, such as frequent and through hand washing.

vi. Refrigeration : Proper temperature control in the prevention of bacterial food poisoning. Food should not be left in warm pantries. Cook and eat the same day is a golden rule. Cold is bacteriostatic at temperature below 4^{o}C and refrigeration temperature should not exceed this level.

3.3. DISEASES TRANSMITTED THROUGH PARASITES

3.3.1. Amoebiasis : Amoebiasis is a common infection of the human gastro intestinal tract.

Causative organism : Entamoeba histolytica.

Incubation period : As long as the cysts are excreted, the period may be several years, if cases are unrecognized and untreated.

Mode of transmission

- Faecal – oral route.
- Sexual transmission among male homosexuals.
- Flies, cockroaches, rodents and contaminated food and drinks.

Clinical features

- Colicky abdominal pain.
- Diarrhoea : watery foul smelling stool containing blood streaked mucus.

Treatment : Flagyl 800 mg thrice daily for 5 to 7 days.

Control measures

- Sanitary disposal of human excreta.
- Provision of safe and adequate drinking water.
- Hygienic kitchen practice.
- Protection of food against flies.
- Periodic examination of food handlers.
- Health education regarding
  - Proper toilet habits
  - Releasing and protecting vegetables and fruits.
  - Controlling insects.

Preventive measures

- Periodic deworming at intervals of 2 to 3 months.

3.3.2. Hookworm infection: Hookworm disease is a chronic infestation of small intestine. They may occur as single or mixed infections in the same person.

Causative organism:

- Ancylostoma duodenale
- Necator americanus

Incubation period: Six weeks

Mode of transmission: Infective larvae from soil enter the human host by piercing the skin of bare foot.

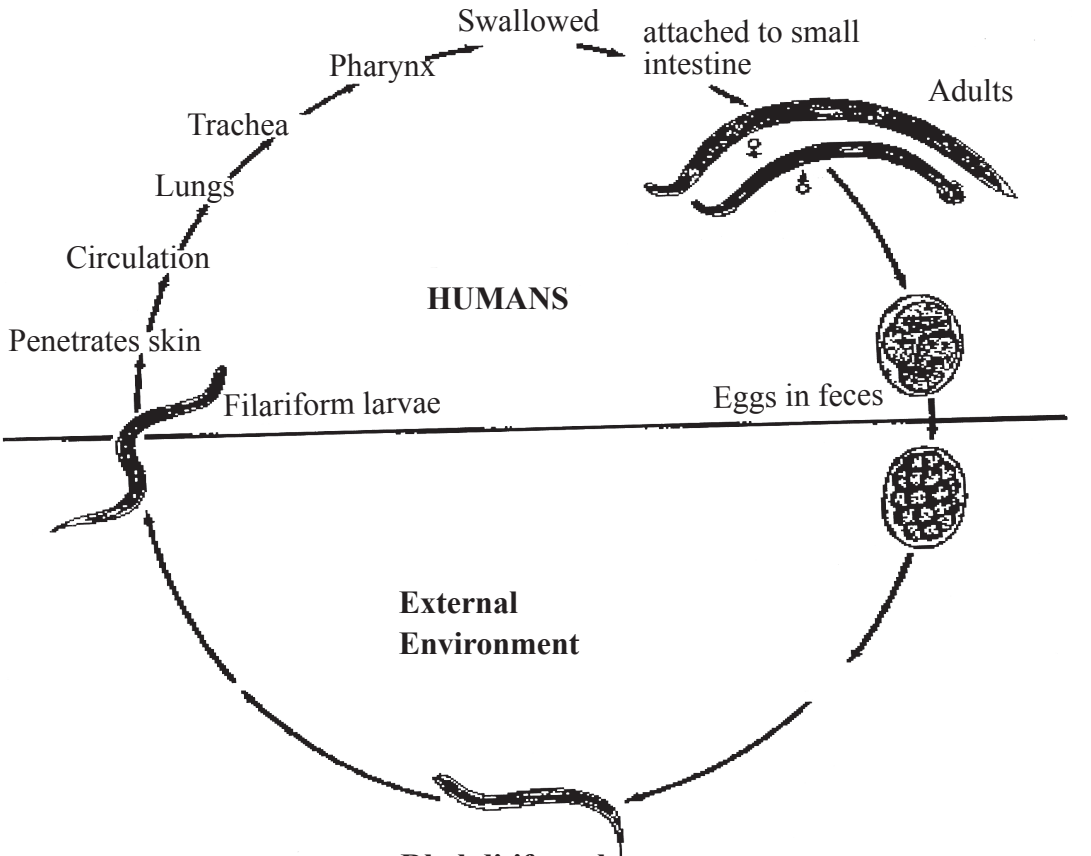


Fig. 3.3 - Hookworm life cycle

Clinical manifestations

- Hookworms occur in the small intestine, particularly jejunum. They cause small ulcers in the intestine and cause chronic blood loss, leads to iron deficiency anemia.
- Weakness, puffiness of the face.
- Flatulance, constipation with alternate diarrhea and pain in the abdomen.
- Odema of legs and palpitation.
- Pallor of the whole body, tongue and conjunctiva.
- Slight fever
- Loss of appetite
- Malnutrition

- Infected children may have retarded mental and physical development leading to delayed puberty.
- Affected persons have low body resistance.

Treatment

- The drug of choice is Tablet .Mebendazole.
- Hookworm anaemia is treated with iron and folic acid.
- Prevention and control measures
- Sanitation measures
- Sanitary latrines
- Efficient sewage disposal
- Disinfection of all faeces to avoid contamination water and soil.
- Maintain personal hygiene and cleanliness.
- Wear chapels whenever going out.
- Vegetables and fruits must be washed properly before eating.
- Educate people about the spread, danger and prevention of this disease.

3.3.3. Tape worm infestation : Tape worm infestation or taeniansis is a group of cestode infections which are important zoonotic diseases.

Causative organism

Taenia solium (pork tape worm) and Teania saginata (Beef tape worm)

Taenia eclimintococcus.

Mode of Transmission : Through the ingestion of infective undercooked beef or pork, through ingestion of infected food.

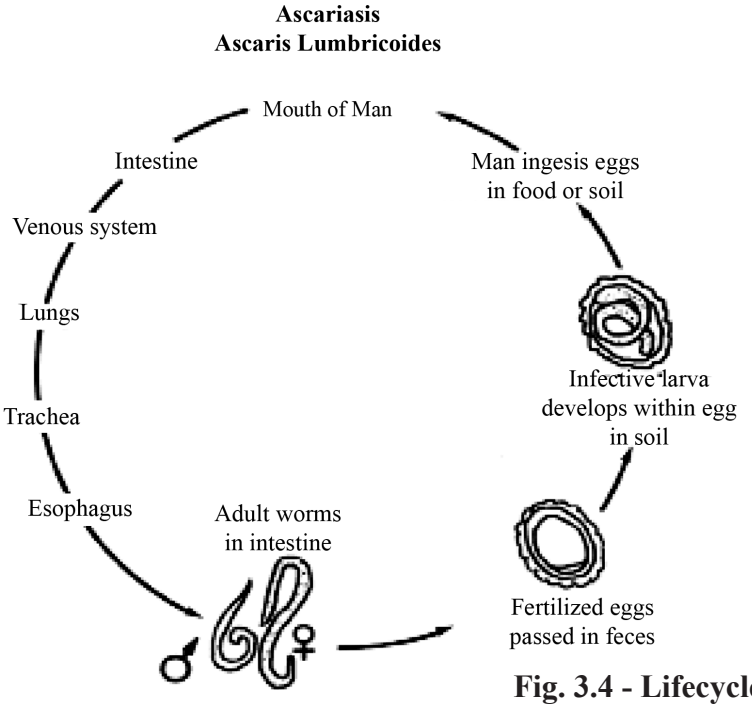


Fig. 3.4 - Lifecycle of Ascarisis

Incubation period : 8 to 14 weeks.

Clinical manifestation

- Abdominal pain or abdominal colic.
- Digestive disturbances such as indigestion, anorexia and vomiting.
- Nervousness and insomnia.
- Loss of weight
- Headache
- Segments may be seen in the stools.

Treatment

- Tablet .Albendazole is the drug of choice.
- Tablet .Quinacrine may be given to patient.
- A long process is followed to have good effect of drug.
- Patient's stomach and intestine must be completely emptied, the patient can take only liquid diet. Drugs may be given to remove the hardness of the stools. After 2 hours 240 grains magnesium sulphate is given.

3.3.4. Ascariasis

Ascariasis is a common helmenthic infection in man.

Causative organism : Ascaris lumbricoids

Incubation period : About 2 months.

Mode of transmission : Faecal – oral route i.e. by ingestion of infection eggs with food or drink.

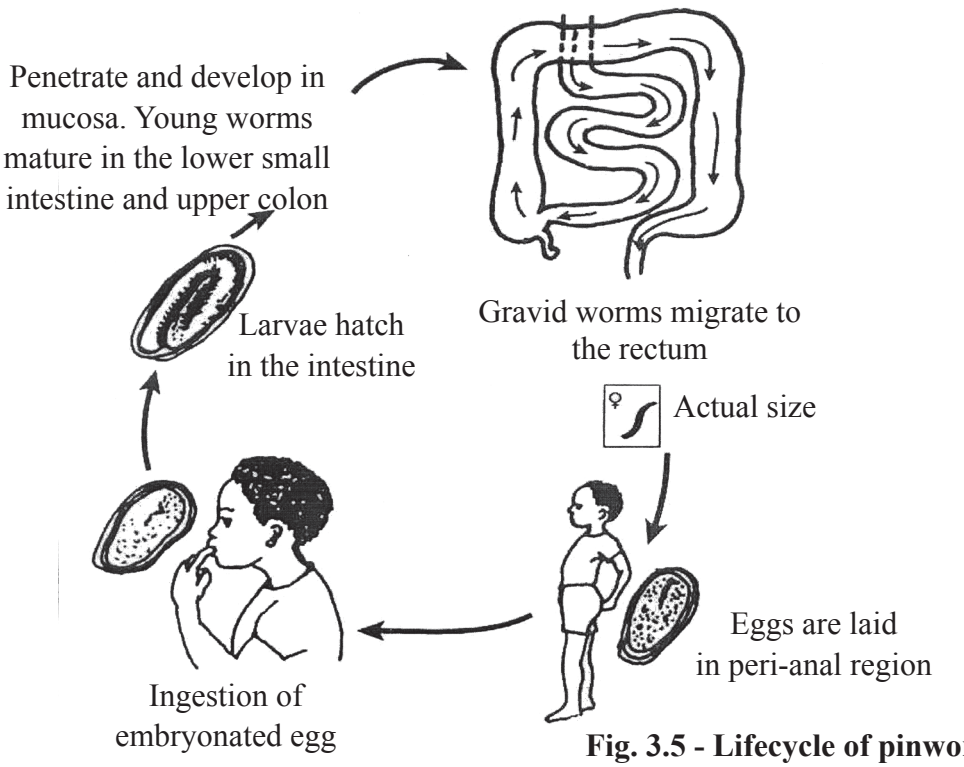


Fig. 3.5 - Lifecycle of pinworm

Clinical manifestations

- General weakness and his body becomes pale.
- Loss of appetite
- Occasional vomiting
- Flatulence
- Live worm may be passed in the vomit or stools.
- Sometimes patient may have an asthmatic attack.

Treatment : The drugs of choice are Tablet piperzine and Mebendazole.

Prevention and control

- Use of sanitary latrines
- Efficient sewage disposal
- Maintain personal hygiene
- Hand washing with soap and water after defecation and before eating.
- Washing vegetables and fruits before eating them raw..
- Protection of food from flies.
- Avoid pollution of the soil and water supply.

3.4 DISEASES TRANSMITTED THROUGH AIR:

3.4.1 Chickenpox (Varicella) : Chickenpox or varicella is an acute highly infectious disease caused by varicella zoster.

Causative organism : Chicken pox disease is caused by varicella zoster virus.

Incubation period : Usually 14-16 days. Extremes as wide a 10-21 days have been reported.

Mode of Transmission : Chickenpox is spread mainly by droplet infection and droplet nuclei

Clinical manifestation

1. Pre-Eruptive stage: Onset is sudden with mild or moderate fever, pain in the back, shivering and malaise.
2. Eruptive stage: In Children the rash is often the first sign. It comes on the day the fever starts the distinctive features of the rash are.
    a) Distribution: The rash is symmetrical. It first appears on the trunk where it is abundant and then comes on the face, arms and legs where it is less abundant.
    b) Rapid Evolution: The rash advances quickly through the stages of macule, papule, vesicle and scab.
    c) Pleomorphism : A characteristic feature of the rash in chicken is the pleomorphism that is all stages of the rash papules vesicules and crusts may be seen simultaneously at one time.
    d) Fever : The fever does not run high but shows exacerbations with each fresh crop of eruption.

Control measures : The control measures are notifications isolation of cases for about 6 days after onset of rash and disinfection of articles soiled by nose and throat discharges.

Several antiviral compounds provide effective therapy for varicella including acyclovir, vlacyclovir, famicyclovir and foscarnet. Acyclovir can prevent the development of systemic disease.

Preventive measures

1. Varicella zoster immunoglobulin : Varicella zoster immunoglobulin given within 72 hours of exposure has been recommended for prevention of chicken pox.

   Susceptible persons receiving immune suppressive therapy.

   Persons with acquired immune deficiency including HIV/AIDS.

   Susceptible and exposed person in particular pregnant women.

2. Vaccines : The live attenuated varicella virus vaccine is safe and currently recommended for children between 12-18 months of age who have not had chicken pox.

Treatment

There is no specific treatment for chickenpox.

Complications (Children and Adults)

- Haemorrhages
- Encephalitis
- Varicella pneumonia
- Pneumonia
- Acute cerebellar ataxia

For Mother during pregnancy

- Birth defects
- Microcephaly and low birth weight.
- Cerebro – cortical atrophy.
- Atrophied limbs
- Cataract.

3.4.2 Measles (Rubeola) : Measles is an acute highly infectious disease of childhood caused by a specific virus of the group myxoviruses.

Causative organism: caused by an RNA paramyxovirus.

Mode of spread: Droplet infection

Incubation period: 10 days from exposure to onset of fever and 14 days to appearance of rash. Average 7 days.

Clinical features: There are three stages

1. Prodromal stage : Begins 10 days after infection and lasts until day 14. It is characterized by fever, coryza with sneezing and nasal discharge, cough, redness of the eyes, lacrimation and often photophobia. There may be vomiting or diarrhoea. A day or two before the appearance of the rash koplik's spots appear on the buccal mucosa opposite the first and second upper molors. The koplik's spot are small bluish-white spots on a red base smaller than the head of a pin and they show the pathogenicity in measles.

2. Eruptive phase : This phase is characterized by a typical, dusky-red, macular or macula-popular rash which begins behind the ears and spreads rapidly in a few hours over the face and neck and extends down the body taking 2 to 3 days to progress to the lower extremities.

3. Post-measles stage: The child will have lost weight and will remain weak for a number of days. There may be failure to recover and a gradual deterioration into chronic illness due to increase susceptibility to other bacterial and viral infections, nutritional and metabolic effects and the tissue destructive effects of the virus. There may be growth retardation and diarrhea, cancrum oris, pyogenic infections, candidiasis, reactivation of pulmonary tuberculosis etc.

Complications : Measles – associated diarrhea, pneumonia and other respiratory complications and otitis media. The serious neurological complications like febrile convulsions, encephalitis and sub-acute sclerosing and pan-encephalitis.

Prevention of measles:

The following guidelines are important in combating measles.

a) achieving an immunization rate of over percent and

b) ongoing immunization against measles through successive generations of children.

Measles vaccine: Measles is best prevented by active immunization. The vaccine is presented as a freeze dried product. It is most important to store the vaccine at 2 – 8 degree celsius.

The most effective month of immunization by World Health Organization is at 9 months of age.

Control measures: The following control measures have been recommended:

a) Isolation for 7 days after the onset of rash.

b) Immunization of contacts within 2 days of exposure .(if vaccine is contra indicated immunoglobulin should be given within 3 – 4 days of exposure)

c) Prompt immunization at the beginning of an endemic is essential to limt the speed.

3.4.3 Mumps : Mumps is an acute infections disease caused by virus infections are common in winter.

Causative organism: Causative organism an RNA virus classified as genus Rubella virus of the family paramyxoviridae.

Mode of transmission: The disease is spread mainly by droplet infection and after direct contact with an infected person.

Incubation period: Varies from 2-3 weeks usually 18 days.

Clinical features: Non-supportive swelling of the parotid glands is the first indication of mumps. Pain and stiffiness on opening the mouth.

In severe cases fever and headache are the main symptoms.

Complications :

- Nerve deafness
- Hydrocephalus
- Cerebellar ataxia
- Polyarthritis
- Encephalitis
- Facial palsy

Preventive measures

a) Vaccination : Highly effective live attenuated vaccine is now available for the prevention of mumps. A single dose (0-5 ml) intra muscularly produces defectable antibodies in 95 percent of vaccines.

b) Immunoglobulin : A specific immunoglobulin is available, but its protective effect has not been established.

Control measures: The control of mumps is difficult because the disease is infections before a diagnosis can be made. The long and variable incubation period and the occurrence of subclinical cases make the control of spread difficult. Cases should be isolated till the clinical manifestations subside.

3.4.4. Influenza: Influenza (commonly known as Flu) is an acute infection of the respiratory tract. It is caused by the influenza viruses. Influenza tends to spread very rapidly.

Causative organism: It is caused by influenza virus which there are 3 types. A, B, C, D.

Mode of transmission: Influenza is spread mainly from person by droplet infection or droplet nuclear created by sneezing. Coughing or talking the portal of entry of the virus is the respiratory trust.

Incubation period: 18 – 72 years

Clinical features: The virus enters the respirations tract and causes inflammation and necrosis of superficial epithelium of the tracheal and bronchial mucosa followed by secondary bacterial invasion. The viruses cause, fever, chills, aches and pain coughing and generalized weakness.

Preventive measures: Killed influenza vaccines are widely used for protection against influenza but they are not completely protective. Two doses of 1 ml each spaced of an interval of about 10 days are recommended. To be effective the first dose must be given before the onset of an epidemic.

Control measures: Control of epidemics of influenza is not easy because the disease spread rapidly and we do not have, as yet an effective vaccine against influenza. Cases should be reported to the State Health Authorities and the identified cases should be isolated and treated.

Antiviral drugs: A dose of 100 mg of amantodine or rimantidine twice a day for 3-5 days has been found effective for treatment. These drugs may also modify the severity of influenza. If started with in 24-48 hours of onset of illness.

Complications : Pneumonia

3.4.5. Diphtheria

Diphtheria is an acute infections disease caused by the exotoxin of diphtheria bacilli. The disease attacks mainly the throat, tonsils, larynx or nose. Where it produces a grayish-white membrane which spread in to the air passages.

Causative organism : Corynebacterium diphtheria caused by exotoxin of diphtheria bacilli.

Mode of transmission : The disease is spread mainly by droplet infection. It can also be transmitted directly to susceptible persons from infected cutaneous lesions.

Incubation period : 2-6 days occasionally longer.

Clinical manifestation

- Respiratory tract forms of diphtheria consist of pharyngo tonsillar, laryngeo tracheal, nasal and combinations.
- Patients with pharyngo tonsillar diphtheria usually have a some throat, difficult in swallowing and low grade fever.
- Laryngeal diphtheria causes obstructive croup stridor and eventually asphyxia.

Treatment

- The specific treatment is diphtheria antitoxin which must be given immediately in doses ranging from 10,000 to 80000 units according to the severity of the case.
- Antibiotics (penicillin) help to eliminate the infection and prevent production of further toxin.
- Bed rest is essential to prevent heart failure.
- Tracheostomy may be needed if there is respiratory obstruction.

Preventive measures

- Diphtheria can be prevented by active immunization either by DPT or diphtheria vaccine.
- The current practice is to immunize in all infants with DPT starting from the age of 6 weeks.
- DPT vaccine protect not only against diphtheria but also against pertussis and tetanus.
- DPT vaccine is given along with oral polio and BCG when the child is 6 weeks old.
- A booster dose (0.5 ml) of DPT is recommended at the age of 1½ to 2 years followed by another dose (DT only) at the age of 5-6 years.

Control measures

1. Cases and carriers

a) Early detection : Carriers can be defected only by culture method. Swabs can be taken from both the nose and throat and examined by culture methods for diphtheria bacilli.

b) Isolation : Suspected cases and carriers should be promptly isolated, preferably in a hospital for at least 14 days.

c) Treatment: For Cases when diphtheria is suspected diphtheria antitoxin should be given without delay. Iron or IV in doses ranging from 20,000 to 1,00,000 units or more depending upon the severity of the case.

For Carriers : The carriers should be treated with 10 days course of oral erythromycin which is the most effective drugs for the treatment carriers.

2) Contacts : Contacts merit special attention. They should be throat swabbed and their immunity status determined. The bacteriological surveillance of close contact should be continued for several weeks.

3) Community : The only effective control is by active immunization with diphtheria toxoid.

All children and are not previously immunized should be given a dose of 500 to 1000 IV diphtheria antitoxin.

Complication

- Neurological (Encephalitis encephalopathy)
- Prolonged convulsions
- Infantile spasms.

3.4.6. Whooping Cough : A highly infectious disease of the respiratory tract, caused by the whooping cough bacilli. The disease occurs in epidemics every 3-4 years.

Causative organism : Whooping cough bacilli Bordetella pertussis.

Mode of transmission : Spread directly by droplet infection or indirectly by articles soiled with discharges from infected cases.

Incubation period : Usually 7 to 14 days but not more than 3 weeks.

Clinical manifestation : The clinical features comprise the following slight fever, cold and running of the nose irritating cough which gradually becomes paroxysmal within 1-2 weeks.

Control measures

1. Cases and contacts

a) Early diagnosis

b) Isolation and treatment of cases

c) Disinfection of discharges from nose and throat are general principles of control

d) Early diagnosis is possible only by bacteriological examination of nose and throat secretions.

e) Enthroning may help to shorten the duration of illness.

2. Activation Immunization: It is not common place to administer pertussis vaccine in combination with diphtheria and tetanus toxoid as DPT vaccine.

3.4.7. Meaningococcal Meningitis : Meningococcal meningitis or cerebrospiral fever is an acute communicable disease caused by N. meningitis. It usually begins with intense headache, vomiting and stiff neck and progresses to coma within a few hours.

Causative organism: Disease caused by Neisseria meningitis.

Mode of transmission: The disease spread mainly by droplet infection the portal of entry is the nasopharynx.

Incubation period: Usually 3-4 days but many vary from 2-10 days.

Clinical features: Meningococcal meningitis has a sudden onset of intense headache, fever, nausea, vomiting photophobia, stiff neck and various neurological sign.

Prevention and control.

a) Control of cases, carriers and contacts.

b) Cases : Treatment with antibiotics can save the lives of 95% of patients provided that it is started during the first 2 days of illness. Penicillin is the drug of choice.

c) Contact : Close contact of persons with confirmed meningococcal disease are at an increased risk of developing meningococcal illness.

d) Mass chemoprophylaxis: Mass medication of the total population some of which are not infected. Mass chemoprophylaxis be restricted to close and medically supervised communities. Mass treatment causes an immediate drop in the maintenance rate of meningitis and in the proportion carriers.

e) Vaccine: The vaccine should be offered only to travelers at significant risk of infection.

Internationally licensed meningococcal vaccines are bivalent or tetravalent.

f) Environmental measures: Improved housing and prevention of over-crowding are long term measures.

3.4.8. Acute Respiratory Infections : Acute respiratory infections may cause inflammation of the respiratory tract anywhere from nose to alveoli.

Causative organism : Caused by the SARS coronavirues.

Mode of transmission : Normally transmitted by the air-born route. The chain of transmission is maintained by direct person to person contact.

Incubation period : 18-72 hours

Clinical manifestation : Clinical features induces running nose, cough, sore throat, difficult breathing and ear problems. Fever is also common in acute respiratory problem, most children with these infections have only mild infection such as cold or cough.

Treatment: In India there are standard treatment guidelines for acute respiratory infections.

Tablet Cotrimoxazole is the drug of choice for the treatment of pneumonia. Ampicillin and procaine pencillin and cure rate upto 95%. Recommended dose schedule of Tablet. Cotrimoxazole for children aged 2 month upto 5 years. The children less than 2 months cotrimaxazole is not routinely recommended.

Prevention of acute respiratory infections measles vaccine

Pneumonia is a series complication of measles and the most common cause of death.

Reducing the incidence of measles in young children through vaccination would also help to reduce deaths from pneumonia.

HIB vaccine: Haemophilus influenza type B, HIB is an important cause of pneumonia and meningitis among children in developing decade. It reduces dramatically the incidence of HIB

meningitis and pneumonia in infants and nasopharyngeal colonization by HIB bacteria.

Control measures: The high mortality and morbidity rate attribute to acute respiratory infections have long been a matter of serious concern.

3.4.9. Severe Acute Respiratory Syndrome: Severe acute respiratory syndrome is a communicable viral disease.

Causative organism : Caused by a new strain of coronavirus.

Mode of transmission : The mode of transmission is through close contact with the patient and infected material via the eyes, nose and mouth with infections respiratory droplet.

Incubation period : The incubation period has been estimated to be 2 to 7 days, commonly 3-5 days.

Clinical manifestation : The most common symptoms in patient progressing to SARS include fever, malaise chills, headache, myalgia, dizziness, cough sore throat and running nose, rapid deterioration with low oxygen saturation and acute respiratory distress requiring ventilator support.

Treatment : There is no specific for SARS. No clinical improvement has been attributable to the use of antibiotics.

Prevention :

a) Prompt identification of person with SARS their movement and contacts.

b) Effective isolation of SARS patient in hospitals.

c) Appropriate protection of medical staff treating these patients.

d) Comprehensive identification and isolation of suspected SARS cases.

e) Exit screening of international travelers.

f) Timely and accurate reporting and sharing of information with other authorities and or governments.

3.4.10. Tuberculosis

Tuberculosis is a chronic infections disease caused by tubercle bacilli. The disease primary affects lungs and causes pulmonary tuberculosis. It can also affect intestine, meninges, bones and joints, lymph glands, skin and other tissues of the body. The disease also affects the animals such as cattle which is known as bovine tuberculosis.

Causative organism : Tuberculosis caused by Mycobacterium tuberculosis

Mode of transmission Droplet infection, Tuberculosis is mainly spread by droplet infection by an infections case.

Other ways: Pulmonary tuberculosis is also transmitted by inhalation of infected dust.

Incubation period: This may be weeks or months, depending upon the lost-parasite relationship and the dose of infection,

Clinical features

- Chronic cough
- Continous low grade fever
- Chest pain
- Haemoptysis
- Loss of weight

Control of tuberculosis

a) Early case finding
b) Chemotherapy
c) BCG Vaccination
d) Health education

Early case finding

The case: The first step in tuberculosis control programme is early detection of all cases in the community. The WHO defines a case of pulmonary tuberculosis as a person whose sputum is positive for tubercle bacilli.

Case finding tools : Sputum examination by direct microscopy is now considered the method of choice for early detection of cases. The reliability cheapness and case of direct sputum examination has made it number one case finding measure all over the world.

Chemotherapy : Chemotherapy has completed revolutionized the treatment of pulmonary tuberculosis. The objective of chemotherapy is to achieve bacterial cure rapidly. Current chemotherapy is based on multiple drugs (short course chemotherapy) with the addition of Rifampicin and Pyrizinamide to conventional drugs. Chemotherapy of tuberculosis is now more rationally based than in the treatment of other infectious diseases. Chemotherapy are judged not by the anatomic healing of lesions, but mainly by the elimination of bacilli from the patient's sputum. Chemotherapy should be easily available.

Anti tuberculosis drugs

There are now twelve or thirteen drugs active against mycobacterium tuberculosis six are considered to be essential.

- Highly effective
- Free from side effect
- Easy to administer
- Reasonably cheap.

The drugs classified into two groups

- Bactericidal
- Bacteriostatic

DOTS : Direct observed treatment short course is the recommended strategy for global tuberculosis control. DOTS is a community based tuberculosis treatment and care strategy which combines the benefit of community based care and support. DOTS will be given by peripheral health staff such as Multipurpose workers or voluntary health worker such as teachers Anganwadi workers, dais ex-patients, social workers etc. They are known as DOT agent.

BCG vaccination : Bacilli calmettee Guerin is a live vaccine. It is prepared from living attenuated bovine strain of tubercule bacilli in all countries. The infant below age of one month the dose is 0.05 ml. The vaccine is administered intradermally using a tuberculin syringe. The site of injection is just above the insertion of the deltoid of the left arm. BCG vaccine can be given soon after birth.

Health education : The health education programme should be directed motivating patients for undergoing regular treatment and follow up, disposals of sputum and co-operation with agencies administering the programme.

3.4.11. Swine flu

Swine flu which is called pig flu. Swine flu and is caused by swine influenza virus.

Causative organism : It is caused by swine influenza virus subtypes H_1N_1, H_1N_2, H_3N_1 and H_3H_2.

Mode of transmission : Influenza virus can be directly transmitted from pigs to people .

Incubation period: Within 7 days.

Clinical features

- Fever
- Sore throat
- Cough
- Body ache
- Fatigue
- Nausea
- Chills
- Headache
- Shortness of breath

Prevention's control measures

- Adequate amount of sleep and nutritious food.
- Consider taking multivitamins and vitamin C supplement.
- Regularly wash your hands with soap and water.
- Avoid close contact or stay away from sick people.
- Avoid sharing drinks or utensils.
- Avoid touching your face.
- Wear a face mask as direction by authorities.
- Stay updated and avoid travelling to affected areas.

Treatment

- Vaccination
- Vaccination is the best protection against contracting the set vaccines as soon as possible.
- Antiviral drugs can be used for prevention or treatment of flu viruses.

Control and preventive measures

- Treatment of infected person
- Meat inspection
- Health education
- Adequate sewage treatment and disposal
- Early detection and early treatment
- Through cooking of beef and pork is the most effective method to prevent food borne infection.

3.4.12. Avian Influenza

Avian influenza refers to a large group of different influenza viruses that primarily affect birds.

Causative organism : It causes influenza viruses.

Mode of transmission : Influenza spread mainly from person to person by droplet infection.

Incubation period : 18-72 hours

Clinical features

- Fever
- Headache
- Shivering
- Sore throat
- Sneezing
- Nasal block
- Pain all over the body
- Cough and weakness

Control measures : Cases should be reported to the state health authorities, cases should be isolated and treated. Rest, fluids and analgesics usually sufficient. Appropriate antibiotics

Preventive measures: Killed influenza vaccines are widely used for protection against influenza but they are completely protective.

3.5 DISEASES TRANSMITTED THROUGH ARTHROPODS:

3.5.1. Dengu syndrome

Dengue Haemorrhagic fever

- All symptoms of dengue viral fever.
- Maculopapular
- Scarlatine form or petechial rash
- Appears on 3rd day of illness
- Head ache
- Nausea, vomiting
- Coffee colour vomiting
- Abdominal pain
- Pharyngitis
- Cough and dyspepsia

Dengue shock syndrome

- In addition to signs and symptoms of the above clinical feature client may go for shock.
- Sudden collapse
- Cold and clammy extremities
- Weak thread pulse
- Circumoral cyanosis along with haemorrhagic manifestation
- Occasionally epistaxsis, haematemesis, malena or subarachnoid haemorrhage.

Incubation period: 3 to 14 days usually 4 to 7 days.

Treatment

- Bed rest is advisable during the acute febrile phase.
- Antipyretics or sponging are required to keep the body temperature below the increased level or 98.6°F

- Aspirin should be avoided particularly in dengue hemorrhagic fever, it may cause gastritis, bleeding and acidosis.
- Oral fluid and electrolyte therapy is recommended for patients with excessive sweating, vomiting or diarrhea.
- Analgesics or a mild sedative may be required for those with severe pain.
- Home available fluids to be given to prevent dehydration,
- Fluid replacement should be minimum volume that is sufficient to maintain effective circulation during the period leakage.
- Excessive replacement will cause respiratory distress, pulmonary congestion and oedema.
- The types of fluids used are crystalloids. 5% dextrose in acetated Ringer's solution. 5% dextrose in half strength normal colloidal solution dextran 40% and plasma

Management of shock : Immediate replacement of plasma loss with isotonic salt solution (5% dextrose in activated Ringer's solution or 5% dextrose in normal saline solution) at the rate of 10-20 ml/kg body weight /hour or in the case of profound shock as a bolus of 10 ml/kg body weight. In case of continued or profound shock (with high haematocrit values) colloidal fluid (dextran or medium molecular weight in normal saline solution or plasma) should be given at the rate of 10-20 ml/kg body weight / hour. Blood transfusion is indicated in case with profound or persistent shock. In small children 5% dextrose us a half-strength normal saline solution (5% D/1/2 NSS) is used following initial resuscitation. 5% dextrose 1/3 NSS may be used is infants under one year of age, if the serum sodium is normal. Intravenous fluid should be discontinued when the haematocrit reading drops to 40% and vital signs are stable.

Control measures

1. Mosquito control

- Cover all water containers.
- Change the water in flower vases every week.
- Clean the surrounding area of the house.
- Use insecticide spray in the house to kill adult mosquitoes.

2. Vaccines : So far there is no satisfactory vaccine and no immediate prospect of preventing the disease by immunization

3. Other measures

- Isolation under bed rest during first few days individual protection against mosquitoes.
- Wearing of full sleeves shirts and full pants.
- Use of mosquito repellent creams, liquids, coils, mats etc.
- Use of bednets for sleeping infants and young children during day time to present mosquito bite.

3.5.2. Malaria : Malaria is a protozoal disease caused by infection with parasites of the genus plasmodium.

Causative organism : It is transmitted to man by the infected, female anopheles mosquitoes.

Incubation period : Plasmodium vivax – 14 days

Plasmodium falciparum – 12 days

Some strains the incubation period may be delayed for as long as 6-9 months.

Mode of transmission : Malaria is transmitted by the bite of infected female anopheles mosquito. The malaria parasite may also be transmitted by blood transfusion.

Clinical features

Intermittent fever has 3 stages.

1. Cold stage (1/4 to ½ hours) - Head ache, Shivering fever rising rapidly cold skin
2. Hot stage (1/2 to 5 hours) - Very hot feeling, severe headache, skin flushed, fever starts falling
3. Sweating stage - Profuse sweating, temperature normal, Enlargement of spleen and secondary anaemia

Treatment: Presumptive treatment for all suspected / clinical malaria cases

Day 1	Tab.chloroquine	10 mg/kg body weight (600 mg adult dose)
	Tab.Prima quine	0.75 mg/kg body weight (45 mg adult dose)
Day 2	Chloroquine	100 mg/kg body weight (600 mg adult dose)
Day 3	Chloroquine	5 mg/kg body weight (300 mg adult dose)

Microscopic confirmation of species

P.Vivax – Tab primaquine 0.25 mg/kg body weight

(15 mg adult dose) daily for 5 days.

P. Falciparum – No further treatment required.

Control measures:

a) Anti-adult measures

1. Residual spraying : The spraying of the indoor surface of houses with residual insecticides (eg. DDT, malathion, fenitrothion) is still the most effective measure to kill the adult mosquito. Malathion and Fenitrothion are organophosphate insecticides which are being used with increasing frequency for malaria control following the development of vector resistance to DDT.
2. Space application : Application of pesticides in the form of fog or mist using special equipment. The ultra-loco-volume method of pesticide dispersion by air or by ground equipment has proved to be effective and economical.

3. Individual protection : Man-vector contact can be reduced by other preventive measured such as the use of repellents, protective clothing, bed nets, mosquito coils screening of houses etc.,

b) Anti-larval measures

i) Larvicides : Anti-larval measures such as spoiling the collections of standing water or treating them with paris green effectively controlled malaria.

ii) Source reduction : Techniques to reduce mosquito breeding sites which include drainage or filling, deepening or flushing, management of water level, changing the salt content of water and intermittent irrigation are among the classical methods of malaria control to which attention is being paid again.

iii) Integrated control : Integrated vector control methodology which includes bioenvironmental and personal protection measure.

3.5.3. Lymphatic Filariasis : Lymphatic filariasis is a mosquito borne disease caused by the filarial parasites.

Causative organism: Wucheriria bronchofti, Brugia malayi

Mode of transmission : It is transmitted by the bite of culex mosquitoes.

Incubation period : 5 to 10 months

Clinical manifestations

- Attacks of fever
- Lymphangitis
- Elephantiasis evident in legs and arm.

Treatment : Hetrazen (Diethyl carbamazine) is the only safe and effective drug. The recommended dose is 6 mg per leg body weight daily for 12 doses to be completed in 2 weeks

Control measures

1. Chemotherapy

a) Diethylcarbamazine : Diethylcarbamazine (DEC) is both safe and effective

b) Filaria control in the community

i) Mass therapy : DEC is given to almost everyone in the community irrespective of whether they have micro filaraemia, disease manifestations or no signs of infection.

ii) Selective treatment : DEC is given only those who are micro filarial positive. To recommended dose is 6 mg/kg body weight x 2 weeks.

iii) DEC medicated salt : Common salt medicated with 1-4 of DEC per kg has been used for control of filariasis.

2. Vector control

- Anti larval measures
- Chemical control – mosquito larvicidal
- It is active against oil all pre-adult stages.

- Removal of pistia plant : Removing the pistia plant from all water collections and converting the ponds to fish or lotus culture.
- Minor environmental measures : Larvicidal operations are complemented by minor engineering operations such as filling up of ditches and pools, drainage of stagnant water, adequate maintenance of septic tanks and soakage pits etc.,

3.5.4. Chikungunya Fever : A dengue like disease caused by a group A virus.

Causative organism : Aedes, culex and mansonia mosquitoes

Incubation period : 4 to 7 days

Mode of transmission : Bite of mosquitoes

Clinical manifestation

- High fever with chills
- Severe articular pains in the limbs and spinal column.
- Arthralagia
- Anorexia
- Conjunctivitis
- Coffee-coloured vomiting
- Epistaxis
- Arthropathy : pain, swelling and stiffness, especially of the metacarpophalanges wrist, elbow, shoulder, knee, ankle and metatarsal joints.

Treatment

- Analgesics like diclofenac sodium
- Antipyretics like paracetamol
- Fluid supplementation

Control and Prevention

- The Aedes aegypti mosquito breeds in clean water.
- All water containers should be covered eliminate the breeding places.
- Abate is increasingly used as a larvicide.
- Aerosol spray of ultra low volume (ULV) quantities of malathion or sumithion (250 ml / hectage) has been found to be effective in interrupting transmission and stopping epidemics of dengue haemorrhagic fever.

3.6. DISEASES TRANSMITTED THROUGH ANIMALS

3.6.1. Rabies

Rabies also known as hydrophobia (fear of water) is primarily a disease of warm blooded animals such as dogs, cats, jackals, wolves etc.

Causative organism: The causative agent is called lyssa virus type 1

Mode of transmission

By the bite of rabid animals

By the licks on abroaded skin or mucosa.

Incubation period: 1 to 3 months usually.

Clinical manifestations

- Headache
- Slight fever
- Malaise
- Twitching
- Pain and numbness at the site of the bite.
- Intolerance to noise and bright light.
- Difficulty in swallowing
- Fear of water
- Intense spasms on being offered food of fluids

Treatment

- Local treatment : Wounds should be washed immediately with soap and water for several minutes and then treated with alcohol or tincture of iodine to kill as much of the residual virus as possible. Then apply a dressing and bondage. Dress the wound every other day until the wound is healed.
- Observe the animal for 10 days
- Anti-Rabies vaccine is given.
- The vaccination schedule recommended consists of 6 doses (1 ml each) on days 0, 3, 7, 14, 28 and a booster dose on day 90. Injections are given intramuscularly in deltoid region.
- Isolation
- Protect from exposure to cold draughts or other stimuli.
- Universal precaution.

Prevention and control

- Registration and licensing of all domestic dogs.
- Destroy all stray and ownerless dogs.
- Restraint of dogs in public places.
- Health education of people regarding the care of drugs and prevention of rabies.
- Vaccinate all dogs when they are 3 months of age.
- Booster dose every year or 3 years.

3.6.2. Leptospirosis : Leptospirosis is considered to be the most widespread of the disease transmissible from animal to man.

Causative organism : Several serotypes of leptospira (Spirochetes)

Mode of transmission

a) Direct contact : Leptospira can enter the body through skin abrasions or through intact mucous membrane by direct contact with urine or tissue of infected animal.

b) Indirect contact : Through the contact of the broken skin and soil water or vegetation contaminated by urine of infected animals or through ingestion of food or water contaminated with leptospirae.

c) Droplet infection : Infection may also occur through inhalation as what milking infected cows or goats by breathing air polluted with droplets of urine.

Incubation period : Usually 10 days with a range of 4 to 20 days.

Clinical manifestation : Mild to severe febrile illness

Sometimes fatal disease with liver and kidney involvements.

Treatment

Antibiotics : Penicillin is the drug of choice but other antibiotics (tetracycline or doxycycline) are also effective.

Preventive and control measures

- Preventing exposure to potentially contaminated water.
- Rodent control and protection of workers in hazardous occupation,
- Proper disposal of water
- Health education

3.6.3. Plague : Plague is primarily and basically a Zoonoses disease in which man becomes accidently involved.

Causative organism : The causative agent is Yersenia pestis

Mode of transmission

The bite of an infected flea.

Occasionally by direct contact with the tissues of the infected animal.

By droplet infection from cases of pneumonic plague.

There are atleast 5 basic types of transmission cycles in plague.

1. Commensal rats : rat fleas – man

This is the basic cycle in epidemic bubonic plague.

2. Wild rodents: wild rodent fleas or direct contact – man

The disease is transmitted from rodent to rodent via wild rodent fleas or contaminated soil. Man contracts the infection from infectious wild rodent fleas or by direct contact with infected rodents.

3. Wild rodents, peridomestic rodents, commensal rodents wild rodent fleas, peridomestic rodent fleas _____ man

Plague mainly impinge upon the habitats of peridomestic or Commensal rodents. Interaction of the rodents and their fleas convey the infection to man.

4. Man _____ human flea _____ man

5. Man _____ man (Pneumonic plague)

Incubation period

a) Bubonic plague 2 to 7 days

b) Septicaemic plague 2 to 7 days

c) Pneumonic plague 1 to 3 days

Clinical manifestations

a) Bubonic plague: Sudden fever, chills, headache, prostration and painful lymphadenitis

Within a few days greatly enlarged tender lymph nodes (buboes) develop in the groin and less often in the axilla or neck.

b) Pneumonic plague : Primary pneumonic plague is rare, it generally follows as a complication of bubonic – septicaemic plague. The plague bacilli are preset in the sputum.

c) Septicaemic plague : Primary septicaemic plague is rare, but bubonic plague may develop into septicaemic plague in the face of an overwhelming infection.

Treatment : The drug of choice is streptomycin 30 mg/kg of body weight daily administered intramuscularly in two divided doses for 7 to 10 days.

Tetracycline orally (30-40 mg per kg of body weight daily) is an alternative drug and is sometimes given in combination with streptomycin

Isolation : Disinfection of sputum discharges and articles soiled by the patient should be carried out. Dead bodies should be handled with precaution.

Prevention and control

1. Control of cases

a) Early diagnosis: During epidemic situations, diagnosis of plague can be made readily on clinical manifestation. It is essential that plague suspected human should be examined bacteriologically to confirm the presence of plague.

b) Notification: If a human case is diagnosed, health authorities must be notified promptly.

c) Isolation: Although most bulbonic plague patients are non-infections, isolation is recommended whenever possible. All patients with pneumonic plague including suspected cases should be isolated.

d) Treatment : Treatment must be started without waiting for confirmation of the diagnosis. Unless promptly treated, plague may have a high mortality.

e) Disinfection : Disinfection of spectrum discharges and articles soiled by the patient should be carried out. Dead bodies should be handled with aseptic precautions.

2) Control of fleas : The most effective method to break the chain of transmission is the destruction of fleas by the proper application of an effective insecticide. DDT and BHC should be used as insecticide containing 10 percent and 3 percent of the active ingredient respectively.

3) Control of rodents : The control of rodents can be done by improvement of general sanitation, improvement of housing and quality of life.

4) Vaccination : Vaccination is the only method for the prevention. The vaccine is given subcutaneously in two doses of 0.5 and 1.0 ml at an interval of 7 to 14 days.

5) Chemoprophylaxis : It should be offered to all plague contacts, medical, nursing and public health personnel exposed to the risks of infection. The drug of choice is tetracycline.

6) Surveillance : Surveillance should cover all aspects or rodent and human plague . On the basis of information provided by surveillance, effective control measures must be established.

7) Health education : Education should aim at providing the public with the facts about plague. Emphasis must be placed on the need for the prompt reporting to dead rats and suspected cases so that preventive measures can be taken.

3.6.4. Japanese Encephalitis : Japanese encephalitis is a mosquito borne encephalitis infecting mainly animals and incidentally man

Causative organism : Group B Arbovirus (Flavi virus) and transmitted by culex mosquito.

Mode of transmission : The disease is transmitted to man by the infected mosquito.

Incubation period : The incubation period in man, following mosquito bite is not exactly known. Probably it varies from 5 to 15 days.

Clinical manifestations

a) Prodormal stage : The onset of illness is usually acute and is heralded by fever, headache and malaise. The duration of this stage is usually 1-6 days.

b) Acute Encephalitic stage : Fever is usually high 38 to 40.7^{o}c nuchal rigidity.

c) Late stage of sequelae **:** This stage begins when active inflammation is at an end. i.e. the temperature and ESR touch normal. Neurological signs become stationary and tend to improve.

Control and preventive measures:

Vector control: The vector mosquitoes of Japanese encephalitis are widely scattered and not easily amendable to control. An effective way to deal with them is a resort to aerial or ground fogging with ultra-low-volume insecticides (e.g. malathion, fenitrothion)

Vaccination: The vaccine provides adequate protection throughout childhood following two primary doses 4 weeks a part, and boosters after 1 year and subsequently at 3 yearly interval until the age of 10-15 years. The vaccine is given subcutaneously in dose of 0.5 ml for children under 3 years and 1 ml for children more than 3 years of age.

3.7. DISEASES TRANSMITTED THROUGH CONTACT

3.7.1. Scabies: Scabies is a skin disease

Causative organism : Itch mite (sarcoptes scabiei or Aearus scabbier) is an extremely small globular anthropod just visible to the naked eye.

Mode of transmission

Close contact : Scabies is usually transmitted by close contact with an infected person. This is often due to sleeping in the same bed or by children playing with each other or nursing an infected person. Because of close contact, the disease tends to spread through families. Scabies is therefore called a familial or household infection.

Contamination clothes : The disease may be acquired sometimes from contaminated clothes and bed linen.

Clinical manifestations

- Itching which is worse at night
- Examination reveals follicular lesions in the hands and wrist, extensor aspect of elbows, axillae, buttocks, lower abdomen, feet and ankles, palms in infants also affects the breast in women and the genitals in men.
- Secondary infection leads to crusted popular and pustules

Treatment: Benzyl benzoate 25 percent is an effective sarcopticide. It should be applied with a paint brush or shaving brush to every inch of the body below the chin including the soles of the feet and allowed to dry. In the case of babies the head must also be treated. The application should be repeated after 12 hours on the third day a bath is given and all the undergarments, clothes and bed linen are changed and washed.

Prevention and control and scabies:

- Before commencing the treatment the patient is given a good scrub with soap and hot water.
- Avoid close contact with the infested person.
- The contaminated clothes and bed liven should be disinfected properly.
- Avoid playing with infested children.

3.7.2. Trachoma : Trachoma is a chronic infections disease of the conjunctiva and cornea.

Casuative organism : The causative organism is Chlamydia trachomatis.

Incubation period : 5 to 12 days.

Mode of transmission

Direct contact : Sleeping together

Indirect contact : Contact with ocular discharges of infected person or fomites.

House fly : Eye seeking flies play some role in spreading the disease.

Some role in spreading the disease.

Clinical manifestations

- Mild itching of eyes, irritation and headache.
- Inflammation and follicles appear on the conjunctiva.
- Blurring of vision and increasing discomfort.
- Acute muco-purulant conjunctivitis
- Photophobia
- Sear formation, atrophy of follicles of conjunctiva and blood vessels get constricted.

Treatment : Oral sulphonamide with antibiotics such as aureomycin, tetracycline, erythromycin and tetracycline eye ointment. All children irrespective of signs and symptoms intermittent therapy of tetracycline eye application twice daily for 5 consecutive days.

Control and preventive measures

- Early diagnosis and treatment until cure is achieved.
- Health education emphasizing the importance of using clean towels and linen.
- Fly control
- Preventing flies sitting on the faces of infants and children.
- Good personal hygiene.

3.7.3. Tetanus: Tetanus is an acute neuromuscular disorder characterized by paraoxysms of convulsive tonic, and sometimes clonic contraction of the voluntary muscles.

Causative organism : Clostridium tetani

Incubation period : 3 to 21 days

Mode of transmission : Infection is acquired by contamination of wounds with tetanus spores.

Clinical manifestations : Difficulty in opening the mouth and swallowing owing to the spasm of masseter and facial muscles. Temperature is elevated. Pulse rate is increased. Spasm of respiratory muscles. Cause long periods of cyanosis

Treatment: The patient with tetanus should be treated in a calm, quite and dark room. Prevent respiratory and cardiovascular complications and to promote early recovery. Avoid sudden stimulants and light, slightest stimulation may trigger paroxysmal spasms. Adequate airway must be maintained by using endotracheal tube or tracheostomy. Secretion should be removed by frequency suctioning. Muscles relaxants, sedatives and anticonvulasants drugs, should be administered to treat muscle rigidity and convulsions.

Preventive and control measures

Active immunization

Tetanus is entirely preventable disease by means of active immunization. With tetanus toxoid. All persons should be immunized regardless of the age. A complete primary immunization consists of 3 spaced injections (0.5 ml each dose) from 3 to 9 months along with diphtheria and

pertussis. It is given to them in 2 more doses. It is given to them in 2 more doses at one month interval intramuscularly

I booster dose 18-24 months II booster dos 5-6 years III booster dose 10th year

Antenatal mothers

I dose 10 to 20 weeks II dose 24 – 28 weeks

Passive immunization : Temporary protection against tetanus can be provided by injecting 1500 IU subcutaneously after sensitive testing. 250-500 units of human Ig in one arm and 0.5 ml of absorbed tetanus toxoid into the other arm or gluteal region. To prevent tetanus in neonatal immunization during antenatal period and taking efforts to have clean delivery practices alone. If any injury the wounds must be thoroughly cleaned soon after injury, removal of foreign bodies, soil, dust and narcotic tissue and debris Inj. Tetanus Toxoid 0.5 ml to be given as soon as the injury is sustained or within 24 hours.

Don't apply any cow dung and powder over the wound.

3.7.4. Leprosy : Leprosy otherwise known as Hansen's disease is a chronic infections disease which affects mainly the peripheral nerves.

Causative organism : Mycobacterium leprac.

Incubation period : Leprosy has a long incubation period of 3 to 5 years.

Mode of transmission

1. Droplet infections : Leprosy may be transmitted via acrosols containing mycobacterium leprae.
2. Contact transmission : Leprosy may be transmitted from person to person by close contact between an infections patient and a healthy but susceptible person. The contact may be skin to skin contact or contact with soil and fomites.
3. Other routes : Bacilli may also be transmitted via breast milk from lepromatous mothers by insect vectors or by tattooing needles.

Clinical manifestations :

- Hypo pigmented or Erythematous patches on the skin.
- Diffuse thickening of the skin with a shiny appearance.
- Loss of sweating or lose of hair over the skim lesion.
- Loss of pain, touch and temperature in the hands and feet.
- Thickening of cutaneous nerves, especially ulnar, median, lateral popliteal
- Nodules in the skin especially of the nose, chin and ears.
- Thickening of ear lobes.
- Recurrent wounds and ulcers which do not heal.
- Depression of the bridge of nose.
- Wrinkling of the facial skin.

- Loss of eyebrows
- Disfiguration of ear
- Stiffness of joints of fingers
- Shortening and loss of finger and toe.
- Claw finger, wrist drop, foot drop etc.

Treatment : Multidrug treatment Regimen: The drugs used are Rifampicin, Dapsone, Dofazimine.

Control and preventive measures: Interrupt transmission of the infection thereby reduce the incidence of the disease so that it no longer constitutes a public health problem. To treat patients in order to achieve their cure and where possible, complete rehabilitation. To prevent development of associated deformities. Ultimate prevention is achieved by breaking the chain of transmission.

3.7.5. Sexually transmitted infections : Sexually transmitted infections are a group of communicable diseases that are transmitted predominantly by sexual contact.

Bacterial STD	–	Gonorrhoea
		Genital chlamydial infection
		Syphilis
		Chanchroid
Viral STD	–	Genital herpes
		Genital human papilloma
		Virus infection

Causative organism	**Disease**
Neisseria gonorrhoea	Gonorrhoea
Treponema pallidum	Syphilis
Haemophilus ducreyl	Chancroid
Chdamydia trachomitis	Neinatal conjunctivitis
Herpes simplex virus	Genital herpes
Hepatitis B virus	Acute and chronic hepatitis
Human papillomaviruses	Genital and anal warts
Human immune deficiency virus (HIV)	AIDS
Candida Albicans	Vaginitis
Trichomonas vaginalis	

3.7.5.1. Syphilis: Syphilis may be defined as a contagious disease caused by Trepenoma pallidum

Causative organism : Treponema pallidum

Mode of transmission : Sexual contact and occasionally by accidental infection

Types

- Acquired syphilis
- Congenital syphilis

Acquired syphilis : The organism enters through micro abrasions on the skin or mucosa.

Congenital syphilis: A pregnant syphilitic woman can transmit palladium to the fetus through placenta beginning about the tenth week of gestation

Clinical features

- Painless, hard, red papule development at the site of inoculation
- Lymph gland enlargement
- Popular spleen rashes
- Mucous patches in oropharynx
- There may be eye and meningeal involvement
- Ulcers in the legs, palate, face or tongue
- Disease of the aortic valve or the walls of blood vessels leading to aneurysm
- Periostitis
- Involvement of central nervous system

Treatment : The antibiotics used to treat syphilis are penicillin, doxycycline and erythromycin.

3.7.5.2. Gonorrhoea : Gonorrhoea is venereal infection related to its chronicity, latency and multiplicity of localization

Causative organism : Neisseria gonorrhoea

Incubation period : 3 to 10 days

Mode of transmission : Sexual contact.

Clinical manifestations

- Urinary frequency
- Dysuria
- Discharge of a yellowish exudates from the urethra or the vagina.
- In female tubal infection (salphingitis) pelvic inflammatory disese.

Treatment: The antibiotics of choice are ciprofloxacin ceftriaxone, cefixime.

3.8.5.3. Chanchroid : Chanchroid is an acute, localized, auto inoculable infection of the genitals.

Causative organism : Haemophilus duereyl

Incubation period : 1 to 5 days but it can occasionally last as long as 30 days.

Clinical manifestation : Lesion, small inflammatory papule surrounded by narrow zone of bright erythema and becomes pustular if it ruptures from a painful, sharply circumscribed ulcer. Vascular granulation tissues present which are tender to touch and bleed easily.

Treatment: The drugs of choice are Ciprofloxacin, Erythromycin, Ceftriaxone and azithromycin

3.8.5.4. Genital Herpes: Herpes simplex virus type 2 is the primary cause of genital herpes.

Clinical manifestation: Popular lesions that progress to multiple blisters and ulcers.

Herpes simplex virus 2 infection is life-long and recurrent ulcerative episodes occur.

Treatment: Oral antiviral medications such as acyclovir, vanclovir and famiciclovir are all effective in reducing the severity and duration of first episode genital herpes.

Preventive of sexually transmitted disease

- Having sex with one partner only.
- Proper sex education
- Mass education is necessary to prevent people from getting this infection.
- Education about personal protection and laws should be enforced against prostitution.

Control of sexually transmitted diseases

- Notify to health authorities
- Patient should avoid sexual intercourse.
- Discharges from the open lesions must be collected and disinfection.
- If pregnant woman has syphilis, treat her during pregnancy to prevent her baby from getting congenital syphilis
- Provision should be made for privacy free treatment and diagnosis of the patient.

3.8.6. AIDS : Aids, the acquired immune-deficiency syndrome (sometimes called slim disease) is a fatal illness caused by a retrovirus.

Causative organism : Human immunodeficiency virus, Incubation period

Incubation period is long (upto 6 years or more) from HIV infection to the development of AIDS.

Mode of transmission : Sexual transmission

Blood transfusion : Transfusion of infected blood

Maternal – foetal transmission (mother to child transmission)

Clinical manifestation : Initial infection with the virus and development of antibodies. Asymptomatic carrier state infected persons have antibodies, but no overt signs of disease, except persistant generalized lymphadenopathy.

AIDS related complex **:** Un-explained diarrhea, lasting longer than a month, fatigue, malaise, loss of more than 10% body weight, fever, night sweats or other milder opportunistic infections such as oral thrush.

AIDS : AIDS is the end stage of HIV infection. A number of opportunist infections commonly occur in this stage.

- Persistent cough for longer than one month.
- Generalized pruritic dermatitis.

- Recurrent herpes zoster
- Oropharyngeal conditions
- Generalized lymph adenopathy

Treatment : The treatment for HIV/AIDS is called antiretroviral treatment. The drug of choice are Zidovudine, Dudanosine, Zalcitabine, Stavudine, Lamivudine, Abacavir

Control of AIDS

Prevention

Education: To enable people to make life-saving choices (e.g. avoiding indiscriminate sex, using condoms) . Other education topics include:

a. Avoiding using shared razors and tooth brushes.

b. Intravenous drug users should be informed that the sharing of needles and syringes.

c. Women with AIDS should avoid becoming pregnant, since infection can be transmitted to the newborn.

d. Educational material and guidelines for prevention should be made widely available. All mass media channels should be involved in educating the people in AIDS.

e. People in high-risk groups should be urged to refrain from donating blood.

f. Preventing perinatal transmission of HIV.

g. Monitoring the efficacy of ART.

Summary

- The important water borne diseases are typhoid fever cholera hepatitis A and acute diarrhoeal disease.
- Typhoid fever is caused by salmonella typhi and the mode of transmission is by faecal oral route.
- Complication of typhoid fever is intestinal perforation.
- Cholera is an acute infectious disease caused by cholera (vibrio cholera and the mode of transmission is by oro -faecal route.
- Cholera is a notifiable disease and is not identified and treated early can cause sudden death.
- Hepatitis a is a systematic disorder that primarily affects the liver the causative organism is hepatitis a virus. Mode of transmission is faecal oral route of and direct contact and the incubation period is 15 to 50 days usually 28 days.
- Acute diarrhoeal disease is an acute or chronic intestinal disturbance characterized by passing more than three loose motions in a day on 24 hours.
- Oral rehydration therapy is the most important thing in maintaining the hydration level.
- Poliomyelitis is an acute viral infection caused by polioviruses. It is a crippling disease

- The causative organism is three types of polioviruses (Type I, II and III)
- Mode of transmission is by faeco oral route and droplet infection.
- Food poisoning is an acute gastro enteritis caused by the ingestion of food or drink contaminated with either living bacteria or other toxins or chemical substances.
- Diseases transmitted through parasites are amoebiasis, ancylostomiasis, Taenia solium and Tarmia saginata and Ascariasis.
- Amoebiasis is a common infection of the human gastro intestinal tract and caused by Entamoeba histolytica.
- Hook worm infestation is a chronic infestation of small intestine. The causative organism is Ancylostoma duodenale, Necator americanus.
- Ascariasis is a common helmenthic infection in man caused by Ascaris lumbricoids.
- Tape worm infestation or Taeniansis is a group of cestode infections which are important zoonotic disease.
- All the diseases transmitted through oro-faecal route and the diseases caused by parasites may be controlled and prevented by proper sanitation method, improved personal hygiene and vaccines.
- Chickenpox or varicella an acute highly infectious disease caused by varicella – zoster virus it is characterized by vesicular rash that may be accompanied by fever and malaise.
- No supportive swelling of the parotid glands is the first indication of mumps.
- Influenza is spread mainly from person to person by droplet infection or droplet nuclei created by sneezing coughing or talking.
- Diphtheria is spread mainly by droplet infection. Transmission by objects (e.g. cup, thermometer, toys, pencils)
- Meningococcal meningitis or cerebro spinal fever is an acute communicable disease caused by N. meningitis.
- Acute respiratory infections may cause inflammation of the respiratory tract anywhere from nose to alveoli.
- The word rubeola means red spots.
- There are three main test currently used in tuberculosis, mantoux intradermal test, the heaf and the tine multiple puncture test.
- The tuberculosis also affects the animal is known as “bovine tuberculosis.”
- Swine flu which is called pig flu caused by influenza virus.
- Malaria is a protozoal disease caused by infection with parasite of the genus plasmodium and transmitted to man by infected anopheline mosquito.
- Lymphatic filariasis is caused by Wuchereria bancrofit.
- The lymphoedema management is washing and drying the affected lumb, elevating the limb and exercising.
- Diethylcarbamazine is the drug of choice for filarial.

- Rabies is otherwise called as hydrophobia.
- Rabies caused by lyssavirus type 1.
- In 1883, pasteus performed the first successful human anti-rabies vaccination.
- Leptospirosis is essentially animal infection by several serotypes of leptospira (spirochetes) and transmitted to man under certain environmental conditions.
- Dengue fever is otherwise called as break-bone fever.
- Chikungunya fever caused by group A virus, the chikungunya virus and transmitted by Aedes, culex and mansonia mosquitoes.
- The incubation period of chikungunya fever is 4-7 days.
- Plague is a zoonotic disease caused by yersenia pestis.
- Japanese encephalitis is a mosquito borne encephalitis infecting mainly animals and incidently man.
- Scabies is a skin disease caused by itch mite.
- Scabies is usually transmitted by close contact with an infected person.
- Trachoma is a chronic infections disease of the conjunctiva and cornea caused by Chlamydia trachomatis.
- Tetanus is an acute neuromuscular disorder caused by clostridium tetani.
- Tetanus is entirely preventable disease by active immunization with tetanus toxoid.
- Leprosy is otherwise known as Hansen's disease.
- Leprosy is caused by mycobacterium leprae.
- Syphilis is a sexually transmitted disease caused by Treponema palladium.
- AIDS is otherwise called as slim disease,
- AIDS is the end stage of HIV infection,
- AIDS is caused by human immune deficiency virus.
- The treatment for HIV/AIDS is called antiretroviral treatment,
- Antiretroviral treatment is started when the CD4 count is <200 cells/mm^3

QUESTIONS

I. Choose the best answer

1. Typhoid fever is caused by
   a) salmonella typhi
   b) wuchereria bancrofti
   c) Varicella zoster
   d) Mycobacterium tubercle
2. Typhoid fever is a
   a) vector borne disease
   b) water borne disease
   c) airborne disease
   d) zoonotic disease

3. Mode of transmission of cholera
   a) oro-faecal
   b) droplet
   c) contact with infected persons
   d) blood transfusion
4. Incubation period of cholera is
   a) few hours to 2 days
   b) few hours to 5 days
   c) few hours to 7 days
   d) more than 7 days
5. Control measures for food poisoning
   a) food sanitation and personal hygiene
   b) good environmental sanitation
   c) antibiotics
   d) bland diet
6. Chickenpox is caused by
   a) Rubeola
   b) varicella-zoster
   c) german measles
   d) varicella virus
7. A typical dusky red mucular or muculo popular rash which begins in the stage of
   a) prodromal stage
   b) eruptive phase
   c) post measles stage
   d) pre-eruptive stage
8. The incubation period of mumps is
   a) 2-3 weeks b) 18-72 hours c) 2-6 days d) 7-14 days
9. The causative organism of tuberculosis is
   a) M.leprae b) M.tuberculosis c) RNA virus d) Y.pestis
10. The drug used for the treatment of tuberculosis is
   a) tetracycline b) Rifamycin c) C.Ampicillin d) T.Dapsone
11. Dengue fever is caused by
   a) plasmodium vivax
   b) Aedes aegypti
   c) plasmodium falciparum
   d) Aedes albopictas
12. The drug of choice for malaria
   a) Diethyl carbamazine
   b) chloroquine
   c) flagyl
   d) Dexamethozone
13. Filariasis is transmitted by the
   a) bite of infected vector mosquitoes
   b) bite of infected animals
   c) bite of infected brids d) bite of infected flies.
14. Incubation period of filariaa is
   a) 1-6 months b) 6-8 months c) 8 to 16 months d) 16-18 months
15. The duration of hot stage in malaria
   a) ½ to 5 hrs b) ½ to 8 hrs c) ½ to 10 hrs d) ½ to 12 hrs.

16. Complication of malaria

a) Secondary anaemia b) tuberculosis c) filaria d) kala-azar

17. Plague is caused by

a) Y.Pestis b) T.Pallidum c) Vibrio cholera d) C.tetani

18. The incubation period 8 pneumonic plague is

a) 2-7 days b) 2-6 days c) 3-5 days d) 1-3 days

19. The drug used for the treatment of scabies is

a) Azithromycin b) Benzylbenzoate

c) Tetracycline d) Rifampacin.

20. The incubation period of trachoma is

a) 1-6 days b) 5-12 days c) 12-18 days d) 6-10 days

21. The causative organism of leprosy is

a) M.Tuberculosis b) M.Leprae c) T.Pestic d) C.tetani

22. Genital herpes is caused by

a) Herpes simplex virus b) Heptatis B Virus

c) Human papilloma virus d) candida Albicam

23. An example for viral sexually transmitted disease

a) Gonorrhoea b) syphilis

c) chancroid d) Genital human papilloma

II. Fill in the blanks

1. Poliomyelitis is a _____disease.
2. Hepatitis a affects _____.
3. _____, _____, _____ causes acute diarrhoeal disease.
4. Incubation period of malaria is _____.
5. Tab.chloroquine dosage is _____/kg/body wt.
6. Arthropathy is present in _____ fever.
7. Leptospirosis is transmitted from _____ to man
8. Chickenpox is transmitted from _____ to _____.
9. Koplik's spots appear on the _____ Mucosa.
10. Influenza is a acute _____ infection
11. Whooping cough otherwise known as _____
12. SARS caused by _____ virus.
13. BCG vaccine is given to prevent _____
14. Gonorrhoea is transmitted through _____
15. Leprosy is otherwise called as _____

16. Drugs for multibacillary leprosy are _____, _____ and _____
17. Loss of pain, touch and temperature in the hands and fet is the cardinal sign of _____
18. The incubation period of tetanus is _____
19. Scabies is transmitted through _____
20. Japanese encephalitis is transmitted to man by _____
21. The insecticide used for destruction of rat flea is _____

III. Write short notes (5 marks)

1. Poliomyelitis
2. Tuberculosis
3. AIDS
4. Leprosy
5. Cholera

IV. Write briefly

1. Disease transmitted through parasites.
2. Sexually transmitted diseases
3. Diseases transmitted through arthropod.
4. Disease transmitted through animals.

V. Write in detail

1. Disease transmitted through oro faecal route
2. Disease transmitted through air.
3. Diseases transmitted through contact.

4. NON COMMUNICABLE DISEASE

Non-communicable disease are assuming increasing importance among the adult population in both developed and developing countries. Cardiovascular diseases and cancer are at present the leading causes of death in developed countries accounting for 70 to 75 percent of total deaths. The most prevalence of chronic disease is showing an upward trend in most countries and for several reasons this trend is likely to increase. For one reason, life expectancy is increasing in most countries and a greater number of people are living to older ages and are at greater risk of chronic diseases of various kinds. For another reason, the life styles and behavior patterns of people are changing rapidly these are being favourable to the onset of chronic disease.

4.1 OCCUPATIONAL DISEASES

4.1.1 Lead Poisoning:

More industrial workers are exposed to lead than to any other toxic metal. Lead is used widely in a variety of industries because of its properties.

i) low boiling point

ii) mixes with other metals easily to form alloys

iii) easily oxidized

iv) anti-corrosive

Definition: When a person is exposed to lead in inhalation, ingestion and absorption, it will lead to lead poisoning. All lead compounds anetonic-leadasenole, lead oxide and lead carbonate are most dangerous.

Causes:

- The greatest source of environmental (non-occupational) cause is lead gasoline. Thousands of tons of lead every year is exhausted.
- Lead may also released from water pipes when person drinks water through that pipes.
- Chewing lead paint
- Lead may also used in industries like storage batteries, glass manufacture, ship building where the workers exposed to lead poisoning.

Mode of absorption: Lead poisoning may occur in three ways:

i) Inhalation: most causes of industrial lead poisoning is due to inhalation of fumes.

ii) Ingestion: small quantities of lead trapped in the upper respiratory tract may be ingested. Lead may also be ingested in food (or) drink through contaminated hands.

iii) Skin: absorption through skin occurs only in respect of the organic compound of lead especially tetraethyl lead.

Clinical manifestation: The clinical picture of lead poisoning or plumbism is different in the inorganic and organ lead exposure.

The toxic effects of inorganic lead exposure are abdominal colic (obstinate constipation, loss of appetite, blue line on the gums, stippling of red cells, anaemia, wrist drop, and foot drop.

The toxic effects of organic lead compounds are mostly on the central nervous system – insomnia, headache, mental confusion, delirium, etc.

Diagnosis:

Diagnosis of lead poisoning is based on:

1) History: A detailed history of lead exposure
2) Clinical features: such as loss of appetite, intestinal colic, persistent headache, weaker abdominal cramps and constipation, joint and muscular pain, blue line on gums, anaemia.
3) Laboratory test:
    a. Coproporphgria in urine (CPU) : Measurement of CPU is a useful screening test. In non-exposed person it is less than 150 micrograin/litre.
    b. Lead in blood and urine: Measurement of lead in blood of urine requires refined laboratory techniques. They provide quantitative indicators of exposure.

Preventive measures:

Substitution: That is where possible lead compounds should be substituted by less toxic materials.

Isolation: All processes which give rise to harmful concentration of lead dust on fumes should be enclosed and segregated.

Local exhaust ventilation: There should be adequate local exhaust ventilation system to remove fumes and dust promptly.

Personal protection: Workers should be protected by approved respiration.

Good housekeeping: Good housekeeping is essential where lead dust is present

Working atmosphere: Lead concentration in the working atmosphere should be kept below 2 mg per 10CC waters of air, which is usually the permissible limit (or) threshold value.

Periodic examination of workers: All workers must be given periodical medical examination, laboratory determination of urinary lead, blood lead, red cell count.

Personal Hygiene: Hand washing before eating is an important measure of personal hygiene. There should be adequate washing facilities in industry.

Health education: Workers should be educated on the risks involved and personal protection measures.

Management:

- The major objectives in management of lead poisoning are the prevention of further absorption, the removal of lead from soft tissues and prevention of recurrence. Early recognition case will help in removing them from further exposure.

- A saline purge will remove unabsorbed lead from the gut. The use of pencithamine has been reported to be effective like Ca-EDTA. It is a chelating agent and works by promoting lead excretion in urine.

4.1.2 Occupational cancer

Occupational cancer is a serious problem in industry. The sites of the body most commonly affected are skin, lung, bladder, and blood forming organs.

4.1.2.1. Skin Cancer:

Peruval Pott was first to draw attention to cancer of scrotum in chimney sweeps in 1775. It was subsequently found that cancer of the scrotum and of the skin and other part of the body was caused by coal, tar, X-rays, certain oils, dust.

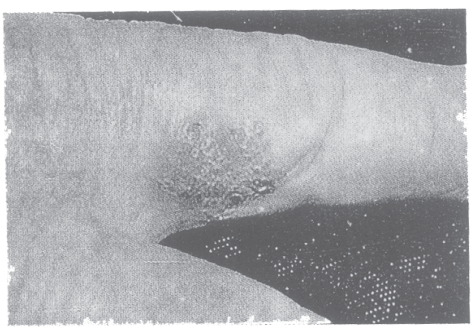


Fig. 4.1 - Squamous cell carcinoma of the finger

4.1.2.2. Lung cancer

Lung cancer is a hazard in gas industry asbestos industry nickel and chromium work arsenic, roasting plants and in the mining of radio-active substances. Nickel chromates, asbestos, coal tar, radioactive substances and cigarette smoking are proved carcinogen for the lung. Arsenic beryllium an Isopropyl oil are suspected carcinogenic.

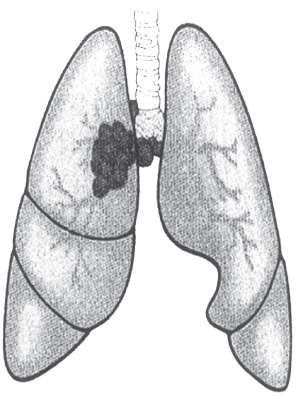


Fig. 4.2 - Small cell (oat cell) carcinama

4.1.2.3. Cancer bladder

Cancer bladder was first noted in main aniline Industry in 1995. In more recent years it was noted in the rubber industry. It is now known that cancer bladder is caused by aromatic amines, which are metabolized in the body and excreted in the urine. The industries associated with cancer bladder are the dye stuff and dyeing industry, rubber, gas and electric cable industries.

4.1.2.4. Leukaemia

Exposure to benzol, roentgen rays and ratio active substances causes leukaemia. Benzol is a dangerous chemical and is used as a solvent in many industries. Leukaemia may appear long after exposure has ceased.

Characteristics of occupational cancer

- They appear after prolonged exposure.
- The period between exposure and development of the disease may be as long as 10 to 25 years.

- The disease may develop even after the cessation of exposure.
- The average age incidence is earlier than that for cancer in general.
- The localization of cancer is remarkably constant in any one occupation.
- Personal hygiene is very important in the prevention of occupational cancer.

Control of Industrial cancer

The control measures comprise the following:

- Elimination (or) control of industrial carcinogen
    - Technical measures like exclusion of the carcinogen from the industry well designed building (or) machinery, closed system of production, etc.
- Medical examination
- Modification
- Personal hygiene measures
- Research
- Inspection of factories
- Licensing of establishment
- Education of workers and management

4.1.3. Occupational Dermatitis:

Occupational dermatitis is a big health problem in many industries. The causes may be:

- Physical : Heat, cold, moisture, friction, pressure, X-rays and other rays.
- Chemical – acids, alkalies, dyes, solvents, grease, tar, pitch, chlorinated phenols.
- Biological : living agents, such as viruses, bacteria, fungi, and other parasites.
- Plant products: Leaves, vegetables, fruits, flower, vegetables, dust.

Dermatitis producing agents are further classified into:

- Primary irritants
- Sensitizing substance

Primary irritants (Eg. Acids, alkalies, dyes, solvents) cause dermatitis in workers exposed in sufficient concentration acid for a long enough period of time. On the other hand, allergic dermatitis occurs only in small percentage of cases due to sensitization of the skin.

Prevention:

Occupational dermatitis is largely preventable if proper control measures are adopted.

Pre-selection: The workers should be medically examined before employment, and those with an established (or) suspected dermatitis.

Protection: The worker should be given adequate protection against direct contact by protective clothing, long leather gloves, aprons, boots. The protective clothing should be frequently washed and kept in good order.

Personal Hygiene: There should be available a plentiful supply of warm water, soap and towels – the worker should be encouraged and educated to make frequent use of these facilities.

Periodic Inspection: There should be a periodic medical checkup of all workers for early detection and treatment of occupational dermatitis.

4.1.4. Farmers Lung:

Definition: Farmer's lung is due to the inhalation of mouldy hay or grain dust.

Causes: The grain dust (or) hay with a moisture content of over 30% bacteria and fungi, grow rapidly, causing a rise of temperature to 40-50 degree. This heat encourages the growth of themophilic actinomycetes of which "Micro polyspora facni" is the main cause of farmers lung. The acute illness id characterized by general and respiratory symptoms and physical signs.

Clinical manifestation:

- Pulmonary fibrosis, inevitable pulmonary damage, cor pulmonale
- Physical symptoms : are temperature elevation and body pain
- Respiratory symptoms are: Cough, respiratory problems.

Treatment: The treatment is aimed at reducing symptoms. The main cause is to stay away totally from hay mold spores. After several years, the person may not be able to perform their regular duties. In severe cases farmers lung is fatal.

Minimize effects

- Use a milky pastor to keep feeding and have some else to feed the herd
- Use a free stall (or) open barn system along with excellent barn ventilation
- Use mind inhibitory.

1.1.5 Byssinosis

Definition: Byssinosis is a disease of the lungs brought on by breathing in cotton, dust or dusts from other vegetable fibres such as flax, hemp or jute while at work.

Incidence: In United States, more than 35000 textile workers have been disabled by byssinosis and 183 died between 1979 and 1992. In India, among 35% of textile industry 7 to 8% of workers are affected with byssinosis.

Causes

- The most common cause is breathing in the dust produced by raw cotton.
- People who work in the textile industry
- Smoking increase the risk for this disease.

Signs and Symptoms:

- Chest tightness
- Progressive Dyspnea
- Chronic Cough
- Tachypnea
- Wheezing
- Symptoms will get worse at the beginning of the work week and then improve while you are away from the work place, or late in the work week.

Diagnosis:

- History collection : Occupation and will ask many questions to try to find out whether your symptoms relate to certain exposure or times of exposure.
- Physical examination
- Chest X-ray
- Pulmonary function tests: Shows typical airflow obstruction and a reduction inventilatory capacity, especially if measured at the start and end of the first work shift.

Treatment:

- The most important treatment is to remove the source of exposure to the offending agent.
- Medications such as bronchodilators will usually improve symptoms.
- Corticosteroids may be prescribed in more severe cases
- Stopping smoking is very important for people with this condition
- Respiratory treatments including Nebulizers and postural drainage for chronic conditions
- Home oxygen therapy if low blood oxygen levels are detected
- Physical exercise programs, breathing exercises and patient education programs are often very helpful for people with a chronic lung disease.

Complications:

- Chronic lung disease
- Emphysema

Prevention:

- Controlling dust to prevent the occurance of disease
- Using face masks prevent the dust entering the airway
- Improving ventilation of the factory so that the dust is reduced
- Reduction of dust levels by improving machinery
- Stop smoking if you are a textile industry worker
- Wetting procedures so that the dust will not concentrated in the air.

Nurses role:

- Health education on preventive measures
- Provide nursing care during the acute and chronic stages of the disease.

4.1.6. Silicosis:

Definition: Silicosis, also known as Potter's rot is a form of occupational lung disease caused by inhalation of crystalline silica dust and is marked by inflammation and scarlingin forms of nodular lesions in the upper lobes of the lungs. It is a type of pneumoconiosis, from pneumo (lung) and konis (dust).

Causes: Because of the wide presence of crystalline silica in nature in an undisturbed form, as in rocks and the earth's crust, people in occupations that disturb the natural state or those involved in collecting or refining the material are at risk of developing silicosis.

These occupations include the following: Mining, quarying, drilling, crushing stones, chipping, grinding, sand blasting, grinding or polishing, in pottery and foundry work, cement manufacturing, glass manufacturing, masonry, blast furnaces, coal mining, construction, cutting or manufacturing heat resistant bricks, dental laboratory technicians.

Signs and Symptoms:

- Dyspnea exacerbated by exertion
- Cough, often persistent and sometime severe
- Fatigue
- Tachypnea
- Loss of appetite and weight loss
- Chest
- Fever
- Gradual dark shallow rifts in nails eventually leading to crack as protein fibre within nails beds are destroyed.

In advance cases:

- Cyanosis
- Corpulmonale
- Respiratory insufficiency.

Diagnosis:

- History collection
- Physical examination
- Chest X-ray reveals findings consistent with silicosis
- Pulmonary function testing : may reveal airflow limitation, restrictive defects, reduced diffusion capacity, mixed defects or may be normal (in uncomplicated) .

Treatment:

Silicosis is an irreversible condition with no cure. Treatment options currently focus on alleviating the symptoms and preventing complications. These include:

- Stopping further exposure to silica and other lung irritants, including tobacco.
- Cough suppressants
- Antibiotics for bacterial lung infection
- TB prophylaxis for those with positive tuberculosis skin test
- Chest physiotherapy to help the bronchial drainage of mucus

- Oxygen administration to treat hypoxemia, if present
- Bronchodilators to facilitate breathing
- Lung
- Transplantation.

Prevention:

- Rigorous dust control measures like wearing mask improving the ventilation of work place.
- Water spray is often used where dust emanates
- Dust can also be controlled by dry air filtering.

Nursing role:

- Providing nursing care in the acute and chronic stages
- Health education regarding the prevention of the disease.

4.1.7. Asbestosis

Definition: Asbestosis is a chronic inflammatory and fibrotic medical condition affecting the parenchymal tissue of the lungs caused by the inhalation and retention of asbestos firbes.

Causes:

· Exposure to asbestos fibres

· Occupation like mining, manufacturing, handling or removal of asbestos are at risk of developing asbestosis.

· Smoking increases the risk of developing asbestosis.

Signs and symptoms:

- Dyspnea especially on exertion
- Chest pain
- Cough, crackles present

Possible additional symptoms include:

- Nail abnormalities
- Clubbing of fingers

Diagnosis:

- History collection about the occupation and will ask many questions to try to find out whether you relate to occupation
- Physical examination
- Chest X - ray shows lung changes
- CT scan of the lungs shows the specific areas affected
- Gallium lung scan shows the specific areas affected

- Pulmonary function tests shows typical airway obstruction and a reduction in ventilatory capacity.

Treatment:

- There is no cure available
- Stopping further exposure to asbestos is essential
- To ease symptoms, postural drainage, chest percussion and vibration can help remove secretion from the lungs.
- Nebulizers to thin secretions
- Oxygen therapy by mask or by a plastic piece that fit the nostrils
- Lung transplantation
- Complications:
- Malignant mesothelioma
- Pleural effusion

Nurse's role:

- Health education on prevention
- Providing nursing care in acute and chronic stages.

Prevention:

- In people who are exposed to asbestos, early screening by chest X-ray
- Dust control measures like wearing mask, wetting procedures, ventilation should be improved in the work place
- Frequent rest periods
- Usage of sophisticated machines.

4.1.8 Anthracosis

Definition: Black lung disease, also known as Coal worker's pneumoncoriosis, is caused by long exposure to coal dust. It is a condition characterized by the accumulation of carbon in lungs.

Causes: Inhalation of coal dust.

Risk Factors: Smoking

Signs & Symptoms:

- No early symptoms
- Chest pain
- Dyspnea
- Cyanosis
- Shortness of breath
- Cough
- Breathing difficulty
- Bronchitis
- Progressive lung stiffening
- Impaired lung functions.

Diagnosis:

- History collection
- Physical examination
- Chest X-ray
- Pulmonary function tests
- Chest CT Scan
- HRCT – High resolution CT Scan

Treatment:

- There is no cure for the black lung disease.
- Treatments are aimed at the symptoms and complicated.

Nursing Role:

- Health Education on preventive aspects
- Early identification
- Providing Nursing care of patients with acute or chronic stages of anthracosis.

Prevention:

- Dust control measures like wearing face mask
- Improving the ventilation of the factory
- Improving the machinery to reduce the dust
- Wetting procedures should be carried out so that the dust will not concentrated in air.

4.2 CARDIOVASCULAR DISORDERS

4.2.1. Rheumatic Heart Disease:

Definition: Rheumatic fever/Rheumatic Heart Disease is an inflammatory disease of the heart potentially involving all layers of the heart (endocardium, myocardium and pericardium) .

Causes: Rheumatic heart disease is mainly caused by the bacterial infection especially streptococcus infection and rheumatic fever, upper respiratory tract infections and if the family members have the history of this heart disease previously may also cause rheumatic heart disease.

Risk factors: The children who are below the age of 5-15 years of age and the people living in crowding areas are the major risk persons to Rheumatic Heart Disease.

Signs and Symptoms:

- The clinical features are referred to as "Jones Criteria".
- The major criteria include carditis (cardiomegaly, murmurs, pericarditis), Polyarthritis (inflammation of multiple joints), chorea (NDS manifestations, weakness, ataxia, spontaneous choreic symptoms) and subcutaneous nodules.
- The minor criteria include fever of more than 103 degree F and arthralgia (Joint pain)

Diagnostic Evaluation: The patients detailed history collection and physical examination give the needed information for Rheumatic Heart Disease. Antispleptolysin O (Asotiter) is a specific diagnostic tool to identify specific streptococcus infection. RHD may also be identified by

taking throat culture, monitoring C-reactive protein, WBC count, chest X ray, electro and echocardiogram.

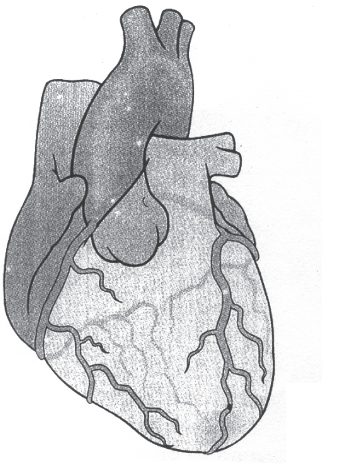


Fig. 4.3 - Heart

Collaborative therapy: Bed rest should be the major concern for the Rheumatic Heart Disease patient. The patient will be medically treated with Benzathine Penicillin(1-2 MV, IM) or procaine penicillin (6,00,000 units, UM) qd, for 10 days, Aspirin injection (analgesics) to relieve from pain and corticosteroids.

Nursing Management: The nurse should provide good emotional support for the disease patient. Adequate rest should be provided and low cholesterol and fat diet will advise to the patient. The skin care should be provided to prevent the infection. Comfort measures and devices like cotton roll and pillows for joint pain management. The patient should be advised to have regular follow-up care. The nurse should check the vital signs regularly, administers the medications at the correct time and provide nursing interventions to improve the clients' health status. She should identify the correct signs and symptoms and complications and should refer to the physician.

4.2.2. Coronary Heart Disease:

Coronary heart disease/Ischemic heart disease is a common cardiovascular disease that affects the major group of people. It affects more that 34% of the toal population.

Definition: Coronary heart disease is defined as "An abnormal accumulation of lipid or fatty substances and fibrous tissue in the vessel wall reducing blood flow to the myocardium and resulting in blockage of the vessel.

Risk Factors: The risk factors are divided into two categories:

i) Modifiable factors are:

- Cigarette smoking
- High blood cholesterol
- Obesity
- Raise in blood pressure
- High blood glucose level
- Infection

ii) Non-modifiable factors:

- Positive family history
- If the males are above 45 years and females are above 55 years, they can develop coronary artery disease
- Females are more prone to get CAD.

Causes: The major causes for coronary artery disease are:

- Accumulation of high cholesterol in blood vessels
- Angina pectoris (chest pain)
- Myocardial infarction / Ischemia (heart attack).

Signs and symptoms: The major signs and symptoms are:

- Radiating pain over the neck, axilla and left hand
- Breathing difficulty

- Nausea, chest tightness
- Discomfort.

Diagnostic findings:

- Detailed history should be collected
- Physical examination will be carried by the physician
- Chest X-ray, echocardiogram, electrocardiogram, cardiac catheterisation and nuclear imaging studies and complete blood count monitoring may all play a major role in diagnosing coronary artery disease.

Collaborative therapy: Treatment of underlying cause is the major role in the management of coronary artery disease. High Fowler's position (head lift arm-chair like fashion) should be provided. Drugs like:

- Morphine (opiod analgesis to relieve pain)
- Diuretics (to treat edema)
- Digitalis IV, (Vasoconstrictors)
- Nitroglycerin and nitroprusside will be administered.

If the patient is very sick, endotracheal intubation and mechanical ventilation may be implemented.

Nursing Management:

- The nurse should monitor the patient's weight regularly. The oxygenation should be maintained for maintaining the airway.
- The nurse should advice to avoid high cholesterol and low-density lipoprotein foods such as meat, ghee, butter, cheese, nuts, etc. salt-restricted diet like pappads, pickle, dry fish, etc.
- The patient will be advised to avoid sedentary lifestyles, smoking and alcohol consumption, tobacco chewing, etc.
- The patient will be advised to avoid strenuous physical activity like lifting heavy objects, climbing etc. but can do small exercised like walking.
- The patients should be encouraged to identify their problems and seek medical aid as soon as possible.
- Nurses should not engage the patients in increased level of exercises. She should monitor the vital signs frequently and maintain intake and output chart.
- The nurse educates the patient to relax in Semi-Fowlers position and involve the family members to provide proper psychological support and good ventilation to patient.

4.3. GASTROINTESTINAL DISORDERS

4.3.1. Peptic Ulcer:

Definition: Peptic ulcer disease is a condition characterized by erosion of the gastro-intestinal mucosa resulting form the digestive action of hydrochloric acid and pepsin.

Causes: Peptic ulcer is majorly caused by Helicobacter-pylori organism which is a bacterial infection.

Predisposing factors: The person who is having a family history of peptic ulcer and person with 'O' type of blood group are more prone to get the disease. Non-steroidal anti-inflammatory drugs by using chronically and excessive intake of alcohol ingestion and smoking may lead to peptic ulcer. High stress is one of the major predisposing factors affecting all age groups.

Signs and symptoms: The signs and symptoms are dull, of nerving pain and burning sensation in the mid-epigastrium or in the back, and pain is relieved by eating. Other symptoms like pyrosis (heart burn) may be present. Here vomiting is rate in uncomplicated duodenal ulcer, constipation diarrhea may result from diet and medications. Bleeding and tarry stools may be present.

Diagnostic Evaluation: Epigastric tenderness and abdominal distension is identified by physical examination. Endoscopy is the major diagnosis to identify the condition of peptic ulcer. Analysis of stool specimens, biopsy and histology with culture to detect H-pylori may be done.

Medical Management: Dietary modification is essential for managing peptic ulcers in which spicy foods should be avoided, fasting should be avoided and the diet menu should be modified at small and frequent meals. Fluid rich foods should be encouraged.

Advice the patient to avoid smoking and stress reduction management should be encouraged means of yoga, meditation, etc.

Pharmacological management: The drugs such as antibiotics combined with proton pump inhibitor, H_2 receptor antagonist Eg. T. Rantac 150mg, cycloprotective agents and anti cholinergics are recommended.

Surgical Management:

- Vagotomy (surgical cutting of any branches of the vagus nerve
- Vagotomy with pyloroplasty (a surgical operation in which the outlet of the stomach is widened by a form of reconstruction)
- Billroth I and II.

Nursing Management: Pain management by means of analgesics and improving the nutritional status of the patient is essential. Monitoring and managing complications are very important. Follow up care such as dietary modification and stress management are recommended.

4.3.2. Obesity

Definition: Obesity is as an abnormal increase in the proportion of fat cells, mainly in the viscera and subcutaneous tissues of the body.

Causes: Excessive stimulation of feeding center and hypersecretion of glucocorticoids are the major cause of obesity. Environmental factors and genetic factors is common and emotional component of overeating leads to obesity.

Clinical manifestation: The variety of problems occurs at a rate higher than the expected rate. Some of the condition such as hypertension, hyperlipidemia, type 2 diabetes Mellitus,

degenerative joint disease, GOUT, Insulin resistance with hyperinsulinemia, Respiratory problems, cardio-vascular diseases, gall bladder disease, non-alcoholic fatty liver disease, stroke and some kinds of cancer.

Diagnosis: A brief history and physical examination helps to diagnose, monitoring Body Mass Index helps to find the range of obesity.

Management: Dietary restriction and exercise helps to manage obesity. Behaviour-cognitive modification and drug therapy like appetite suppressing drugs and nutrient absorption blocking drugs can be given.

Surgical Management:

- Lipectomy (Adipectomy)
- Liposuction
- Gastrointestinal Surgeries – vertical banded gastroplasty/gastric bypass.

Nursing Management: Motivating the patient to participate regular physical activity programme and maintain weight loss at specified level. Encouraging, modifying eating levels can be recommended.

4.4. NEUROLOGICAL DISORDERS

4.4.1. Cerebrovascular Accident (Stroke)

Definition: A cerebrovascular accident (CVA) is an ischemic stroke or brain attack, "is a sudden loss of brain function resulting from a disruption of the blood supply to a part of a brain.

Causes: Blood loss (Hemorrhagic) is one of the cause of stroke, lack of blood supply to the brain, any of the cardiogenic diseases and other causes such as cocaine use, coagulopathies, migraine etc.

Risk Factors: The person with cardiovascular diseases, uncontrolled hypertension, excessive or prolonged drop in blood pressure, excessive alcohol consumption and injury are the risk factors.

Clinical manifestation: General signs and symptoms include numbness or weakness of face, arm or leg, confusion or change in the mental status, visual disturbances, loss of balance, dizziness, sudden severe headache.

Motor loss causes hemiplegia, hemipareris, flaccid paralysis and communication loss such as Dysarthria (difficulty speaking) , Dysphasia or aphasia (defective speech or loss of speech) , Apraxia (inability to perform a previously learned action) .

Diagnosis: Complete physical and neurological examination helps to diagnose stroke, computed tomography (CT) and MRI (Magnetic Resonance Imaging) , Carotid ultrasonography, cerebral angiography, electrocardiography, echocardiography helps to diagnose stroke.

Management: The medical management includes monitor for internal bleeding and administer osmotic diuretics, elevate the head of bed and provide anticoagulation therapy. Check for airway patency.

Nursing Management: Monitoring and managing potential complications is essential. Improve the mobility and preventing deformities to the patient. Establish exercise program to the patient. Prepare for ambulation to attain bowel and bladder control. Maintain the skin integrity and improve family coping. Promoting home and community based care.

4.5. RESPIRATORY DISORDERS

4.5.1. Bronchial Asthma:

Definition: Bronchial asthma is a chronic inflammatory disease of the airways characterized by hyper-responsiveness, mucoral edema and mucus production.

Causes: Exposure to indoor and outdoor allergens may cause inflammation of air passage, pulmonary edema and congestion of lungs caused by left ventricular failure.

Risk factors: Family history of bronchial asthma is one of the major risk factors, strongest factor causing the disease is allergy, and chronic exposure to airway irritants or allergens (Eg: grass, weed pollens, mold, dust or animals), airway irritants exposure (Eg: pollutants, cold, heat, strong odors, smoke, perfumes) . Erection, stress, sinusitis and esophageal reflux are also the risk factors.

Signs and Symptoms: The patient is having cough with or without mucus production, dyspnea (difficulty in breathing) , wheezing and chest tightness may be present. Additional symptoms such as Diaphoresis, tachycardia and a widened pulse pressure may be present, and severe symptoms such as status asthmatics may be complicated.

Diagnosis: Sputum and blood test helps to diagnose the disease, arterial blood gas (ABG) analysis, pulmonary function test and pulse oximetry are the investigations done.

Medical Management: The pharmacological management includes Beta-adrenergic agonists, methyl xanthines, anticholinergics, cortico-steroids and mast cell inhibitors are used as treatment.

Nursing Management: The nurse should promote the airway clearance and minimizing the patients anxiety. Administering fluids and antibiotics and assist with intubation and respiratory support as needed.

4.6. DIABETES MELLITUS

Definition: A group of metabolic diseases characterized by hyperglycemia, resulting from defects in insulin secretion, Insulin action or both.

Causes:

- The insulin secreted in the body is decreased in sensitivity.
- The insulin production in the body itself is less.

Risk Factors:

- The persons who are having family history may easily get diabetes.
- People who are not having enough work or not doing enough exercise.
- People who are with less fiber intake diet.

Clinical Manifestations: (Signs and Symptoms) :

- Polyuria – passing increased urine. A person who is passing excessive urine especially in the night time.
- Polydypsia: Increased thirst. Drinking more water than usual.
- Polyphagia: Increased appetite. Eating more

Other Symptoms:

- Fatigue : General weakness
- Sudden vision changes may occur
- Wound may get more time to heal
- Tingling or numbness sensation in hands or feet and dry skin.

Diagnostic Evaluation

- Fasting plasma glucose – blood to be taken before taking diet in the morning
- Post prandial plasma glucose: Blood taken 2 hours after taking breakfast
- Oral glucose tolerance test: Glucose load (100 gms) to be given and blood to be taken in fasting, 1 hour, 1.1/2 hours and 2 hours after food.
- Urine sugar and urine ketone bodies : Urine to be tested for sugar
- HbA1C (Glycosylated Haemoglobin).

Management

Nutrition Management

a. Food should provide all essential food constituent

b. Achieving and maintaining a reasonable weight

c. Patient energy needs to be met

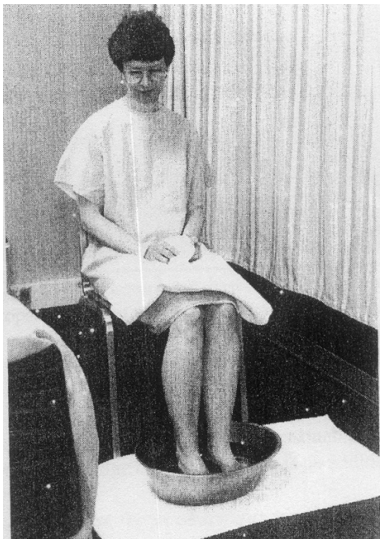
Exercise: Daily ½ an hour walk is a must for diabetic patient. Cycling and swimming also a best exercise

Monitoring: Blood glucose to be monitored by the individual with the help of self monitoring blood glucose machine

Pharmacologic Therapy: Insulin therapy and oral anti diabetic agents.

Education: Regarding

- How to test blood glucose to themselves
- Diabetic diet
- Physical activity to be explained
- Physical and emotional stress to be avoided



Foot care: (for diabetic patient)

- Foot should be washed with warm water and dried with towel.
- Don't leave any water on the foot
- Jelly may applied for dry foot for fissures
- Advice the patient to see the foot with mirror because they are not able to inspect their foot by own.
- If there is any ulcer in the foot immediate medical help to be sought
- Advise to wear soft chapels like MCR.
- Nails should be cut short that is in straight manner.

Fig. 4.4 - Soak feet for 10 to 20 minutes

4.7. BREAST CANCER

Definition: Cancer is a disease process whereby cells proliferate abnormally, ignoring growth regulating signals in the environment surrounding the cell.

Causes:

- No definite cause
- Hormones and genetics play some role in causing breast cancer

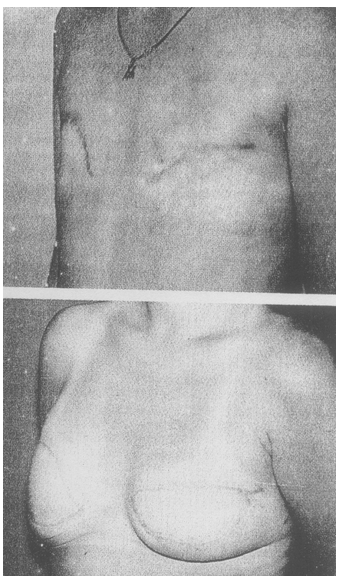


Fig. 4.5 - Breast Cancer

Risk factors:

- Breast cancer may be seen after the age of 50
- Personal or family history of breast cancer may lead to a main cause
- Persons with early menarche may have more chances of getting breast cancer
- Females who are not having children are more prone to breast cancer
- Late maternal age at first birth
- Late menopause also one of the cause
- Exposure to ionizing radiation
- Obesity also rarely cause breast cancer.

Signs and Symptoms:

- Non tender, fixed, hard mass with irregular border in the breast.
- Peau d'orange (orange peel) appearance of the skin seen on the breast
- Nipple retraction in advanced cancer
- Ulcerating and fungating lesions.

Diagnosis:

- Self breast examination: The individual has to examine her breast on the 7th day of each menstrual cycle.
- Fine needle biopsy
- Open biopsy
- Incisional biopsy
- Core biopsy
- Histologic examination

Surgical Management:

- Mastectomy – removal of the affected breast
- Modified radical mastectomy
- Breast conservation surgery
  - Lumpectomy
  - Partial mastectomy
  - Segmental mastectomy
  - Quadrantectomy.
- Axillary lymph node dissection

Radiotherapy:

Radiation may be passed after surgery

Chemotherapy:

It is a treatment which is given with the help of group of drugs.

1. Hormonal therapy
2. Bone marrow transplantation

Nursing Management:

1. Family support
2. Exercise
3. Psychological exercise or emotional support to patient and family members
4. Dressing
5. Relieving pain and comfort
6. Maintain skin integrity
7. Educate post operative exercise

Family support: Family and members should be supported with proper counseling. Explain them about the treatment modalities available now. Family members are advised to support the patient who is suffering with cancer.

Post Operative Exercises:

a. Wall climbing exercise: Advise the stand near the wall and face the wall, advise to put the affected side on the ward, and slowly move the hand on the wall with finger walk.

b. Rope pulling exercise: Advise to hang the rope on a rod and hold the two ends of the rope with two hand and lift the hand one by one in opposite direction.

c. Rope turning exercise: Tie a rope on the door and turn the rope with hand of affected side.

Dressing:

a. Breast binder may be applied if necessary

b. Supportive bra to be worn by the patient

c. Cosmetic brassieres also available in the market (It may be provided with silicon balls).

4.8. CERVICAL CANCER

Definition: Cancer which occurs in the cervix that is the lower most part of the uterus is called cervical cancer.

Causes (Risk Factors)

Sexual activity

i) Multiple sex partners
ii) Early sex activity
iii) Early child bearing
iv) Exposure to human papillovirus
v) HIV Infection
vi) Smoking
vii) Low socioeconomic status
viii) Nutritional deficiency
ix) Chronic cervical infection

Signs and Symptoms:

- Vaginal discharge
- Bleeding after sexual intercourse
- Irregular bleeding
- Pain in the back (excruciating)

Diagnostic evaluation:

- Pap smear
- Pelvic examination
- Casecatory test
- Colposcopy
- CT scan
- Intravenous Urogram
- Cervical biopsy
- Pelvic X-ray
- Punch biopsy
- Dilation and curettage
- MRI
- Cystogram

Medical Management:

- Percursor (or) preinvasive lesions

Surgical Management:

- Hysterectomy
- Radical Hysterectomy
- Pelvic exenteration

Brachytherapy

Radiotherapy

Chemotherapy

Nursing Management:

- Family support: Family members should be supported with proper counseling. Explain them about the treatment modalities available now. Family members are advised to support the patient who is suffered with cancer.
- Personal hygiene: Maintaining personal hygiene is very important to reduce infection. Perineal hygiene is important. Wash the genitals with warn water after urination and defecation. Inner-wears should be washed well and dried in sunlight. Advise to see the medical practitioner if there is any fowl smelling discharge.
- Advise to come for regular check up even if there is no complaints.

Summary

- Rheumatic heart disease is an inflammatory disease of the heart usually caused by bacterial streptococcal infection.
- Coronary artery disease is characterized by an abnormal accumulation of lipid or fatty substance that results in blockage of the vessel leading to infarction.
- Risk factor of coronary artery disease is classified into modifiable and non-modifiable factors.
- Diabetes mellitus is metabolic disorder characterized by hyper-glycemia, resulting from defects in insulin secretion insulin action or both.
- There are many carcinoma types – they are lung cancer, breast cancer, cervical cancer, etc.
- Occupational lung diseases are silicosis, Byssinosis, asbestosis, anthracosis, Bagassosis and others like lead poisoning, occupational dermatitis and farmer's lung.
- Gastrointestinal disorder which is common is peptic ulcer disease.
- Obesity is a very common health problem at present
- Cerebro-vascular accident (stroke) is a sudden loss of brain function resulting from a disruption of the blood supply to a part of a brain.
- Bronchial asthma is a chronic inflammatory disease of the airways characterized by hyper responsiveness, mucosal edema and mucus production.

QUESTIONS

I. Choose the correct answer

1. Rheumatic fever is caused by:

   a) Streptococcus b) Corynebacterium c) Spirochete d) Viruses

2. Byssinosis is caused by Inhalation of:

   a) cotton dust b) crystalline silica

   c) coal dust d) sugarcane dust.

3. Malignant mesothelioma is the complication of:

   a) Anthracosis b) Asbestosis c) Byssinosis d) Silicosis

4. Allergic dermatitis occurs due to:

   a) Acid b) Alkalis c) Dye d) Sensitization of the skin.

5. Post prandial blood glucose is to be taken after how many hours:

   a) 2 hours b) 4 hours c) 5 hours d) 1 hour

6. Toxic effect of organic lead compound:

   a) abdominal colic b) constipation c) loss of appetite d) delirium

7. Major cause for coronary artery disease is:

   a) infection b) obesity

   c) poor personal hygiene d) accumulation of high cholesterol

8. Sudden loss of brain function resulting from disruption of blood to be a part of the brain:

   a) Stroke b) Haemorrhage c) Hypertension d)Diabetic mellitus

9. Treatment for coronary artery disease:

   a) Paracetamol b) cotrimazole c) penicillin d) nitroglycerin

10. The term difficulty in breathing is also called:

    a) Chest tightness b) Dyspnea c) tCough d) Chest pain

11. Which is present in urine is useful for screening the lead poisoning:

    a) porphyrin b) Axylin c) Thiamine d) Coproporphyrin

12. Which chealating agent is used in execution of lead:

    a. Ca-EDTA b) EDTA c) Ca d) Heparin

13. Inhalation and retention of Asbestos fibres will cause:

    a. Byssinosis b) Lung cancer c) Anthracosis d) Asbestosis.

14. Pulmonary function test is used in:

    a. Pneumoniasis b) Breast Cancer c) Bladder cancer d) Stroke

15. Erosion of gastro-intestinal mucorsa is seen in:
    a) Stroke b. Diarrhoea c. Vomitting d. Peptic ulcer.
16. Surgical removal of the branches of vagus nerve is called:
    a) Billroth I and II b. Vagotomy c. Pyloroplasty d. Jejunostomy
17. Polyuria is:
    a) Blood in urine b. Pus in urine
    c) Burning micturation d. Excessive urination
18. Increased thirst is called:
    a) Polyphagia b) Polydipsia c) Dyspnea d) Polyuria
19. Breast self examination to be done on which day after menstruation:
    a) 5^{th} day b) 6^{th} day c) 7^{th} day d) 8^{th} day
20, Pap smear is used for investigation of _____ cancer:
    a) vaginal cancer b) cervical cancer
    c) uterine cancer d) ovarian cancer

II. Fill in the blanks

1. _____will removes unabsorbed lead from the gut.
2. _____is due to the inhalation of mouldy hay or grain dust.
3. Abnormal proliferation of body cells is called _____.
4. The other name of silicosis is _____.
5. _____ is called black lung disease.
6. Jones criteria is used in classifying the signs and symptoms of _____.
7. Peptic ulcer disease is mainly caused by the organism _____.
8. _____ is major sing for coronary artery disease.
9. Increased pulse rate is called _____.
10. Monitoring Body Mass Index helps to find the range of _____.

III. Write briefly

1. Signs and symptoms of Rheumatic heart disease
2. Peptic Ulcer disease
3. Bronchial Asthma
4. Breast Cancer
5. Preventive measures of lung cancer.

IV. Write in detail

1. Silicosis
2. Coronary Artery Disease.

5. NUTRITION

Nutrition forms the basic component of health without an intake of a balanced diet, it is impossible to maintain good health. (Adequate nutrition is a basic component of health). Health, as defined by WHO "health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity".

5.1 Relationship of nutrition to health:

Optimal health is based on good nutrition. Eating the right kind and amount of food and following good dietary habits throughout the entire life cycle provide a healthier bodies and minds, greater vitality and energy, greater resistance to disease, efficiency, happiness and longevity.

Food is the substance taken into the body, which will help to meet the body's need for energy, maintenance and growth. The role of the nurse in the nutritional care is important, as she is the one in close and continuous association with patients. The nurse has to work as a co-ordinator between the physician and the dietician, as an interpreter of the tests and dietary recommendations and as a teacher or educator of sound nutritional practices.

Food is a mixture of compounds called nutrients. A nutrient is any substance which performs one or more functions in the body, which includes carbohydrates, fat, protein, minerals, vitamins and water.

Based on their functions, nutrients have been classified as:

Ø Energy yielding foods

Ø Body building foods

Ø Regulatory and protective foods

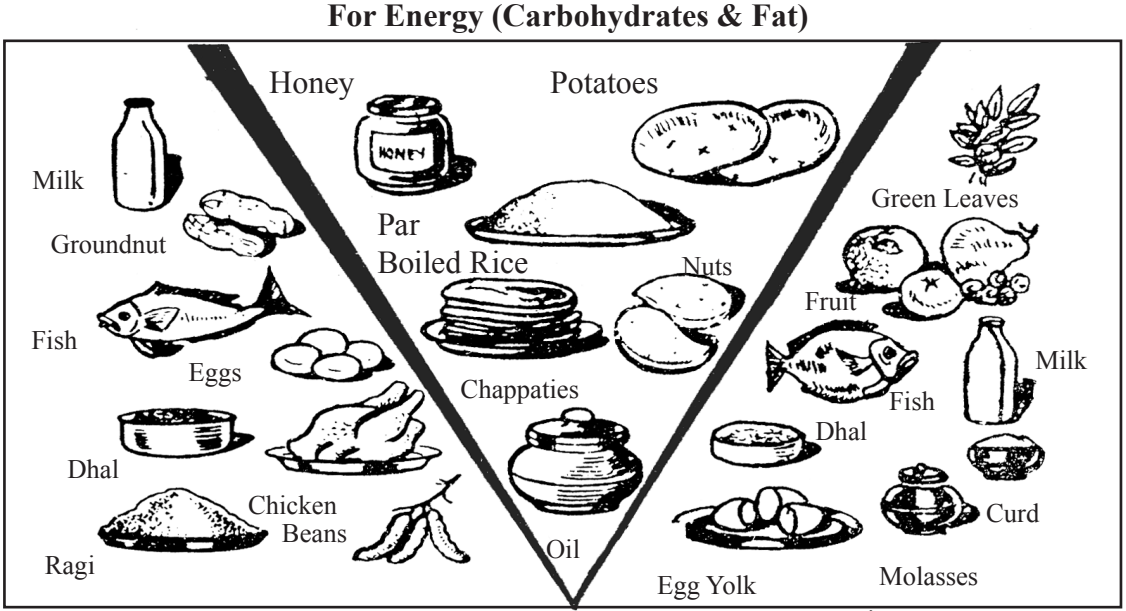
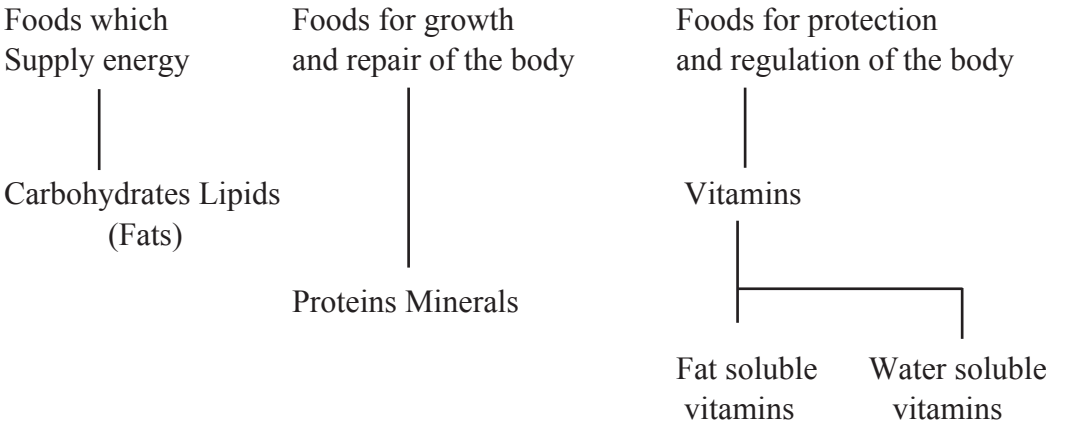


Fig. 5.1 - An Adequate Balanced Diet

Classification of foods:

(Based on chemical composition, sources and function)



5.2. Functions of food

Table 1 – Common functions

S.No.	Function	Nutrient	Food sources
1	Energy yielding	Carbohydrates	Sugar, jaggery, sweets, cereals, cereal products, roots, fiber and fruits
		Fats	Butter, ghee, oils, margarine and hydrogenated fats, cream
		Protein – to some extent	Milk, meat, fish, eggs, pulses, nuts, oil seeds, soya beans
2	Body building (build and repair body tissue)	Proteins	-do-
		Minerals	Milk and milk products, nuts, fruits, vegetables, egs, meat, fish
		Calcium	Milk and milk products, eggs, meat, leafy vegetables, whole grain cereals, pulses and dried fruits
		Iron	Organ meats, dark green leafy vegetables, whole grain cereals

3	Regulatory and protective	Water, Minerals, Vitamins, Vitamin-A	Milk, butter, eggs, liver, dark green and yellow vegetables and fruits
		Vitamin D	Meat, fish, poultry, whole grain cereals, egg yolk
		Vitamin B, thiamine	Milk, pork, meat, fish, poultry, eggs, organ meats, whole grains
		Riboflavin	Meat, poultry, ground nuts, beans, whole grain, cereals, milk and milk products, green leafy vegetables
		Niacin	Chicken, beef, liver, whole grains, mushrooms
		Vitamin C	Citrus fruits, tomatoes, cauliflower, red and green pepper
		Vitamin E	Vitamin E is essential for normal reproduction

5.3. CLASSIFICATION OF FOOD DEPENDING ON THEIR NUTRITIVE VALUE

- Cereals and millets
- Legumes (pulse)
- Oil seeds and nuts
- Vegetables:
  - green and leafy
  - roots and tubers
  - other vegetables
- Fruits
- Fats and oils
- Foods of animal origin
- Milk and its products
- Sugars, spices and condiments

5.4. ENERGY

Energy may be defined as “the capacity to do work”. The energy value of foods is measured in kilocalories (kcal) or mega joules (MJ) .

Kilocalorie is the heat required to raise the temperature of one kilogram of water to one degree centigrade.

Physiological energy values of foods are given as:

- 1g carbohydrate yields - 4 kcal
- 1g fat yields - 9 kcal
- 1g protein yields - 4 kcal

The body needs energy for maintaining body temperature, metabolic activity, growth and physical work. The energy yielding food factors, i.e. carbohydrates, fats and proteins, are oxidized in the cells of the body with utilization of oxygen and production of carbon-di-oxide, water and heat.

5.4.1. The factors which influence the total energy metabolism in a human being are:

- Weight: total metabolism includes work done in moving one's own weight from place to place. Therefore, the heavier the individual, the more energy he/she requires for movement.
- Age: Age also affects total metabolism, eg., adolescents require more total energy than adults.
- Temperature: the body must have sufficient food to make up for heat loss. The amount of heat lost from the body depends on two main factors:
- The amount of work done: the more active a person is, either at work or play, the more heat is produced and this heat must be eliminated from the body.
- External temperature: the greater the difference of temperature between the body and the surrounding atmosphere, the greater will be the heat loss from the body.
- Pregnancy: during pregnancy, energy requirements are increased due to the growth of foetus, placenta, increase in the blood volume.

5.4.2. Carbohydrates: is a simple sugar or a compound formed by the combination of two or more simple sugars.

Classification: - Mono saccharides

Di saccharides

Poly saccharides.

5.4.2.1. **Monosaccharides** : These are simple sugars and all carbohydrates must be broken down to monosaccharide before they can be absorbed into the human body.

Glucose: Glucose serves as the main source of energy in the body. Glucose is present in a free state in many fruits and honey.

Fructose : Occurs in a free state along with glucose, in many fruits and honey. It is readily utilized by the body as a source of energy.

Galactose: Does not occur in the free state. It is a constituent of lactose present in milk.

Ribose: These are present in both: plant and animal tissues.

5.4.2.2. Disaccharides*:* these are formed by the combination of two monosaccharides by the elimination of one molecule of water i) sucrose (ii) maltose, lactose.

- Sucrose (cane, sugar, beeet sugar) : It is manufactured on a large state from sugarcane or beetroot.
- Maltose: Is formed from starch during the germination of cereal grains and digestion of starch by enzyme amylase.
- Lactose: Is present in the milk of all animals.

The disaccharides are crystalline substances soluble in water, but they must be broken down to their constituent monosaccharides to be absorbed in the body.

5.4.2.3. Polysaccharides*:* these are made up of many units of monosaccharides. The majority are insoluble, or only slightly soluble in water. Important polysaccharides are starch, glycogen, dextrin, and dietary fiber.

- Starch: It is polysaccharide made up of a large number of glucose molecules.
- Glycogen: Is a reserve carbohydrate found in the liver and muscles of animals and man. It is sometimes called animal starch.
- Dextrin: Are a group of substances formed during the breakdown of starch to maltose during the process of digestion in the human body, or in the germination of seeds, or in some of the processes used in cooking.

5.4.2.4. Dietary fibers*:* are cellulose, hemi-cellulose, gums, mucilages and lignins:

- Cellulose: A very stable insoluble compound. It forms a large part of the plant foods used in nutrition (eg) cereals, dhals, fruits and vegetables. Cellulose does not give any caloric value in the diet of human beings because it is not broken down by digestive processes in the human body. The main value of cellulose is adding bulk or roughage to the diet and thus stimulating peristalsis in the intestine.
- Hemicellulose: Is found in whole grain cereals, vegetables and hulls of legumes, etc.
- Pectin: In the presence of citrus fruits, green peas and carrots. It is also used in medicine for the treatment of diarrhea.
- Gums: Are found in whole wheat, rye, peach, pear, plum, mature vegetables.

Functions of carbohydrates: Each gram supplies 4 calories. Carbohydrates supply 50% or more of the total daily requirement of calories for human beings. In ordinary diets, about 10% of total calories is supplied by proteins and 20-25% by fat and the remaining 65-75% by carbohydrates.

- Carbohydrates are essential for the oxidation of fats. They prevent the excessive breakdown of fat and the development of ketosis.
- Carbohydrates prevent excessive break down of protein. When there is no carbohydrate available, protein is used as a source of energy.
- Carbohydrates in the form of cellulose aids in the elimination of waste materials from the intestine.

Sources of carbohydrates: in the diets are cereals and millets, sugar and jaggery, roots and tubers, pulses and dried fruits.

Requirements: 60-70% of energy should be derived from carbohydrates for adults and 40-60% for children.

5.4.3. Lipids: Fats and oils belong to a group of substances called 'Lipids'.

- Saturated fatty acids: The sources of saturated fatty acids are animal fat.
- Unsaturated fatty acids: The sources are vegetable oils like corn oil and soyabean oil. Vegetable oils are rich in unsaturated fatty acids (coconut oil being the exception).
- Essential fatty acids: The three poly unsaturated fatty acids Linoleic, Linolenic and arachidonic are known as essential fatty acids. They cannot be synthesized in the body and so must be supplied in the diet. They are necessary for proper growth and metabolism.

Functions of fats: Fat is an important source of energy, giving 9Kcal/gm. It is important to note, however, that the quality of fat, which can be eaten in one day is limited and therefore, the proportion of calories from fat is not usually greater than the proportion of calories from fat is not usually greater than the proportion of calories from carbohydrates.

- Fats are essential for the absorption of vitamins A,D,E,K and especially carotenoids (pro – vitamin A) present in the foods of vegetable origin.
- Some animal fats (eg.) fish, liver oils, butter and ghee, contain vitamin A.
- Excess carbohydrate in the diet is converted to fat and stored. This acts as padding for blood vessels, vital organs and in protecting against heat loss.

Sources of fat: Foods of animal origin, eg., meat, fish, milk, butter, cheese, eggs and fish liver oils contain varying amounts of fats and contribute to the caloric value of food.

Fat requirements: the daily intake of fat should be such that it contributes not more than 15-20% of the calories in the diet.

5.4.4. Protein: are the main organic constituents of the animal body. They form the basis of the muscular tissue of the body, of the protective structure such as bones, cartilage, skin, hair and nails and provide a large part of the total solids of the body.

Classification:

- Simple proteins eg. Albumin and globulin
- Conjugated protein eg. Nucleo protein and hemoglobin
- Derived protein, eg. Peptones and peptides.
- Complete protein: It contain all the essential amino acids, eg. plant proteins like dhal and cereals. These promote moderate growth.
    - Partial complete protein: these are partially lacking in one or more essential amino acids, eg., plant proteins like dhal and cereals. These promote moderate growth.
    - Incomplete proteins: they are completely lacking in one or more essential amino acids (eg.) gelatin and zein of corn. These do not promote growth.

Digestion and absorption:

The end products of protein digestion are water-soluble amino acids. These are absorbed rapidly from the small intestine, directly into the portal blood system. In the liver, some are built into required amino acids and some are broken down for the production of energy and the resultant waste product is urea.

Enzyme action in specific organs for digestion of proteins:

Organ	Active enzyme	Action
Mouth	-	Mechanical only
Stomach	Pepsin Rensin (infants) Calcium necessary for activity	Protein – polypeptide Casein coagulated curd

Protein Requirements: The ICMR recommends 1gm of protein/Kg of body weight for adults. The amount of protein should be increased for pregnant and lactating mothers by 14 and 25g/day.

Sources of Protein:

- Foods containing 1st Class protein : Milk (Cow"s) , curds, mutton, beef, liver, fish, egg (hen's), groundnuts, soya.
- Foods containing 2nd class protein: Wheat, ragi, rice(par boiled) , red gram dhal, bengal gram.

5.5. Minerals: 4-5% of the human body weight is made up of minerals. Minerals are builders, activators, regulators, transmitters and controllers. 100mg/day, are called major minerals and those with required intake of less than 100mg/day are called 'trace elements'.

Major minerals:

- Calcium
- Phosphorus
- Magnesium
- Sodium
- Potassium
- Chloride
- Sulphur

Trace elements:

Iron, iodine, zinc, copper, manganese, chromium, cobalt, selenium, fluorine.

General functions of minerals:

- As constituents of hard tissue (eg.) calcium and phosphorus in bone and teeth.
- As constituents of soft tissue (eg.) sulphur and phosphorus
- As constituents of substances assisting in the regulatory function of the body (eg.) salts in solutions influence nerve and muscle action.

5.5.1. Calcium and phosphorus:

- 99% of the total body calcium is found in the bones and teeth.
- Calcium is, therefore, necessary for growth and maintenance of bones and teeth.
- Calcium is present in blood. It is also present in other fluids of the body (eg.) cerebrospinal fluid and in the milk, which is secreted by the mammary glands.
- Calcium is necessary for the correct functioning of nerves and muscles.

Functions of calcium and phosphorus:

- Necessary for muscle contraction and relaxation
- Necessary for the cell membrane permeability
- Calcium ions are important activators of some enzymes.
- Phosphorus compounds are necessary for carbohydrate metabolism and for the calcification of bones and teeth
- Needed for transport of fatty acids.

Metabolism: Calcium is concerned mainly wit the calcification of bone. If the calcium intake is adequate and without excess phosphorus, calcification of bones is good but if the calcium intake in inadequate and if there is excess phosphorus, the bones do not harden properly and cannot bear the weight of the body.

Requirements of calcium:

- Adult (man and woman) – 400mg/day
- Pregnant and lactating women – 1000mg/day
- Infants – 500-750mg/day.

Sources of calcium:

- Milk is one of the best sources of calcium for the human body
- Cereals and millets - Ragi

- Pulses and legumes - whole Bengal gram, whole horse gram, rajmah
- Nuts and oil seeds - mustard seeds, poppy seeds
- Green leafy vegetables - agathi, drumstick leaves
- Milk and milk products - cow's milk, buffalo's, milk, cheese, khoa
- Fish and sea foods.

Sources of phosphorus:

- Whole grain cereals and flours,
- Legumes,
- Nuts
- Fish

5.5.2. Iron: the amount of iron present in the adult human body is very small, but it is very important substance and essential for the maintenance of life.

Functions of Iron:

- It is present in the nucleus of cells and is very necessary for oxidation in the tissues
- It is an essential constituent of hemoglobin and is responsible for the oxygen carrying capacity of the blood.
- Iron may also be considered as necessary for one of the regulatory functions of the body.
- Copper is believed to be a catalyst in the formation of hemoglobin. There is only a very small amount of copper in the human body and in a diet, which is adequate in all other nutrients.

Sources of iron: Liver, lean meats, fish and poultry are good sources of iron in the form of haeme. Legumes, dry fruits, whole grain cereals and hand pounded cereals as well as green leafy vegetables are good sources.

5.5.4. Iodine:

Content of the human body is less than 30mg of which more than half is found in the thyroid gland, which consists of two lobes situated or placed on either side of the trachea near the base of the neck.

Sources of Iodine:

Salt water fish, shell fish, eggs, dairy products, meat, poultry depends upon the iodine content of the animals diet. Fortification of common salt with potassium iodate is a recommended method of making iodine easily available..

Functions: Iodine is an important constituent of thyroxine, the hormone secreted by the thyroid gland. Iodine is responsible for the regulation of physical growth.

Absorption: Iodine absorbed from the small intestine is quickly taken up by the thyroid gland where it is used for the production of thyroxine.

Requirement: 0.15 to 0.2 mg/day for adult and 0.05 to 0.2 mg/day for infants and children.

5.5.5. Sodium, Potassium and chloride: are all present in foods and are required for normal functioning of the body. These three minerals are related to one another. Potassium is mainly present inside the cells of blood and soft tissues, while sodium is present mainly in the fluids bathing the cells i.e. in blood plasma and tissue fluid.

Function:

- Sodium helps to maintain osmotic pressure
- Chloride is necessary for the production of hydrochloride acid for gastic secretion
- Sodium, potassium and calcium assist in correct functioning of muscles during contraction.

Sources of potassium: meat, poultry, fish, milk, curds and whole grain cereals, pulses, vegetables and fruits (bananas, potatoes, tomatoes, carrots, orange, grapes and custard apply) .

Sources of sodium: milk, egg white, meat poultry, fish and some vegetables such as spinach, beets, celery, fruits, cereals and legumes

5.5.6. Magnesium: human body contains about 25gms of magnesium. Half of it is present in bones and in combination with phosphate and carbonate and about $1/5^{th}$ in soft tissues.

Sources of magnesium: dairy products (excluding butter) fresh green vegetables, meat, nuts, sea food and legumes are good sources of magnesium

5.5.7. Other Inorganic Elements:

- Copper : functions with iron in the formation of hemoglobin
- Manganese : has a similar effect though less marked than copper
- Cobalt: is present in vitamin B12 which is also necessary for the formation of hemoglobin.
- Zinc: is found mainly in pancreatic tissue and may have an important part to play in the storage of insulin in the gland.

5.6 VITAMINS

Vitamins in food is for the protection and regulation of body functions.

Classification: There are two main classes of vitamins. They are fat soluble and water soluble vitamins.

5.6.1. Fat soluble vitamins: Vitamin A, D, E, K.

5.6.1.1. Vitamin A*:* is food in foods of both plant and animal origin.

Functions:

- Vitamin A is necessary for the health of the eyes.
- For the prevention of night blindness
- For the prevention of xeropthalmia
- Vitamin A is necessary for the maintenance of the normal epithelial tissues of the body.
- Vitamin A is necessary for growth and proper utilization of protein.

Sources: is obtained from animal and plant sources (eg.) dark green leafy vegetables, ref and yellow fruits and vegetables, like carrots, tomatoes, red peppers, pumpkins, mango, papaya and jack fruit, milk, butter, cheese and egg yolk, liver, fish and fish liver oils.

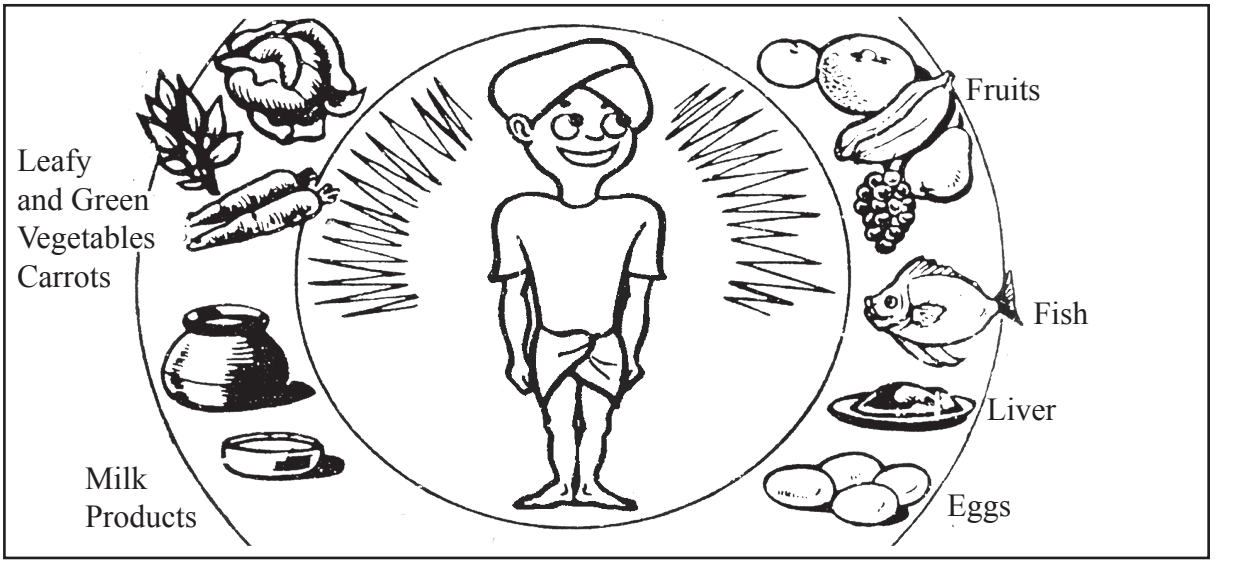


Fig. 5.2

5.6.1.2. Vitamin D*:* can be synthesized in the body with adequate exposure to sunlight.

F**unctions**: vitamin D is necessary for the proper calcification of bone and thus for the prevention of rickets.

Requirement: 400-800 IV is considered sufficient for young children.

Sources: the chief sources of such foods are milk, butter, cheese, egg, fish and fish liver oils, and foods which have been fortified by addition of vitamin D.

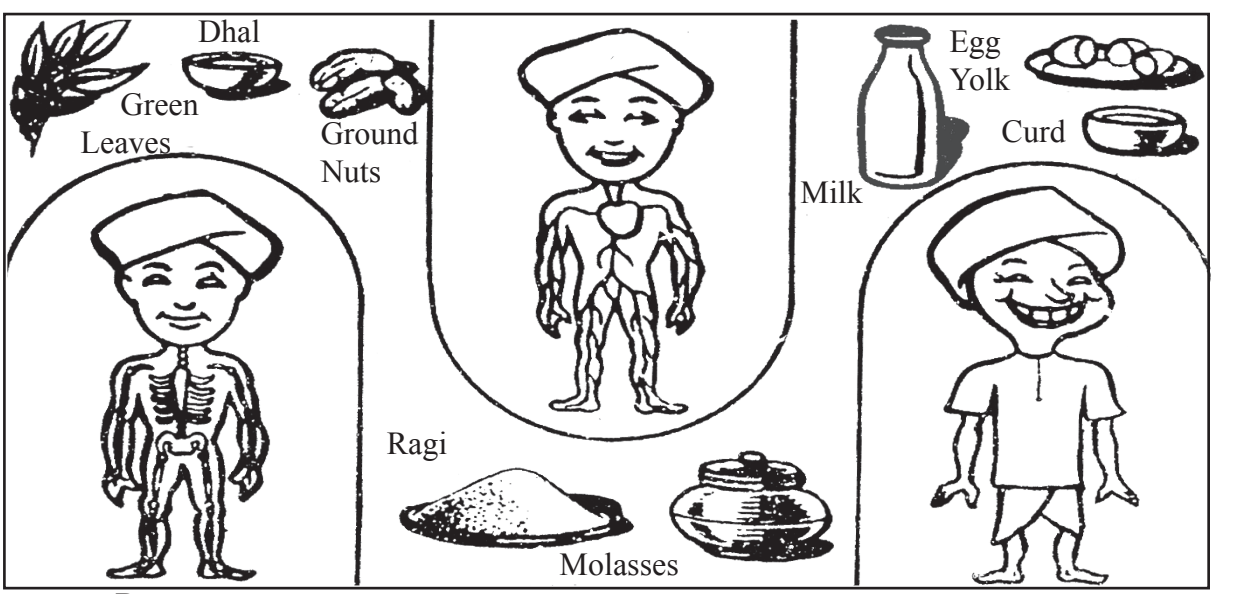


Fig. 5.3

5.6.1.3 Vitamin E: It protects cellular and sub cellular membranes and hence tissue integrity. It is necessary for normal muscular function.

Sources: Fats of vegetable origin and food grains are rich sources of Vitamin E.

5.6.1.4. Vitamin K: Vitamin K is necessary for the coagulation of blood.

Sources: of vitamin K in human nutrition are green leafy vegetables and muscle meats.

5.6.2. Water soluble vitamins:

- Thiamine or B1
- Riboflavin or B2
- Nicotinic or B3
- Pyridoxine or B6
- Folic acid or B9
- Cyanocobalamine or B12

5.6.2.1. Vitamin B Complex (Thiamine) : Thiamine is essential for the normal metabolism of carbohydrates and fats. It is necessary for the transmission of nerve impulses.

Storage: It is found in all tissues, especially heart, brain, kidney and liver tissues that are very active in metabolism, but it is not stored for any length of time in the body.

Sources: whole grain cereals, wheat, ragi, pulses(dhal) , vegetables and potatoes, green leafy vegetables.

5.6.2.2. Vitamin B2 (Riboflavin) : is essential for the metabolism of carbohydrates, amino acids and lipids

Sources: milk, green leafy vegetables, idli, dosai, sprouted grams.

5.6.2.3 Vitamin B3 (Nicotinic acid) : functions as a co-enzyme along with thiamine and riboflavin in the oxidation of carbohydrates.

Functions:

- Helps in the metabolism of protein
- It stimulates the formation of red blood cells in rats
- Storage: is present in all tissues of the body, especially liver

Sources: potatoes, green leafy vegetables and some of the fruits.

5.6.2.4. Folic acid B9 and Cyanocobalamine (B12) : function together in helping in the formation of red blood cells. B12 is necessary for the proper functioning of nerve cells.

Sources of B12 – beef, chicken, liver, lean meat, oysters and crab, green leafy vegetables.

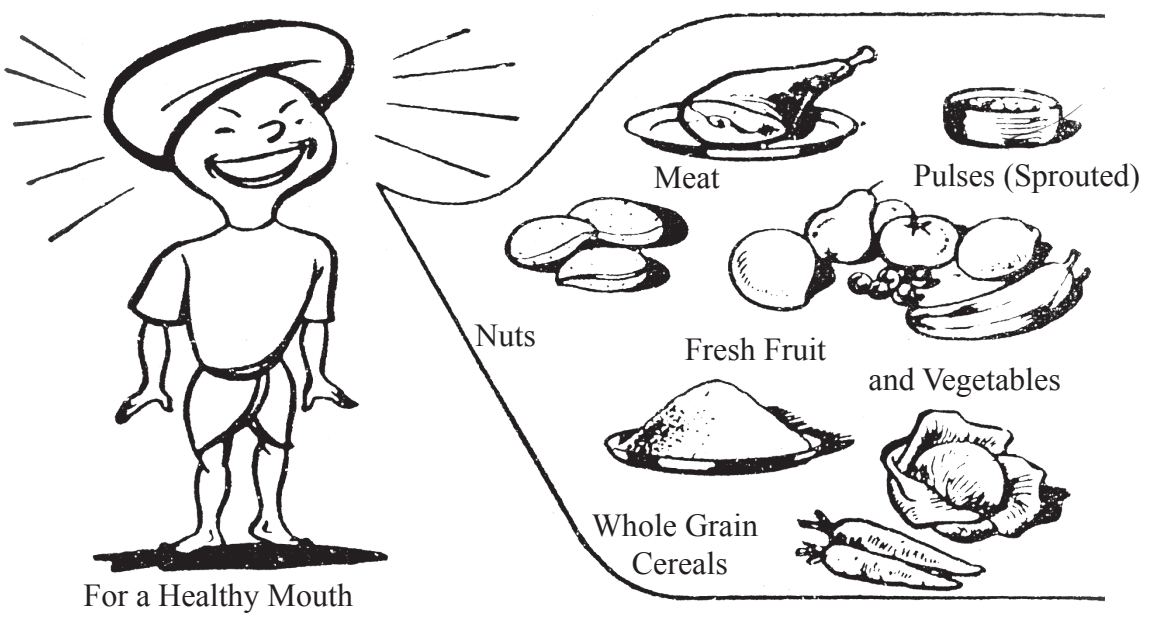


Fig 5.4 - Foods to Protect Health

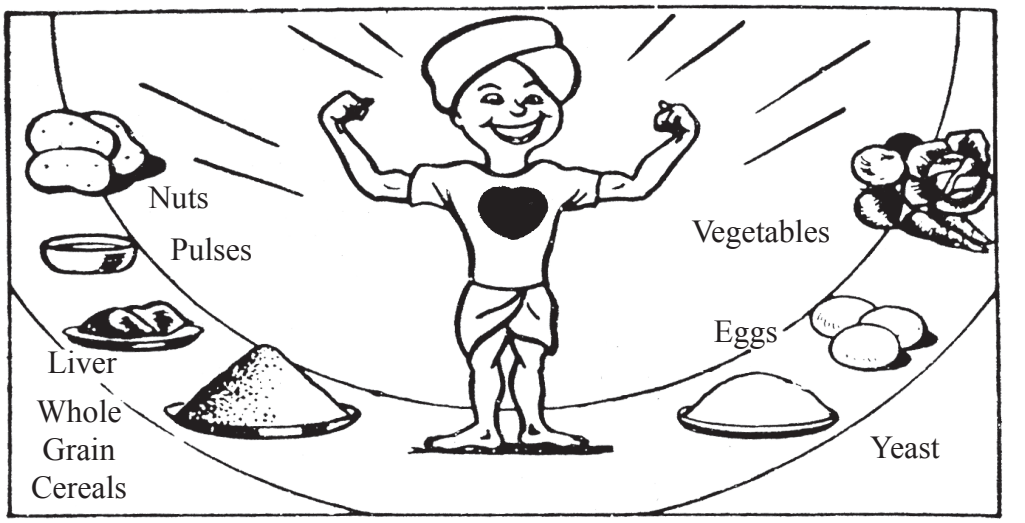


Fig 5.5 - For a sound Heart and Good Nerves

5.7. DEFICIENCY DISEASE

Fat – obesity, increased serum cholesterol levels, atherosclerosis, hyperlipidemia.

Protein – kwashiorkor, marasmus

- Kwashiorkor: growth failure, mental changes, oedema, muscle wasting, moon face, liver changes, gastro intestinal tract, skin and hair changes, anaemia.
- Marasmus: growth retardation, wasting of muscle and subcutaneous fat, dry skin and atropic. Anaemia may be present

Vitamin Deficiency: angular stomatitis and glossitis due to deficiency of riboflavin.

Vitamin A deficiency (i) Night blindness (ii) Xerosis conjuctinitis (iii) xerosis cornea (iv) Bitot's spots (v) Keratomalcia

Vitamin D deficiency: (i) Pathological changes in bone (ii) Rickets (iii) Osteomalacia (iv) Osteoporosis.

Vitamin K deficiency: inadequate intake of vitamin K by the mother may cause the hemorrhagic disease of the new born.

Vitamin C deficiency – general weakness, scurvy, shortness of breath, pain in bones, joints and muscles of the extremities.

- Swollen and tender joints and hemorrhages in various tissues
- Bleeding gums and loose teeth.

Thiamine (Vitamin B1) deficiency – beriberi

Nicotinic deficiency – pellagra, dermatitis, diarrhea, glossitis and stomatitis are present

Folic acid deficiency – anaemia

Vitamin B12 deficiency - soreness of the mouth and inflammation of the tongue.

Calcium deficiency (1) decreased rate of growth, (2) loss of calcium from bone leading to the development of osteoporosis (3) hyperplasia (4) tetany (5) hypocalcemia (6) hypercalcemia

Magnesium deficiency – clinical features were muscular weakness, muscular tremors, delirium and tetany.

Iron deficiency – anaemia.

5.8 Methods of cooking: During the process of cooking, heat applied to food in someway or the other methods of cooking which may be used are boiling, simmering, stewing, poaching, steaming, frying, grilling, baking and roasting:

- Boiling is satisfactory for cereals, pulses, dhals and vegetables. It is not a good cooking method for meat and fish because it hardens the fibers of flesh foods.
- Simmering food is cooked in water just under boiling point. Simmering is useful for meat and fish because the temperature is high enough to coagulate the protein but not high enough to harden the fibers.
- Poaching is similar to simmering, using water or other liquid in an open pan. This method is used particularly for eggs and fish.
- Steaming is food cooked in the vapour, which rises from boiling water. It is a slower process than boiling, but flesh foods can be made very tender by this method. Care must be taken to see that the pan of water does not boil dry.
- Stewing is to simmer food very slowly with only a little liquid in a covered pan on the top of the stove.
- Frying is cooking food in very hot fat or oil. It is one of the quickest methods of cooking and should be done in an open pan
- Baking is to cook food with hot air all around it. This method can be used for almost any food but particularly for bread, cakes and pastry. An oven is needed for baking.
- Roasting is similar to baking. This method is very good for cooking large joints of meat and rood vegetables.
- Grilling is cooking food by exposing it directly to high heat from a bright flame of fire or with a special grilling plate. This method can be used for making toast and for cooking thin cuts of meat and fish.

5.9 Preservation:

- Using salt – plain salting as in pickling alongwith condiments
- Using sugar – as in preparation of jams and jellies, squashes and fruit drink and as fruit preserves
- Drying – salting and drying of fish, meat, drying of vegetables and fruits
- Canning – processing using heat and preserving in thins or cans
- Freezing – vegetables and meat products may be pretreated and frozen and kept for a while.
- Heat – boiling pressure-cooking and baking also preserve foods for a short time.

Summary:

- Nutrition forms the basic components of health.

- Food is the substance taken into the body, which will help to meet the body's need for energy, maintenance and growth.
- Food is a mixture of compounds called nutrients.
- Based on the functions, nutrients have been classified as: energy yielding foods, body building foods, regulatory and protective foods.
- Energy may be defined as "the capacity to do work".
- 1g carbohydrate yields - 4 kcal
- 1g fat yields - 9 kcal
- 1g protein yields - 4 kcal
- Carbohydrates are a simple sugar or a compound formed by the combination of two or more simple sugars.
- Monosaccharides are simple sugars.
- Disaccharides are formed by the combination of two monosaccharides by the elimination of one molecule of water.
- Dietary fibers are cellulose, hemi-cellulose, gums, mucilage and lignins:
- Fats and oils belong to a group of substances called 'Lipids'.
- Proteins form the basis of the muscular tissue of the body.
- 4-5% of the human body weight is made up of minerals.
- The various methods of cooking are boiling, simmering, stewing, poaching, steaming, frying, grilling, baking and roasting.
- The various methods of food preservation are using salt, using sugar, drying, canning, freezing and heating.

QUESTIONS

I. Choose the best answer

1. Sucrose is manufactured from

   a) Sugarcane b) Cereals c) Milk d) Glucose

2. The reserve carbohydrate found in the liver and muscles

   a) Dextrine b) Sucrose c) Glycogen d) Glucose

3. Peptones are

   a) Simple proteins b) Conjugated proteins

   c) Derived proteins d) All of the above

4. The daily requirements of calcium for pregnant women is

a) 400 mg/day b) 1000 mg/day c) 500 mg/day d) 750 mg / day

5) The vitamin needed for proper functioning of nerve cells is

a) Folic acid b) Vitamin B2

c) Thiamine d) Cyanocobalamine

II. Fill in the blanks

1. Deficiency of iron causes _____
2. Beri beri is caused by _____
3. The daily requirements of protein for pregnant mother _____
4. The vitamin essential for normal reproduction is _____
5. Deficiency of vitamin A causes _____

III. Write short notes on

1. Lipids
2. Fat soluble vitamins.
3. Water soluble vitamins.
4. Methods of cooking.
5. Methods of preservation.
6. Factors influencing total energy metabolism.

IV. Write briefly on

1. Carbohydrates.
2. Proteins.
3. Deficiency diseases.

V. Write in detail on

1. Energy yielding foods.
2. Body building foods.
3. Regulatory and protective foods.

6. MATERNAL HEALTH

Introduction

The discipline of women's health views the care of young girls to aging women comprehensively. The menstrual cycle can serve as a developmental parameter for specific health promotion needs focused on specific age cohorts. The school age girls and adolescents need information about body changes. This development phase highlights decision making regarding initiation of sexual activities, birth control, and peer pressure regarding sex, alcohol and drugs. Aging women need health education on the transition of perimenopause of education on prevention of specific health rises such as osteoporosis, heart disease of diabetes.

6.1 MENSTRUAL CYCLE (or) UTERINE CYCLE

Definition: Menstruation refers to the monthly discharge through the vagina of blood, tissue of debris from the uterine cavity as the mines lining sheds, is variable is amount of duration in non-pregnancy adult female, the menstrual cycle lasts an average of 28 days, but it can vary normally is women from 21 to 40 days. From menarche to menopause. The menstrual cycle continues monthly, except when pregnancy intervenes.

Role of hormones in the menstrual cycle

The mechanism is controlled by the hypothalamus. Gonodotrophin releasing hormone stimulates the anterior pituitary gland to secrete follicular stimulates hormone (FSH) and luteinizing hormone. FSH + LH hormones stimulate growth of maturity of ovum is follicle. Ovum is released. Corpus luteum secretes progesterone and estrogen. Progesterone prepares uterus for implantation of fertilized ovum. If fertilization does not occur secretion of progesterone and estrogen ceases, menstruation begins. Absence of progesterone and oestrogen stimulate gonadotrophin releasing hormone

Physiological changes during menstrual cycle

a) Ovarian hormones b) Ovarian changes c) Uterine changes

a) Ovarian hormones: Ovarian hormones include the follicle stimulating hormone and luteinizing hormone. Secretion of ovarian hormones leads to changes in the ovaries and endometrium. The menstrual cycle, regularly receiving physiological changes, in the endometrium that ultimate in its shedding may vary is length, average length being about 28 days. There hormones maintains the menstrual cycle regularly.

b) Ovarian changes

1. Pre ovulatory phase changes 2. Leuteal phase changes

The hypothalamus released gonadotrophin releasing hormone, which travels through the portal system to the anterior pituitary system. Secretion of follicle stimulating hormone FSH most follicles die leaving one to mature into a large graffian follicle. The follicle ruptures and release an ovum into the peritoneal cavity

The leuteal phase begins with ovulation. The body temperature drops of then rises by 0.5 to 1 around the time of ovulation. Corpus luteum is formed from follicle cells that remains in the ovary following ovulation. Corpus leuteum secretes oestrogen and progesterone during the remaining 14 days of cycle. Corpus return degenerates, if the ovum is not fertilized.

c) Uterine changes

1) Menstrual phase
2) Proliferative phase
3) Secretary phase
4) Ischemic phase

1) **Menstrual phase**: Characterized by vaginal bleeding and casts for 4-6 days. Physiologically this is the terminal phase of the menstrual cycle. The endometrium shed up to the basal layer along with the blood from capillaries and the unfertilized own. Bleeding occurs when the coiled arteries return to a state of construction.

2) **Proliferative phase**: This phase follows menstruation and lasts until ovulation. The first few days the endometrium is reforming is termed as "Regenerative phase." Early proliferative phase lasts for about 9 days. Estrogen stimulates proliferation and growth of endometrium. The endometrium is less than 20 cm thick the glands are narrow and straight. The blood vessels are numerous and prominent. Under the control of oestrogen re-growth and thickening of endometrium begins. In late proliferative phase the estrogen stimulates blood vessels to develop. The blood vessels in turn ring nutrients and oxygen to the uterine living and it begins to grow and become thicker, due to glandular hyperplasia and an increase in the stromal ground substances. Ovulation occurs between day 12 and day 16.

3) **Secretary phase**: Lasts about 12 days. This phase is initiated response to increase in luteinizing hormone. Progesterone prepares the endometrium for pregnancy. The functional layer thickens to 3.5 mm and become spongy in appearance. The endometrium is vascular and rich in glycogen, spiral or coiled arteries develop.

4) **Ischemic phase** : On day 27 and 28 oestrogen and progesterone levels fall because the corpus luteum is no longer producing them. Without these hormones, the uterine lining becomes ischemic. The living starts to slough the women has come full cycle and is once again at day first of the menstrual cycle.

Neither sperm nor ovum survives longer than 2 to 3 days and fertilization mostly likely to occur if intercourse takes place not than 48 hours before or 24 hours after ovulation. So, conception will take place about 14 days before the next period.

Normal menstrual cycle

- Intervals to cycle: 28 days
- Length of cycle: 22 to 35 days
- Usual duration: 4-6 days
- Blood flow characteristics: Liquid / regular
- Blood amount: 25 ml to 60 ml for each menstruation.

Menarche: Menarche is the first menstruation of a women it occurs at the age of 12 or 13 years. Sometimes it occurs early as 10 year or late as 16 years.

Puberty: Refers to which the reproduction organs develop to reach maturity, from childhood to sexual maturity.

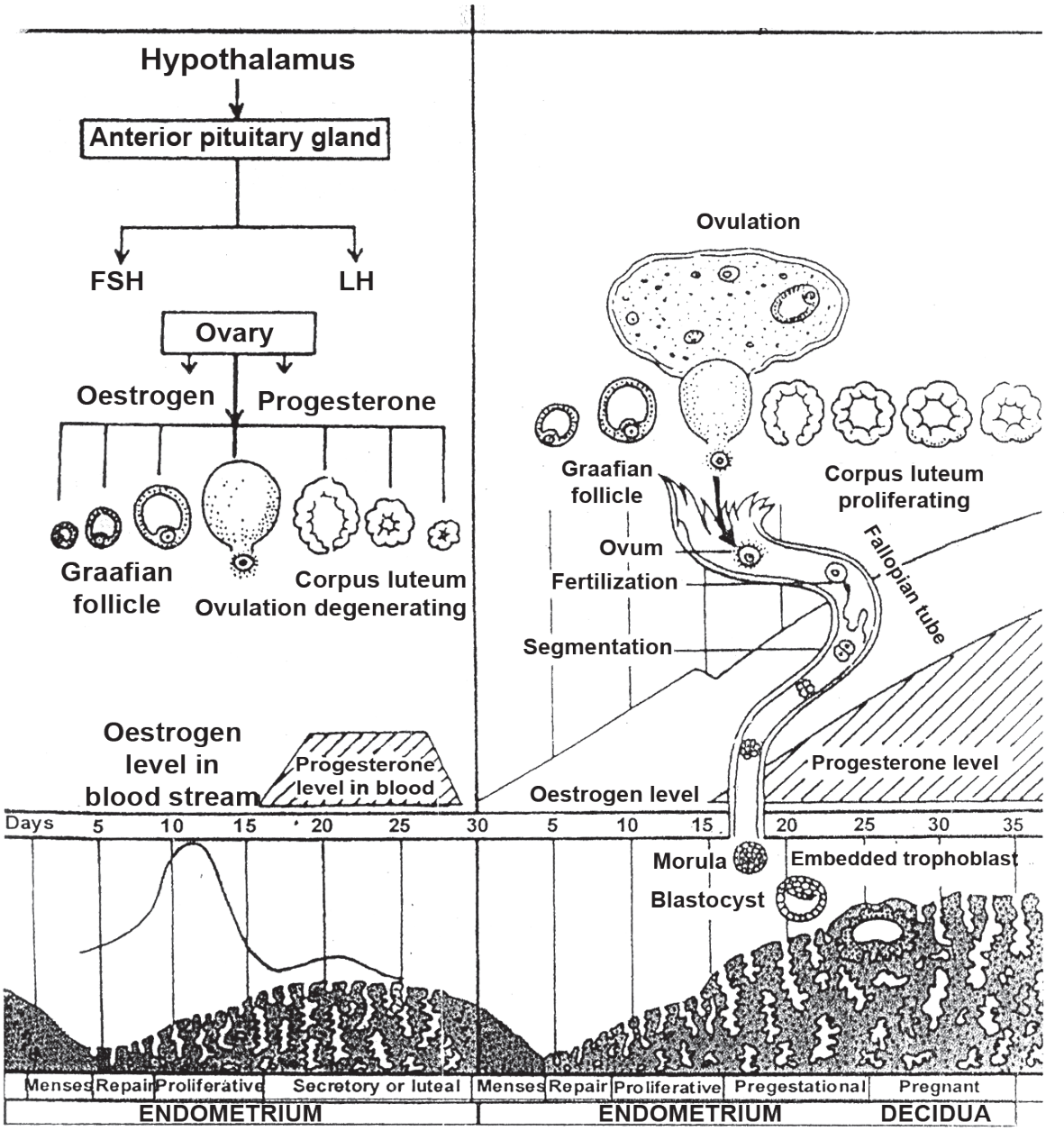


Fig. 6.1

Physical Chances In puberty due to hormones:

Oestrogen:

- Increase in size of external genitals.
- Development of maturation of secretary functions of the ovaries, uterus, and fallopian tubes, breast.
- Growth of long bones of closure of epiphysis
- Development and maintenance of bone matrix secondary sex characteristics and fat deposition pattern, skin, thickness and texture, appearance of public hair

Progesterone:

- Preparation of uterus for implantation.
- Development of secretary function of the fallopian tube and breast
- Puberty culcuminates in the onset of menstruation

Menopause : Menopause is the cessation of mensus. It occurs between 45 and 50 years of age. The ovarian hormone being gradually with drawn. The menopause thought to take about two years.

Physical chances during menopause:

- Palpitation, vasomotor irritability and expressed as hot lashes.
- Thinning scalp hair, darkening or thickening of other body hair.
- Loss of firmness, increased sensitivity to sunlight exposure.
- Breast glandular tissue replaced by fat.
- Flattening of form, depression and anxiety
- Urinary system, thinning of tissue in bladder and urethra
- Increased risk of urinary tract infection.
- Vaginal mucosa becomes thinner of less lubricated and vaginal pH changed.
- Reproduction organs decrease in size

Dysmenorrhoea: Difficult or painful menstruation

Characteristics: cramp like pain in the lower abdomen. Sometimes headache, irritability, mental depression, malaise and fatigue.

Metrorrhagia : Refers to menstrual bleeding that is normal in amount but occurs of irregular intervals, between the menstrual periods hemorrhage from the uterus, independent of menstruation.

Menorrhagia: Excessive menstrual discharge {or} bleeding and can lead to anemia, if left untreated.

Amenorrhoea : Refers to the temporary cessation (or) absence of menstruation is called amenorrhoea.

6.2 FERTILIZATION

Definition: Impregnation. The union of the matured spermatozoa and matured ovum. By this event, also called conception.

6.2.1 Process of fertilization

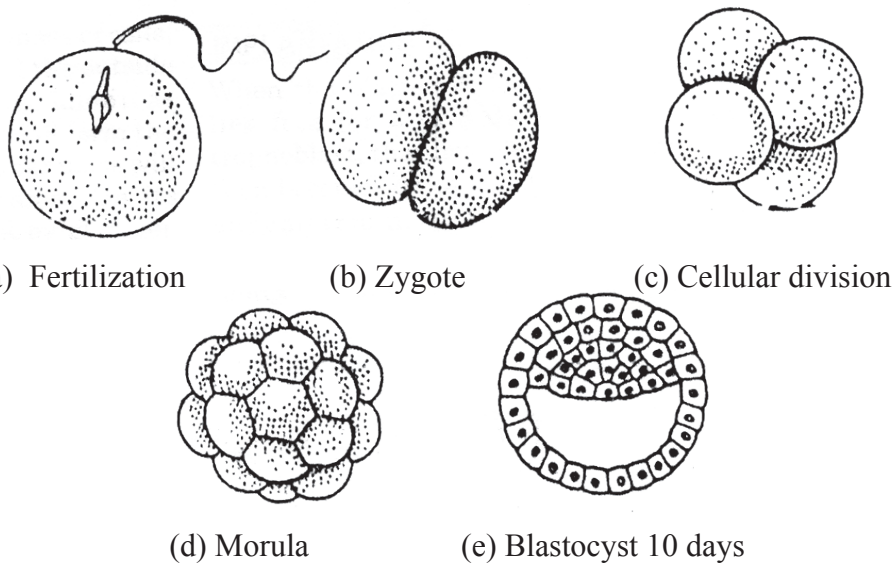
- Fertilization occurs in the upper region (Ampulla) of the fallopian tube.
- Fertilization occurs within 12 hours of ovulation and with in 2 to 3 days of insemination the average duration of viability of for the ovum of the sperm.
- If intercourse take place, at this time alkaline mucous attacks the spermatozoa

- At intercourse about 300-600 million sperms are deposited in the posterior to fertilization to approximately 24 to 48 hours after release form the ovary.
- The matured ovum are propelled by the cervical mucus reach the fallopian tube and other ovums' are destroyed by the acid medium of vagina.
- The sperm are viable for 24 to 72 hours after ejaculation into female reproducing system.
- The matured sperm producing the enzymes which allow the penetration of zone produced of the ovum
- The ovum should be surrounded by cell membrane. Only one sperm enter into the ovum of fertilization occur.
- After that the membrane is sealed to prevent the entry of other sperm and nuclei of the two cells fuse.
- The sperm and ovum each contributes half of chromosomes to make the total of 46
- The sperm and ovum are known as male and female in "Gametes."
- After fertilization, the fertilized ovum is know as "zygote"

6.2.2 Development of the fertilized ovum

- Fertilized ovum (zygote) reaches the uterus by3-4 days.
- Zygote begins the process of mitotic division know as "cleavage"
- The zygote transforms from one cell to two cells and cell further divided into four cells, these each cells in turn divides of for a total of eight then 16 cells
- These each cells contains the diploid number of chromosomes 46 and this is the First mitotic division.
- All the while that cleavage is occurring; the zygote is traveling through the fallopian tube toward the uterus
- At about 3days, after fertilization, the total cell count has reached 32. The solid cell cluster of total cells are called as a "Morula"
- At about 5 days after fertilization the dividing cell mass has developed a hollow filled core know as "Blastocyst"
- By the 10^{th} day the blastocyst is completely buried in the uterine lining , know as "Implantation" or "embedding " some women have small amount of bleeding during the time of implantation which is know as " Implantation Bleeding"
- The implantation of the fertilized ovum of embedding is known as "nidation nesting "
- By the 11^{th} day after ovulation and the endometrium closes over it completely.
- During the process of implantation, small cavities called "lacunae" they develop around the blastocyst. It allows nutrients from the women to be exchanged for metabolic wastes from the blastocyst
- The tiny blastocyst begins to produce human chorionic Gonadotrophin (HCG)

- Progesterone maintain the endometrial lining and pregnancy.
- At this point in the woman's menstrual cycle, the endometrium is ready to support the pregnancy and it is called as "Decidua."
- The trophoblast will go on to become the structure that nourish and protect the developing conceptus. This is known as "Pre-embryonic period."
- At the end, the inner cell mass has become the embryonic period.
- At the end, the inner cell mass has become the embryonic disk, which will eventually become the fetus.



(a) Fertilization (b) Zygote (c) Cellular division

(d) Morula (e) Blastocyst 10 days

Fig. 6.2 - Schematic Representation

Formation of fetal membrane and placenta:

Trophoblast has 2 layer

- Syncitio trophoblast
- Cytotrophoblast

Ectoderm - Forms skin nervous system, nasal passage crystalline lens of eye pharynx, mammary glands and salivary glands.

Mesoderm- Forms bones muscular system, heart of blood vessels reproductive system connective tissue kidneys and uterus including those which are placenta

Endoderm- Forms mucus membranes alimentary trace respiratory tract bladder, pancreas, liner and glands.

Pre-Embryonic - It begins with fertilization and encompassed the first 2nd weeks there after. Cellular division of implantation occurs during this period.

Zygote- The first 3 weeks after conception the term used is fertilized ovum and zygote.

Embryo- The developing of 5 points after the implantation until the end of 8 weeks after conception. The organs of major systems are developed by 7th month.

Fetus- Fetal stage is from the beginning of the 8th week after fertilization of continues until birth is called fetus.

Baby- After birth it is called baby.

Amniotic Cavity- Lies on the side of the ectoderm of provides nourishment for the embryo till the placenta is formed.

Decidua - The endometrium after conception in during pregnancy is called deciduas – it is made of 3 layers basal layer, functional, compact layer.

Placenta: Is a compound vascular structure. Made up of chorionic villi, fetal blood vessels, containing fetal blood, the decidua basalis, the chorio - decidual spaces containing maternal blood the fetus makes own blood which never mixes with the maternal blood. The nourishment being absorbed into feral blood by the langerhan's layer of the chorionic villi. The fetal heart pumps 500 ml of blood though the placenta per minute. The placenta is completely formed and started function by 10th week after fertilization. Placenta is a flat, round mass, about 15 to 20 cm in diameter, 2.5 -3cm thickness, 15-20 lobes, weighs 1/6th of baby's weight or 500 – 600gms at broth.

There are 2 surfaces --maternal and fetal

Maternal surface: Made up of chorionic villi arranged in lobes called "cotyledons" which are separated by grooves of sulci of furrows. The surface is covered by a layer of trophoblast cells. The maternal surface it is a blush red in color. The gritty deposits of live salts over the maternal surface called in "calcanious degeneration".

Fetal surface: It is smooth white and shiny, covered by 2 membranes –chorion & amnion. The chorion and amnion form the fetal sac and umbilical cord is attached in the centre

Development of placenta: At about 3rd seek of pregnancy the trophoblast is completely surrounded by tiny projections that is called early chronic villi. These are situated in the decidua basalis, grow and known as chorion frondosun. - The chorion frondosum which multiply rapidly to form structure known as "Placenta".

Chorionic villi: Is a branched structure, assisting from the chorionic membrane with 2 cell layers one artery and one vein. The two cell layers are langerhan's layers and syncytium layer. These are two kinds of chorionic villi like anchoring villi and shorter villi.

Functions of the placenta

1) Respiratory: Placenta act as lungs to the fetus taking in oxygen from the mother's haemoglobin and giving of Co_2 into the maternal blood.
2) Nutritive: The fetus selects from the mother blood protein for tissue building, glucose for energy and growth. Calcium and phosphorus for bones and teeth, vitamins, iron and other minerals for blood formation.
3) Storage: The liver is sufficiently developed. Placenta stores glucose is the form of glycogen and reconverts if into glucose as required by the fetus.
4) Excretory: The waste products are given off and taken away by the ovarian and uterine veins.
5) Protective: To protect the fetus, the placenta prevents a number of organisms from passing through into the fetal blood.

6) Endocrine: The placenta also has an endocrine action producing hormones like follicular stimulating and leutinizing hormones of the gonadotrophic hormone and oestrogen and progestetone.

Liquor Amni (Amniotic fluid) : The amniotic cavity is filled with a specialized fluid called Amniotic fluid. It is produced from maternal blood, fetal urine, secretions from the fetal respiratory tract. The liquor amni is the clear, pale, yellow to straw colored fluid which the fetus floats. The quantity is from 1 to 3 pints (500-1500) . It is filtered and replace every 3 hours. It consists of 99% water, remaining 1 year is dissolved solid matters, including electrolytes creative, urea, glucose, hormones, fetal cells, food substances, waste products like albumin urine and vernix caseosa and lanugo present.

Functions of liquor amni

1) It allows for growth and free movement of fetus.
2) It protects the fetus, acting as shock absorber.
3) It maintains an even temperature for fetus.
4) It prevents pressure on the word.
5) It prevents adhesions of the amnion for the fetus.
6) It acts as cushion around the fetus, because it protects the fetus from injury, if mother is bumped or falls.
7) It is a fluid source that the fetus drinks and then urinates.

Umbilical cord (Funis) : The cord extends from the umbilicus of the fetus to the fetal surface of the placenta. If the cord are two arteries that bring waste products and deoxygenated blood from the fetus to the placenta. In the cord, are vein carries oxygenated and nourished blood from the placenta to the fetus. These three vessels are surrounded by a "Wharton's Jelly" which is a clear gelatinous substances and gives support to the cord and prevent compression of the cord. The length of the umbilical cord is 40 to 50 cms and 20 cm wide. The blood flow through the word is about 400 ml/mt. At birth when the lungs commence to function the function of the placenta ceases.

6.3 FETAL DEVELOPMENTS

0-4 weeks after conception

- The ovum is of size of a grape with a fire shaggy covering.
- There are no human characteristics.
- Rapid growth
- Formation of embryonic form.
- Primitive central nervous system forms.
- Heart develop and begins to beat.
- Limbs buds forms.

4 weeks development

- Very rapid cell division takes place.
- The sac is 2.5 cm long and size of a pigeons egg.

- The head and facial gestures develop.
- The embryo is like a bean, the head and tail almost meeting.
- The rudimentary eyes are present to the beginning of the limbs.
- The circulation of blood in a rudimentary form exists and the heart is beating.

8 weeks development

- Sac is now the size of a hen's egg.
- The shaggy appearance having all gone, except in decidua basalis from which the placenta is formed.
- Embryo is just 3cm long, the head being very large.
- All major organs lay down in primitive form
- Hand and feet can be seen also, ossification of some bones has begun, weight 4 gms.
- External genitalia present but sex not distinguishable.
- Early movements and visible on ultrasound from 8 weeks.

12-18 weeks development

- The sac is the size of goose egg and the placenta is well formed.
- The fetus is now 10 cm long and weight under 60 gms approximately.
- Eyelids fuse, finger and toes are present.
- Kidneys begin to function and fetus passes urine from 2 weeks.
- Fetal circulation functions properly.
- Sucking and swallowing begins.
- Sex apparent and moves freely (felt by the mother)
- Some primitive reflexes present.

16 weeks development

- The fetus is 15 cm long and weights about 170 gm
- The heart is beating and fetal movements are present
- Sex can be distinguish / Lanugo appears
- Rapid skeletal development visible in x -ray and ultrasound.
- Meconium present in the gut.
- Nasal septum and the palate fuse.

20 weeks development

- The fetus is now 20 cm long and weights 300 gms.
- Find lanugo hair on the head and eyebrows.
- Vernix caeseosa is seen on the skin.
- Ringer nails can be distinguished.
- Quickening mother feels fetal movements

- Fetal heart sounds heard on auscultation.
- Skim cells begins to be renewed.

24 weeks development

- The fetus now measures 30 cms long and weight 70 gms.
- Meconium is present in the intestine.
- Most organs become capable of functioning.
- Periods of sleep and activity.
- Responds to sound.
- Skin red and wrinkled

28 weeks development

- The fetus is now viable, measures 35 cm long and weights 1.1 kg.
- Survival may be expected, if boon.
- Eyelids reopen.
- Respiratory movements present.

32 weeks development

- The fetus measures 40 cm long and weights 1.5 kg.
- The skin is pale and less wrinkled.
- There is very little subcutaneous fat present.
- Begins to store fat and iron.
- Tests descend into scrotum.
- Lanugo disappears from face.

36 weeks development

- The fetus measures 46 cm long and weighs about 2.5. cms.
- The finger nails have reached the finger tips.
- There is a little subcutaneous fat present.
- Survival rate is 96%.
- Increased fat makes the body more rounded
- Lanugo disappears from the body – plantar crease visible.
- Head hair lengthens / Ear cartilage soft.

40 weeks development

- The fetus is now 50cm long and weighs is 3.2 kg.
- It is well covered by subcutaneous fat and is not wrinkled or red in colour.
- Term is reached and birth is due.
- Contours rounded and skull firm.

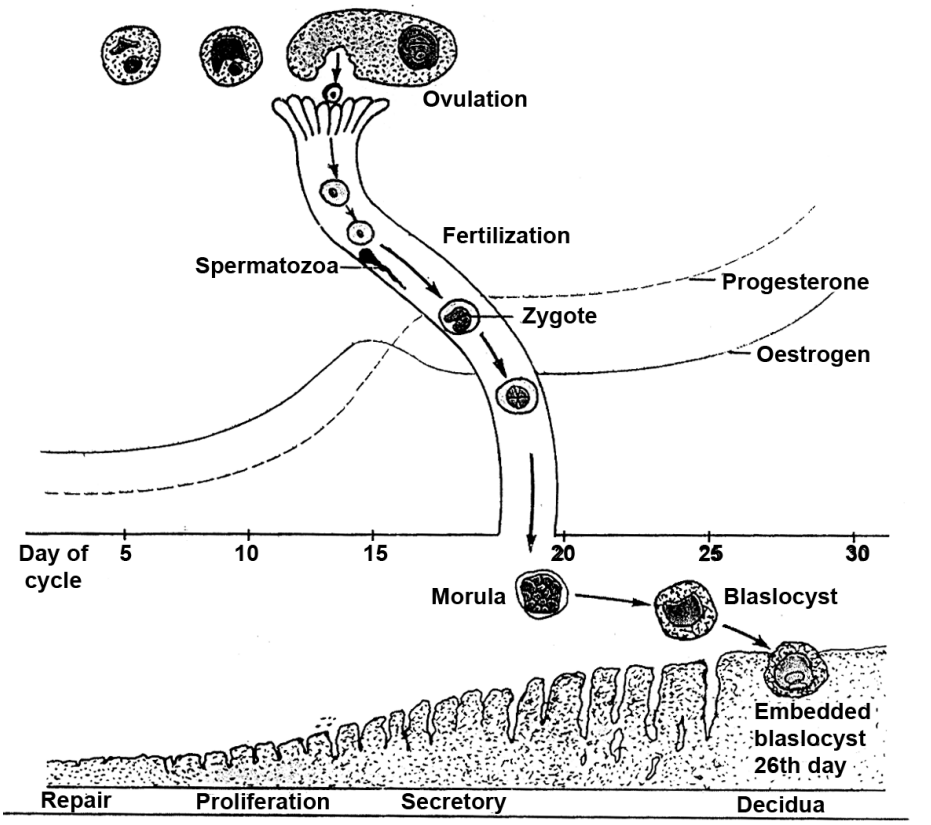


Fig. 6.3 - Fertilization and Nidation

6.4 FETAL CIRCULATION

- To understand the fetal circulation is that oxygen is derived from the placenta.
- Placenta is the source of nutrition and the site of elimination of waste.
- The umbilical vein leads from the umbilical cord to the under surface of the liver and carries blood rich in oxygen and nutrients.
- It has a branch which joints the portal vein and supplies the liver.

Important four temporary structures

Ductus venosus: (Drain from the vein to vein) connects the umbilical vein to the interior vena cava.

Foraman ovale: (an oval opening between the right and left atrium) the blood entering from the inferior were cava to the right atrium and to the left atrium through the foraman ovale.

Ductus Arteriosus: (From an artery to an artery) leads from the bifurcation of the pulmonary artery to the descending aorta entering just beyond the point where the subclavian and carotid arteries leave.

Hypogastric arteries: Branch of from the internal iliac arteries and become the umbilical artery when they enter the umbilical cord and return the blood the placenta.

Fetal circulation: It possesses two blood supplies which never mix. The blood supplies are fetal blood supply and maternal blood supply.

Fetal blood supply: It is carried by the umbilical arteries from the fetus to the placenta for purification and replenishing.

Maternal Blood supply: The maternal blood supply from the uterine arteries circulates in the chorion – decidual spaces. The oxygen and nourishment are absorbed through the cells of the villi into the fetal blood. The waste being returned by the uterine veins. The interchange of substances taken place by osmosis and diffusion by the Langerhan's layer selecting the required substances and returning the replenished blood to the fetus via the umbilical vein.

Placental blood: Umbilical vein carries unmixed blood. Enter the abdominal wall to the under surface of the liver. Dutus venosus carries mixed blood from the lower body. Unmixed blood carried to the interior vena cava. Blood enter into the right atrium. From the Rt atrium to Lt Atrium pass through the foraman ovale. From the left atrium blood goes to the left ventricle. From the left ventricle blood enter into the aorta. Coronary carotid arteries and subclavian are branches of aorta, so heart brain and upper limbs are getting well oxygenated blood. That reason only, arms are more developed than the legs at birth. Blood collected from the upper body, enter in the superior vena cava with depleted oxygen and nutrients. This blood mixes with inferior vena canal blood in the right atrium. 25% of mixing blood allowing a little oxygen and nutrients to the lungs through the pulmonary artery which is necessary for the lung development. Remaining blood is passed for the aorta through the Ductus arteriosus. Low oxygen and nutrient blood is supplied to other organs of the body and legs via aorta. Internal iliac arteries lead to hypogastric arteries which return the blood to the placenta via umbilical arteries. Remaining blood supply to the lower limbs and return to the inferior vena cava.

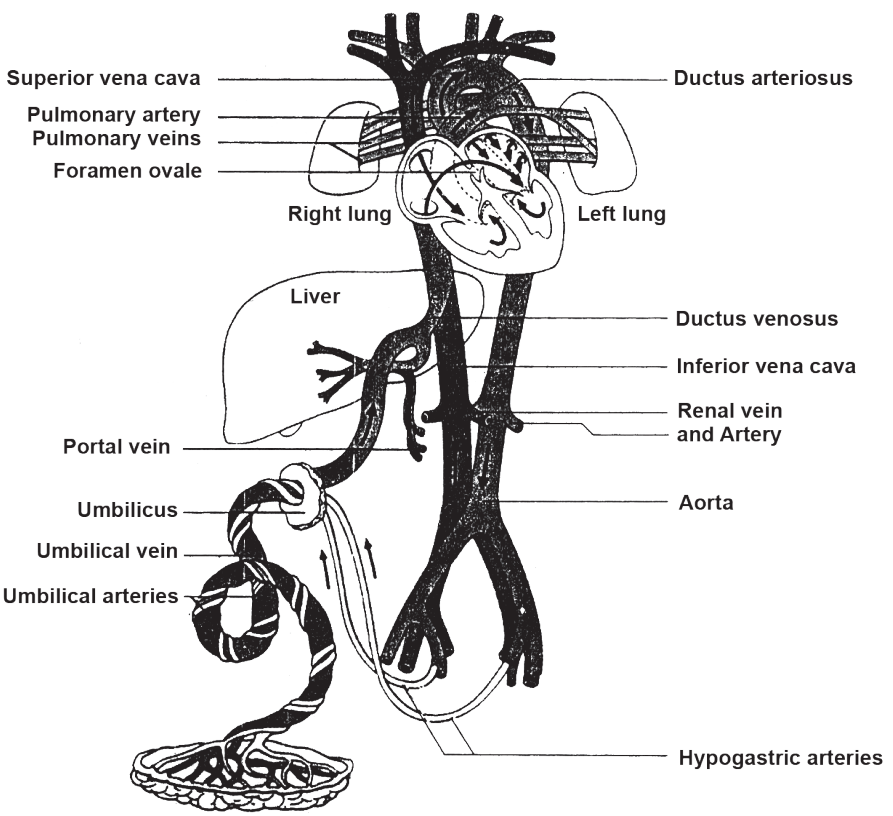


Fig. 6.4 - Fetal circulation

6.5 ANTENATAL CARE

Pregnancy is special, let's make it safe "is the theme of world health organization". Antenatal care and treatment are important factors in preventive medicine and if properly conducted, controls many complication which would otherwise have serious results.

Definition: Antenatal care refers to the care that is given to pregnant women from the time that can caption is confirmed until the beginning of labour.

Aim and objective

- To promote protect and maintain the health of the mothers during pregnancy.
- To prepare the women for labour, lactation and subsequent care of her child and herself.
- To diagnosis any abnormalities of medical or obstetrical condition and to over come it.
- To avoid complication during pregnancy i.e. Anaemia, toxemia, haemorrhage.
- To have full term, healthy living child.

Antenatal visit

According to world health organization

- I visit at 20 weeks.
- II visit at 32 weeks.
- III visit at 36 weeks.

1 month visit First 7 month Twice a month 8th month Once a week next month

First visit

Health history: Patient information: Name, age, address, husband Name, occupation of both partners, income of the family

Social history: Whether client belongs to low, middle or upper class family, bread winner of the family, environmental status like ventilation, lighting, electricity facilities drainage systems.

Family history: Inquiries are mode with regard to hereditary disease such as diabetes, hypertension, and tuberculosis. Mental illness, epilepsy and whether there is history of multiple pregnancies in their family.

Medical history: Details of any disease are noted like diabetic mellitus, tuberculosis, venereal disease, cardiac problem, typhoid disorders are asked as the past medical history from the patient.

Menstrual history: Age at Menarche, menstrual duration, regularity, painful menstruation, presence of clots, last menstrual period.

Obstetrical history: Past child bearing experience have an important part to play in predicting the possible outcome of the current pregnancy.

A clear summary of any previous pregnancies and miscarriage is important, complication such as hemorrhage history of toxemia, nature of delivery baby weight, sex of the baby, colour of baby at birth live or still birth, term or preterm.

Expected date of delivery

Total 40 weeks / 280 days

Naegele's rule: 9 months and 7 days from first day to LMP (Last Menstrual period) .

Ex : LMP 4.1.2010 is 4.11.10.2010

Physical examination

Height

Weight

Body Mass Index

Vital signs

1. Temperature 2. Pulse 3. Respiration 4. Blood pressure

General Appearance: Client conscious, oriented body built to be adequate, hygienic.

Head: Facial appearance gives general impression of physical and mental health well being. Here is looked for cleanliness.

Face: Facial edema is a grave sign of pre eclampsia,

Mouth: Lips look for any sign of infection. Soft palate - note the colour. Tongue colour is pink ie. Pallor denotes sign of anemia. pallor of gums. Lips conjunction may denote the presence of anaemia.

Breast: Nipples: Looks normal inspected for any cracked or retorted nipple.

Observe for charges of pregnancy in breast fissure. Palpate the breast for softness

Abdominal examination

Inspection:

Size: Inspect the abdomen size, make rough estimation for the gestation period and suggest it is appropriate as non appropriate.

Shape: When lie is longitudinal shape will be ovoid in shape. If lie is transverse, shape will be transversely end.

Umbilical: Look umbilicus for flat, dimple or protruded.

Skin changes: Inspect the abdomen for charges in skin during pregnancy like linea Nigra and striae gravidarum

Palpation:

Assessment of fundal height: Ulnar ridge is placed at fundus levels distance between funds and to the symphysis pubis is measured by tape of calipers. At term fundal height is 28 cm to 32 cm. abdominal girth is measured after 32 weeks of gestation. Abdominal birth is measured at the level of umbilicus. +2 to 2.5 cm / week after 32 weeks abdominal birth increased.

Fundal palpation: This measure will help to determine the presentation and suggest whether breech as fetal head is occupied.

Lateral palpation: It is useful for locating the back of the foetus. Gentle pressure is applied with palms of alternative lends i.e. the parts of foetus. Back : Long continuous curvature. Fetal : Small irregular snoby like projection.

Pelvic palpation: This is done to identity the presentation.

Findings when head is engaged: The greatest bulk of the head is not palpable above the brim. The head is not mobile.

The anterior shoulder would be little more than 5 cm above the symphysis pubis Main causes for non engaging

Contracted pelvis

Placenta Previa type III, IV.

Abnormal presentation

Pelvic tumour.

Auscultation: The fetal heart sound can be heard after 20 weeks of gestation with pincard stethoscope. Place the foetoscope over the area at which fetal left scapula or ribs cave in contact with the uterine way. Normal fetal heart rate 120-140 beats/min.

Importance of fetal heart sound

- A positive sign of pregnancy
- Proof that the fetus is alive.

Place of fetal heart sound

- Vertex: below umbilicus eight as left look per position.
- Breech: above umbilicus either right or left.
- Transverse: Two fingers upward as downward at the level of umbilicus.
- If fetal heart rate is below 120 per minute or above 160 per minute is a case of fetal distress.

Investigation

- Complete urine analysis
- Complete blood count including Hb
- Blood grouping Rh determines for Prenatal advice
- Personal hygiene
- Family planning
- Stool examinations
- Serological examination.
- Diet
- Breast feeling
- Antenatal exercises.

6.6 POSTNATAL CARE

Postnatal care involves care of the mother and her newborn. Purposes of hospitalization and care after birth are to identify maternal and neonatal complications and to provide professional assistance at a time when the mother is likely to need supportive care. In postnatal assessment, following delivery, the maternal organs begin the task of readjusting to non - pregnant state assessment of the postnatal client includes checking the uterus, lochia, perineum, bladder, blood pressure, heart rate, temperature, psychological status and pain.

Objectives of the postnatal care

- To preserve and promote good physical, mental health during postnatal care.
- To identify maternal and neonatal complications.

- To prepare the woman for breast feeding, subsequent care of her child and herself.
- To avoid complications during postnatal period.
- To impact family planning guidance.

Definition: Puerperium is the period following child birth during which the body tissues, specially the pelvic organs revert back approximately to the prepregnant state, both anatomically and physiologically. Puerperium begins as soon as the placenta expelled and lasts for approximately 6 weeks.

Changes during postnatal period:

Uterus

1) Uterus is assessed every 15 minutes for first hour. Placement of uterus in relation to the midline and consistency as noted.
2) It funds is not formed, it is massaged gently in a circular motion until the uterus contracts and become firm.
3) Clots are expelled at this time by applying gentle firm pressure downwards on the fundus, while observing the perineum for the amount and size of expelled clots.
4) Bladder fullness must be checked with a full bladder, uterus remain at or above the level of umbilicus and displace to one side.

Breast

1) Breast usually soft, warm, contain only small amount of colostrums.
2) The nipples should be intact without redness, tenderness, cracks or blisters.
3) Breast engorgement which may begin as tingling sensation may appear from 2 to 4 days following delivery.
4) Breast should be inspected for presence for inverted nipples, cracks, blisters, fissures and palpated for fullness and tenderness.

Lochia

The uterine discharge of blood, mucus and tissue after birth is called lochia.

Lochia is divided into three types

- Lochia rubra,
- Lochia serosa and
- Lochia alba

Lochia rubra, which is of bright red colour is present for first three days.

Lochia serosa, which is watery, pink or brain tinged and light in amount occurs for five to ten days.**,** is a whitish yellow creamy discharge occurs from ten to fourteen days.

Estimation of lochia as follows

- Scant – blood on perineal pad less than two inches in one hour.
- Light – blood, less than four inches in one hour.
- Moderate - Less than six inches strain
- Heavy – a saturated perineal pad in one hour.

Perineum

1) Perineum is observed every fifteen minutes for the first time is assess the episiotomy site or laceration repair to ensure that it is intact and for edema, bleeding and hematoma.
2) Ice packs provide comfort and swelling.
3) Inspect the episiotomy using a good light source
4) The **REEDA** (Redness, Edema, Echymosis, Discharge and Approximation) scoring scale can be used when assessing the episiotomy.

Bladder

1) In the immediate postpartum period, urinary distension, incomplete emptying and residual urine may occur due to edematous perineum.
2) Pain reflects spasm and bladder desensitization.
3) Early ambulation and comfort facilities urination.
4) Urination within six hours of at least 300 ml with complete emptying of bladder is appropriate.
5) When the client cannot urinate bladder becomes distended, catheterization is done.

Bowels and Gastrointestinal system

1) Mothers appetite typically return to normal immediately after delivery if there is no anesthesia complications regular food may be consumed.
2) A diet high in protein and iron facilitates tissue healing and restore iron levels.
3) Bowel pattern should remain unchanged, bowel movements normally occurring two or three days of postpartum.
4) Drinking six to eight glasses of fluid daily and eating high fiber diet should be encouraged.
5) When constipation is severe, administering analgesic and stool softener before ambulation may assist in facilitating a bowel movement.

Extremities

- Assessment of the extremities include examination of varicosities, deep reflex, tenderness, odema or nodular area of legs.
- Pain, erythema or local swelling on the legs. Especially the calves may signify thrombophlebitis in mother who had spinal or epidural anesthesia.
- Legs should be assessed for sensation and mobility.
- The mother should able to more her toes and life her buttocks off the bed with 2 to 4 hours after release of anesthesia.

Blood pressure

- Blood pressure is monitored every 15 minutes for first hair and more frequently if mother condition warrants.
- The pressure reading should return to pre labour levels within first hour of vaginal delivery.

Pulse

- Pulse reading, rhythm and regularity are assessed every 15 minutes for first hour.
- The pulse usually returns 10 pre labor rates within first hour.
- If nurse detects any abnormalities, increase pulse rate should be rule out.

Temperature

A temperature reading is taken during first hour.

An increase upto 100^{o}F is not usual. But this should be reported immediately.

Integumentary system

- The skin dislocation that appears during pregnancy disappears by end of pregnancy.
- The hyper pigmentation of the areola and linea nigra may be permanent.
- The striae on her breast thigh and abdomen eventually fade to pale colour but never completely disappear.
- There may be a hair loss for the first two months after delivery.

Musculo skeletal system

- Abdominal muscle relax and become flaccid after delivery.
- Some degree of muscle separation called dractis recti may be noticed a long the center while palpating the abdomen and the fundus.
- Following multiple gestation, macrosomea and hydramnios, muscle tone do not return to the normal state.

Psychological status

- The mother may be emotionally and physically exhausted and at the same time dated and talkative.
- Women often feel hungry immediately of the delivery.
- Food is usually withdrawn until after one hour as the gastrointestinal tract is still slowed from the harmones of labour.

Advices given general

- She is allowed to resume her full duties either a home or in employment.
- Post partum exercises may be continued for another 4-6 weeks.
- To evaluate the progress of baby periodically in pediatric unit and to continue breast feeling for not less than 6 months.
- Family planning counseling given according to the parity either temporary or permanent.

6.7 NEW BORN ASSESSMENT

Assessment of the new born is done during and after the transition period of -6 hours of life. The nurse determines that the infant is physiologically stable by skilled examination and assessment of the infant general appearance (skin) , thermo regulatory effort and different body system.

Definition: Fetus which is born after 40 weeks and who weight is more than 2.5 kg and cried soon after birth having none congenital abnormality or deformity whose head circumference is 33-35cm and height is 48-50 cm is called normal infant.

Assessment of the skin : The skin of the babies is examined for following

1) Pallor - pale, mottled appearance indicating poor perfusion
2) Plethora (beetroot colour) - indicating excess of circulating red blood cells.
3) Cyanosis: Central cyanosis always requires immediately care and attention.
4) Jaundice: early jaundice is abnormal.
5) Skin rashes: such as milia, miliaria, petechiae, mongolion blue spots, brushing and erythema toxicum.
6) Infections lesions. Eg. Thrush, simplex virus, umbilical sepsis, hullous impetigo.

Respiratory system

1. Respiratory should be counted by watching the lower chest and abdomen rise and fall for a full minute.
2. Abnormalities to look include the following

a) Unilateral chest expansion and diminished breath sound on oneside.
b) Tachypnea.
c) Retraction (inspiration pulling in of the chest wall above and below the sternum or between the ribs)
d) Nasal flarring
e) Grunting: an abnormal expiratory sound.
f) Apnea: Cessation of breathing for 20 second and more.

Body temperature

The normal body temperature range for team infants is 36.5^{o}C -37^{o}C rectally (core temperature)

1) Hypothermia: A core temperature below 36^{o}C is termed a hypothermia which indicates respiratory distress hypo glycemia and sepsis.
2) Hyperthermia: An auxillary temperature above 37.5^{0}C is considered hypothermia. The usual hyperthermia is due to overheating the environment, sign of sepsis, brain injury or drug therapy.

Cardio vascular system

1) The normal heartbeat of term newborn is 120 – 160 beats per minute and of a preterm infant is 130-170 beats per minute.
2) Cardiovascular dysfunction should be suspected in infants who present with lethargy and breathlessness during feeding.
3) Infants who appear breathlessness with little or no rib recession, and no grunting may have heart disease.
4) Presence of murmur is indicative of cardiac lesion.

Central Nervous system : Abnormal postures such as neck retraction, for a like postures, hyper extension, hyper flexion of limbs filter or abnormal involuntary movements, high pitched or weak by when assessed indicate neurological impairment.

Genitalia and Anus : The genitals should be examined for sex determination and any abnormalities like ambiguous genitalia or undescended testis patency of once should be checked using a rectal thermometer or rubber catheter.

Limbs and digits : Length and movement of limbs are checked and the digits counted and separated to ensure that webbing is not present normal flexion and rotation of wrists and ankle joint are confirmed.

Spine : With the baby lying prone, the back should be inspected and palpated is detect any swelling, dimples or hairy patches which may signify occult spinal defect.

Measurements : The baby head circumference, chest circumference length and weight are measured and recorded.

New born care : New born can includes both initial care and general care.

1) As the baby born, wipe the head gently, mucus can be wiped gently, can should be taken is avoid stimulation, reflex inhalation.
2) Oral and endo tracheal suction when indicated.
3) As the baby born it is covered in warm blanket. The time of birth sex is noted and recorded
4) Umbilical cord is cut 8-10 cm from abdomen and cord clamp is applied.
5) Place the baby in radiant warmer.
6) The infant is thoroughly dried and wrapped while drying the infant, respiration effort, color, muscle tone can be observed. Heart rate and respiratory rate are counted.
7) Replace the initial camp and apply disposable plastic clamp 2-3 cm from the umbilicus.
8) Instillation of prophylactic eye drops.

Head to foot assessment of new born

a. General inspection: for position flexed and

- Skin dry of cracking
- Heart auscultation rate and rhythm.
- Lung for expansion and breath sounds.
- Blood pressure
- Auxillary body temperature
- Head to toe length, head circumference, chest circumference.
- Head molding between, face for symmetry, birth marks, milia, nevi over the head and eyelids.
- Monitor for natal teeth and abnormalities of hard and soft palate and tongue.

- Femoral and brachial pulses
- Hip for dislocation
- Reflexes for maturity of neurological system.

The baby should be remain with his mother whenever both are in good condition.

b. General care

- The nurse should verify the baby name, sex, date and time of birth. On both name bands and transfer the baby.
- Observe the baby's colour breathing and umbilical cord.

c. Ongoing daily care

- Positioning the baby in his cot on his side after feeding.
- Dressing and wrapping the baby adequately to prevent hypothermia.
- Using individual articles for baby and ensuring proper hand hygiene to prevent infection.
- **Skin care:** First bath after the baby's condition is stable and cleansing of face, skin, flexuses and napkin area once or twice daily.

d. Vaccination and immunization are given according to the policy.

e. Daily examination of baby include

- Noting the baby's posture colour and respiration. Jaundice may be noted from third day.
- Palpation of head for anterior fontanel for its level, resolution of caput succedaneum, moulding and cephal heamatoma.
- Inspection of mouth and skin for infection,
- Inspection of skin rashes, septic spots, excoriation or abrasions.
- Examination of umbilical cord for redness.
- Check for body temperature in the axilla.
- Observation of the stools for constipation, water stools and excoriation and frequency of passing stools and urine.
- Presence of breast engorgement and pseudo menstruation.
- Daily weight to assess the normal loss in first three days.
- Recording the findings in baby record.

6.8 FAMILY PLANNING METHODS

6.8 .1.Temporary methods

6.8.1.1. Female diaphragm: A doom shaped rubber cup attached to a flexible coiled spring in the rim and prevents entry of sperms from the upper genital tract. The diaphragm should be inserted deep so that cervix is covered.

Advantages

1. Effective contraceptive and protects against STDs.
2. It also protects against cervical cancer.

Disadvantages

1. Failure rate is 5%-20% and increased risk of urinary tract infections.

6.8.1.2. Female condom: The female condom is a polyurethane sheeth 7.8 cm in diameter and 17 cm long. It has 2 polyurethane rings; one ring lies inside at the closed end of the sheeth and other forms. The extend opening lying outside the vaginal orifice after insertion.

Advantages

1. Impenetrable to the HIV
2. Protective against STDs.
3. Easy to use, no hazards

Disadvantages

1. More expensive
2. Anchoring high visible outside the labia
3. For every fresh act of coitus a new condom should be used.

6.8.1.3. IUCD (Intrauterine contraceptive devices) : A commonly used device which includes copper T – CuT 200, CuT 380A, multi load 250, multi load 375, progostasert and levonorgesterol.

Time of insertion: Inserted 6 weeks after delivery or abortion. The timing should be preferably within 2 to 3 days of completion of menses.

Post abortal or post MTP insertion

Post placental insertion: Insertion immediately after delivery of the placenta.

Post partal: Insertion before the patients is discharged from the hospital.

Advantages

1. Provides excellent contraception and action easily reversible.
2. Reduces dysmenorhoea and menorrhagia.

Disadvantages

1. Do not protects against STDs
2. Uterine anomalies
3. Not used for patients with pelvic infection.

6.8.1.4 Male Condoms: There are made of latex or vinyl. The spermicide immobilizes or kills the sperms, providing additional protection in case of breakage or leakage.

Advantages

1. Best for prevention of STDs.
2. Prevents sperm allergy and formation of sperm antibodies.
3. Inexpensive and easy to carry.
4. No systemic side effects

Disadvantages

1. Latex allergy
2. Possible breakage of condom, slippage or leakage of semen.
3. Must be used with every act of intercourse.
4. Not reusable.

6.8.1.5 Chemical contraceptives: There are agents that immobilize and kill the spermatozoa. This usual agent is non proxynol - 9 and octoxynol. Spermicide offer protection against STDs.

Foam: Used along with condoms. It is effective immediately and its action last for about an hour.

Creams and gels: May use along with or in combination with diaphragm or cervical cap.

Suppositories: May use alone or along with the condom. Action begins 10-15 mts after insertion penile insertion prior to complete dissolution and dispersion may cause irritation to both partners.

Sponge: Needs to be moistened and squeezed prior to use. Insert along the back wall of the vagina. So that the cervix about to against the dimple.

Advantages

1. Easy to use
2. Offer some protection about STDs
3. Protective against the risk of cervical cancer.

Disadvantages

1. Local irritation, allergy,
2. High failure note of 10-25 per 100 women per year
3. Needs to be respected of every act of coitus.

6.8.1.6 Hormonal methods

A. Combined oral contraceptives or the pill -28 day pill pack containing 21 pills.

Pharmacological activity and 7 iron or vitamin pills.21 day pill pack does not contain placenta pills. The user takes a 7 day break after completion of the 21 day pill course.

Efficacy: failure is about 01% with perfect use and 2-3% with typical use.

Side effects

Oestrogen excess with progestin deficiency: Bloating, Dizziness and syncope, edema, cyclic headaches, irritability, leg cramps, nausea and vomiting, visual disturbances and cyclic weight gain.

Oestrogen and progestin excess: Breast tenderness, headaches, hypertension and myocardial infection.

Advantages:

1. Highly effective, reversible and effective at all ages and effective control of endometriosis.
2. Regular menstruation and moderate blood flow.
3. Decrease incidence of pelvic inflammatory disease and ovarian neoplasm, breast cancer and ectopic pregnancy.
4. Not coitus dependent.

Disadvantages and precautions

1) The women have to remember to take the pill daily.
2) These are many potential side effects some resolve after few cycles and others.
3) The drug effect is diminished by certain drugs like anti-tuberculosis therapy and anti-epileptics.
4) Not suitable for lactating mothers as it suppresses lactation.
5) Oral pills do not offer protection against sexually transmitted disease.

Contra indications

Thromophlebitis and history of thromoembolism, Coronary artery disease, suspected breast cancer, oestrogen dependent neoplasia, suspected pregnancy, hepatitis, presence of gall stones, undiagnosed vaginal bleeding, hypertension, diabetes mellitus, migraine headaches, all bladder diseases, sickle cell disease.

B. Emergency contraceptives: Among the various methods of emergency contraception, use of hormones constitutes an important contribution. The "morning after pill" reduces sperm transport and alters the endometrium makes fertilization lets likely. It is appropriate for women who have had unprotected intercourse within the previous 72 hours, or in cases of victims of sexual assault or when the condoms tear, slips or leakage occur.

Indications:

1) Inter course without contraception
2) History of missed oral contraception pills with intercourse.
3) Broken or leaking condom.
4) Sexual assault
5) IUCD expelled

Advantages : The efficacy of the morning after pill is 98% for prevention of pregnancy, provided that the pills taken with 72 hours of coitus.

Disadvantages : Side effects include nausea and vomiting, spotting and irregular vaginal bleeding.

Caution: The morning after pill should not be used by women in whom pregnancy is suspected or by women with history of thromboembolic episodes.

6.8.1.7 Injectable contraceptives

Progestin given in the form of injection blocks the mid-cycle LH surge and causes suppression of ovulation, thickening of cervical mucus, atrophy of endometrial lining and altered tubal motility.

The preparations available are Medroxyprogestenone acetate (DMPA) or Depo-Provera 150 mg IM one in every 3 months. Novethindrone 200 mg 14 once in every 2 months.

Advantages

1) Effective in 24 hours and long acting.
2) Does not interfere with sexual intercourse.
3) Can be recommended to women over 35 years.
4) Safe for women with history of thrombo embolism and smoking habits.
5) Offers protection against endometrial and ovarian cancers.
6) Higher level of complaints of lower rates of failure.

Disadvantages

1) Return of fertility may be delayed for 6 months
2) Weight gain
3) Irregular bleeding
4) Amenorrhea
5) Excessive bleeding
6) Lack of protection from STDs.

Contra Indications

1) Known or suspected pregnancy
2) Unexplained abnormal vaginal bleeding
3) Liver diseases
4) Suspected cervical cancer.

Side effects

1) Irregular bleeding
2) Weight gain
3) Delayed return of fertility
4) Headache, nausea, dizziness and breast tenderness

5) Loss of libido, fatigue, nervousness.

6) Acne

7) Loss of scalp hair.

6.8.2. Permanent methods

Female sterilization: It is an operation where resection of a segment of both fallopian tubes is done to achieve permanent sterilization.

Indications

1. Couples who desire permanent sterilization
2. Women with medical disorders in whom pregnancy care is risk of impairing health or being hazardous of life.
3. Women with severe inheritable genetic disorders in whom child bearing is not desirable.

Contra indications

Absolute

1) Active perineal infections

2) Severe cardio pulmonary or metabolic disorders

3) Lack of informed consent.

Relative

1) Marked obesity

2) Medical or surgical risk factors present due to severe anaemia

3) Uncontrolled diabetes.

Disadvantages

1) This method is permanent not easily reversible.

2) It does not offer protection against STDs.

3) There are small surgical risks involved.

Male sterilization or vasectomy: It is a surgical procedure in the male where segments to vas deferens of both sides are resected and the cut ends are ligated.

Advantages

1) Simple operative procedure which can be performed under local anesthesia

2) Does not require hospitalization

3) Free from long term side effects

4) Does not alter sexual functions

5) Costs are lower

6) Surgical reversible possible

7) Failure rate is 3-4 per 100 procedures.

Disadvantages

1) Procedure is permanent
2) Does not protect against STDs
3) Not effective immediately, requires alone 20 ejaculations before becoming effective.
4) Not free from surgical risks.
5) Some men suffer from psychological ill effects.

6.9 NATIONAL FAMILY WELFARE SERVICES

Nursing services are necessary for every patient seeking care of various types including primary, secondary and tertiary care. Services are provided at different levels they include, district, taluk, PHC and PHU level. The health interventions of family welfare services are.

a. Spacing and small family norms.
b. Prevention and Management of unwanted pregnancy.
c. Maternal care which include care during pregnancy, deliver and after delivery.
d. Child care Immunization and prophylactic services.
e. Management of reproductive tract infections and sexually transmitted disease.

Family welfare schemes: The ministry of health and family welfare has a number of scheme to cover the under privileged sections of society and help them with maternity, post and neonatal health care and family planning. The schemes are as follows.

A. National family welfare programme
B. National population policy.
C. National Rural health mission
D. Urban family welfare schemes.
E. Sterilization beds scheme
F. Child survival and safe mother hood programmes.
G. Reproductive and child health programmes
H. Implementation machinery
I. Social marketing of contraceptives.
J. Medical termination of pregnancy
K. Prenatal sex determination

A. National family welfare programme : The programme was launched in 1951 with the objective of reducing the birth rate to stabilize the population at a level with the requirement of the National economy.

B. National population policy: The National population policy, 2000 affirms the commitment of government towards voluntary and informed choice and consent in family planning services.

C. National Rural Health Mission: The National rural health mission (2005-12) seeks to provide effective health care to rural population through out country with special focus on 18 states which have week public health indicators.

D. Urban family welfare schemes: The main focus was to provide services through setting up of health posts mainly in slum areas.

E. Sterilization beds scheme: A scheme for reservation of sterilization beds in hospital run by Government, local bodies and voluntary organization introduced in 1964 to provide immediate facilities for tubectomy operations.

F. Child survival and safe motherhood programme : Introduced in 1992 has brought about great improvements in the field of immunization.

G. Reproductive and child health programmes: The reproductive and child health programme was launched in October 1997. It was integrated and strengthened in services and interventions under the child survival and safe motherhood programme.

H. Implementation machinery: It is implemented by state government with full central assistance. In rural areas it is provided by sub centre, primary health centre and community health centre.

I. Social marketing of contraceptives : It aims at making contraceptive available to that segment of population which can afford to buy the same from the market at a lower cost. Under this scheme contraceptive, condoms and oral pills are currently sold a low prices.

J. Medical termination of pregnancy: It is estimated that about 12% of maternal morbidity is due to illegal abortions. In order to prevent these health hazards to women, the medical termination of pregnancy act 1971 was hundred. Under the act MTP can be done in pregnant woman upto 20 weeks. If pregnancy results in

- Birth of congenitally malformed child
- Continuation of pregnancy is likely to harm the mother
- Rape and contraceptive failure

K. Prenatal sex determination: Any test to determine the sex of an unborn child has become illegal. Punishment is prescribed for illegal use of pre-natal diagnostic technique.

6.10 COMPONENTS OF THE SERVICE

1) Effective maternal and child healthcare.
2) Increased access to contraceptive care.
3) Safe management of unwanted pregnancies
4) Nutritional services to the vulnerable groups
5) Prevention and treatment of RT1/STI.
6) Reproduction and treatment of Gynecological problems.
7) Screening and treatment of cancers, especially uterine, cervical and breast.

Service package

For Mothers

- All pregnancies are registered by health worker.
- All registered pregnant are screened.
- Provided three antenatal checkups (2 doses of tetanus toxoids, Iron folic acid tablets) .
- Institutional deliveries
- In case of complication referrals are made to first referral units.
- Three postnatal checkup are given to mother's after delivery.
- Spacing of at least three years between children are encouraged.

For children

- Essential newborn cares like keeping the baby warm, checking the baby's weight and giving the baby mother's first milk.
- Babies that are premature or have low birth weight are provided special care.
- Babies with any complications should are referred to health centre.
- Exclusive breast feeding is encouraged for the first three months.
- BCG, DPT, Polio measles immunization are administered to every child meticulously to prevent death and disabilities.
- Six doses of vitamins A are given to children
- Parents are informed about oral rehydration therapy
- Acute respiratory infection in children is detected.
- Treatment of Anemia is carried out.

For eligible couples

1) Promoting use of contraceptive methods among eligible couples is important to prevent unwanted pregnancies. Couples should be able to choose from various contraceptive methods including condoms, oral pills, IUCD's male and female sterilization.

2) Safe deliveries for medical termination of pregnancies should be encouraged for women desiring abortions.

6.11 BENEFITS

1. **Janani Suraksha Yojna:** The scheme is modification of National Maternity benefits scheme, referral transport etc.Assistance to mother increased to Rs. 700 in rural areas and urban areas Rs. 600. Assistance package of Rs. 600 in rural area for institutional delivery in low performing state to meet Dai/ASHA fee transport cost and food and incidental charges during delivery.
2. **Dr. Muthu Lakshmi Reddy maternity benefit:** Rs. 6000 as a onetime financial support to all pregnant women in the state.

3. **Dikri Yojna:** In order to motivate people to stop discrimination against the girl child a scheme called Dikri Yojna has initiated. The couples that have adopted sterilization without waiting for the birth of a son receive a national saving certification worth Rs. 600 and Rs. 5000 respectively.

4. **Varummun kappom scheme:** Mass screening camps are organized through out the state with specialties and modern equipments.

5. **Vande matram scheme:** The scheme is continuing under public private partnership with the involvement of federation of obstetric and gynecological society of India and Private clinics. Aim is to reduce maternal mortality and morbidity of the pregnant and expected mothers and utilizing the vast resources of health care provides.

Summary

- Menstruation refers to the monthly discharge through the vagina of blood, tissue and debris from the uterine cavity.
- Menstrual cycle lasts average as of 28 days.
- Menarche is the first menstruation of a woman.
- Menopause is the cessation of menstruation
- Fertilization is the union of the sperm and ovum.
- Contraception includes all measures that are temporary and permanent designed to avoid or postponed pregnancy.
- Temporary methods include natural methods, barrier method, chemical method and hormonal method.
- Permanent methods include tubectomy and vasectomy.
- India launched the national family welfare programme in 1951.
- The various family welfare programmes include national family welfare programme, national population policy, National health mission, Urban family welfare scheme, sterilization beds scheme, child survival and safe motherhood programme and reproduction and child health programme.
- Antenatal care is the care provided to the pregnant women during her pregnancy period.
- Puerperium is the period following child births, which last for 42 days.
- Fetus which is born after 40 weeks of gestation is the normal newborn.

QUESTIONS

I. Choose the correct answer

1. The first menstruation of a women is a

   a) Menarche b) dysmenorhoea c) Amenorrhoea d) menorrhagia

2. The absence of menstruation is

   a) Menarche b) Dysmenorrhoea c) Amenorrhoea d) Menorrhagia

3. The span and ovum are known as the male and female

   a) Gamete b) Spermatozoa c) Oocyte d) none of the above

4. Shape of the female diaphragm in

   a) Round b) dome c) diamond d) ovoid

5. Emergency contraceptives should be taken within

   a) 24 hrs b) 72 hrs c) 48 hrs d) all the above

6. The average weight gain during pregnancy is

   a) 10-12 kgs b) 12-14 kgs c) 14-16 kgs d) 10-18 kgs

7. Puerperium period lasts for

   a) 4 weeks b) 6 weeks c) 8 weeks d) 10 weeks

8. The normal heart rate of term newborn is

   a) 100-120 beats/mt b) 120-140 beats / mt

   c) 140-160 beats/mt d) 160-180 beats/mt

II. Fill in the blanks

1. The union of the maternal spam and ovum is known as _____
2. The blasotocyst is completly buried in the uterine living is known as _____.
3. The endometrium is ready to support the pregnancy called as _____
4. The umbilical cord contains _____ artery and _____ vein.
5. Permanent method of male sterilization is called as _____.
6. The immunization given for antenatal mother is _____.
7. India launched the National family welfare programme is _____
8. CSSM programme introduced in _____.

III. Write short notes

1. Physical changes in puberty
2. Process of fertilization
3. Fetal circulation
4. Functions of placenta

5. Hormonal methods of contraception
6. Emergency contraception
7. RCH programme
8. Child survival and safe motherhood programme.

IV. Write briefly

1. Menstrual cycle
2. Newborn care
3. Antenatal care
4. Postnatal care
5. Family planning methods

V. Write in detail

1. Development of fertilized ovum.
2. Maternal health programme.

7. CHILD HEALTH NURSING

7.1 GROWTH AND DEVELOPMENT

7.1.1. Definition of growth

Growth refers to an increase in physical size of the whole (or) any of its parts and can be measured in inches (or) cm and in pounds (or) kg. It causes a quantitative change in the child's body. Growth results b ecause of cell division and protein synthesis.

7.1.2. Definition of development

Development refers to a progressive increase in skill and capacity to function. It causes qualit0 ative change in the child's functioning.

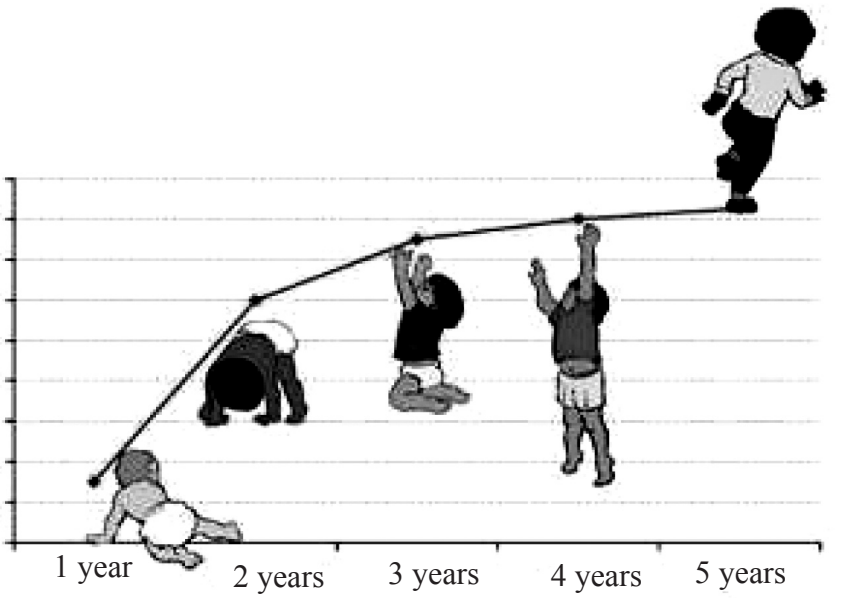


Fig. 7.1 - Growth and Development of Children

7.1.3. Factors influencing growth and Development

A number of factors influence growth and development

Genetic

Certain hereditary influence may have a bearing on the ultimate constitution of the body. Tall parents are likely to have tall offsprings. Transmission of some abnormal genes may result in a familial illness which affects maturation.

Nutrition

Nutritional deficiency considerably retards growth and development.

Socio-economic

Poverty is associated with diminished and affluence with good growth.

Environmental

Physical surroundings (sunshine, hygiene living standard) and psychological and social factors (interpersonal relationship) affect growth and development.

Chronic Disease

Chronic diseases of heart, chest, kidney, liver, digestive system impair growth.

Growth potentials

The growth potential is somewhat indicated by child's size at birth.

Prenatal and intrauterine

IUGR, maternal illness, infections adversely affect foetus and thereby the new born.

Emotional

Emotional trauma from unstable family, insecurity, sibling jealousy and rivalry, loss of parents, inadequate schooling all have negative effect on growth and development.

7.2. STAGES OF CHILDHOOD

Childhood period is broadly classified into the following four groups namely

- Neonatal birth to 28 days
  - Infancy 1 month to 12 months
- Early childhood 1 to 6 years
  - Toddler 1 to 3 years
  - Preschooler 3 to 6 years
- Middle childhood 6 to 12 years
  - School age 6 to 12 years
- Later childhood 11 to 19 years
  - Prepubertal 10 to 13 years
  - Adolescence 13 to 19 years

7.2.1. Infancy 1 month to 12 months

The infancy period is one of the rapid motor, cognitive and social development period. Through the mutality of the care giver, the infant establishes a basic trust in the world and the foundation for future interpersonal relationship.

S. No.	Age (in months)	Physical growth / characteristics	Development			
			Gross motor	Fine motor	Language	Socialisation / behavior
1	1 to 4 months	Weight 4.4 ± 0.8Kg > gains above 680 gm per month till 6 months Length 53 ± 2.5 Cm > gains 2.5 cm/month for first 6 months Head circumference Increases 1.5cm per month for first 6 months Pulse 130+20 Respiration 35+10 Blood pressure 80/50 + 20/10 Reflexes Primitive reflexes govern movements. Has well developed reflexes Physiologic immaturity breath through nose	- Raises head when prone - can sit for short periods with firm support - can sit with head erect - attains complete head control - lifts head while lying prone - rolls from back to side -Pre-crawling attempts	- purposeful attempts to grab objects -follows objects from side to side - brings objects to mouth - watches hands and feet - grasps objects with both hands	- makes sound with smiling - can make vowel sound - vocalizes - babbles	- smiles at human face - is awake greater portion of day - establishes sleep-awake cycle - recognizes familiar and unfamiliar faces - freezes in presence of strangers

2	4 to 8 months	> Weight Birth weight doubles at 6 months >Height Most extensive growth occurs in trunk	- holds head erect continuously - bounces forward and backward - rolls from back to side - can sit with support for short intervals	- uses thumb and fingers for grasping - explores grasped objects - picks up objects with cupped hands - transfers objects from hand to hand	- increasing vocalizations - uses two syllable words - able to form vowel sounds together ("baba")	- constrained in presence of strangers - begins to play with toys - fear of strangers emerges - easily frustrated
3	8 to 12 months	Weight > birth weight triples at the end of 1 year >approx. weight at 1 year is 22 pounds > infant gains 1 pound/month Height >most extensive growth occurs in trunk >grows ½"/ month >total height increases by 50% at 1 year >head circumference = chest circumference at one year	- Sits from standing position without help - can stand erect with support - stand erect momentarily - crawls - walks with help	- uses pincer grasp - waves with wrist - can locate hands for play - can put objects in containers - drinks from cup with help - uses spoon with helps - eats with fingers - holds crayons and makes marks on paper	- speaks first word - uses sounds to identify objects, person - imitates wide range of word sounds - understand meaning of prohibition "no" - responds to own name and those of immediate family members - three word vocabulary - one word sentence	- plays simple games - cries when scolded - makes simple request with gesture - intense anxiety with separation - recognizes family members

Milestone development

Months	Milestone development
2	Social smile
3	Holds head steady when upright (or) head control
4	Hold up head at 90 angle while on stomach
5	Roll over
6	Sits momentarily with support
7	Sits without support
8	Starts crawling
9	Stand while holding onto something
10	Stand holding onto someone
11	Stand alone momentarily
12	Says one word, some children start walking with support

Dentition

Central incisors - 6 to 8 months

Lateral Incisors - 8 to 11 months

7.2.2. Toddler

Toddlers is the developmental age group from 1 year to 3 years of age. This period is characterized by intense activity and discovery. It's a time of marked physical and personality development.

S. No.	Age (in months)	Physical growth/characteristics	Development			
			Gross motor	Fine motor	Language	Socialisation/ behavior
1	15 months	In general (1 to 3 yrs) Weight - average weight gain is 1.8-2.7 kg/yr - birth weight quadriples at 2.1/2 yrs - weight gain decelerates considerably	- walks alone with wide -based gait - creeps up stairs - can throw objects	- builds tower of two blocks - opens boxes - pokes finger in holes - uses spoon but spills contents	- recognizes names of various parts of body - responds to simple familiar commands - says 2-6 words - names familiar pictures/ objects	- hugs & kisses parents - less fearful of strangers - begins to imitate parents - very early temper tantrums
2	18 months	Height - increases about 10 to 12.5 cm/yr - at 2 yrs – 85 cm - arms and legs grow at a faster rate than head and trunk	- walks alone with wide-based gait - begins to run, seldom falls - climbs up and down stairs - climbs onto furnitures - seats self on chairs	- builds tower of three blocks - scribbles in random fashion - drinks from cup	- identifies one/more parts when named - speaks few real words - names pictures - uses words more than gestures	- begins to have temper tantrums - bedtime rituals begin - less fearful of strangers

3	24 months	- Lumbar lordosis of spine is evident - legs have a bowing appearance - ratio of upper segment lower segment is 1.7: 1 Head Circumference HC = CC by (1-2 yrs) - the rate of slows until at age 5 yrs.	- walks with steady gait - runs in more controlled manner - walks up & down stairs using both feet on each step - jumps crudely - kicks balls without losing balance	- drinks from cup held in one hand - uses spoon without spilling - builds tower of 4 blocks - empties contents of jar - draws vertical line and circular shape	- understands ore complex sentences - enjoys stories with pictures - identifies 4 body parts when named - tells about immediate experiences - verbalizes need for drink, food/ toileting - 2 to 3 word sentence length	- little social interaction with other children - possessive in nature - pulls others to show them something - upset by changes in routine
4	30 months	- at 2 yrs HC – 49 to 50 cm - anterior Fontanelle closes by 1 to 1.1/2 yrs Chest circumference - continues to increase in size and exceeds HC during this age - AP diameter < lateral diameter - midarm circumference = 13 to 16 cm	- can balance momentarily on one foot use both feet for jumping - jumps down from furniture - pedals tricycles	- holds crayons with fingers - draws cross figure crudely - builds tower of 6 blocks	- identifies fine body oarts when named - gives full name when asked - talks constantly - asks “why” - uses 4-5 words sentences	- egocentrism still present - ritualistic behaviour speaks - knows own sex - begins to learn to cope-up with separation

5	36 months	Dentition 1st molars – 10 to 16 months 2nd molars – 20 to 39 months Vital signs Temperature 97.8 ^{0}F– 98.4^0 F. Pulse 1-2 yrs 110 – 130 b/mt 3 yrs 100 – 120 b/mt Respiration 24-40 b/mt Blood pressure 91/56 mmHg	- dresses and undresses self - pedals tricycle - walks backwards - walks up and down alternating feet - balances momentarily on one feet	- strings large beads - copies cross and circle - unbuttons front and side buttons - builds and balances 10 block tower	- constantly asks questions - talks whether audience present/not - omits 'W' from speech - pluralises words - repeats phrases and words aimlessly - has vocabulary of 900 words	- attains toilet training - temper tantrums may (or) may not decrease - reluctant to go to bed - imitates sex-role behaviour of adults

7.2.3. Preschooler

The children between 3 and 6 years of age are known as preschooler. Children in the preschool years grow relatively slow. They become taller and thinner without gaining much weight. They look more like an adult because of skeletal maturation

Age	Physiologic growth	Development			
		Gross motor	Fine motor	language	Psychosocial
3 years	Weight – 12.5 to 16.5 kg Height – 09.5 to 101.5 cm Pulse – 105 ± 15 b/m Blood pressure 100 ± 24/67 ± 25 mmHg	- walks a straight line - walks backward - walks on tiptoes - kicks a ball	- build a tower of 9-10 blocks - copies a circle - puts beads on string	Receptive - can obey two preposition commands (ie) on, under. Expressive - uses 4 word sentences - give sex and full name - names figures in a picture - has vocabulary of 800-1000 words	- egocentric - alternates between reality and imagination - less dependent on parents - may have dreams and nightmares fears the dark

4 years	Weight – 13.5 to 19.5 kg Height – 95 to 109 cm Pulse – 100 ± 10b/m Respiration – 24±4b/m Blood pressure – 100/66±20	- Runs on tip toes - balances on foot (3-5 sec.) - jumps from greater heights - hops on preferred foot - climbs tree, ladders	- copies a square - draws a simple face - cuts around pictures with scissors	Receptive - understands directives (on, under, back, front) Expressive - names one or more colours - uses I - counts to 5 - vocabulary – 1500 words	- egocentric - tends to be impatient and selfish - aggressive - dreams and nightmares continue - jealousy of siblings
5 years	Weight-15.4-21.4 kg Height- 103-115cm Pulse-95 ± 15b/m Respiration 22±3b/m BP100/60±14/10	Skips alternates feet - jumps rope - walks a balance beam - imitates dance steps - catches a ball smoothly with one hand	- copies a triangle - crosses vertical lines - copies letters - draws a three part man	Receptive - carries out instruction with three suggested tasks (wash,dry,sit) Expressive - names primary colors - asks meaning of words - counts to 10 - vocabulary 1200 words	- Egocentric - separates easily from parents - looks for parental encouragement and support - very industrious - engages in co-operative play

7.2.4. School aged Child

The segment of life span that extends from age 6-12 years is known as School age. This is a time of gradual growth and development with more even progress in both physical and emotional aspects.

Age	Physical Growth	Development			
		Gross motor	Fine motor	Language	Psychosocial
6-8 yrs	Weight – 17.5 – 25.5 Height – 110-124 cm Pulse 90±15b/m Respiration-21±3b/m BP-100/60±16/10mmhg	- rides bicycle without training wheels - runs, jumps, climbs, hops - constantly in motion - co-ordination improving	> knows right from left hand > draws a person with 12-16 parts > prints words > learns cursive writing	Receptive Follows series of 3 commands Expressive * can repeat sentences of 10-12 words * vocabulary - 2500 words * knows number combination upto 10	> egocentric > insists on being first in everything > jealous of siblings

8-10 yrs	Weight – 22 to 32 kg Height – 121.5 to 136.5 cm Pulse – 85 ±10b/m Respiration-20+3b/m Blood – 102/60±16/10 pressure	· performs tricks on bicycle · participates in organized sports · throws a ball skillfully	· uses both hands independently · draws a person with 18-20 parts · prints fluently · cursive writing improved	Receptive Follows suggestions better than commands Expressive * Begins to use shorter and more compact sentences	* Curious about everything * concerned about relationship with others * Easy to get alongwith others * Begins hero worship * helps when mother is busy
10-12 yrs	10 years Wt 25.5-39.5Kg Ht-131.5-147.5cm Pulse-90+20b/m Respiration-19±3b/m BP – 109/58±16/10 12 years Boys Wt-30-48 Kg Ht – 142-158 cm Girls Wt- 30-50 Kg Ht – 144-160cm Pulse 90±20b/m Respiration 19±3b/m BP113/59±18/10	Enjoys all physical activities	- co-ordination continues to improve	Receptive - follows suggestions better than requests - is receptive Expressive - oral vocabulary 7200 words - reading vocabulary-50000 words - use numbers beyond 100 with meaning - use parts of speech correctly	- has greater self control - respects parents and their role - has short bursts of anger - fears about dark - hero worship continues

7.2.5. Adolescent

Adolescent is a period of transition from childhood to adulthood – a time of rapid physical, cognitive, social and emotional maturing. This period is viewed as beginning with the gradual

appearance of secondary sex characteristics (11/12 yerars) and ending with cessation of body growth at 18-20 years.

Age	Physiologic Growth		Development			
	Male	Female	Gross motor	Fine motor	Language	Psychosocial
12-13 yrs	Wt-38-60 Kg Ht- 154-172 cm Pulse-65±8b/m Respiration 19+3b/m BP-114/68±10/Kg * Secondary sex characteristics develop	40-60 kg 153-167 cm 65±8b/m 19±3b/m 112/66±10/12	Motor function comparable to adult	Eye-hand co-ordination at adult level	Uses slang within and outside peer group * Uses distinct meaning for words	> world centers around the child > intense loyalty to peer group > shows mood swings > day dreams over heroes > continues same sex friendship
14-16 yrs	Wt-50-60 kg Ht – 164-180 cm Pulse – 63±8b/m Respiration 17±3b/m BP 116/70±12/14	42-64 kg 155-169 cm 66 ± 8b/m 17±3b/m 114/70±14/ 12mmHg	Motor function comparable to adult level	Eye-hand co-ordination at adult level	* uses language as a medium to convey ideas, opinions and values * incorporate complex structural and grammatical forms * evident use of slang and peer accepted terminology	- egocentrism diminishes - separation from parents continues - heterosexual relationships - verbally attacks parents belief
17-19 yrs	Wt 56-80 Kg Ht 163-182 cm Pulse 70±10b/m Respiration 17±3b/m BP 126/74±26/16	48-72 Kg 156-170 cm 70±10b/m 17±3b/m 126/74±26/16	Motor function comparable to adult level	Eye-hand co-ordination at adult level	-do-	- severs tie with parents - establishes interdependent relationship with parents - fewer but closer friends

7.3. MAJOR CHILD HEALTH PROBLEMS

The main health problems encountered in the child population comprise the following

1. Low birth weight
2. Malnutrition
3. Infections and parasitoses
4. Accidents and poisoning
5. Behavioral problems

7.3.1. Low Birth Weight

A LBW infant is any infant with a birth weight of less than 2.5 Kg regardless of gestational age.

It includes 2 kinds of infant.

a. **Preterm babies**

Babies born before 37 weeks of gestation. Given good neonatal care, these babies can catch up growth and by 2-3 years of age will be of normal size and performance.

b. **Small for date**

These babies may be born at term or preterm. They weigh less than 10^{th} percentile for the gestational age.

SFD babies have a high risk of dying not only during the neonatal period but during their infancy. Most of them become victims of protein-energy malnutrition and infections.

Risk Factors

- Malnutrition
- Infection
- Unregulated fertility

Prevention

i) **Direct intervention**

a) Increase food intake

b) Control infections

c) Early detection & treatment of medical disorder.

ii) **Indirect intervention**

a) Family planning

b) Avoidance of excessive smoking

c) Improved sanitation

Treatment

a) Incubatory care

b) Feeding

c) Prevention of infection

7.3.2. Malnutrition

Scarcity of suitable food, lack of purchasing power of the family, traditional beliefs, taboos lead to an insufficient balanced diet resulting in malnutrition.

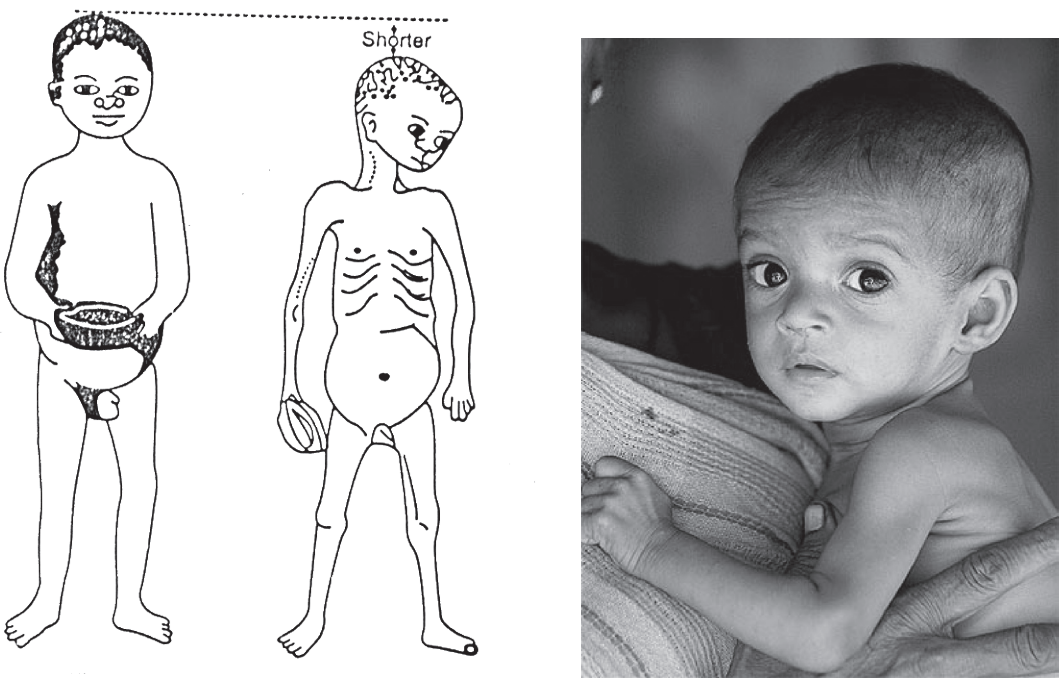


Fig. 7.2 - Malnourished child

Specific nutritional deficiencies

a) **Protein-energy malnutrition**

Characterised by poor growth and high level of mortality in children between 12 and 24 months of age.

b) **Micronutrient malnutrition**

Refers to a group of conditions caused by deficiency of essential vitamins and minerals such as vitamin A, calcium, iodine, iron and zinc.

7.3.3. Infectious and parasitic diseases

Young children fall an easy prey to infectious diseases. They are diarrhea, respiratory infections, measles, pertussis, polio, neonatal tetanus, tuberculosis and diphtheria. Intestinal parasites such as ascariasis, hookworm, giardiasis. These are common because of poor environmental sanitation and paucity of portable drinking water.

7.3.4. Accidents and poisoning

Main accidents among children are burns, trauma, falls, drowning, traffic accidents and poisoning.

7.3.5. Behavioral problems

Children abandoned by their families present severe social and health problems.

Definition

Behavioral problem is characterized by a significant deviation from the socially accepted normal behavior.

Etiology

- Faulty parental attitude
- Inadequate family environment
- Mentally and physically sick or handicapped children
- Influence of social relationship
- Influence of mass media
- Influence of social charge.

Common behavioral problems

1. Feeding problems
    - Food refusal
    - Over-eating
    - Pica
    - Anorexia nervosa
2. Habit disorders
    - Thumb sucking
    - Nail biting
    - Enuresis
    - Encopresis

3. Sleep problems

- Somnambulism
- Night terrors
- Night mares
- Insomnia

4. Adjustment problem

- Disobedience
- Misconduct
- Tempertantrum

5. Antisocial problem

- Delinquency
- Kleptomania
- Drug addict
- Sexual assault

Management

- Warm and understanding family environment
- Communication between family members should be direct
- Deal with emotional disturbances at the earliest
- Behavioral therapy
- Positive reinforcement
- Relaxation therapy
- Referral to child guidance clinic
- Drug Therapy

7.4. HEALTH PROGRAMMES IN INDIA RELATED TO CHILD HEALTH

Since India became independent, several measures have been undertaken by the National Government to improve the health of the people. Prominent among these measures are the National Health Programmes, which have been launched by the Central Government for the control/eradication of the communicable diseases, improvement of environmental sanitation, raising the standard of nutrition, control of rural population and improving rural health. Various international agencies like WHO, UNICEF, SIDA, DANIDA, USAID have been providing

technical and material assistance in the implementation of these programmes. A brief account of these programmes which are currently in operation and related to child health are discussed below

7.4.1. Maternal and child health program

The term 'maternal and child health' refers to the promotive, preventive, curative and rehabilitative health care for mothers and children.

Objectives

The specific objectives of MCH are

- Reduction of maternal, perinatal, infant and childhood mortality and morbidity
- Promotion of reproductive health
- Promotion of the physical and psychological development of the child within the family
- The ultimate objective of MCH service is life-long health.

Antenatal care

Antenatal care is the care of the woman during pregnancy.

The package of antenatal care for all pregnant women consists of Screening for anaemia, eclampsia, pre-eclampsia, multiple pregnancies. Haemoglobin estimation is done, blood pressure recorded and fundal height is measured.

- Iron and folic acid supplementation
- Immunization against tetanus
- Group or individual instruction on nutrition, family planning, self care, delivery and parenthood.

Intranatal care

The programme envisages delivery of infant by a trained birth attendant.

Education is also imparted to mothers regarding breast feeding, immunization, family planning and general hygiene.

Care of children

Early neonatal care

The first week of life is the most crucial period in the life of an infant.

The objective are

- Establishment and maintenance of cardio-respiratory function
- Maintenance of body temperature

- Avoidance of infection
- Establishment of satisfactory feeding regimen
- Early detection and treatment of congenital or acquired disorders

Clearing the airway

To help establish breathing, the airways should be cleared of the mucus and other secretions. Positioning the baby with the head low may help in the drainage of secretions. This can be assisted by gentle suction to remove mucus and amniotic fluid.

Apgar score

The Apgar score is taken at 1 min, 5 min and 10 min. It required immediate and careful observation of the heart rate, respiration, muscle tone reflex response and colour of the infant care of the cord.

The umbilical cord should be cut and tied when it has stopped pulsating. Care must be taken to prevent tetanus by using sterilized instruments and cord ties. The cord should be kept as dry as possible.

Care of the Eyes

Before the eyes are open, the lid margins of the newborn should be cleaned with sterile wet swabs, one for each eye from inner to outer canthus. Instill a drop of freshly prepared AgNo3 solution.

As a preventive measure, specific maternal genital tract infection should be treated effectively prior to or during pregnancy, and specific care should be taken while conducting delivery.

Care of the skin

The first bath is given with soap and warm water to remove vernix, meconium and blood clots. The first bathing may be delayed to 12-24 hours after birth to avoid cooling the body temperature.

Maintenance of body temperature

Immediately after birth, the child is quickly dried with a clean cloth and wrapped in warm cloth and given to the mother for skin to skin contact.

Breast Feeding

Breast feeding should be initiated within an hour of birth. The first milk called “colostrum” is the most suitable food for the baby as it contains high concentration of protein and other nutrients. The baby should be allowed to breast-feed whenever it wants.

Identification of "at risk" infants

The basic criteria for identifying these babies include

- Birth weight less than 2.5 kg
- Twins
- Birth order 5 and more
- Artificial feeding
- Weight below 70% of the expected weight
- Failure to gain weight during 3 successive months
- Children with PEM, diarrhea
- Working mother/one parent.

Late neonatal care

The remaining 3 weeks of the neonatal period carry serious hazards of infection and failure of satisfactory nutrition. Diarrhoea and pneumonia are the common problems.

7.4.2. Integrated child development services

Currently the most important scheme in the filed of child welfare is the ICDS scheme. It was initiated by the Govt. of India in the Ministry of social and women's welfare in 1975.

As on 30th Sep. 2007, 6284 ICDS projects have been sanctioned, out of which 5959 with 9.3 lakh anganwadi centres are functioning.

Objectives

The objectives of the ICDS Scheme are

- To improve the nutritional and health status of children in the age group of 0-6 years.
- To lay the foundations for proper psychological, physical and social development of the child, to reduce mortality and morbidity, malnutrition and school drop out.
- To achieve an effective co-ordination of policy and implementation.
- To enhance the capability of the mother and nutritional needs of the child through proper nutrition and health education.

Delivery of services

1. Supplementary nutrition

It is given to children below 6 years and nursing and expectant mothers from low income group.

- Each child upto 6 years to get 300 cal and 8-10 gms of protein.
- Each adolescent girl to get 50 cal and 20-25 gm of protein

- Each pregnant and nursing mother to get 500 cal and 20-25 gm of protein
- Each malnourished child to get 600 cal and 16-20 gms of protein.

Supplementary nutrition is given 300 days in a year. Children are weighed every month.

Nutrition and Health Education

Nutrition education and Health education are given to all women in the age group 15-45 years.

Immunization

Immunization of children against 6 vaccine preventable disease is done and for expectant mother tetanus toxoid is recommended.

Health check-up

This includes

Antenatal and postnatalcare

Expectant mothers are given IFA tablets along with protein supplements. A minimum of 3 physical examination are done. High risk mothers are referred.

Care of children < 6 years include

Record of weight and height of children at periodical intervals.

- Watch over mile stones
- Immunization
- General check-up every 3-6 months
- Treatment for minor diseases
- Deworming
- Prophylaxis against Vit. A deficiency and anaemia
- Referral services.

Non-formal pre-school education

Children between 3-6 years are imparted non-formal pre-school education in an anganwadi in each village about 1000 population. The aim is to develop desirable attitude, values and behavior pattern among children.

Health of adolescents

A number of major approaches to reducing problems by modification of the contributing factors will serve to promote good health among young. They include

- Informing, educating and sensitizing key groups in society to individual health and social development
- Advocating appropriate policy, legislation and programmes for promoting adolescent reproductive health
- Using appropriate and innovative research to improve knowledge of young peoples' sexual contraceptive and reproductive decisions and behavior.
- Modifying, extending and evaluating services
- Mobilizing the energy, creativity and idealism of young peopled in promoting health.
- Facilitating action to extend education opportunities for girls.

7.4.3. Child survival and safe motherhood program

This programme was initiated in 1992.

Components of this programme

- Early registration of pregnancy
- To provide minimum three antenatal check-ups
- Universal coverage of all pregnant women with TT immunization
- Advice on food, nutrition and rest
- Detection of high risk pregnancies and prompt referral
- Clean deliveries by trained personnel.
- Birth spacing
- Promotion of institutional deliveries

Essential newborn care

The primary goal is to reduce perinatal, neonatal mortality. The main components are

- Resuscitation of newborn with asphyxia
- Prevention of hypothermia
- Prevention of infection
- Exclusive breast feeding
- Referral of sick newborn

Essential newborn care Oral Rehydration Therapy

Diarrhoea is one of the leading cause of child mortality. Supplies of ORS packet (150) twice a year are provided to sub-centres. The programme emphasizes the rational use of drugs

for the management of diarrhea. Adequate nutritional care of the child with diarrhea and proper advice to mothers on feeding are two important areas of this programme.

Acute respiratory disease control

Peripheral health workers are being trained to recognize and treat pneumonia. Cotrimoxazole is being supplied to the health workers through the CSSM drug Kit.

Prevention and control of Vit. A

Under the program, doses of Vit.A are given to all children under 5 years of age. The first dose (1 lakh units) is given at nine months of age alongwith measles vaccination. The second dose (2 lakh units) is given alongwith DPT/OPV booster doses. Subsequent doses (2 lakh units each) are given at six months intervals.

Prevention and control of anaemia in children

The national family health survey II (98-99) revealed that 74.3% children under the age of 3 years were anaemic. Under this programme of control and prevention of anaemia, tablets containing 20mg of elemental iron and .1mg of folic acid are provided at the sub-centre level. Current programme guidelines instructs the health workers to provide 100 tablets to children clinically found to be anaemic.

Reproductive and child health program

The National Family Welfare Program has been renamed in 1997, as the Reproductive and Child Health Program.

Reproductive and child health approach has been defined as "people have the ability to reproduce and regulate their fertility, women are able to go through pregnancy and child birth safely, the outcome of pregnancies is successful in terms of maternal and infant survival and well being, and couples are able to have sexual relations free of fear of pregnancy and of contracting disease".

Packages of RCH services

The packages include

- Prevention and management of unwanted pregnancy
- Services to promote safe motherhood
- Provision of services to promote child survival
- Nutrition supplements for vulnerable groups
- Prevention and treatment of reproductive tract infections
- Infection and sexually transmitted disease
- Reproductive health survey for adolescents

- Information and counseling for health and sexuality
- Availability of a referral system

7.4.4. National programs on immunization

In 1974, WHO launched its "equated programme on immunization" against six killer diseases, diphtheria, pertussis, tetanus, polio, measles, tuberculosis. The UNICEF in 1985 renamed it as "Universal Child Immunization".

Universal Immunization Programme was started in India in 1985.

Component

Immunization of pregnant woman against tetanus.

Immunization of children in their first year of life against the six EPI target diseases.

Aim

The aim was to achieve 100% coverage of pregnant women with 2 doses of TT and atleast 85% coverage of infants with 3 doses of DPT, OPV and one dose of BCG and measles by 1990.

Objectives

The objectives are

- To increase immunization coverage
- To improve the quality of service
- To achieve self-sufficiency in vaccine production
- To train health personnel
- To ensure district-wise monitoring

The immunization services are provided through the existing health care system ie. MCH centres, PHC subcentres, hospitals, dispensaries and ICD units.

Targets achieved

Although the target was "universal" immunization, in practice no country has ever achieved 100% immunization. Universal immunization can be interpreted as that no child should be denied immunization against six killer disease.

Neonatal tetanus elimination has been achieved by 1995. Reduction in number of cases and deaths due to measles has been achieved by 1992 onwards. Polio eradication is expected to achieve by 2007.

Annually 25 million infants and pregnant woman have been reached out.

Self-sufficiency in vaccines

Over 21854 PHCs and 1,32,730 subcentres are rendering immunization services. 1500 lakh doses of OPV, 1200 lakh doses of DPT, 550 lakh doses of BCG and 330 lakh doses of measles vaccines are freely available annually.

Programme Implementation Plan

To strengthen routine immunization, Govt. of India has planned the SIP Part C. It consists of

- Support for alternate vaccine delivery from PHC to
- Subcentre and outreach sessions
- Deploying retired manpower to carryout
- Immunization in underserved areas
- Mobility support to district immunization officer
- Review meeting at the state level
- Training the staff
- Support for mobilization of children to immunization sites
- Printing of immunization cards, monitoring sheet, cold chain chart vaccine inventory charts.

Introduction of Hepatitis – B Vaccine

A pilot project for the introduction of Hepatitis vaccine in the National Immunization programme was initiated in June 2002. Under this project Hepatitis-B vaccine is being administered to infants alongwith the primary doses of DPT vaccine on 6^{th}, 10^{th} and 14^{th} week.

Urban measles campaign

A special campaign with assistance of UNICEF was taken up for covering the slum localities during 1998. The emphasis is on covering all unprotected children upto 3 years with single dose of measles vaccine.

Neonatal Tetanus Elimination

In order to achieve early elimination of neonatal tetanus, ICMR has advised to cover all pregnant women with 3 doses of TT through a campaign.

Pulse Polio Immunization Programme

Pulse polio immunization programme was launched in the country in the year 1995. This is a strategy of mass immunization by which one can eradicate poliomyelitis. Extra doses of OPV are given to all children below 5 years of age in an area (like country, state, city) at a time on a given day. PPI is given in as two rounds in year about 4 to 6 weeks. The aim is to achieve 100% coverage.

An improvement in PPI during 1998 has been the use of vaccine vial monitor. Colour monitor or labels are put on vaccine bottles. The quality assurance will ensure that the children will have better protection against polio.

The intensification will reduce the number and size of high risk areas or groups.

7.4.5. Integrated Management of neonatal and childhood illness (IMNCI)

An integrated approach to manage sick children is, therefore, necessary. IMCI is a strategy for an integrated approach to the management of childhood illness as it si important for child health programmes to look beyond the treatment of a single disease. This is a cost effective and emphasizes prevention of disease and promotion of child health and development besides provision of standard care management of childhood illness.

The line of action is as follows

1. Check for danger signs
   - convulsions
   - lethargy/unconsciousness
   - inability to drink/breastfeed
   - vomiting
2. Assess main symptoms
   - cough/difficulty breathing
   - diarrhea
   - fever
   - ear problems
3. Assess nutrition and immunization status and potential feeding problems
4. Check for other problems
5. Classify conditions and identify treatment actions.

According to color coded treatment

Pink	Yellow	Green
Urgent referral Emergency triage &	Treatment at out patient health facility	Home management

Treatment

Intensification of immunization programme has contributed to a significant decline in IMR in the last few years.

Acute Respiratory Infection control programme

ARI are a major cause of infant and childhood mortality, contributing to 20-30% of the total deaths in children.

ARI Control program

The WHO protocol puts forward two signs as the "entry criteria" for a possible diagnosis of pneumonia. These are cough and breathing.

Patients under 3 months age group are treated with antibiotics parenterally in the form of a combination ampicillin 25-50 mg/kg/day and gentamicin 5 mg/kg/day for a period of 7-10 days.

Presence of any of the under mentioned signs is indicative of severe illness.

- Respiratory rate more than 60breaths/min
- Chest indrawing in the absence of nose block
- Abnormally sleepy/difficulty to wake
- Hypothermia
- Convulsions

Clinical assessment and management of ARI

Clinical Signs	Classification	Treatment
Not able to drink Central cyanosis	Very severe pneumonia	Admit/refer O2, IV chloremphenical, 25mg/Kg/ day
Chest indrawing No cyanosis Able to drink	Severe pneumonia	Admit/refer IV pencillin – 25000U/kg/dose – Q6H
RR - > 40breaths/min No chest indrawing	Pneumonia	Cotrimaxazole 5-8 mg/kg , ampi/amox 250 mg/kg/day
No fast breathing, chest drawing, feeding well	No pneumonia	Treat like URI

7.4.6. Control of diarrhoeal disease programme

Diarrhoea is the cause of almost one fourths of deaths in preschool children. Treatment of dehydration caused by diarrhea was therefore included in the child survival program.

Objectives

The objective was to reduce diarrhea related deaths in children under the age of 5 years by 30% by 1995 and by 70% by year 2000 AD.

Strategy

The strategy adopted was

- To train medical and other health personnel in standard case management of diarrhea
- Promote standard case management practices among private practitioners
- Instruct mothers in home management of diarrhea and recognition of signs which signal immediate medical care
- Make available the ORS packets free of cost at Government health facilities

ORS treatment

The dehydration caused by diarrhea can be treated using ORS. The composition of ORS is given below

Sodium chloride	-	2.6gm
Sodium citrate	-	2.9 gm
Potassium Chloride	-	1.5 gm
Glucose	-	13.5 gm

A sachet containing the above content is dissolved in 1 lite of water and is kept in a clean utensil. 150-200 ml is administered each time a stool is passed.

Patients who are diagnosed to have dysentery are given cotrimaxazole in addition to ORS. In case of unsatisfactory response, nalidixic acid is given for 5 days.

Any programme for diarrhoeal disease control must include provision of potable water.

Parents must also be educated regarding storage of water and foods in clean utensils, continuance of breast feeding, using only freshly prepared weaning foods and thorough washing of hands with soap before handling foods.

7.4.7. School AIDS Education Programme

It is one of the important activities of NACP that focuses towards student youth to raise awareness level and develop a safe and responsible lifestyle. A training module called "learning for life" has been distributed to all the states.

National Paediatric AIDS initiatives

National paediatric AIDS initiative was launched on 30th November 2006.

At present, paediatric drugs are provided at all ART centres

- Establishment of seven regional paediatric centres
- Free CD4 monitoring
- Free DNA-PCR testing for children upto 18 months
- Liquid formulations for babies weighing < 5 kg

Diagnosis and treatment of opportunistic infections and micronutrient supplementation.

The initiative also includes training of paediatrician, setting of laboratories for diagnosis introducing dried blood spot system to transport dried blood samples.

Nutrition Programs

The government of India have initiated several large scale supplementary feeding programmes

7.4.8. Vitamin A prophylaxis programme

This programme was launched by the Ministry of Health and Family Welfare in 1970.

Goal

The goal of the program is to prevent Vit. A associated blindness by 2000 AD

Components

- One of the components of National programme for control for blindness is to administer a single massive dose of an oily preparation of Vit. A containing 2,00,000 IU (110 mg of retinol palmitate) orally to all preschool children in the community every 6 months through peripheral health workers.
- Promotion of breast feeding and feeding of colostrums
- Encourage the intake of green leafy vegetable and yellow coloured fruits.
- Increase of coverage with measeles vaccine, as an attack of measles depleted Vit.A stores.

7.4.9. Anaemia Control Programme

This programme was launched by the Govt. of India during the fourth five year plan (1979 – 1984).

Beneficiaries

NNACP covers pregnant woman, nursing mothers, women acceptors to terminal methods and IUD.

Fifty percent children in age group of 1-5 years have also been included in the programme. Recommended daily dose of IFA tablet is as follows.

Adult women

- 60 mg elemental iron + 0.5 mg folic acid
- If the preschool children cannot swallow the tablets, 2 ml liquid should be given

7.4.10. Special Nutrition Program

This programme was started in 1970 under the Ministry of Social Welfare Beneficiaries

- Children < 6 years of age
- Pregnant and nursing mothers

Aim

The aim of this programme is to improve the nutritional status of the target group.

The supplementary food supplies about 300 kcal and 10-12 g of protein/child/day. The beneficiary mothers receive daily 500 kcal and 25 gm of protein.

This supplement is provided to them for about 300 days in a year.

This programme was originally launched as a central programme and was transferred to state sector in the fifth five year plan as part of the Minimum Programme.

7.4.11. Balwadi Nutrition Program

This programme was started in the year 1970 under the Ministry of Social Welfare.

Beneficiary

Children in the age group of 3-6 years

Activity

The programme is implemented through Balwadi's which also provide primary education to these children. The food supplement provides 300 kcal and 10gms of protein per child per day.

7.4.12. Mid-day meal programme

Mid day meal programme is also known as school lunch programme to noon meal programme. This programme has been in operation since 1961 throughout the country under Ministry of Education.

Objectives

To attract more children for admission to schools and retain them so that literacry improvements of children could be brought about.

Principles

In formulating mid-day meals for school children the following broad principles should be kept in mind

- The meal should be a supplement and not a substitute to the home diet
- The meal should supply at lease 1/3rd of the total energy requirement and ½ of the protein need
- The cost of the meal should be reasonably low
- The meal should be such that it can be prepared easily in schools ; no complicated cooking process should be involved
- As far as possible, locally available foods should be used, this will reduce the cost of the meal and
- The menu should be frequently changed to avoid monotony.

A model menu is given below

Cereals & Millets	-	75g/day/child
Pulses	-	30 -do-
Oils & Fats	-	8 -do-
Leafy vegetables	-	30 -do-
Non-leafy vegetables	-	30 -do-.

The minimum number of feeding days in a year should be 250.

Goals

The important goals to be accomplished are

- Re-orientation of eating habits
- Incorporating nutrition education in the curriculum
- Encouraging the use of local commodities
- Improving school attendance as well as
- Educational performance of the pupils.

The mid-day meal programme has become part of minimum needs programme in the V Five Year Plan.

7.4.13. Iodine Deficiency Disorders Programme

India commenced a goiter control programme in 1962, based on iodized salt.

Studies revealed that prevalence of cretinous and sub-cretinous levels of developmental damage to the brain of children in these regions. These findings made the government include salt iodation in the 20 point program of the Prime Minister in 1984. And a major national programme – The IDD control programme has been initiated in which nationwide, rather than area. Specific use of iodized salt is being promoted. It was decided as a national policy to fortify all edible salt in a phased manned by end of 8th plan.

Components

Initial survey to identify endemic areas.

Supply of iodized salt to the identified area.

Re-survey after 5 years of continuous supply of iodized salt to assess impact of the measures.

The district administration has been given the responsibility of advocacy, policy implementation and monitoring.

7.4.14. National Programme for control of blindness

It was launched in the year 1976 with the goal to reduce the prevalence of blindness from 1.4% - 0.3%

Objectives

- To reduce the backlog of blindness through identification and treatment of the blind
- To develop eye care facilities in every district
- To develop human resources for providing eye care services
- To improve quality of service delivery
- To secure participation of voluntary organizations in eye care.

Service Delivery and Referral System

Tertiary Level	-	Regional Institute of Opthalmology & Centres of Excellence in Eye Care Medical Colleges
Secondary Level	-	District Hospital & NGO Eye Hospital
Primary Level	-	Sub district level hospitals/CHCs

Mobile ophthalmic units, Upgraded PHCs

Link workers/Panchayats

NPCB is 100% centrally sponsored program.

7.4.15. National School Health Program

The beginning of school health services in India dates back to 1909.

1953 – Secondary Education Committee emphasized need for medical examination

1960 – Govt. of India constituted school health committee

1961 – Committee submitted the report.

Objectives

The objectives of this programme are

- The promotion of positive health
- The prevention of diseases
- Early diagnosis, treatment and follow-up of defects
- Awakening health consciousness in children
- The provision of healthful environment

Aspects of School Health Service

1) Health appraisal of school children

a. Periodic medical examination

b. Daily morning inspection by the teachers

The following clues will help the teachers to suspect who need the medical attention.

Flushed face, rash, acute cold, coughing, sore throat, rigid neick, nausea and vomiting, pediculosis, chills or fever, etc.

Remedial measures and follow up

Special clinics should be conducted for school children at PHC in rural areas and selected schools or dispensaries for a group of 5000 children in urban areas. There should be provision for beds in the existing referral hospitals for the school children.

Prevention of communicable diseases

A well planned immunization programme should be drawn up against common communicable diseases.

Nutritional services

The school health committee recommended that school children should be assured of atleast one nourishing meal.

First-aid and Emergency care

All teachers should receive adequate training in first-aid and emergency care.

Mental Health

The school teacher should be concerned with helping all children attain mental health. There should be enough relaxation between intense work. No distinction should be made between race, religion, rich, poor, etc.

7.5. NEW BORN CARE

7.5.1. Definition of new born

The period from birth to 28 days of life is called neo-natal period and the infant in this period is termed as neonate (or) new born baby.

Early neonatal period

The first week of life is known as early neonatal period.

Late neonatal period

The late neonatal period extends from 8^{th} to 28^{th} days of age.

Normal characteristics of the new born

7.5.2. Normal characteristics of the Newborn

Measurements

Length

- The length of the average new born boy is 50 cms (20 inches) and new born girl is 49 cms (19.6 inches).
- The normal range of height for both sexes is from 47.5 to 53.75 cms (19 to 21.5 inches) .
- Weight

The normal full term infants weigh between 2700 and 3850 gm and the average weight is about 2.9 kgs. The weight is very variable from country to country and in different socio-economical status.

Head circumference

The head circumference usually varies from 33 to 37 cms.

Chest circumference

The chest circumference is about 3 cms less than head circumference.

The chest is rounded rather than flattened antero-posteriorly.

7.5.3. Other characteristics

- The upper segment to lower segment ratio is 1 8 1. The midpoint of the length/stature of the neonate lies approximately at the level of the umbilicus, instead of the symphysis.
- Another mark that may be present is the so-called Mongolian Spot. These slate-coloured spot usually occur on the buttocks whose parents are black. Oriental (or) from the mediteranean region. They fade during the pre-school age without treatment.

Head

- The skull is formed of eight bony plates, each one connected to other by suture lines. Growth of these bones occurs along their edges causing their edges, causing the head to increase in size.
- The fontanels are openings at the point of union of the skull bones. These should be palpated to determine whether they are open or closed.
- The anterior fontanel is diamond-shaped and is located at the juncture of the two parietal and two frontal bones. It is 2 to 3 cms in width and 3 to 4 cm in length.
- The posterior fontanel is triangular in shape and between the occipital and parietalbone.It is much smaller than the anterior fontanel and may be nearly closed..
- The anterior fontanel normally closed by the time the infant is 12-16 months old and the posterior fontanel by the end of the second month

Integument

The skin is pink (or) red, in the black infant, reddish black.

- The bluish hands and feet (acrocyanosis) may present for a short after birth, even in normal new born.
- Skin may be covered with vernix caseosa is a cheese like, greasy yellowish white substance.
- Lanugo is a slight downy distribution of fine over the body, most evident on the shoulders, bath extremities, forehead and temples.

Posture

The term new born has more subcutaneous fat tissue and rests in a more flexed attitude.

Ear

The mature newborn's ear cartilages are well formed and the hair is more likely to form firm, separate strands.

Sole : The mature new born's sole (feet) is well and deeply creased.

Female genitalia

The mature female new born's labia majora are fully developed and the clitoris is not as prominent.

Male genitalia

The term male new born's scrotum is well developed pendulous, and rugated and the testes are well down in the scrotal sac.

Scarf sign

The mature new born's elbow may be brought to the midline of the chest resisting attempts to bring the elbow past the mid line.

Grasp reflex

The mature new born's grasp is strong, allowing the infant to be lifted up from the mattress.

Heel-to-ear maneuver

This maneuver is not possible in the term infants, since there is considerable resistance at the knee.

7.5.4. Physiological characteristics of healthy neonates

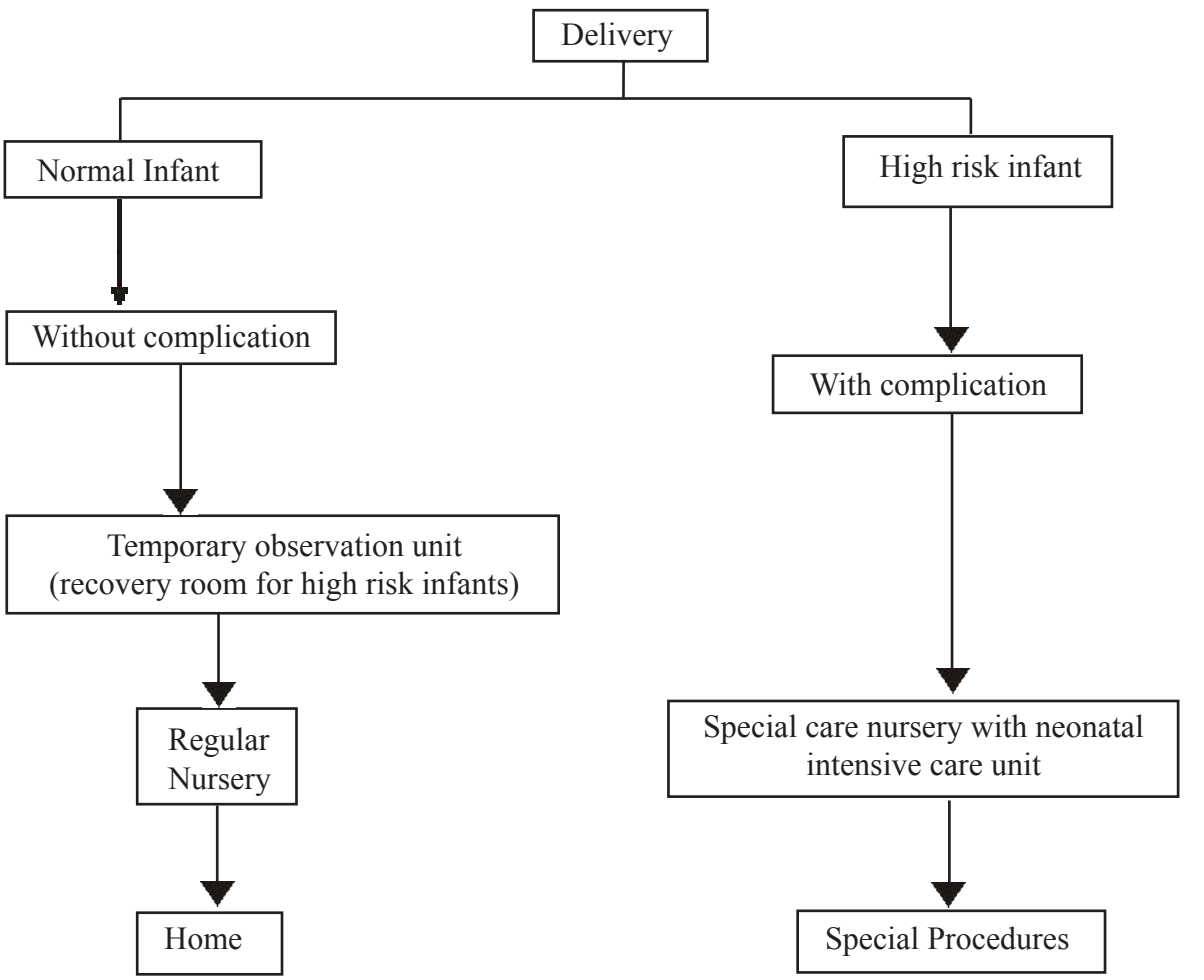
Vital signs

Usual findings	Common variations or minor abnormalities	Potential skins of distress or major abnormalities
Axillary Temperature 36.5 degree – 37.6 degree C (97.9 – 99.7 F)	Crying slightly increasing body temperature Radiant warmer falsely increasing axillary temperature	Hypothermia Hyperthermia
Apical heart rate 120 – 140 beats/min	Crying increasing heart rate Sleeping decreasing heart rate During first period of reactivity (6-8 hours) Rate reaching 180 beats/min	Bradycardia – resting rate < 80 – 100 beats/min Tachycardia – rate > 160-180 beats/min Irregular rhythm

Respirations 30-60 breaths/min	Crying increasing respiratory rate ; sleep decreasing respiratory rate During first period of reactivity (6-8 hours) , rate reaching 80 breaths/min	Tachypnea – rate > 60 breaths/min Apnea – breathing stops for 20 seconds
Oscillometric blood pressure 65/41 mmHg in arm and calf (age 1-2 days mean 50mm Hg)	Crying and activity increasing blood pressure (BP)	Oscillometric systolic pressure in calf 6-9 mmHg less than in upper extremity (possible sing of coarctation of aorta)

7.5.5. Flow chart of optimum newborn care

Nursing care of healthy neonates



- Essential care of the normal health, neonates can be best provided by the mothers under supervision of nursing personnel or basic/primary health care providers. About 80% of the babies require minimal care.

- The first week of life is the most crucial period in the life of an infant. In India 50-60 percent of all infant death occur within the first month of life.
- The problem is more acute in rural area where expert obstetric care is scarce, and the home environmental conditions in which the baby is born are usually unsatisfactory.
- The 100 % hospital (or) institutional delivery is advised.

The objectives of early neonatal care is to

(i) Establishment and maintenance of cardio-respiratory functions

(ii) Maintenance of body temperature

(iii) Avoidance of infection

(iv) Establishment of satisfactory feeding regiment

(v) Early detection and treatment of congenital and acquired disorders, especially infections.

7.5.6. Nursing care of healthy new born baby after birth should be provided as

I. Immediate care of the neonates

II. Daily routine care

I. **Immediate care of the neonates**

Immediate basic care of neonates at birth includes, maintenance of temperature, establishment of open airway, initiation of breathing and maintenance of circulation.

- As majority babies cry at birth and take spontaneous respiration, no resuscitation requires at birth in about 95 to 98 percent neonates.

1. **Clearing the airway**

Establishment and maintenance of cardio-respiratory function (eg. Breathing) is the most important thing the moment the baby is born and everything else is secondary.

- To help establish breathing, the airways should be cleaned of mucus and other secretions. This process can be assisted by gentle suction to remove mucus and amniotic fluid.
- Resuscitation becomes necessary if natural breathing fails to establish within a minute, as in the case of babies who have already been subject to hypoxia during labour.
- Resuscitation may require more active measures such as suction, application of oxygen mask, intubation and assisted respiration.
- All the labour wards should be equipped with resuscitation equipment including oxygen. If the heart has stopped beating for 5 mins. The baby is probably dead.

2. **Apgar Score**

Another significant assessment of the neonates is "Apgar scoring' as described by Dr. Virginia Apgar. Despite its limitations, it is an useful quantitative assessment of neonate's condition at birth, especially for the respiratory, circulatory and neurological status.

APGAR SCORING

Criteria	0	1	2
Respiration	Absent	Slow ; irregular	Good, crying
Heart rate	Absent	Slow (below 100)	More than 100
Muscle tone	Flaccid	Some flexion of extremities	Active body movements
Reflex Response	No response	Grimace	Cry
Skin Colour	Blue pale	Body pink extremities blue	Completely pink

Total score = 10 No depression -7-10

Mild -4-6

Severe depression -0-3

These healthy normal neonates need only warmth, breast feeding, close observation for early detection of problems and protection from infection and injuries. The baby should not be separated from the mother.

Daily routine care of neonates

The major goal of nursing care of the new born infant is to establish and maintain homeostasis.

1. **Warmth**

Warmth is provided by keeping the baby dry and wrapping the baby with adequate clothing in two layers, ensuring head and extremities are well-covered.

Baby should be kept by the side of the mother, so that the mother's body temperature can keep the baby warm.

Baby can be placed in skin to skin contact with mother (Kangarooing) to maintain temperature of infant and facilitate breast feeding.

2. **Care of the umbilical cord**

- The umbilical cord is cut about 2-3 inches from the naval with aseptic precautions during delivery and tied with sterile cotton thread (or) disposable plastic clip.

- The cord must be inspected afterwards for bleeding which commonly occurs due to shrinkage of cord and loosening of ligature.
- No dressing normally it fall off after 5 to 10 days but may take longer especially when infected.

3. **Care of the eyes**

- Eyes should be cleaned at birth and once every day using sterile cotton swabs soaked in sterile water (or) normal saline.
- Application of kajal in the eyes must be avoided to prevent infection (or) lead poisoning.
- The eyes should be observed for redness, sticky discharge (or) excessive tearing for early detection of problems and prompt management.

4. **Skin care**

- The baby must be cleaned off blood mucus and meconium by gently wiping before he/she is presented to the mother.
- No bath, especially dip baths should be given till the umbilical cord has fallen off.
- In summer months, the baby can be sponged using unmedicated soap and clean lukewarm water.
- During hospital stay 'no bath' reduces the incidence of neonatal infections. No vigorous attempts should be made to remove the vernix caseosa, as it provides protection to the delicate skin.
- Each baby should have own separate clothings and articles for care to prevent cross infection.

5. **Breast feeding**

- The baby should be put to the mother's breast within half an hour of birth (or) as soon as possible the mother has recovered from the exertion of labour.
- No pre-lacteal feeds to be given and colostrum feedings must be offered. Educate the mother about breast feeding techniques.

Initially the feeding should be given in short interval of 1 to 2 hours and then every 2-3 hours. Most babies regularize their feeding pattern by the end of first week.

6. **Baby bath**

- Can be given at hospital (or) home following the instruction for bathing
- It should be given using warm water in a warm room gently and quickly
- The baby should be dried swiftly and thoroughly from head to toe and wrapped in a dry warm towel (or) clothing

- Bathing should be avoided in open places. Unnecessary exposure should be avoided during winter months the baby should have sponge bath rather than dip bath to avoid cold stress (or) hypothermia.
- Use of olive oil (or) coconut oil can be allowed after 3 to 4 weeks of age. Oil massage improves circulation and muscle tone.
- Exposure to sun rays is an important source of Vit. D and warmth. The talcum powder can be used for aesthetic purposes and should be applied over the axillal ; groins and buttocks.
- During bathing the baby should be observed for behaviour and presence of any abnormalities (or) infection.

7. **Clothing of the baby**

- The baby should be dressed with looses, soft and cotton cloths. The frock should be open on the front (or) back for easy wearing.
- The large buttons, synthetic frock and plastic (or) nylon napkin should be avoided.
- A triangle of square piece of thick, soft absorbent should be used as napkin.
- The cloths should not be tight specially around the neck (or) abdomen.
- In winter woolen (or) flannel clothings should be used.
- Woolen cloths should not be stored with moth balls, because there is chance of severe jaundice in the baby with G-6-PD deficiency.
- The cloths preserved with moth balls should be exposed to bright sunlight for one (or) two days.
- Baby clothing should always be cleaned with light detergent, that will be washed properly and sun dried to prevent skin irritation.

8. **General care**

- The new born baby should be kept with the mother for continuous mothering in hospital (bedding-in) or in home (rooming-in) in a well ventilated room.
- Baby should be handled with gentle approach after proper hand wash
- No infected person should take care (or) touch the baby.
- Baby should be allowed to sleep in supine position which can prevent sudden infant death syndrome.

9. **Observations**

- The baby should be thoroughly observed twice daily for early detection of any abnormalities

- Temperature, pulses/heart rate, respiration, feeding behaviour, stool, urine, and sleeping pattern should be assessed.
- Mouth, eyes, ears and skin should be looked for any infections.
- Daily routine observation is essential to detect the presence of danger signs for early interventions.

10. **Weight recording**

- The average daily weight gain in healthy term babies is about 30gm/ day in the first month of life.
- It is about 20 gm/day in the second month and 10 gm/day afterwards during the first year of life
- Most infants double their birth weight by 4 to 5 months.
- But in the first week of life there is physiological loss of body weight due to removal of vernis, mucus, blood, passage of meconium and reduction of extra cellular blood volume. Delay and unsatisfactory feeding is also contributing to weight loss.
- With adequate breast feeding, majority of the babies regain the weight within 7 to 10 days of birth.
- The babies with adequate breast feeding should have good sleep and 5 to 6 times urination.

11. **Immunizations**

- In institutional delivery, all neonates should be immunized with BCG vaccine and 'O' dose OPV, hepatitis 'B' vaccine can be administered at birth as first dose.
- Other doses in one month and 6 months of age (Hepatitis – B)
- In outside (or) home delivery the BCG and OPV should be given within first week of life.
- Mother should be informed about the recommended National Immunization Schedule".

12. **Follow-up and advice**

- Each infant should be followed up, atleast once every month for first 3 months and subsequently 3 months interval till one year of age.
- Follow-up is necessary for assessment of growth and development, early detection and management of health problems.
- Health education for prevention of childhood illness.

13. **Harmful traditional practice for the care of neonates**

- A large number of customs and cultural practices are found for mother craft and child rearing some of them are useful, but harmful practices are more in number.

The common harmful traditional practices are

- Not adopting measures for clean delivery at home
- Harmful resuscitation practices
- Use of unclean substance like cowdung mud on umbilical cord.
- Immediate bathing of baby after birth
- Unnecessary use of prelacteal feeds, discarding colostrums, delayed breast feeding and giving water in between breast feeds.
- Neglecting new born female baby emotionally and nutritionally
- Application of kajal in the new born's eyes
- Instillation of oil drops into ears and nostrils during bathing the baby
- Use of unhygienically prepared herbal preparations (ghutti) or gripe water orally.
- Use of pacifiers and introduction of artificial feeding with diluted milk
- Giving opium and brandy to the neonates
- Use of feeding bottles, and ready-made expensive formula feeds.

7.6. BREAST FEEDING

7.6.1. Introduction

The rate of growth of the infants during the first 6 months of life is greater and faster than any other periods of life. Its birth weight is doubled by 5 months and tripled by one year. Keeping this in mind, the baby should be nursed adequately (both quantitatively and qualitatively) which allows easy digestion and absorption. Breast feeding is the elixir to a newborn.

Fig. 7.3 - Breast feeding

Exclusive breastfeeding

"All the babies regardless of the type of delivery should be given early and exclusive breast feeding upto 6 months of age. Exclusive breast feeding means giving nothing orally other than breast milk".

7.6.2. Physiology of lactation

Although lactation starts following delivery, the preparation for effective lactation starts during the pregnancy. The physiological basis of lactation is divided into four phases namely.

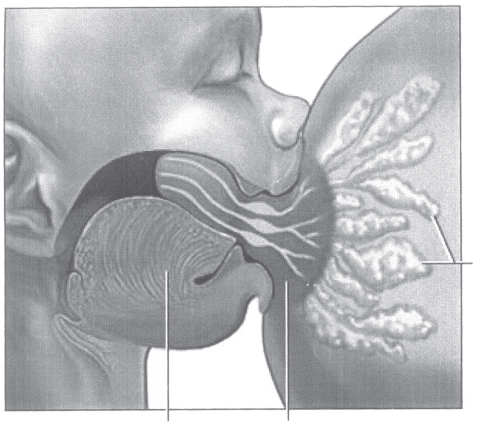


Fig. 7.4 - Physiology Lactation

a. Preparation of breasts (mammogenesis)

b. Synthesis and secretion from breast alveoli (lacto genesis)

c. Ejection of milk (galactokinesis)

d. Maintenance of lactation (galactopoesis)

Mammogenesis

Pregnancy is associated with a remarkable growth of both the ductal and lobular growth of the breast tissue. Hence, the preparation of lactation starts during pregnancy itself.

Lactogenesis

Though some secretory activity is evident during pregnancy, milk secretion actually starts on 3rd/4th postpartum day, due to the effects of steroids-estrogen. Progesterone makes the breast tissues unresponsible to prolactin. When its withdrawn following delivery, prolactin begins its milk secretory activity in previously fully developed mammary glands.

Galactokinesis

Discharge of milk from the mammary glands depends not only on the suction exerted by the baby during sucking but also on the contractile mechanism which expresses the milk form the alveoli into the ducts.

Let down/milk ejection reflex

Ascending suckle impulses from nipple/areola

- Via thoracic sensory nerves
- Para ventricular and supra optic nuclei of hypothalamus
- Synthesize and transport oxytocin to post pituitary
- Oxytocin
- Produces contraction of myo epithelial cells of

Alveoli and the ducts containing milk

- Milk is forced down into ampulla of lactiferous ducts
- Let-down of milk

Presence of infant/infants cry can induce let down reflex without sucking.

Galactopoiesis

For maintenance of effective and continuous lactation, Sucking is essential. Secretion is a continuous proves unless suppressed by congestion (or) emotional disturbances. Milk – production – Milk pressure decreases the rate of production and hence periodic breast feeding is necessary to relieve the pressure which in turn maintains effective lactation.

7.6.3. Initiation of breast feeding

Breast feeding should be initiated within first half an hour of birth (or) as soon as possible and 4 hours caesarean section delivery. Early sucking provides warmth security and colostrum. the baby's first immunization.

7.6.4. Types of breast milk

Colostrum

It is secreted during first 3 days after delivery. It is thick yellow and small in quantities. It contains more anti-booster cells with higher amounts of proteins, fat soluble, vitamin and protective factors for the baby.

Transitional Milk

It follows the colostrums and secretes during first two weeks of postnatal period. It has increased fat and sugar content and protein and immunoglobulin content.

Mature milk

It is secreted usually from 10 to 12 days after delivery. It is watery but contains all nutrients for optimal growth of the baby.

Preterm milk

The breast milk secreted by a mother who has delivered a preterm baby us different from the milk of a mother who has delivered a full term baby. This milk contains more proteins, sodium, iron, immunoglobulin.

Foremilk

It is secreted at the starting of the regular breastfeeding. It is more watery to satisfy the baby's thirst and contains more proteins, sugar, vitamins and minerals.

Hindmilk

It is secreted towards the end of a regular breast feeding and contains more fat and energy. The mother should feed the baby allowing one breast to empty to provide foremilk and hind milk, before offering other breast.

Difference/comparison between breastmilk during 1st month of lactation and unprocessed coco's milk

S.No.	Constituents	Breast milk (gm/L)	Coco's milk (gm/L)
1	Proteins	11	33
	Casein	4	28
	Soluble proteins	7	5
	Lactoalbumin	3.5	to 1.8
	Immunoglobulin	1 to 2	0.5
	Lysozyme	0.5	Traces
2	Non-protein	0.32	0.32
3	Lipids	35	35
	Linoleic acid	3.5	1
4	Carbohydrates	70	50
	Lactose	62	50
	Oligosaccharides	8	0
5	Minerals	2	8
	Calcium	0.33	1
	Phosphorus	0.15	1
	Iron	0.4 to 1.5 mg	0.3 – 0.5 mg
6	Vitamins		
	C	60 mg	20 mg
	D	50 I..U	25 I.U
7	Energy	640-720 kcal	650 kcal
8	Fat (gm/100 ml)	3.4	4.1

7.6.5. Techniques of breast feeding

- Mother should be comfortable and relaxed physically and mentally before giving feed. She should wash her hands and can have a glass of water (or) milk. Mother should have no due work in her works.
- Baby should be cleaned and dried before feeding because baby may feel discomfort (or) may not co-operate during feeding.

7.6.5.1. Positioning during breast feeding

- Sit (or) lie down comfortably with mother's back supported
- Make sure the baby has one arm on either side of the breast as you pull the baby close
- Use firm pillows/folded blankets under the baby to keep the baby supported during the feeding. As the baby gets older, it needs extra-support.
- Support the baby's back and shoulders firmly. Don't push on the back of baby's head
- Once the baby's mouth is open wide, pull the baby quickly onto your breast.

7.6.5.2. Common positions used during breast feeding

Football

- Hold on the baby's back and shoulders in the palm of hand
- Tuck the baby up under the arms, keeping the baby's ear, shoulder and hip in a straight line
- Support the breast. Once the baby's mouth is wide open, pull the baby quickly to you.

Cradling

- Cradle the baby in the arm closest to the breast with the baby's head in the crook of the arm
- Have the baby's body facing you tummy to tummy
- Use opposite hand to support the breast.

Lying down

- Lie on one side with a pillow at your back and lay the baby, so that mother and baby are facing each other.
- To start, prop mother up on her elbow and support the breast with her hand.
- Pull the baby close to mother, lining up the baby's mouth with the nipple.
- Once the baby is feeding well, lie back down. Hold the breast with the mother's opposite hand

Across the Lap

- Lay the baby on firm pillows across the lap
- Turn the baby facing the mother
- Reach across the lap to support the baby's neck and shoulders with the palm of mother's hand

- Support breast from underneath to guide it into baby's mouth.

Latching on

- Hold the breast in one hand with fingers underneath and thumb on top
- Have the hand back from areola
- Line up the baby's lips with mother's nipples
- Touch the lips of baby with the mother's nipple until the baby's mouth opens and tongue is down
- Pull the baby quickly onto the breast
- If nursing hurts first few sucks, take the baby off and start over. Make sure baby's mouth is wide open, covering the whole of the areola, baby's chin touching the breast and establishing eye contact between baby and mother. The lower lip should cover the whole of nipple and areola.
- The mother may hear the swallowing sound doesn't feel pain in the nipple. All these indicates favourable signs of good attachment/latching on.

7.6.5.3. Duration of breast feeding

- Initially breast feeding can be given at 1-2 hours interval and then on 'self-demand by the baby
- Duration of feeding should be continued till the baby is satisfied, usually 20 minutes. One breast should be emptied completely before starting with another breast. Next feeding should be started with opposite breast, (ie) which was fed last in previous feed.

7.6.5.4. Burping

- Burping of the baby is essential to prevent aspiration of milk into trachea. Burping should be done each time after every feed. Put the baby over the mother's shoulder and give a gentle tap on the child's back, till the baby burps (or) for few seconds

7.6.6. Advantages of breastfeeding

Nutritive value

- Breast milk contains all the nutrients in the right proportion which are needed for optimum growth and development of the baby upto 4-6 months.
- It is essential for the brain growth of the infant because it has high % of lactose and galactose which are important components of galactocerebroside.
- It facilitates absorption of calcium, which helps in bony growth
- It contains amino acids like taurine and cystesine which are important as neurotransmitters

- Breast milk fats are polyunsaturated fatty acids which are necessary for myelination of nervous system
- It has vitamins, minerals, electrolytes and water in the right proportion for infant
- Breast milk composition of calories, fat, proteins, minerals and vitamins are ideal for an infant.

Digestibility

Breast milk is easily digestible. The protein of breast milk are mostly lactoalbumin and lactogobulin which form a soft curds that is easy to digest. Diarrhoea is prevented in breast fed infants through breast feeding.

Protective value

Ø Breast milk contains IgA, IgM, macrophages, lymphocytes, bifidus factors, unsaturated lactoferrin, lysozyme, compement and interferon. Thus breast fed baby are less likely to develop infections like GI & Respiratory infections.

Ø It also provides protection against malaria and various viral and bacterial infections like skin infections, septicemia.

Ø Breastfeeding protects the infant from allergy, bronchial asthama. It also protects against tetany, neonatal hypocalcemia, deficiencies of Vit E and Zinc.

Ø EBM has less chance of developing malnutrition, hypertension, diabetes mellitus, coronary artery disease, ulverative colitis, childhood lymphoma, etc.

Psychological benefits

Ø Breast feeding promotes close physical and emotional bondage with the mother by frequent skin to skin contact, attention and interaction. It stimulates psychomotor and social development

Ø It leads to better parent child bonding fewer behavioral disorder

Ø It promotes development of higher intelligence and feeling of security in infant

Maternal Benefits

Ø Breast feeding reduces the chance of postpartum haemorrhage and helps in better uterine involution. Lactational amenorrhea helps in promotion of recovery of ironstores

Ø It can protect from pregnancy for first 6 months, if exclusive breast feeding is carried out.

Ø It reduces the risk of breast and ovarian cancer of mother

Ø It improves slimming of mother by consuming extra fat which accumulated during pregnancy

Ø It is more convenient, time saving and economical for the mother

Ø Mother can provide fresh, pure, ready-made clean uncontaminated milk to her baby at right temperature without any preparations.

Family and community benefits

Ø Breast feeding is economical in terms of saving of money , time and energy

Ø Family has to spend less on milk, health care and illness

Ø Community expenditure on health care and contraceptive are reduced.

7.6.7. Contra-indications of breastfeeding

True	Real
• Galactosemia • Phenylketonuria	Maternal conditions like > Radiotherapy > Ergot therapy > Anti-metabolites therapy > Lithium therapy

Maternal illness should not result in interruption of breast feeding.

7.6.8. Don'ts of breastfeeding

Prelactecal feeds like gold rubbed in water, honey, sugar water, distilled water should be avoided. This will decrease the vigour to suck and may lead to diarrhoea and helminthic infestation.

7.6.9. BFHI [Baby friendly hospital initiative]

It is a joint of WHO and United Nations Children Fund to encourage, promote and support breast feeding as the model for optimum infant's nutrition.

Breast feeding among working mothers (Expressed breast milk)

Ø Mother should express her milk manually in a clean, wide mouthed container, and this milk should be fed to her baby by the caretaker, in the absence of the mother.

Ø Expressed breast milk can be stored at room temperature for 8 hours and in refrigerator for 24 hours.

Ø Expressed breast milk can be given with paladai/spoon and cup

Thus, breastfeeding is the first immunization and a boom for the growing child. With all such goodness of breastfeeding, one should always encourage, promote and support breast feeding.

7.7. IMMUNIZATION

Immunization against vaccine preventable diseases is essential to reduce the child mortality, morbidity and handicapped conditions. It is mass means of protecting large number of people of various diseases

7.7.1. Definition of immunization

"Immunization is the process of protecting an individual from a disease through introduction of live/killed/attenuated organisms in the individual system".

7.7.2. Vaccine Preventable diseases

a) **Six-killer vaccine preventable diseases**

- Ø Poliomyelitis
- Ø Tuberculosis
- Ø Diptheria
- Ø Pertussis
- Ø Tetanus
- Ø Measles

b) **Other vaccine preventable diseases**

- Ø Hepatitis – B
- Ø Rubella
- Ø Typhoid
- Ø Influenza
- Ø Chicken Pox
- Ø Yellow fever
- Ø Plague, rabies.
- Ø Mumps
- Ø Hemophilus Influenza Type B (hpb)
- Ø Meningococcal Meningitis
- Ø Pneumococcal Pneumonia
- Ø Rota virus diarrhea
- Ø Cholera, malaria

7.7.3. National immunization schedule

Ø Immunization schedule should be planned according to the needs of the community. It should be relevant with existing community health problems.

Ø The WHO launched global immunization program in 1974 known as Expanded Program on Immunization (EPI) to protect all children of world against 6-killer diseases.

Ø The EPI is now renamed as Universal Child Immunization, as per declaration of UNICEF. In India, it is called as Universal Immunization Program (UIP) and was launched in 1985, November, for the universal coverage of eligible population.

Fig. 7.5

RECOMMENDED UNIVERSAL IMMUNIZATION SCHEDULE
(Followed in India)

S.No.	Age	Preventable disease	Vaccination
1	At birth	Hepatitis – B Polio Tuberculosis	Hep-B – I OPV -) dose BCG
2	Birth to 6 weeks	Tuberculosis	BCG
3	4-6 weeks	Hepatitis – B	Hep.B-II
4	6 weeks	Diptheria Pertusis Tetanus Polio	 DPT-I OPV-I
5	10 weeks	Diptheria Pertusis Tetanus Polio Hepatitis - B	 DPT – II OPV – II Hep.B-III
6	14 weeks	Diptheria Pertusis Tetanus Polio Hepatitis-B	 DPT – III OPV – III Hep.B - Booster
7	9 months	Measles Polio	Measles – I OPV - IV
8	16-24 months	Diptheria Pertusis Tetanus Polio	DTP-booster OPV booster
9	5-6 years	Diptheria Tetanus	DT booster
10	10-16 years	Tetanus	
	<u>Pregnant Women</u>		
	Early in Pregnancy	Tetanus	TT – Ist dose
	One month after	Tetanus	TT – IInd dose

General considerations

Ø Immunization may be started at any age if an immunization program is not begun in infancy, a slightly different schedule may be followed depending on child's age.

Ø An interrupted primary series of immunization need not be restarted. It need only be continued after consultation with the physician.

Ø The immune response is limited in a significant proportion of young infants and the recommended booster doses are designed to ensure and maintain immunity.

7.7.4. The Cold Chain

The cold chain system is necessary, because vaccine failure may occur due to store and transport under strict temperature controls.

Definition : The cold chain is a system of storage and transport of vaccines at low temperature from the manufacturer to the actual vaccination site.

The cold chain equipment : The cold chain equipment consists of the following

a) Walk in cold rooms (WIC) : They are located at regional level meant to store vaccines upto 3 months and serve 4-5 districts.

b) Deep freezers : Is a top opening CCE and available as 300L/140L. Big deep freezers is supplied to all districts and the WIC locations alongwith ILR. Small deep freezers are supplied to PHCs, urban family planning centers and post partum centers.

Deep freezers are used for making ice packs and for storing polio and measles vaccine.

c) Ice line Refrigerator : Is a top opening refrigerator. Two types of ILR (ie.) Ice tubes (Electrolux) and with icepacks (vestofrost) – as the lining. The bottom of the ILR is the coldest part.

All vaccines at PHC level are stored in the ILR. DPT, DT, TT and diluents are kept ion the basket provided with the ILR. These vaccines should not be kept on the floor of the ILR as they may get denatured. A dial thermometer should be kept in the ILR and temperature recorded twice a day. Defrosting should be done at regular intervals.

Do's

- Keep the equipment in cool room away from direct sunlight and 10 cms away from the wall.
- Keep the equipment leveled
- Fix the equipment through voltage stabilizer
- Keep vaccines neatly with spacefor air condition
- Keep the equipment locked and open only when necessary

Dont's

- Do not keep any objects on these equipment
- Do not store any other drug,water /food item
- Do not keep > 1 months requirement at PHC level

- Do not keep date expired vaccines.

d) Cold boxes : Are supplied to all peripheral centres. These are used for transportation of vaccines and to store vaccines during failure of electrical supply. Before the vaccines are placed in the cb, fully frozen ice packs are placed at the bottom and sides. The vaccines are first kept in cartons or polythene bags. The vials of DPT, TT, DT and diluents should not be placed in direct contact with the frozen ice packs.

e) Vaccine carriers : Are used to carry small quantities of vaccines (16-20 vials) for the out of reach session for fully frozen ice packs are used for lining the sides and the carriers should be closed tightly.

f) Day carriers : Are used to carry 6-8 vials of vaccine to a nearby session. Two fully frozen packs are to be used. It is used only for few hours.

g) Ice packs : The ice packs contain water and no salt should be added to it.water should be filled upto the level marked on the side

For successful cold chain system, cold chain equipment, transportation system and motivation and training of the workers for maintenance of cold chain link are essential.

Polio stored at – 120 degree Celsius

Vaccines stored in freezer – Polio, measles

Vaccine cold compartment - DPT, DT, TT, diluents, typhoid, BCG.

7.8. FEEDING OF INFANTS AND CHILDREN

7.8.1. Feeding of infants (0-1 year)

Upto 6 months, all the babies should be put on exclusive breast feeding (giving only breast milk by mouth)

After 6 months, due to the increasing body demands of the infant, there is a mismatch between the nutrients supplied by the breast milk to the infant to that of the increasing body demands of infants. Hence, complementary feeding should be started after 6 months of age.

7.8.1. Complementary feeding

Meaning : It's a gradual addition of solid foods to the infant's diet according to individual infant's capacity and gradual diminution of breast/artificial feeding in frequency and quantity.

Importance of complementary feeding

Ø This is the time where breast-feeding become inadequate to meet the child nutritional needs particularly in relation to iron and Vit. C.

Ø Enzymes necessary to digest the complex structure of solid foods are developed.

Ø Biting is an accomplishment that becomes possible at about 6 months of age

Ø It is a good chance for the child to learn independency by using cup and spoon to feed himself.

Ø To accustom the infant to chew and swallow solid food.

7.8.2. Principles of Complementary feeding

Ø Start weaning when child is free from any GI troubles.

Ø One food item is introduced at intervals of 4-7 days to allow for identification of food allergies and to allow the child to get used to it.

Ø New foods are fed in small amounts, from one teaspoon to a few tablespoon

Ø Food should not be mixed in bottle and feed through nipple with a large hole.

7.8.3. Feeding of toddler (1 - 3 years)

The toddler age group needs 1200 calories/day. The primary aim in dietary management is these children is to

Ø Accustom to chopped food Ø Remove all strained food from the diet.

The basic food remains the same. The only difference is the consistency of each food and size of serving is governed by the child's activity, rate of growth, body structure and the food habits that he begins to initiate.

7.8.4. Feeding of Preschool Child (3-6 years)

Needs 1500-1600 calories/day. The basic food for preschool continues as the main stay in the diet. Children of this age-group need and enjoy serving to them in shapes and sizes. They can pick up and examine (eg.) – Raw carrot, straws.

7.8.5. Feeding of School-child (6-12 years)

Needs 2000-2500 calories/day. The basic food continues to be the same although the size of serving must be increased.

Ø Offer new food when the baby is hungry

Ø Never force the infant to take the new food.

7.8.6. Methods of Complementary feeding

Start with a teaspoon daily and gradually increase both the quantity given and number of times, it is fed to the baby.

S.No.	Age	Food items to be given
1	4-6 months	- dhal soup - orange juice/fruit juice - green leafy vegetable soup - ragi porridge - banana
2	6-9 months	- idli - mashed rice with dhal - vegetable soup - egg yolk/fish - mashed carrot/potato - biscuits/kichidi/kesari
3	9-12 months	- chicken/liver -chappati/idli/idiyappam - bread/rice/dhal/egg (Family pot feeding)

Things to remember while feeding young children

- Ø Serve in very small amounts, encourage to ask for 2nd helping
- Ø Serve attractively
- Ø Give older children some freedom to choose food and to eat in his own way
- Ø Don't allow drinking all milk first
- Ø Don't with-hold food for punishment
- Ø Don't hurry the child
- Ø Spices have no nutritional value and hence its use is to be limited
- Ø Give praise at the end of the meal.

7.9. MINOR DISORDERS OF NEW BORN

Stuffy nose : Stuffy nose leads to mouth breathing and excessive air swallowing which inturn lead to abdominal distention and vomiting. Cleaning the nostrils with cotton swabs soaked with normal saline will reduce the problem.

Sticky eyes : Sticky eyes may be due to chemical irritants or bacterial staphylococcus infection. This problem can be managed by the use of erythromycin 0.5% ointment every 6 hours for 7-10 days.

Skin Rashes : A transient rash is also called erythema neonatorum. The lesions may appear suddenly anywhere on the body. Although the appearance is alarming, the rash has no clinical significance and requires no treatment.Mastitis Neonatarum

Swelling of the breast tissue is caused by hyperestrogenism of pregnancy. This condition has no clinical significance, requires no treatment and subsides as maternal hormones are eliminated within few days.

Thrush : Thrush may be oral or in the napkin area including buttocks and inner thighs. Treatment is 1% GV paint or Nystatin suspension applied with cotton swabs 3-4 times a day.

Phimosis : Pinpoint prepuce which makes the baby cry during micturition. It requires dilatation by mosquito forceps.

Mongolian Spots : Bluish black areas of pigmentation more commonly noted on the back and buttocks. They fade gradually over months or years.

Nevi : Telengiectatic Nevi are pink and easily blanched. They may appear on the upper eyelids, the nose, the upper lip and nape of the neck. They have no clinical significance and fade by second year of life.

Vaginal bleeding : Pseudomenstruation or vaginal bleeding is caused by pregnancy hormones. It resolves when maternal hormones deplete from neonates body. Reassure the parents.

Physiologic jaundice : 40% of term neonates and 60% of preterm neonates develop physiologic jaundice. Jaundice becomes visible on 2nd-3rd day, usually peaking between the 2nd and 4th day and decreasing between 5th and 7th days of life. It is believed to be the result of increased bilirubin production from the breakdown of fetal RBCSs. Treatment is not necessary, but some children may need phototherapy.

Summary

- Ø Growth refers to an increase in physical size of the whole (or) any of its parts
- Ø Development refers to a progressive increase in skill and capacity to function
- Ø Factors that affect growth and development are genetic, nutrition, socioeconomic, environmental, chronic disease, growth potentials, prenatal and intrauterine and emotional.
- Ø Stages of childhood can be broadly described into 4 stages namely – Neonatal and Infancy (0-28 days – neonate) ,(28 days to 1 yr infant) respectively ; early childhood (1-6 yrs.), middle childhood (6-12 yrs.) and late childhood (12-19 yrs.).
- Ø Period from birth to 28 days of life is called neonatal period and the care provided to a new born is termed as new born care.
- Ø It includes immediate care of newborn and daily routine care
- Ø Daily routine care includes warmth, breast feeding, skin care, care of umbilical cord, baby bath, care of eyes, clothing the baby, growth monitoring, immunization and follow-up advice.
- Ø Immunization is the process of protecting an individual from a disease through introduction of live/killed/alternated organism in the individual system.
- Ø Types of acquired immunity are active and passive.
- Ø Expanded program on immunization is renamed as universal immunization program in India.
- Ø All the babies regardless of the type of delivery should be given early and exclusive breastfeeding upto 6 months of age.
- Ø Baby must be put to breast within half an hour after normal delivery
- Ø Colostrum is secreted in first 2-4 days after delivery which is high in immune globulins and nutrients which is utmost essesssntial to new born.
- Ø Numerous advantages of breast feeding are there for both baby and the mother
- Ø BFHI – Baby friendly hospital initiative is an organization to encourage, promote and support breast feeding.
- Ø After 4-6 months due to increasing body demands of infants, complementary feeding should be started
- Ø Complementary feeding is a gradual addition of solid foods to infant's diet and gradual diminution of breast (or) artificial feeding.
- Ø For the toddlers, family pot feeding is given. Only difference is consistency of each food.
- Ø Pre-schoolers need and enjoy serving to them in shapes and sizes.
- Ø For schoolers, the size of the serving should be increased.
- Ø Major childhood diseases are low birth weight, malnutrition, infections and parasitosis, accidents and poisoning, behavioural problems.
- Ø Health programmes, has been launched by the central government for the control/ eradication of communicable diseases, improvement of environmental sanitation, raising the standards of nutrition, control of population and improving rural health.

QUESTIONS

I. **Multiple choice questions**

1. Birth to 28 days of life in a child is called
   a. Neonate b. Infant c. Toddler d. Adolescent
2. Which immunity is produced by stimulating immunological defense mechanism by administration of antigen
   a. Passive b. Active c. Herd d. None of the above
3. Six killer vaccine preventable diseases include everything of the following, except
   a. Polio b. Tuberculosis c. Measles d. Typhoid
4. Upto how many months of age, exclusive breast feeding should be given
   a. 1 month b. 6 months c. 8 months d. 2 months
5. How many calories/day, does school children need
   a. 2000-2500 kcal/day b. 1000-1500 kcal/day
   c. 2000-2250 kcal/day d. 900-1500 kcal/day
6. Midday meal programme was started since
   a. 1961 b. 1986 c. 1950 d. 1956.
7. Most of the infant double their birth weight by
   a. 4 to 5 months b. 3-4 months c. 6-8 months d. 8-10 months
8. The baby is said lowbirth weight neonate when the birth weight is
   a. < 3.0 kgs b. <2.7 kgs c. <2.5 kgs d. <2 kgs
9. Measles vaccine should be given at
   a. 3 months b. 5 months c. at birth d. 9 months
10. Which month the infant crawls
    a. 4 months b. 5 months c. 11 months d. 8 months.
11. In the National Programme for control of blindness, administration of a single massive dose of
    a. Vit. D b. Vit. C c. Vit. B d. Vit. A
12. Maximum APGAR SCORE is
    a. 8 b. 15 c. 11 d. 10
13. Maintenance of lactation is called
    a. galactopoeisis b. galactokinesis c. lactogenesis d. mammogenesis
14. Bluish black areas of pigmentation more commonly noted on the back and buttocks of the newborn
    a. Nevi b. Thrush c. Mongolian spots d. Skin rashes
15. Colostrum is secreted during first how many days after delivery
    a. 2-4 days b. 6-7 days c. 1-3 days d. 4-5 days.

II. Fill in the blanks

1. _____ refers to progressive increase in skill and capacity to function.
2. Later childhood comprises of _____ age group
3. Babies born before _____ are called as preterm babies
4. National family welfare program has been renamed in 1997 as the _____
5. IMNCI is abbreviated as _____
6. ICDS programme was initiated by the government of India in Ministry of social and women's welfare in the year _____
7. ORS is abbreviated as _____
8. A slight downy distribution of fine hair over the body of newborn is called _____
9. Average daily weight gain in health term babies is about _____
10. A system of storage and transport of vaccines at low temperature is _____

III. Short answer

1. Write briefly on the stages of childhood
2. Chart out the universal immunization schedule followed in India
3. Midday meal programme
4. List out the advantages of breastfeeding
5. Feeding of infants and childrens – discuss briefly
6. Analyse the factors influencing growth and development

IV. Write briefly

1. Discuss elaborately on the care of newborn
2. Enlist the minor disorders in newborn and their management
3. Enlist the major childhood diseases and discuss briefly on each of them

V. Write in detail

1. List down the various child health programs and discuss elaborately on ICDS programme
2. Explain about pulse polio immunization.

8. GERITARIC CARE

In the twentieth century most nations experienced a tremendous rise in their populations despite wars, famines, floods and other natural and man-made disasters. The main reasons for population explosion are : the unprecedented socio-economic growth in most societies, discovery of potent antibiotics and vaccines, and better public health practices. People now not only survive the early-life mortality but also live long into ripe old age. The rise in number in the segment of older people (aged 60 years or more) in the population has been much more than of any other segment.

Fig. 8.1

Nurses and health professionals, therefore, have to be aware of the complexity of the care of older people.

Ø Health care needs of the elderly are different from those of other age groups.

Ø The goal of health interventions among older people is more likely to care than cure. Consequently, restoration of functions and improvement of quality of life gets priority over eradication of disease.

8.1. AGEING PROCESS

Ageing is the progressive and generalized impairment of functions resulting in the loss of adaptive response to stress and in increasing the risk of age related diseases. The overall effect of these alterations is an increase in the probability of dying, which is evident from the rise in age-specific death rates.

8.1.1. Some Important Mechanisms of Ageing:

Ø Biological Process:

- Genes determines the life-span, genes may have a role to play in the ageing process.
- Wear and tear of important organs by continuous functioning.
- Accumulation of toxic materials, (eg. Cholesterol) and products of metabolic process (eg. Amyloid) in vital organ like heart, brain, etc. and thereby damaging them.
- Loss of important genetic material during DNA repairs.
- Exhaustion of production and deficiency of important hormones, eg. Growth hormone, androgen, estrogen and thyroid hormones.
- Accumulation of stress over lifetime with its resultant effects.
- Long exposure to environmental toxins and hazards.

8.2. EVOLUTIONARY BASIS OF AGEING

Ageing is also being linked to the evolutionary process. Survival after the reproductive age or period is not beneficial to the propagation of species because it leads to over crowding and competition for resources for survival.

8.2.1. Psycho-Social Aspects of Ageing : Several changes also take place in the attitude, behavior, thinking and mental state of the older person. Older people are expected to give up their place to the younger generations. There is a tendency to make older people feel unproductive, dependent and unwanted.

Hospital base studies have identified the following diseases as the most common diagnoses among older patients:

- Ø Hypertension
- Ø Cataract
- Ø Osteoarthritis
- Ø Chronic Obstructive pulmonary disease
- Ø Ischemic heart disease
- Ø Diabetes
- Ø Benign prostatic hypertrophy
- Ø Upper and lower gastro-intestinal dysmotility, dyspepsia and Constipation
- Ø Depression.

The common causes of death among older people are the following:

- Ø Bronchitis and pneumonia
- Ø Ischemic heart disease
- Ø Stroke
- Ø Cancer
- Ø Tuberculosis

8.2.2. Health Risks in Older People have Been Identified

- Ø Malnutrition (over nutrition and under nutrition)
- Ø Inadequate consumption of fibres and fruits.
- Ø Physical inactivity and sedentary life style.
- Ø Smoking
- Ø Excessive alcohol consumption
- Ø Adverse drug reaction.
- Ø Accidents and injuries.

Over Nutrition : Causes obesity and is associated with hypertension, IHD and diabetes, which are among the commonest health problems in old age.

Under-Nutrition : Is equally harmful which can lead to frailty, physical dependence and premature death apart from impairment of the immune system, increased risk of infection and poor wound-healing.

Several Socio-Psychological : Factors also affect food intake, eg. economic condition, food beliefs (hot and cold foods) religious beliefs, social beliefs, care-giver neglect and abuse, depressions and loneliness.

Common Nutritional Deficiencies : Include total calories, iron, fibre, folic acid, Vitamin C and Calcium, Zinc and Vitamin A.

Exercise : Ageing causes a progressive decline in power, strength and endurance of the skeletal and cardiac musculature. Sedentary life style and lack of physical activity accelerate this decline and are responsible for higher risk of morbidity and mortality.

Tobacco Smoking: Cigarette smoking is the cause of many fatal diseases in older people. Smoking is responsible for:

Ø Most respiratory problems in the elderly

Ø Cancers of lungs and the gastro-intestinal tract

Ø Ischaemic heart disease

Ø Stroke.

Ø **Alcohol:** intake in excess increases the potential for diseases such as cardiomyopathy, cirrhosis of the liver, atrophic gastritis, chronic pancreatitis, peripheral neuropathy and dementia, falls and accidents, malnutrition, immune suppressions and social isolation.

Ø Alcohol increases the effects of analgesics and central nervous system depressants such as sedatives, tricyclic anti-depressants, anxiolytics and benzodiazepines.

Ø Several features of alcohol abuse such as memory loss, poor balance, frequent falls and ill health may be ignored as consequences of ageing.

Ø Treatment of chronic alcoholism is difficult and requires specialized effort by a multi disciplinary team through hospitalization. Nutritional support, treatment of withdrawal symptoms, psychiatric support and group therapy are some of the measures which should be part of the management of chronic alcoholism.

Ø The nurse must educate the patient and guide them in de-addiction.

8.2.3. Prevention of Accidents

Accidents are associated with: pain and trauma of injury, loss of function, prolonged immobility and its complications, fear of future accident and self imposed isolation and loss of independence.

Ø Most accidents in old age are in some way ot the other related to normal age related changes in the sensory system and the musculoskeletal system. These changes include:

- Degeneration of sense organs – vision, hearing, pain, touch, temperature.
- Decline in body balance.
- Defective stance and gait
- Poor muscle strength and co-ordination

Ø In addition, several other factors increase the probability of falls and accidents in elderly subjects. They are:

- Dementia
- Confusion
- Chronic illness
- Use of medications for heart diseases
- Emotional stress.

Fig. 8.2

The nurse needs to identify the risk factors for accidents and environmental hazards for an older person and intervene by simple and innovative measures. These include:

- Use of walking aids
- Use of visual aids
- Use of flat shoes
- Proper flooring inside the home and the immediate outside environment.

8.2.4. Prevention of Adverse Drug Reaction

Ø Common drugs which produce adverse reactions are: Antibiotics, anti-arhythmic drugs, digoxin, diuretics, anti-inflammatory drugs, sedatives, anti-depressants, antihypertensives, anti-coagulants and psychotrophic drugs.

Ø Common adverse drug reactions are : Confusion, delirium, postural hypotension, falls, anxiety, depression, sleep disturbances, constipation, urinary incontinence and urinaty retention.

Ø Interventions to reduce adverse drug reactions are:

Ø Frequent review of medication

Ø Instructions about possible side effects

Ø Minimizing the number of drugs used

Ø Use of medicines which do not have major side effects.

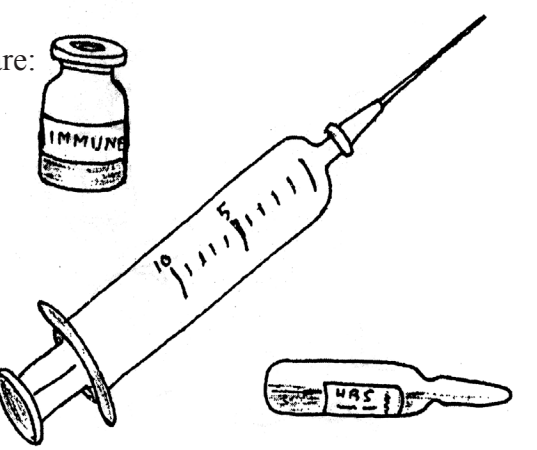


Fig. 8.3

Immunization : Specific immunization against the following three agents have been recommended in old age : Pneumococcus, Influenza virus and Tetanus.

▪ Pneumococcal vaccine should be administered only once while the influenza vaccine is recommended every year.

8.2.5. Mental health

Stresses of old age:

- Common situational stresses in older people include:
- Widowhood and the death of other significant relatives.
- Stress of caring for an aged and diseased spouse or relatives.
- Fear of death, financial difficulties and loss of independence.
- Social isolation and loneliness
- Ageism and age discrimination
- The emotional response to these problems include: Grief, guilt, loneliness, loss of meaning in life and lack of motivation, anxiety, anger, feelings of powerlessness and depression.

Psychiatric Diseases of Old Age:

Physical illnesses increase the vulnerability to mental health illness:

- Ø Depression
- Ø Late-life delusional disorders
- Ø Personality disorders
- Ø Alcoholism
- Ø Cognitive impairment and dementia.
- Ø Anxiety disorders
- Ø Obsessive compulsive disorders
- Ø Self neglect
- Ø Drug and substance abuse

Depression

- Ø Usual symptoms are somatic complaints, sleep disturbances and agitation. Other symptoms include anorexia, thoughts of death, impaired concentration and dysphoria.
- Ø The aetiology of depression in old age includes genetic susceptibility, chronic disease and disability, pain, frustration with limitation in activities of daily living, personality trait, adverse life events and lack of social support.
- Ø Depression destroys the enjoyment of living and interferes with the quality of life.
- Ø Depressive patients with cognitive impairment have a poorer prognosis.
- Ø There is a great need for family and patient education with regard to the nature of the disease, treatment, prognosis and the risk of suicide.
- Ø With treatment, about one-third of the patients get better, one-third remain the same, and one-third get worse.

8.2.6. Sensory System

Skin : Age-related changes: The thickness of epidermis decreases along with loss of moisture making the skin dry and rough. The melanocyte number declines, which reduces protection against sunrays and leads to appearance of small hypopigmented spots.

- Ø In the dermis the fibroblast number and the production of extra cellular matrix decreases causing wrinkling of the skin

- Ø Scalp hair turns grey due to loss of melanin, there is loss of hair on the scalp.
- Ø Growth of nails slows down.

8.2.7. Common Disease Conditions:

- Ø Infections: are herpes zoster, scabies and pyoderma.
- Ø Pruritus : as a result of dryness or systemic disease.
- Ø Xerosis : dry and rough skin as a result of ageing.
- Ø Drug reaction.

8.2.7.1. Eye-Lids : become lax, the lid margins rotate away from the eyeball causing disruption of flow of tear. Lacrimal gland secretion is reduced and eyes become dry.

- Ø Subconjunctival vessels become fragile and give rise to subconjunctival haemorrhage
- Ø Lens becomes rigid and there is loss of accommodation (presbyopia) .
- Ø Denaturation of lens protein leads to the formation of cataract.
- Ø Defective colour vision i.e. red, orange, and yellow seen better than blue, green and purple.

Common diseases

- Ø Cataract is the commonest cause of visual impairment in old age.
- Ø Cataract is characterized by painless blurring, gradual loss of vision, increased sensitivity to glare and general darkening of vision.

Sign and symptoms include : (1) frequent changes in eye glasses, (2) needing brighter light to read (3) poor night vision and (4) fading or yellowing of colours.

Treatment : Surgery > after the removal of the lens, which has now been replaced by the implantation of an Intra-ocular lens which restores hear normal focusing ability.

Glaucoma : is a condition in which there is an increased intro-ocular pressure due to a defect in the outflow of aqueous humour. Left untreated, glaucoma can lead to blindness.

Open-angle or chronic glaucoma in which there is loss of peripheral vision late in the disease. Vision loss usually begins with deteriorating side vision, also known as “tunnel vision”. The diagnosis is made by measuring intra-ocular pressure using specialized equipment.

Narrow-angle glaucoma occurs when drainage angle of the eye, extreme pain, headaches, nausea, vomiting and blurred vision.

Macular Degeneration:

- Ø Age-related macular degeneration is a common cause of impaired vision and rarely complete blindness
- Ø Exudative form of macular degenerations is characterized by capillary leakage and sub-retinal haemorrhage. Laser photo-coagulation has been considered useful.
- Ø Atrophic form of macular degeneration involves degeneration of retinal pigment epithelium and capillaries, resulting in the dys functioning of photoreceptors. There is no treatment for this condition.

Diabetic retinopathy: Is one of the commonest complications of diabetes mellitus. Development of diabetic retinopathy depends on the duration of disease and control of diabetes.

Ø The primary goal of management is prevention of retinopathy in the first place through proper blood sugar control.

Ø Regular monitoring for retinopathy is the single more important steps in its management

Ø Prognosis of diabetic retinopathy has improved tremendously in recent years with regular monitoring and laser photocoagulation.

8.2.7.2. Ears: With ageing, structural changes take place in the sense organ of hearing which include a decrease in the number of hair cells and ganglion cells. Blood supply to cochlea decrease. There is also a decline in the number of sensory nerve fibres from the sense organ.

Hearing loss can also interfere with socialization as making an effort to listen becomes to embarassing, with eventual avoidance of participation in talking and hearing.

The following behavior suggests hearing loss associated with ageing.

- The older person tends to shout and others tend to speak very loudly to him/her.
- The older person often requests to have things repeated.
- The older person becomes suspicious that things are being said about him.

Often a hearing aid can be helpful. Older person and the family know how to i) insert the appliance ii) turn it on and off properly iii) know the battery type and where to get more iv) know how to test and replace the batteries.

While communicating with the older person speaking slowly, facing the person with lower pitch of voice, can be more useful than raising the voice and only creating more high frequency sounds, which are heard with difficulty. Avoiding background environmental noise.

Ear wax is frequently a cause of, or at least aggravates, hearing difficulties therefore, this should be the first thing to be checked. Cleaning the ear is usually preceded by insertion of wax-dissolving drops to loosen the cerumen.

8.2.7.3. Taste and Smell :

Ø Taste receptors are located primarily in the taste buds of the tongue. With ageing, the number of taste buds diminishes and the remaining buds have a higher threshold for stimulation to activate them. It is uncertain whether taste declines enough with age to interfere with the enjoyment of eating. It takes more flavour or spice to stimulate taste buds.

Ø Receptors for smell are located in the lining of nasal passages and the number of nerve fibres decreases with age.

Ø Interfere with the ability of smell and taste to protect the elderly from harm. For eg., if older persons cannot smell smoke they may be unaware of a fibre hazard

Ø Most interventions for the age related decline in taste and smell involve education of the older person and the family about the changes in these senses and the possible dangers to safety which may be associated with them.

8.3. TYPES OF ELDERLY CARE SERVICES

8.3.1. Health promotion and disease prevention services:

- Ø Health education (exercise, nutrition)
- Ø Screening of general health (Blood pressure, Blood sugar, cholesterol, vision)
- Ø Screening for cancer of the uterine cervix
- Ø Specific health promotion programme (smoking cessation, immunization) .

8.3.2.Curative:

- Ø Early diagnosis and treatment of day to day ill- health in Primary Health Centre
- Ø Diagnosis and treatment of serious health problems in District hospitals, general hospitals and tertiary care institutions.
- Ø Chronic care in long-term-care institutions and/or home/health care programmes.

8.3.3.Rehabilitative:

- Ø Physiotherapy
- Ø Restorative surgery
- Ø Prosthesis
- Ø Occupational therapy
- Ø Long-term care for cognitive impairment

8.3.4.Mental health services:

- Ø Counseling services for retirement, relocation, widowhood and bereavement
- Ø Drug and substance abuse
- Ø Ambulatory treatment for mental diseases.

8.3.5. Counselling the older patient:

The elderly people are more vulnerable and prone to a variety of problems that are generally multi-dimensional.

- Ø Some of the problems for which elderly people may seek the help of a counselor are:
- Ø Fear of diminished competency at work
- Ø Anxiety about retirement
- Ø Awareness of ageing
- Ø Physical illness and dependence on others
- Ø Fear of a decrease in sexual potency
- Ø Loneliness
- Ø Bereavement
- Ø Fear of increasing disability and dependence

- Ø Vocational/occupational counseling
- Ø Perceived loss of control

8.4. HEALTH EDUCATION FOR THE ELDERLY PERSONS

- Ø Human biology: The older subject and his or her family should be informed about the biological changes in the structure and function of the body as a result of ageing. Informed about the difference between age-related changes and the pathological states.
- Ø Family health: Information regarding different patterns of human growth and development
- Ø Hygiene : Personal hygiene as well as environmental hygiene.

8.4.1. Education on personal hygiene: should include information on bathing, clothing, toilet, washing of hands before eating, care of the feet, nails and teeth, prevention of indiscriminate spitting, coughing and sneezing and inculcation of clean habits.

8.4.2. Education on environmental hygiene : should include information maintaining a clean home, the need for fresh air and light, ventilation, hygienic storage, disposal of waste, sanitation, disposal of excreta food sanitation, vector control etc.

- Ø Control of communicable and non-communicable diseases.

84.3.Mental health: Cognitive and affective disorders are extremely common in older subjects. Older people need to be educated about adjusting to their changed role in the family and the community as a result of old age and retirement. In addition, education regarding dementia, depression, anxiety and bereavement needs also to be provided.

8.4.4. Prevention of accidents: Older people should be made aware that they are especially vulnerable to accidents and their complications because of their physical decline and higher risk of fractures and life threatening injuries. Simple measures and tips followed in daily activities can drastically reduce the risk of accidents.

8.4.5. Nutrition: the nurse must guide older people and their families to understand, the principles of a balanced diet, the nutritive value of food, getting the value for money spent on food and its storage, preparation, cooling, etc. In addition, older people need to know about the food that improves their bowel movement, protects them against disease and improves their health.

8.4.6. Exercise: Regular physical exercise has proven value in health promotion, which include:

- Ø Greater survival
- Ø Protection against cardio-vascular disease
- Ø Weight reduction
- Ø Control of high blood sugar in diabetes
- Ø Improvement of muscle strength and functional capacity
- Ø Improvement in psychological well-being

Ø Physical exercise should be carried out at a frequency of 3 to 5 days per week, between 20 to 60 minutes per session, to achieve the maximum heart rate.

Ø Physical exercise in old age is limited by diseases such as obesity, IHD, chronic obstructive lung disease, stroke and arthritis, which reduce exercise tolerance

Ø Several types of physical exercises are available. The older person should choose the one which is enjoyable, easy to perform, brisk walking and stretching exercise seem to be the best for older individuals.

8.4.7. Yoga : Has been accepted as one of the most ideal forms of exercise with several health benefits. Yoga must be learnt and practiced under supervision.

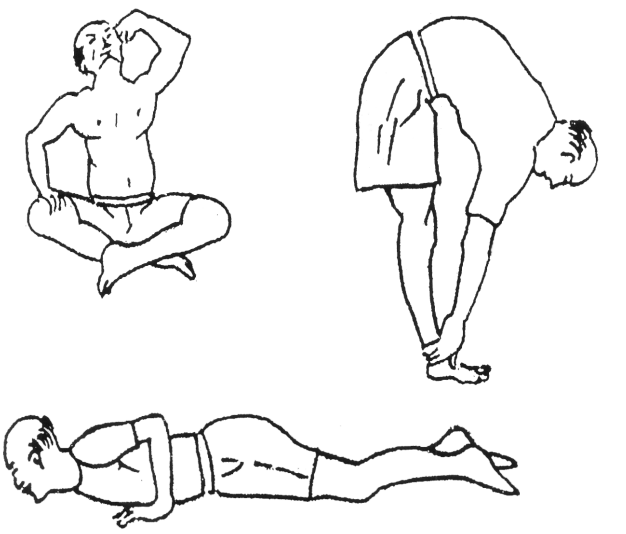


Fig. 8.4

Healthy life style:

Ø Exercise strengthens muscles around the bones. Regular brisk walking will help keep your bones healthy. It also improves your balance and co-ordination and prevent falls.

Ø Alcohol and tobacco are harmful to bones and must be avoided

Ø Excess intake of tea and coffee and cola drinks are also bad for bones, hence should be avoided

8.4.8. Use of health services : older people need to be educated to use the health services available in the community to the maximum extent. There are various barriers to the use of health services which include : acceptance of disease and disability in old age as natural a fatalistic attitude, poverty, ignorance and self-neglect. The nurse needs to identify them and intervene to remove these barriers. They must also be encouraged to participate in national health programmes designed to promote health in old age and prevent diseases.

8.4.9. Healthy eating : There is a guide to the foods you should try to eat each day:

Ø Milk and other dairy foods : Choose three servings of milk or milk products per day

Ø Meat, poultry, fish, cheese, eggs, beans, pulses and nuts : these foods are good sources of protein. Eat a portion of any of two at your meals each day.

Ø Fruit: try to eat atleast one piece of fresh fruit every day.

Vegetables: These are the main source of fibre and give your food variety. Aim to have atleast three servings of vegetables everyday.

Butter and cooking fats: provide us with energy and can make food taste better, but use them sparingly if you are watching your weight as they are high in calories. Use a small amount of vegetable oil such as sunflower.

Biscuits and sweets : these foods are enjoyable, but they can lead to weight gain.

Drinks: Atleast six to eight tumblers of tea, coffee, fruit juice, milk and water should be taken daily

Healthy bones: Diet rich with calcium and Vitamin D.

Adequate intake of calcium and vitamin D is essential to maintain bone health, particularly as you grow older. The rich sources of calcium and vitamin are (1) milk and milk products beans, spinach, nuts and dried fruits. Older people can consume calcium tablets available in the market. 500mg for men and 1000mg for women.

8.4.10. Good sleep:

- Ø Follow a regular schedule of going to sleep and getting up at the same time each day
- Ø Moderate physical activity 2 to 4 hours before bedtime improve your sleep
- Ø Avoid drinking tea or coffee late in the evening and if you like a drink before bed, a glass of warm milk may help
- Ø The sleeping room should be dark, well-ventilated and quiet.

8.4.11.Taking care of your oral cavity:

Healthy oral cavity is a sign of good health and good personality. An important part of good oral health care is knowing how to brush properly. Careful daily brushing removes plague which routinely forms on the teeth. Dry mouth which makes you feel thirst or feel the need to sip liquids frequently is common in many adults. Dry mouth is usually caused by salivary glands failing to function properly. This is a side effect of many medications and can accompany certain physical problems. Dry mouth can affect oral health, by contributing to tooth decay and gum disease. To relieve the dryness, drink extra water and avoid sugar snacks, drinks containing caffeine, tobacco and alcohol which can increase dryness of the mouth.

If you have false teeth, you should keep them clean and free from food deposits that can cause permanent staining, bad breath and gum irritation. Once a day, brush all surfaces of the dentures with a denture care product. Remove your dentures from your mouth and place them in water or a denture-cleansing liquid while you sleep. It is also helpful to rinse your mouth with a warn salt-water solution in the morning, after meals and at bed time.

8.4.12. Foot care:

Foot problems are common in old age which usually result from long years of wear and tear, ill-fitting shoes, poor circulation to the feet, untrimmed toe-nails and sometimes diseases. Exposure to cold temperatures, pressure on the feet form shoes, long periods of sitting or resting and smoking can reduce blood flow to the feet. On the other hand, elevating the feet, standing up and stretching, walking and other forms of exercise promote good circulation. Gentle massage and warm foot baths can also help increase blood flow to the feet.

Wearing comfortable well fitting shoes can prevent many foot ailments. Thick soles lessen pressure on the feet when walking on hard surfaces. Wearing of high heels should be avoided. Dry skin sometimes results in itching and burning of feet. Dryness can be helped by applying a lotion to the legs and feet every day and by using mild soaps. Corns and calluses are caused by friction and pressure from bony areas rubbing against shoes and can be painful. Curative treatment for corns is surgery.

Warts are skin growths caused by viruses. Surgery or burning it off with chemicals is usually helpful.

Spurs are bony growths developing on the bones of the foot as a result of prolonged standing, having improperly fitting shoes or being overweight. Treatments for spurs include proper foot support, heel pads, heel cups, drug infections, and occasionally surgery.

Diabetics are particularly prone to sores and infections on their feet. To keep their feet clean and dry, to inspect it regularly, for any injury or infection and to avoid stepping on sharp objects or surfaces.

8.4.13. Cognitive impairment and stroke:

Cognitive impairment: of old age can be 'benign senescent forgetfulness or age-associated memory impairment' or 'dementia'.

Age associated memory impairment:

- Ø Onset after 50 years of age
- Ø Gradual onset of memory dysfunction, substantiated by psychometric evidence
- Ø Intact global intellectual function
- Ø Absence of dementia
- Ø Absence of any neurological, medical or psychiatric disease or use of drugs.

8.4.14. Dementia : On the other hand, is a clinical syndrome characterised by persistent impairment of multiple cognitive capacities, which include impaired memory disturbance of language function and a variety of behavioral problems.

Several pathological conditions causes dementia. Alzheimer's disease and vascular dementia are most common among them. Other causes include: Parkinson's disease, alcohol, hypo-thyroidism, subdural hematoma and head injury.

The clinical course of Alzheimer's disease and other dementias passes slowly but steadily through three phases : first phase of loss of higher mental function, second phase of focal neurological deficit and third phase of global neurological dysfunction. Dementia in general is associated with reduced survival.

Clinical manifestations of dementia:

Cognitive problems in dementia	Behavioral problems
Ø Memory loss	Ø Agitation
Ø Poor concentration	Ø Personality change
Ø Visuospatial difficulties	Ø Abnormal eating behavior
Ø Non-specific focal cortical damage	Ø Wandering
Ø Speech and language defect	Ø Mood disorder
Ø Focal neurological deficit	Ø Anxiety, phobias, fear
Ø Loss of language	Ø Restlessness
Ø Inability to recognize self and others	Ø Delusions
Ø Seizures	Ø Hallucinations, illusion
Ø Disturbances of muscle rigidity and gait	Ø Shouting, rage, violence
Ø Bladder and bowel incontinence	Ø Dysinhibition
Ø Total confinement to bed	Ø Compulsive behavior

Clinical diagnosis of dementia involves a two-step process:

(1) Diagnosis of dementia and its differentiation from ageing, other psychiatric illness, delirium and amnestic syndromes.

(2) Determination of the possible causes of cognitive decline.

Dementia patients usually do not have a sudden onset and neurological signs of focal damage (hemiparesis, visual field defects, sensory loss) early in the course of the disease.

Vascular dementia is usually due to ischaemia of the brain due to atherosclerosis, repeated small strokes or a few major strokes.

The treatment modalities for Alzheimer disease are (1) alzhiemer's disease are (i) symptomatic (choline esterase inhibitors) and (ii) disease-modifying.

Care of the demented patient:

Ø Protection from harm

Ø Maintenance of independence in daily activities as long as possible

Ø Improvement in communication

Ø Prevention and reduction of occurrence of difficult behavior

Ø Provision of support to family care-givers.

The most common behavior problems in demented persons include:

Ø Resisting care

Ø Screaming

Ø Repeating things over and over

Ø Striking out physically

Ø Inappropriate sexual behavior

Ø Taking clothes off in inappropriate places or undressing throughout the day

Ø Hoarding things

Ø Smearing faecal matters.

Approaches in reducing violent behavior may include the following:

Ø Making a routine for daily care to improve predictability

Ø Determining the ideal time of day for doing needed things

Ø Trying not to surprise the person by any action

Ø Avoiding argument and physical restraining

Ø Diverting the person's attention

Ø Engaging the older person in recreational activities which use the whole body

Ø The patient and any visitor to the patient should be referred to by name

Ø Re-orientation to time, place and person

Ø The family needs a great deal of emotional support in taking care of a relative with dementia.

8.5. Stroke : Is the commonest neurological problem in old age in terms of frequency, urgency and hospital admissions.

Ø Stroke is defined as rapidly developing clinical signs of focal or global disturbance of cerebral function with symptoms lasting 24 hours or longer or leading to death with no apparent cause other than of vascular origin.

8.5.1. Clinical manifestations:

Strokes can be either occlusive or haemorrhagic:

Ø Occlusive/ischaemic strokes account for 65% of all strokes and can be due to thrombosis or embolism involving large vessels and small vessel occlusion (lacunar stroke) . Thrombotic strokes are the commonest of all varieties resulting from atherosclerosis of cerebral blood vessels. Embolic strokes usually have the cardiac structural and/or rhythm abnormalities as the main source of embolism.

Ø Haemorrhagic strokes account for 35% of all strokes and can be due to the rupture of micro-aneurysm and intra-cerebral blood vessels. Haemorrhagic stroke is nearly always associated with hypertension.

8.5.2 Risk factors:

Ø Increasing age

Ø Family history

Ø Obesity and hyper-cholesterolemia

Ø Smoking

Ø Lack of exercise

Ø Heart failure

Ø Atrial fibrillation

Ø Diabetes mellitus

Ø Anti-coagulant therapy

8.5.3. Management of stroke involves:

Ø Medical intervention to minimize impairment

Ø Prevention and treatment of acute complications

Ø Nursing interventions, nutrition, skin care, positioning to avoid aspiration, bladder and bowel care

Ø Rehabilitation to minimize disability

Ø Adaptation to minimize handicaps.

Ø Prevention of stroke in patients

Ø Modification of risk factors : hypertension, smoking, cholesterol

Ø Drug therapy with anti-platelet agents and anti-coagulants

The patient as well as the family requires support in terms of education, training and counseling. Community and domicillary rehabilitative services are essential for stroke patients living in communities.

8.5.4.Rehabilitation:

- Ø Stroke rehabilitation is a multi disciplinary activity which focuses on problem solving education about the disability in order to reduce the handicap
- Ø The basic principles of stroke rehabilitation are documentation of the impairment and handicaps, and minimization of dependency
- Ø Training in activities of daily living
- Ø Avoidance of spascity

8.6. Common cardio-vascular problems:

- Ø Hypertension: a large number of the elderly hypertensive have isolated elevation of systolic blood pressure, which greatly enhances cardio vascular risk.
- Ø Treatment of hypertension in old age produces major benefits and reduces the incidence of stroke, ischaemic heart disease and heart failure.
- Ø Treatment should begin with life style modification, salt restriction and weight loss
- Ø Pharmacological interventions can include Beta – blocker (atenelol) and diuretics alone or in combination. Calcium channel blockers and ACE inhibitors have been found to be more useful in hypertension with their extra effect on coronary events.
- Ø Drug dosage in old age should be half the standard dose for younger patients
- Ø The side-effects of anti-hypertensive drugs in older patients are more frequent and severe. The adverse effects include orthostatic fall of blood pressure. Drugs that produce orthostatic hypotension should be avoided.

8.6.1. Ischemic heart disease:

- Ø Risk factors of IHD in old age more or less remain the same, which include hypertension, smoking, dyslipedemia and obesity. In addition, oestrogen deficiency of post menopausal state and poor physical activity are other important risk factors specific to old age.

IHD medical management : Short and long acting nitrates, ●-adrenergic blockers and calcium channel antagonists which are useful drugs, though development of tolerance to nitrates is a frequent problem.

- Ø Coronary angioplasty is an excellent option for older subjects who continue to have symptoms despite medical management
- Ø Acute myocardial infarction in old age may be missed due to the absence of pain. Dysponea and fatigue may be the only manifestations. Thrombolytic therapy in old age is limited by the present of several contra-indications and is associated with higher rates of mortality and complications.

8.6.2. Congestive cardiac failure:

- Ø Hypertension, diabetes mellitus, coronary artery disease and vascular heart disease are the well recognized causes of cardiac failure in old age.

- Ø In addition, a substantial number of patients without these risk factors also develop cardiac failure due to an increase in myocardial volume and stiffness due to accumulation of fat, fibrous tissue, lipofusion and amyloid. Both the systolic and diastolic functions of the myocardium, more so the diastolic function of the heart is impaired, leading to a clinically manifest cardiac failure.
- Ø In the absence of agreed and objective criteria, the diagnosis of cardiac failure may be difficult in old age
- Ø Breathlessness on exertion and fluid overload are classical features of cardiac failure. In older patients, due to lack of much physical effort, especially in a bed ridden patient, dysponea may be absent, and fatigue, weakness and tiredness may be the only symptoms. On the other hand, fluid overload may be present in the absence of cardiac failure due to prolonged immobility, hypoproteinemia and venous insufficiency.

Treatment: the management of chronic cardiac failure is dieretic therapy. Start with a low dose of frusemide 20mg to be increased slowly upto 160mg in the absence of response. Renal function and electrolyte status should be regularly monitored.

- Ø Digoxin is a very useful drug in cardiac failure in older patients
- Ø Ace inhibitors have multiple benefits in cardiac failure, including survival benefit
- Ø Vaso dilators have been used in older patients with cardiac failure with mixed results
- **Ø Treatment :** resistant cardiac failure in old age can be due to poor compliance, use of NSAIDs, simultaneous use of ● – adrenergic blockers, calcium channel antagonists, persistent or frequent arrhythmias, infection and unsuspected value lesions.

8.7. Common respiratory problems:

- Ø Pneumonia: The decrease inciliary function and cough reflex, along with changes in the immune system, make the older person more susceptible to pneumonia.

Pneumonia happen as the terminal event in patients with other serious or chronic diseases such as cerebro-vascular accidents, degenerative neuro-muscular disease, dementia, congestive cardiac failure and malignancies.

Despite advances in the treatment of pneumonia with antibiotics in intensive care, nearly one third of hospitalized elderly patients die of it.

The signs of inflammation like fever, tachycardia and leucocytosis may be absent. Same form of ill health in present in most patients, the chronic obstructive airways disease being the commonest. These differences attain significance if the individual is living alone as the disease may progress without the patient seeking medical care.

The progression and resolution of pneumonia is also slower in old age with a prolonged stay in hospital. The bad prognostic factors for pneumonia are lack of fever, systolic hypotension, incontinence and hypoxia.

The initial antibiotic treatment should include an oral beta-lactam and a macrolide antibiotic for ambulatory patients. For hospitalized patients antibiotics should be administered parenterally and reviewed every 48 to 72 hours.

Most organisms require treatment for about one to two weeks with 3-6 days of parenteral antibiotic therapy.

The presence of any of the risk factors that increase the risk of death is an indication for hospitalization. These risk factors are: age over 65 years, presence of co-existing illnesses (COPD, diabetes, chronic renal failure, heart failure, liver disease, dementia) presence of tachypnoea, hypotension, high fever, extra-pulmonary complications, decreased level of consciousness, leucopenia, hypoxia, need for mechanical ventilation, multilobar involvement and uremia.

8.7.1. Bronchial asthma: Is often confused with the more prevalent chronic obstructive pulmonary disease (COPD) in old age, though it remains a distinct entity.

Ø Older patients are often present with intermittent cough, sneezing and breathlessness. These features are often confused with COPD and left ventricular failure, which are also common in old age.

Ø Acute asthma should be managed with high flow oxygen and nebulised B-agonists (Salbutamol) and ipratropium. Patients who do not respond to this treatment warrant intravenous aminophylline. Patients with rising carbondioxide levels and impending exhaustion may need mechanical ventilation, which is difficult to wean off.

Ø Chronic bronchial asthma is usually managed with metered dose inhales of B – agonists (salbutamol or terbutaline) steroid (budesonide) and ipratropium. Chronic severe bronchial asthma required oral corticosteriods with its accompanying adverse effects

8.7.2. Chronic obstructive pulmonary disease:

Ø Smoking is the commonest cause of COPD.

Ø The clinical course of COPD includes smoker's cough to start with, which goes to become chronic bronchitis, and with a fall in the forced expiratory volume (FEV) below 60% breathlessness sets in.

Ø Symptoms of hypoxia, which include fatigue malaise and weight loss and sleep disturbances are other common symptoms.

Ø Signs include hyperinflated chest, wheezing polycythaemia and cyanosis, and edema and raised jugular venous pressure (JVP) in the presence of right heart failure.

Ø Clinical features : and chest x-ray are diagnostic which can be confirmed by the obstructive pattern in pulmonary function testing.

Ø Treatment of COPD involves relief of airway obstruction by:

Ø Bronchodilators – oral or inhaled ● – agonists (Salbutamol, terbutaline) and inhaled anticholinergic.

Ø Steroid inhalers

Ø Sustained release oral theophylline

Ø Long-term home oxygen therapy is recommended in patients with persistent hypoxia for a minimum of 16 hours per day

- Ø Pulmonary rehabilitation improves exercise tolerance and include:
- Ø Aerobic exercise for exercise retraining
- Ø Resistive respiratory muscle exercise
- Ø Maintaining physical activity
- Ø COPD is a strong indication for influenza and pneumococcal vaccination
- Ø Acute exacerbation of COPD : is the commonest cause of hospitalization of COPD patients. Upper or lower respiratory tract infection is the usual cause of acute exacerbation. It causes severe hypoxia and can lead to death.
- Ø Treatment involves antibiotics, bronchodilators by nebulization and oxygen inhalation by mask steroids have no role.
- Ø Patients not responding to this therapy and developing severe hypoxia may require mechanical ventilation for which age is not a contraindication.

8.8. Common disorders of the GI tract:

- Ø Hiatus hernia and gastro-esophageal reflux are the most common problems of upper GI tract in an old age. Their prevalence increases after the age of 50 and may be present in as many as 2/3rd of the people over 60- years, the condition being more common in women.
- Ø Symptoms include heart burn, dysphagia, pain in the region of lower sternum, belching, reflux of food and vomiting
- Ø Interventions to correct the situation include:
- Ø Weight loss if the person is obese
- Ø A diet of small frequent feedings of boland but nutritious food
- Ø Avoid coffee, tea and colas
- Ø Reduce the amount of saturated fat
- Ø Sleeping in a semi-upright position using 2-3 pillows
- Ø Taking antacids for relief of heart burns, skimmed milk can also help.

8.8.1. Cancers of the gastrointestinal tract:

- Ø Cancers of the gastrointestinal tract increase with age. Cancer of the colon is more common in men
- Ø Symptoms include change in bowel habits, new onset of constipation or diarrhoea, decreased size of stool, blood in stool loss of appetite, wasting, weight loss, weakness, and dull pain radiating to the back which can be relieved by bending
- Ø Colorectal examinations are recommended for screening of cancer. Digital rectal examination and checking of stool for occult blood should be part of routine health checks for older people
- Ø The incidence of cancer of the oral cavity, esophagus and stomach also increases with age

- Ø Oral screening for sores and other signs of cancer should be done, especially among persons who are at high risk from smoking, chewing tobacco and drinking alcohol or especially hot beverages regularly.

8.8.2. Constipation

- Ø Older persons frequently complain of constipation and often actually have more constipation than younger persons.
- Ø Diet deficient in fibres and poor fluid intake are most important causes of constipation in old age. Other causes of constipation are :
- Ø Drugs: Diuretics, anti cholinergics, opiates and antidepressants
- Ø Mental health problems : Depression and Dementia
- Ø Laxative abuse
- Ø Inadequate fibre (fruits and vegetables) in diet
- Ø Chronic debilitating disease and functional disability
- Ø Lack of physical exercise
- Ø Long term complications of constipation are faecal impaction, megacolon, coronary infection and incontinence and confusional state
- Ø Impacted stool that needs to be removed manually which is unpleasant, embarrassing and can cause rectal bleeding
- Ø Use of laxatives and purgatives are very common in old age. A right mix of life style changes and laxatives can relieve constipation in old age.

8.9. Common endocrine problems:

8.9.1. Diabetes mellitus:

- Ø A majority of the elderly diabetics have non-insulin dependent diabetes though insulin dependent diabetics are also now living in ripe old age with better management
- Ø A fasting venous blood glucose of 120 mg % or more and a level of 180 mg % after two hours of 75 gm of oral glucose indicate a definitive diagnosis of diabetes.
- Ø Older diabetics with vascular and neurological complications of diabetes burden the hospital services 2-3 times more than the general non-diabetic population
- Ø Diabetes is also associated with a higher risk of Dementia
- Ø The aims of managing diabetes in the elderly are:
- Ø To relieve symptoms of hyperglycemia, prevent undesirable weight loss or weight gain and avoid hypoglycemia and other adverse drug reactions
- Ø To assess the impact of co-existing hypertension and IHD
- Ø To screen and prevent complications
- Ø To minimize disability, maintain well being and quality of life.
- Ø Various common problems faced during the management of diabetes are:

- Ø Irregular oral intake (confusion, poor appetite, concurrent illness)
- Ø Recurrent infections (UTI, LRTI, Skin)
- Ø Leg ulcers, bed sores
- Ø Increased vulnerability to hypoglycemia
- Ø Concurrent systemic disease
- Ø Difficulty in communication

Control of blood sugar can be achieved by:

- Ø Adequate diet (calorie and composition)
- Ø Physical exercise
- Ø Oral hypoglycaemic drugs in NIDDM and Insulin in IDDM.
- Ø Insulin is indicated in NIDDM for proper control despite oral hypoglycaemic drugs in the presence of infection, Ketosis, hyperosmolar state, surgery and diabetic neuropathy.
- Ø The nurse needs to educate the diabetic patient about : the need to follow a planned diet, insulin injection, symptoms of hypoglycaemia, care of the feet, regular eye check-up and blood pressure monitoring.

8.10.Osteoarthritis: It is a degenerative disease of the joints.

- Ø It is characterized by a loss of and change in the composition of cartilage, leading to failure of normal responses to stress. Consequently, the cartilage breaks down and the bone is exposed. Ultimately a clinical syndrome of pain and disability is established.
- Ø Osteoarthritis usually affects the weight bearing joints such as knees, hips, lower spine, cervical spine and fingers. The onset is usually gradual.
- Ø Being a degenerative disease, the treatment of osteoarthritis is limited to symptomatic relief with analgesics and physiotherapy. Replacement of hip and knee are very useful but not affordable by most older people.
- Ø Osteoporosis : is a systemic disease characterized by low bone mass and mirco-architectural deterioration of the skeleton, leading to enhanced bone fragility and increased risk of fracture.
- Ø Risk factors : the primary risk factors are increasing age, heredity and oestrogen status. Other risk factors which can cause osteoporosis are:
- Ø Premature and surgical menopause
- Ø Heavy tobacco and caffeine use
- Ø Alcoholism
- Ø Inadequate dietary calcium and vitamin D intake
- Ø Sedentary life style
- Ø Drugs : costicosteroid and anti-epileptic drugs

Ø The most common fractures to occur are that of the wrist, the hip and the vertebra. A significant collapse of one vertebral body usually leads to severer pain. In addition to repeated pain, numerous crush fractures result in loss of height and often in marked kyphosis which may lead to cardio-pulmonary embarrassment and severely reduced exercise tolerance and disability.

Management of osteoporosis:

Various drugs used in the treatment and prevention of osteoporosis are: oestrogen, bisphosphonates, calcium, calcitonin, fluoride, parathyroid hormone, vitamin D and anabolic steroids.

Ø Primary prevention of osteoporosis involves:

Ø Taking diet rich in calcium and vitamin D

Ø Avoiding tobacco, alcohol and excess of tea and coffee

Ø Brisk physical exercise

Ø Hormone replacement therapy for post menopausal women.

8.11. Benign prostatic hypertrophy

Ø Enlargement of the periurethral position of the prostate leads to the obstruction of urinary outflow which begins with features of prostatic hyperplasic and ends up with urinary obstruction.

Ø Diagnosis is usually done by rectal digital examination and ultra sound examination of the bladder and the prostate. Urodynamic studies help in the therapeutic decision-making.

Ø Till recently, surgery, initially abdominal and later transurethral was the only mode of therapy for prostatic hypertrophy.

Ø Medical management with specific long acting adrenergic antagonists and a reductase inhibitors have been used with excellent results.

8.12. Urinary incontinence :

Either acute or chronic:

Ø Acute or sudden incontinence can be due to urinary tract infections, vaginal infections, faecal impaction, medications use, confusion and systemic sepsis. Acute incontinence resolves as soon as the underlying cause is treated.

Ø Chronic urinary incontinence can be:

- Stress incontinence : loss of urine during coughing, sneezing, laughing or other physical activity that increases abdominal pressure.
- Urge incontinence : loss of urine associated with an abrupt and strong desire to void.
- Overflow incontinence : Loss of urine associated with over-distension of the bladder. Most symptoms can be minimized by behavioral techniques and adaptation to the environment.
- Stress incontinence is usually managed by improving the strength of pelvic musculature.

- Urge incontinence is managed by anti-cholinergic drugs and pelvic muscle exercise.
- Overflow incontinence is associated with full bladder and required intervention for the primary disease.

In the presence of irreversible conditions such as neurogenic bladder, catheterization may be required.

- In addition, the patient needs to be educated with several behavioral interventions such as:
- Bladder retraining by regular voiding at 2 hour interval even if there is no urge.
- Limiting of fluid intake to daytime
- Using some form of protection because leakage
- Wearing loose clothing so that changing clothes is easier
- Avoiding strenuous exercise
- Limiting the use of dietary irritants : caffeine, carbonated drinks
- Practising relaxation techniques
- Maintaining good skin care and good hygiene
- Monitoring for urinary tract infection.

SUMMARY

- **Ø** **A**geing is the progressive and generalized impairment of functions resulting in the loss of adaptive response to stress and in increasing the risk of age related disease
- Ø Biological factors are wear and tear accumulation of toxic materials and products of metabolic process in vital organs.
- Ø Psychosocially several changes takes place in the attitude ,behavior ,thinking and mental state of the older person.
- Ø Common diseases among elderly are hypertension cataract, osteoarthritis ,COPD, IHD, Diabetes mellitus ,Benign Prostate Hypertrophy, Depression, etc
- Ø The major health risks in older people are malnutrition, lack of physical activity ,sedentary life style., smoking, alcoholism, and adverse drug reaction.
- Ø The major psychiatric diseases of old age are depression, anxiety disorders, personality disorders, alcoholism and cognitive impairment and dementia.
- Ø Depresssive patients with cognitive impairment have a poor prognosis.
- Ø Age related changes in the skin are decrease in the thickness of epidermis the melanocyte number declines and reduces the protection against sunrays.
- Ø The common diseases are herpes zoster, scabies, pyoderma pruitus, and xerosis.
- Ø Denaturation of lens protein leads to the formation of cataract.
- Ø Macular degeneration, Diabetic retinopathy are the other diseases.

- Ø Hearing loss interferes with the ability of smell and taste is also common among elderly.
- Ø Health promotion and disease prevention services are health education, screening of general health and any form of cancer.
- Ø Curative services are early diagnosis treatment in primary health care centers , District Hospitals, General Hospitals and tertiary care institutions.
- Ø Rehabilitative services are physiotherapy restorative surgery, prosthesis, occupational therapy and long-term care for cognitive impairment.
- Ø Health education on personal hygiene, environmental hygiene ,mental health, prevention of accidents, nutrition, exercises and yoga.
- Ø Age associated memory impairment starts gradually after 50 years of age.
- Ø Stroke is the commonest neurological problem in old age.
- Ø The common cardio vascular problems are ischemic heart disease, congestive cardiac failure, and coronary artery diseases.
- Ø Common respiratory problems are pneumonia, bronchial asthma and chronic obstructive pulmonary disease.
- Ø Common disorders of the G.I. tract are constipation and cancer.
- Ø Common endocrine problems are diabetes mellitus.
- Ø Other diseases are osteoarthritis osteoporosis, benign prostate hypertrophy and urinary incontinence.

QUESTIONS

I. Choose the correct answer

1. Psychiatric disease of old age
   a) Depression b) Anxiety disorders
   c) Personality disorder d) All of the above.
2. Cognitive problems in Dementia
   a) Memory loss b) Agitation c) Wandering d) Mood disorder
3. Drugs used in the treatment and prevention of osteoporosis
   a) Calcium b) Oestrogen c) Vitamin D d) All of the above.
4. Common diseases of old age
   a) Hypertension b) Cataract c) Osteoarthiritis d) All of the above
5. Cigrette smoking is the cause for
   a) Ischemic Heart Disease b) Depression
   c) Infections d) Xerosis

II. Fill in the blanks

1) Blood sugar is controlled by _____.
2) Common mental health problem among older people is _____.
3) Short and long acting nitrates are useful in _____.
4) Adequate intake of_____ and_____ are necessary for maintaining the health of the bone.
5) Commonest cause for visual impairment among older people is _____.

III. Short Answer

1) What are the health risk in elderly people?
2) Write the adverse effects of smoking?
3) What is Glaucoma?
4) How to manage Acute Asthma?
5) What are the causes for constipation?

IV. Write briefly

1) What is stroke? And management of Stroke?
2) Common respiratory problems among Geriatric?

V. Explain in detail

1) Describe the role of nurse in geriatric care?
2) Describe the geriatric problems?

9. EMERGENCY MANAGEMENT

Disasters are not confined to a particular part of the world. They can occur anywhere and anytime. Major emergencies and disasters have occurred throughout history and as the world's population grows and resources become more limited, communities are increasingly becoming vulnerable to the hazards that cause disaster. There are many types of disasters such as earthquakes, cyclones, floods, tidal waves, land slides, volcanic eruptions, tornadoes, fires, hurricanes, snowstorms, severe air pollution (smog), heat waves, famines, epidemics, building collapse, toxicologic accidents (e.g.) release of hazardous substances, nuclear accidents and warfare etc. The relative number of injuries and deaths differ depending on number of factors such as the type of disaster, the density and distribution of the population, condition of the environment, degree of preparedness and opportunity of the warning. There are three fundamental aspects of disaster management, "Disaster response", "Disaster preparedness" and "Disaster mitigation".

Disaster: Disaster is defined as "any catastrophic situation in which the normal pattern of life or eco system has been disrupted and extra ordinary emergency interventions are required to save and preserve human lives and/or the environment".

Hazard: Rare or extreme event in the natural or man-made environment that adversely affects human life, property or activity to the extent of causing disaster.

Phenomenon: Phenomenon that poses threat(s) to people, structure or economic asset that may cause a disaster either

- Human introduces (or) • Naturally occurring in the environment

Types of disasters:

Natural disaster can be subdivided:

1. **Meteorological disaster**
    a. Storms (Cyclones, lai storms, hurricane, tornadoes, typhoons, snowstorms) Cold spells, heat waves, droughts
    b. Topological disaster – land slides, floods.
    c. Telluric and Tectonic disasters – earthquake, volcanic eruption

Fig. 9.1 - Storms, hurricanes and tornadoes

2. **Man-made disasters**
    a. Civic disturbances – riots & demonstrations
    b. Warfare – conventional and non conventional
    c. Refugees
    d. Accidents
3. **Other types of disasters**

a. Those based on deterioration
    i. Declining health
    ii. Environmental degradation
    iii. Social services

b. Those based on failing of industrialized society
    i. Technological failures
    ii. Oil spillage, factory explosions
    iii. Fires
    iv. Gas leakage
    v. Transport collision

Types of disaster can be divided by cause, predictability and extent of damage

1. **According to cause/occurrence**
    a. Natural caused by forces of nature (e.g.) earthquake, typhoons, volcanic eruptions
    b. Man made – caused by errors of man (e.g.) war, civil strife or other conflicts
    c. Technological – air crashes, pollution, nuclear accidents, explosions
2. **According to predictability**
    a. Sudden onset – no warning issued
    b. Slow onset – disasters that come with warnings(e.g.) typhoons, volcanic eruptions.
3. **According to extent of damage**
    a. Large scale – effects not solely limited to the impact area
    b. Small scale – effects are localized, limited only to the impact area

Phases of disaster

1. **Warning Phase :** With aid of satellite and network of weather station, bodies such as world metrological organization can now predict many meteorological disasters well enough in advance in order to take adequate precautions. This phase is called warning phase.

2. **Period of impacts :** This is the period when the disaster actually strikes and when very little is done to lessen the effect or aid the survivors.

3. **Rescue phase :** The rescue phase starts immediately after the impact and continues until organization and authority have been restored to the affected community.
4. **Relief Phase :** Professional teams of relief workers start to evaluate the damage, assess the most urgent needs and prepare an operational plan.

Loss of crops and live stock

Effect on normal activities both commercial and social

Psychological effects

Economic effects

Short term effects of major disaster

Effect	Earth Quakes	High winds without flooding	Tidal waves flash floods	Slow onset floods	Land slides
Death	**Many**	**Few**	**Many**	**Few**	**Many**
Severe injuries requiring extensive treatment	Many	Moderate	Few	Few	Few
Damage to health facilities	Severe	Severe	Severe but localized	Severe	Severe but localized
Damage to water system	Severe	Light	Severe	Light	Severe but localized
Damage to drainage system	Severe	Light	Severe	Light	Severe
Food shortage	Rare	Rare	Common	Common	Rare

Management

Disaster Cycle

Aim of Management: Immediate repair and initial efforts to re-establish the essential services associated with social and economic functions of a community.

Alert Period: This refers to the time when a disaster is developing and when it has not yet hit the community, threats are detected, warnings are issued and evaluation is facilitated. Evaluation can take three forms:

- Forced
- Voluntary
- Displaced

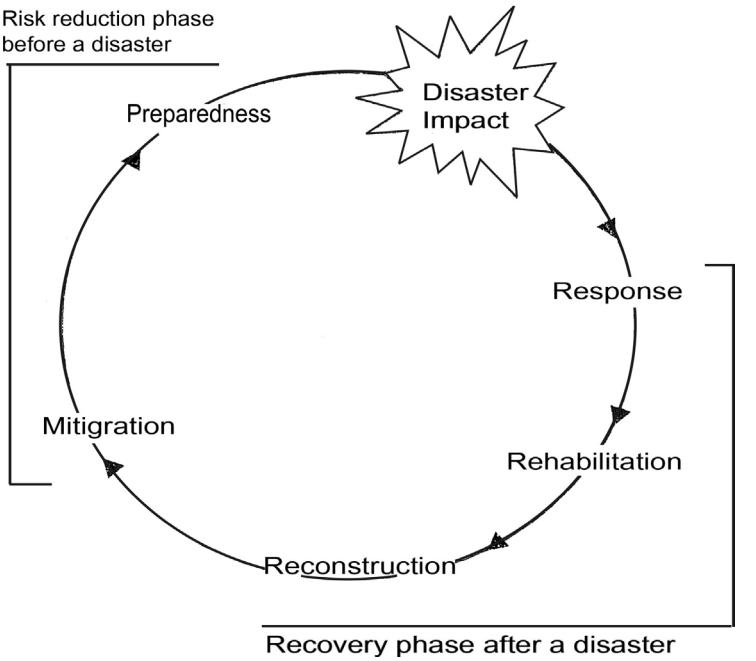


Fig. 9.2

Disaster Nursing: The adaptation of professional nursing knowledge, skills and attitude in recognizing and meeting the nursing and medical needs of disaster victims..

Basic Principles in Planning for Disaster Nursing:

N – Nursing plan should be integrated and coordinated

U – Update physical and psychological preparedness

R – Responsible for organizing, teaching and supervision

S – Stimulate community participation

E – Exercise competence

Basic Principles of Nursing care for Disaster Victims:

A – Adaptation of skills to situation

C – Care for disaster victims

C – Continuous awareness of the patient's condition

T – Teach auxiliary personnel

S – Selection of essential care

Management of mass casualities, rescue, transfer, triage and tagging:

Objectives: Illustrate the application of triage and tagging procedures in the management of mass casualities.

Mass Casuality Management:

Field Care: Most injured persons coverage spontaneously to health facilities, using whatever transport is available, regardless of the facilities, operating status. Provision should be made for food and shelter. A centre should be established to respond to inquiries from victims' relatives

and friends. Priority should be given to victim's identification and adequate mortuary space should be provided. Provide prompt and adopted care to the victims.

- Simple
- Triage
- Rapid treatment/ transport

START – Simple Triage Rapid Treatment

- Those who are beyond help
- The injured who can be helped by
- The injured whose transport can be
- Those with injuries who need help less urgently

First priority: Immediate [Red Tag]: Victims who's life is threatened but have a high probability of survival if received immediately to care – they require immediate surgery or life saving intervention

(picture)

Second priority: Intermediate [Observation Yellow] Victims who are seriously injured and whose life are immediately threatened – can delay transport and treatment for 2 hours.

Low priority: Waiting [Walking wounded, delayed Green tag] Hold care, can delay transport upto 3 hours.

Black tag: Expectant, died victims – severely injured 100% burns/cardiac arrest/septic shock.

Public health issues:

- Injuries and death
- Epidemics – food or water borne diseases, air borne diseases
- Emotional disorder
    - Fear and anxiety
    - Anger
    - Depression
    - Irritability
    - Disorientation
    - Apathy
    - Withdrawal

Epidemologic Surveillance and disease control:

- **I**mplement as soon as possible all public health measures
- Organise a realiable disease reporting system
- To identify out breaks and to promptly initiate control measures
- Investigate all reports of disease out break rapidly

Vaccination: Health authorities are often under considerable public and political pressure to begin mass vaccination programmes usually against typhoid, cholera and tetanus.

Nutrition

- Assessing the food supplies after the disaster
- Assessing the nutritional needs of the affected population
- Calculating daily food rations and need for large population groups
- Maintaining the nutritional status of the affected population

Rehabilitation: Starts from the very first moment of a disaster

Protection measures:

- Water Supply, priority of ensuring water quality in emergency situations, chlorination it is the best way of disinfecting water.
- Restrict access to people and animals if possible errect a fence and appoint a guard
- Ensure adequate excreta disposal at a safer distance from water source
- Prohibit bathing, washing and animal husbandry up-stream of intake points in rivers and streams
- Upgrade wells to ensure that they are protected from contamination
- Estimate the maximum yield of wells and if necessary ration the water supply
- All water tankers should be cleaned and disinfected before transporting water.

Food Safety: Poor hygiene is the major cause of food borne diseases in disaster situations. Where feeding programme are used, kitchen sanitation is of utmost importance.

Basic sanitation and personal hygiene: Many communicable diseases are spread through faecal contamination of drinking water and food. Hence every effort should be made to ensure the sanitary disposal of excreta. Emergency latrines should be made available to the displaced, where toilet facilities have been destroyed. Washing, cleaning and bathing facilities should be provided to the displaced persons.

Vector Control : For vector borne diseases should be intensified in the emergency and rehabilitation period, especially in areas where such diseases are known to be endemic. Special concerns are dengue fever and malaria, leptospirosis and rat bite fever, typhus and plague. Flood water provides chance for breeding opportunities for mosquitoes.

Role in disaster preparedness:

- Facilitate preparation
- Initiate and update disaster plan
- Provide educational programmes in specific area
- Organize disaster drills (mass drills)
- Provide updated record
- Educate the vulnerable population
- Nurse should seek safe environment

- Assess the environment hazard
- Understand the community resources
- Physical readiness
- Professional readiness
- Community readiness

9.1. NATURAL CALAMITIES

9.1.1. Floods

A large amount of water covers an area which is usually dry, for example when a river flows over its banks or a pipe bursts or heavy raining.

What to do before hand: While town planning is a government responsibility, individuals should find out about risks in the area where they are living (e.g.) people who live in areas downstream from a dam should know the special signals when a dam threatens to break. Forecasting of floods or tidal waves is very difficult, but hurricanes and cyclones often occur at the same time of the year when particular vigilance must be exercised. They are often announced several hours or days before they arrive.

During Flood

- Turn off the electricity to reduce the risk of electrocution
- Protect people and property [as soon as the flood begins, take any vulnerable people children, the old, sick and the disabled to an upper floor]
- Whenever possible, move personal belonging upstairs or go to raised shelters provided for use in floods
- Beware of water contamination if the taste, colour or smell of the water is suspicious. It is vital to use some means of purification
- Evacuate denser zones as ordered by the local authorities.

After a flood : When a flood is over, it is important people do not return home until told to do so by the local authorities, who will have ensured that buildings have not been undermined by water. From then on it is essential to

- Wait until the water is declared safe before drinking any that is untreated
- Clean and disinfect any room that has been flooded
- Sterilize or wash with boiling water all dishes and kitchen utensils
- Get rid of any food that has been in or near the water including canned foods and any food kept in refrigerators and freezers.
- Get rid of all consumables (drinks, medicines, cosmetics, etc.)

9.1.2. Storms, Hurricanes and Tornadoes

Storms: A storm is a very bad weather with heavy rain, strong winds and often thunder and lightning.

Tornadoes: A tornado is a violent wind storm consisting of a tall column of air which spins around very fast and causes a lot of damage.

What to do before hand:

- Choose a shelter in advance, before the emergency occurs, a cellar, a basement, or an alcove may be perfectly suitable.
- Minimize the effects of the storm – fell dead trees, prune tree branches, regularly check the state of roofs, the state of ground.
- Prepare a family emergency kit.

During Emergency:

- Listen to the information and advice provided by the authorities
- Do not go out in a car or boat once the storm has been announced
- Evacuate houses if the authorities request this, taking family emergency package
- In a thunderstorm keep away from doors, windows and electrical conductors, unplug electrical appliances and television aerials
- Do not use any electrical appliances or the telephone
- Anyone who is outside should
    - Look for shelter in a building (never under a tree)
    - If out in a boat, get back to the shore
    - Keep away from fences and electric cables
    - Kneel down rather than remain standing

After an emergency

After the storm has subsided,

- Follow the instructions given by the authorities
- Stay indoors and do not go to the stricken areas
- Give the alert as quickly as possible
- Give the first aid to the injured
- Make sure that the water is safe to drink and check the contents of refrigerators and freezers
- Check the exterior of dwellings and call for assistance if there is a risk of falling objects (tiles, guttering etc.)

9.1.3. Earthquakes

Earthquake: An earthquake is a shaking of the ground caused by movement of the earth's crust.

What to do before hand:

- Build in accordance with urban planning regulations for risk areas
- Ensure that all electrical and gas appliance in houses together with all pipes connected to them are firmly fixed
- Avoid storing heavy objects and materials in high positions
- Hold family evacuation drills and ensure that the whole family knows what to do in case of an earthquake
- Prepare a family emergency kit.

During an earthquake:

- Keep people calm – do not panic
- People who are indoors should stay there but move to the central part of the building
- Keep away from the stairs which might collapse suddenly
- People who are outside should stay there, keeping away from building to avoid collapsing walls and away from electric cables.
- Anyone in a vehicle should park it, keeping away from bridges and buildings.

After an earthquake:

- Obey the authorities' instructions
- Do not go back into damaged buildings since tremors may start again at any moment
- Give first aid to the injured and alert the emergency services in case of fire, burst pipes etc.
- Do not go simply to look at the stricken areas, this will hamper rescue work
- Keep emergency packages and a radio near at hand
- Make sure that water is safe to drink and food stored at home is fit to eat

9.1.4. Clouds of toxic fumes

What to do before hand:

People in risk area should

- Find out about evacuation plans and facilites
- Familiarize themselves with the alarm signals used in case of an emergency
- Equip doors and windows with the tightest possible fastenings
- Prepare family emergency kit

During an emergency:

- Do not use the telephone, leave lines free for rescue services
- Listen to the messages given by radio and other media
- Carry out the instructions transmitted by radio or loudspeaker

- Close doors and windows
- Stop up air intakes
- Seal any cracks or gaps around windows and doors with adhesive tape
- Organize a reserve of water
- Turn off ventilators and air conditioners

After an emergency:

- Comply with the authorities' instructions and do not let go out until there is no longer any risk
- Carry out necessary de contamination measures

9.2. MAN MADE DISASTERS

There are many disasters which have large elements of human causation either accidental or intentional. They can be divided into three categories:

9.2.1. Sudden disaster

Such as Bhopal gas tragedy in India on 3rd December 1984 in which a leakage in the storage tank of methyl isocyanate into the air wind conditions and an atmospheric inversion along with delayed warning and a population that had not been taught the nature of risks and the appropriate response increased the impact. About 2 million people were exposed to the gas leaving about 3000 dead.

The second example is the accident at the reactor of Chernobyl nuclear power station in the Soviet Union on April 26, 1986 which resulted in the largest reported accidental release of radioactive material in the history of nuclear power.

9.2.2. Insidious disasters

Disasters such as chemical exposure and insidious radiation exposure as nuclear weapons production factories, research laboratories is release of radioactive substances in the air, soil, underground water. Chemical plants releasing their toxic wastes into rivers and other water sources is another example.

Another form of long term and continuing human made disaster include global warming used by the heat trapping of gases in the atmosphere released by burning of fossil fuels and depletion of ozone layer due to the use of aerosolized chlorofluorohydro carbon etc.

9.2.3. Wars and civic conflicts

The latest example is the attack on twin towers of the World Trade Centre in New York, in which about 6000 people lost their lives and thousands were injured.

As a citizen of India, primary prevention and response to prevent man made disaster i.e. prevention of occurance of the disaster, much can be done to prevent not only the consequences but also the occurances of fires, explosions, ashes and sudden chemical and radiation exposures.

9.3. CORE EMERGENCY PREPAREDNESS COMPETENCIES FOR NURSE

Challenges to disaster management

- Identification of potential disaster and emphasis on disaster rehabilitative phase.
- Climate change – threat to food security in the country
- Impact on all the natural system as well as on health
- Increase the vulnerability of the environment to recover effectively
- Risk analysis, regulatory authority, training and capacity building
- Use of new and improved technology for monitoring, assessing, forecasting and communication of information sharing – minimize the loss of life
- Increased community preparedness and preventive measures

Fig. 9.3

Preparedness at hospital level

Hospital preparedness is very important to reduce the impact of disaster to human health and to save human life and disability

1. A defined mechanism to alert medical, nursing units and other staff to an external or internal disaster.
2. The disaster cupboard – every hospital should have arrangement for at least 50 victims at any time excluding routine emergency cases
3. Policy for disaster management – there should be a policy for disaster management in every hospital. E.g.
   a) . Extra staff (medical and nursing) should be posted to emergency from other areas.
   b) . Extra trolley men should be posted at the gate to transfer the casualty to emergency
   c) . Disaster cupboard should be kept open and needed equipment should be checked
   d) . Information should be sent to all concerned authorities
4. Disaster preparedness team – Members of the team should come from all ranks of the facilities personnel and the disaster preparedness programme must identify each possible disaster and explain how to recognize it, when it shall actually become a threat and who is to do what, where and how.
5. It is important that each hospital have a simple, organized well defined disaster plan.

Hospital disaster plan: It is a blue print for taking action during disaster to manage casualities.

Aims of hospital disaster plan: The ultimate aim of disaster plan of any hospital is to "Save as many lives" as possible by providing "Best possible medical care" under adverse circumstances.

Type of disaster expected: Every hospital should identify the expected disasters in their catchment area. E.g. vehicular accidents, cyclone, flood, earthquake, terrorist activity.

Problems to be handled: Transportation of victims to hospital

- Provision of prompt medical care
- Advice on prevention of outbreak of epidemics

Disaster Committees: A hospital should have a disaster committee under the chairmanship of medical superintendent

Control centre/room : Every hospital should identify a room as control room during a disaster situation.

Activating the plan: On receipt of the information from an authentic source, the duty medical officer in accidental emergency would activate the plan

Reception centre : Every hospital should identify a place of reception centre for a disaster situation

First aid and sorting : Every hospital should have a plan for first aid and sorting the casualities in disaster.

Casualty flow chart : Each hospital should have a casualty flow chart for a disaster situation.

Additional bed space : In addition to bed strength, hospital should have identified extra space to accommodate the casualties.

Linen stores: Identified or marked a room for linen store for disaster situation

Emergency Blood bank : Efforts should be made for blood for all the available groups to be stacked

Staff

- Medical Staff in addition to members to regulate clinical units the faculty members of para-medical and pre-clinical would be asked to render help.
- Nursing staff – a pool of nursing staff would be created by the nursing superintendent.

Document centres : A suitable place should be identified for documentation centre in disaster situation

Information services : Medical superintendent would be functioning as information officer. All information to press and govt. must be issued by him only

Disaster drills : Regular drills are a must otherwise plans remain only on paper.

Therefore it is important that each hospital be prepared for a disaster by having a simple, organized and well defined disaster plan. A disaster committee with representation from nursing

services must be formed. In addition frequent, planned drills are essential to the implementation of a disaster plan twice a year.

9.4. Rehabilitation phase of disaster management

Disaster, the very word creates anxiety in the heart of many nurses. One reason for this dread may be that most nurses even including emergency room specialists, lack confidence in their ability to function effectively in a disaster. This lack of confidence is attributable to the fact that few have had training or education designed to prepare them to deliver care effectively in disaster or mass casualty.

Rehabilitation phase : The rehabilitation or recovery phase constitutes the time needed to return to a relatively stable and balanced way of life. It may last from weeks to years depending on the type of disaster and the people involved. The rehabilitation or recovery phase is one which has received relatively little notice undramatic and unspectacular.

The second picture is of a flourishing, rebuilt community often better looking than it had been originally

Components of rehabilitative stage

- **Restoration** of essential community
- **Re-establishment** of community order
- Meeting of **Victim's welfare demands**
- Repair of community damage
- Continued damage assessment
- **Procurement** of local, state and federal assistance
- Initiation of preventive measures
- The assistance required during this phase will be in the nature of
    - **Long term financial**
    - **Technical help as provided by**
        - Foreign governments
        - International Monetary Fund
        - The World Bank
        - Local Bodies

Psychological aspects of rehabilitative phase

Psychological support can be accomplished by

- Supportive family members
- Lay volunteers
- Health care professionals
- Mental health workers like
    - Psychiatrists
    - Psychologists
    - Psychiatric nurse specialists
    - Social Workers

Fig. 9.4

Mental health care workers are mainly involved in consultative, supervisory role. At this time, the ego defense mechanisms of denial and repression are replaced by

- Grief
- Depression
- Anger
- Guilt
- Post traumatic neuroses
- Psychosomatic illness
- Increased physical illness
- Rise and fall of post disaster utopia

Anger may be directed towards

- Minority ethnic group
- Civic leaders
- Care providers
- Governments

Changes take place in reconstruction and recovery phase

- New equilibrium in family and social relations may occur
- Alterations in attitudes, values and morale change the way people relate to each other
- Life style may change for many phase economic base is less than what it was before the disaster.

Communicating process in rehabilitative phase

Communication may be aimed at the following

- Circulating information about disaster
- Reporting on community progress

- Identifying needs for community for restoration
- Collection of information on the extent of disaster damage
- Damage

9.5. RECOVERY AND REHABILITATION PHASE PLANNING MISSION IN 'EARTH QUAKE'

Extensive discussion were held with the IRCS (Indian Red Cross Society) on the long term health programme, reconstruction, disaster preparedness and disaster response, organizational development and the country assistance strategy with special emphasis on Gujarat.

Rehabilitation includes the provision of temporary public utilities and housing as interim measures to assist long term recovery.

Major problems

- Deaths, injuries and disabilities are the aftermath
- Manifestations of disaster people have to be shifted to temporary shelters where environmental measures such as safe drinking water and food, proper excreta and waste disposal need particular attention as important interventions against diseases and illness
- Provision of proper healthcare facilities
- Health implications in these instances manifest in the form of many diseases
- Impact on mental health is another implication of disaster. Anxiety neurosis and depression may be seen mainly due to shock and insecure conditions caused by multiple factors such as loss of near and dear ones and increased stress due to altered living conditions
- Ischemic heart diseases, renal failure and obstetrical are also seen in this population

Strategies involved

- Aims of any disaster management programme is to reduce the suffering of people and to carry out preventive action in a planned manner

Prevention of epidemics and control of communicable diseases

- Immunization coverage
- Disinfection of water supply
- Sanitary latrines and other hygienic measures of waste disposal
- Disease surveillance
- Treatment facilities
- Constant public information to allay fears and avoid panic
- Proper distribution system of safe food stock
- Proper deployment of resources
- Restore lines of communication and information
- Avoid inaccurate media reporting
- Restore transport routes

Control the situation

From looters

Influx of private vehicles and unwanted people

Consider the manpower resources of the community

Enable community participation and development of self reliance

Co-ordinate activities with various agencies

Local, public, state, national and international, government and non-government.

9.6. LEGAL IMPLICATIONS OF NURSING PRACTICE IN MAJOR DISASTER

To assure that all resources are concentrated on the medical problems presented during a disaster, the actions of health care providers must not be unduly influenced by legal considerations. However, matters of law that may apply to disaster situations should be determined and disseminated as part of disaster planning and preparedness. The law does make allowances for the special circumstances presented by emergencies and disasters, however it is very difficult to make generalizations.

The international Red Cross defined disaster as a catastrophic situation in which the day to day patterns of life are suddenly disrupted and people are plunged into helplessness and suffering, and as a result need protection, clothing, shelter, medical care and other necessities of life.

Nursing Standards and Practice : No law specifically defines the scope of nursing practice as it pertains to disaster situations. However, other sources can be used to determine guidelines for nurses who may be on a disaster response team or who may find themselves called unexpectedly to attend to victims of a disaster. Guidelines may be drawn from the following sources.

- Nurse practice acts
- Joint association agreements
- Professional organization standards
- Current customs practice
- Common law

Nurse Practice Act : State nursing council enacts nurse practice law, which defines who can practice as a nurse. It gives the nurse the right to diagnose, teach, refer and collaborate with other professionals in rendering health care services.

Joint Association Agreement : Joint association agreements are not legal opinions. However, these agreements may serve as evidence for persons trying to prove that their actions were with in the scope of their practice.

Professional Organization's Standards : An important source of guidelines is the standards promulgated by the professional organization. The scope of practice of the emergency nurse encompasses activities that are directed towards health problems of various levels of complexity. Rapidly changing physiological or psychological status may be life threatening and it requires assessment, intervention, ongoing reassessment and supportive care to significant others. Life support, health education and referral are among the several roles and responsibilities.

Current Custom and Practice : Another source of guidelines is derived from the current custom and practice of similarly situated nurses. Professional nursing is constantly changing and increasing in accountability and responsibility. Current professional literature keeps the profession's members abreast of such changes, roles and responsibilities.

General Liability and Common Law : The traditional elements providing a cause of action for negligence to be brought against a nurse are stated below:

1. Duty or Obligation: It is recognized by law requiring the actor to conform to a standard of ordinary care for the protection of others against unreasonable risks.
2. Deviation from duty: A failure on the actor's part to conform to the standard required
3. Direct causation: A reasonably close causal connection between the conduct and the resulting injury.
4. Damage: An actual loss or damage resulting to another.

Institutional Role in Disaster Management: Institutional disaster planning by its nature involves foresight and careful consideration of institutional and individual roles. A credible plan assures training and duties appropriate to intended functions during an actual disaster. In case of individual nurse involvement her action in disaster would not be preplanned so, is considered a volunteer in a disaster situation by the necessity of the moment.

Medico legal Responsibilities of Nursing Personnel in Disaster: At the disaster site main responsibility of the nursing personnel is to save the life and ensure safe transportation of the casualties to the hospital in collaboration with other members of the health team. While the care provided at the emergency department should be with due skills and as per accepted standards of nursing practice. The medico legal responsibilities are as follow:

1. Register all casualties as medico legal cases – every victim of disaster is to be registered as medico legal case
2. Provide care with respect and dignity to each casualty
3. Take consent for further treatment from the patient or near by relative
4. Maintain hospital records and ensure safe custody of the records
5. Intimate the police
6. Dispose off casualties who on examination are found already dead either at the disaster site or on arrival in emergency department.

9.7. HIGH POWERED COMMITTEE FOR PREPARATION OF DISASTER MANAGEMENT PLAN

The essential roles played by the government at central, state and district levels are:

At Central level:

Short term:

- Facilitation central govt., can facilitate provision of assistance to the relevant state govt. in coping with the disaster.

- Resource mobilization – many provide additional funds.
- Special inputs various national/international institutes agencies doing specialized work in disaster management, state govt., can play the role of providing the inputs to the state.

Long term:

- International assistance
- Monitoring preparedness and prevention measures
- Development initiative

At State level: Disaster management plans at the state level are the most critical plans providing for roles both for the central as well as district level. Such plans have to be based on the disaster vulnerability conditions prevailing in the state.

Co-ordination after disasters are spread over several districts. As a co-ordinator, the state government also needs to maintain close liaison with the centre as well as the district authorities. Preparedness – identify possible areas where disasters strike. The state govt. would have to inform the relevant district authorities and advise them on suitable line of action.

Resource mobilization: Extra resources are required to face the situation. The states in its "Action plan" should be geared to provide necessary funds from state budgeting

At District level:

- Evacuation – must start on receipt of advance warning
- Relief and rescue operations – the district head quarters is the focal point for all the rescue and relief activities
- Damage assessment and information gathering

How to prepare a disaster management plan

Short term plan

- Define vulnerable area(s)
- Role players
- Assess intensity and spread of various disaster in the area in the past 10 year period
- Documentation
- Past records

Short term plans should be based on the declared vulnerability of the area.

- Committee/task forces for plan
- Operationalization

Long term plan

- Establishing its need in an area
- In case of rehabilitation plan-rehabilitation
- Would depend considerably on the damage assessment report

- Disaster management as a component of development planning
- Rehabilitation

The long term plan should seek an objective of achieving over all development (shelter, economic, social) . It may be successfully implemented through partnership with NGO's and community participation.

When disaster strikes

- Power goes
- Lift does not work
- Drinking water gets contaminated
- Telephone goes out of order
- Normal transportation means and communication are not in operation
- And when casualties seen in dozens that is not the time for planning. It is the time for action

Summary

- Disaster is broadly classified into Natural Disaster, Manmade disaster and other types. Natural disaster is of meteorological disaster, topological disaster, telluric and tectonic disaster. Man made disaster is of civic disturbance, warfare, refugees and accidents
- The type of disaster can be divided by cause, predictability and extent of damage
- The phases of disaster such as warning phase, period of impact, rescue phase, relief phase were explained.
- The short term effect of major disaster such as injuries, damage were explained
- The disaster cycle preparedness, impact, response, rehabilitation, reconstruction, mitigation was explained.
- The basic principle in planning disaster management is NURSE and ACCTS
- The management of casualties according to triage was explained
- Flood management during and after flood was explained
- Storms, Hurricanes, Tornadoes, before hand, during hand, after disaster was discussed.
- Earthquake, its management before, during and after was illustrated
- Clouds of toxic fumes was explained.
- The disaster management at a hospital level was explained
- The rehabilitation of disaster management is discussed
- The legal implication in disaster management is discussed

QUESTIONS

I. Choose the correct answer

1. Storm is the
   a) Man made disaster b) Natural disaster c) both d) None
2. The victims which are life threatening has a high possibility of survival are classified as
   a) red tag b) yellow tag c) black tag d) green tag
3. The first step in management of disaster during flood is
   a) Turn off electricity b) shift the people to safe area
   c) Evacuate danger zones d) clean and disinfect rooms
4. What can be done to prevent earthquake?
   a) Build in accordance of urban planning b) keep calm
   c) Give first aid to injured d) keep away from stairs
5. The Bhopal if as tragedy occurs due to leakage of storage tank of
   a) Methyl iso-cyanate b) carbon monoxide
   c) methane d) Ethane
6. The phase in disaster where satellite and network of weather station. Predict metrological disaster
   a) Warming phase b) Period of impact c) Rescue phase d) Relief phase
7. A hurricane is an extremely violent
   a) Wind of storm b) Rain c) Flood d) None of above
8. After, earthquake the persons
   a) Does not go back to damaged building b) Should go back to damaged building
   c) None of above d) All the above
9. The ultimate aim of hospital disaster plan is
   a) Save as many lives b) Best possible medical care
   c) All the above d) none of above
10. What is the first step in prevention of epidemics control of communicable diseases?
    a) Immunization disease b) Treatment
    c) Distribution of food d) None of the above
11. The medical, legal responsibilities of nursing personnel in disaster is
    a) Register all causalities as medico legal cases b) Distribution of food
    c) Treatment d) None of the above.
12. The disaster which is based on failing of industrialized society
    a) Technological failure b) Hand slides c) Flood d) Earthquake
13. The disaster which occurs due to technological causes
    a) Air crashes b) Earthquake c) Flood d) Landslide

14. Black tag classification is given to

    a) Dead/ severely injured b) Mild injury c) Ambulating client d) None of above.

15. After flood, it is essential.

    a) To wait until water declared safe b) To drink water immediately

    c) All the above d) None of the above.

16. In hospital, there is policy for disaster management

    a) Extra staff should be there in emergency room. b) Best possible medical care

    c) All of the above d) None of the above

17. The components of rehabilitation stage is

    a) Restoration of essential community service b) Reestablishment of community order

    c) All the above d) None of the above.

18. The ego defense mechanism of denial and repression are replaced by

    a) Grief, depression b) Happiness c) Stability d) None of the above

19. The disaster management plan at central level in short term is

    a) Facilitation of central government b) Resource mobilization

    c) None of the above d) All the above

20. The short term disaster management plan in district level is

    a) Defined vulnerable area b) Assess intensity and spread of disaster

    c) All the above d) None of the above

II. Fill in the blanks

1. Flood is the _____ type of disaster.
2. Disaster can be divided into _____, _____ disaster.
3. Disaster preparedness and mitigation is _____ phase.
4. In triage system black tag indicates _____.
5. One of the manmade disaster is _____
6. In triage system green tag needs immediate _____
7. _____ is very bad weather with heavy rain, strong wind often thunder and lightning.
8. Iis a shaking of the ground caused by movement of the earth's crust.
9. The disaster cycle preparedness includes_____, _____ ,_____ , _____, _____.
10. The management of causalities are according to the _____ order.

III. Short answers

1. Write the causes for disaster?
2. What are the protective measures you will carry out during disaster?
3. What are the precaution that one should follow during disaster?
4. Write about preparedness of disaster at hospital level?
5. Writd about preparation of disaster management at state and central level?

IV. Write briefly

1. Explain about disaster management following “Triage” criteria?
2. Explain about legal implications of nursing practice in major disaster?
3. What are the steps in rehabilitative phase in disaster management

V. Write in detail

1. Write in detail about ‘Emergency Management’?
2. Write in detail about Natural disaster management according to the “Triage” order?

10. HOME NURSING

Home nursing is that component of a continuous of comprehensive care where by health social and support services are provided to individuals and families in their places of residence and in the community for the purpose of promoting or restoring health or of promoting maintaining or restoring health or of maximizing the level of independence while minimizing the effects of disability and illness including the terminal illness services appropriate to the needs of the individual and family are planned coordinated and made available by providers organized for the delivery of home care through the use of employed staff contractual arrangements or a combination of the two pattern.

Home health services enable individual of an ages to remain in the comfort a security of their homes while receiving health care, family support, familiar surroundings is and participation in the care procedure contribute to feelings of worth and dignified senses may include skilled nursing. physical therapy, speech, language therapy ,occupational therapy all are included in the home nursing care. Home health care grew five times faster than the average of other heath care industries between 1997 and accounted for more than 6%of health services jobs.

Physical hare become more involved in home care advancing technology has allowed more care to be delivered in the home.

Home health care in need because people are living longer and thus have more disease conditions that require care also hospital stays on previous years, so many patents still require nursing interventions on discharge from the hospital.

Home health care in also essential because an increasing number of women are working outside the home. Women who traditionally provided health care for their families are no longer available to provide this service there is an increased mobility in our society and an increase in single-parent families with female head of households there factors hare of the family .

Recently there has been a shift to community based care this led to an increased number of acutely ill home care.

Patients changing demands on health care providers and a greater unserved and underserved population.

The approach to patient care one of teamwork and blending of disciple the nurse is a valuable team member of this very important health care service although home care has traditionally been a part of public and community health services focus is now much narrower.

Home Nursing is that component of continuum of comprehensive health care whereby health services are provided to individuals and families in their places of residence for the purpose of maintaining promoting on restorating health or maximizing the level of independence while minimizing illness.

10.1. CONCEPTS OF HOME HEALTH CARE

- Client : Rational, biological, emotional, social being desiring the use of home care services.
- Family : Loved one (s) : Any other individuals present in the home and willing to participate in care as needed by the client to maintain self care at home.

- Professional nurse : Individual with license to practice professional nursing in state.
- Quality of care : Care meets standards for home health practice, certification, accreditative standards
- Self care capability : Ability to perform activities of daily living that permit the individual to live independently at home.

10.2. HISTORICAL OVERVIEW

Home care was formerly defined as simply providing physical care to the sick in their homes but the scope and complexity of the concept and practice have grown roots of the concept can be traced to the new testament of the bile, which describes visiting the sick as a form of charity one of the earliest organized system for home care was developed in 1617 by St. Vincent de Paul, who organized the sisterhood of the dames de charite to meet social welfare and required nursing needs. In the 1700 families wore the primary care givers. The poor were hospitalized, whereas those with financial means were cared for in their homes by visiting physicians.

The fist visiting nurse service in the united states was formed in service in Philadelphia in 1886 it was directed by nurses who provided care to all ages of persons with both acute and chronic care needs in the late and easy 1900s visiting nurse association were formalized, and public health department become widespread.

Metropolitan Life Insurance had a major impact on the growth and nature of home service when in 1909 it began offering nursing services to its millions of industrial policy holders. This initiated third party payment for services payment until then had been provided primarily on a charitable or patient paid basis.

The social security Act of 1935 first provided governmental rather than local charitable funding for selected services such as maternal health, communicable diseases and the training of public health professionals. It subsidized assistance for the poor and aged.

Medicare provided direct federal monies for the health care of all citizen 65 and older, regardless of socio-economic status. The companion Medicaid bill covered the care needs of the poor and indigent of all ages. When Medicare became effective in 1966 it revolutionized home care by

i) Changing it to medical rather than nursing model of practice.

ii) Defining and limiting services it would reimburse and

iii) Changing the payment source and even changing the reason home care was provided.

The next major influence on home care came in 1983. Congress enacted the prospective payment system as a part of the Tax Equity and Fiscal responsibility Act for hospitals receiving Medicare reimbursement. This system, based on major diagnostic categories and diagnosis related groups paid a set rate for the hospitalized patients care rather than the "cost" or changes traditionally billed by institutions.

Definition: Home Nursing is defined as "to all the services and products provided to clients in the homes to maintain, restore or promote their physical mental and emotional health".

10.3. PURPOSE

- Prevention of disease
- Treatment needed
- Relief of suffering and comfort of the client
- Support and assurance to patient and family
- Utilization and adaptation of home equipment
- Respect of family's beliefs and ways of doing things as for as possible

10.4. PRINCIPLES

- Form good relationship with each family and help them in relationship with each other with in the family and with others in the community.
- Collect information about the family size, occupation, education, religion, customs and traditions etc.
- Identity the health problem of the family with priorities.
- Discuss with the family their problems and find out what they are willing to do about them.
- Help the family to plan and carryout the needed action.
- Encourage the family to be self reliant in meeting their needs and improving the health welfare and nutrition of the family.

10.5 HOME HEALTH CARE SERVICES: HOME CARE SERVICES INCLUDES

- Medical and dental care
- Pharmaceutical services
- Social services counseling
- Physical therapy
- Occupational therapy
- Laboratory testing
- Nutritional advice
- Home maker of home health aide services
- Medical equipment and supplies provision

Care of the sick in the Home: The health worker may be called to see the person who is sick in the home and realizes the individual needs of the family members and take care of them according to the needs.

Assess the sick person condition and the situation first to find out what kind of sickness it is by

- Asking question about his symptom
- Examining the person including taking TPR noting the strength and weakness color and other sign

- Decide what need to be done in order to care for the patient in the best possible way consider the environment facilities and persons available to help.

Plan for care of the sick person

- Reassurance kindness, and if necessary some firmness to get his co-operation
- Rest in reasonable comfort and good ventilation
- Cleanliness of the bed, surrounding and of the sick person especially mouth and skin.
- Nourishing diet, and enough fluids to drink.
- Medicines and treatments as needed. Teach relatives how to give the medicines and to do simple treatment.
- Teaching on follow up care and how to know well in future.

Use the opportunity to educate the family and village health guide on health and nursing skills.

Health education is given on the cause of the illness, the reason for cleanliness, and disinfection good ventilation, rest and sleep. Proper diet good nursing care such as changing position etc.

Repeat visit should be regulating mode to check on the condition for the patient. The treatment and nursing care being given and whether health teaching is being followed.

10.6. CARE OF THE AGED PERSON IN THE HOME

A grandfather or grandmother living with the family need not be a burden. In most cases an older person is of great help to the family. As a friend of the family the health worker may be help to the aged person and other family members to adjust and help one another so that everyone is happy. The aged person has less physical strength and may have defects such as a four eyesight or hearing, lack of teeth, poor memory etc. on the other hand they can offer contribute wisdom and calmness. Aged people have time to spare for amusing children and watching over their safety. In some cases parents leave their children with grandparents for long periods. If people keep physically and mentally active eat well but avoid getting over weight, avoid smoking and drinking too much. Know how to relax and not over work they can be healthy all through life including old age.

Health problems of aged persons

- The kinds of problem some aged person have are often due to high blood pressure this can be avoided by living a healthy lifestyle.
- High blood pressure may result in heart disease or in a stroke with hemiplegia.
- Other problems are rheumatoid arthritis chronic cough, swelling of the legs, older men may have an enlarged prostate gland and trouble with passing urine.
- In order that aged people may enjoy life and be active and independent for as long as possible. They may not complete care but symptoms can mostly be relieved with the help of medicines.
- If eyesight is a problem ask whether the aged person has had eye checkup. It may be that glasses with help or that a contract operation will restore sight.

- If hearing is a problem the aged person may be helped by means of a hearing aid.
- If teeth are lost, the aged person may be referred to a dentist and be fitted with a denture. This may result in a great improvement in digestion and clean speech.

Health Education of the family on care of the aged

- Encouraged the aged to be active and helpful in the home for a long possible, but make sure they have plenty of rest.
- Include them in family activities and decision as far as possible.
- Help them to adjust to being more dependent on others as they grew older and weaker.
- Realize that even if the body is weak the mind of an aged person may go on being active and capable with constant practice.
- Aged person may not want much to each but they do need a nutrition diet.
- Accidents are more likely when sight or hearing is weak or bone become brittle. Make sure that someone younger is with the aged person when walking, especially on public roads with fast traffic.
- Aged person feel the cold more because of poor blood circulation, warm clothing needed.
- Lifelong habits, like and dislikes, should be respected as far as possible as these help the aged person to be happy and comfortable. Sudden change may upset them very much.
- Most of all aged, people need to be loved and cared about, not just cared for. One partner may be left after the other has died leaving an emptiness healing to be filled.

10.7. CARE OF THE HANDICAPPED IN THE HOME

People often think of handicapped being person who care lame or paralyzed but there are other physical handicaps such as blindness and deafness. There are also different types of mental handicaps such as the retarded and cretins. Handicapped person may be children or persons of any age.

Thinking about the problem: Some children are born with birth defects. No one should be blamed for this the reason may not be known. Some handicaps can be prevented by means of

- Choosing marriage partners who are not closely related.

If Pregnant women

- Having a nutrition diet with iodized salt.
- Avoiding unnecessary medicines, alcohol and smoking.
- Keeping away from any person with German measles.
- Delivery of the child by a trained midwife.
- Breast feeding and other nutritious diet for the proper growth of the child's body's mind.
- Immunizations of infants, especially oral polio drops.

- Early attention to ear and eye problems and giving vitamin A concentrate to children.
- Avoiding accidents, first aid and proper care when accident occurs.

Understanding the handicapped person: Handicapped persons often develop psychological problem for various reason such as

- Frustration at not being able to do some things that people normally do (e.g) lane children being unable to run about.
- Wrong attitudes of society, perhaps even of the family people may think the handicap is due to fate or a curse and so the handicapped person is uncared for and ignored.
- Some handicapped persons take to begging and never try to become useful citizens.
- Those that are encouraged to study or lean a trade may have a problem getting employed and so become bitter against society.

Principles of care of handicapped:

- Form good relationship with each family and help them in relationship with each other with in the family and with others in the community.
- Collect information about the family size occupation, education, religion, customs and traditions etc.
- Identity the health problem of the family with priorities.
- Discuss with the family their problems and find out what they are willing to do about them.
- Help the family to plan and carryout the needed action.
- Encourage the family to be self reliant in meeting their needs and improving the health, welfare and nutrition of the family.

10.8. Components of home care services: Most home health agencies follow the basic Medicare model of services offered primary services include the following.

- Skilled Nursing
- Physical therapy
- Speech language therapy
- Occupational therapy
- Medical social services
- Home maker home health aide.

Skilled Nursing: Skilled nursing services are provided and directed by currently licensed registered nurses. Some agencies require that nurses have a bachelor's degree in Nursing, whereas others graduates of all types of Registered Nurse (RN) programs and teach them agency policies and specific procedures.

Physical therapy: Services must be provided by a qualified and licensed physical therapist. A physical therapy assistant under the supervision of licensed therapist may deliver limited

services. The goals of treatment must be restorative for Medicare reimbursement but may be maintenance or preventive for other payer sources. The therapist completes a detailed assessment of the patient and then determines treatment education, and assistive devices needed for rehabilitation.

Speech language therapy: To be reimbursed by Medicare, speech services must be provided by master's prepared clinician who has been certified by the American Speech and healing association. Therapy goals include minimizing communication disorders and their physical. Emotional and social impact. Services maybe provided after stroke or surgery.

Occupational therapy: Occupational therapy services deal with life's practical tasks. Therapist are prepared at the bachelor level and may earn the occupational therapist, registered designation if they meet the registration requirements of the national occupational therapy association. Some services may be provided by the certified occupational therapy assistant under the supervision of the occupational therapist registered.

Medical social services: Medical social services are provided by social workers prepared at the master's level. Bachelor' prepared workers may provide services under mastered social worker (MSW) supervision. Their focus is on the emotional and social aspects of illness. The patient, family or other support systems are evaluated for social, emotional and environmental factors.

Homemaker – Home health aides: Medicare refers to the homemaker home health aide. These workers are an integral part of the home health care. They provide the basic support services that can enable an elderly individual, disabled adult or dependent child to remain at home.

10.9. OUTREACH SERVICES

Outreach can be hard to define, but usually refers to activities designed to make contact with clients primarily in their natural setting. On the street, at home in clubs or other meeting places. These activities can be delivered by professionals or by peers. Outreach work and its evaluation are important in the substance misuse field because they may help to reach target populations that will not attend static services.

Definition: Outreach is an effort by individuals in an organization or group to connect its ideas or practices to the efforts of other organizations, groups, specific audiences or the general public.

Palliative care: Palliative care is any form of medical care or treatment that concentrates on reducing the severity of disease symptoms rather than striving to halt, delay or reverse progression of the disease itself or provide a cure. The goal is to prevent and relieve suffering and to improve quality of life for people facing serious, complex illness.

Adult day Health services or medical day care: Adult day health services for individuals, who due to their physical and or mental impairment, need health maintenance, rehabilitation and restorative services supportive to their community living. Most adult day services programmes provide.

- Health assessment
- Nursing supervision
- Nursing assessment

- Medication administration.
- Assistance with toileting, bathing and other activities of daily living
- Therapeutic recreation
- Socialization
- Group activities
- Nutrition assessment
- Case management
- Care co-ordination
- Transportation
- Adult day health service user is elderly, disabled and averages 75 years of age.

Case management services: Case management provides a range of clinical and medico-legal services in relation to brain injury and also for stress related and other psychological conditions.

It established in 1988, the team includes case managers, psychologist, occupational therapist, physiotherapist, social workers nurses and rehabilitative assistants. All staff and associates are suitably qualified and experienced.

Supportive services: The supportive services provide assistance on a non-discriminatory basis extending equal treatment and access to services for children, parents and providers of child care without regard to race, religion, age, sex and sexual orientation, mental or physical disability.

Social worker services: Social workers are licenses mental health professionals trained to help people find solutions for many problems, from daily issues to life's most difficult situations. Social workers work with families to deal with crisis, cope with illness and other life stressors, identity and solve problems with relationships, enhance communication with the medical treatment, access hospital and community services

Outreach education: Outreach education is a team of teachers based in major public organizations. The role of outreach education is to ensure that all school students and their teachers have the best possible access to the resources and events at those organizations. Outreach education is managed through the open access college.

Medical social services: Medical social services professionals help individuals, couples and families cope with the social, psychological, cultural and medical issues resulting from an illness. Professionals in medical social services also help patients fully utilize medical care and services by Explaining health care resources and policies to patients, family and professional staff. Helping patient and families receive needed follow up care by referral to health care resources.

Providing advocacy through appropriate organizations.

Elderly health services: Elderly health services provide a hospital based service for acutely ill older people and rehabilitation of older patients.

10.10. REHABILITATION SERVICES IN HOME NURSING

Community based rehabilitation is a strategy for enhancing the quality of life of disabled people by improving the service delivery system by providing equitable opportunities and by promoting and protecting their human rights.

Definition: Community based rehabilitation is a strategy within community development for the rehabilitation, equalization of opportunities, and social inclusion of all people with disabilities.

Objectives of community based rehabilitation

- To identify all persons with disability in the community.
- To provide required rehabilitation service to disabled people.
- To create awareness about all issues related to disability.
- To priorities service for disabled person.

Characteristics of rehabilitation

Reduction of disability and handicap.

Empowerment: The individual becoming more in control of himself and his health and life through mobilization of appropriate resources to enable his needs to be met.

Independence

Social independence, i.e. having the power to demand rights of society.

Economic independence, i.e. having the ability to provide for oneself and meaningful others.

Physical independence, i.e. related to mobility and other daily living activities.

Mental independence, i.e. the ability to problem solving.

Problem – solving: Rehabilitation should aim to facilitate and develop further such as individuals problem solving skills, providing new knowledge and training for life, to enable effective decision making.

Client centered rehabilitation: To the notion of client centered.

The holistic approach**:** The concept of holism suggests total well being, which has been defined as that state of harmony between mind, body emotions and spirit an ever changing environment.

Principles of community based rehabilitation

- Utilization of available resources in the community.
- Transfer of knowledge about disabilities and skills in rehabilitation of people with disabilities, families and communities.
- Community involvement in planning, decision making and evaluation.
- Utilization and strengthening of referral services at the district and national levels.
- Utilization of co-ordinate approach and education, health and social systems.

Advantage of community based rehabilitations

- Home based
- Less expensive
- Existing community response and resources.
- Focus on quality rather than quantity
- Multiple approaches based on community needs.

Planning for community participation in community based rehabilitation

Community participation requires clean understanding of the prevailing attitude of people in the community, their current level of participation in the program and the expected level of participation to be achieved in the future. If is difficult to begin a program with full ownership consumers. Community based rehabilitation program needs to find ways to motivate the marginalized groups of disabled persons, their families and community to follow a participating mode of development in which the local community will take up most of the responsibilities of the rehabilitation program.

Community participation in community based rehabilitation may be in different levels ranging from receiving benefits from their service but contributes nothing to the extent of entirely running the community rehabilitation program by the community including financial and technical assistance.

The community should support the basic necessities of life and help to families who carry out rehabilitation at home. The family of disabled person is the most important resource. Disabled community members and their families should be involved in all discussions and decision regarding services and opportunities provided for them.

Barriers to community participation in community based rehabilitation program

- People expect the government should for all the responsibility for the society.
- Powerful groups in the community that often corner the benefits from development program for their personal benefits, ignoring the needs of other marginalized groups.

10.11. HOME MANAGEMENT

Everywhere on earth people use home remedies. In some places, the older or traditional ways of healing have been passed down from parents to children for hundreds of years. Many home remedies have great value. Home remedies like modern medicines must be used with caution. For many sickness, time-tested home remedies work as well as modern medicines or even better. They are often cheaper and in some cases they are safer. Most common health problems could be handled earlier and better by people in their own homes. We must consider all the following

- Felt needs – what people feel are their biggest problems
- Real needs – Steps people can take to correct these problems in a lasting way.
- Willingness – or readiness of people to plan and take the needed steps.

- Resources – the persons, skills, materials and money needed to carry out the activities decided upon. Use local resources whenever possible. Early treatment is a form of preventive medicine.

10.11.1. Fever

When a person's body temperature is too hot, we say be has a fever. Fever itself is not a sickness, but a sign of much different sickness. However, high fever can be dangerous, especially in a small child. Normal body temperature 98.4oF or 37^{o}C more than 100^{o}F is consider fever.

Home management

- Uncover him completely small children should be undressed completely and left naked with the fever goes down.
- To provide fresh air or a breeze
- To apply cold compress
- To provide lot of drinks or water (juices, other liquids)
- To administer Tablet. Paracetamol according to the weight of the person.
- To take temperature every 30 minutes, if not reduce refer the child to health centre.

10.11.2. Diarrhea

When a person has loose or watery stools, he has diarrhea. If mucus and blood can be seen in the stools, he has dysentery.

Diarrhea is more common and more dangerous in young children, especially those who are poorly nourished. Most children who die from diarrhea die because they do not have enough water left in their bodies. The lack of water is called dehydration.

Signs of dehydration

- Thirst is often a first early sign of dehydration
- Little or no urine, the urine is dark yellow
- Sudden weight loss
- Dry mouth
- Sunken, fearless eyes
- Loss of elasticity or stretchiness of the skin.
- When a person has watery diarrhea, or diarrhea and vomiting, do not wait for signs of dehydration. Act quickly.

Home management

- Give lots of liquids to drink – rehydration drink is best or give a thin rice porridge or tea or even plain water.
- Keep giving food – as soon as the sick child (or adult) will accept food, give frequency feedings of foods he likes and accepts.
- To babies, keep giving breast milk often – and before other drinks.

- Give the dehydrated person sips of this drink every 5 minutes day and night, until be begins urinate normally.
- A large person needs 3 or more litres a day.
- A small child needs at least 1 liter a day or 1 glass for each watery stool.
- Keep giving the drink often in small sips, even if the person vomits.

Three ways to make Home mix rehydration drink

1. With sugar and salt	2. With powdered rice and salt	3. Ready made ORS pocket
In 1 liter of clean water put half of a level teaspoon of salt and 8 level teaspoons of sugar.	Powdered rice is best, or use finely ground maize, wheat flour (or) cooked and mashed potatoes. In 1 liter of water put half a teaspoon of salt and 8 heaping teaspoons or 2 handfuls of powdered cereal	In 1 liter of water add 1 pocket of readymade ORS pocket, mixed it well, can given frequent small feeds.
Caution : Before adding the sugar taste the drink and be sure it is less salty than sugars	Boil for 5 to 7 minutes to form a liquid gruel or watery porridge. Cool the drink quickly and start giving it to the child	Sodium chloride – 3.5 gram Tri sodium citrate – 2.9 gram Potassium chloride – 1.5 gram Glucose 20.0 gram Water 1 litre
To either drink add half a cup of fruit juice coconut water or mashed ripe banana. If available. This provides potassium which may help the child accept more food and drink	Caution : Taste the drink each time before you give it to be sure it is not spoiled. Cereal drinks can spoil in a few hours in hot weather.	Oral fluid therapy is based on observation that glucose given orally enhances the intestinal absorption of salt and water, and is capable of correcting the electrolyte and water deficit.

10.11.3. Headaches and migraines

Headache is common with any sickness; it can be helped by rest and applying pain palm. It often helps to put a cloth soaked in hot water on the back of the neck and to massage (rub) the neck and shoulders.

Migraine: Is a severe throbbing headache often on one side of the head only.

Home management

- Lie down in a dark, quiet place.
- Best to relax, try not to think about your problems.
- To take tablet, paracetamol 2 with a cup of strong coffee or strong black tea.

10.11.4. Colds and the flu

Colds and the flu are common virus infections that may cause runny nose, cough, sore throats and sometimes fever or pain in the joints.

Home management

- Drink plenty of water and get enough rest.
- No special diet is needed.
- Fruit juices, especially orange juice or lemonade are helpful.
- Breathing hot water vapor to loosen mucus.
- Also breathe hot water vapors. Sit on a chair with a bucket of very hot water at your feet, place a sheet over your head and cover the bucket to catch the vapors as they rise. Breathe the vapors deeply for 15 minutes, repeat several times a day, some people like to add mint (or) eucalyptus leaves or vapor- rub, but hot water works just as well alone.

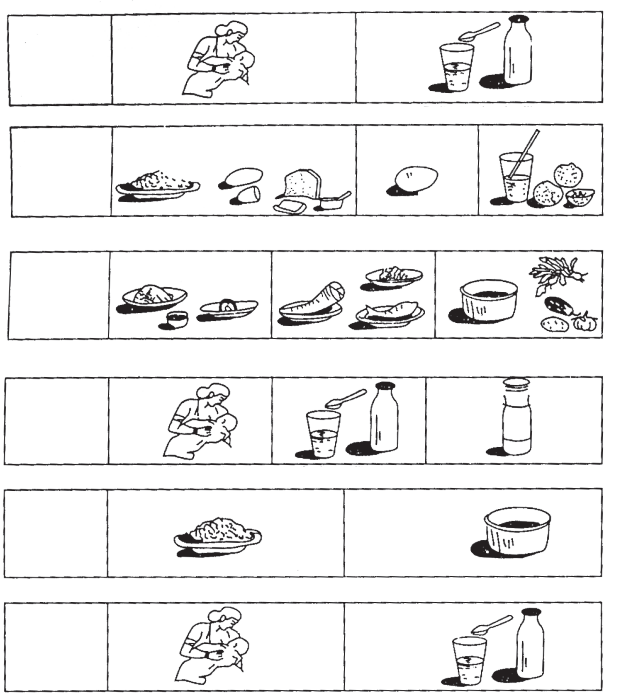


Fig. 10.1

For all kinds of cough, especially a dry cough the following cough syrup can be given

Mix 1 part honey : Take a teaspoonful every 2 or 3 hours, for little children and people who have difficulty in breathing leave out the alcohol, for babies under 1 year, if possible use sugar instead

1 part lemon juice

1 part gin or run.

10.11.5. Arthritis : painful, inflamed, joints

Home management

- Rest: if possible / avoid hard work and heavy exercise that bother the painful joints.
- Place cloths soaked in hot water
- Boil water and allow it to cool until you can just hold your hand in it.
- Fold a clean cloth so it is slightly larger than the area you want to treat, wet the cloth in the hot water and squeeze out the extra water.
- Put the cloth over the affected skin
- Cover the cloth with a sheet of thin plastic or cellophane
- Wrap it with a towel to hold in the heat
- Keep the affected part raised
- When the cloth starts to cool, put it back in the hot water and repeat.

10.11.6. Fits (Convulsions) : We say a person has a fit when he suddenly loses consciousness and makes strange, jerking movements (convulsions)

Causes for fits

- High fever
- Severe dehydration
- Meningitis
- Cerebral malaria.
- Poisoning
- Epilepsy

Home management

- Try to keep the person from hurting himself
- Move away all hard or sharp objects.
- Put nothing in the person's mouth while he is having fit no food, drink, medicine or any object to prevent biting the tongue.
- After the fit the person may be dull and sleepy. Let him sleep.
- After woke-up taking her/him to doctor.

10.11.7. Tooth aches

Home management

- Clean the food particle from the tooth wall.
- Rinse the mouth with warm salt water
- If the tooth infection is severe (swelling, pus, large tender lymph nodes) refer to the dentist.

10.11.8. Constipation: A person who has hard stools and has not had a bowel movement for 3 or more days is said to be constipated.

Causes

- Poor diet intake
- Not eating enough fruits, green vegetables or foods with natural fibres .
- Lack of exercise

Home management

- Drinking more water 2 liter / day.
- Eating more fruits, vegetables and food and natural fiber (whole grain bread, carrots, raisins, nuts, pumpkin, wheat bran)
- Exercise
- Regular bowel movements.

10.12. EXTENDED ROLE OF HOME NURSE:

The various extended role of nurses are there in home nursing. They are used in follow-ups of various disease conditions and surgeries. They are

- Pneumonia
- Laryngectomy
- Pulmonary tuberculosis
- Cardiac surgery
- Bronchial asthma
- Mastectomy
- Coronary artery disease
- Client with casts
- Diabetes mellitus
- Ostomy such as gastrostomy
- Hypertension
- Ortho surgeries
- Anemia
- Arthritis
- Blindness
- Cancer
- Cerebro vascular disease
- Mentally challenged conditions
- Epilepsy / fits

The various extended role of home nurses in generally on the aspects of

a) Activity / rest

b) Circulation

c) Elimination

d) Food and fluids

e) Hygiene

f) Monitoring / surveillance

g) Safety

h) Ventilation

a) Activity and rest: In activity and rest the nurses role is on

- Active and passive range of motion exercises
- Body mechanics
- Low back pain exercises
- Post Mastectomy exercises

Active and passive range of motion exercises: They are those that take the body joints through their extent of movement. Their purpose is to maintain joint function and muscle tone. Ranges of motion exercise are categorized according to the independence of performance.

- Active range of motion exercise: Those performed independently by client.
- Assisted Range of motion exercise: Those the client can partially perform but requires some assistance for the whole performance.
- Passive range of motion exercise: Those exercise the client is unable to perform and that requires total assistance from another person.

The nurse role is to teach the client and family to

- Perform each exercise accurately
- Perform the exercise consistently
- Integrate the exercise in other daily activities such as bathing. Watching television, or playing games.

Body mechanics: The term body mechanics refer movements used to lift and move. Objects or person in a manner that is efficient and preventive of muscle and or back strain. Family members caring for client in the home are often required to perform. Lifting maneuvers or other movements requiring good baby mechanics to ensure safe and efficient use of muscle groups.

The home nurse should teach the client and family to

- Develop an awareness of good body alignment
- Lift, push and move with least expenditure of energy
- Push rather than pull

- Push or pull rather than lift.
- Carry objects close to the body
- Engage in moderate
- Exercise program to develop strength and flexibility

Low back pain exercises: The complaint of low back pain is commonly occurring one. Most low back pain occurs after injuries and in process of normal aging. The prevention of back strain is primarily controlled by posture and daily exercise program designed to build strong and support to back muscles. It is therefore requires persistence and daily motivation on the part of the client and family support if the exercise program is to be successful.

Post mastectomy exercise: The purpose of post mastectomy exercise is to strengthen the muscles of arm and shoulder on the affected side. Exercise usually begins within 24 hours after surgery and continued throughout rehabilitation phase. The goal is to develop muscle use. On the affected side to the preoperative side. The nurse should teach client to perform exercise, discontinue in excess pain and consistently wear prosthetic device.

b) Circulation: In circulation the home nurse should emphasize on

- Basic life support
- Permanent pace maker

Basic life support: The techniques of basic life support are similar whether resuscitating child or adult. Whether there are one or more rescuers at the scene. The home health care nurse should perform CPR in case of emergency.

Care of client with permanent: People who have permanent dysfunction of normal cardiac conduction system and whose conditions cannot be controlled by drugs may be the candidates for the insertion of permanent pacemaker. More commonly the pacemaker is inserted for people with heart rates too slow to maintain an adequate cardiac output. The home nurse should check for 12 ECG when necessary

Monitor reports of pacemaker telephone evaluation for indication of pacemaker malfunction.

c) Elimination: The aspects of eliminative home nursing care are

- Providing assistive devices
- Bladder training program (incontinence)
- Bowel training
- Enema administration
- Care of indwelling catheter
- Ostomy care
- Supra pubic catheter care

Providing assistive devices for elimination: The bedpan and urinals are devices used to collect feces and urine. They are used in home primarily for clients who are unable to ambulate to toileting facilities. The placement of bed pan, urinal and evaluate the body alignment of the client should be observed. The sacral area, perineal area and rectal area should be taken care.

Bladder training programme (incontinence) : The term urinary incontinence refers to inability of external urethral. Sphincter to control the urinary flow from the bladder. A bladder training program consisting of exercise of sphincter to reduce the frequency of urinary incontinence. The program is lengthy one. Motivation, persistence and family support are essential to the success of the program.

Bowel training: Bowel incontinence results from inability to control the aual sphincter muscle in relation, to urge to defecate. Thus in turn is often related to an impairment of sphincter itself or to the neural mechanism, controlling it. Many of the movements can be assisted to regain bowel control through a systematic program of bowel training exercises performed regularly and consistently.

Enema administration: The administration of an enema introduction of solution to rectum ad sigmoid colon. With the solution returning by normal or artificial mean. An enema is used for the following purpose.

- To remove fecal matter or gases from bowel.
- To stimulate peristalsis in lower bowel.
- To decrease the body temperature.
- To introduce medication into gastrointestinal system

Care of the indwelling catheter: Indwelling catheters that are inserted directly into the bladder through the urethra or through an artificial opening in the abdominal wall.

The home care nurse should

- Make periodical visit to evaluate quality of care of the catheter and cleanliness of insertion site.
- Periodically urine should be collected for analysis.
- The nurse should observe family member or client to irrigate the catheter.

Ostomy care: The term ostomy refers to surgical diversion of waste products through artificially created opening on the abdominal surface. The term stoma refers to artificially created opening in the bowel system. Ostomy care relates to the care of stoma , irrigation procedures if ordered. Cleansing of equipment for odor control. In addition, the client and family often require assistance with body image adaptations.

Suprapubic catheter: A suprapubic catheter is inserted in to bladder through a permanent opening that has been surgically crated to create a alternate path of urine from the bladder. A retention catheter is inserted in to the opening which is usually located midway between pubic bone and umbilicus. The urinalysis should be done. Periodical inspection of stoma and skin should be carried out.

d) Food / Fluid: The food and fluid aspects in home nursing care includes

- External feeding tube insertion.
- Infant Nutrition
- Tube Feeding

External Feeding tube insertion: For people who require long term nutritional support, external feeding is an option if there is healthy absorptive tissue in the gut. They are less expensive and have fever complications than human parentral nutrition. The person will require intubation unless a surgical opening such as gastrostomy has been made for feeding purposes. The size of the tube selected should be smallest through which the feeding will flow. The bolus feedings are administered for clients with head and neck problems.

Infant Nutrition: The sucking and swallowing reflexes are present at birth. Feeding time meets the infant need for closeness and tactile stimulation. After the 2nd month of life, the infant begins to equate mother with food. Feeding schedule varies. The newborn usually feeds about 5 times a day and should soon sleep through the right. After age 3 months, the infant will be able to swallow with less tongue protrusion.. At this age, the infant will recognize the bottle as source of food and will not readily accept a cup. Feeding the infant should fit in to everybody schedule of the family. A major goal of home care is to provide the family with confidence to meet the nutritional needs of infant with minimum of disruption to normal routine.

Tube feedings: Because of escalating health care costs and changes in third party payment for hospitalization, many people and candidates for home nutritional support programs. Some categories of malnutrition occurs in connection with many health problems including anorexia, malabsorption. Protein calorie malnutrition leads to problem with cell mediated immunity and delayed wound healing.

e) Hygiene: The home care aspects in hygiene are:

- Baths
- Douche
- Eye care
- Ear care
- Foot care
- Oral care

Baths: Bathing is used to cleanse the body of dirt and debris that accumulates due to direct contact and elimination of waste through the skin. There are three types of baths for the client who is confined totally or partially to bed, the complete bed bath in which client is completely bathed in the bed, the abbreviated bed bath during which only the parts of the clients body, if neglected might cause illness, odor an discomfort are washed such as face and axilla.

Douche: Douche involves irrigation or flushing of the vaginal canal. It may be done to cleanse and disinfect the vagina and adjacent parts or to apply medication to relieve discomfort. It is used to reduce offensive odors arising from the vaginal area. The effectiveness of a medicated douche may be assessed by observation of the progress of the condition in which douche was given.

Eye Care: The eye , the organ of vision is extremely sensitive and susceptible to trauma and infection. The eyelids are protective moveable sheath of tissue located inside the eyeball. Eye care may involve application of medicated drops of ointments , application of a path or compresses or irrigation to remove foreign particles and treat infection.

Ear Care: The ear is not only important for hearing. It is also involved in balance and equilibrium. The glands lining the auditory canal secrete a waxy substance called cerumen. The mucous membrane that lines the middle ear is continuous with that of pharynx. Thus it is possible for infection to travel along the mucous membrane from the nose or the throat to the middle ear. If the family need to do the ear irrigation, observe the techniques and do the suggestions if needed.

Foot Care: The feet of ill bed ridden clients are easily susceptible to infection and other problems because the feet are farther from the heart than any other body part, they are most compromised by vascular conditions that interfere with normal circulation. Those conditions that generally affect bed ridden client include foot drop, intermittent claudications, ulcers and gangrene. Foot drop is a deformity in which the foot is extended abnormally at the ankle in the direction of the sole of the foot. Intermittent claudication is a severe pain in the calf muscles caused by inadequate circulation. It usually occurs during walking, but subsides with rest. Ulcers and gangrene are common side effects of diabetes. They occur because of inadequate circulation to the foot which retards natural healing process.

Oral Care: Cleansing of the mouth , teeth and gums is important to maintain the client's sense of well being as well as to prevent tooth decay and infection. Saliva is an important mechanical and chemical cleanses of the mouth. It combines with food particles which aids in digestion. Dental caries are the areas of localized destruction of tooth tissue by bacterial action. Demineralization of surface enamel ultimately causes destruction of dentition and pulp of the tooth. Caries are actually caused by acid production by bacteria which forms colony on the tooth surface.

f) Monitoring and surveillance:

The aspects of home health care which comes under monitoring and surveillance are

- Neurological signs evaluation.
- Urine glucose testing.
- Vital signs.

Neurological Signs Evaluation: Neurological evaluation of the client can be obtained by objective and subjective data that are gathered through series of tests and evaluation techniques. The neurological status evaluation may be indicative of deteriorating condition or assessment of cognitive state. This is particularly important in home when traumatic injury is evaluated on when progressive neurological involvement may be side effect of medication therapy.

Urine glucose testing: Urine glucose testing is used to assess the status of person's diabetic condition. Diabetic results from body's inability to utilize food efficiently. When food is digested, it is broken into glucose, which is stored in liver and muscle tissue in the form of glycogen. Insulin facilitates the storage process. Diabetics do not produce sufficient insulin: therefore blood glucose levels rise to abnormally high levels. The normal fasting level of blood glucose is approximately 60 mg/dl to 115 mg/dl. Glucose does not appear in urine until the blood level reaches 180 mg/dl. Therefore, urine glucose level may be interpreted as reflection of actual blood glucose level.

Vital signs: Measurement of vital signs is done. To assess the physiological status of the client in relation to those vital canters of the body those are necessary to sustain life. The vital sign

indicators are temperature, pulse, respiration and blood pressure. The temperature may be taken by oral, rectal or axillary route. The pulse may be measured by palpation, on auscultation of chest area; blood pressure is measured by means of sphygmomanometer.

g) Safety: The home care which comes under safety is

- Cast care
- Crutch walking
- Decubitus and pressure area care
- Hot and cold application
- Insulin injection
- Intravenous therapy
- Oral administration of medication
- Traction
- Wound care

Cast care: Cast care applied to provide immobilization of an extremely and or joint following inference causing fractures on sprains to correct structural defects. Casts can be applied to only one part of extremely or can be extensive as a body cast. Traditionally casts were made of plaster of paris.

Crutch walking: Crutches are mobility aid of choice, when the client has

- Leg impairment that prevents fall having on the leg.
- Sufficient upper body and arm strength to properly use crutches.
- Relativity good sure of balance and coordination

The appropriate gait to be taught depends on the amount of weight bearing capability the leg can sustain. The appropriate gait will have to be taught to be client.

Decubitus and pressure area care: A decubitus ulcer also known as pressure sore or a bed sore is a circumscribed area in which cutaneous tissue has been destroyed. The destruction is caused by a restriction of blood flow to the area from excessive or prolonged pressure. Most common sites of pressure some are over bony prominence between folds of flesh in above clients. Decubitus ulcer is potential problem of the immobile. Those particularly at risk an elderly, obese, emaciated and the paralysed.

Hot and cold applications: Hot and cold applications are applied to the clients in order to change the tissue temperature locally on systematically for a therapeutic purpose.

Insulin injection: Since the major diabetes is thought to be the lack of inadequate use of insulin diabetic therapy often includes the use of insulin, in addition to dietary and exercise control. If the diabetic has little or no insulin production, capability in the pancreas, insulin is administered. The client family will be primarily responsible for performing the procedure on a daily basis. The injection should be performed with aseptic technique.

Intravenous therapy: Because of recent changes in health care industry encouraging early discharge from hospital, increasing number of clients requires (IV) therapy at home. Home

IV therapy can provide additional fluids and electrolytes selected, nutritional supplements, on a route for medications. Insertion of IV cannula and initiation of the infusion will usually rest with the how health nurse.

Oral administration of medications: Oral administration of medications is the least expensive and the most convenient method for clients in the home physiologically oral route is safest one. Drugs are given sublingually. Usually are intended to be absorbed in to blood vessels of the underside of the tongue. Those given basically act locally on the mucous membrane or systematically in the saliva.

Traction: Traction is applied for the purposes of immobilization and the application of force to a body part usually an extremity. Traction is used to prevent movement of a body part to decrease muscular strain, to full fractured or displaced bone in to connect alignment or prevent skeletal deformities.

Wound care: A wound is a break in the integrity of body tissue. It may be internal or external. Wounds may also be contaminated or infected. The goal of wound care is to prevent infection and hasten healing.

h) Ventilation: The home care of the ventilation aspects are

- Oxygen administration
- Suctioning

Oxygen administration: Oxygen is commonly administered in the home who require supplemental oxygen for respiratory problem such as chronic obstructive pulmonary disease.

The equipment should be maintained check nasal mucosa for irritation of using nasal prongs.

Suctioning: Surgical procedures, pain and chronic medical problems such as muscular dystrophy reduce the clients' ability to cough effectively. A laryngectomy on tracheostomy will facilitate suctioning the trachea but more potential for respiratory infection. Endo-tracheal suctioning may be requiring if the person cannot mobilize suctions and does not have artificial airway in place. The technique requires more skill and usually performed by home health nurse.

10.13. COUNSELING SERVICES IN HOME HEALTH CARE

The counseling program provides intensive. Counseling services to families in the comfort of their own home. The families typically have children between the ages of 5 and 21 who are showing behavioral on emotional concerns. The services recognize each family individual strengths and work with partners to achieve goals. Commonly addressed Issues include

- Anger management
- Anxiety and depression
- Alcohol and drug abuse
- Child discipline techniques
- Couples conflicts
- Different behavior such as violence
- Grief and loss
- Parent / child conflicts

Counseling sessions may include whatever combination of members the family feels is important to achieve their goals. The length of the treatment depends on family's unique needs.

10.14. ADVANTAGES OF HOME HEALTH CARE

- Home health care offers many advantages to patients, particularly older adults.
- Patients recuperating from acute illness / accident recover faster in a home environment
- Home can gives an older adult a some of independence by offering an important measure of control over day to day events.
- Home care improves quality of care provided and increased patient satisfaction.
- Home care is of low cost.

10.15. Disadvantages of home health care

- The person who is simply too ill or complex to be cared at hospitals.
- Home environment may be unsafe.
- There is shortage of home can providers (especially nurses)

Summary

- Home nursing is that component of a continuum of comprehensive care where by health, social and support services are provided to individuals and families in their paces of residence and in the community.
- Home care was formerly defined as simply providing physical care to the sick in the homes. This had a major development.
- The purposes of home nursing are the prevention of disease and provision of treatment.
- Home health care services include medical and dental care, pharmaceutical services physical therapy, occupational therapy, nutritional advice, medical equipment and supplies provision.
- The components of home care are skilled nursing. Physical therapy, speech and language therapy, occupational therapy, medical social services.
- Outreach is an effort by individuals in an organization on group to connect its idea and practices to the efforts of other organization, group, specific audiences or general public.
- Community based rehabilitation is a strategy within community development for the rehabilitation, equalization of opportunities and social inclusion of all people with disabilities.
- The extended role of nurse is generally on activity / rest, circulation, elimination, food and fluid, hygiene, monitory / surveillance, safety, ventilation.

QUESTIONS

I. Choose the correct answer

1. When person's body temperature is too hot, it is called

   a) Fever b) Chills c) Headache d) Vomiting

2. When person has passed loose or watery stool it is called

   a) Constipation b) Diarrhea c) Dysentery d) Fever

3. The home health care services include

   a) Medical care b) Pharmacy

   c) Social services d) All the above.

4. Outreach is the effort by individual in are organization or group connect its idea or practices to the efforts of

   a) Other organization b) Some organization

   c) All the above d) None of above

5. Palliative care is any form of medical care that concentrates on

   a) Reducing severity of disease b) Curing disease

   c) Increasing severity of disease d) None of the above

6. The characteristics of rehabilitation is

   a) Empowerment b) Commitment

   c) Containment d) None of the above

7. The principle of community based rehabilitation are

   a) Utilization of available resources b) Procuring on more resources

   c) None of the above d) All the above

8. The eye care can be provided by

   a) Ointments b) Hot compression

   c) Water irrigation d) All the above

9. The needs to be considered in home management is

   a) Felt needs b) Real needs

   c) All the above d) None of the above

10. The home mix rehydration drink can be prepared by mixing

    a) sugar and salt b) sugar and tender coconut water

    c) salt and tender coconut water d) tender coconut water

11. The severe throbbing headache occurs on one side of head only is

    a) migraines b) cold c) flue d) none of the above

12. The common virus infections that cause running more, some throat and some times fever or pain in joints

a) common cold b) diabetes c) hypertension d) none of the above

13. The painful inflamed joints is called

a) Arthritis b) peritonitis c) cystitis d) none of the above

14. When a person suddenly losses consciousness and makes strange jerking movements we call it as

a) Typhoid b) fits c) malaria d) swine flu

15. For client with toothache, We can advise to rinse the mouth with

a) plain water b) warm salt water c) ice water d) none of the above

16. When a person passes frequent stools, it is said to be

a) diarrhoea b) fever c) constipation d) fits

17. The care which meets the standards of home health practice certification and accreditation is referred to as

a) quality care b) quantity care c) self care d) none of the above

18. The role of nurse in extended home care in activity / rest includes

a) exercises b) feeding

c) catheter care d) oxygen administration

19. The exercise which is performed independently by client

a) active exercise b) passive exercise

c) all the above d) none of the above

20. The devices which are used to collect feces

a) bed pan b) urinal c) bed rest d) none of the above.

II. Fill in the blanks

1. The form urinary incontinence refers to inability of _____ to control the urinary flow from the bladder.
2. Enema is used to remove _____ from bowel.
3. Indwelling catheter are tube that are directly inserted into bladder through _____ or artificial opening in the bladder.
4. The term ostomy refers to the surgical diversion of _____ through artificially created opening on the abdominal surface.
5. Feeding time meets the infant need for _____ and tactile sensation.
6. _____ in which client is completely bathed in bed.
7. Douche involves _____ of the vaginal canal.

8. The condition which generally affect bed ridden client in foot is _____ _____
9. _____ is an important mechanical and chemical cleaner of mouth.
10. Urine glucose testing is used to even the status of person's _____ condition.

III. Write short notes

1. Write down about historical overview of home nursing?
2. Describe the principles of home health care?
3. Explain about the health education of the family on the care of aged?
4. Illustrate about rehabilitation services in home nursing?
5. Explain home management of diarrhea?

IV. Write in detail

1. Discuss the extended role of nurse in safety of the client in home care?

11. ADMINISTRATION OF MEDICINE

Clients with acute or chronic alterations in this health may have to use a variety of medications. The role of nurse in the administration of medication has become increasingly complex and diversified. Administrations of correct medication and dosage by the specified route using proper technique and taking appropriate precautions were once all that was expected of a nurse. Administrations of medication are a basic nursing function that involves knowledge and skill. The safe and accurate administration of medication is one of the most important responsibilities of a nurse.

11.1. BASIC KNOWLEDGE REGARDING DRUGS

- Name of the drug
- Classification
- Route and time of administration
- Principles of drug action
- Dosage
- Medication standards
- Types and forms of drugs
- Source of information distribution
- Medication order
- Prescription and non-prescription medication
- Weights and measures used
- Preparation of solutions and calculations of fractional dosage
- Storing of medications
- Factors affecting safety in the administration of medications
- Abbreviations and symbols used
- Rules of administration of medicine
- Legal aspects of medication administration nurse practice acts
- Institutional medication policies
- Client's rights
- Substances abuse
- Nurse's role is administration of medication.

11.2. DRUGS AND MEDICATIONS

A drug is any substance that alters physiological function with the potential for affecting health.

Medicine may be defined as a substance used to promote health, prevent ill ness, to diagnose. To alleviate or cure disease

A medication is a drug administered for its therapeutic effects. Thus all medications are drugs, but not all drugs are medications.

11.2.1 Names of the drugs (nomenclature)

Drugs may be known by several names

11.2.2. Chemical name

Chemical name is the name by which a drug is known to the chemists usually it indicates the ingredients of the drug

It identifies the molecular structure for example, the chemical name of the anti- inflammatory agent ibuprofen is 2-4 (iso- butyl/ phenyl/) propionic acid

11.2.3. Generic name or non proprietary name

Generic name is the name assigned by the manufacturer who first developed the drug and is assigned by the united states adopted names council.

Generic name is derived form the chemical name.

(examples) morphine sulphate, ibuprofen

11.2.4 Official name

Official name is the name by which the drug is identified is the official publications

For example, BP (british pharmacopoeia)

USP(United state pharmacopoeia) .NF(National formulary)

Official name is the name by assigned by the food and drug administration(FDA)

11.2 5. Trade name (or) brand name (or) proprietary name

Trade name is the registered name assigned by the manufactures and is copy righted

Brand names are nouns with the first letters capitalized and marked with a circled R[O] For example. Paracetamol (chemical name) have different trade names such as crocin, calpol, ifimol, metacin etc.

11.3. CLASSIFICATION OF DRUGS

11.3.1 Types and Forms of Drugs

Drugs may be classified in several ways, awarding to their chemical composition. Therapeutic effects body systems, their purpose and uses by the symptoms relieved by the drug etc.

Classification of drugs according to their action

Analgesics : Drugs used to relieve pain

Anaesthetic : Drugs causes loss of sensation

Anti helminthic and

Vermifuges : Drugs which destroy and expel worms

Anti Pyretics: –Drugs which reduce fever

Antidotes: Substances used to counteract the effects of poison.

Anti – infective : Act either to inhibit, kill and retard the growth of micro- organisms.

Anti – inflammatory : Those help to reduce inflammation

Anti – coagulants : substances which inhibit or decrease the blood clotting process

Anti – histamines: The agents which block the effect of the histamines.

Antacids : Substances that react with hydrochloric acid to

Decrease The activity of gastric secretions.

Anti – convulsions: Prevent or treat convulsions

Antibiotics: products of living micro- organisms that have ability to destroy the growth of micro – organism.

Anti-diarrhetics : used to treat diarrhoea

Anti tussives: Inhibit the cough reflex

Anti –asthmatics: Drugs which provide symptomatic relief of asthmatic attacks

Androgen : Hormones secreted by the testis by the adrenal cortex

Ant pruritis : A drug that relieves itching

Anti:-phlogistic: To prevent the progress of inflammation.

Antiseptic : A substances that inhibit growth of bacteria.

Anti fungal (antimycotic)) : Drugs which prevent the growth of fungi

Antispasmodics : agent that relieve spasmodic pains

Antiemetics: Relieve or preventing nausea and vomiting.

Anti- tubercular : The specific drugs used in the treatment of tuberculosis

Anti rheumatic : Drugs used to treat rheumatism

Astringent : Drugs that cause the contraction of tissue and arrest discharge

Bronchodilators : Medicines which relax muscles of the bronchioles

Bitters : A class of chemically bitter tasting substances.

Biologicals : Medicine preparation of a complex biologic nature belong to the group of silagogue.

Coagulants: Drugs that help in the clotting of blood.

Carminatives: Drugs which cause expulsion of gas from the stomach

Cathartics : Drugs used to cause intestinal evacuation

Cholagogues : Drugs which are used to increase the amount of bile secretedionttico-steroids : Hormonal drugs extracted from the adrenal cortex

Caustics : Cretio that are destructive to living tissue .

Diaphonetics : Drugs used to induce perspiration.

Diuretics : Which increase the flow of urine

Demulcents : Substances that soften, soothe and protect mucus membrane.

Detergents: A cleansing agent.

Digestants: Agent that promotes digestion.

Emetics : Drugs that produce vomiting

Ecbolics or oxytocics: Drugs that stimulate uterine contraction.

Expectorants : Increase the bronchial secretion.

Emnagogues : A drugs that stimulates or favours the menstrual discharge.

Emollient : Substances that soothen, soften and protect the skin.

Galactogogue : Substances increase the flow of milk

Hypnotics: Drugs that produce sleep

Haemostatics : An agent that check haemorrhage.

Hypotensive: Substance cabable of lowering blood pressure.

Hypoglycaemics: Drugs lower the blood sugar level

Haematinics : Agent which tends to increase the haemoglobin content of blood

Hormones: Substitutes for body hormones.

Inotropes : Drugs that strengthen cardiac output

Keratolytis : Drugs which softens the horny layer of the skin

Mydriatics : Dilate the pupil of the eye

Myotics: Contract the pupil of the eye

Muscle relaxants : Agents used for diminution of tension

Nasal decongestants: Drugs which produce shrinkage of the engorged nasal mucosa and relieve the nasal congestion.

Narcotics : A drug that produces stupor of complete insensibility

Scabicides : Anti – infectives used in the treatment of scabies.

Stypics :- An agent that check haemorrhage.

Sedative expectorants: Drugs which lesson paroxysmal cough

Stimulant expectorant : Drugs used to increase the bronchial secretion .

Sulphonamides: Antibacterial drugs which have a chemical resemblance

Sedatives: Substances lessen the body activity

Stimulants: Increase the functional activity of an organ or system.

Specific: Have a specific curative action in certain disease.

Stomachics or gastric tonics : Drugs which increase appetite.

Tranquillizers: drugs which principal effect is to calm nervous, anxious, encited or disturbed.

Urinary antiseptics : inhibits the growth of bacteria in the urinary tract.

Vasicanis: A blistering agent.

Vermifuges: A drugs that expels worms or intestinal parasites.

Vasodilators: Drugs which dilate the blood vessels.

Vasoconstrictors: Drugs that cause constriction of blood vessels.

Classification of drugs (To promotes the functional health patterns)

Health Pattern	Class of drugs
Activity and Exercise	Antihypertensive Antiarrhythmics Inotropes Antianginals Anticoagulants Bronchodilators
Nutrition and Metabolism	Antibiotics Antiemetics Antacids Insulin Corticosteroids Thyronine, Vitamins and Minerals
Elimination	Laxatives Antidiarrhoeals Diuretics
Sleep, rest, cognition and perception	Sedatives, hyphotics, analgesics, Antipsychotics
Coping and stress tolerance	Anti-anxiety agents. Anti-depressants
Sexuality and reproduction	Ovarian Hormones (provide hormones replacement, helps in birth control)

Drugs forms

Medications are manufactured in a variety of forms or preparation to make them.

Common forms for drug preparation

Form Preparation	Description
Aqueous solution	One or more drugs dissolved in water
Aqueous suspension	One or more drugs finely divided in a liquid such as water
Tablet	Tablet coated with gelatin that gets dissolved in stomach.
Capsule	Powder or gel form of drug encased in a hard or soft outer casing that dissolves in t to stomach.
Elixir	Drug dissolved in a clear liquid containing water, varying amounts of alcohol.
Emulsion	Drug in which one liquid is spread by means of small droplet.
Enteric – coated tablet	Tablet coated with a substances that blocks absorption
Extract	Concentrated preparation of a drug from vegetables or animals
Fluid extract	Alcoholic liquid extracts of drugs made by percolation
Glycerite	Solution of drug combined with glycerin for external use contains atleast 50% glycerin
Intraocular dish	A small flexible oval consisting of two soft outer layers and a middle layer containing medication when moisten by ocular fluid.
Liniments	Mixture of drugs with oil, soap, water, alcohol that is applied on the skin
Lotion	Drugs in liquid suspension intended for external use
Lozenge or troche	Drugs in a flavoured or sweet base.
Mucilages	Aqueous preparations containing viscous substances such as gums and starches.
Ointment (Salve)	Semisolid preparation of a drug in petrolatium
Paste	Semisolid Form of a drug, thick and stiff than the ointment, that is applied to and observed by skin.
Patch (transdermal)	Drugs encased in a manufactured material that allows continous drug absorption through the skin at a steady rate.

Pill	Drugs in a powder form mixed in a cohesive material
Powder or granules	A finely ground form of a drug or drugs.
Plaster	Solid preparation used as a counter irritant or as an adhesive externally
Poultice	Soft moist preparation that supply moist heat to the body, used externally.
Solution	Liquid preparation containing one or more substances completely dissolved in a solvent.
Suppository	A drug of several drugs mixed in a firm base such as glycerinated gelatin and shaped for insertion into the body cavity.
Suspension	Undissolved particles or powder placed in a liquid
Sustained release	Solid dosage form that contains small particles of the drug coated with material.
Syrup	Drug dissolved in a solution containing water and sugar
Sponsule	A drug made up in a capsule in such a way that there is slow release of its contents.
Spirits	A concentrated alcoholic solution of volatite substance. Also known as essence.
Tablet	Solid drug that is compressed or moulded into a particular shape and may be swallowed whole.
Transdermal disk or patch	Medication contained within semipermeable membrane, disk or patch which allows medication to the absorbed.
Water	Saturated solutions of volatile oils
Tincture	Alcoholic (or) hydro alcoholic solution prepared from drugs and derived from plants

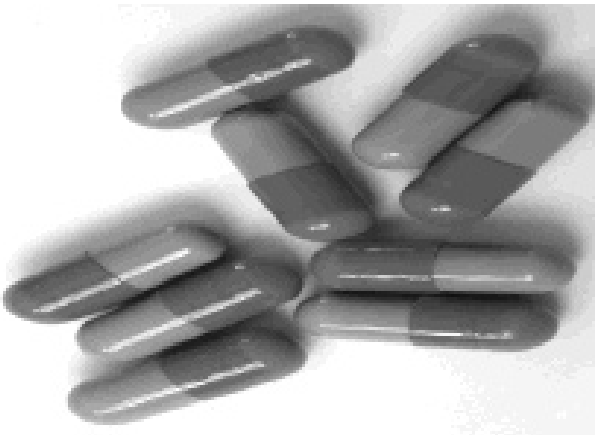


Fig. 11.1. Capsules

Fig. 11.2. Tablets

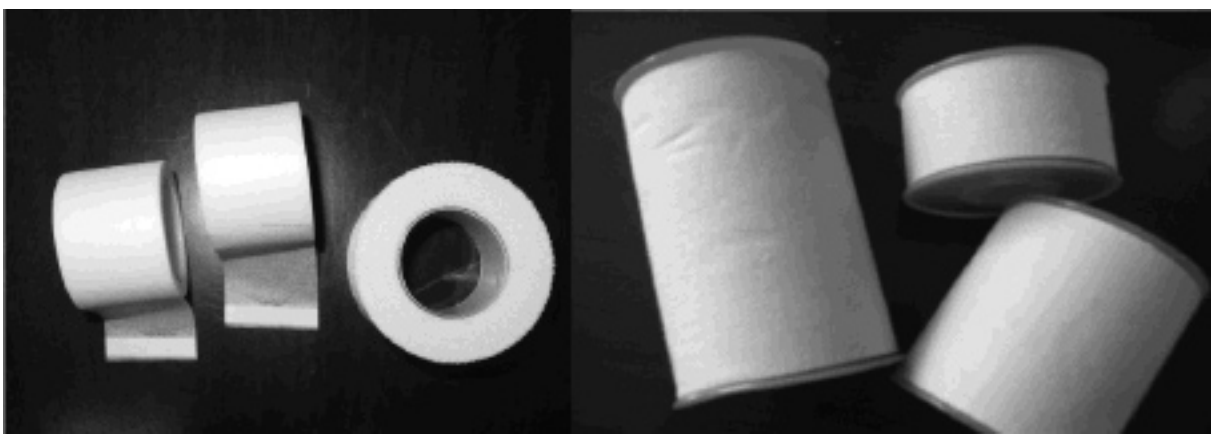


Fig. 11.3. Plaster

Fig. 11.4. Ointment

Fig. 11.5. Syrup

11.4. SOURCES OF INFORMATION ABOUT MEDICATIONS

A fundamental rule of safe administration of a drug is "never administer an unfamiliar medication."

a) Printed materials

Number of books are written and published from which general information can be obtained. Detailed information available from source such as American hospital formulary service drug information. (AHF SDI).

b) People

Certain key people are good sources of drug information.

Physicians who prescribe the particular drug and others experienced nurses, pharmacists and pharmaceutical, sales representatives and some of representatives and some of the key persons.

c) Computer –based resources

Resources which are based on computers are also available for drug reference.

d) System of medication distribution:-

Four types of system are used to ensure the safe storage and administration of medications.

1) The stock supply
2) Unit dose supply
3) Automated medication dispensing system
4) Self administered supply.

1). The stock supply

In this system large, Quantities of frequently prescribed medications are provided in a client care are which are stored in locked cupboard in a storage room.

Individual doses are administered to clients in that particular unit by Nurses.

2). Unit dose

In this system the pharmacy of manufacture does the prepackaging are prelabelling of the individual client dose

The individual unit dose is a prescribed amount of medication dispensed at a specified time

e) Automated medication dispensing system:-

This machines usually contain a combination of medication frequently used in a unit. (so that newly ordered medications can be immediately administered) .

This system help to keep an account of all medications used for billing and controlled substance for record keeping.

f) Self administer medication

In this each client is supplied with his/her prescribed dose and quantities for a given period.Each medication is supplied in a separate container and is used only for one client medication.

g) Medication order :

Components

1. **Client's name :** A client first name must be written with the medication order to avoid confusion between two client with same name.

2. **Identification of medical number**

3. **Medication name :** Use generic or trade name the name should written clearly because of similar spelling for many medications. Yet there are different drugs.

4. **Amount and dosage :** Dosage can be written using the metric apothecary or household measurement systems

The strength and frequency of the dose can also be indicated (eg; Inj Dexamethazone 4 mg twice a day)

5. Rouites of administrations : Many medications can be administered by several routes. Eg. Oral, intramuscular, intravenous. So route must be specified.

Non- prescription medication : Many medications are available without specific written orders from a health care providers as they are thought to the safer for use with medication of nursing supervision they are sold over the counter. Food and drug administration maintains control over the safety effectiveness and adversing of non-prescription medication.

Prescription Medication : A prescription is a legal order for the preparation and administration of a medication certain medication requires medical supervision because of dangerous side effects.

Usually prescription is given by a physician and in some countries nurse Practitioners may give prescription.

b.d (b.i.d)	Bis in die	twice a day
t.i.d (t.d.s)	ter in the die	Three times a day
q.i.d.	quarter in die	four times a day
stat	statim	at once
rep	repetatur	repoat
h.	hora.	Hour.
Q	quaque	every

Abbreviation used regarding preparation of the drug.

Abbreviation	**Derivation**	**Meaning**
Aq	aqua	water
Aq. Dist	aqua Distillate	Distilled water
Comp	compositum	compound
Dil	dilutis	dilute
Et	et	and
Fl	fluidium	fluid
Inf	infusum	infusion
Empl.	Emplastrum	plaslca
Lin	linementum	liniment
Liq	liquer	liquid
Lot	lotio	lotion
Mist	mistura	mintura
Ol	okeum	oil

6. Signature of the health care provider

Important since it is legal document an unsigned order is invalid

7. Date and Time of the writing prescription.

8. Use of abbreviations:-

Abbreviations are commonly used use only standard abbreviations which indicate the amount and frequency of a meditation dosage.

Abbreviations used regarding time of administrations

Abbreviation	Derivation	Meaning
a.c	ante cibum	before meals
p.c	post cibum	after meals
a.m	ante meridiem	before moon.
p.m	post meridiem	after noon
alt.die	alternis diebus	Alternate days
o.d	omni mane	Daily (once a day)
o.m	omni mane	Each morning
o.n	omni note	Each night
h.s	hora somni	At bed time
h.n	hac note	tonight
c.m	cras mane	tomorrow morning
p.r.n	pro-re-nata	when required
so.s	si opns sit	if necessary

Abbreviation used regarding the route

Abbreviation	meaning
Ad	right ear
As	left ear
Au	each ear
H	hypodermic
Im	intramuscular
Inj	injection.
Iv	intravenous.
Ivp	intravenous push
Rx	take prescription
Op	right eye
Sc	subcutaneously
Sq	subcutaneous

Os	left eye	
Ou	both eye	
Por p	by mouth	
Per os po	after, por	
Ec	enteric coated	
Elix	elixir	
Ext.	external	
Os	mouth	
pil	pilula	pill
pulv	pulvis.	Powder
sp	spiritus	spirit
syr	syrupus	syrup
trltinec	trinctura	tincture
ung	unguentum	ointment
inj	injection	injection

Hours of Administration

Q4H every 4hours (6 times a day) 8-12-4 10-2-6 (or) (or) 10-2-6

Q6H Every 6 hours (4 times day) 6-12 (or) 10-4

6-12 10-4

T.D.S thrice a day (3 doses) 8-2-8

B.D twice a day (2 doses) 8-8

O.D once a day (1 doses) 8000 p.m

H.S At bed time 8 p.m

Q8H every 8 hours (3 doses) 6-2-10 or 8-4-12

Q12H every 12 house (2doses) 8-8 or 10-10

Alt h alternate hours every three hours

.qh every hours every one hours

D day every two hour

Qod every other day night

Weights and measures:-

Unit approximate value

1Dram = 60 minims 1 once =30 grams

= 60 grains 8 teaspoonful

= 4 grams 480 grains

= 4ml (cc) 8 drams

=1 tea spoonful 25ml (cc)

1 litre =1000ml **1 tablespoon** = 4drams

=40 ounces = 4tsf

=2 pints = 15 ml (cc)

=1quart =1/2 ounces

1 gram =1000mgm **1 teacup full** = 6 ounces

= 15 grains = 150 ml

1gram = 60mgm **1 glass full** = 8 ounces

1cc = 1ml =200ml

= 15 minims

1 minim =1 drop **1meter** = 39.4.inches

1 pint =20 ounce = 1.1 yard

=500ml cc) =100 cm

1 pound =480 grams **1cm** = 10mm

=16 ounces **1km** =100m

1kg =1000 grams **1km** =0.6 mile

=2.2tbs **1 mile** =1.6 km

1mgm =1000 mcg **1 foot** = 12 inches

=30 cm

1 gallon = 4000ml **1 inches** =2.5cm

4 quarts **1 yard** = 0.9m

1tsf = 4 to 5ml

= 60 drops

Types of orders

a) Standing orders: This is one that should be carried out for a specified number of days or until another order cancels.

For example: standing orders given by the medical officer of PHC in emergency situation.

b) PRN order: It is states guidelines for administering a medication when needed

For this types of orders, a good judgement is need so that medication can be administered safely. Eg : pain killers, laxatives.

c) ONE TIME order OR SINGLE order : It is a written order for a medication which is administered only once. E.g : preoperative medications.

d) STAT order: It is a medication order which is administered immediately and only once. E.g: Inj Lasix 20mg iv stat.

e) TELEPHONE, VERBAL and FAX order : Sometimes after discussion with the doctor about the clients condition over the phone, the nurse may write the ordered medication. Sometimes communication can take place using fan machine.

Principles of Drug Action

Pharmacokinetics : Pharmacokinetics is the process by which a drug moves through the body and is eventually eliminated this has the four parts absorption. Distribution, metabolism by excretion.

Absorption: Absorption is the process by which a drug enters a blood stream. Absorption affected by following

1. Route of administration.
2. Solubility of the drug.
3. Site of administration.
4. PH of the body fluid.
5. Concentration of the drug and its dosage

Distribution:

Is the process by which the medication delivered to the target cells and tissues.

Distribution is influenced by

1. Effectiveness of the circulatory system
2. Amount of medication bound to protein.
3. Tissue specificity of the drug

Metabolism:

Is the process of deactivation of the drug in the body

Excretion :

Is the process of removing the drug or its metabolites from the body.

Pharmaco dynamics:

Refers to the physiological and biochemical effects of a drug on the body

11.5 EFFECTS OF DRUG ON THE BODY

Therapeutic effect: It is the effect which is desired or the reason a drug is prescribed.

Therapeutic effects are the medication desired and intentional affects

Local and systemic effects:-

Local effects of drug are expected when they are applied topically to the skin or mucus membrane

Adverse efects:-

Adverse effect is any effects other than the therapeutic effect.

Side effects:-

Side effects are the minor adverse effects side effects can be harmful (or) harmless.

Allergic reactions.

A client can react to a drug as a foreign body and this develop symptoms of allergic reaction

Anaphylaxis

Skin & rashes

Prurities

Angioedema

Rhinitis

Lacrimal

Nausea and vomiting

Diarrhea

Shortness of breathing.

Atropine –like side effects: Certain drugs causes dryness of the mouth and nose flushing and dryness of the skin, tachycardia. Urinary retention and blurring of vision.

Effects on the urinary system: Certain drugs may cause renal damage which is characterized by anuria, oliguria, haematuria, crystalluria, albuminuria etc.

Effects on the cardio – vascular system:-

Arrhythmias : any changes in the rate, rhythm volume or character of the pulse.

Hypotension : it is decreases the blood pressure dizziness, syncope and shock.

Hypertension : this is characterized by elevated blood pressure, epistaxis

Emotional irritability .

Blood dyscrasias:-

Aplastic anaemia

Thrombocytopenia.

Gramulocytosis, leucopenia.

Effects on the nervous system:-

Abnormal involuntary movements:

Tremor, chorea, dystonia, alteration is the muscle tone difficulty in preserving equilibrium in erect and setting position.

Stimulations of the central nervous system :-

These are characterized by anxiety, nervousness insomnia, headache , double vision etc..

Depression of the central nervous system

It is characterized by dizziness, vertigo, drowsiness, fatigue and ataxia.

Effects of the gastrointestinal system:-

Irritation of the gastric mucosa

This is characterized by dizziness vertigo, drowsiness, fatigue and ataxia.

Small bowel ulceration:

It is characterized by abdominal pain melaena, distension, diarrhea.

Constipation.

Hypersensitivity reaction: This develops in a client who is sensitive to a medications therapeutic effects or secondary effects

Tolerance: It occurs when a client develop decreased response to a drug, requiring increased dosage to achieve the therapeutic effects.

Toxicity: High levels of the drug in the blood streams produce tonic effects.

Interactions: Medication interaction occurs when a medication's effects are altered by the concurrent presence of other medications or food.

Synergism: Synergistic effect occurs when a combination of medications are given.

Antagonism : If results in decreased drug effectiveness sometimes food influences a drug

Drug incompatibility: Drug incompatibility is a condition in which a drug precipitates from solutions of mined with other medications.

Dosage:-

A dose is the amount of drug administered at one time

The "minimum dose' is the smallest quantity of the drug that will

Produce an effect in the body

The 'maximum dose' is the largest quantity of the drug that can be administer one time

11.6 FACTORS WHICH MODIFY THE DOSAGE OF THE DRUGS

Age: Infants, children and the old require smaller dosage of a drug than that of an adult person.

Weight: A person over weight requires a larger dose. Than the usual one

Under weight requires a smaller dose.

Sex: Males requires larger dose than females.

Physical condition: The client with distressing symptoms needs large dose of drugs.

Cumulative action of the drug: The frequency and dose of a drug administration depends upon the rare excretion from the body.

Tolerance : The client who process a tolerance for certain drugs will require larger doses.

Habituation: Clients are said to be habituated to a drug when they have used it continuously for a long period.

Addiction: Prolonged use of alcohol and narcotics may produce extreme form of habituation and result in a condition known as addiction

Idiosyncrasy: It is defined as a peculiar susceptibility of an individual to some drug, protein other substances

Route of administration: Drug given by I.V route have a very quick and immediate action.

Absorption and excretion of the drug : Absorption of a drug refers to the entry of the drug into the blood stream from the source of entry into the body

The rate of absorption affected by

Route of administration.

Solubility of the drug

Site of administration

The PH of the body fluid

Concentration of the drug and its dosage.

11.7 ROUTES OF ADMINISTRATION

Drugs are administered according to the preparation of the drug.

a) ORAL administration: It is most common route and the most convenient route for the most clients

The disadvantages of oral administration are their unpleasant taste, the irregularity of absorption from the gastrointestinal tract

b) SUBLINGUAL administration: Drugs such as nitroglylerin are given sublingually by planning it under the tongue and letting it slowly dissolve.

c) Inhalation: The volatite drugs are given in this method

The client inhales the fumes into the drugs to have a local or systemic effect.

d) Inunction (Topical application) : Inunction is the application of the drug to the skin usually by a friction. eg ointment.

e) Instillation : Instillation is pulling a drug in liquid from into a body cavity such as urinary bladder

f) Insertion : Insertion means introducing solid forms of drugs into the body orifices eg = suppositories.

g) Insufflation: It is the administration of drugs in the form of powder vapour or air into a wound or body cavity by blowing with an insuflator.

h) Implantation : Implantation means planting or pulling in of solid drugs into the body tissue

i) Parentral administration:-

'parenteral' means giving of therapeutic agents outside the alimentary tract.

Intramuscular = into the muscle. It is the introduction of a drug into the muscle with a syringe and needle. Quantity range from

Subcutaneous = into the suburtaneous tissue, subcutaneous injections involve placing medication into the loose connect tissue under the dermis. (hypodermic)

Intradermal = under the epidernies into the deemics. Intra dermal injections are given at the inner aspect of the anterior chest and upper aspect of the posterior chest.

Intravenous = into the vein. Introducing a single dose of concentrated medication directly into the systemic circulation.

Intra arterial = into the artery

Intra radial = into the cardiac muscles

Intrathecal = into the spinal cavity

Intraspinal (or)

Intrasseous =into the bone marrow

Intraperitoneal = into the peritoneal cavity.

Time of administration

In the administration of oral medication the time of administration is highly important.

The concentration of certain drugs have to be maintained at a constant level over 24 hours of the drug to act effectively.

Such drugs are to be rotated in a cyclic pattern over 24 hours

Eg 4 hourly, 6 hourly etc.

Indication

Indication means the purpose for which the medicine is ordered.

11.8 MEDICATION ASSESSMENT

The important information to be obtained during initial assessment

History of medication.

Allergies and intolerance

Medical history

Pregnancy and lactation.

11.8.1 Assessment before Medical Administration

1. Medication record

It is important that the nurse checks the medication administration record of the client before administering any medication.

2. Diet and fluid order

This is to avoid administering medication to a client who is kept nil orally in preparation for surgery or some diagnostic tests.

3. Laboratory values

This may be used to monitor serum drug levels,

Medication effects and side effects

For example anticoagulant are administer after assessing prothrombin time

4. Physical assessment

This is done to assess the clients physical ability to take the medication.

Ability to swallow

Gastrointestinal motility should be normal

Adequate muscle mass

Adequate venous access

Vital signs

Body system assessment

Assessment of Knowledge and Compliance

Assess the extent of knowledge the client has and build up on this knowledge

Compliance with a medication routine means that the client takes medication exactly as is prescribed.

Medication Error

Which is given not quarding to the order is administered as per the order, but is unsafe or inappropriate for the client

When documentation is a chart does not reflex that a medication was administered as ordered medication was given but not charted administration of I.V medication at the wrong route.

Giving medication by wrong route

Giving a drug that has deteriorated

11.9 STORING OF MEDICINES

Care of medicine cabinet and drugs

To stock the medicines, each ward should be provide with a medicine cabinet

It should be large enough to accommodate all drugs to be stocked in ward

The medicine cabinet should be kept in a separate room adjacent to the nurses room.

A wasting sink with running water should be provide in that room for hand washing facilities.

Adequate lighting should be provided with the cabinet to read the tables clearly.

These should be separates compartments for different categories of drugs – for mixtures, tablets, powder etc,

Drugs used to external use should be kept separate form the drugs used for internal use use.

Poisonous drugs should be kept in a separate cup board which must have separate lock and key.

11.10 SAFETY MEASURES

Five Rights

- Right patient
- Right drug
- Right dose
- Right time
- Right route

1. Right client

Read the physician's orders to make sure for whom the medicine is ordered

Read the client's name on the client's chart on the medicine card.

Call the client by name and ask him to repeat his name.

2. Right drug

Read the physician's orders to study the correct name of the drug.

To make sure the drug is copied correctly on the medicine card, drugs whose names sound a like select the right drugs from the cup board before taking the drug from the shelf before measuring is.

When returning the container or the shelf and before removing the hand.

Look for the colour, odour and consistency of the drug,

Administer medicine only from a clearly cabelled container .

Avoid conversation or anything that distracts the mind

Be familiar with the trade names.

Avoid accepting the verbal orders

Always identify the client before giving medication.

Make sure that the drug has not been discontinued by the physician.

3. Right dose

Read the physician's order to know the correct dose

Consider the age weight of the client know the minimum by maximum dose of the medicine administered.

Measure accurately.

Have the medicine card or written order in hand before you prepare the drug.

Avoid conversation or anything that distract the mind.

Consider how many capsules (or) tablets are required for the dose

Know the abbreviations by symbols used.

4. Right time:-

Read the physician's ordered

Know the hospital routines for the intervals

Give at stated intervals for blood levels

Know the abbreviations for the time

e.g. B.D T.D.S etc.

Give the medicine near the time ordered 15 min before or after the designated time

Give the medicine as ordered in relation to the food intake

e.g= before food or after food

5. Right method:-

Read the physician's orders to determine the route of administration.

Dilute the medicine if indicated

Know the method of giving drugs.

Know the abbreviations used to designated the route of administration.

Identify the client correctly stay with client until taken the medication.

11.11 RULES FOR THE ADMINISTRATION OF MEDICATION

While preparing the medicines:

Read the physician's order before preparing the drug

Check the medicine card again the physicians orders.

Concentrate the mind on the preparation of medicines.

Calculate the fraction of dosage accurately.

Given the medication only from a clearly labeled container

Always use a calibrated measure in order to measure the accurate dose

Make sure that the medicine glasses are clean and dry before the medicine is taken.

Shake the fluid medication before pouring it into the ounce glass.

Wipe the mouth of the bottle. On the side opposite to the label.

Pour the medicine from the bottle on the side opposite to the label.

Regarding the administration:-

Observe the five rights – right clients, right medicine, right dose ,right time, right method, of administration.

Observe the symptoms of over dosage of the drugs before it is administered

Identify the client correctly – by the bed number, room number, calling the name of the client.

Give the drugs one by one

Stay with the client until he has taken the medication.

Observe for any contraindications in oral administration of medicine such as nausea. Vomiting, unconsciousness.

Always give the medicine you have prepared your self.

Remove the unpleasant taste of medicines from the mouth by the use of orange syrups, lemon juice or by mouth wash.

Always provide a drink of fresh water to the client after giving on oral medicine

Report an error in medication immediately to the charge nurse and the physician

Do not leave the medicine with the client prepare a fresh dose of medicine if the medication is to be given later.

The drugs that stimulate appetite should be given before food

Regarding the recording of drugs:-

Record each dose medicine soon after it is administered.

Use standard abbreviation in recording the medications

Record only that medicines which you have administered.

Record the date, time name, of the drug administered, the dose of the medicine and the strength

Never record a medication before it is given to the client,

Record the medications that are vomited by the client refer by the client and those drugs that are administered to the client.

11.12 ETHICAL AND LEGAL ASPECTS

Under the law nurse are responsible for their own action regard less of a written order it is expected that the nurse should know the minimum and maximum dose of every medicine that she administers

The nurse should know the law about the use of narcotics the narcotics should be kept under the safe us custoday of nurses and an amount should be kept.

Narcotics should be stoked only by the person/institutions who possess licence to do so

The nurses responsibility includes prevention of medication errors by observing the five right's of giving medication.

Charting the administration of medication or its omission is the legal responsibilities of the person who gives the medication

The nurses should know what is and what is not acceptable practice in her own institution. Eg; leaving medications at the bedside of the client is strictly prohibited.

Another legal responsibility of the nurse is when she is involved in the experimental drug programme

Summary:

- This chapter provided knowledge about ":administration of medicine"
- To the students and also dealt with; basic knowledge about medication,
- Name of the drugs(chemical name, Generic name , trade name)
- Classification of drugs according to the action, and functions.
- Common forms for drug preparation.
- Source of information about medication.
- System of medication distribution
- Abbreviation used regarding time of administration.
- Abbreviation used regarding the route
- Abbreviation regarding the amount
- Types of medication orders.
- Effects of the drugs on the body
- Factors which modify the dosage of the drugs
- Routes of administration.
- Assessment before medication administration
- Method and care of medicine cabinet
- Rules for the administration of medicine.
- Ethical and legal importance.

QUESTIONS

I. Choose the correct Answer

1. Drugs used to relieve pain

   (a) anaesthetics (b) antidotes (c) Analgesis (d) androgen.

2. Drugs which reduce fever

   (a) antidotes (b) anaesthetics (c) antipyrelics (d) analgesis

3. Drugs reduce the inflammation

   (a) anlagesis (b) antidotes (c) anaesthetics (d) anti- inflammatory.

4. Substances that react with hydrochloric acid to decrease the activity of gastric secretions

   (a) anti pyretics (b) anti-infective (c) antacids (d) antibiotics

5. Substances with inhibit or decrease the blood clotting process

   (a) antacids (b) antibionics (c) anaesthetics (d) anti coagulants

6. The specific drug used in the treatment of tuberculosis

   (a) anti biotics (b) anti- tuberculosis

   (c) antiseptic (d) antacid

7. Drugs which relax muscles of the bronchioles

   (a) antacids (b) bronchodilators (c) analgesic (d) antidotes

8. Drugs which increase the flow of urine

   (a) Antiemetics (b) diuretics (c) emetics (d) antacids

9. Substitutes for body hormones.

   (a) hormones (b) myotics (c) anti biotics (d) antacids

10. Drugs that produce sleep

    (a) analgesics (b) antibiotic (c) hypnotics (d) hormones.

11. Laxatives given for

    (a) sleep (b) elimination (c) rest (d) vitamin.

12. One or more drugs dissolved in water

    (a) aqueous solution (b) capsule (c) emulsion (d) all

13. Drugs dissolved in a solution containing water and sugar.

    (a) suspension (b) syrup (c) solution (d) pill.

14 Expension of IVP is

(a) injection (b) intramuscular

(c) intra venous (d) intravenous push

15. Any charges in the rate, rhythm, volume of characters of the pulse

(a) hypotension (b) hypertension (c) arrhythmias (d) all

16. Minimum amount of drug is given is called

(a) minimum dose (b) maximum dose (c) equall dose (d) all

17. A cleansing agent

(a) emetics (b) detergents (c) cathartics (d) all

18. Drugs that produce vomiting.

(a) diuretics (b) caustics (c) cathartics (d) all

19. Contract the pupil of the eye is

(a) muscle relaxants (b) myotics

(c) detergents (d) all

20. Dilate the pupil of the eye

(a) inotropes (b) hormones (c) my driatics (d) specific

II. Fill in the blanks

1. Drugs used so induce perspiration……
2. An agent that promotes digestion……..
3. Drugs used to treats rheumatism…….
4. Relieve (or) preventing nausea and vomiting…….
5. Drugs which dilate the blood vessels……..
6. Concentrated preparation of a drug from vegetables or animals……..
8. The abbreviation for every 8 hours drugs given ……
9. The process of deactivation of the drug in the body ……..
10. The process of removing the drug or its metabolites from the body……

III. Short Answer

1. How will you classify the drugs according to the functions?
2. Write the some common forms for drug preparation?

3. What are the source of information about medications?
4. Write about medication order?
5. What are side effects of drugs on the body?

IV. Essay questions

1. What are factors which modify the dosage of the drugs?
2. Write in detail about routes of administration of drugs?
3. Write about assessment of the client before medication?

V. Write in detail

1. Write in detail storing and care of medicine cabinets?
2. Rules for the administration of medication?
3. Ethical and legal issues on administration of drugs?

NURSING

Practical - I & II

Vocational Education

HIGHER SECONDARY - SECOND YEAR

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Untouchability is a sin
Untouchability is a crime
Untouchability is inhuman

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PRACTICAL - I

S. No.	Procedure	Date		Signature
		Ward	Classroom	
1.	Methods of feeding			
2.	Oxygen inhalation			
3.	Steam inhalation			
4.	Hot application			
5.	Cold application			
6.	Collection of specimen Urine Motion Blood			
7.	Urine Examination Albumin Sugar			
8.	Administration of medication			
9.	Turning schedule			
10.	Minor wound dressing			
11.	Nasogastric aspiration			

PRACTICAL - II

S. No.	Procedure	Date		Signature
		Ward	Classroom	
1.	Assessment of Pregnant abdomen			
2.	Anthropometric measurement for under five children			
3.	Restraints			
4.	Preparation of balanced diet			
5.	Preparation of diet for sick			
	Liquid			
	Semi-solid			
	Solid			
6.	Ante-natal exercise			
7.	Postnatal exercise			
8.	Cord care			
9.	Breast care			
10.	Perineal care			
11.	Foot care for diabetes mellitus			

CONTENTS

Nursing Laboratory - 200 periods

Clinical area - 90 period

CONTENTS

Nursing Laboratory - 200 periods

Clinical area - 90 period

PRACTICAL - I

1. METHODS OF FEEDING

Definition

Feeding given other than, through the mouth is called "Extra oral feeding"

Different methods of artificial feeding:

- Nasal feeding or nasal gavage
- Gastric gavage, feeding through oro-gastric tube.
- Gastrostomy and enterostomy feeding.
- Rectal feeding
- I.V infusion.

Nasal Feeding (Or) Nasal Gavage

The administration of liquid foods into stomach by a tube inserted through the nostrils is called nasal feeding or nasal gavage.

Purpose:

- To provide adequate amount of all type of nutrients.
- To administer large amount of fluids.
- To aspirate the stomach contents

Indications:

- When the client is unable to take food by mouth for example, unconscious, semi conscious and delirious client.
- For client who refuses food eg: client with psychosis.
- When the condition of mouth or oesophagus make the swallowing difficult or impossible for eg: Fracture of the jaw, repair of the cleft lip and cleft palate, surgery of the mouth, throat and oesophagus, paralysis of face and throat, stricture of oesophagus
- When the client is too weak to swallow food or when the conditions make it difficult to take a large amount of the food orally.
- When the client is unable to retain the food.

Articles	Purpose
1. Feeding cup with water	To give mouth wash
2. Kidney tray	before and after the food to receive the waste liquids
3. *Mackintosh* and towel.	To protect the garments
4. Cotton tipped applicators	To clean the nostril
5. Saline soda bicarb solution	To flush the tube
6. Levine tube or Ryle's tube in a bowl of ice.	To insert
7. Lubricant such as water soluble jelly or Glycerin or liquid paraffin.	To lubricate the passage.
8. Adhesive plaster and scissors.	To fix the tube in position
9. Rag pieces in a container	To wipe the secretions.
10. Paper bag	To collect the wastes.
11. Clean syringe or a funnel in a tray.	To aspirate the gastric contents and to give the feeding.
12. A glass of food in a bowel of warm water.	To give the feed at the body temperature.
13. Ounce glass	To measure the fluid intake.
14. A bowel with water	To test the location of the tube
15. Clamp	To clamp- the tube to prevent leakage of gastric contents.
16. Section apparatus	To clear the airway in case of unconscious or seriously ill client who is prone for vomiting and aspirating the fluid into the respiratory tract.

Steps of Procedure	Reason
1. Wash hands	To prevent cross infection
2. Take the tube and check whether it is good order condition, Expel the water from the tube and check the tube for patency.	Any blockage should be corrected before introducing the tube if any water is remaining in the tube, it can dribble into the trachea and chock the client.
3. Lubricate the tube for about 6 to 8 inches with the lubricant should be applied to the minimum.	Lubrication of the tube reduces friction between mucus membrane and the tube. if the lubricant is excessive, it may dribble into the trachea and may cause respiratory distress
4.Measure the distance on the tube, from the bridge of the nose to earlobe and to the tip of the xiphoid process of the sternum. Mark the distance of the tube.	Rough guide to determine length of the tube to reach the stomach.
5.Hold the tube, coiled in the right hand and introduce the tip into the left nostrils.	Nasal septum is deviated to the right side.
6.Pass the tube gently but quickly, backwards and downwards. Momentary resistance may occur as the tube is passed into the nasopharynx. Have the client to flex the head withdraw the tube about one inch, rotate it inside ways and gently advance the tube.	Flexion of the head, helps to flex the tube at the Naso-pharyngeal junction and the tube enters the pharynx. Stop if there is marked resistance and inspect the posterior cavity for coiled tubing.
7.When the tube reaches the pharynx, the client may gag. Allow him to rest for a moment. Ask him to take panting breaths	Panting relaxes the pharynx. A brief pause, may prevent vomiting
8.Have the client, take sips of water and swallow on command. Advance the tube 3 to 4 inches, each time client swallows. Continue to advance the tube until it reaches the previously designated mark.	Swallowing facilitates the swallowing of the tube through the oesophsgus. Mark on the tube indicates the tube has reached the stomach.Excessive gasping, coughing and cyanosis are signs of the respiratory distress; the tube may be in the trachea. Immediately pull it out.

9. Check the placement of the tube in the stomach. • Aspirate for gastric contents with a syringe. • Place the end of the tube with a syringe barrel or dip into a bowel of water and note the rhythm of escaping bubbles. • Ask the client to hum or speak.	Fluids cannot be freely aspirated from the lungs. If the tube is in the trachea air bubbles will coincide with the expiration of each breath. The client will be unable to hum or speak if the tube is in trachea.
10. After the tube is in place tape it, to the side of the face and wait for sometime before giving the feed.	Careful fixing of the tube prevents it from being displaced. A few minutes rest will help to subside the peristalsis and prevent nausea and vomiting.
11.Before giving feed pours some water through the funnel and lower the funnel slowly, so as to expel the air. • Then give the feed and the medications which are kept ready for the client. When the feed is finished, pour a little water and clamp the tube firmly to prevent leakage of fluids.	Expelling the air from the tube before the feed is given, not allowing the fluid to run completely, damping the tube at the end of the each feed, are some of the measures to prevent the entry of air into the stomach.

AFTER CARE OF THE CLIENT AND ARTICLES

1. Offer a mouthwash, clean the face and hands and dry them.
2. Remove the mackintosh and towel.
3. Make the client comfortable in bed.
4. In case of unconscious or seriously ill clients apply suctions, if secretions are collected in the mouth.
5. Take all articles, to the utility room, discard the water and clean the articles with soap and water. Dry them. Replace them into their proper place.
6. Wash hands.
7. Record the time, date, amount of feed, the nature of the feed, the reaction of the client if any, in the nurses' record as well as in the intake and output chart.
8. Remove the tube when the tube feeding need to be stopped.

Gastrostomy Feeding : It is the introduction of Fluid (or) liquid food through a tube or catheter which the surgeon has introduced in to the stomach through the abdominal wall.

Purpose : To give nourishment to the patient.

Indications

- Tumours or operations on the upper alimentary tract.
- Cancer of oesophagus
- Stricture of oesophagus caused by poisoning.

Contra indication : Abdominal surgery

Articles required

- A funnel, rubber tubing, glass connection and a screw clip which were sterilized boiled and kept in covered container.
- A cup of drinking water.
- Required amount of feed in a jug, kept in a bowl of warm water.
- Sterile lubricant.
- A sterile tray with dressing materials and forceps
- Medicines offered if any
- Kidney tray.
- Many tailed binder.
- Small mackintosh and towel

Procedure

- Explain the procedure to the patient and screen the bed.
- Assemble all the equipments at the bed side.
- Protect the dress and bed of the patient by spreading the small mackintosh and towel.
- Open the binder, and wash hands.
- Remove the dressing and clean the surrounding area and cover the wound with a sterile piece of gauze.
- Unscrew the clamp from the gastrostomy tube and attach the glass connection rubber tubing and funnel.
- Keep the tube pinched, to prevent air from getting in.
- Pour some clear water into the funnel and lower the funnel a little to let out the air.
- Then pour the feed, before the funnel is empty.
- If any medicine is ordered that should be poured in.
- Follow it with water to irrigate the tube and to prevent the escape of gastric juice.
- Disconnect the glass connection tubing and funnel of clamping the gastrostomy tube.
- Clean and apply sterile ointment, dress the wound apply binder, remove the equipment clean, boil and replace them.
- After the feed, instruct the patient to remain quiet in the bed.
- When the tube is to removed after feeding, it is left for few minutes in the stomach to avoid peristalsis.
- It is then gently removed. Record the time, kind and amount of feed and condition of the surrounding area.

Oro Gastric Tube

Oral insertion of the gastric tube follows the same, guidelines as in the nasal insertion.

1. Premeasured the tube from the lips to sternum.
2. To facilitate the passage of the tube, ask the client to suck on the tube, as if like a straw and swallow at the same time.

Summary

1) Feeding given other than, through the mouth is called “Extra oral feeding”
2) Different methods of artificial feeding:

- Nasal feeding or nasal gavage
- Gastric gavage, feeding through oro-gastric tube.
- Gastrostomy and enterostomy feeding.
- Rectal feeding
- I.V infusion.

3) The administration of liquid foods into stomach by a tube inserted through the nostrils is called nasal feeding or nasal gavage.

4) Gastrostomy feeding is the introduction of Fluid (or) liquid food through a tube or catheter which the surgeon has introduced in to the stomach through the abdominal wall.

QUESTIONS

I. Choose the correct answer

1. The lubricated about Ryle's tube is

   a) 2-4 inches b) 4-6 inches c) 6-8 inches d) 7-9 inches.

2. The measurement for nasal feeding is taken from

   a) The bridge of the nose to ear lobe to the tip of the xiphoid process.

   b) From the mouth to the xiphoid process c) From the neck to the xiphoid process

   d) From the mouth to the umbilicus

II. Fill up the blanks

1. Contraindication for gastrostomy feeding is _____.
2. The placement of the ryle's tube is checked by _____.

III. Write short answers

1. What are the different methods of artificial feeding
2. Write the purposes of nasal feeding

IV. Write in detail

1. Various methods of artificial feeding.

2. OXYGEN INHALATION

Definition

Patients with respiratory dysfunctions are treated with oxygen inhalations to relieve anoxaemia or 'hypoxaemia' (deficiency of oxygen in the blood).

Indications for Oxygen Therapy

- Cyanosis (bluish colour of the skin, nail beds and mucus membranes).
- Breathlessness or labored breathing.
- An environment low in oxygen content. Eg..high attitudes.
- Anaemia.
- Diseases or conditions in the oxygen across the capillary membrane.
- Shock and circulatory failure.
- Haemorrhage and asphyxia.
- Critically ill patients.

Methods of oxygen administration

The manner in which oxygen is administered depends upon the condition of the patient.

Oxygen can be delivered

1.Nasal cannula 2. Oxygen by nasal catheter

3. Oxygen by mask 4. Oxygen tent

5. Transtracheal oxygen

1) Nasal cannula

A nasal cannula is simple comfortable device

The flow rate is 4L / min (1L =24%., 2L = 28%., 3L =32%., 4L = 36%)

2) Oxygen by nasal catheter

Most common method of oxygen administration.

Flow of 1 to 4 litres of oxygen/mt

The oxygen concentration will be 22-30%

3) Oxygen by mask

It has many types

- Simple Mask:
  Flow rate: 5-10 L/MIN
  Oxygen concentration: 40-60%
- Partial Rebreathable Mask:
  Flow rate: 6-15 L/MIN
  Oxygen concentration: 50-90%
  (use reservoir bag)

PURPOSE: capture some oxygen for rebreathing

- Non Rebreathable Mask
  Flow rate: 6-15L/min
  Oxygen concentration: 70-100%.

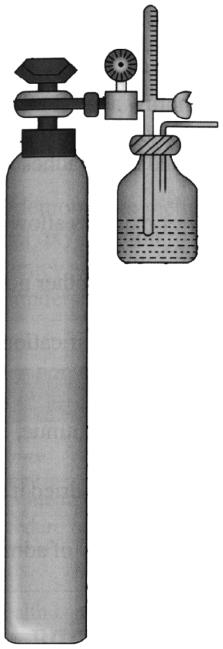
- Venture Mask

  Oxygen concentration: 24-50%
- Oxygen Tent

  Flow rate: 8-12L/MIN

  Oxygen concentration: 24-100%

  Hazards of oxygen inhalation



- Infection
- Combustion [fire]
- Drying of the mucus membranes of the respiratory tract
- Oxygen toxicity
- Atlectasis
- Retrolental fibroplasia
- Asphyxia

Preparation of articles

Articles	Purpose
A) Oxygen cylinder with its:	
• Stand and accessories.(the regulator,flow meter, humidifier, connecting tube etc.,)	
• Check and see whether the whole system works in good condition.	
B) A tray containing	
• Nasal catheter of appropriate size, clean and sterile or disposable type.	To administer oxygen without introducing infection into the respiratory passage.
• Water soluble lubricating jelly.	To lubricate the catheter.
• Adhesive tapes.	To secure the catheter.
• Bowl of water.	To test the oxygen flow
• Flow light and tongue depressor.	To help to assess the correct placement of the catheter.
• Cotton applicators and normal saline in a container.	To clean the nostrils.
• Kidney tray and paper bag.	To receive the wastes.
• Mackintosh and towel.	To protect the garments.
• Rag piece (or) gauze pieces in a container.	To wipe the secretions nose and mouth.

Procedure:

Steps to procedure	Reason
• Wash hands	To prevent cross infection
• Measure the length of the catheter from the tip of the nose to ear lobe. Mark the length with ink.	The distance from the tip of the nose to ear lobe roughly equals the distance from the anterior nares to the uvula.
• Check he apparatus for the working condition. Open the main valve in an anti clock wise direction. Look for the pressure reading on the gauge. Adjust the flow of oxygen to 2-4 litres for adults.	Checking the apparatus before inserting the catheter will help to find out the amount of oxygen in cylinder to check whether whole apparatus is good working condition
• When the wheel valve is opened, the oxygen will start bubbling through the water in the wolf's bottle.	Bubbling through the water in the wolf's bottle will help to humidify the gas, to assess the patency of tube and flow rate.
• Lubricate the tip of the catheter sparingly with water soluble jelly and check the flow by immersing it in water.	Lubricating the tube prevents the irritation of the nasal mucosa.
• Introduce catheter slowly into one of the nostrils of the previously marked distance. Never use force.	Forcing the catheter can cause injury to mucus membrane.
• Check the position of the catheter in the oropharynx at the level of the uvula.	
• It can be checked by asking the patient to open his mouth widely.	Checking is done to make sure that the catheter is positioned in a correct place and not kinked.
• Depressing the tongue with tongue depressor, directs the flash light into the throat.	
• Fix the catheter over the forehead or at the cheek with adhesive tapes	Prevent the displacement of the catheter when the patient moves in the bed
• Save the connecting tube to the bed clothes, patient gown, safety pin.	

After care of the patient and articles:

- ✓ Stay with the patient till he is at ease.
- ✓ Keep the patient warmth and comfort
- ✓ Assess the vital signs frequently
- ✓ Record the procedure with date and time on the nurses record.
- ✓ Check the apparatus for its good working condition.
- ✓ Change the nasal catheter by every 8 hours.
- ✓ When the oxygen is to be stopped do it gradually.
- ✓ Watch the patient for any deteriorating symptoms after the removal of oxygen inhalations.

Summary:

- Patients with respiratory dysfunctions are treated with oxygen inhalation.
- Cyanosis , labored breathing , high altitudes, anaemia, certain disease conditions of the lung, shock , haemorrage and asphyxia are the indications for oxygen therapy.
- Oxygen can be delivered through nasal cannula, nasal catheter, oxygen mask, oxygen tent and through trans tracheal methods.
- The hazards of oxygen inhalations are infection, combustion, dryness of mucus membranes of the respiratory tract, oxygen toxicity, atelectasis, oxygen induced apnoea and retrolental fibroplasias.

QUESTIONS

I. Choose the correct answer

1. Oxygen concentration by simple mask is

   a) 50 90% b) 40 60% c) 70-100% d) 24-50%

2. Flow rate of oxygen by rebreathable mask is

   a) 6-15 lit/min b) 5-10 lit/min c) 4lit/min d) 4-10 lit/min

II. Fill up the blanks

1. Oxygen flow rate by nasal cannula is _____
2. Oxygen flow rate by simple mask is _____
3. Oxygen flow rate by partial rebreathable mask is _____

III. Short answers

1. What are the hazards of oxygen inhalation.
2. List the articles required for oxygen inhalation and with purposes.

IV. Write in detail

1. Write down the indications for oxygen therapy and the various methods of oxygen inhalation.

3. STEAM INHALATION

Definition

Breathing warm and moist air produced by a vaporizer is called steam and moist inhalation.

Purpose

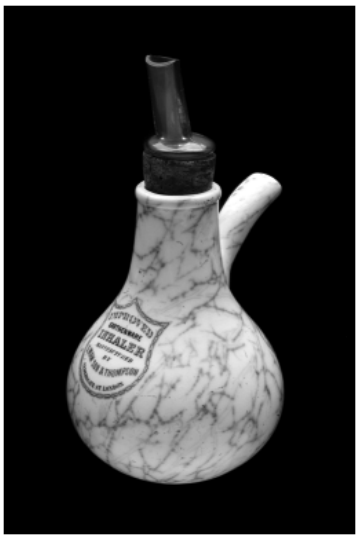
- To relieve the inflammation and congestion of the mucous membrane of the respiratory tract and paranasal sinuses.
- To soften thick, tenacious mucous and help its expulsion from the respiratory tract.
- To provide heat and moisture to prevent dryness of mucous membranes of lung.
- To aid in absorption of oxygen.

Drugs used:

- Tincture benzoin 5ml per 500ml of boiling water.
- Eucalyptus 2ml per 500ml of boiling water.
- Camper few crystals per 500ml of boiling water.

Methods of giving steam inhalation

Jug method : In this method, a Nelson's inhaler is used. Inhalant and boiling water is filled in jug and patient is ashed to breaths the vapour.



Steam tent: When a high concentration of steam is required, a steam tent may be used. A quick and easy method is to place a screen on either sides of the patient's bed and stretch blankets or sheets across them and form a lobby.

The steam can be directed into the tent from the spout of a kettle. The steam may be given for 20 to 30 minutes at a time and it may be repeated every four hours.

Electric steam inhaler : Small electric vaporizes can be used to give steam inhalation. It consists of small jar with a heating element extending into the jar. Jar is filled with water. On the top of the jar is a removable perforated cup to which a small metal spout is attached.

Nurses responsibilities in the administration of steam inhalation using a Nelson's inhaler
Preparation of articles

Articles	Purpose
• Nelsons inhaler with a mouth piece tightly fitted to the neck of inhaler.	To prevent the escape of vapour and to prevent the spillage of water.
• Bowl or basin large enough to hold the inhaler.	To place inhaler safely.
• A flannel piece or towel	To wrap around the inhaler.
• Face towel	To wipe the patient's face.
• Bath towel	To put over the patient's head and jug to prevent loss of steam.
• Tincture benzoin or any other inhalant ordered.	Used as a respiratory antiseptic.
• Teaspoon or a measurement glass.	To measure inhalant.
• Gauze piece in a container.	To wrap around mouth pieces.
• Cotton swabs	To plug spout.
• Kidney tray and paper bag.	To receive wastes.
• Back rest or cardiac table	To increase the size of the thoracic caritis and to maintain upright position lean forward and support.

Procedure

Steps	Reasons
• Measure the capacity of inhaler with cold water.	To determine the amount of inhalant
• Warm inhaler by pouring a little hot water into jug and empty it.	To maintain temperature.
• Pour required inhalant into inhaler and fill jug with 2/3 hot water.	If the inhaler is filled till brim there is a possibility of drawing water into mouth.
• Place the mouth piece and close jug tightly. See that mouth piece is in opposite's direction to the spout.	This arrangement keeps spout away from patient.
• Cover jug with flannel piece.	To prevent injury to the lips.
• Place inhaler in basin and take it to bedside.	To reduce chance of burns.
• Place apparatus in front of patient with spout opposite to the patient. Remove cotton plug and discard it.	Removing cotton plug to keep up patency of spout for air.
• Instruct patient to place lips on mouth piece of the apparatus and breathe in vapour. After removing lips from mouth piece breath out air. Alternately breathe through nostrils.	Directing steam through nostrils relieve congestion of mucous membrane.
• Cover the patient's head and jug with a bath blanket or a bath towel.	To direct the steam around face of patient.

After care of patient and articles

- Continue treatment for 15 to 20 minutes.
- Wipe off the perspiration from the face.
- Remove the back rest and cardiac table.
- Adjust position of patient in bed. Make him comfortable.
- Instruct him to return in bed for 1 to 2 hours to prevent draught.
- Record the procedure on the nurse's record with date and time.

Summary

1) Steam inhalation is to relieve the inflammation and congestion of the mucus membranes of the respiratory tract and paranasal sinuses.

2) There are three methods of steam inhalation are jug method, steam tent, electric steam inhaler.

3) Drugs used for steam inhalation are:

- Tincture benzoin 5ml per 500 ml of boiling water.
- Eucalyptus 2ml per 500ml of boiling water.
- Camper few crystals per 500 ml of boiling water.

QUESTIONS

I. Choose the correct answer

1. The duration for steam inhalation is

   a) 5- 10 minutes b) 10-15 minutes c) 15-20 minutes d) 20-25 minutes

2. Drugs used for steam inhalation are:

   a) Tincture benzoin 5ml per 500ml of boiling water

   b) Eucalyptus 2ml per 500ml of boiling water.

   c) Camper few crystals per 500ml of boiling water.

   d) All of the above

II. Fill up the blanks

1. Nelson inhaler is the _____method of steam inhalation.
2. The steam may be given for _____ to _____ minutes.

III. Write short notes

1. Methods of steam inhalation.
2. Articles and purpose of steam inhalation.

IV. Write in detail

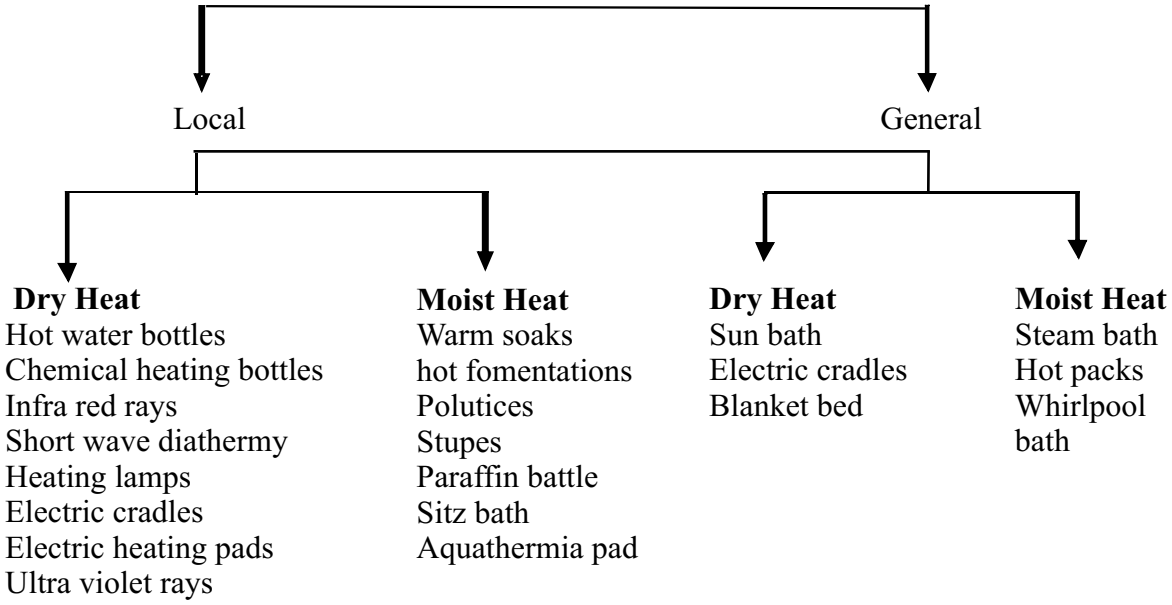
1. Write the steps involved in Nelson's steam inhalation procedure with rationale.

4. HOT APPLICATION

Definition

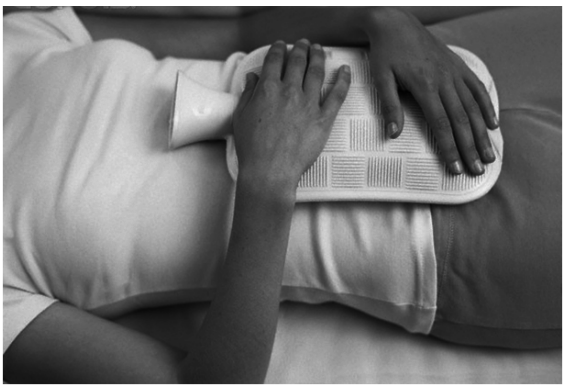
Hot application is the application of a hot agent, warm the skin either in a moist or dry form, on the surface of the body to relieve pain and congestion to provide warmth, to promote suppuration to promote healing to decrease the muscle tone and to soften the exudates.

Classification of Hot application



Purpose

- To stimulate circulation
- To promote suppuration
- To promote healing
- To relieve pain
- To reduce pain
- To reduce inflammation and congestion.
- To supply warmth and comfort
- To relieve muscle spasm.
- To relieve retention of urine.



Indications

- Local congestion
- Muscle spasm
- Fatigue
- Pain

Contra indications

- Heat is not used in malignancies, because heat increases, the metabolism of both the normal and abnormal cells.
- Heat is not used for client with impaired kidney, heart and lung functions. The vasodilatation of the cutaneous vessels produced by the heat might greatly reduce the blood supply to these vital organs and defect their functions.
- Heat should not be applied to actually inflamed areas. E.g. acute applications and tooth abscess. Because heat may cause them to rupture and surrounding tissues.
- Heat should not be applied on the clients with paralysis, weak and debilitated clients, because they have impaired perceptions and they may not be responding to hot application resulting in burns.
- Heat should not be applied, when there is oedema, associated with venous or lymphatic disease. It can increase the oedema.
- Heat should not be applied in case of head ache, because the resulting vasodilatation will increase the discomfort.
- Heat should not be applied on clients with metabolic disorders. Because of the increased hazards of tissues damage. e.g client with diabetes, Arteriosclerosis.
- Heat should not be applied on client with high temperature.
- Heat should not be applied to very young and very old people because of the risk of tissue burns.

Articles Required

Articles	Purpose
Hot water bag (1)	To take water
Jug(1)	To wipe the outside of the3 bag
Duster(1)	To insulate the hot water bag.
Towel(1)	To wipe the skin.
Vaseline or oil	To apply on the skin, if its red
Lotion thermometer	To check the temperature of the water

Procedure

Steps of procedure	Reason
• Wash hands	To prevent cross infection
• Take hot water in the jug pour some water into the hot water bottle and empty it.	To warm the hot water bag, so that very little heat is lost to warm the rubber and the client gets the full benefit of the heat application.
• Check the temperature of the water, or keep the boiled water until the steam disappears.	The water should not be hot, enough to scald the client, if the bag, leaks or bursts. The temperature of the water should be between 120 to 140°F.
• Full one- third to half of the bottle with the hot water.	To avoid unnecessary, weight on the body part, especially if applied over the abdomen. Full bag is not pliable to mould over the body, area to provide even heat.
• Place the bag, over a flat surface and expel the air, cork it tightly.	Air in the bag, will integrate with the conduction of heat.
• Dry the outside of the bag and test for leakage by holding the bag upside down.	To prevent scalding of the client
• Put on the cover and take it to the bedside.	The cover is used to absorb any moisture, since water is a good conductor of heat, any moisture between the hot water bottle and the skin increases the risk of burns.
• Apply the hot water bottle over, the area and cover it with the towel or sheet.	Towel or sheet is used to insulate, the bag from the heat loss.
• Keep the bottle in a place, for about 20 to 30 minutes changing the position of the bag as necessary. Inspect the area occasionally. Refill the bag, if necessary	Application of heat beyond 30 minutes, may lead to secondary effects. Inspection of the area and changing the position of the bag will prevent burns.

After care of the client and the articles

- Remove the hot water bag, when the treatment is completed.
- Dry the area, if moist with perspiration.
- Inspect the area for redness; if redness is present apply Vaseline or oil.
- Cover the client, with sheets and remove the drapes if any.
- Position the client comfortably on the bed.
- Take all articles to the utility room. Remove the cover of the hot water bottle and put it in the laundry bg. Empty the bag was the outside of the bag with soap and water, dry the inside of the3 bag, hanging it upside down. When dried, fill it with air and cork it, and store it. In its proper place. Replace all other articles.
- Wash hands.
- Record the procedure with date and time, the area to which it is applied, the purpose of the application and the reactions if any.

Infra red rays: (infra red lamp) : Infra red lamps transmit infra red rays, which are invisible heat rays., beyond the red end of the spectrum.

Ultra violet rays (Ultra violet lamp) : Ultra violet lamp transmits Ultra violet rays which are invisible heat rays beyond the visible spectrum at the violet end. Both these rays are used therapeutically for production of heat in the tissues.

Therapeutic uses

1. Promotes healing of decubitus ulcer.
2. Softens connective tissue
3. Relives pain spasm of the strained muscles.

Chemical Heating Bottles : These are sealed plastic containers of various sizes, contain two different kinds of chemical compounds in separate compartments.

When heat treatment5 is to be given, the nurse kneads, strikes of or squeezes the bottle vigorously. The two compounds are designed to maintain a constant temperature between 40 and 46^{o} for 30 minutes to 1 hour.

The radiation heat produced by the infra red and ultra violet lamps are more intense the heat given off from the heating lamps. The effects of the exposure to the ultraviolet lamps.

- Pigmentation of the skin.
- Production of Vit D
- Bactericidal effects
- The duration of the treatment is usually 20 to 30 minutes.

Electric cradles:

1. Electric cradles is a bed cradle, inside of it is fitted a light source and a thermometer.
2. It is used when a large body part is to be treated. E.G to dry large plaster body coasts.
3. It is also used, when the with gown or sheets.
4. Sheet is used over the cradle to prevent draughts.
5. Blankets can be added the cradle to maintain the heat at the desired level.
6. The duration of the heat cradle treatment is 20 to 30 min after the unit is warmed up or it may be used continuously, provided a low temperature is maintained.

Heating Lamps : Flexible necked lamps are used to supply heat to the body part. The distance between the exposed part and the lamps depend upon the wattage of the light bulb, the pigmentation of the skin and the heat tolerance by the client.

The recommended distances are as follows

1. 25 watt bulb = 35 cm from the body part
2. 40 watt bulb = 45 cm from the body part
3. 60 watt bulb = 60 to 75 cm from the body part.

Electric heating pads

Electric heating pads are composed of an electric coil inside of a water proof rubber covering and is provided with a heat control switch to maintain the temperature at the desired level.

The following precautions are to be taken, when using heating pads.

1. It should be covered with a flannel cloth to absorb the perspiration and to insulate the pad.
2. No wet dressings should be applied when an electric heating pad is being used.
3. Do not apply a heating pad with pressure, since the pressure reduces the number of air space between the client and the appliances. It increases the chances of burns.
4. Instruct the client, not to lie or lean against the heating pad.

Summary

1. Hot application is the application of a hot agent to warm the skin either in a moist or dry form.
2. Hot applications are classified into local and general application.
3. The local applications and general applications are further classified into dry heat and moist heat.

4. The purposes of hot application are to stimulate circulation, promote suppuration, healing to relieve pain, reduce inflammation and congestion, muscle spasm and retention of urine and to supply warmth and comfort.

5. The indications for hot applications are local congestion, muscle spasm, fatigue and pain.

QUESTIONS

I. Choose the correct answer

1. The hot application is to promote

   a) Circulation b) Sleep c) Muscle spasm d) All of the above

2. Application of heat in a place for

   a) 20 -30 minutes b) 5 10 minutes c. 30 -40 minutes d) All of the above

3. Ultra violet rays are used for

   a) Soften connective tissues b) Improve circulation
   c) improve comfort d) All of the above

4. The chemical heating bottles temperature is between

   a) 40- 46^0c b) 15- 25^0c c) 50- 56^0c d) All of the above

II. Fill up the blanks

1. Temperature of the water of hot fomentation is _____
2. The duration of the ultra violet lamp treatment is _____
3. Air in the hot water bag will interferes with _____ of heat.
4. The ultra violet rays promotes healing of _____.

III. Short answers

1. Classification of hot applications.
2. Write the purposes of hot applications.
3. Mention the therapeutic uses of ultra violet rays.

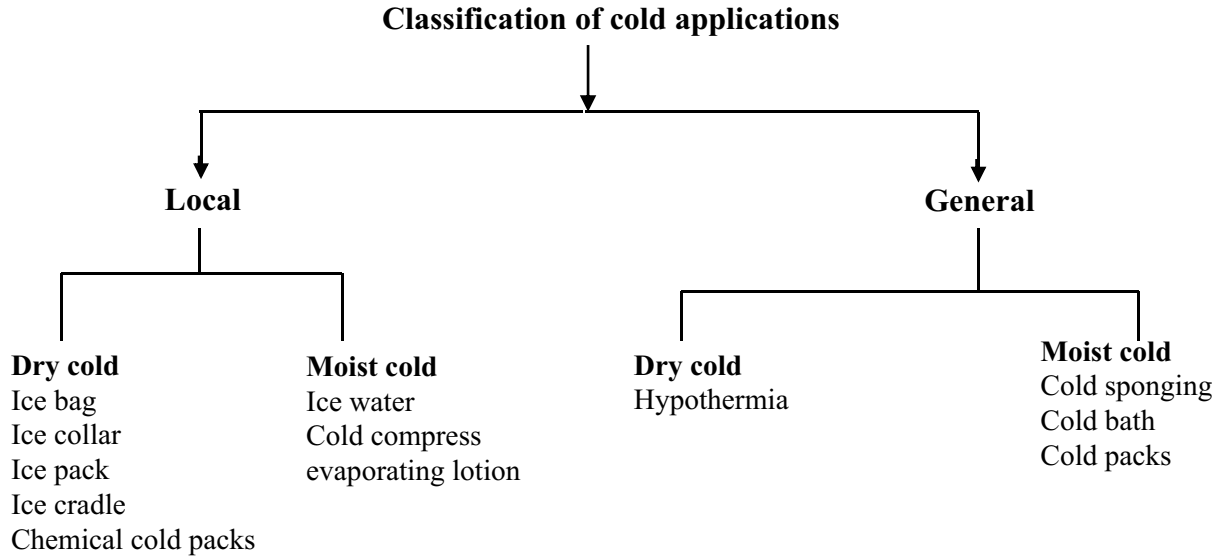
IV. Write in detail

1. Dry heat methods.
2. Procedure of hot application.

5. COLD APPLICATION

Definition

Cold application is the application of a cold agent cooler than skin either in a moist ort dry form on the surface of the skin, to reduce pain and body temperature to anesthetize an area to check hemorrhage to control the growth of bacteria to prevent gangrene, to prevent oedema and reduce inflammation.



Purpose

- To reduce pain and body temperature.
- To anesthetize an area
- To check haemorrhage
- To control the growth of bacteria
- To prevent gangrene
- To prevent oedema
- To reduce inflammation

Indications

- Fever
- Haemorrhage
- Inflammation

Contra indication

- Hypothermia
- Surgery
- Severely il

Local cold applications

Ice bag : An ice bag is a dry cold application. The bag is filled with crushed ice or ice chips and sprinkled sodium chloride. The salt lowers the melting point and prevents the ice from melting.

Crushed ice is better than ice cubes. The smaller pieces of crushed ice, allow easier moulding of the bag to the body point. There is loss airspace between crushed ices. The result is a more even cooling.

Articles required

- Ice bag or collar
- Gushed ice or ice chips
- Flannel cover
- Sodium chloride

Procedure

- Explain the procedure to the patient.
- Fill the ice bag with water, put in the stopper turn the bag, upside down to check for any leakage.
- Fill the bag half to two-third with crushed ice
- Sprinkle sodium chloride.
- Keep the bag on a flat surface and squeeze out the air presence of air will interfere with the thermal conductivity
- Screw the cap tightly.
- Wipe outside of the bag and put on the cover. Apply the Ice bag over the area.
- Clean the area with a bath towel.
- Make client comfortable.
- Clean the equipment and place it in the proper place
- Discard the used articles.
- Wash hands.
- Document the care-time, site, duration of the application.

Cold packs: Commercially prepared ices are available. These bags are sealed containers filled with chemical or non-toxic substance. Depending on the type, the bags ate frozen in the freezer or squeezed to activate the chemical that produces the cold. These packs have the advantage that the frozen solution remains pliable and can be easily moulded to fit the body part.

Articles Required

- Large basin with ice.
- Small basin with cold water.
- Gauze pieces or small towels.
- Water proof pad.
- Bath towel

Procedure

- Explain the procedure to the patient.
- Wash hands.
- Place the small basin with cold water into large basin with ice.
- Place the compress in the cold water.
- Keep the water proof materials under the part.
- Check the area, every 5 minutes.
- Change the compress every 5 min or when it becomes hot.
- Place the bag in the flannel cover. Flannel cover will absorb the moisture collected on the outer Ride of the bag.
- Apply it on the ordered area since the ice bag is cooler than the skin, the ice takes up heat from the body and reduces the temperature.
- The ice bag is applied for 30 minutes and then it is discontinued for at least 1 hour to allow for the recovery period.
- Make sure the client is comfortable.
- Empty the contents clean the articles and replace it in proper place.
- Wash hands.
- Document the care-time, site, response of the client, observation of the skin area.

Ice collar : It is applied to the neck, commercial ice bags are available. They are re-frozen for reuse. They are filled with a special solution and kept in the freezer until needed. Flannel covers are needed with ice collar (or) commercial ice bags.

Cold-compress : It is a local moist cold application. It may be sterile or unsterile. Sterile cold compress1 are applied over open wounds or breaks in the skin.

Cold compress are made out of folded layers of gauze, limit piece or old soft linen, wring out of cold or ice water. Or in some evaporating lotion (1 Part of sprit with 3 parts of water) and applied to the required area. It is left uncovered. Cold compress is left in a place for not more than 20 minutes.

The skin beneath the pack should be assessing periodically for symptoms of numbness and pain. Non-commercially, the pack can be wash cloth, towel, flamed or a piece of old linen depending on the size of the body part receiving the application.

A basin of cold water is prepared and the packs are immersed into it, when cooled, the excess of water is wrung out and the pack is applied to the body parts. Replace the pack as necessary to maintain coolness.

Chemical cold packs : These are similar to the chemical hot packs.

General cold applications: Cold sponging is used to reduce temperature in a client with "hyperpyrexia".

Large areas of the body are sponged at one time permitting the heat of the body to transfer to the cooler solution on the body surface. Often wet towels are applied to the neck, auxillae, groin and ankles where the blood circulation is close to the skin surface. Each area is dried by patting rather than by rubbing, since the rubbing will increase the cell metabolism and raise the heat production. The vital signs is checked frequently, to detect the early signs of the complications.

Cold sponging is hazardous to the client if the temperature of the body is bought down, rapidly from a high temperature to a very low temperature. In cold sponging, the temperature of the coater is kept between 65 and 90°F.

Tepid sponging : Tepid sponging is a safe method to reduce the body temperature in high pyrexia. It is carried out on the order of a physician. The temperature of the water is kept between 85 and 100° F.

Summary

1) Cold application is the application of a cold agent, cooler than skin either in a moist or dry form on the surface of the skin.
2) There are two types of cold application local and general.
3) Indication for cold application are fever haemorrhage and inflammation.

QUESTIONS

Choose the correct answer.

1. Contra indication for cold application is

   a) Surgery b) Fever c) Inflammation d) All of the above

Fill up the blanks

1. _____bag is used to cold application.
2. _____ is a safe method to reduce the body temperature in high pyrexia..
3. The ice bag is applied for_____ minutes.

Write short notes

1. Classification of cold application
2. Purposes of cold application

Write in detail

1. Local cold applications
2. General cold applications.

6. COLLECTION OF SPECIMEN

Definition of specimen : A specimen may be defined as a small quantity of a substances (or) object which shows the kind and quantity of the whole (sample)

The Nurses responsibilities in collection of specimen are,

- Preparation of the patient
- Informed consent
- Safety measures
- Preparation of the equipment
- Documentation

Collection of the equipment

- Methods of collecting single urine specimen.
- Methods of collecting mid stream specimen.
- Methods of collecting 24 hours' urine specimen.

Methods of collecting single urine specimen

Definition : Single urine specimen means the amount of urine voided at a time. Usually morning specimens are collected. 100-200 ml of urine necessary.

Purpose

For test purpose only.

Procedures

a. Cleaning the genital area.

b. Provide clean kidney tray (or) urinal (or) directly into the specimen bottle.

c. Taking care not to spill the urine outside of the container.

Methods of collecting mid-stream urine

Definition : Mid stream urine collection means collecting mid-stream part of the urine.

Purpose

- For culture test.
- To detect UTI infection
- To analyze of quantities and qualities of urine.

Procedure

1. Clean the genital area with soap water rinse with water alone.
2. In female patient, the labia are separated for cleaning and kept apart until the urine had been collected.

3. In male patient, the foreskin should be returned and glands penis is cleaned before the collection of the urine.
4. The client begins to void into the toilet, commode or bed pan.
5. Then the client stops the streams of urine.
6. The sterile container is positioned. And continues to void into the urine container.
7. When enough urine has been voided for specimen, the client stops the stream again.

Methods of collecting 24 hrs urine specimen

Definition : Twenty-four hour's urine specimen means to collect all the urine voided in 24 hours.

Procedure : Collection of specimen begins at 6 am and all subsequent voiding collected in bottle. Continue to collect till next morning. The urine collection stopped at 6 am on next day.

Preservatives: It decomposes the bacteria in urine container. Eg: HCL, Formalin, Chloroform etc.

Methods of collecting urine specimen from unconscious client and children.

Procedures

Male: Test tube with barrel of a syringe (or) Nirodh with rubber tubing, attached to penis. The rubber tubing collected to a bottle.

Female : Attach a wide mouthed container or a funnel with rubber tubing to the vulva by means of a "T" binder. The rubber tubing is connected with bottle.

Collection of stool specimen

Definition : Stool may contain worms or segments of worms. Eg: round worm, thread worm, hook worm and tape worm. On microscopic examination, the stool is found to contain various amoebae.

Procedures

1. Water proof disposable containers (or) wide-mouthed containers are provided with necessary instructions.
2. The client passes stool in clean bedpan.
3. Small amount of stool is removed with a stick or spatula and placed in a container.
4. Discard the stick in a waste bin.

Collection of sputum

Definition : Sputum may be collected to detect the presence of any bacteria such as streptococci, pneumococci, diphtheria bacilli and other diagnostic examination.

Procedures

For adult

a. A sterile waterproof disposable sputum cup (or) wide- mouthed containers used to collect the specimen.

b. The client instructed to cough deeply.

c. The sputum should be collected in the morning before brushing the teeth.

To children

a. Use a cotton applicator and test tube

b. When sputum is coughed up, wipe off the sputum with cotton applicator.

c. Drop the sputum into the test tube close the tube with cotton plug.

Collection of blood specimen

- Blood is collected by venipuncture strict aseptic techniques.
- The Proper Size of Bore (18, 19, 20)
- The blood is collected in test tube.
- Penicillin tube.
- Blood should be withdrawn slowly without suction.
- Blood may be collected by finger pricking.

Transport of specimen

- These are certain specimen such as blood and CSF which are normally sterile.
- No antiseptic or anti-microbial agents should come into contact with the specimen. All specimens should be sterile.
- Specimen should be sent to laboratory immediately. In case of unavoidable delay suitable transport medium has to be used.
- Proper disposal of the specimen after use must be ensured.

Summary

1. A specimen may be a small quantity of substance or object which shows the kind and quality of the whole
2. Sputum may be collected to defect the pressure of any bacteria such as streptococci, pneumococci diphtheria bacilli.
3. The midstream urine collection means collecting the midstream part of the urine

4. Blood is collected by venipuncture strict aseptic techniques.
5. Blood may be collected by finger pricking
6. Specimen should be sent to laboratory immediately .In case of unavoidable delay, suitable transport medium has to be used.

QUESTIONS

Choose the correct answer

1. The sputum be collected in early

   a) Morning b) Evening c) Night d) All of the above

Fill up the blanks with suitable answer

1. The sputum should be collected in _____
2. Blood is collected by venipuncture site _____ techniques.

Write short notes

1. Collection of blood specimen
2. Collection of stool specimen
3. Collection of sputum specimen.

Write in detail

1. Collection of urine collection.

7. URINE EXAMINATION

Albumin test

It has 2 types of test.

- Hot test
- Cold test

Hot test

Definition

Hot test means when the result is obtain after the boiling.

Requirement

- Spirit lamp
- Test tube
- Acetic acid
- Filtered urine

Procedures

- Fill 3/4th of test tube with urine.
- Heat the upper third of urine with spirit lamp.
- Allow it to boil.
- Acetic acid added drop by drop
- The cloudy appearance indicates the presence of albumin.

Cold test

Definition

Cold test means the result is obtain directly without boiling.

Requirements

- Nitric acid
- Sulphosalic acid 3%
- Test tube

Procedure

- Add equal amount of nitric acid and urine in a test tube.
- A white precipitate in junction indicates the presence of albumin.

Acetone test

Definition

This test used for detect the acetone whether it is present or not in the urine. It's otherwise called ***Rothera's test.***

Requirements

- Ammonium sulphate crystals
- Sodium nitroprusside crystals
- Liquor ammonia
- Urine

Procedure

- Take 2cm depth of NH_3 SO_4 crystals in a tube and add equal amount of urine, sodium nitropruside
- Close the test tube and shake it
- Take liquor Ammonia and trickling through the sides.

Result

Purple colour ring indicate the presence of acetone.

Test for sugar

Definition : It is the procedure for testing the urine for presence of urine sugar.

Requirement

- Spirit lamp
- Test tube
- Filtered urine
- Benedict solution.

Procedures

- Take 5 ml of Benedict solution in the test tube.
- Heat the bottom of the test tube with spirit lamp.
- Allow it to boil.
- Check for any color changes.
- Add 8 drops of urine in the test tube.
- Check for any color changes.

Blue color - +

Green color - ++

Orange color - +++

Brick red color - ++++

Summary

- There are 2 types of albumin test-

  1. Hot test and 2. Cold test
- In hot albumin test , fill 3/4th of test tube with urine, heat the upper third of urine.
- In cold test, and equal amount of nitric acid and urine in a test tube.
- White precipitate present at junction indicates the presence of albumin.
- Acetone test otherwise called as Rothera's test.
- Purple color ring indicate the presence of acetone.
- Urine sugar is tested using Benedict solution.

QUESTIONS

I. Choose the correct answer

1. The presence of acetone in the urine is identified by

a. Presence of orange colour ring.

b. Presence of purple color ring

c. Precipitation.

d. Cloudiness

II. Fill up the blanks

1. _____ is to be added in hot albumin test.
2. Acetone test is otherwise called as _____

III. Short notes

1. Albumin test- cold test
2. Acetone test

IV. Essay

1. Explain albumin test.
2. Test for urine sugar.

8. ADMINISTRATION OF MEDICATION

The role of nurse in the administration of medication has become increasingly complex and diversified. Administration of correct medication and dosage by the specified route, using proper technique and taking appropriate precautions were once all that was expected of a nurse. Besides administering medication, a nurse has to observe and interpret the client's response to therapy, so as to recognize the possible incompatibilities and interactions of medication. The nurse should have thorough knowledge about actions and side effects of medications and about the moral , ethical and legal aspects of drug therapy .

Administration of medication is a basic nursing function that involves knowledge and skill. The safe and accurate administration of meadication is one of the most important responsibilities of a nurse.

Nurse's six rights for safe medication administration

- The right to a complete and clearly written order.
- The right to have the correct drug route dose dispensed.
- The right to have access to information.
- The right to have policies on medication administration.
- The right to administer medications safely and to identify problem in the system
- The right to stop, think and be vigilant when administering medications.

Safety measures

- The "five rights" ensures safety in giving drugs.
- Right client
- Right drug
- Right dose
- Right time
- Right method

Nurse's responsibilities in the administration of oral medication

- Check the diagnosis and age of the client
- Check the identification of the client the name, bed number
- Check the physician's orders for the correct name of the drug, dosage and method of administration
- Check the nurses record for the time at which last dose given
- Check for any contraindications present in the client for an oral intake of medication such as nausea, vomiting and unconsciousness
- Check the consciousness of the client and the ability to follow instruction
- Check the articles available in the client's unit

Administering oral medication

Definition : Administration of medication by mouth. Oral medication administration includes buccal (cheek) and sub lingual(under tongue).

Preparation of the medicine trolley

Articles required	Purpose
A trolley	To take different medications and articles to the bedside
A tray containing:	
A bowl of clean water	To wash the medicine glass
Ounce glass, minim glass, teaspoon, dropper etc.	To measure the medication
Drinking water in a glass or feeding cup	To offer to client after the medicine is given to him
Mortar and pestle	To crush and powder the tablets if necessary
Medicine slab and spatula	To divide the powdered drugs into single doses
Duster or towel	To wipe the outside of the bottle after pouring the medications
Kidney tray and paper bag	To discard the waste
Plastic measuring cups and soufflé cups	To take the medication to the individual client
Medicine cards	To write the medication order from the

Procedure

Nursing action	Rationale
Determine patient's preferences and physician's order for fluid restriction, if any	Patient's on restricted fluids such as those with renal lung disease
Prepare drug:	
▪ Wash hands	Reduces transfer of micro organisms to Medication and equipment.
▪ Arrange the medication tray	Saves time
▪ Prepare medicine of one patient at a time	Reduces chance of error
▪ Calculate correct drug dose	Provides accuracy
▪ If the patient has difficulty in swallowing grind tablets in a mortar with pestle. Crush it to a fine powder and mix with small amount of fluid.	Ground tablets are easy to swallow.

Nursing action	Rationale
Prepare liquids ▪ Shake the bottle ▪ Hold medication cup to eye level and fill it to desired level. ▪ For volume less than 5ml/10ml a syringe without needle can also be used to measure the quantity of medication ▪ Return drug container back to cupboard after checking label. **Administer drug** ▪ Take medication to patient at correct time ▪ Identify the patient by comparing name on card	Label should not be soiled with spilled liquids. Ensures accuracy Third check of label reduces errors.
▪ Perform necessary pre- administration assessment for specific medication ▪ Administer drugs properly Ask if patient wish to hold medications in cup/ hand before placing in mouth. ▪ Administer only one drug at twice. ▪ Offer a glans of water with the drug to be administered.	This gives information as to whether medications should be given at that time.
▪ Place medication under tongue and allow it to dissolve completely.	Certain drugs when swallowed are destroyed by the gastric juices or rapidly Detoxified by liver and thus therapeutic levels are not attained.
▪ Instruct patient to place the medication in mouth against checks until it dissolves completely in case of buccal administration	Promotes local activity on mucus membranes

▪ If patient is unable to hold medication in hand place cup to the lip and introduce each drug	Single tablet or capsule avoids difficulty in swallowing and aspiration.
▪ Assist patient to comfortable position	Maintain comfort
▪ Dispose off soiled supplies	Reduces transmission of micro organisms
▪ Record the medication administration with date time and signature	Signature establishes accountability for administration
▪ Return within 30 minutes to evaluate effectiveness of medication	Useful in detecting therapeutic effects and also detecting side effect or adverse effect

After care of the client and articles:

- Remove the towel and wipe the face with it.
- Position the client for good body alignment. Tidy up the bed
- Wash and dry all articles and replace them in their proper places
- Wash hands
- Record medications given and record the reason for omission. Record any reactions observed after the administration of the medicines.
- Return the medication cards to the storage area.

Administration of injection : The parenteral route refers to medications that are given by injection or infusion. It means giving therapeutic agents outside the alimentary tract.

Safety measures

Asepsis

a. Sterile syringes and needles.

b. Sterile water for injections.

c. Drugs used for injection should be sterile.

d. Handling the drugs and equipment used for injections with aseptic technique.

e. Cleaning of the injection site with antiseptics to reduce the number of bacteria present in the skin.

f. Protecting the injections and the equipment during the transportation of the injections to the client.

Selection of the site for injection

The selection of the site depends upon

a. Route ordered by the physician
b. The quantity of medication to be given
c. The characteristic of the medication to be given
d. Knowledge of the anatomical location of nerves.
e. Expected action of the drug.

Selection of equipment for injections

Description of syringes and needles The most usual sizes are 2, 5, 10, 30 and 50ml. the insulin and tuberculin syringes are special syringes. All syringes are made of 2 parts. The outer part is called barrel and the inner part is called piston or plunger on the barrel of all syringes is a scale indicating cubic centimeters or millimeters. The scale on the insulin syringes is marked in units according to the concentration of the insulin being used. Eg U-40, U-80 etc

Needles are made up of steel or other metals and are available in 2 varieties- disposable and reusable. These vary in length from 3/8 to 5/8 inches. The diameter sizes of the needles are indicated by number 14- 27. The gauge number is usually found on the hub of the needle.

A needle has 2 parts- the hub and the shaft. The hub of the needle fits tightly into the syringe. The shaft of the needle goes into the tissues during the injection of the medicines. A long bevel has a sharp point. Needle should be sharp and shiny in order to penetrate the tissues quickly and safely.

Criteria for selection of syringes and needles

a) The route ordered
b) Viscosity of medication solution
c) Amount of medication to be administered
d) Body size and amount of fat.

In selecting the needles, the nurse should see that these are appropriate for the therapy

a) The bevel should be sharp and without hooks.
b) Needle size should be at smallest gauze appropriate for medications.
c) Needle length appropriate to the site and the person.
d) Needle should fit tightly to the syringe, so that the pressure of the liquid injected will not blow of the needle.

Articles : A tray containing

- Medication card
- Syringes and needles of appropriate size
- Disposable gloves
- Sterile medication (in ampoule/ vial)
- Antiseptic swab
- Kidney tray.

Preparation of the client and environment

- Identify the client correctly
- Explain the procedure and get the co-operation.
- Provide privacy with curtains.
- Place the client in a comfortable and relaxed position suitable for the type of injection. If the injections are given in the buttocks. Place the client in a prone position or a lateral position with the knees flexed. If the injections are given on the hand, let the client take a lying down position with the hands flexed at the elbow.

Dorsal gluteal site : Identify the greater trochanter of the femur and the posterior superior iliac spine. Draw an imaginary line between these 2 bony landmarks. Site will be the upper and outer quadrant or divide the buttocks into 4 regions by imaginary lines. Select the site at the upper and outer quadrant or divide the buttocks into 4 regions by imaginary lines. Select the site at the upper and outer quadrant or divide the buttocks into 4 regions by imaginary lines. Select the site at the upper and outer quadrant for the intramuscular injections.

Ventral gluteal site : Place the tip of the index finger on the anterior superior ilaiac spine of the client, the middle finger just below the iliac crest. The "V"shaped area is the area in which the injection can be given safely.

Vastus lateralis site : It is located on the lateral aspect of the thigh. It is the area between mid anterior thigh and mid lateral thigh, one hand's breadth from below the greater trochanter to one hand's breadth above knee.

Mid deltoid site : Locate the lower edge of the acromion process and form or rectangle, the deltoid area is used to inject very small quantities of non- irritating drugs.

Subcutaneous injections : It meets the following criteria

- The skin and underlying tissues are free of abnormalities.
- Not over bony prominences
- Free of large blood vessels and nerves.

The subcutaneous injections are usually given outer aspect of the upper arm, posterior chest wall below the scapula, anterior abdominal wall from below the breasts to the iliac crests, and the anterior and lateral aspect of the thigh.

Intradermal injections : They are given at the inner aspect of the lower arm, upper aspect of the anterior chest and upper aspect of the posterior chest.

Procedure	Purpose
Select the medication. Read the physician's order.	Observe "5" rights of the administration of medicine to ensure safety.
Wash hands	To practice asepsis
Prepare the medication	
Select appropriate syringe and needle.	
Check whether they are in good working order	To practice economy of time, material and effort
Obtain spirit swab	To promote asepsis
Calculate the dosage after medication	To prevent under dosage and over dosage of the medication.
Select the solvent	If the medication is in the powder form
Take the solvent in the syringe and introduce it into the vial or ampoule f medication	The medication should be in the form of solution; otherwise it will be lost in the container.
Mix the powder well, take out the required amount of solution in the syringe.	When mixed well, the solution will be clear without lumps.
Carry medication to the client	
Identify the client: Ask the client to repeat the name	Checks are essential to prevent errors.
Prepare the site for the injection Select the site.	
Clean the site with spirit swab	To remove the surface bacteria.
See that the client is in a comfortable position.	
Inject the medication. ***For intramuscular injections***	***Take the following precautions***
Spread the tissue between the thumb and forefinger to make the skin taut.	The needle should belong to reach the muscles Insertion d withdrawal of the needle should be gentle and quick to minimize the pain.
Needle is inserted at a 90 angle, holding the syringe in the right hand, using a steady push on the needle.	Aspirate the piston to prevent accidental intramuscular deposition of the drug.

With the right hand, on the syringe, aspirate blood by pulling back the piston with the left hand.If blood appears in the syringe, quickly withdraw the needle.	The syringe and needle are held firmly throughout the procedure to minimize the tissue injury.
If no blood comes, give the medication slowly by pushing the piston.	Expel the air form the syringe by holding the syringe with needle vertical at the eye level taking care not to expel the drug.
Remove the needle quickly and massage the site for the quick absorption of drug.	Do not massage the area. Massaging the site spreads the medications into the tissues causing a strain. Diverting the attention of the conversations helps to achieve relaxation of the client.

Z-track technique

- Pull skin to one side, downward or laterally about a rich using non- dominant hand.
- Inject medication with air lock at 90 degree angle
- Withdraw the needle and release the skin.

Intravenous: Introducing a single dose of concentrated medication directly into the systemic circulation.

Articles

1. Disposable gloves
2. Medication in ampoule or vial.
3. Sterile needle
4. Antiseptic swab
5. Medication administration record.

Procedure:

Nursing action	Rationale
Check physician's order for name of medication, dosage and route of administration	Ensures safety and accuracy in medication administration.
Collect information necessary to administer drug safely including action, purpose, side effects, normal dose, nursing implication	
Check patient's history of drug allergies	Allergic .reaction could prove fatal
Wash hands and put gloves	Reduces transmission of infection
Check patient's identification by asking name and compare with medication card.	Ensures that drug administered to the correct patient
Explain procedure to the patient and encourage patient to report symptoms of discomfort at IV site	Inform patient to planned therapies

Method of giving intramuscular injection: To give subcutaneous injections:

- Length of the needle and angle of insertions for the subcutaneous injections. A 90 angle is normally used with or 5/8 inch needle for obese clients. A 45 is used with a needle ¾ inch long or longer for an average client or in a thin client.
- The technique of giving injection for hypodermic injections will be same as in IM injection except the following:

  1. Use only non- irritating medications.
  2. Use only a small quantity of medications
  3. Deposit the medications in a fold formed by picking up a layer of skin and fat
  4. Be sure to insert the needle beyond the thickness of the skin.

To give intra dermal injections : This method is used for skin tests to detect allergies. The skin is held tout, by grasping it under the forearm with the bevel of the needle facing up; insert the needle at an angle of 10-15 □ to the skin. The needle enters between the 2 layers of the skin- the bevel should be practically visible through the skin. Inject the medication slowly, to produce a wheel on the skin. A quantity of 0.01 ml of medication is injected intradermally.

Take out the needle quickly. Do not try to clean or massage the area.

After care of the client and articles

1. Inspect the area for bleeding. If bleeding take place apply pressure but do not massage.
2. Ask the client to take rest for 15 minutes to 1hour especially when the drug is expected to produce some form of allergic reaction in the client.
3. Ask the client to move the limbs to check whether any nerve injury has taken place
4. Watch for the signs and symptoms of allergic reactions
5. If the client develops numbness or weakness on walking. It may be due to nerve injury. Ask him to take rest, and inform the doctor.
6. If the client develops pain, redness, indurations etc., at the site of injection, apply warmth. Inspect the area for abscess formation. The nurse can prevent these complications using correct method of injection and by rotation of sites.
7. ***Used injection*:** syringes and needles are put in the bowl of water to prevent the piston tucked into the bevel of the syringe if the syringe is disposable, dispose the syringe and the needle must be burnt.
8. Clean with warm water and dry and keep in a proper place and clean all other articles and replace them in their proper place.
9. Wash hands

10. Record the procedure on the nurse's record. With date and time. Record the name of the medication, strength, amount administered the route of administration the time, the effect, any reactions that have taken place etc., if any allergic reactions took place after the injection, it has to be recorded in capital. Letters and in red ink, so that it could be easily visible to others and also for the future reference.

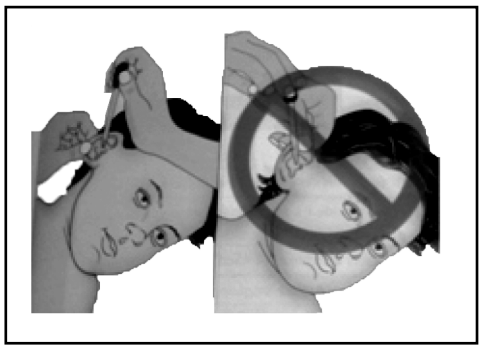
Instilling:

Purpose:

- To soften ear wax for removing it
- To reduce localized inflammation and destroy infective organisms in the external ear canal.
- To relieve pain
- To facilitate removal of foreign body

Articles

- Disposable gloves
- Cotton tipped applicators
- Medication bottle with dropper
- Cotton balls
- Kidney tray
- Bowl with normal saline



Nursing action	Rationale
Assess for allergy to medication	
Check medication order for name, dose, time, amount and ear to be treated	Reduces risk of medication errors
Assist patient to a side lying position to a side lying position with ear being treated upper most	
Clean meatus of ear canal. Using cotton tipped applicators use normal saline if necessary	Removes any discharge before instillation
Fill ear dropper partially with medication	
Straighten auditory canal. For an infant under 3 years pull pinna down and back. For an adult, pull pinna upward and backward	Straightening the canal can ensure solution to flow the entire length of the canal.
Instill correct number of drops and holding the dropper ½ inch above ear canal	Reduces risk of rupture of tympanic membrane
Instruct the patient to remain in side lying position for about 5 minutes	Prevents drop from escaping
Insert a small piece of cotton plug in the ear for 15-20 minutes	The cotton helps to retain medication
Replace medication and other articles	Reduces spread of micro organisms
Wash hands	
Document medication administration, name of medication, no. of drops administered and patient's response	
Hydrocortisone ear drops are contraindicated inpatients with fungal and viral infection in the ear	
Use sterile technique in administration of medication in case of perforation of the tympanic membrane.	

Inunctions: (topical applications):

It is the application of medication locally to the skin or mucous membranes in the form of lotion, ointments or liniments.

Purposes:

- To protect, soothed or soften surface areas.
- To warm an affected area and also for muscle relaxation.
- To relieve itching.

Articles:

A tray containing
- Medicine
- Kidney tray
- Gloves
- Adhesive tape
- Cotton ball
- Dressing pad

Procedure

Nursing action	Rationale
Explain the procedure	
Wash hands and put gloves on dominant hand	Prevents spread of micro organisms
Expose only the area where lotion is to be applied	
Clean the area with soap and water and pat dry it if required	
a. Powders: make sure that the skin surface is dry and sprinkle evenly over the area till a fine thin layer covers the skin	Moisture can cause the powder to stick and cause uneven distribution
b. Lotions: shake the container and put a small amount of lotion on a gauze dressing pad and apply it evenly in the direction of hair growth	Shaking the container ensures uniform distribution of the medication
c. Creams, ointments and pastes: take a small quantity of medication in gloved hand. Smear it evenly over skin using long strokes in the direction of hair growth.	Smearing medication evenly on the skin ensures uniform distribution
d. Aerosol spray: shake the container well or mix contents. Hold the container at 15-30cm away from the area and spray. Ensure teat spray does not enter into eyes or nose.	Aerosol spray if enters into eyes or nose can cause adverse effects.

Nursing action	Rationale
e. Transdermal patches: select clean dry area which is free of air. Take the patch holding it without touching the adhesive edges and apply it firmly using palm of hand and press if for 10second. Remove the patch at the appropriate time folding it with the medicated side in side. Observe the area carefully for changes in color, swelling, and appearance of a rash or other observable signs.	Applying the patch for longer time than required can cause increased rate of absorption than required

Intra abdominal : Administration of low molecular weight heparin (LMWH) requires special consideration. Use the right or left side of the abdomen at least 2 inches from the umbilicus and do not pinch the injection site. Administration LMWH in its prefilled syringe with the attached needle, and do not expel the air bubble in the syringe before giving the medication.

Intra thecal : Nurse administer intrathecal medications through a catheter placed in the subarachnoid space or one of the ventricles is often associated with long term medication administration through surgically implanted catheters. In most institutions a physician usually injects medications into intrathecal catheters.

Inhalation: Inhalation is the act of drawing in air, vapour or gas into the lungs. Drugs are inhaled either for a local effect (eg. Steam inhalations to relieve congestion in the respiratory tract).

Steam inhalation : Deep breathing of warm and moist air (vapour) into the lungs for local effect on the air passages or for a systemic effect.

Purposes

- To relieve the inflammation and congestion of the mucus membranes of the respiratory tract
- To soften thick tenacious mucus which helps in its expulsion from the respiratory tract
- To relieve spastic conditions of the larynx and bronchi
- To provide antiseptic action on the respiratory tract

Articles : A tray containing

- Towel
- Sputum cup with antiseptic solution
- Gauze piece
- Ounce glass
- Kidney tray
- Pillows
- Boiling water (160°F)
- Nelson's inhaler in a bowl
- Inhaler mouth piece
- Cotton ball
- Face towel
- Cardiac table
- Medication like tincture benzoin

Procedures:

Nursing action	Rationale
Check the physicians order and nursing care plan	
Explain the procedure to patient and ensure that patient has emptied his bowel and bladder	Helps in promoting relaxation
Warm the inhaler by pouring a little hot water into the inhaler and emptying it after one minute	Reduces loss of heat from inhaler during procedure.
Pour the required amount of inhalant into the inhaler and fill to a level below the spout with boiling water. The water should remain just below the spout	If the inhaler is filled up to the level of spout there is possibility of drawing water into the mouth when inhaling and cause scalds. If the spout is filled with water it will not act as on air inlet
Place sterile mouth piece and close the inhaler tightly. See that the mouth piece is in the opposite direction to the spout	This arrangement keeps the spout away from the patient when inhalations are taken in
Cover the mouth piece with a gauze piece and plug the spout with a cotton ball	Covering the mouth piece with a gauze piece will prevent burns of the lips. Cotton ball in the spout will prevent escape of steam
Place a towel around the inhaler and position it in the bowl	Insulates the inhaler and prevents heat loss
Switch off fan	
Position the patient in high fowlers or sitting position	
Place the apparatus conveniently in front of the patient on cardiac table with spout opposite to the patient. Remove the cotton plug and discard it into the paper bag.	Keeping the spout opposite to the patient reduces the chances of burns. Removing the cotton plug helps to open spout, so that it can act as an inlet for air.

Instruct the patient to place lips on the mouth piece, breathe out air through nose	Directing the steam out through the nostril relieves the congestion of the mucus membranes of the nostril
Continue the treatment for 15-20 minutes as long as patient gets the vapors	Help in effectiveness of the procedure
Remove inhaler from the patient after the stated time, wipe after persuasion from the patient's face	Enhances comfort of patient
Give chest physiotherapy and encourage patient to bring out sputum by coughing	
Instruct the patient to remain in the bed for 1-2 hours	Reduces chances of dizziness and effects of sudden temperature variation
Take articles to the utility room, empty the inhaler , clean the inside with alcohol to remove tincture benzoin	Cleaning of articles avoids contamination and cross infection
Record the procedure in nurses record with date, time, purpose and patient's response to the procedure	

Intravenous infusion: Introduction of a large amount of fluid into the vein continuously by a drip apparatus is called intravenous infusion.

Nursing action	Rationale
Check physician's order for name of medication, dosage and route of administration	Ensures safety and accuracy in medication administration
If drug is to be given through existing IV line, determine type of additive in IV solution if any	IV medication may not be compatible with additive
Assess condition of needle insertion site for signs of infiltration	Drugs should not be administered if site in edematous or inflamed
Check patient's history of drug allergies	IV bolus delivers drugs rapidly
Wash hands and wear gloves	Reduces transmission of infection

Prepare medication from vial or ampoule Check patient's identification by asking name and compare with medication card	Ensures that drug is administered to the correct patient
To give intravenous injection: Locate the vein and apply the tourniquet between the site chosen and the heart to obliterate the venous circulation. Ask the person to clench and unclench the hands. By pulling the skin tact, place the needle in line with the vein at the angle of 15° to 45°. Follow the course of the vein and insert the needle into the vein. When back flow of blood occurs into the syringe, release the tourniquet and inject the medication very slowly. Apply pressure at the site of the veinpuncturw after the needle is withdrawn.	
Dispose of uncapped needles and syringe in proper container	Prevents accidental needle sticks
Remove gloves and wash hands	Reduces transmission of microorganisms
Observe patient closely for adverse reactions during administration and for several minutes thereafter	IV medications act rapidly
Record drug, dose, route and time on medication forms	Timely documentation prevents medications errors
Report any adverse reactions to nurse in charge or physician	Adverse reactions to IV bolus may necessitate emergency measures

Intravenous injections: Intravenous injection is the introduction of the drug directly into a vein by means of syringe and needle.

Purposes

- If a very rapid effect is needed for e.g cardiac and respiratory stimulants, general anesthetics
- When the drug is given for its action in the blood stream or in the vessel.

- When the drug cannot be tolerated when given by other routes
- when it is desired to produce local clothing in the treatment of varicose veins
- When it is desired to introduce a drug into the circulation for diagnostic purpose. E.g., intravenous pyelogram
- Supply the body with food in the form of fluid.

Selection of veins

Veins usually selected for intravenous injections are cephalic or the median basalic at the inner aspect of the elbow or anyone of the veins of the lower forearm above the wrist.

The saphenous vein above the ankle is another point at which the injection may be given.

With the infants and small children the jugular, femoral and veins in the scalp are used.

Assessment

- Identify the patient with all details
- Check the doctor's order for the time of injection, type and dose of medicine etc.
- Get the instruction and help from senior sister
- Note the condition of the veins and decide the points to be punctured
- Find out the purpose of injection
- Check the details of medicines like name of the medicine, dosage, date of expiry, physical properties etc.

Articles required : A tray containing

- Tourniquet
- Methylated spirit or alcohol swab
- Adhesive plaster
- Sterile 5cc or 10cc syringe and needles
- The required medicine
- Kidney tray
- Small jar with sterile water
- Pair of scissors
- Cotton swabs
- File if drug is in ampoule

Procedure: Win the confidence and co- operation of the patient by proper explanation. Assemble the equipment to the bedside.

Nursing action	Rationale
Wash hands and wear gloves	Reduces transmission of infection
Place the patient in a comfortable position lying down with the arms extended and supported. Apply the tourniquet around the elbow or hold it firmly well enough to distend the vein.	For proper venipuncture
Clean the skin with the swab moistened with methylated spirit or with alcohol swab and discard it in the kidney tray	Prevent the transmission of infection
Take the drug in the ampoule or vial and make it ready to fill in the syringe	
Fill the syringe with medicine and introduce the needle into the vein after expelling the air. Puncture the vein and when the blood appears in the syringe release the tourniquet and then inject the drug slowly	To prevent entry of air into the blood vessels and causing air embolism To prevent infiltration
When the drug is finished place a piece of cotton or gauze over the site and withdraws the needle.	To prevent infection and oozing of blood
Ask the client to flex the arms for a minute or two. If oozing is present apply tincture benzoin dressing	
Make the client comfortable and tidy up the place	
Dispose the uncapped needles and syringe in proper containers	Prevents accidental needle sticks
Remove gloves and wash hands Replace the articles	Reduces transmission of micro organisms
Observe client closely for adverse reactions during administration and for several minutes thereafter	IV medications act rapidly and to identify and signs and symptoms anaphylactic shock
Record drug, dose, route and time of medication forms	Timely documentation prevents medication errors
Report any adverse reactions in charge or physician	To prevent further complications and to provide immediate care
It is better to have an assistant to apply and release the tourniquet or to hold the hand.	

Summary

- The safe and accurate administration of medication is one of the most important responsibilities of a nurse.
- The 5 rights ensures safety in giving drugs:
  1. Right client 2. Right drug 3. Right dose 4. Right time 5. Right method
- Oral medication administration includes buccal (check) and sublingual (under tongue)
- The syringes are made up of 2 parts. The outer part is called barrel and the important is called piston or plunger.
- The needle has 2 parts 1. Hub 2. Shaft
- Select the upper and outer quadrant for giving intramuscular injections
- Intradermal injections are used for skin tests to detect allergies.
- Inunction means application of medication locally to the skin or mucus membranes in the form of lotion, ointments or liniments.

QUESTIONS

I. Choose the correct answer:

1. The quantity of intradermal injection is
   a) 0.5ml b) 2ml c) 0.01-0.1ml d) 0.2ml
2. The purpose of steam inhalation is
   a) To reduce fever b) To relieve congestion in the respiratory tract
   c) To improve the circulation d) To maintain the hydration level.
3. The degree of giving intravenous injection is
   a) 10-20° degree b) 15-45 ° degree c) 45-60 ° degree d) 90° degree
4. Z- track technique is followed in
   a) Subcutaneous injection b) Intravenous injection
   c) Intramuscular injection d) Intrathecal injection
5. The degree of giving intramuscular injection is
   a) 90° degree b) 45 °degree c) 60 °degree d) 75° degree

II. Fill up the blanks

1. The application of ointment in the ski it is called as _____
2. The subcutaneous injection is given at _____
3. _____ route of medicine is directly enter into the systemic circulation.

III. Short notes

1. Method of administering intradermal injections
2. Method of giving intramuscular injection
3. The purpose of articles needed for instilling

IV. Essay

1. Explain the procedures of steam inhalation.

9. TURNING SCHEDULE

Definition

Change the position of unconscious patient in bed frequently is called as turning schedule. The patient should turn and change positions in bed every 2 hours.

Purpose

- Turning in bed improves venous return
- Improves respiratory function
- Improves gastrointestinal function
- Improves peristalsis movement
- Prevents unrelieved pressure on skin
- Prevents bed sore.

Indications

- Turn the position of unconscious patients every 2 hours.
- Turn the patient who cannot able to move.
- Turn the patient who has fracture injury.
- Turn the patient who have traumatic injury.

Contraindications

- The patient should not be turned if the doctor's prescription does not allowed
- The patient should not be changed if they had pain in that position.
- The patient should not be changed if he had any discomfort in that position.

Review of procedure : Review the physicians' orders and nursing plan of care patient activity. Identify any movement limitations and the ability of the patient to assist with turning consult patient handling algorithm if available to plan appropriate approach to moving the patient.

- Gather any positioning aids or supports if necessary.
- Identify the patient. Explain the procedure to the patient
- Perform hand hygiene and put on gloves if necessary.
- Close the room door or curtains place the bed at an appropriate and comfortable working height.
- Adjust the head of the bed to a flat position or as low as the supports to be used for positioning within easy reach
- Lower the side rail nearest you if it has been raised if not already in place position a friction reducing sheet or drawsheet under the patient.
- Using the friction reducing sheet or drawsheet move the patient to the edge of the bed, opposite the side to which he or she will be turned. Raise side rail and move to the opposite side of the bed.

- Stand on the side of the bed toward which the patient is turning lower the side rail nearest you.
- Stand opposite the patient's center with your feet spread about shoulder with and with one foot ahead of the other. Tighten your gluteal and abdominal muscles and flex your knees. Use your leg muscles to do the pulling.
- If available activate the bed mechanisms to inflate the side of the bed opposite from where you are standing.
- Position your hands on the patient's for shoulder and hip and roll the patient toward you or you may use the friction reducing sheet or drawsheet to gently pull the patient over on his or her side.

- Use a pillow or other support behind the patients back. Pull the shoulder blade forward and out from under the patient.
- Make the patient comfortable and position in proper alignment using pillows or other supports under the leg and arm as needed. Readjust the pillow under the patients head. Elevate the head of the bed as needed for comfort.

Summary

- Change the position of unconscious patient in bed frequently is called as turning schedule.
- The position should turn every 2 hours
- The purpose of turning schedule is to prevent bedsore, prevents unrelieved pressure on skin.
- The patient should not be changed if he had any discomfort.

QUESTIONS

I. Choose the correct answer

1. Indication of turning schedule is

   a) Unconscious b) Schizophrenia c) Anemia d) Leukemia

II. Fill up the blanks

1. The frequency of turning schedule is_____.

III. Short notes

1. Define turning schedule , write the purposes of turning schedule
2. Indications and contraindications of turning schedule.

IV. Essay

1. Explain the steps of turning schedule.

10. MINOR WOUND DRESSING

Definition

Wound is a cut or break in the continuity of the skin. Cotton or gauze pieces are used to clean the wounds. The dressing of the wounds with dressing materials are called wound dressing.

Types of dressing

Dressings may vary by type of material and mode of application. They should be easy to apply comfortable and made up of materials that promote wound healing

- ***Gauze dressing***: are the commonest. Gauze is available in different textures and shapes (eg) in square, rectangle and rolls of various lengths.
- ***Non antiseptic dressings***: are sterile unmedieated dressings applied to a fresh wound to protect it from infection.
- ***Antiseptic dressings***: are impregnated with some medication and are applied to wounds already infected to limit the septic process.
- ***Wet dressings:*** are used in infected wounds to soften the discharge, promote drainage and also in wounds that require debridement. It is also used to supply heat to the tissues. Moist heat is more penetrating than dry heat. Therefore moist heat is more beneficial in localizing the infection in an area.

  For applying wet dressing the contact dressing layer is moistened to increase the gauze ability to collect exudates and wound debris and then apply a dry second layer of absorbent dressing. This method of application effectively cleanses infected and necrotic wounds.
- ***Pressure dressings***: when there is danger of bleeding or when there is oozing from the wounds a pressure dressing may be applied. This is a thick sterile pad made up of gauze or gauze and cellulose applied with a firm bandage, Elastoplasts or binder.
- ***Non- adherent gauze dressings***: such as TELFA are used to cover clean wounds. Telfa gauze has a shiny, non adherent surface that does not stick or incisions or wound opening but allows drainage to pass through to the softened gauze above.
- ***Self adhesive transparent film:*** it acts as a temporary second skin. This is ideal for small superficial wounds and wounds which do not require debridement.

Purposes:

- Protect the wounds from contamination with micro organisms
- Aid in hemeostasis
- Promote healing by absorbing drainage and debriding a wound
- Support the wound site with splint

- Prevent the client from visualizing the wound
- Promote thermal insulation to the wound surface
- Provide maintenance of high humidity between the wound and dressing
- Provide mental and physical comfort for the patient.

Articles	Purpose
A sterile tray containing	
Artery forceps- 1	To clean the wound
Dissecting forceps-2	
Scissors-1	For the debridement of the wound if necessary or to cut the gauze pieces to fit around the drainage tubes etc
Sinus forceps- 1	To open the sinus tract or to pack the sinus tract if necessary
Probe -1	To take the cleaning solutions
Small bowl- 1	To fix the drain in case the drains are cut short.
Safety pin-1	To use when large wounds are dressed
Gloves, masks and gowns	To clean and dress the wound
Cotton balls, gauze pieces cotton pads etc as necessary	To create a sterile field around the wound
Slit or dressing towels	
Un sterile tray containing:	
Cleaning solutions as necessary	To clean the wound and the surrounding skin area
Ointment and powders as ordered	To apply on the wound
Vaseline gauze in sterile container	To prevent the dressing adhering to the wound
Ribbon gauze in sterile containers	To pack a sinus tract or a penetrating wound
Swab sticks in sterile container	To apply the medications if necessary
Transfer forceps in a sterile container	To handle the sterile supplies
Bandages, binders, pins adhesive plaster and scissors	To fix the dressing in place
A large bowl with disinfect solution	To discard the used instruments
Kidney tray and paper bag	To collect the wastes
Mackintosh and towel	To protect the bed garments

Procedure

Steps of Procedure	Reason / Explanation
Tie the mask	To prevent wound contamination with droplets.
Wash hands thoroughly	To prevent cross infection.
Put on gown, gloves etc as necessary.	To ensure asepsis.
Open the sterile tray spread the sterile towel around the wound.	To create a sterile field around the wound.
Pick up a dissecting forceps and remove the dressings and put it in the paper bag. Discard the dissecting forceps in the bowl of lotion.	To prevent contamination of the hands with the soiled dressings.
Note the type and the amount on drainage present.	To prevent contaminating the hands of the nurse by the outside of the bottle.
Ask the assistant to pour small amount of cleaning solution into the bowl.	Cleaning should be done from the cleanest area to the less clean area wound line is considered cleaner than the surrounding area.
Clean the wound from the centre to periphery and discard the used swabs after each stroke.	
After thoroughly cleaning of the wound dry swabs using the same precautions.	To keep the wound as dry as possible.
Discard the forceps in the bowl of lotion.	
Apply medications if ordered.	To apply the ointment directly to the wound may be difficult, apply a small portion on the dressing that goes directly over the wound.
Apply the sterile dressing, apply the gauze pieces first and then the cotton pads.	Cotton placed directly onto the wound may stick on the wound the discharge dries.
Re in force the dressing on the dependent parts where the drainage may collect.	Reinforcing the dressing will prevent oozing of the drainage onto the bed of patient.
Remove the gloves and discard it into the bowl with lotion.	Gloves worn during the dressing will be highly contaminated.
Secure dressing with bandages or adhesive tapes.	

AFTER CARE OF THE PATIENT

- Help the patient to dress up and to take a comfortable position in the bed, change the bed garments if soiled with drainage.
- Replace the bed linen.
- Remove the mackintosh and towel.
  - Take all articles to the utility room. Discard the soiled dressing into a covered container and send for incineration. Remove the instruments and other articles from the disinfectant solution and clean them thoroughly. Dry them reset the tray and send for autoclaving. Replace all other articles to their proper places. Send the soiled linen to the laundry bag for washing.
- Wash hands.
- Record the procedure on the nurse's record with date and time. Record the condition of the wound, the type and amount of drainage condition of sutures etc. on the nurse record. Report to the surgeon any abnormalities found.
- Return to the bedside to assess the comfort of the patient special instruction in the care of wound is to be communicated to the patient.
- Ensure the cleanser of the patient and his surrounding.

SUMMARY

- Wound is a cut or break in the continuity of skin.
- Purpose of dressing is protecting the wound from contamination with micro-organisms.
- The types of dressing are 1) Gauze dressing (2) non-antiseptic dressing, 3) Antiseptic dressing, 4) wet dressing , 5) pressure dressing , 6) Non- adherent gauze dressing, 7) self adhesive transparent film.

QUESTIONS

I. Fill up the blanks

1. The sterile unmedicated dressing applied to a wound it is called as _____
2. In non-adherent gauze dressing _____gauze are used to a cover clean wounds.
3. The wound should be cleansed from _____ to _____

II. Short notes

1. Types of dressing.
2. Purpose of dressing.

III. Essay

1. Explain the dressing procedure.

11. NASOGASTRIC ASPIRATION

Definition: Aspiration of the stomach contents by introducing a Ryle's tube into the stomach and aspirating the stomach contents at different stages of digestion after giving a specific meal. It is also called as fractional test meal.

Purpose

- For diagnose of gastric condition (eg) presence of cancer cells and bacteria.
- To investigate the emptying capacity of the stomach.
- To investigate stomach secretions as hydrochloric acid. The results usually obtain in terms of

  Hyperchlorhydria Hypochlorhydria Achlorhydria

Indications:

- Patients who have gastric problems.
- Patients who have excess of gastric contents.
- Patients who have digestive problem.

Contra indications:

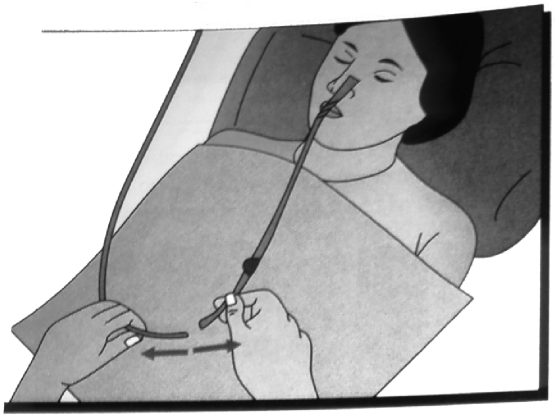
- Patients who have nasal ulcers.
- Patients who have surgical incision in the alimentary tract.
- Patients who have symptoms of nausea and vomiting.

Articles required

A tray containing:

- A Ryle's tube kept in a bowl of cold water after boiling.
- Liquid paraffin
- Rag pieces or collection swabs.
- 20 cc syringe in a syringe case or bowl.
- A pint measure with meal.
- Feeding cup with mouthwash.
- A glass for giving the meal.
- Sterile test tubes or bottles numbered consecutively on a rack two sterile bottles of 300 ml capacity one for resting juice and other for the residual juice.
- Kidney tray

- Mackintosh
- Sputum cup
- Adhesive plaster and scissors.
- Swab sticks
- Boric solution 2%.
- Screw clip.
- Paper and pen.



Steps of procedure:

- Get the co-operation and confidence of the patient by proper explanation of the test. Place the patient in a comfortable position proper up with pillows and provide privacy. Assemble the equipment to the bedside.
- Place the mackintosh and towel around the neck and shoulder and fix it with safety pins at the back. Clean the nostrils with swab sticks in the kidney tray. Wash hands.
- Take the Ryle's tube from the bowl and lubricate the tip with liquid paraffin. Before introducing the tube measure the length of the tube to inserted i.e. from the bridge of the nose to the ear lobe and from there to xiphoid bone that is at the level of the stomach and mark the tube to be inserted.
- Gently insert the tub e into the nostrils through the nasopharynx into the oesophagus by forward backward and downward movement.
- At this point while the tube is being directed into the stomach instruct the patient to breathe through the mouth and swallow frequently.

  Pass the tube to the length of the mark [40 to 60cm] up to the 2nd mark in the Ryles tube. Make sure that the tube is in the stomach. Take the 2oml syringe from the bowl and connect to the Ryles tube after expelling the air. Slowly withdraw all the resting juice and collect in the bottle and marked for it. If no fluid is aspirated pass the tube down further to 60 cm. place a swab around the tube and attach it by means of adhesive plaster conveniently to the patient.
- Place the rag piece over the end of the tube and clamp it with a screw clip. Give meal to the patient either by mouth or through the tube. Note the time. Write down the times of withdrawing the specimens. Make the patient comfortable and give some reading material to him.
- At the end of every 15 minutes withdraw about 5-10 ml of stomach contents and place it in the appropriate tubes or bottles.
- Continue this procedure until no material from the stomach can be obtained.

- When the required number of specimen have been taken or at the end of the stomach and place the whole residue in the bottle labeled residual juice. Withdraw the tube carefully and keep in the kidney tray.

After care of the patient

- Give mouth wash and remove the mackintosh and towel.
- Leave the patient comfortable.
- Allow the patient to have his food.
- Remove the articles to the utility room.
- Label the specimens correctly and send to the laboratory.
- Clean and boil the Ryle's tube for 5 minutes and hang it for dying. Clean and sterile the syringe and keep back it in place.

Summary

- Nasogastric aspiration is otherwise called fractional test meal.
- Before introducing the nasogastric tube measure the length of the tube from the bridge of the nose to the ear lobe to xiphoid bone.

QUESTIONS

I. Choose the correct answer

1. The insertion techniques of Ryles tube is

   a) Forward, backward and downward movement b) Forward, backward movement

   c) Backward movement only d) Forward and downward movement

2. Ryles tube is used for

   a) Aspiration b) Feeding. c) Giving medication d) All the above

II. Fill up the blanks

1. Liquid paraffin is used for _____.
2. The insertion length of Ryle's tube is _____.

III. Short notes

1. Write the articles and it purpose needed for nasogastric aspiration.
2. Contra indication for nasogastirc aspiration.

IV. Essay

1. Explain the procedure of N.G. aspiration and after care of the patients.

PRACTICAL - II

1. ASSESSMENT OF PREGNANT ABDOMEN

Definition: It is the procedure done during pregnancy to know the fetal condition.

Purpose

- To assess the gestational age, lie, presentation, position, attitude and engagement of the foetus.
- To assess the fetal well being.
- To detect abnormalities, mal presentations, mal position earlier.

Articles

Physical examination tray : A tray containing

- Inch tape
- Fetoscope.
- Stethoscope

Pre procedure

- Explain the procedure to the mother.
- Pregnant women should be relaxed during the procedure.
- Maintain privacy.
- Bladder to be emptied.
- Stand to right side of the mother.
- Warm hands before palpation.
- When the mother is having contraction, avoid FHR reading.
- Avoid palpation when contraction present.
- Collect and record the history of the mother.

Procedure

Steps	Rationale
1.Explain the procedure and purposes to the mother.	Proper explaining reduces anxiety.
2. Ask the mother to void.	Full bladder will cause pain and give false findings.
3. Provide privacy and comfortable position. Dorsal position with slightly flexed knees.	Abdominal muscles will be relaxed in knee flexed position.
4. Wash and warm the hands.	Chill hands may stimulate uterine contraction.

Inspection 1. Size of the uterus: See whether it is corresponding to the period of gestation. 2. Shape of the uterus: See whether it is longitudinally ovoid or transversely ovoid or globular. 3. Contour: • See for pendulous abdomen. • See for lightening. • See for fullness of flank. • Check height of fundus in centimeters and weeks. • Check the umbilicus whether dimpled or elevated. • Check fetal movements. • See for skin changes like striae gravidarum, linea nigra, cholasma, previous operational scar.	Primi with pendulous abdomen may be suspected for contacted pelvis. Lightening takes place after 38 wks. 38 wks shows fullness of flank indicates lightening has occurred. To know whether it corresponds to the period of gestation. Sometimes LSCS scar give way during uterine contraction leading to uterine rupture.
Palpation: Expose only the abdominal area. 1. Measure the height of the fundus in weeks. • Place the left hand on the upper most level of the fundus. • Divide the part between umbilicus and fundal area into two equal parts by keeping 2 fingers in between umbilicus and fundal area.	To elicit the normal fetal growth.
2. Measure height of fundus in centimeters. • Locate the upper border of the fundus by left hand and mark this point. • Measure the distance between the upper borders of the symphysis pubis up to the marked point by an inch tape in centimeters. • Measure abdominal girth (after 20 weeks). • Touch the scar and check for tenderness.	To assess if the growth of the fetus corresponds to period of gestation. Scar tenderness is a early sign of uterine rupture in case of previous caesarian section.
1. Fundal palpation: ▪ Always stand on the right side on the right side of eh woman facing the woman's head.	

▪ Use finger pads to palpate. ▪ Lace both hands on the sides of eh fundus with fingers held together and curving round the upper boarder of the uterus. ▪ Apply gentle pressure with the palmar surfaces of hand. Findings: Soft, non ballotable mass indicates buttocks of fetus at the fundal area. So presentation is cephalic, lie is longitudinal. 2. Lateral palpation: • Apply pressure with the palms of alternate hands, one hand to steady the uterus and push the fetus towards the examining hand. Walk the finger tips of both hands aver the abdomen from one side to other help-[s to locate the back.	
Findings: • In LOA (left occipito anterior) right side small part (like buds) felt indicates fetal limbs. • Left side Regular "C" shaped continuous curvature felt indicates fetal back Pelvic palpation: **.Grip I:** • Turn yourself, facing towards the woman's feet. • Grasp the side of the power uterine segment below the umbilical level between the palms of the hands. • Outstretched thumbs will meet at about umbilical level. • Direct the fingers inwards and downwards. Findings: • Hard regular defined mass felt cephalic presentation. • Two poles are felt. Along with limbs, sinciput felt. Along with back, occiput felt.	

• Sinciput felt higher than occiput the attitude would be complete flexion. **Grip II** • Face woman's head. • Without removing the hands, place the thumbs and fingers on the right side of the uterus then on the left side of the uterus. • Keep thumb and fingers of the right hand for enough to accommodate the fetal head. • Move the left hand to the upper border of the fundus and keep it there. • Ask her to take a deep breath. • Move the head in between the fingers. Findings: If it is moving - Non engaged head. If it is not moving - engaged head. Auscultation: • Ask her to stretch her legs. • Place foetoscope in the area between the umbilicus and iliac spine. • Count and record the FHR(fetal heart rate).	Stretching of the legs will enhance stretching of the abdominal wall.

After care:

- Make the mother lie comfortably.

Record:

- Record your findings in ac hart.
- Replace the articles.

Summary:

- Abdominal palpation is the procedure done during pregnancy to know the fetal condition.
- The purpose of this procedure is to assess the fetal wellbeing, to detect any abnormalities.
- It includes inspection, palpation, and auscultation.

QUESTIONS

I. Choose the best answer

1. During palpation the position of the mother is

   a) Left lat4eral position b) Dorsal recumbent position

   c) Dorsal position with knees slightly flexed d) none of the above.

2. Washing and warming the hands before palpation is to

   a) Reduce infection b) Uterine contraction

   c) Promote circulation d) Reduce discomfort.

II. Fill up the blanks

1. During lateral palpation, "C" shaped continuous curvature suggestive of _____
2. Fetal heart sound is heard in between _____

III. Write in detail

1. Abdominal palpation.

2. ANTHROPOMETRIC MEASUREMENT FOR UNDER FIVE CHILDREN

Definition

Quantitative expression of body mass, which indicates state of growth and health, is measured in kilograms or pounds using infant weighing scale.

Purposes

- To check whether an infant has adequate weight for age.
- To calculate food requirements.
- To calculate intravenous fluids and medications.
- To monitor whether an infant is gaining or loosing weight depending on disease condition.

Equipment

- Infant weighing scale-Infantometer
- Draw sheet
- Duster
- Paper and pencil for calculation

Procedure

- Note infants previous weight from record for last weighing
- Clean weighing scale with wet duster
- Place draw sheet on scale
- Balance scale to read zero
- Place the balance close to the wall to prevent the child from falling.
- Instruct mother to stand beside the scale. Undress the child before weighing and ensure that child remains still during the procedure.
- Mummify the infant with the same draw sheet and place infant on the scale.
- Place left hand over the infant without touching.
- Note weight.
- Lift the infant from the scale and help the mother to dress the infant.
- Check and compare previous weight.
- Difference of more than 100gms,needs to be clarified by rechecking the infants weight immediately.

- If the difference is still the same, it should be informed toward sister or the doctor concerned.
- If the weight is in pounds and ounces, it must be converted ti kilograms using conversion table.
- Document the weight.

Anthropometric Measurement : Anthropometric measurement includes Height, Weight, Head circumference, Chest circumference and Mid-arm circumference. These are the growth parameter assessment done by the registered nurse, a licensed practical nurse, or unlicensed assistive personnel who received education in the appropriate techniques for growth assessment.

Equipment Needed

- Small sheet, or paper drape to cover scale.
- Infant weighing scale.
- Toddler scale.
- Paper measuring tape.
- Flat surface, flat measuring board.
- Measuring device affixed to wall. (STADIOMETER) Height assessment rod attached to scale or an electronic length measurement device.

Measurement of length (infant / toddler) : Measurement of head, chest, length by placing the child on a paper covered surface,. Making the end points of the top of head and the heels of the feet, and measuring between the two given points gives the length of the child.

Measurement of head circumference

1. Place light drape or paper on flat surface.
2. Place infant/toddler in supine position or seated on paper drape.
3. Place tape measure over the most prominent point of the occiput , around the head just above the eyebrows and pinna. This is point of largest head circumference.

Measurement of chest circumference: Place tape measure underneath the back of baby and bring it to front measured at nipple line gives the chest circumference.

Measurement of mid arm circumference

1. Place the tape vertically, along the posterior aspect of the upper arm to the acromian process and the olecranon process.
2. Half measured is the midpoint.
3. Place the inch tape at the midpoint and measure around the arm. It gives the mid arm circumference.

Measurement of height and weight (preschooler)

Weight

1. Determine whether child is able to stand and balance on the scale.
2. Note child's previous weight, if available.
3. Place paper or drape on the scale.
4. Calibrate scale to "0" position.
5. Ask child to remove shoes and heavy clothing, children older than 24 months of age may be weighed while wearing light clothing.
6. Assist child to stand on scale.
7. Have child's hands at the sides of the body or hold belly , ask child to be still.
8. Note and record child's weight in kilograms.
9. Assist child to step down from scale or proceed to height assessment.
10. Document weight on child's growth and or related records specific to care location.

Height

1. Determine whether child is able to stand and balance on the scale or move the child to an area where measure is attached to wall.
2. Note child's previous height.
3. Ask child to remove shoes. It allows for accurate measurement of body height.
4. Assist child to stand on the scale or help the stand with the back touching the wall/ stadiometer. The child's heels, buttocks, shoulders and occipital should be in contact with the wall or height bar of the scale. The child should look straight ahead without tilting the head.
5. Place height rod and extend height assessment bar over the child's head.
6. Lower height rod to top of child's head.
7. With the examiner eye to eye with the child and with gentle traction applied to the jaw, note the height measurement and record child's height in centimeters.

8. Assist child to step down from scale.

9. Document height on child's growth chart and or related records specific to care location.

NORMAL MEASUREMENT

AGE GROUP	HEIGHT	WEIGHT
Infant 1-12 months) Toddler (1- 3yrs) Preschooler (3- 5 yrs)	45- 50 cm Increases 7.5 cm per year Birth height doubles at the age of 4 yrs	2.5- 3 kg Gains 2- 3 kg of weight per year Gains 2- 3 kg rep year
Age group	**Head circumference**	**Chest circumference**
New born Infant at the age of 1 yr to toddler 3 yrs	33- 35 cm Head and chest circumferences are equal	Less than head circumference

Mid arm circumference : During first year of life the circumference of upper arm of a healthy infant is 16cm remains constants until the age of five years.

13.6cm-16cm normal

12.5cm-13.5cm moderately malnourished

12.5cm and below severely malnourished

Summary

1. Anthropometric measurement is the assessment of baby height, weight head circumference, chest circumference and arm circumference
2. The purpose is for identifying Growth and development of babies.
3. It may indicate the babies well being or illness.
4. It is measured by the use of weigh machine, Infantometer , and stadiometer.
5. The measuring techniques and the procedures to follow to measure the anthropometric measurement be known by all the Nursing professionals.

QUESTIONS

I. Choose the correct answers

1 . Infantometer is used to measure the weight of the

a) Infant b) Toddler c) Pre school d) Schooler

2. Weight of the baby is measured with

a) Garments b) Removing of garments

c) With covering of towel d) with draping she

II. Fill in the blanks

1. New born baby weighed with the use of_____
2. Normal head circumference of the baby _____
3. _____ is the normal mid-arm circumferance

III. Short answers

1. Define anthropometric measurement?
2. Write the techniques used for assessing mid-arm circumference?

IV. Essay

1. Write elaborately about the anthropometric measurements?

3. RESTRAINTS

Definition

Restraints are devices used for partially or completely immobilizing infants for various medical and nursing procedures.

Purposes

1. To immobilize the infant.
2. To examine the specific body parts.
3. To perform medical and nursing procedures.

Types

1. Jacket Restraint
2. Mummy Restraint.
3. Elbow restraint.
4. Extremity restraint.
5. Abdominal restraint.
6. Crib with dome.

Jacket restraint

The jacket is put on with the strings in the back, so that the child cannot reach them. Instead of using a jacket restraint to prevent a child from climbing over a crib rail, an enclosed type of crib should be used. The danger in the use of jacket restraint is that of strangulation through pressure of a restraint that has slipped out of place and encircled a child's neck.

Mummy restraint

One corner of eh blanket is folded. The infant is placed on the blanket with head and neck at the edge of the fold. One side of blanket is to be pulled firmly and to be pulled firmly and tucked over the opposite shoulder. This is to be repeated on the other side. The extremities are to be covered properly and secured.

Alternative method of mummy restraint to examine the chest and abdomen

Pull the blanket firmly over both arms and tuck it under the arms. Wrap the leg in the remaining portion of the blanket and secure it.

Elbow restraint

The elbow restraint is made of a double piece of muslin or other string material with pocket sewn into which tongue blades are inserted. The tongue blades should be long enough to reach from the axilla till the wrist, so that the elbow cannot be bent. The




Abdominal restraint

It must not be applied too tightly that it inhibits the respiratory movements. The most significant point to be remembered in the use of any restraint is the degree of entanglement of the child in the strings resulting in possible suffocation or impairment of circulation, if it is tied to the frame of the crib. It is important therefore, that the restraints be applied correctly and that the child be observed frequently when such restraints are used.

Crib with dome

If an infant or toddler is capable of climbing over the crib sides, a crib net or a plastic dome may be used to keep the child safely in the crib. A crib net should be applied snugly over the top and sides of the crib and tied to the frame. The knots used must be of the type that can be untied quickly in case of emergency. Tongue blades hat are too long should not be used because of the danger of injury to axilla.

Extremity restraint

One of the extremity restraint is the clove hitch restraint. The equipment needed are; a strip of gauze bandage 2 inches wide and ½ yard long, cotton padding around the gauze, cut into 2 inches wide long enough to encircle the infants wrist or ankle. to apply the restraint, spread the gauze strips on the bed with one end towards the nearer side of the bed. In the middle of the strip make a figure of eight. Place padding gauze around the infant's wrist or ankle as necessary. This may be used to immobilize one or more extremities.

Summary

1. Restraints are devices used for partially or completely mobilizing infants for various medical and nursing procedures.
2. There are various types of restraints are being used.
3. The types of restraints are jacket restraints, mummy restraints, elbow restraints, extremity restraints, abdominal restraints, and crib with dome restraints.

QUESTIONS

I. Choose the best answer

1. Jacket restraints is applied with

   a) Strings b) Splints c) Both a and b d) None of the above

2. Mummy restraints is used to _____the body

   a) Visualize b) Cover c) Both a & b d) None of the above

II. Fill up the blanks

1. Padding gauze applied around the infants _____ or _____ in the extremity restraints.
2. The knot used in the frame of crib with dome restraint must be _____ .

III. Short notes

1. Purposes of restraints
2. Principles of restraints.

IV. Write in detail

1. Explain about restraints.

4. PREPARATION OF BALANCED DIET

Introduction

According to WHO health is the state of complete physical, mental, social well being and not merely the absence of disease or infirmity. To maintain good health ingesting a diet containing the essential nutrients in correct amounts is very important.

Balanced diet is one which contains different types of foods in such quantities and proportion so that the need for calories, proteins, minerals, vitamins and other nutrients in adequately met in a small provision is made for extra nutrients to with stand duration of leanness.

Factors

Age, sex, physical work, physiological stress, pregnancy and lactation.

Five groups

- Cereals, grains & products
- Pulses and legumes
- Milk and milk products
- Fruits and vegetables
- Fats and sugar

Points to keep in the mind while planning menu:

1. Energy derived from cereals should be not more than 75%
2. Whole grain cereals, parboiled grains or malted grains give higher nutritive value
3. It is better to include 2 cereals is one meal like rice and wheat
4. Flour should not be sieved for chapatti as it will reduce bran content
5. One serving of cereal is 25g. a day's menu may require 12-14 servings.
6. Minimum ratio of cereals proteins to pulse protein should be 4% in terms of the grains it will be 8 parts of cereals and one part of pulses.
7. One serving of pulse is 25g. 2 to 3 servings should be taken.
8. One serving of vegetables is 75g green leafy vegetables can be taken more than one serving if fruit is not included in the diet.
9. It is better to serve the fruit raw without much cooking or taking juice out of it. Everyday diet should contain atleast one medium size fruit.
10. There should be a minimum milk of 100ml/ day one to 2 glasses of milk or curd should be included in balanced diet
11. Energy derived from oils or fats is 15-20% of total calories and 5% from sugar and jaggery.
12. One egg weighs around 40g. This can be served along with cereal or pulses to improve the quality of protein. Instead, one serving of poultry/ fish can also be included in the diet.

13. Inclusion of salads not only help in meeting the vitamin requirements but the meals would be attractive and have high satiety value, due to the fiber content.
14. Fried foods cannot be planned if oil allowance is less or in low calorie diets.
15. One third of nutritional requirement atleast calories, protein should be met by lunch's dinner.
16. If possible meals should be planned for served days.
17. Usually the number of meals would be four and for every young children and diseases number of meals can be more.
18. Ideally each meal should consist of all the 5 food groups.
19. For quick calculations average value of calories and proteins from the same group can be taken.

Principles of planning a meal

- ✓ **Meeting nutritional requirement**: a good menu is one which will not only provide adequate calories, fat and protein but also minerals, vitamins essential for the physical wellbeing of each member of a family.
- ✓ **Meal pattern must fulfill family needs**: a family meal should cater to the needs of the different members.
- ✓ **Meal planning should save time and energy:** planning of meals should be done in such a way, that the recipes should be simple and nutrition. By using pressure cooker, time and energy can be saved.
- ✓ **Economic consideration**: any meals if do not satisfy the budget of the family, cannot be put into practice. The cost may be reduced by using the 1. Seasonal foods 2. Bulk purchasing 3. Substituting greens for fruits 4. Combinations of foods.
- ✓ **Meal plan should give maximum nutrients:** losses of nutrients delivering, procuring, cooking should be minimized. Sprouted grains, malted cereals, fermented foods enhanced nutritive value.
- ✓ **Consideration for individual likes and dislikes:** meal should plan according to the individual preferences likes vegetarian or non- vegetarian. If a person does not like particular greens, it can be tried in a different form or substituted by equqlly nourishing food.
- ✓ **Planned meals should provide variety:** if the meals are monotonous it is not consumed. Variety can be introduced in colour, texture and taste.
- ✓ **Meals should give satiety:** each meal should have some amount of fat, protein and fiber to get satiety. Meals should be planned in such a way that intervals between the meals is also considered.

	Man			Woman		
	Sedentary	**Moderate**	**Heavy**	**Sedentary**	**Moderate**	**Heavy**
Energy kcal	2425	2875	3800	1875	2225	2575
Protein	1g/kg of body weight					
Calcium	400	400	400	400	400	400
Iron	28	28	28	28	30	30
Retinol	600	600	600	600	600	600
Betacarotene	2400	2400	2400	2400	2400	2400
Riboflavin	1.4	1.6	1.9	1.1	1.3	1.5
Ascorbic acid	40	40	40	40	40	40
Folic acid	100	100	100	100	100	100
B12	1	1	1	1	1	1

Fat: 20% energy is usually derived from fat.

Minerals: calcium requirement can be met by taking 200ml of milk. Iron requirement is 2g is higher than man.

Vitamins: b vitamin requirement is based on calorie requirement (0.5g of thiamine, 0.6g of riboflavin, 6.6mg of niacin per 1000 cal). Hence the requirement is nurse for heavy worker. Vitamin-20mg is sufficient but the 50% is lost in cooking. Hence the requirement is 40g/day.

Low cost balanced diet (sedentary man)

Ingredients	Amount (gms)
Cereals	460
Pulses	40
Leafy vegetables	50
Other vegetables	60
Roots & tubers	50
Milk	150
Oil and fat	40
Sugar and jiggery	30

Suggested low cost recipes:

- Green dhal/ kootu
- Dry fish
- Fermented food (idli)
- Ragi adai/ chapatti with greens
- Sprouted gram

Summary: 5 food groups are there:

- Cereals grains and products, pulses and legumes, milk and milk products, fruits and vegetables, fats and sugar.
- Minimum ratio of cereal protein to pulse protein should be 4:1
- Everyday diet should contain atleast one medium size fruit
- Each meal should consist of all the five food groups
- Good menu is one which will not only provide adequate calories, fat and proteins but also minerals, vitamins essential for the physical . ideally each should consist of all the 5 food groups.
- A growing adolescent boy may need rich food to satisfy his appetite, where as a young child may require soft and bland diet. Pregnant women require more greens in the diet.
- The cost of meals can be reduced by using a) seasonal foods, b) by bulk purchasing, c) substituting greens for fruits, d. combination of foods like cereals and pulses.

QUESTIONS

I. Fill up the blanks

1. Energy derived from oils_____
2. The energy requirement for sedentary worker_____
3. The iron requirement for women_____
4. RDA required for the 1kg of body weight _____
5. Iron content foods are _____

II. Short notes

1. Define balanced diet and what are all the factors to be considered while planning a balanced diet?
2. List out the low cost balanced diet?

III. Essay

1. Explain the principles of planning a meal?

5. PREPARATION OF DIET FOR SICK

Introduction: Diet is an important as medicine in the treatment of diseases. A modification in the diet or in the nutrients can cure certain diseases e.g., a patient suffering from peptic ulcer needs a bland diet for this recovery. A salt free diet can reduce the blood pressure in a patient with hypertension.

For everyone, eating food is an employment. When the person is ill. The food intake becomes a problem.

Liquid diet : Liquid diet must be used for patients who are unable to take or tolerate solid food. It consists of clear fluids and full fluid diet.

Clear fluid : Clear fluids are used when there is a marked intolerance to foods and roughage. These include clear tea, black coffee, clear soups, whey water strained fruit juices, soda water and other aerated beverages.

Clear tea : Have water ready for boiling. Do not use water, which has been boiling for sometime as it spoils the flavor. When the water starts to boil pour a little into the teapot to warm it.

Empty out this water and put the tea in to the teapot pour the boiling water over the tea and allow standing for 3 to 5 minutes. Strain and pour. Dilute with hot water if desired and add a few drops of time or lemon juice and sugar to taste.

Black coffee: One heaped table spoon of pure coffee powder

Freshly boiled water 300ml.

Heat the coffee jug thoroughly. Put the coffee powder into the jug. Pour boiling water and allow to stand near the fire for 10 minutes. Strain and serve as black coffee with sugar if desired.

Clear soup: The basis of clear soups is meat stock. To make stock allow two pints of water to each pound of bones or meat. Chop the bones and cut of the meat, then put into cold water and bring to simmering point. If a little salt is added if helps the scum to rise. Simmer the stock for a minimum of 2-3 hours removing the scum as it rises. Allow cooling thoroughly, strain through fine muslin to remove the fat and solid matter.

The stock may be used as it is for soup, or simmered again with diced vegetables to add other flavours. Strain and serve very hot.

Fruit juice : Fruit juice may be prepared from fresh fruit, or by dilution of commercially prepared fruit squashes. Remove the juice from citrus fruit by means of a squeezer, strainer, dilute with water and add sugar or glucose to taste.

Fruits which stew well. E.g apple, tomatoes may be stewed with a little water until pulpy, then strained through muslin. Add water and sugar or glucose to taste.

Raw tomato juice : Select ripe, juicy tomatoes. Pour boiling water over the tomatoes and left stand for 2 minutes to loosen the skin. Remove skin, mash the tomatoes and press thorough a strainer as much of the juice and soft part as possible. Add salt and pepper to taste. Some may prefer sugar.

Whey : To 500 ml of fresh milk warmed to blood heat (37^0c) add one to two teaspoon of rennet. Set it aside in a warm place for a quarter of an hour. Then break up the curd thoroughly by stirring with a fork. Let it stand for 15 minutes, then strain the whey through the muslin and bring it to the boiling point. Curds may be used in place of rennet.

Lime whey : To 500 ml of fresh milk add 4 table spoon of lime juice. Boil without stirring until the curd separate. Strain through several thickness of gauzes and add sugar. Cool and serve.

Barley water:

- 1 tablespoon of barley flour.
- 500 ml of boiling water.
- 2 tablespoon of cool water.
- Salt.

Mix the flour to a smooth paste with cold water gradually add the boiling water stirring all the time. Boil about 30 minutes, add salt and one teaspoon of lime juice and strain before use.

Full fluid diet:

Tea and coffee: Tea and coffee should be prepared as for clear fluids and served hot with the addition of milk or cream and sugar or glucose to taste.

Egg flips or egg nog : Beat an egg thoroughly (yolk not used. albumin water may be used) and add 250 ml of milk. Stir well and strain before serving. This may be flavored with sugar, or lemon juice. If desired it may be added to coffee or tea.

Dhal soup:

- ½ cup of dhal
- 2 cups of water
- 1 large onion
- Salt

Grind the Dhal finely. Chop and fry the onion, mix all the ingredients and boil for 20 -30 minutes.

Vegetable soup:

- ¼ cup diced vegetables
- 2 cups of meat stock
- Small pat butter (about 1 teaspoon)
- Salt and pepper.

Prepare and dice the vegetables. Place in saucepan and sauté in melted butter for a few minutes. Add the boiling stock, salt and pepper to taste and boil gently until the vegetables are tender. Mix 15 gm flour with a little cold stock, add to the boiling stock, stirring continuously, and

boil until the soup is thickened. If desired, the vegetables may be rubbed through a strainer before thickening the soup.

Light cereal preparation

Double boiled rice:

- 2 tablespoons of rice
- Pinch of salt
- 240 ml of milk, water or milk and water mixed.

Wash the rice and add it to the milk. Simmer gently for 1 to 1/ 2hours, till it is reduced to a pulpy mass. Add sugar if desired before serving. Cooking in a double boiler more easily regulated than in an ordinary saucepan.

Ragi conjee: Ragi, after being ground, should be shifted two or three times through muslin one tablespoon of ragi flour should be mixed till smooth with a little cold water, then gradually add 300ml of boiling water with a pinch of salt and boil for 15 minutes. If prepared half milk and half water may be used.

Arrowroot conjee

- 2 teaspoons of arrowroot
- 125 ml of boiling water
- Sugar to taste
- 1 tablespoon of cold water
- 125 ml of hot milk
- A pinch of salt.

Mix the arrowroot to a smooth paste with the cold water and add the boiling water gradually. Boil for 10 minutes, stirring constantly, then add milk and salt and boil for 10 minutes more. Add sugar if desired before serving.

Barley conjee

- 1 tablespoon of prepared barley flour
- 2 tablespoons of cold water
- ¼ teaspoon of salt
- 125 ml of warm milk
- 125 ml of boiling water

Mix barley flour to a smooth paste with cold water, add he boiling water gradually stirring constantly, and boil for 30 minutes add milk and salt, and bring to the boiling point.

Soft diet

- This is one of the most frequently used routine diets. It bridges gap between acute illness and convalescence. It is used in acute infections.
- Made of simple foods
- Easily digestible.
- Contains no fiber
- Near to normal diet
- No highly spiced or seasoned

It is nutritionally adequate when planned on the basis of normal diet.

Light puddings

Fruit jelly

- 500 ml of juice
- 100 gm of sugar
- 20 gm of powdered gelatin

Put all ingredients into a pan and warm gently, stirring all the time. Turn into a rinsed mould and allow setting, preferably in a refrigerator. Keep cold until served.

Corn flour pudding

- 500 ml milk
- 30 gm sugar
- 30 gm corn flour
- Thin strip lime or orange peel or other flouring
- 15 gm custard powder

Pour about three quarters of eh milk into a saucepan, add the orange rind or other flavoring, sugar and a pinch of salt and bring to the boil slowly. Mix the corn flour and custard powder together with the remaining cold milk. Pour the boiling milk into the mixed custard and corn flour, stirring well. Return to the pan and boil for a few minutes until it thickens. Pour into individual moulds and allow setting until cold.

Summary

1. Diet is important as medicine in the treatment of diseases.
2. For everyone, eating food is an employment, when person is ill.
3. Liquid diet must be used for patients who are unable to take or tolerate solid foods.
4. Fruit juice may be prepared from fresh fruits.
5. Tea and coffee should be prepared as far clear fluids and served hot with the addition of milk or cream and sugar or glucose to taste.
6. Soft diet is one of the most frequently used routine diets. It bridges gap between acute illness and convalescence.

QUESTIONS

I. Write short notes

1. Preparation of whey water.
2. Preparation of vegetable soup.
3. Preparation of corn flour puddings.

6. ANTE-NATAL EXERCISES

Objectives

1. To stimulate the circulation
2. To strengthen the pelvic and perineal muscles
3. To stretch tight inner thigh muscles for greater comfort in stirrups.
4. To reduce fatigue, encourage relaxation during pregnancy and labour.
5. To promote physical comfort and correct posture.

Ante-natal exercises

1. Good Posture

   Stand with your feet about 10 inches from a wall and press the back of the head, spine, shoulders, hips and thighs against the wall. Tuck the buttocks in at the back, contract abdominal muscles to flatten the back, and straighten the neck, throw your shoulder girdle at the back and the arms hanging straight on your sides. Bend the knees slightly and press the foot on the floor. Wrigle the toes for few minutes.

2. Pelvic tilting or (rocking):

   In half lying position, well supported with pillows, knees bent and feet flat. Place one hand under the back and other on the top of the abdomen. Tighten the abdominals and buttocks and press the back down on to the underneath hand. Breathe normally, hold for up to 10 seconds then relax. Repeat up to 10 times. Pelvic tilting can also be performed while sitting, standing or kneeling.

3. Transverse exercise:

   Sit comfortably or kneel on all fours with a level spine. Breathe in doubt, and then gently pull in the lower part of the abdomen below the umbilicus keeping the spine still and breathing normally. Hold up to 10 seconds then relaxes gently. Repeat up to 10 times.

4. Pelvic floor exercises:

   Sit, stand or half lie with legs slightly apart. Close and draw up around the back passage as though preventing a bowel action then repeat around the front two passages as though preventing the flow of urine. Draw up inside and hold for as long as possible up to 10 seconds, breathing normally, then relax. Repeat up to 10 times.

5. Foot and leg exercises:

   Sit or half lie with legs supported. Bend and stretch the ankles at least 12 times. Circle both feet at the ankles at least 12 times. Circle both feet at the ankle at least 20 times in each direction. Bend both knees, hold for a count of four, and then relax. Repeat 12 times.

Summary

1. The objectives of antenatal exercises are:
   - To stimulate the circulation
   - To strengthen the pelvic and perineal muscles
   - To stretch tight inner thigh muscles for greater comfort in stirrups.
   - To reduce fatigue, encourage relaxation during pregnancy and labour.
   - To promote physical comfort and correct posture .
2. The common exercises are pelvic tilting, Transverse exercise, Pelvic floor exercises, Foot and leg exercises:

QUESTIONS

I. Choose the correct answer

1. The antenatal exercise helps in

   a) Stimulate circulation b) Stimulate labor

   c) Stimulate uterine contraction d) All of the above

2. In pelvic floor exercise the breath should be held for

   a) 5 seconds b) 10 seconds

   c) 15 seconds d) 20 seconds

II. Fill up the blanks

1. Pelvic tilting can be done while _____
2. In foot exercise the leg should be held for_____

III. Write in detail

1. Antenatal exercises.

7. POST NATAL EXERCISES

Objectives

- To improve the muscle tone which have stretched during pregnancy and delivery, the perineal and abdominal muscles.
- To teach about correct posture to be maintained, while getting up from the bed.

Postnatal exercises include

1. Circulating Exercises:

   Foot and leg exercises must be performed, to improve circulation, reduce oedema, and prevent deep vein thrombosis. If edema is present, the foot of the bed may be raised slightly.

2. Pelvic Floor Exercises:

   As explained in the antenatal exercises i.e., sit and stand or half lie with legs slightly apart. Close and draw up around the back passage as though preventing and bowel action. Then repeat around the front 2 passages as though preventing the flow of urine. Draw up inside and hold for as long as possible up to 10 seconds, breathing normally, then relax. Repeat up to 10 times.

3. Abdominal Exercises:

   This include abdominal breathing, head and shoulder raising, leg raising, pelvic tilt, knee rolling, hip hitching and sit ups.

4. Abdominal Breathing:

   Mother is taught to take deep breathe, raising her abdominal wall and exhale slowly to ensure that the exercise is being done correctly place one hand on the chest and one on the abdomen. When inhaling, the hand on the abdomen should be raised and the hand on the chest should be remain stationary Repeat the exercise five times.

5. Head And Shoulder Raising:

   On the second post partum day, lie flat without pillow and raise head until the chin is touching the chest. On the third post partum day, raise both hand and shoulders and lower them slowly. Increases gradually until able to do ten times.

6. Leg Raising:

   The exercise may begin on the 7^{th} post partum day. Lying down on the floor with no pillows under the head, point toe and slowly raise one leg keeping the knee straight. Lower the leg slowly, gradually increase to 10 times each leg

7. Pelvic Tilting or Rocking:

   Lie flat on the floor with the knees bent and feet flat. Inhale and while exhaling, flatten the back hard against the floor so that there is no space between the back and the floor. While

doing this, tighten the abdomen muscles and the muscles of the back. Inhale normally, hold breathe for up to 10 seconds and then relax. Repeat up to 10 times.

8. Knee Rolling:

   In back lying with knees bent, pull in the abdomen and roll both knees to one side, keeping the shoulders flat. Return the knees to upright position and relax the abdomen. Pull in again both knees to the other side. Repeat up to 10 times.

9. Hip Hitching:

   In back lying, with one knee bent and other knee straight. Slide the heel of the straight leg downwards thus lengthening the leg. Shorten the same leg by drawing the hip towards the ribs on the same side. Repeat up to 10 times. Change to the opposite side and rotate

Summary

1. The objective of postnatal exercises are:

- To improve the muscle tone which have stretched during pregnancy and delivery, the perineal and abdominal muscles.
- To teach about correct posture to be maintained, while getting up from the bed.

2. The various post natal exercises are Circulating Exercises, Pelvic Floor Exercises, Abdominal Exercises, Abdominal Breathing, Leg Raising, Pelvic Tilting or Rocking, Knee Rolling, Hip Hitching.

QUESTIONS

I. Choose the best answer

1. The postnatal exercises helps in

   a). Improve muscle tone b) Correct posture c) Both a & b d) None of the above.

2. Leg raising exercises can be begun at

   a) 5th postpartum day b) 6th postpartum day

   c) 7th postpartum day d) 8th postpartum day

II. Fill up the blanks

1. Circulating exercise helps to _____

2. Head and shoulder raising exercise should be started on _____

III. Write in detail

1. Postnatal exercises.

8. CORD CARE

Definition

It is the cleaning of the umbilical cord and applying medicine.

Purposes

1. To clean the cord and prevent infection setting in to the body.
2. To inspect the cord to check for sign of infection.

Articles

1. Cotton swabs
2. Spirit
3. Medicine as per standing order
4. Waste paper bag

Procedure

1. Arrange the necessary articles near to the babys presence.
2. Inspect the cord for signs of infection and pus formation to determine further action.
3. Clean the cord stump with spirit and apply cord medicine to prevent getting infection to the cord.
4. Discard the used cotton balls and wash the hands and replace the articles.
5. Record the procedure, observation of the cord

Summary

1. It is the cleaning of the umbilical cord and applying medicine.
2. The purpose of cord care are:
    - To clean the cord and prevent infection setting in to the body.
    - To inspect the cord to check for sign of infection.

QUESTIONS

I. Write in detail

1. Cord care

9. BREAST CARE

Definition

Breast care is the hygiene provided to prevent breast infection and to promote safe lactation.

Purpose:

- To promote lactation.
- To prevent infection.
- To examine the breast fro cracked nipples, depressed nipples and enlargement.
- To teach the mother about hygiene of the breast.

Articles required

- Screen
- Tray containing

1. Big bowl - 1
2. Jug with warm water
3. Sponge clothes 1
4. Towel small - 1
5. Small bowl conting gauze pieces
6. Kidney tray

Steps	Rational
1. Explain the procedure to the mother	Enhances co operation and reduce fear and anxiety.
2. Assemble the articles at the right side of the mother.	Prevent wasting of time and energy.
3.Screen the bed	Provide privacy.
4.Wash hands.	Prevent infection.
5.Expose the mother's breast and put the towel below the breast.	
6. Examine the breast for cracked nipple / depressed nipple/ engorgement.	
7. Clean the breast from the areola to the nipple with water in circular motion (Hoffman's method).	Removes dirt enhances blood circulation.
8.Dry the breast.	Bacteria may reproduce in the moist area.
9. Cover the clean breast with clean towel.	Provides security to the mother.
10.Expose and clean the other breast as above.	
11.Wash and replace the articles.	Records are legal documents.
12. Record the procedure.	

Procedure

Assisting with breast feeding

Definition : Assisting a mother to feed at breast by using approriaste technique.

Purposes

- To assist mother to breast feed her child.
- To educate an importance of breast feeding and teach appropriate technique.
- To create positive attitude towards breast feeding.
- To help baby receive all benefits of breast feeding.

Equipments:

1. Bowl with luke warm water.
2. Kidney tray.
3. Few rag pieces.
4. Bath towel.

Procedure

1. Make sure that mother has taken bath.
2. Instruct her to wash hands before feeding.
3. Instruct mother to keep breast and nipples clean after each feeding.
4. Assist her in cleaning of breast if necessary.

   a) First clean nipple area with rag piece and then clean breast with luke warm water.

   b) Clean one breast at a time.
5. Change baby's soiled , wet linen before feed.
6. Assist mother to assure comfortable position (sitting or lying), provide adequate support to back.
7. Assist mother to place baby at the level of the breast.
8. Assist mother to place baby at her angle of elbow and support the baby with same hand.
9. Assist mother to compress the breast with the thumb on top and fingers underneath the areola.
10. Instruct mother to slightly touch the baby's lower lip with the nipple, stimulating the mouth to open.
11. When the mouth is open, assist mother to pull the baby to the nipple and ensure that the baby's mouth covers the nipple and an areola radius of 2-3 cm all around the nipple.

12. Make sure that baby's nose does not get pressed against mothers breast by making mother support breast with her index and middle finger.
13. Allow baby to feed at each breast for 10 20 minutes.
14. Arouse baby in between feeds by stroking sole of feet or ear lobe.
15. Help mother to stop feed and break suction by placing her fingers in corner by baby's mouth and keeping it there until the nipple is completely out of the baby's mouth.
16. Advise mother to burp baby after feeding by placing baby in upright sitting position on lap and by gently tapping baby's back or shoulder.
17. Place baby in cradle in left lateral position.
18. Document time of feed, baby's condition, sucking ability and any problems related to condition of breast and nipple.
19. Replace equipments.

QUESTIONS

I. Choose the best answer

1. Breast care will promote

   a) Lactation / hygiene b) enlargement of the breast

   c) Circulation d) all of the above.

2. Clean the breast from the

   a) Areola to the nipple b) Nipples to the areola

   c) Simultaneously both surfaces. d) One of the above

II. Write in detail

1. Breast care

10. PERINEAL CARE

Definition

Cleaning of the perineum to minimize the occurrence of infection before, during and after delivery.

Purposes

1. To minimize infection.
2. To visualize the episiotomy area for REEDA (Redness, Edema, Ecchymoses, Discharge and Approximation).

Points to remember

1. Always go from a cleaner area to less cleaner area.
2. Never expose the mo0ther unnecessarily.
3. Be careful and use antiseptic lotion with correct concentration.

Articles

Unsterile tray containing

1. Savlon 2% solution (2 ml in 100 ml of water in jar)
2. Spirit.
3. Betadine.
4. Kidney tray with lining.
5. Draping sheet.
6. Sanitary napkin

Bedpan

Sterile tray containing

1. Artery clamp
2. Thumb forceps
3. Big cotton balls 10
4. Bowl with 1:20 savlon
5. Gauze pieces -3.

Preparation of the mother

1. Explanation
2. Ask her to void.

Preparation of Unit

Good light for adequate visualization of the suture area.

Method	Rationale
1. Explain to her	
2. Make her lie in dorsal position with knee flexed	Good visualization of perineal area is possible.
3. Provide privacy with screen	Un necessary exposure of the area may cause discomfort to the mother.
4. Remove the knot of the napkin at the back as well as at the front and keep the pad in place.	
5. Keep the bedpan (The bedpan should be warmed up by pouring warm water over it before keeping)	
6. Wash hands.	To prevent cross infection.
7. Wear mask. Open the tray and take a gauze piece keep it over the end of the pad and remove the pad.	Using gauze to remove the pad will avoid contamination of hand.
8. Keep the pad in a kidney tray (inside of the pad should not be exposed to the outside).	
9. Pour the 2% savlon solution over the perineal area.	Antiseptic lotion will prevent infection of the wound.
10. Take cotton ball with the help of artery calmp. Dip it inside the antiseptic lotion in the bowl (1:20 savlon).	To prevent additional infection.
11. Clean the perineum in the following order a) Monspubis b) Vestibule c) Labia minora d) Labia majora e) Perineal area without touching the wound. f) Lateral thighs g) Anus	

12. Dry it with cotton balls. Discard the artery clamp in the kidney tray.	
13. Examine the wound area carefully. Take gauze piece with the help of thumb forceps.	To assess the signs of infection.
14. Clean the wound area first then the surrounding skin with cotton dipped in spirit.	To prevent infection.
15. Discard the thumb forceps.	
16. Apply a fresh pad tie it at the front.	
17. Remove the bedpan.	
18. Make her to turn to one side.	
19. Tie the pad at the back.	
20. Clean the back with antiseptic lotion and dry it.	
21. Make her to lie down comfortably.	

QUESTIONS

I. Choose the correct answer

1. Hand washing is done to

   a) Prevent cross infection b) promote cleanliness

   c) all of the above d) none of the above

2. The position of the mother during perineal care is

   a) Supine position b) left lateral position

   c) Lithotomy position d) All of the above

II. Write in detail

1. Perineal care.

11. FOOT CARE FOR DIABETES MELLITUS

Foot care involves all aspects of preventive and curative care of the foot and ankle. People who have diabetes are vulnerable to nerve and vascular damage that can result in loss of protective sensation in the feet, poor circulation and poor healing of foot ulcers. Diabetes may reduce blood flow to the feet, making it harder to heal an injury or resist infection.

Purposes

- To maintain skin integrity
- To provide comfort for clients and sense of well being.
- To maintain foot function
- To encourage self-care.
- To prevent foot ulcers.
- To identify any corns and calluses and to treat them early and effectively.

Equipments needed

- Water proof pad
- Wash cloth
- Soft towels
- Wash basin
- Warm water
- Soap
- Lotion
- Disposable gloves
- Nail clippers
- Polish remover (if necessary)

Assessment

- Assess vital signs of the client
- Explain the procedure to the client.
- Assess foot wear worn by client. Socks should be worn to absorb excess perspiration and avoid fungal infection.

Procedure	Rationale
• Wash hands	To prevent infection
• Make client to sit in the chair comfortable if the client is bed ridden elevate the head of bed.	To promote comfort
• Fill ¾ of basin with warm water 100F -104F Place water proof pad under basin. Soak client's feet in basin.	Warm water softens nails, increases local circulation. Diabetic clients may have decreased sensation in their extremities. Test water temperature carefully to prevent burns.
• Allow feet to soak for 20 minutes.	Softening allows easier removal of dead epithelial cells and reduces possibility of nails from cracking.
• Apply soap and wash the feet thoroughly	Application of soap and washing removes the dirt's
• Dry the feet thorough with soft towel including the area between the toes	Soft towel is good for easy absorption and wiping the area between the toes reduces risk for bacterial growth.
• Apply water soluble lotion if the skin is dry.	To provide comfort.
• Replace the articles correctly	
• Wash hands.	
• Record the procedure.	
• Teach and encourage the client to do the procedure daily to prevent foot complications.	To identify early if there is any problem and to treat properly.
• Teach them to check feet daily for red spots, cuts, swelling and blisters. To see the bottom of the feet use a mirror or ask someone to help.	Commercial removers may contain ingredients that can lead to development of infection and ulcers.
• Explain the dangers of giving barefoot.	
• Advise to wear appropriate shoes.	Skin or feet may be injured.
• Advise not to use heating pads and hot-water bottles.	Inappropriate shoes may cause friction and injury to the feet.
• Educate the client to put the feet while sitting. Wiggle the toes and move the ankles up and down for 5 minutes two or three times a day.	Danger of blistering and burning the feet. To enhance blood circulation.
• Ask not to cross the legs and sit for long period of time.	
• Advise not to smoke or drink alcohol if the client has that habit.	To prevent further complications.

NAIL CARE

Procedure

Purpose

- Maintain skin integrity around nails.
- Provide for clients comfort and sense of well being.
- Maintain foot function
- Encourage self-care.

Assessment

- Note client gait for limping or unusual position. Unnatural gait can be caused by painful feet or bone and muscle disorders.
- Assess footwear worn by client. Socks should be worn to absorb excess perspiration and avoid fungal infections.
- Identify clients at risk for foot or nail problems:
    - Diabetes is associated with changes in micro circulation to peripheral tissues. The diabetic client is at high risk for infection from breaks in skin integrity and may have decreased sensation to pain as a result of neuropathies.
    - Elderly client's ability to perform foot and nail care may be impeded by poor vision, obesity, or musculoskeletal conditions that limit their ability to bend and maintain balance.
    - Cerebrovascular accident may alter the client's gait due to foot drop, muscle weakness, or paralysis.
    - Conditions associated with foot and ankle edema (renal failure, congestive heart failure) interfere with blood flow to surrounding tissues and impede proper shoe fit.
- Determine client's ability to perform self-care.
- Inspect nails and skin of fingers, toes, and feet. Assess areas between toes for dryness and cracking.
- Assess client's knowledge of foot and nail care practices.
- Review agency policy for trimming nails. Many agencies require
- Identify clients going to surgery. Nail polish must be removed, so nail beds can be assessed for changes in oxygenation.

Equipments :

Water proof pad

Washcloth, towels

Washbasin, warm water, soap

Lotion

Disposable gloves

Nail clippers, file

Orange stick

Polish remover (if necessary)

Procedure

Steps	Rationale
• Wash your hands	
• Help client to chair if possible. Elevate head of bed for bedridden client.	
• Remove colored nail polish if client is scheduled for surgery. Review agency policy to determine patient may wear clear nail polish.	Coloured nail polish prevents observation of the nail beds for changes in colour associated with poor oxygenation.
• Fill washbasin with warm water. (100-104° F). Place waterproof pad under basin. Soak clients' hands or feet in basin.	Warm water softens nails, increases local circulation, and reduces inflammation.
• Place call bell within reach. Allow hands or feet soak for 10-20 minutes.	Softening allows easier removal of dead epithelial cells and reduces possibility of nails cracking during trimming.
• Dry the hand or foot that has been Soaking. Rewarm water, and allow other extremity to soak while you work on the softened nails.	Soaking the second hand or foot while the nurse works on the first increases efficiency of time.
• Gently clean under nails with orange stick.	
• Beginning with large toe or thumb, Clip nail straight across.	
•Push cuticle back gently with orange stick.	Cuticle care reduces inflamed cuticle and bang nail formation.

• Repeat procedure with other nails. • Rinse foot or hand in warm water. • Dry thoroughly with towel, especially between digits. • Apply lotion to hands or feet. • Help client to comfortable position • Remove and dispose of equipment. • Wash your hands.	Removing excess moisture inhibits bacterial growth.

Summary

- Foot care involves all aspects of preventive and corrective care of the foot and ankle.
- Foot care to maintain skin integrity and to maintain foot function to prevent foot ulcers.
- Diabetes may reduce blood flow to the feet making harder to heal an injury or resist infection.

QUESTIONS

I. Fill up the blanks

1. In performing foot and nail care allow hands or feet soak for _____to minutes.
2. Temperature of water for foot care is _____

II. Essay

1. Explain the procedure of foot care.