Geriatric Care Assistant

(Qualification Pack: Ref. Id. HSS/Q6001)
Sector: Healthcare
(Grade XII)

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About the Textbook

The world's population is ageing at an unprecedented rate. With advances in medicine, technology, and overall living standards, people are living longer than ever before. This demographic shift has created a growing demand for specialized healthcare professionals who can care for older adults with dignity, empathy, and skill. Among these professionals, the Geriatric Care Assistant (GCA) plays a vital role in supporting the physical, emotional, and social needs of elderly individuals.

One of the essential responsibilities of a GCA is monitoring and maintaining the vital signs of elderly patients. Vital signs such as temperature, pulse, respiration, and blood pressure are the body's basic indicators of health status. Accurate measurement and timely reporting of these parameters can help detect early signs of illness and provide medical interventions.

The integration of technology has transformed the way healthcare is delivered to older adults. From wearable devices that monitor heart rate, oxygen levels, and movement, to telehealth platforms that allow doctors to consult patients remotely, technology enhances both efficiency and safety in elder care. As you begin your journey into the field of geriatric care, you will learn to assess and meet the health needs of older adults, integrate technology into caregiving, safeguard yourself from occupational hazards, and handle biomedical waste responsibly.

Through structured lessons, case studies, and practical exercises, this book aims to prepare you for both the challenges and rewards of working in this field. Caring for the elderly is caring for the wisdom and experience of generations—and as a Geriatric Care Assistant, you are entrusted with the responsibility of making their later years safe, comfortable, and meaningful.

UNIT: 1
ROLE OF GERIATRIC AIDE IN PATIENT CARE

Introduction

Caring for the elderly is a vital part of modern healthcare systems. Geriatric care focuses on supporting older adults in observing vital signs and other body parameters, safe administration of medicines under supervision, and participating in providing rehabilitation care. This unit introduces students to the core knowledge and skills required to function as competent care assistants for older adults.

SESSION 1: Identifying Vital Signs in a Patient

The four traditional vital signs—pulse, temperature, blood pressure, and respiratory rate—are the fundamental components of the physical exam and nursing assessment. Vital signs are indicators of the body's regulation. Hence, changes in vital signs are necessary information about the body processes.

Vital signs show the body's most basic functions. They provide information about a client's physiological and psychological health. In this session, you will learn about the different vital signs and how to identify them. Body temperature, pulse, respiration, and blood pressure are the four vital signs of life.

Fig: Vital signs

Evaluating body functions helps geriatric caregivers identify specific life-threatening conditions and plan interventions. It also helps in detecting changes in the client's health status. In a healthy person, vital signs stay within a consistent range. These indicators are useful for detecting or monitoring medical issues in the body. Age-related variations occur in normal vital signs, such as high blood pressure or hypertension, as people grow older. The risk of developing hypertension increases in older adults, as does the risk for heart problems such as tachycardia (fast heart rate),

bradycardia (slow heart rate), or arrhythmia (abnormal heart rhythm). Environmental and lifestyle factors such as smoking, drinking, and dietary choices have a direct influence on the cardiovascular system.

Temperature

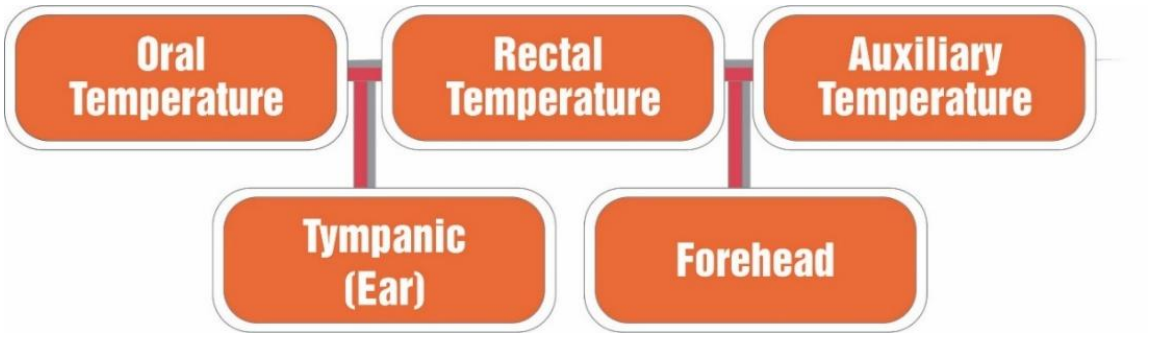


Fig: Sites of Temperature

Human body temperature, under normal conditions, is known as normothermia or euthermia and varies based on factors such as the measurement site in the body, the time of day, and the person's activity level. Measurements taken directly inside the body cavity, such as rectal and vaginal assessments, tend to be slightly higher than oral measurements, which in turn are somewhat higher than skin temperature. To elaborate, the widely accepted average internal body temperature is 37.0 °C (98.6 °F), while the oral (under the tongue) measurement is 36.8° ± 0.4°C (98.2° ± 0.7°F). These figures represent the average normal temperature, which can vary among individuals. Ear temperature measurement, also known as tympanic temperature, is a method of assessing core body temperature through inserting a thermometer into the ear canal. A forehead thermometer provides a quick and sterile way of assessing temperature.

Fig.2.2: Clinical Thermometer

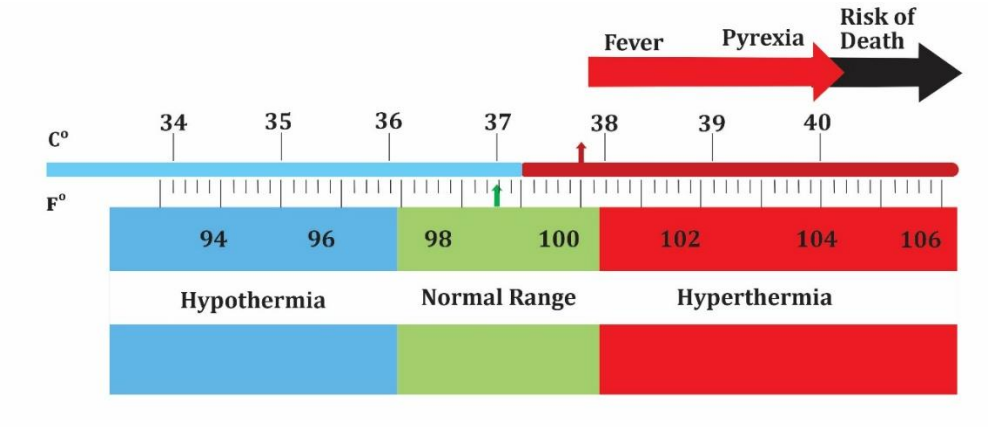
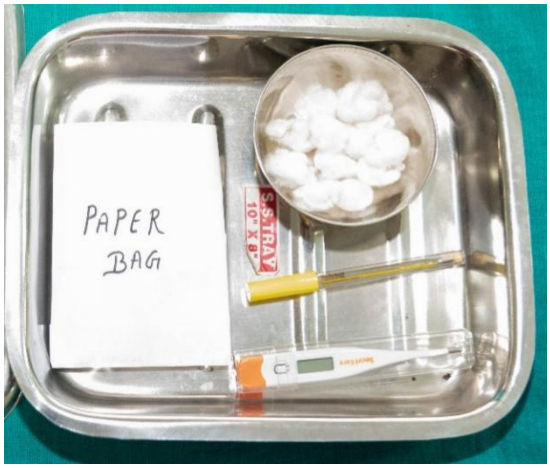


Figure no. showing the range of human body temperature

Preparations for taking the temperature

- Wash hands properly.
- Select appropriate equipment.
- Introduce yourself and describe the procedure to the patient. Clarify doubts.
- Shake the glass thermometer to lower the chemical to < 96^0 or switch on the power button of the electronic thermometer.



Taking Oral Temperature

Fig.2.3: Taking oral temperature

Articles required
Clinical thermometer in a glass bottle, Dry cotton swabs, paper bag, TPR sheets, blue and red pens, spirit.

- Keep the tip of the thermometer in the patient's sublingual pocket of the oral cavity.
- Place it there for at least 1-3 minutes.
- Remove the thermometer and wipe it clean with a tissue to ensure accurate reading of the calibrations.
- Read the temperature by rotating it slowly to view the chemical level and then read to the nearest tenth of a degree, or see the digital display on an electronic thermometer.
- Record the reading.

Taking a Rectal Temperature

Articles required
Clinical thermometer (Rectal) in a glass bottle, Dry cotton swabs, paper bag, TPR sheets, blue and red pens, spirit, and gloves.

- The patient is placed with the upper knee flexed in Sims' position. Cover the patient to expose only the anal area.
- Wear gloves
- Prepare the thermometer and lubricate its tip with water or petroleum jelly (Vaseline).
- Hold the thermometer in your dominant hand, and gently separate the buttocks to expose the anus.
- The patient is asked to inhale. Insert the thermometer or probe gently into anus (infant - ½ inch, adult- 1 ½ inches). Continue the procedure if there is no resistance by holding in place for 1 minute.
- Wipe secretions on the glass thermometer with tissue and dispose of the tissue. Note down the temperature and document the reading.

Taking an Auxiliary Temperature

Fig: Taking an Auxiliary Temperature

Articles required
Small towel, Clinical thermometer in a glass bottle, Dry cotton swabs, paper bag, TPR sheets, blue and red pens, spirit.

- Shake the thermometer to bring down the reading and clean it with soapy cold water or an alcohol wipe in a twisting motion.

OR

- Open the disposable cover of the electronic thermometer. Push the power button to the ON position.
- Assist the patient to a comfortable position.
- Obtain the patient's permission to access the auxiliary area (i.e., the area under the armpit).
- Remove the gown from the selected side of the shoulder.
- Wipe the axillary area to make it dry.
- Place the thermometer or probe into the center of the axilla. Keep the patient's arm straight down and place the forearm across the patient's chest.
- The thermometer should be in place, usually for 5 minutes or until the signal is heard.
- Remove it and read the calibration accurately.
- Record the temperature.
- Keep it in the appropriate storage container.
- Wash hands

Pulse

Fig.2.4: Reading pulse of a patient

The pulse rate indicates the heart rate, or the number of times the heart beats per minute. The arteries expand and contract with the flow of blood from the heart. Pulse beats indicate not only the heartbeat but also the heart rhythm and strength. The average pulse for healthy adults ranges from 60 to 80 beats per minute. The pulse rate may also fluctuate and increase with exercise, illness, injury, and emotions. The flow of blood through the arteries can be felt by firmly pressing on the arteries, which are located close to the surface of the skin at certain points of the body. The pulse can be felt on the side of the lower neck, on the inside of the elbow, or at the wrist. It is easiest to take the pulse at the wrist. While assessing the pulse at the lower neck, ensure it is not pressed hard, as it may block the blood flow to the brain.

Fig: Few Sites for checking pulse

When taking the pulse, the following steps are followed:

- Select the appropriate pulse site and place the tips of three fingers other than the thumb over the pulse site. Press firmly but gently on the arteries using the first and second finger tips until you feel a pulse.
- Count pulse for 60 seconds (or for 15 seconds and then multiply by four to calculate beats per minute).
- When counting, concentrate on the beats of the pulse rather than the time.

Respiration Rate

The respiration rate indicates the number of breaths a person takes per minute. The rate is measured when a person is at rest by counting the number of breaths (or chest movements) per minute. The rate of respiration can vary under many conditions, like fever, illness, and other medical conditions. When checking respiration, it is important to also note whether a person has any difficulty breathing. Normal respiration rate for an adult person at rest ranges from 12 to 16 breaths per minute.

The steps to be followed while checking respiration:

Fig: Respiration rate

Place the patient's hands across the abdomen and your hand over the client's wrist. Observe one complete cycle of inspiration and expiration, which counts as one breath. Start counting with the first inspiration, and check the time for 30 seconds. For adults with a regular rate or rhythm, multiply the count observed in 30 seconds by 2 to estimate the full minute count. When assessing the respiration rate of infants and children, or older adults, count for a full minute.

Blood Pressure

Fig.2.5: Measuring blood pressure of a patient

Blood pressure is the measure of blood flow being pumped by the heart through the artery walls. Each time the heart beats, it results in the highest blood pressure as the heart contracts. Two numbers recorded when measuring blood pressure are the *systolic pressure*, which refers to the blood pressure inside the artery when the heart contracts and pumps blood through the body. The *diastolic pressure* is the arterial blood pressure recorded when the heart is at rest. Blood pressure is measured using a sphygmomanometer. The three types of sphygmomanometers used to measure blood pressure are mercury, aneroid, and digital. Both the systolic and diastolic pressures are recorded as "mm Hg" (millimeters of mercury). This unit was used based on the rise of mercury along the tube in an old-fashioned manual blood pressure device (called a mercury manometer). High blood pressure for adults is considered 140 mm Hg or greater systolic pressure and 90 mm Hg or greater diastolic pressure. High blood pressure or hypertension is one of the risk factors identified for coronary heart disease (heart attack) and stroke.

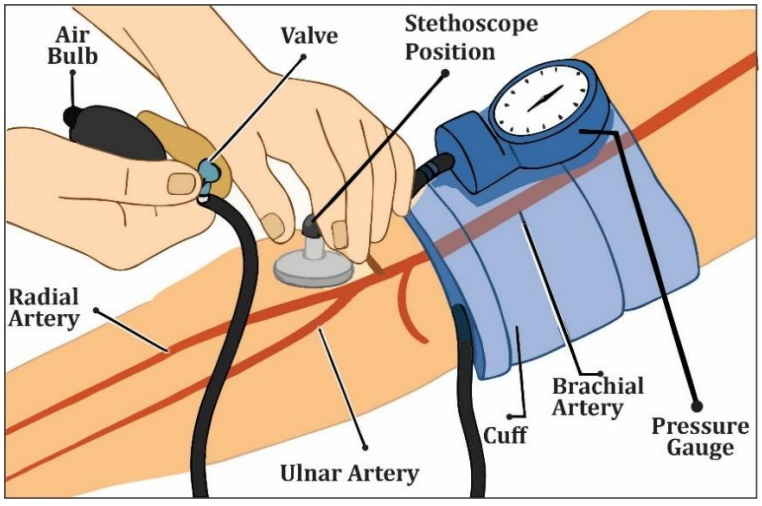


Fig: Monitoring Blood Pressure

Preparation and assessment of blood pressure

Articles required
Sphygmomanometer with cuff as per the patient's requirement, Stethoscope, blue and red pens, spirit swab in a container, paper bag, and Record sheets.

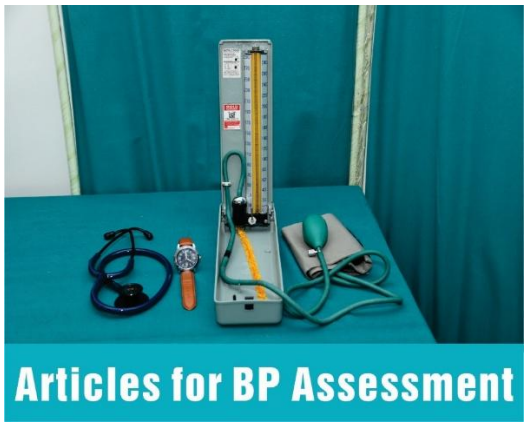


Fig: Articles for Blood Pressure Assessment

Ask the patient to take rest for three to five minutes without talking.

- Seat the patient on a comfortable chair, with back supported and legs and ankles uncrossed.
- The patient's arm should be flexed at the elbow and placed on a table to raise its level with the heart.
- Palpate the brachial artery. Wrap the deflated cuff around the upper part of the arm above the antecubital fossa, so that the midline of the bladder is over the arterial pulsation. The cuff should be wrapped tightly, still allowing one fingertip to slip under it.
- Be sure that the bottom edge of the cuff is at least one inch above the crease in the elbow.
- Inflate the cuff rapidly up to 70mm Hg and further with an increment of 10mm while palpating the radial pulse. Listen to the sound carefully and note the pressure at which the pulse disappears and subsequently reappears during deflation. This method provides an approximate assessment of the systolic blood pressure to ensure an adequate reading.
- Insert the earpieces of the stethoscope into the ear canal. The bell of the stethoscope is placed over the brachial artery pulsation so that the sound gets enhanced.

- Turn the valve clockwise to close and inflate the cuff rapidly and steadily until the manometer registers 20 to 30 mm Hg beyond the previous reading.
- Gradually unscrew the valve counterclockwise to deflate the bladder at a rate of 2 mm/sec. Listen for the five phases of Korotkoff sounds: faint sound, clear tapping sound, swishing sound, intense sound, abrupt muffled sound, and no sound.
- Note the manometer reading corresponding to these sounds. Deflate the cuff slowly and then quickly. Record the systolic phase I and diastolic phase V pressure immediately. It's also important to record the date and time of day along with the blood pressure reading.

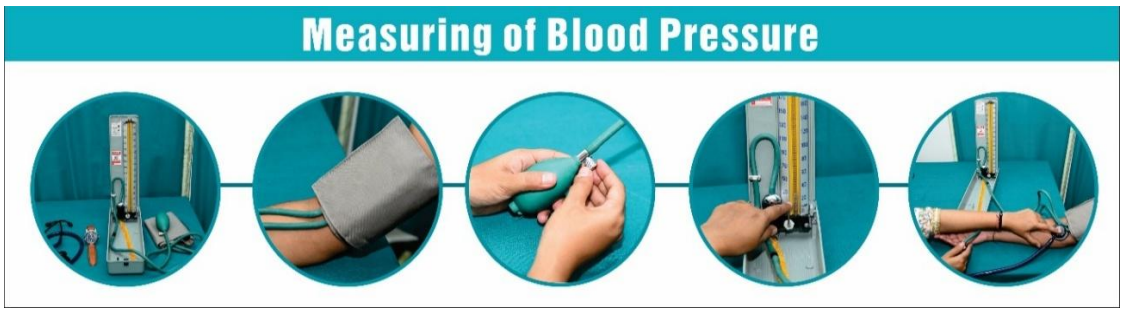


Fig: Step for assessing blood pressure

Alteration in Vital Signs

Vital signs	High	Low
Temperature	Hyperthermia	Hypothermia
Pulse	Tachycardia	Bradycardia
Respiration	Tachypnoea	Bradypnea
Blood Pressure	Hypertension	Hypotension

PRACTICAL EXERCISE

Visit a nearby hospital and observe the procedures adopted for observing vital signs. Fill in the information in the table given below for any five patients.

Name of the Patient :				
Date and Time	**Temperature**	**Pulse**	**Respiration**	**Blood Pressure**

ACTIVITY

1. Prepare a catalogue of the various types of thermometers, BP apparatus available, and identify their functions.
2. Search the database to explore the various methods for assessing blood pressure, body temperature, respiration rate, and pulse.

CHECK YOUR PROGRESS

A. Fill in the Blanks

1. The normal body temperature is _____.
2. Pulse and blood pressure are related to _____ functioning.
3. The respiration rate is the _____ a person takes per minute.
4. The two numbers recorded while measuring blood pressure are the _____ and the _____.

B. Short Answer Questions

1. What are the vital signs of the human body?
2. List the important vital signs of the body.
3. Explain the procedure for measuring temperature and pulse.

Session 2: Observing and recording variations in body parameters

In this session, you will learn about the assistance provided by a geriatric care provider during various patient examinations, including the eyes, ears, nose, throat, neck, chest, and other areas.

Measuring Height and Weight

To measure height, the person should stand by placing their legs evenly on a hard surface in an upright position with their knees straight. The measurement is taken from the soles of the feet to the vertex of the head. The person should stand with heels, back, and head against a wall; a small flat board held from the top of the head to the wall will provide an accurate height measurement, which is the distance from the floor to the board. A person's weight, if they can stand, is usually measured with a standing scale. The patient stands on the provided platform, and the weight is recorded. Typically, weight is measured without shoes.

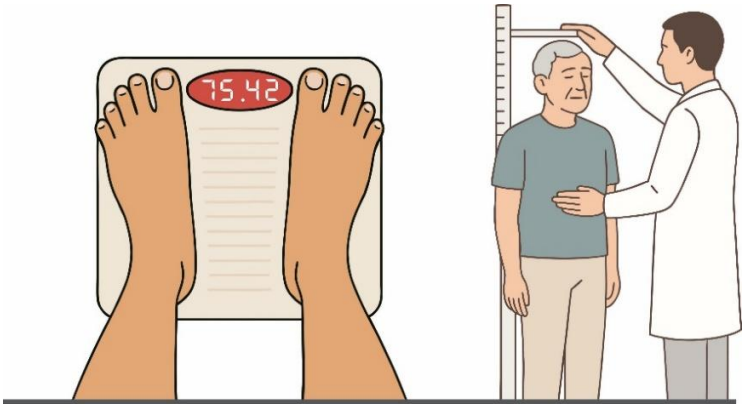


Fig.2.6: Measuring the Height and Weight

Measuring Head Circumference

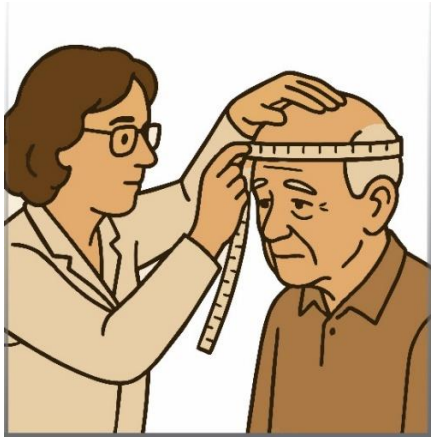


Fig: Measuring Head Circumference

The skull is measured from above the eyes to the occipital protuberance, where the diameter is maximum.

Examination of Eyes

The eye examination is performed in a sitting or lying position. The examiner often uses a head mirror that directs light toward the patient's face. The initial assessment involves checking eye movements, reaction to light, and the ability to focus on near and distant objects. For a thorough examination of the eye's internal structures, an ophthalmoscope is used.

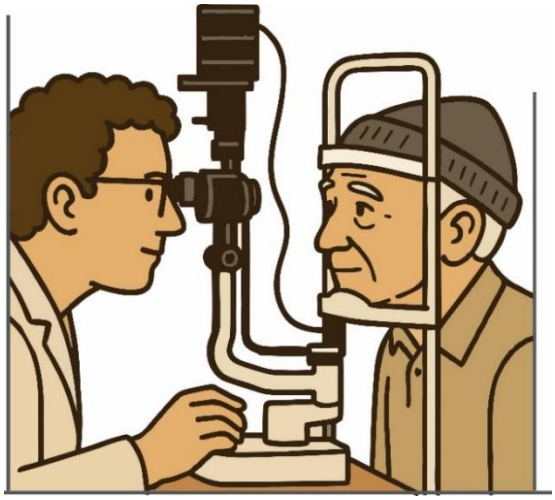


Fig.2.7: Examination of eyes

Examination of Ears

The patient may be placed either in a lying or sitting position with the ear turned towards the examiner. Equipment used for the examination of the ear includes a head mirror, ear specula of various sizes, cotton-tipped applicators, and an auto-scope. The tuning fork test is the basic hearing test.

Fig: Examination of Ears

Examination of Nose, Throat, and Mouth

The patient is seated with the head resting against the back of the chair. A tongue depressor and a good light are needed for examining the throat. Examination of the nose requires a nasal speculum and a head mirror. Sometimes, autoscope is also used.

Fig: Examination of Throat and Mouth

Examination of the Neck

The neck is palpated to check for lymph nodes. To assess the thyroid glands, the patient is asked to swallow saliva.

Examination of the Chest

The anterior chest is examined by placing the patient in the horizontal recumbent position. There are various methods to examine the chest. The percussion technique helps identify fluid or congested areas. The physician also uses a stethoscope to listen to chest sounds. To examine the posterior chest, the patient is positioned sitting up. The heart and lungs are examined through percussion and auscultation.

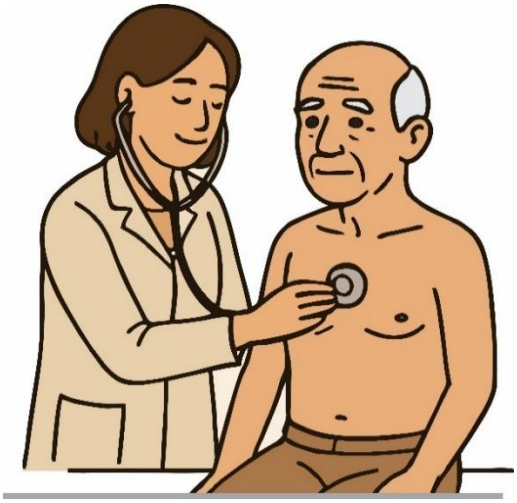


Fig.2.9: Examination of the chest

Examination of the Abdomen

Examination of the abdomen is performed by keeping the patient in the dorsal recumbent position, and the knees are slightly flexed to relax the abdominal muscles. The abdomen is inspected, palpated, auscultated, and percussed to detect any abnormalities.

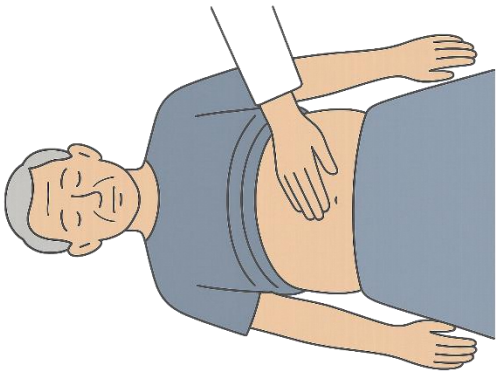


Fig: Examination of the abdomen

Examination of Extremities (Arms and Legs)

Arms and legs are inspected, palpated, and moved in various planes. Edema may be observed at the ankle joint by pressing the skin against the bone, and varicose veins on the posterior part of the leg over the calf muscles. The joints are moved in all directions to assess the movements.

Examination of the Spine

The spine is examined by keeping the patient in a standing position for abnormal curvature.

Examination of the Rectum

For examining the rectum and anus, the patient is placed in a dorsal recumbent or left lateral position. The anus is examined for signs of hemorrhoids, fissures, or cracks. The patient is asked to bend down to check for internal hemorrhoids. To examine the rectum, a clean glove (a finger cot may be sufficient), a proctoscope, lubricant, and a good source of light are necessary.

Variations in the pattern of blood pressure, temperature, pulse, or respiration, or in frequency of urination, color, presence of blood or pus in urine, changes in stool consistency, etc., need to be reported to the corresponding guardian of the elderly person, to take adequate measures.

PRACTICAL EXERCISE

1. Visit a nearby hospital and observe the Doctor examining the following:

Particular	Observation
Height	
Weight	
Eyes	
Ears	
Nose	
Throat	
Neck	
Chest	
Abdomen	
Arms	
Legs	
Spine	

CHECK YOUR PROGRESS

A. Fill in the Blanks

1. To measure the length of a person, the measurement is taken from the sole of the feet to the _____ of the head.
2. The skull circumference is measured by considering its diameter from above the eyes to the _____ protuberance.
3. The detailed internal eye examination is performed using _____.
4. The basic equipment used for a hearing test is _____.
5. The abdomen is examined while the patient is in _____ recumbent position and the knees are slightly flexed to promote relaxation of the abdominal muscles.
6. While examining the anterior chest, the patient is placed in a _____ recumbent position.
7. The weight of a person who can stand is generally measured by a _____ scale and the weight is taken without _____.
8. In a standing position the spine is examined for _____.

B. Match the following

Examination of Organs:		**Position of examination**
1.	Eye	a) Standing position
2.	Spine	b) Head resting against the chair
3.	Nose, throat, mouth	c) Lying or sitting position
4.	Abdomen	d) Dorsal recumbent

C. Short Answer Questions:

1. What is the procedure for the examination of the ears of a patient?
2. What are the techniques of physical assessment used in abdominal examination?
3. What technique is used for chest examination?
4. What are the precautions to be taken while examining the height and weight of the patient?

Session 3: Assisting in administering medication.

INTRODUCTION

Administration of medicine requires the attention and care of treating doctors, nurses, geriatric care assistants, or even a home health aide in emergencies. The basic principles and methods of drug administration are described in this unit.

Methods of drug administration and their procedures have to meet licensing regulations in the storage, safe handling, and dispensing of medicines. Medicines carry risks that can be a serious threat to life if not dispensed to the patient properly. This unit provides information on the precautions to be followed while dealing with medication.

Basic Classification of Drugs

A drug is a substance in liquid, solid, and semi-solid forms that affects human health and alters our physical functioning. Drugs take away control of your body & mind from YOU. Medicines reverse this and restore the control to YOU. It's defined as a chemical substance capable of being used as a therapeutic, like sedatives or narcotics.

A medicine is a substance that is used only for therapeutic purposes and helps to restore 'normalcy' to your body & mind. Normalcy is your control over your own body & mind. Hence, its action can be seen to be the exact opposite of the drug.

Medicine Groups (Classification)

Medicines can be grouped according to their use or function, the system that they treat, or their chemical makeup. For example, they can be grouped according to a body system like this:

- Respiratory medicines
- Cardiac medicines
- Nervous system medicines

They can also be grouped according to their function or use:

- Nonsteroid anti-inflammatory medicines (NSAIDs)
- Narcotic analgesics
- Antidepressants

Lastly, they can be grouped according to their chemical makeup:

- Aminoglycosides
- Estrogens
- Opioids

Most of the medicines within a group are quite alike, but they are not identical. Grouping helps us to see the things that are the same and the things that are different. One of the best ways to learn about a large number of medicines is to learn about groups first.

Rights of drug administration

The Seven "Rights: When helping a person, you must check and double-check that you are dealing with

1. The right patient
2. The right medicine
3. The right time
4. The right dose
5. The right route
6. The right reason
7. The right documentation

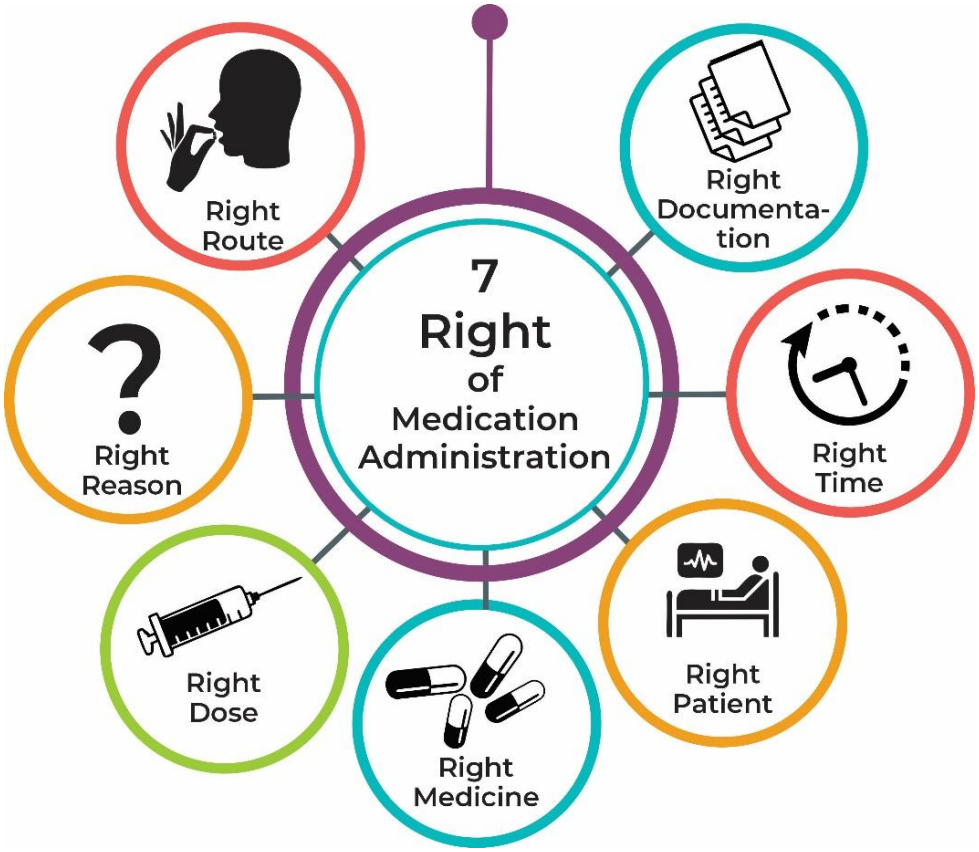


Fig. 2.1: The seven rights of drug administration

Forgotten Medicines

Report and document if the person forgets to take medicine or you forget to remind them to take medicine. Reporting and documenting are essential in these situations.

Observing and Record Keeping, and Documentation

A person's response to medicine should be monitored and recorded. The responses of the patient after taking medicine are observed for any side effects. For example, a person's blood pressure is measured to monitor the effect of the medicine. The record should mention both the wanted and the unwanted responses to medication.

Any medication that is taken, forgotten, held, or refused by the patient must be documented in the patient's medical record. Other information, such as vital signs and apical pulse rate, must also be recorded when necessary. For example, the apical pulse must be taken and recorded for a full minute before a person takes digoxin. If the pulse rate is 54 or higher, the person can take the medication. If the rate is below 54, the dose must be held, and the supervisor must be notified. This information must also be recorded in the person's record.

Complete medication records must include the following details of a patient:

- Full name
- Room and bed number
- Age
- Name of Doctor
- Description of allergies
- Medicine(s) to be taken
- Dose for each medicine
- Route for each medicine
- Form for each medicine
- Date and time that the order was written
- Date(s) and time(s) that the medicine is to be taken/given
- Start and end dates of the order

- Initial signatures of all who have helped with the medicine(s).

Some of the legal rules for record keeping are:

- Do NOT use white fluid if you make a mistake. If you make a mistake, cross it off with one thin line. Do NOT cover the mistake with scribble. Write "error", sign your name, and date
- Write so that other people can read what you write.
- Do NOT scribble.
- Use dark ink on records.

FORMS AND ROUTES OF MEDICATION

Medicines are made in many forms and for many routes. Some medicines perform similar functions but in more than one form. Some medicines can enter the body through more than one route. The patient should be informed about medication, routes, and forms.

Medicines can come in these forms:

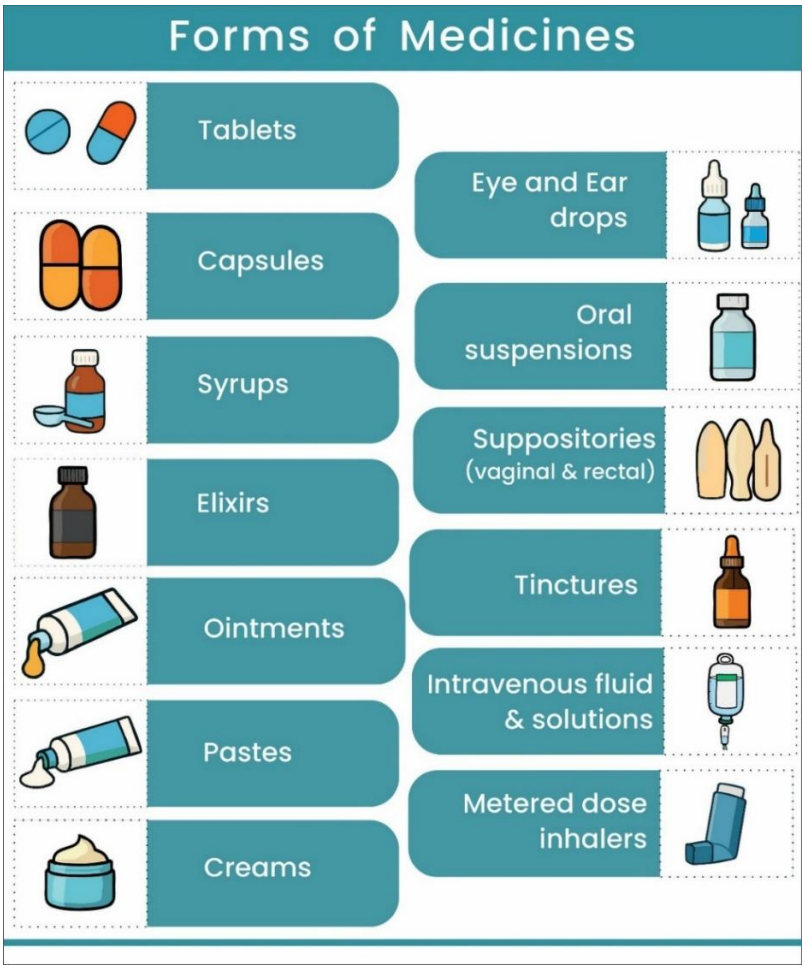


Fig: Forms of medicine

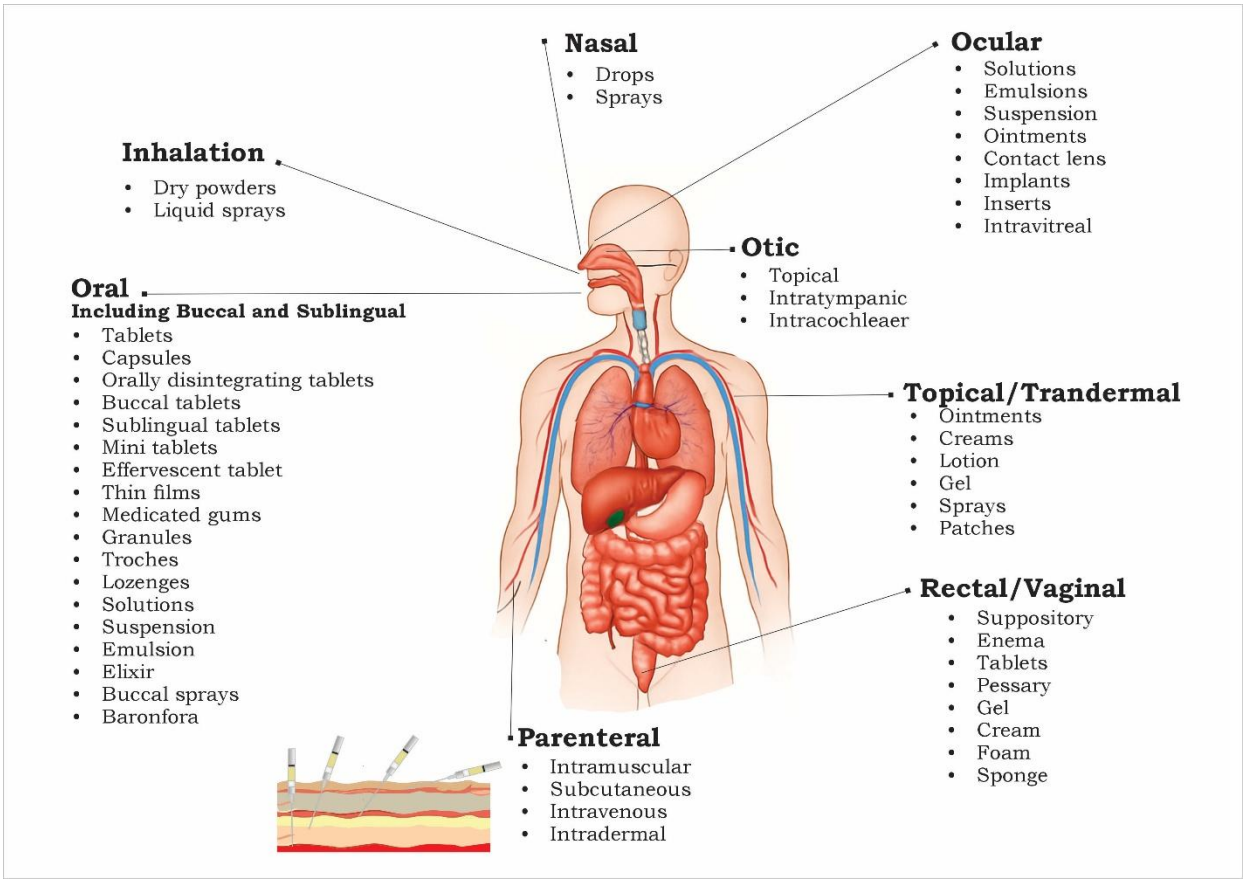


Fig. 2.2: Route of Drug Administration

The following routes of drugs are administered in the human body
Routes can be:

- Oral – by mouth
    - Buccal (between gums and inside cheek)
    - Sublingual (under the tongue)
- Topical – superficially on the skin
- Ophthalmic (eye)
- Otic – Ear
- Nasal
- Inhalation
- Via nasogastric or gastrostomy tube
- Vaginal route
- Rectal route
- Subcutaneous (under skin)
- Intramuscular (in the muscles)

- Intradermal (in the dermis layer of the skin)
- Transdermal (through the skin)
- Intraperitoneal cavity (medicine administered into the abdominal peritoneal cavity)
- Intravenous (into the vein)
- Intra-cardiac (in the heart)
- Intrathecal (in the spinal cord)
- Intra–articular (into the joint)

Fig: Medication tray

Complete Orders

The responsibility of a doctor, or another person, or a nurse, is to write a complete and legible order before giving medicine to the patient. A complete order must have the:

- Date of the order
- Time of the order
- Name of the medicine
- Dose
- Route
- Form
- Time or frequency at which it should be taken
- Signature of the nurse

Labels

All labels must have the:

- Patient name
- Name of the medicine
- Strength of the medicine
- How much to take
- Route
- Form
- Time
- Date of the order
- Date that the bottle or container was filled
- Date that it expires and can no longer be used
- The name of the person who ordered it
- Any special instructions, such as keep out of light and cold places.

Route and Form Considerations

The oral route is the preferred route for the geriatric population. When a patient has a problem with swallowing, as many older people have, the following things may be done.

- **Crushing:** Crushing the pill or opening the capsule and mixing it with something like apple sauce can help. Time-release capsules, some coated tablets, effervescent tablets, medicines that affect the stomach, bad-tasting medicines, and sublingual medicines (those placed under the tongue) cannot be opened or crushed. Check with the supervisor to see if the medicine can be crushed.
- **Liquid form:** Using the liquid form of the medicine can also help those who avoid eating pills and capsules.

Medicine Routes

A geriatric aide must be able to observe the patient or resident for the correct self-administration procedure. Below are routes that a geriatric aide can assist the nurse. The following are the common routes of drug administration

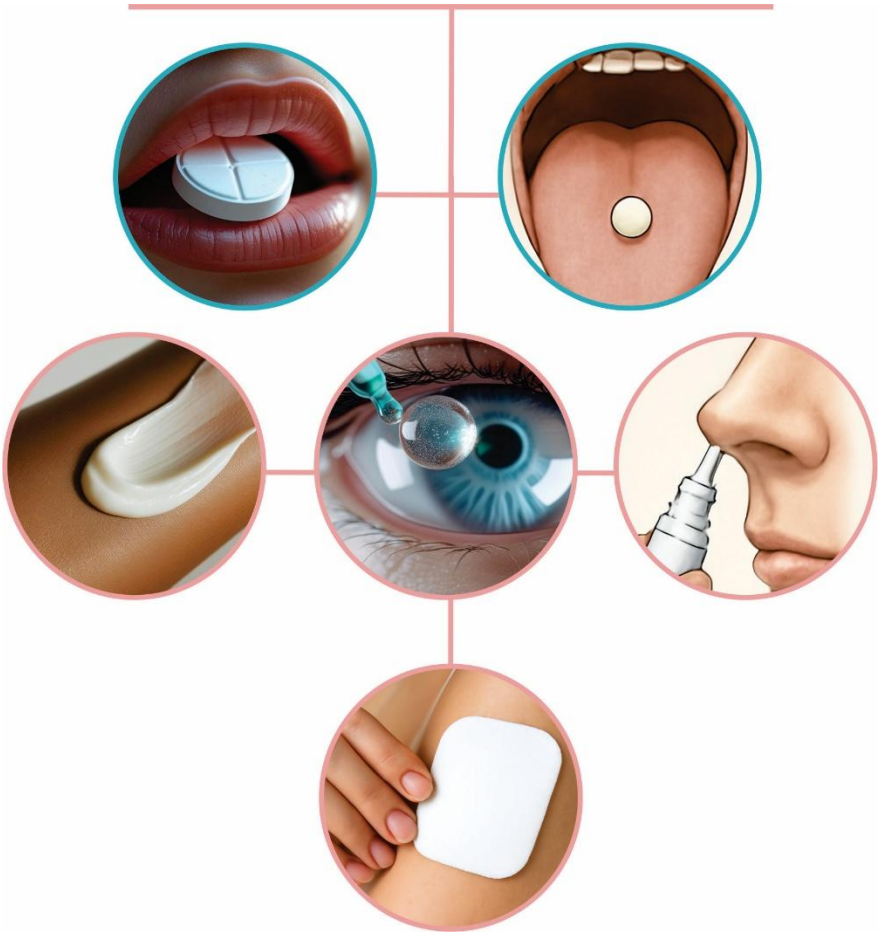


Fig: Medicine Routes

Topical (Skin Surface)

Do not use on skin that is not intact unless, of course, the medicine is being used to treat broken skin. The procedure for using this route is:

1. Open the tube.
2. Place the top upside down to keep it clean.
3. Use gloves during medication.
4. Put the medicine on a tongue depressor. Use a cotton-tipped applicator or sterile gauze for the face.
5. Apply it in long strokes going with the direction of the hair growth.

Transdermal

- Wash the area with soap and water.
- Find a place that has no hair on the person's upper arm or chest.
- Dry the site.
- Put on gloves *(Both the UAP* unlicensed Assistive personnel *and the patient)*
- Put the dose on the patch or strip. Do not let it touch your skin.

- With the medicine down and against the skin, the person should be told to gently move and avoid rubbing the strip.
- Cover with a plastic wrap or special dressing bandage and tie it in place so that it does not open.
- Write the date, time, and your initials on the cover.

Oral

- Give the patient the medicine.
- Remain with the patient until the medicine(s) are swallowed.

Buccal and Sublingual

Buccal medicines are placed between the teeth and the inside of the cheek. Sublingual medicines are taken under the tongue.

1. Give the patient the medicine.
2. Tell the person to put the medicine inside their mouth in (buccal) or under their tongue (sublingual) until it dissolves.
3. Tell the patient to leave the drug in its position so that it can be completely dissolved.

Ophthalmic (Eye)

- Use gloves during eye care to prevent infection.
- Help the person to a sitting position or into a supine position.
- Have the patient tilt their head back.
- Have the patient look up and away.
- Have the person steady their hand against their forehead with the dropper in their other hand.
- Pull down the lower lid. The distance between the eye and the dropper is usually maintained at 2 to 3 cm.
- Put the number of drops into the space under the lower eyelid.
- Clean the excess off with a tissue.

Otic (Ear)

- Warm the ear drops to body temperature.
- Tell the person to place the drops against the side of the inner ear as you continue to hold the ear lobe in place until you cannot see any more drops.
- Have the person keep their head to the side for at least 10 minutes.

Inhalation is also a route to administer medicine.

Precautions and Contraindications

Some medicines are contraindicated or not allowed to be used for some patients. For example, a medicine can be prohibited for patients who have severe renal or liver disease, and other medicines may only be used with some people when they are used with caution. For example, a medicine can sometimes be used, but only with caution, for an older person. It is essential to closely observe and report the patient's responses to the medicine when it is being used with caution. The most common contraindication is an allergy or sensitivity to the medicine. The patient's allergies must be known before you assist the person. If you see NKA on the patient's chart, this means that the person has No Known Allergies.

Allergies

A rash and even a life-threatening reaction can happen if a medicine is taken by a person who has an allergy to it. *Anaphylaxis* is a very severe allergic reaction that can happen if a person is allergic to a food, like peanuts or shellfish, a substance, like latex, or a medicine like penicillin or cephalosporin. It is a medical emergency that needs immediate attention.

The signs are:

- Itching
- Hives
- Swelling of the throat
- Troubled breathing (dyspnea)
- Shortness of breath
- A drop in blood pressure
- Irregular heart rhythm
- Nausea
- Vomiting
- Abdominal pains
- Death

Side Effects and Adverse Reactions

All medicines have side effects. The most common side effects are nausea and vomiting. Some side effects are troublesome; others can be life-

threatening. Adverse drug reactions are serious and can also cause death. You must observe such allergic reactions and report them.

Doses

All medicines have special dosages and/or dosage ranges for adult and child patients. Some adult dosages may be lowered for the elderly because the normal changes of the aging process make this age group more prone to side effects, adverse drug reactions, toxicity, and overdose. Some medicines are prescribed with a dose that is based on how much they weigh.

Abbreviations

Abbreviations save time, but they can also lead to deadly effects. Some of the abbreviations that we have been using for many years are now being stopped because they have led to serious errors. Commonly used and acceptable abbreviations along with their full form meaning are shown in Table 3.

Table 3: Commonly used and acceptable Abbreviations

Abbreviation	Meaning		Abbreviation	Meaning
a.c.	Before meals		**MEq**	Milliequivalent
ad lib	Freely		**Min**	Minute
a.m.	Morning		**Mg**	Milligram
ASA	Aspirin		**ML**	Milliliter
b.i.d	Twice a day		**NBM**	Nothing by mouth
BM	Bowel movement		**NTG**	Nitroglycerin
TDS	Three times a day		**OD**	Once a day
BP	Blood pressure		**p.c.**	After meals
BS	Blood sugar		**p.m.**	Evening
C-with line over	With		**p.o.**	By mouth
Cap	Capsule		**Prn**	When needed
Cc	Cubic centimeter		**Q**	Every
disc or D.C.	Discontinue		**Qh**	Every hour
disp.	Dispense		**Qid**	Four times a day

Elix	Elixir		**SOB**	Shortness of breath
Ext	Extract		**Sol**	Solution
fl or fld	Fluid		**ss.**	One half
g. or Gm. or g	Gram		**Stat**	Immediately
Gr	Grain		**susp.**	Suspension

PRACTICAL EXERCISE

1. Visit a nearby hospital and identify the suitable routes and form of drug administration for older adults. Enlist them.
2. Visit a nearby hospital and observe the medication chart. Identify the meaning of the standard abbreviation used in the medication chart. Fill in the table given below with the full form or meaning of the abbreviation:

Abbreviation	Meaning
a.c.	
a.m.	
b.i.d	
Cap	
NPO	
p.c.	
p.o.	
Prn	

3. Visit a nearby hospital and make a list of medicines given to elderly adult patients there, and collect the pictures.

Trade Name of the medicine	Component present in the Medicine

Check Your Progress

A. Fill in the Blanks

1. The _____is the best route for geriatric age population.
2. Intradermal medicine is used in the _____of the skin.
3. Health professionals are to write a _____order before giving the medicine to the patient.
4. _____are taken under the back of the tongue.
5. A _____ is any substance that alters the physiological function with a potential for affecting health.
6. A _____ is defined as a substance used to promote health, prevention of illness, diagnose, or cure disease.
7. _____ are medicines that are not taken at a special time of the day, but only when needed.
8. A drug is a chemical substance that is in liquid, or_____ form.
9. Medicine can be defined as a substance used to, _____ diagnose, alleviate or treat disease.
10. All the patient's documents must be_____.

B. Match the following

Column A		**Column B**
1. Right medicine	a.	Identify the person
2. Right Patient	b.	Check the clear label
3. The right time	c.	Error to be reported if dosage is less or more
4. The right dose	d.	30 minutes before or after the time recommended

2. Match the following

1. Intravenous	a.	in the heart
2. Intra cardiac	b.	into the vein
3. Oral liquid medicines	c.	in the muscles
4. Intramuscular	d.	Use a syringe, dropper, or nipple

C. Multiple Choice Questions

1. Identify the one that does not represent the form of medicine:
   a. Tablet b. Paracetamol
   c. Syrup d. Ointment

2. Buccal medicines are placed between the

a. Teeth and the inside of the cheek.
b. Under the back of the tongue
c. Upper the tongue
d. Between the teeth

3. The following information about the patient should be available to the health personnel:
   a. Patient name
   b. Medicine name and route
   c. Strength of the medicine
   d. All of these

C. Write the answers to the following questions

1. What is drug administration?
2. Classify medicine groups.
3. While giving the medicine to the patient, write down the seven rights that must be followed.
4. Write the importance of Record Keeping and Documentation.
5. List different forms of medicine.
6. Write the characteristics of a complete order.
7. Write the routes of drug administration.

GLOSSARY: CLASSIFICATION OF DRUGS

Drugs may be classified according to their chemical composition, clinical actions, therapeutic effect on body systems, purpose, and uses. Each class contains drugs prescribed for similar types of health problems. The class need not be the same. A drug may also belong to more than one class, e.g., aspirin is an antipyretic, analgesic, and anti-inflammatory drug. Any healthcare aide should have thorough knowledge about the general characteristics of drugs in each class. Each class of drugs has implications for proper administration and monitoring.

The following are the major categories of drugs:

1. **Antacid Uses**: Gastritis, peptic ulcer, hiatal hernia, and reflux esophagitis. Examples of Medicines in this Group: Aluminum carbonate, Calcium carbonate

1. **Anticoagulant Uses**: Heart attack (MI), pulmonary embolus (lung clots), deep vein thrombosis, disseminated intravascular clotting syndrome (DIC), and atrial fibrillation. It is also used in kidney dialysis. Examples of Medicines in this Group: Warfarin sodium, Heparin

2. **Anticonvulsant Uses:** They prevent seizures. Examples of Medicines in this Group: Phenytoin, Diazepam

3. **Antidepressant Uses**: Depression, bedwetting for children. Examples of Medicines in this Group: Sertraline, Amitriptyline, Bupropion, Phenelzine

4. **Antidiabetic Medicines Uses**: Diabetes and ketoacidosis. Examples of Medicines in this Group: Insulin, Glyburide

5. **Antidiarrheal Uses:** Diarrhea. Examples of Medicines in this Group: Bismuth subgallate, Kaolin and pectin mixtures

6. **Antifungal Uses**: Fungal infections. Examples of Medicines in this Group: Nystatin, Amphotericin B

7. **Antihistamines Uses**: Allergies. Examples of Medicines in this Group: Diphenhydramine hydrochloride, Chlorpheniramine maleate

8. **Antihypertensive uses**: Hypertension. Examples are Thiazide-type diuretics, Calcium channel blockers, Angiotensin-converting enzyme (ACE) inhibitors

9. **Anti-Infectives Uses:** Infections. Examples of Medicines in this Group: Penicillin, Tetracycline

10. **Antineoplastics Uses:** Cancer. Examples of Medicines in this Group: Fluorouracil, Cisplatin

11. **Antiparkinson Agents Uses**: Parkinson's disease. Examples of Medicines in this Group: Levodopa, Entacapone

12. **Antipsychotic and Neuroleptic Agents Uses**: Psychosis and anxiety. They are sometimes used for unrelated hiccups, nausea, vomiting, and child behavior problems, as well as relaxation before surgery. Examples of Medicines in this Group: Haloperidol, Chlorpromazine

13. **Antitubercular Medicines Uses:** Tuberculosis. Examples of Medicines in this Group: Isoniazid

14. **Cough Medicines & Expectorants Uses**: The expectorants are used for a cough from bronchitis, TB, pneumonia, cystic fibrosis, and obstructive pulmonary disease COPD. Antitussive medicines are used for suppressing cough and reducing the activity of the cough center in the brain. Examples of Medicines in this Group: Guaifenesin, Codeine

15. **Antiviral Uses**: Infections caused by a virus, like HIV, herpes, and varicella. Examples of Medicines in this Group: Acyclovir sodium, Cidofovir

16. **Barbiturates Uses**: Epilepsy, sedation, insomnia, anesthesia, and gallstones. Examples of Medicines in this Group: Phenobarbital, Secobarbital

17. **Benzodiazepines Uses**: Anxiety, acute alcohol withdrawal, and pre-operative relaxation. Examples of Medicines in this Group: Diazepam, Clonazepam

18. **Bronchodilators Uses**: Asthma, spasm of the bronchi, COPD, and Cheyne-Stokes respirations. Examples of Medicines in this Group: Albuterol, Aminophylline

19. **Diuretics Uses:** High blood pressure (hypertension) and edema. Examples of Medicines in this Group: Furosemide, Hydrochlorothiazide

20. **Histamine H2 Antagonists Uses:** Ulcers and GI reflux disease. Examples of Medicines in this Group: Cimetidine, Ranitidine

21. **Immunosuppressants Uses:** Prevention of organ transplant rejection. Examples of Medicines in this Group: Cyclosporine, Azathioprine

22. **Laxatives Uses:** Constipation, as bowel prep, and a stool softener. Examples of Medicines in this Group: Psyllium, Docusate sodium

23. **Nonsteroidal Anti-Inflammatory Uses**: Mild to moderate pain, arthritis, and dysmenorrhea. Examples of Medicines in this group include ibuprofen and naproxen.

24. **Opioid Analgesics Uses:** Moderate to severe pain. Examples of Medicines in this Group: Codeine

25. **Salicylates Uses**: Mild to moderate pain, inflammation (arthritis), and for a fever. Examples of Medicines in this Group: Aspirin, Salsalate

26. **Thyroid Medicines Uses**: For an underactive thyroid gland. Examples of Medicines in this Group: Thyroid, Levothyroxin

PRACTICAL EXERCISE

1. The teacher will take the students to the nearest hospital and fill in the table below with examples of the particular drug category used:

Drug Category	Uses	Contraindication	Implications	Examples of medicines
Anticonvulsant				
Bronchodilators				
Immunosuppressants				
Diuretics				
Salicylates				

2. The teacher will take the student to the nearest geriatric setup and collect all the pictures of various medicines and drugs in the hospital.

Check Your Progress

A. Fill in the Blanks

1. _____ is used as a stool softener in constipation.
2. The group of drugs used for controlling blood pressure are _____.
3. One of the common side effects of antidiarrheal medicine is _____.

B. Match the following

Colum A	Colum B
1. Opioid Analgesics	a. They prevent seizures
2. Histamine H2 Antagonists	b. Depression, Bed wetting for children
3. Benzodiazepines	c. Anxiety and pre-operative relaxation
4. Antidepressants	d. Ulcers and GI reflux disease
5. Anticonvulsants	e. Moderate to severe pain

C. Shorts answer questions

4. What is an Antacid?
5. Write the common side effects of Salicylates.
6. Write the uses of antacids.
7. Write the contraindications and side effects of Nonsteroidal Anti-Inflammatory drugs.
8. Prepare a drug file containing the medicine pictures and write down its uses, side effects, contraindications, and effects.

Answer key:

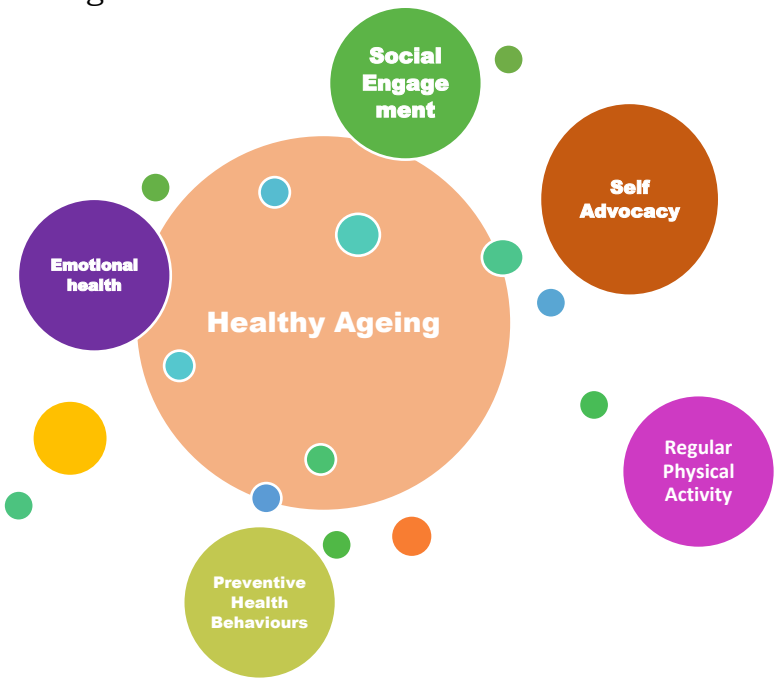
1. Laxatives
2. Antihypertensives
3. Constipation

Session 4: Creating a supportive community for older adults

The rehabilitation needs of older adults differ based on their functional requirements. Goals of rehabilitation include preventing and slowing functional decline, enhancing or restoring abilities, compensating for lost functions, and maintaining current health. Rehabilitation is a set of interventions designed to optimize functioning and reduce disability in individuals with health conditions in interaction with their environment. How can an older adult function effectively within his environment? While planning for the rehabilitation of older adults, the approach should be holistic while aiming to re-able the individual.

The elderly population in India faces numerous social challenges, particularly in rural areas, which affect their overall well-being. Factors such as poverty, urbanization, and changing family structures contribute to their difficulties. Healthy aging, as defined by the World Health Organization, highlights the ability of individuals to maintain a healthy lifestyle and stay socially active as they age. It includes various factors beyond healthcare that influence well-being.

- Healthy ageing involves maintaining a healthy lifestyle and regular physical activity.
- It encourages preventive health behaviours and self-advocacy in health care settings.
- Emotional health and social engagement are crucial for maintaining overall well-being.



Types of Disabilities in the Elderly

Disability encompasses various conditions such as physical, sensory, cognitive, communication, psychosocial, and mental health issues. Recognizing different types of disabilities is essential for effective rehabilitation.

- Disabilities in older adults include physical movement problems, sensory impairments, cognitive issues, communication difficulties, and psychosocial problems.
- Mental health conditions like anxiety, depression, and dementia are common among the elderly.

  The prevalence of common health issues in older adults includes vision problems (66.5%), musculoskeletal issues (58.5%), anemia (43%), hypertension (27.5%), psychological problems (24.5%), hearing problems (11%), and diabetes (6%).

Management of Disability in the Elderly

Rehabilitation requires a team of specialists to address the complex needs of older adults. Each specialist plays a defined role in the rehabilitation process.

- Clinical psychologists assess and manage cognitive and behavioural problems.
- Nutrition therapists address diet and lifestyle-related issues.
- Physiotherapists focus on mobility-related issues.

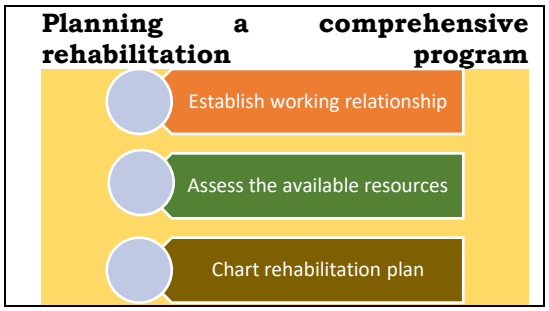
- Occupational therapists recommend activities for cognitive and behavioural stimulation.
- Social workers assist with resources and family therapy.

Early rehabilitation is effective when planned under professional supervision. The feasibility of geriatric rehabilitation is validated after considering individual needs and their socio-cultural background. Focus initially on one or two goals and adjust the program as per the patients' requirements. Observe the person's evolving needs and report to the rehabilitation therapist.

Community-Based and Institutional Rehabilitation Approaches

Rehabilitation services for older adults can be provided in different ways:

- **Community-Based Rehabilitation:** This approach helps older adults stay involved in their communities, promoting equal opportunities and social integration.
- **Institutional Rehabilitation:** Rehabilitation for seniors can also happen in specialized centers or hospitals, where they receive intensive training and care.
- **Outreach Programs:** In this method, trained experts visit communities to provide education and special support to the elderly in their own environments.
- **Integration of Services:** Combining community and institutional approaches ensures more comprehensive and effective rehabilitation care.



How Can Community Members Support Older Adults?

Community members play an important role in supporting elderly people. Here are some responsible ways to help:

- **Sharing Responsibility:** Work together to support seniors' safety, health, and well-being.
- **Awareness:** Learn about the common challenges older adults face, and act responsibly in response to these issues.
- **Interaction and Assistance:** Engage with elderly persons and offer help in daily tasks when needed.
- **Physical Support:** Accompany seniors who are at risk of falling and help them in situations where they might need extra physical support.
- **Forming Support Groups:** Create groups based on the elderly's abilities and interests. Assigning social roles and encouraging participation make seniors feel valued and help fulfil their social needs.

Fig: Factors to be considered during rehabilitation

Individual-Level Rehabilitative Measures for the Elderly

Improving seniors' quality of life and independence involves several individual-level measures, including:

- **Home Assistance:** Health workers provide services at the older person's home, helping with daily living and health needs.
- **Day Care Centres:** These centres offer therapeutic and social activities to elderly participants in a group setting.
- **Residential Facilities**: These places provide 24-hour care for seniors who cannot live on their own.
- **Self-Help Groups:** Seniors support each other and participate in the community, which can boost their confidence and social skills.

Societal-Level Rehabilitation Needs for the Elderly

Society should also support rehabilitation through:

- **Accommodation:** Provide special housing options suited to the needs of the elderly, both individually and in groups.
- **Mobility:** Ensure facilities like reserved seating and ramps are available in public places so seniors can move around easily.
- **Financial Assistance:** Give support through pensions, tax rebates, and deductions for medical expenses to reduce financial stress.
- **Recreational Facilities**: Develop parks and recreation centers for older adults to help them stay active and social.

Special Issues in Elderly Rehabilitation

Older adults face several challenges beyond physical health, such as:

- **Relationship Rights and Foster Families:** Programs connecting elderly people with foster families, including younger generations, can offer mutual benefits and support.

- **Legal Planning:** Creating wills and legal directives ensures that elders' wishes are respected, especially towards the end of life.
- **Security:** Measures should be taken to prevent crimes and abuse against the elderly and ensure their safety.

Rehabilitation Principles for the Elderly with Mental Illness
For seniors with mental illness, rehabilitation should focus on:

- **Restoring Functions:** Help older adults regain their psychological, physical, and social abilities.
- **Team Approach:** Use a multidisciplinary team, including doctors, nurses, social workers, and family members.
- **Comprehensive Assessment:** Individual assessments and tailored plans are crucial.
- **Coordination of Care:** Close cooperation between health professionals, caregivers, and support systems.
- **Addressing All Disabilities:** Support should cover both primary disabilities (main issues) and secondary disabilities (additional difficulties caused by the main issue).

Rehabilitation Needs in Cases of Dementia
Seniors with dementia need special attention:

- **Mild Cognitive Impairment**: Implement strategies to prevent progression to dementia, such as mental exercises and regular checkups.
- **Mild to Moderate Dementia:** Provide support for caregivers and ensure safety assessments at home.
- **Severe Dementia:** Seniors require careful monitoring and assistance with medical and nutritional needs.
- **Cognitive Rehabilitation:** Techniques like memory exercises can help improve functioning in people with dementia.

Practical Exercise

Prepare a checklist to assess the mobility needs of the 75-to 80-year age group.
Develop 2 to 3 community-based activities that enhance the participation of older adults in a natural setup.

Activity

Plan a visit to the nearest senior living facility. Form a self-help group for community-based rehabilitation for the inclusion of older adults.

Check Your Progress

A. Fill in the Blanks
1. ..... is defined as the ability of individuals of all ages to live a healthy, safe, and socially inclusive life.
2. The ..... program aims to enhance the lives of the elderly by making them as independent as possible and improving their overall well-being.

3. .....encompasses various conditions such as physical, sensory, cognitive, communication, psychosocial, and mental health issues.
4. Community-based rehabilitation promotes.....
5. ..... empower seniors to support each other and engage in community activities.

B. Match the following

1.Home-assisted care	a. provides supportive social and therapeutic activities
2. Daycare centres	b. support and engage in community activities.
3. Self-help groups	c. health workers visiting patients at home
4. Residential care	d. Seniors unable to live independently

C. Short answer questions

1. A 68-year-old man who is technically qualified reports loneliness after retirement. How do you plan for his rehabilitation?
2. Need for rehabilitation of elderly with dementia.
3. Rehabilitation programs for elderly care.

Answer key 1. Healthy aging 2. Rehabilitation 3. Disability 4. Social integration and equal opportunities. 5. Self-help groups

UNIT: 2
TECHNOLOGY AID FOR ELDERLY CARE

Technology is vital in training healthcare students to meet the needs of an aging population. Remote monitoring, wearables, telehealth, robotics, and smart home systems enhance elderly safety, independence, and quality of life. These tools enable real-time health tracking, medication management, and emergency response while reducing hospital readmissions. Training students in digital literacy, ethical use, and patient-centered integration of technology equips them to deliver efficient, compassionate, and personalized care. Ongoing education ensures healthcare remains adaptive, inclusive, and respectful of older adults' dignity.

Session 1: Introduction to Telehealth Records

Telehealth records, also known as electronic health records (EHR) or telemedicine records, are digital versions of patients' health information. They go beyond traditional paper records, leveraging technology to enhance healthcare delivery. These records provide a detailed view of a patient's medical history, diagnoses, medications, treatment plans, immunization dates, allergies, radiology images, and laboratory test results.

Fig.4.1 Digital Data Record

Types of Telehealth Records

1. **Electronic Health Records (EHR):** EHRs are comprehensive digital records that include a patient's medical history from multiple healthcare providers. They provide real-time information, allowing healthcare professionals to make informed decisions quickly. The data is accessible securely by authorized personnel, ensuring efficient and coordinated care.

2. **Personal Health Records (PHR):** PHRs are controlled by patients, allowing them to manage their health information independently. Patients can input data, track their health metrics, and share

information with healthcare providers as needed. It empowers individuals to take an active role in managing their well-being.

3. **Telemedicine Records:** These records specifically focus on information related to Telehealth encounters. They include details of virtual consultations, remote monitoring data, and any communication exchanged during telemedicine sessions. Telemedicine records contribute to the continuity of care in a remote setting.

4. **Health Information Exchanges (HIE):** HIEs facilitate the exchange of health information between different healthcare organizations. They promote interoperability, enabling seamless sharing of patient data across different systems and platforms. HIEs play a crucial role in ensuring that healthcare providers have access to a patient's complete medical history.

5. **Mobile Health (m-Health) Records:** With the rise of mobile applications, m-Health records are becoming increasingly popular. These records may include data from fitness trackers, health apps, ABHA app, eSanjeevani, Ayushman Bharat application and wearable devices. Integrating m-Health records with traditional EHRs provides a more holistic view of a patient's lifestyle and health habits. In a nutshell, tele-health records are the backbone of modern healthcare, fostering collaboration, efficiency, and patient-centric care. They bridge the gap between healthcare providers and patients, ensuring that information flows seamlessly, even in the digital realm.

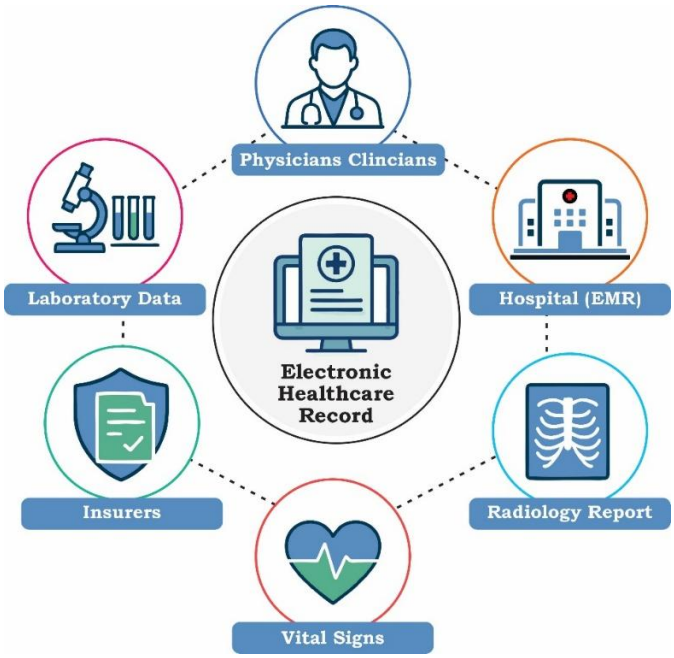


Fig.4.2 Electronic health record

Data collection and storage

Data collection and storage are the second component of a telemedicine system. This is typically implemented in a service provider or clinical care setting. This element automatically collects data and stores it in a secure, password-protected online server. The server may be located either on the hospital premises or in a device-related data repository accessible by health care professionals. In recent times, privacy, security, and hosting sovereignty principles have often been adhered to, for example, compliance with regulations such as the Health Insurance Portability and Accountability Act. Once the data is stored in the central repository, the system can send email, SMS, or fax alerts to healthcare providers regarding the availability of the data.

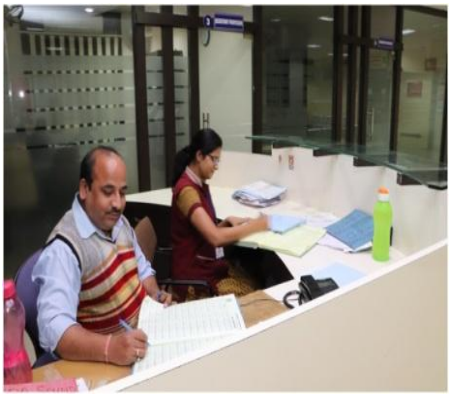


Fig.4.3 Data collection & storage

1. Collect the client's past and present health history -

Past History

Medical History:

- Chronic illnesses (diabetes, hypertension, etc.)
- Previous surgeries or hospitalizations.
- Allergies to medications or any adverse reactions.

Family History:

- Hereditary conditions or diseases among close relatives.
- Any patterns of illnesses in the family tree?

Social History:

- Lifestyle habits (smoking, alcohol consumption, physical activity).
- Occupation and workplace-related exposures.
- Dietary habits and nutrition.

Reproductive History:

- For women: Pregnancy history, menstrual history, contraceptive use.
- For men: Reproductive health concerns.

Psychosocial History:
- History of mental health issues.
- Life events affecting mental and emotional well-being.

Present History

Chief Complaint:
- The main reason for seeking healthcare.
- Symptoms, their onset, duration, and severity.

Medical History:
- Current medications, including over-the-counter and supplements.
- Any recent illnesses or injuries.

Family History:
- Updates on any changes or developments in family health.

Social History:
- Any recent lifestyle changes.
- Updates on occupation and potential exposures.

Review of Systems:
- A systematic inquiry into symptoms related to each organ system.
- Helps uncover symptoms that might not be directly related to the chief complaint.

Psychosocial History:
- Current stressors or life events impacting mental health.
- Changes in mood, sleep patterns, or energy levels.

Allergies:
- Any new allergies or reactions.

Medication Adherence:
- Ask about the adherence to prescribed medications.

Sources of Client Data collection

Patient Interviews:
- Conducting face-to-face or virtual interviews with the client to gather

information.
- Structured and open-ended questions can be used to cover various aspects of their health history.

Medical Records:
- Reviewing existing medical records, including electronic health records (EHRs) and paper records.
- Previous diagnoses, treatments, and test results can provide valuable insights.

Family Members:
- Gathering information from close family members, especially for patients who may have difficulty providing their own history.
- Family members may offer insights into hereditary conditions.

Caregivers and Support Personnel:
- For clients with special needs or those unable to communicate effectively, caregivers can provide crucial information.

Observation:
- Direct observation of the client's physical appearance, behavior, and any visible symptoms.
- This is particularly important in clinical settings.

Laboratory and Diagnostic Tests:
- Results of blood tests, imaging studies, and other diagnostic procedures.
- These provide objective data about the client's current health status.

Pharmacy Records:
- Checking prescription records to understand current and past medications.
- Helps in assessing medication adherence and potential interactions.

Methods of Client Data Collection

Surveys and Questionnaires:
- Distributing written or digital surveys to gather specific information.
- Useful for collecting data on lifestyle, habits, and subjective experiences.

Structured Interviews:
- Conducting interviews with a set of predetermined questions.

- Ensures consistency in data collection.

Focus Groups:

- Bringing together a small group of clients to discuss specific topics.
- Provides a more dynamic and interactive way to collect information.

Telehealth and Remote Monitoring:

- Leveraging technology for virtual consultations and remote monitoring of health metrics.
- Especially useful for clients in remote locations or those with mobility issues.

Medical Examinations:

- Physical examinations conducted by healthcare professionals.
- Hands-on assessment of vital signs, organ systems, and overall health.

Cognitive and Mental Health Assessments:

- Using standardized tools to assess cognitive function and mental health.
- Particularly important in understanding conditions like dementia or mood disorders.

Health Surveys and Apps:

- Encouraging clients to use health apps or participate in health surveys.
- This can provide real-time data on lifestyle and health behaviors.

Fig.4.4 Electronic Record

Inventory of e-documents and incoming calls:

1. Inventory Management

- **Digital Equipment Inventory:** Keep track of Telehealth devices, such as webcams, microphones, and other peripherals.
- **Software Inventory:** Manage licenses and versions of Telehealth platforms and software used for consultations.
- **Supply Inventory:** Track consumables like gloves, masks, or any physical supplies sent to patients.
- **Device Maintenance Records:** Schedule and document regular maintenance or updates for Telehealth equipment.

Fig.4.5 Inventory Management

2. Incoming Calls

- **Call Log:** Maintain a detailed log of incoming calls, including date, time, patient information, and purpose of the call.
- **Appointment Scheduling:** Use scheduling tools to efficiently manage virtual appointments and avoid overlaps.
- **Emergency Protocols:** Establish protocols for handling urgent or emergency calls and ensure staff are trained accordingly.
- **Call Analytics:** Analyze call data to identify trends, assess call volume, and optimize resource allocation.

3. Documentation

- **Electronic Health Records (EHR):** Ensure that all Telehealth consultations are documented in the EHR system, including symptoms discussed, prescriptions, and treatment plans.
- **Consent Forms:** Document patient consent for Telehealth services, outlining the risks, benefits, and limitations.
- **Compliance Documentation:** Keep records to demonstrate compliance with Telehealth regulations and standards.
- **Quality Assurance Reports:** Regularly review and document the quality of Telehealth interactions to identify areas for improvement.

4. Equipment Management

- **Equipment Tracking System**: Implement a system to monitor the location and status of Telehealth equipment.
- **Troubleshooting Documentation:** Create guides for basic troubleshooting of common Telehealth equipment issues.
- **Equipment Training Records:** Document staff training on the proper use of Telehealth equipment.
- **Security Measures:** Document security protocols for Telehealth equipment and communications to ensure patient privacy.

Fig.4.6(a,b): Records in Telehealth services

Importance of records in Telehealth services

1. Health records are a comprehensive and accessible source of a patient's medical history, which allows healthcare providers to make informed decisions and provide better care. This is important in telehealth, as the physical presence of the patient is not possible.
2. Continuity of Care: Health records ensure continuity of care by providing a detailed account of the patient's medical history, including past illnesses, treatments, medications, and allergies.
3. Diagnostic Support: Health records are resourceful for diagnostic assistance, as physical examinations may be limited. Accessing a patient's medical history and test results helps healthcare providers evaluate symptoms, make accurate diagnoses, and suggest suitable treatment plans.
4. Medication Management: Health records help in managing medications effectively. Telehealth providers can review a patient's medication history, identify potential drug interactions, and ensure that prescribed medications are appropriate for the patient's current health status.
5. Remote Monitoring: For patients with chronic conditions or those requiring ongoing monitoring, health records enable remote monitoring of vital signs and other health parameters. Telehealth

platforms can integrate with devices that collect and transmit data, allowing healthcare providers to track and manage patients' health remotely.

6. Efficient Communication: Health records facilitate efficient communication between healthcare providers, even in a virtual setting. By accessing a patient's electronic health record, different members of the healthcare team can collaborate and share information seamlessly, leading to better-coordinated care.
7. Legal and Regulatory Compliance: Maintaining accurate and up-to-date health records is essential for legal and regulatory compliance. Telehealth services must adhere to privacy and security regulations, and health records play a key role in ensuring the confidentiality of patient information.
8. Patient Engagement: Health records can also enable patients to take an active role in their healthcare. Providing access to their health records through secure portals allows them to review their medical history, understand their conditions, and communicate more effectively with telehealth providers.

PRACTICAL EXERCISE

1. Visit a Tele Health Care Center and prepare a report on various types of Tele health records.
2. Visit a nearby hospital and prepare a list of some common forms and registers found in health records, and collect patient information.

CHECK YOUR PROGRESS

A. Multiple Choice Questions

1. Telehealth records, also known as_____
2. Data collection and storage is the second component of a_____
3._____usually involve direct communication between healthcare professionals.
4. _____ help in managing medications effectively.

B. Write the full form of following words

S. No	Word	Full Form
1.	PHR	
2.	EHR	
3.	HIE	

4.	m-Health	

C. Short Answer Questions

1. Define telemedicine record.
2. Write the types of Telehealth Records in Telehealth services.
3. Write the sources and methods of the client's data collection.

D. Long Answer Questions

1. What is the importance of Telehealth records?
2. Explain important aspects of Telehealth services.
3. Differentiate between Verbal, written and electronically records.

ANSWER KEY

A.

1. Electronic health records
2. Telemedicine system
3. Verbal health records
4. Health records

B.

1. Personal Health Records
2. Electronic Health Records
3. Health Information Exchanges
4. Mobile Health Records

Session: 2 Prepare and Manage the Set-Up for Tele Consultation

Preparing the patient and defining the space for consultation makes the process more convenient. Preparation for teleconsultation includes a space that ensures privacy and comfort, accessibility to previous medical records, preferably e-records with prescriptions and investigation reports.

Patients should be informed about any specific equipment they may need before telemedicine health care services. A laptop, phone, or tablet will be required to conduct telemedicine services. Patients should make sure that these devices work properly even before the session. This can be accomplished by video-calling a family member or friend to make sure the microphone and camera are working properly. If accessible, a blood pressure cuff, glucometer, or weighing scale may be helpful to record initial vital signs. Finally, patients should be prepared with an updated and comprehensive list of active medications to assist the physician during the history-taking process.

Prepare the patient's room for consultation

- The patient is instructed to sit on a stable chair with good posture. The room should be properly lit to ensure a clear view. The device should be placed on an even surface and connected to a network.
- Patients' video cameras should also be placed as close to eye level as possible.

Steps for Managing a Telemedicine Site Consultation.

- Ensure that the website is user-friendly and provides clear information about the counseling process.
- Implement an easy-to-use booking system that allows patients to select an available time slot for their Teleconsultation.
- Make sure your site is secure to protect patient information and privacy.
- Provide comprehensive information about the health care professionals providing consultation, their expertise, and their status.
- Provide clear instructions on technical requirements for Teleconsultation, such as compatible devices, software, and Internet speed.
- Regularly update your site with relevant content, such as blog posts, articles, or news related to the healthcare field.

- Collect feedback from patients to continuously improve your site and tele-consultation process.

Challenges in setting up a Telehealth system.

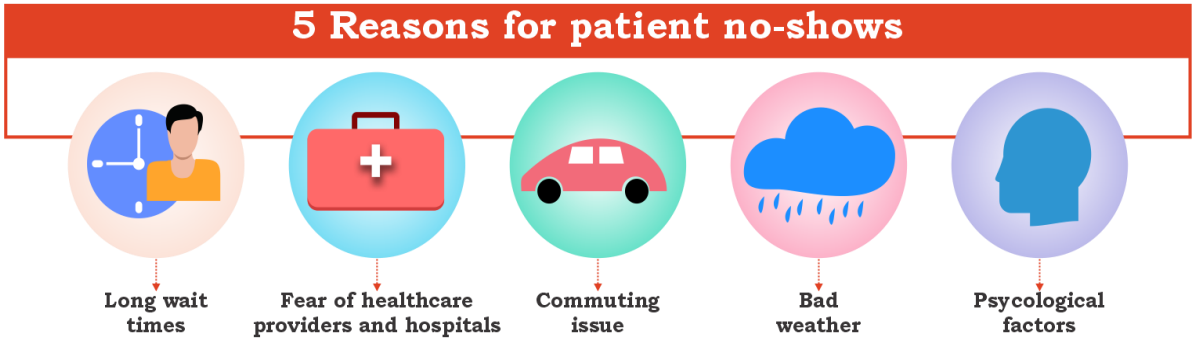


Fig: Challenging issues in telehealth service coordination

Benefits of telemedicine

- **Accessibility:** Provides access to healthcare services for individuals in remote or underserved areas, overcoming geographical barriers.
- **Convenience:** Allows patients to consult with healthcare professionals from the comfort of their homes, reducing the need for travel and time spent in waiting rooms.
- **Cost-Effectiveness:** Reduces travel expenses for patients and may lower overall healthcare costs. It can also result in cost savings for healthcare providers.
- **Time Efficiency:** Streamlines the consultation process, saving both patient and provider time.
- **Preventive Care:** Encourages proactive healthcare by making it easier for patients to seek advice, follow up on symptoms, and receive preventive care.
- **Increased Patient Engagement:** Promotes patient involvement in their healthcare by offering a convenient and accessible means to communicate with healthcare professionals.
- **Flexibility for Healthcare Providers:** Enables healthcare professionals to conduct virtual consultations at times that suit their schedules, increasing overall flexibility.
- **Reduced Exposure to Infections:** Minimizes the risk of infectious disease transmission, as patients can receive care without being physically present in crowded healthcare settings.

- **Enhanced Monitoring:** Enables remote monitoring of patients with chronic conditions through video consultations and connected health devices, facilitating timely intervention.
- **Collaboration and Second Opinions:** Facilitates collaboration among healthcare professionals, allowing for easy sharing of medical information and enabling second opinions from experts worldwide.
- **Patient Education:** Offers an opportunity for healthcare providers to educate patients about their conditions, treatment plans, and preventive measures through visual aids and interactive sessions.
- **Emergency Consultations:** Enables quick access to medical advice in emergencies, allowing for timely decision-making and potentially reducing emergency room visits.

Responsibilities of the Telehealth care Services Coordinator

Care of equipment and electrical appliances:
Taking care of equipment and electrical appliances in telehealth care services is crucial to ensure smooth and reliable operations.

- **Regular Inspections:** Conduct routine inspections of all Telehealth equipment and electrical appliances. Check for any visible wear and tear, loose connections, or damaged cables.
- **Cleanliness:** Keep the equipment clean and free from dust. Dust can affect performance and even cause overheating. Use appropriate cleaning materials to maintain hygiene standards, especially for devices that come in direct contact with patients.
- **Proper Storage:** Store equipment in a dry and cool environment to prevent moisture damage. Consider using protective cases for portable devices to prevent physical damage during transport or storage.
- **Update Software Regularly:** Ensure that all software and firmware are up-to-date. Manufacturers often release updates to improve performance and security.
- **Battery Maintenance:** If your equipment uses batteries, follow proper charging and discharging practices to prolong battery life. Replace batteries as needed, and don't leave devices plugged-in unnecessarily.
- **Adhere to Manufacturer Guidelines:** Follow the manufacturer's guidelines for maintenance and care. This includes recommended cleaning agents, storage conditions, and any specific instructions they provide.

- **Emergency Protocols:** Establish clear protocols for handling equipment malfunctions or failures. Ensure that staff are trained on these procedures.
- **Regular Staff Training:** Train staff on proper usage and care of Telehealth equipment. This includes handling and connecting devices correctly to avoid unnecessary wear and tear.
- **Surge Protection:** Use surge protectors to safeguard equipment from power fluctuations. Unstable power can damage sensitive electronic components.
- **Document and Track:** Keep a record of maintenance activities, inspections, and any issues encountered. This documentation can help identify patterns and anticipate potential problems.
- **Professional Support:** For complex equipment, rely on professional maintenance services as recommended by the manufacturer. Taking proactive measures to care for Telehealth equipment ensures a reliable and efficient Telehealth service, reducing the risk of interruptions in patient care.

Importance of network coverage and internet facilities

- The importance of network coverage and Internet facilities cannot be underestimated in the context of telehealth care services.
- These technological elements form the backbone of remote health care, allowing patients to access medical services from the comfort of their home.
- Reliable network coverage ensures seamless communication between healthcare providers and patients, enabling virtual consultations, real-time monitoring, and the exchange of vital health data.
- This is especially important in situations where physical distancing or mobility issues may hinder traditional health care access.
- Internet facilities support the infrastructure for Telehealth platforms, facilitating the secure transfer of sensitive medical information and ensuring the efficiency of virtual health services.
- As Telehealth care is playing a vital role in improving access to health care, network coverage and robust Internet facilities become essential components in providing timely and effective medical care to individuals around the world.

National Teleconsultation Service

The National Teleconsultation Service of the Ministry of Health and Family Welfare is the first of its kind online OPD service offered by a country's government to its citizens. The National Teleconsultation Service aims to provide healthcare services to patients in their homes. e-Sanjeevani is such a teleconsultation service. Safe & structured video-based clinical consultations between a doctor in a hospital and a patient in the confines of their home are being enabled.

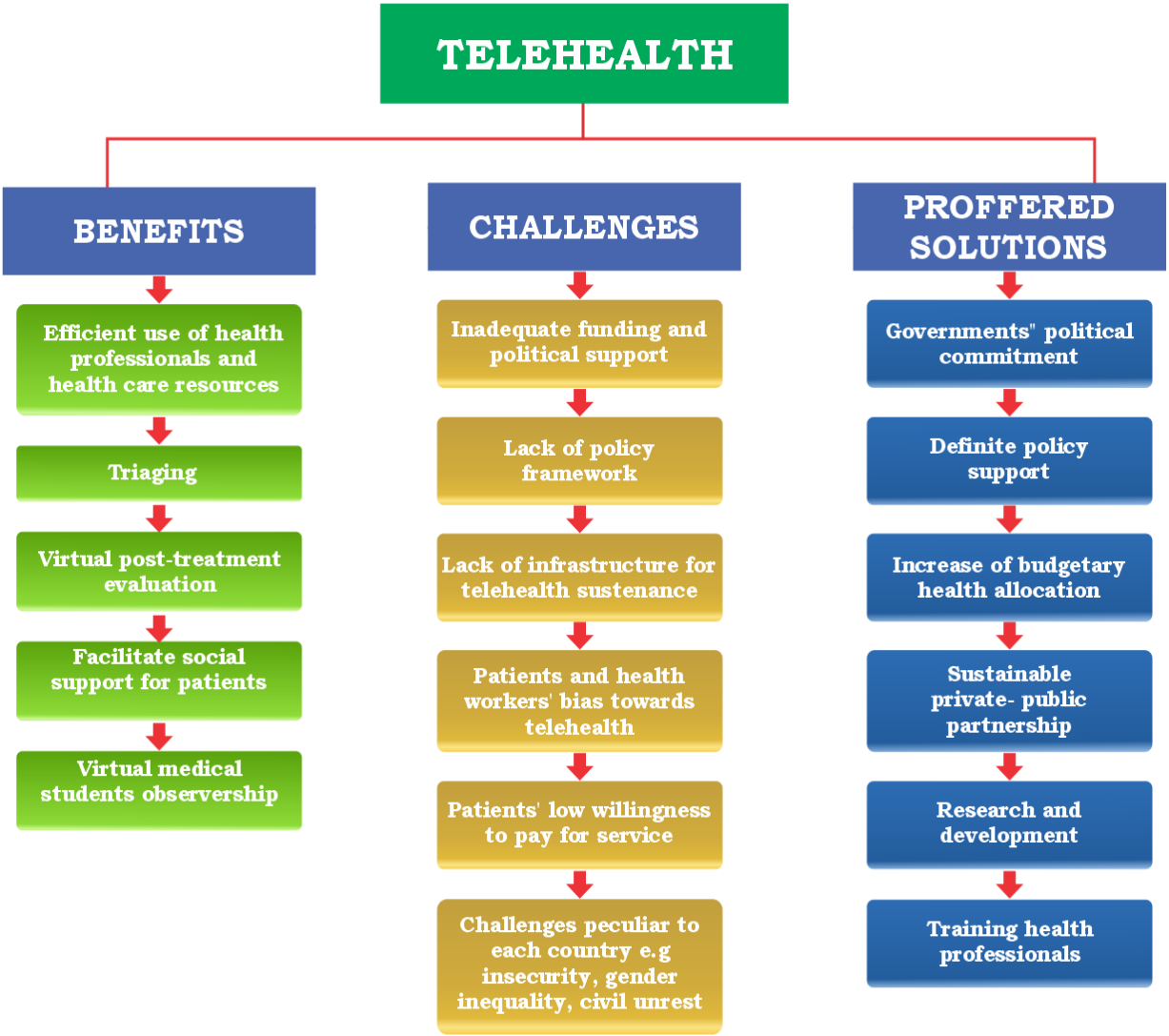


Fig.3.4 Telehealth functions

PRACTICAL EXERCISE

1. Visit the nearby hospital and discuss the e-Sanjeevani and Ayushman Bharat Digital Health Mission (ABDHM).

Check Your Progress

A. Match the column

A	B
1 National Teleconsultation Service	a A laptop, phone, or tablet
2 Telemedicine Equipment	b doctor-to-doctor telemedicine service
3 e-Sanjeevani	c Arogya Mandir
4 Health and Wellness Centres	d Ministry of Health and Family Welfare

B. Short Answer Questions

1. Role of Telehealth services coordinator in Preparation and Managing the Set-Up for Tele Consultation.
2. Write the benefits of telehealth care delivery.
3. Explain the role and responsibility of Tele Health Care Service Coordinator in taking care of equipment and electrical equipment.

Answers

A. 1-b, 2- a, 3-d, 4-c

Session 3: Wearable Technologies

Wearable devices such as smartwatches, fitness trackers, smart clothing, and sensor patches are becoming increasingly important in the care of older adults. These compact and user-friendly tools gather physical and behavioural information continuously, helping manage health more effectively and detect problems early. This real-time monitoring supports older individuals in living independently and safely, while also improving the coordination of care between visits to healthcare providers.

Key Metrics Tracked: Wearables can measure:

- **Heart Rate and Rhythm**: By using light or electrical signals, these devices can identify irregular heartbeats such as atrial fibrillation.
- **Blood Pressure**: Some wearables estimate blood pressure without using a cuff, allowing for easy, frequent checks.
- **Oxygen Levels**: Pulse oximeters built into wearables monitor oxygen in the blood, especially important for people with breathing or heart problems.
- **Body Temperature**: Sensors on the skin can detect changes that may indicate illness or infection.
- **Sleep Patterns**: These devices observe movement and heart rate to track sleep quality and detect disturbances.
- **Physical Activity**: Wearables count steps, track movements, and measure energy use, which encourages regular physical activity.
- **Early Detection of Health Deterioration** With continuous data collection, even small changes—like a slower walking pace or less sleep can be spotted early. Wearables can alert caregivers or doctors, allowing them to take action before the issue becomes serious, helping avoid emergency visits or hospital stays.
- **Advantages of using technology:**

1. **Enhancing Safety and Independence:** Beyond vital-sign monitoring, wearables contribute to elder safety through fall detection, geolocation services, and medication adherence reminders.

- **Fall Detection**: Sensors can detect sudden movements typical of a fall and send alerts to caregivers. Tri-axial accelerometers and gyroscopes automatically identify rapid, high-impact movements characteristic of falls and can trigger alarm notifications.

- **Geo-fencing and Location Tracking**: GPS-enabled wearables allow caregivers to set safe-zone boundaries and receive alerts if an individual wanders beyond designated areas, reducing the risk of disorientation in dementia.
- **Medication Reminders**: Some devices can remind users when it is time to take their medicine, improving treatment success. Smart bracelets or companion smartphone apps can prompt users to take prescribed medications on time and record adherence data for clinician review.
- **Caregiver Support and Clinical Use** Wearable systems often include cloud-based dashboards and mobile apps that present aggregated data trends, alerts, and summary reports. Caregivers gain real-time visibility into the older adult's status, while healthcare providers can integrate data into electronic health records (EHRs) to inform clinical decision-making and personalized care plans.
- **Benefits for Caregivers and Clinicians:** Remote monitoring reduces the need for constant in-person supervision. Helps with timely treatment changes. Provides accurate data to measure the success of care plans, like exercise or medication adjustments.

2. **Medication and Routine Management:** Wearables can be configured to provide reminders for:
   - Medication adherence (reducing missed doses or overdosing).
   - Automated medicine dispenser
   - Hydration.
   - Meals.
   - Appointments.
3. **Location Tracking and Safety:** For seniors with cognitive impairments like dementia or Alzheimer's, GPS-enabled wearables can:
   - Track their location, providing peace of mind for caregivers.
   - Send alerts if they wander outside designated safe areas.
4. **Chronic Disease Management:** Wearables are increasingly being used to manage chronic conditions by:
   - Providing continuous data to healthcare providers for remote monitoring.
   - Facilitating timely adjustments to treatment plans (e.g., blood glucose monitoring for diabetes).
   - Supporting personalized care plans.

5. Promoting Independence and Quality of Life:

- Enabling seniors to live safely and confidently in their own homes for longer.
- Reducing caregiver burden by providing remote monitoring capabilities.
- Encouraging an active lifestyle and improved mobility.
- Supporting cognitive health through memory prompts and cognitive exercises.
- Fostering a sense of control and achievement.

Types of Wearables Used:

- **Smartwatches:** Often equipped with comprehensive health tracking, fall detection, and communication feature.
- **Fitness Trackers:** Focus on activity levels, sleep, and basic vital signs.
- **Dedicated Medical Alert Systems:** Primarily designed for emergency response, often with fall detection and SOS buttons.
- **Smart Clothing/Patches:** Emerging technologies that offer more discreet and continuous monitoring.

Fig: Different types of wearables

Challenges and Considerations

While wearables offer significant benefits, successful deployment in geriatric populations requires addressing:

- **Usability**: Devices should be simple to operate, with clear displays and long battery life.

- **Data Privacy and Security**: Information must be protected according to health data rules. Robust encryption and compliance with regulations protect sensitive health information.
- **Accuracy and Validation**: Devices must be reliable and tested for use in older adults. Devices should be clinically validated for older adults, accounting for conditions like peripheral edema that can affect sensor readings.
- **Equity of Access**: Affordable pricing and support for low-tech users ensure that vulnerable populations are not excluded.

PRACTICAL EXERCISE

Observation Task: Use a demo wearable device or app (like a fitness tracker or health app) for a day. Record your heart rate, steps, and sleep (if possible). Reflect on how this information could help a healthcare provider.

Role Play: In pairs, take turns acting as a caregiver and an elderly person. The caregiver must explain how to use a wearable device and answer questions about its benefits and risks.

Activity

Group Discussion: Debate the following statement: "Wearable devices should be provided free of cost to all elderly citizens." Support your views with points from the chapter.

Design Challenge: Imagine you are designing a wearable for older adults. Make a list of five features your device would include and explain why each one is important.

CHECK YOUR PROGRESS

A. Fill up the blanks

1. ---------- and ---------- enhance the safety and independence of elderly adults.
2. Wearables can measure ---------- and ----------.
3. ---------- of the health data collected by wearables is paramount.
4. Two types of wearables for collecting health data are ---------- and ----------.

B. Short Answer Questions

1. List three key health parameters that wearable devices can monitor in older adults.
2. Explain how wearable technology helps in the early detection of health deterioration.
3. Describe two ways in which wearables enhance the safety of elderly individuals.
4. Why is privacy an important concern when using wearable technology in healthcare?
5. Summarize the benefits of wearable devices for caregivers.

Answer Key

A.
1. Fall detection, Location tracking, Medicine reminder
2. BP, Body temperature, sleep patterns, physical activity
3. Data Privacy and Security 4. Smart watches and fitness trackers

UNIT: 3
MAINTAIN A SAFE, HEALTHY, AND SECURE ENVIRONMENT

Introduction

Work conditions cause stress on the physical and mental health of individuals. Occupational health is a specialized service that attends to the health-related needs of workers. It focuses on promoting good health practices for maintaining workers' physical and mental well-being related to various fields. If we observe closely the health needs of workers, the practices followed by any organization should protect and prevent hazards to the people or the environment. A hazard may be any risk or threat to the health and safety of people. At the workplace, the commonly faced hazards are physical, chemical, biological, or psycho-social. While working in the healthcare sector, the major hazards encountered can be exposure to heat, light, various sound frequencies, radiation, toxic chemicals, infectious diseases, and mental tensions. We have to be aware that treatment is not available for most of the occupational diseases that develop gradually.

As per recommendations of WHO and ILO, any organization employing more than 200 workers should have an Occupational Health Service formed with professionals, including medical officers, health administrators, and staff, to promote health promotion and preventive services and to provide facilities for emergency medical care for workers engaged in any type of work.

The content of this session mentions the safe practices to be followed for ensuring the safety of the healthcare worker and the patient.

Fig.5.1: Bio environment safety

Session 1: Promoting a Safe Working Environment

To promote a safe working environment, the following measures may be adopted:

- You should ensure yourself in terms of knowing your organization's health, safety, and security procedures and follow them while you work.
- Before you begin work, always ensure risk assessments are made if any are required.
- Examine the workplace where you work and all equipment you use to rule out possible risk factors, and they are safe and meet your organization's health and safety policies.
- Try to eliminate, whenever possible, anything that could be a health or safety hazard.
- Ensure patient's needs and choices, take into account all measures that protect your safety and the safety of patients, staff, and others while at work.
- Work within the limits of your role and responsibilities regarding health and safety.
- Take the help of your supervisors to sort out health and safety problems wherever and whenever necessary.
- Report health and safety issues to the appropriate superiors in line with the law and your organization's policies.

How to prevent hazards at the workplace

To ensure all possible risk elimination, you must:

While working with others, try to reduce potential risks in the workplace and therefore.

- Make sure that your health and hygiene do not pose a risk to others.
- Making sure of your presence to all appropriate people at all times to make sure you are safe.
- Take appropriate action in case of an accident or injury, or harm.
- Check the presence of unwanted people in your workplace and politely instruct them to move out.

- Use approved procedures under supervision when carrying out work that could be dangerous.
- Using correct moving and handling techniques.
- Using appropriate hygiene procedures.
- Wearing correct protective clothes in any kind of situation.
- Using and storing equipment and materials in the right place. Dealing with spillages and getting rid of waste.
- Take immediate and appropriate action to deal with emergencies, like:
    - Fire
    - Security problems
    - Accidents

Use your skills and experience until appropriate help arrives:

You must:

- Inform of the appropriate help.
- Continue to provide help under supervision until someone qualified to deal with the emergency is available.
- Support patients and others, including family members who may be affected by the emergency.
- Record and report incidents and emergencies to superiors accurately, under your organization's policies.

Hospital Electrical Safety Measures

Follow the hospital's electrical safety measures by doing the following:

- Use electrical equipment for the intended purpose only.
- Keep television sets and all other electrical equipment and appliances away from bathtubs and washbasins.
- Check all small appliances before use to ensure that they are maintained in good working order. Ensure periodic maintenance checks of all electrical equipment.
- Remove a plug from a wall socket by holding the plug, not the cord.
- Do not overload an electrical outlet point.

- Never use faulty equipment. If an appliance overheats, produces a shock, or gives off an odour while being used, remove the appliance from the area. Follow procedures to have the appliance evaluated by maintenance.

Fig.5.2: Hospital electrical equipment

Hospital Fire Safety Measures

Hospital fire safety measures are very important and must always be followed.

1. Despite the use of fire-resistant material and compliance with fire regulations, fire accidents still happen. Health care organizations should have regular fire drills so that all personnel know exactly what to do. Health care personnel should be trained in:
   - Fire prevention.
   - Locate and use fire alarms.
   - Locate and use fire extinguishers.
   - Locate emergency exits.
   - Evacuation procedures.

Fig.5.3: Fire safety measures

2. Oxygen supports combustion. Poster signs to show that oxygen is in use wherever applicable. If a patient is under oxygen as part of his treatment, be sure to make the patient, his roommates, and visitors know that

smoking is prohibited.

3. If fire occurs, follow these steps:
    - Activate the fire alarm procedures.
    - Turn off the oxygen knob, lights, and all other electrical equipment in the vicinity of the fire.
    - Evacuate the patients who are in immediate danger.
    - Signboard to notify the "switchboard" in the hospital should be prominent, along with a glow signboard of a fire extinguisher.
    - Close windows and doors to reduce ventilation.
    - Using the fire extinguisher, attempt to extinguish the fire.
    - Return patients who are not endangered to their rooms.

Patient Care Environment Safety Measures

Take a look at the environmental safety measures to be followed for patient care:

1. **Identify patients at risk for injury. Those at risk specifically may include:**

    - Elderly or confused patients.
    - Patients with impaired vision or hearing.
    - Patients with impaired mobility (wheelchairs, walkers, and partial paralysis).
    - Patients with a history of falls.
    - Patients with a history of substance abuse.
    - Patients receiving medication that interferes with motor neuron functions.

2. **Protect the patients at risk from any injury.**

3. **Prevent falls by:**

- Placing the bed in the low position.
- Keeping the bedside railing up when the patient is not receiving bedside care.
- Advising the patient to wear low-heeled shoes when walking.

- Ensuring that non-skid strips or mats are affixed at the outside bottom of bathtubs and shower areas.
- Ensuring that bathtubs have supporting handrails in place when needed.
- Warning patients and visitors when floors are wet and slippery. Proper signboards are to be kept at the time of housekeeping.

4. Prevention of burns by hot liquids:

- Placing coffee, tea, and other hot liquids on the table where the patient can reach them easily and safely.
- Carefully following policy when using hot-water bags or heating pads. Because of the danger of burning patients, many health care facilities do not allow their use.

5. Prevent the spread of infection:

A hospital within a healthcare facility may follow its practices to control infections. However, the procedures generally followed are largely based on recommendations from the Centers for Disease Control (CDC), a United States agency that studies various pathogenic organisms, the spread of contagious diseases, and methods used to control the spread of infections.

Some of the preventive tips in this line of action:

- Preventing disease due to infections is a high priority in hospital care services. Geriatric care Assistant, under supervision, should use disinfection and sterilization techniques that prevent the spreading and growth of microorganisms.
- Two methods are used to eliminate the presence of microorganisms and thus prevent infections. These two methods are called surgical asepsis and medical asepsis.
    - Surgical asepsis is a way of practice that eliminates the presence of all microorganisms. This practice is called sterilization or sterile asepsis, like washing the hands and arms with a germicidal solution.
    - Medical asepsis refers to practices that reduce the number and inhibit the growth of microorganisms, especially pathogens or disease-causing bacteria.
    - Technique of asepsis mandates the use of antimicrobial agents,

hand washing, and cleaning the equipment.

Fig.5.4: Hand disinfection

CHECK YOUR PROGRESS

A. Fill up the blanks choosing the most appropriate options given in brackets.

1. The major emergencies usually occurring in hospitals are due to Fire, Security problems and _____. (Road Accidents, Drowning, Electrical shock, None of these).
2. General Duty Assistant should be trained in fire prevention for the use of fire alarm, and to locate _____. (Electrician, Emergency exits, None of them, Trees).
3. If oxygen knob is on then _____ is prohibited. (Sleeping, Eating, Smoking, None)

B. Answer the following question in short.

1. Fire safety measures to be followed in hospitals.
2. Environmental safety measures for patient care
3. Electrical safety measures.

UNIT: 4
BIO MEDICAL WASTE MANAGEMENT

Introduction

In the healthcare industry, the materials that are not utilized fully are discarded and treated as waste. Modern hospitals consume a lot of materials for rendering health services to the people. Wastes are generated as a result of diagnostic, therapeutic, immunization, or research activities in the hospitals.

These waste materials have the potential to transmit serious diseases to the healthcare workers, visitors of the hospital, including patients. Various terms are used about the hospital waste, like “medical waste”, regulated medical waste”, or “hospital waste”. In hospital waste management, the popular term is bio-medical waste. Bio medical waste is the waste generated while the clinical management of patients includes syringes, needles, ampoules, disposable plastics, microbial wastes, human body parts, dressings, and disposable plastics.

Fig. 5.1: Bio medical waste management

Session 1: Introduction to Bio-Medical Waste Management

In this session, you will learn about the concept of Biomedical waste management. You will study the risks involved with poor waste management, classification of hospital waste, and disposal of biomedical waste.

Definitions

Before we study the classification and disposal of hospital waste, let us first try to understand the meaning of some of the terminologies used in hospital waste management.

a) **Bio-Medical Waste:** "Any solid, fluid, or liquid waste, along with the container, any waste generated while the clinical procedures are carried out.

b) **Medical Waste:** Is the waste generated at hospitals, clinics, physicians' offices, dental clinics, blood banks, and medical research facilities.

Fig. 5.2: Bio-medical waste

c) **Clinical Waste:** Is the waste generated after medical care is provided in hospitals or other medical care units, but not the domestic waste.

d) **Hospital Waste:** It refers to all waste, biological or non-biological, that is generated from a hospital, and is not intended for further use.

e) **Pathological Waste:** Is the waste generated during surgery/autopsy, any other medical procedures, for example, human tissues, body parts, body fluids, and specimens, along with containers.

f) **Infectious Waste:** Is the type of bio-medical waste capable of transmitting viral, bacterial, or parasitic diseases, due to high concentration and virulence of pathogenic organisms.

g) **Hazardous Waste:** Is the type of biomedical waste that can be harmful to the health and life of human beings.

h) **Radioactive Waste:** It includes waste contaminated with radioactive nuclides; it may be solid, liquid, or gaseous waste. These are generated from in vitro analysis of body fluids and tissues, in vitro imaging, and other therapeutic procedures.

Fig. 5.3: Container with radioactive symbol

i) **Pressurized Waste:** It includes compressed gas cylinders, aerosol cans, and disposable compressed gas containers.

j) **General Waste:** Is the general/domestic waste generated in offices, public areas, stores, catering Areas, for example, metal cans, floor sweepings, and stationery paper waste.

k) **Recyclable Waste:** Recyclable waste includes cleaned glass, paper, corrugated cardboard, aluminum, X-ray film silver from the solution used to develop X-ray films.

Classification of Hospital Waste

The World Health Organization (WHO) has classified the hospital waste into the following categories:

1. **General Waste:** The waste generated from the office, administrative offices, kitchen, laundry, and stores.

Fig. 5.4: Radioactive waste

2. **Sharps:** Hypodermic needles, needles attached to tubing, scalpel blades, razor, nails, broken glass pieces, etc.

3. **Infected waste:** Equipment and instruments used for diagnostic and therapeutic procedures, waste tissues after surgical procedures, and organs removed and autopsied.
4. **Chemical waste:** Formaldehyde is used to preserve tissues and organs; fixers and developers are used in the radiology department. Solvents like xylene, acetone, ethanol, and methanol are used in laboratories.
5. **Radioactive waste:** Various radioactive wastes are generated through the activities of the department, like research activities, the clinical laboratory, and the nuclear medicine department
6. **Cytotoxic drugs:** Various anti-cancer drugs.

Categories of Biomedical Waste

The Ministry of Environment and Forests has drafted certain rules in exercise of powers conferred by sections 6,8, and 25 of the Environmental Protection Act 1986. The categories of bio-medical wastes, as per the Biomedical Waste (Management and Handling) Rules 1988, are as follows, shown in Table 10:

Table 10: Categories of Biomedical Waste

Waste Category	Waste class and description
Category No.1	**Human anatomical wastes**
Category No.2	**Animal wastes** Animal tissues, body parts, carcasses, organs, bleeding parts, and blood discharge from hospitals, animal houses.
Category No.3	**Microbiology and biotechnology wastes** Wastes from laboratory culture, stocks or specimens of microorganisms, human and animal cell cultures used in research and industrial laboratories, wastes from the production of biological toxins, dishes and devices used for the transfer of cultures.
Category No.4	**Waste sharp** Blades, needles, syringes, scalpels, glass, etc. That is capable of causing punctures and cuts. This includes both used and unused sharps.
Category No.5	**Discarded medicines and cytotoxic drugs** Wastes comprising outdated, contaminated, and discarded medicines.
Category No.6	Solid Waste Items contain blood and body fluids, including cotton,

	dressing, soiled plaster casts, linen, beddings, and other materials contaminated with blood.
Category No.7	**Solid waste** Wastes generated from disposable items other than the waste sharps, such as tubes, catheters, and intravenous sets.
Category No.8	**Liquid Waste** Wastes generated from laboratory and washing, cleaning house housekeeping, and disinfection activities
Category No.9	**Incineration ash** Ash from the incineration of any biomedical waste.
Category No.10	**Chemical waste** Chemicals used in the production of biological products, chemicals used in disinfections, and insecticides.

Importance of Hospital Waste Management

The hospital waste management is important from the following point of view:

Hospital staff members are directly exposed to the risks of waste in the hospital. The potential impact of hospital waste on staff can be highlighted based on the following points:

(i) The hospital staff is responsible for generating, segregating, collecting, storing, and treating the hospital waste.

(ii) The hazards to healthcare workers, while working with sharps like needles, blades, etc., include risks of contracting infection. There is a risk of transmission of HIV/AIDS, Hepatitis B, and C.

(iii) The hospital authorities must organize education and training programs for the healthcare workers, and the hospital authorities must provide an adequate stock of gloves, masks, footwear, goggles, gum boots, and gowns.

Fig. 5.5: Red & white bag container

Nosocomial infections: Nosocomial infections are infections acquired during the duration of stay in a hospital, potentially caused by antibiotic-resistant organisms. These are infections not present at the time of admission of the patient to the hospital, but occur within 72 hours of admission to the hospital. The sources of hospital-acquired infection are as follows:

a) P a t i e n t s ' flora
b) Flora of another patient
c) Fomites-any object or substance capable of carrying infectious organisms.
d) Environmental sources
e) Contamination by patients, attendants, visitors, and hospital staff.

The routes of the transmission of infection can be:

a) Aerial route, for example, through inhalation of hospital dust.
b) Direct contact, for example, through abrasions on skin or mucous membrane.
c) Faeco – oral route, for example, through ingestion of food, water, with contaminated hands
d) Parenteral route during the process of injections and infusions.
e) Through equipment and materials.

Practical Exercise

Visit a nearby hospital. Wear personal protection equipment and identify the different wastes. Classify them according to the category number and fill in the table given below:

Waste Category	**Waste**
Category No.1	
Category No.2	
Category No.3	
Category No.4	
Category No.5	
Category No.6	
Category No.7	
Category No.8	
Category No.9	
Category No.10	

Check Your Progress

A. Multiple Choice Questions

1. The bio-medical waste should be properly discarded because it has –

a) The potential to transmit diseases

b) Radioactive properties
c) Good decaying materials
d) All the above

2. WHO has classified hospital waste into general, infected, chemical, radioactive, _____ and _____.
a) General waste
b) Sharp
c) Cytotoxic drugs
d) b and c

3. Nosocomial sources of infection are the patient's or other patients' flora, fomites, environmental sources, or_____
a) Contamination by patients, visitors, and hospital staff
b) Developmental disorder
c) Road traffic accidents
d) All the above

4. The routes of transmission of nosocomial infection are –
a) Direct contact
b) Faeco-oral and nasal route
c) Parenteral route
d) All the above

B. Match the following

Waste	Generated
1. Microbiology	a) generated from disposable items
2. Waste sharp	b) generated from laboratory and washing
3. Solid waste	c) Needles, syringes, scalpels, blades, glass, etc
4. Liquid Waste	d) chemicals used in the production of biological
5. Chemical waste	e) Wastes from laboratory culture, stocks or specimens

C. Answer the following questions:

1. Write any five terminologies that are used in hospital waste management.
2. Write the classification of hospital-generated waste.

3. How bio-medical waste management helps in environmental protection.
4. What is hospital-acquired infection (HAI)?
5. Describe the importance of hospital waste management.

SESSION 2: SOURCES AND DISPOSAL OF BIO-MEDICAL WASTE

Sources of bio-medical waste

Biomedical waste is generated from medical sources, biological activities in hospitals, clinics, healthcare organizations, veterinary hospitals, etc. Let us now try to identify the various generators of biomedical wastes. The sources can be classified as major and minor sources, depending on the amount of waste generated.

Hospital

- Hospitals of all categories, like general, specialist hospitals, private as well as public sector hospitals, generate biomedical wastes.
- Departments like Surgery, Gynecology and Obstetrics, Pediatrics, Oncology, Orthopedics, Ophthalmology, ENT, Physical Medicine and Rehabilitation, Emergency Services, Operating Theatres, ICU, Critical Care Medicine, Burns and trauma, Neurosurgery, etc. generate a specific type of biomedical waste.

Clinics

- Physicians, Maternity clinics, Dentists, Immunization Clinics, Dialysis centers, and Endoscopists.
- Dispensaries of state or central governments

Healthcare organizations

- Polyclinics
- Nursing homes
- Geriatric homes
- Home for the mentally retarded
- Mental asylums

Support Services

- Blood banks, pharmacy, mortuary, laundry, and Laboratories

Disposal of Wastes

Biomedical waste should be disposed of separately, and not with other wastes. It should be treated and disposed of as per the standards of the notification of Bio Medical Waste (BMW) rule (1998) of the Ministry of Environment & Forest, Govt. of India. Once the wastes have been treated by one or the other method, it is to be finally disposed of in the following manner:

- **Disposal of general / non-hazardous waste**: It is done in the following methods:
  a. For small quantity
    i. Landfill: it is done by
      1. Trench method
      2. Ramp method
      3. Area method
    ii. Use of pits
    iii. Composting

  b. For a large quantity
    i. NADEP composting
    ii. Pelletisation technology
    iii. Biopress and manure
    iv. Pyrolysis

- **Disposal of wastewater and liquid waste**: The liquid waste is disposed of by any of the following manner
  - Discharge into the sewers
  - Soak pits
  - Waste stabilizing ponds.

- **Disposal of human anatomical, blood, and body fluids**: the preferred method is by incineration.

- **Disposal of sharps**: the needles should be destroyed by the needle destroyers and other sharps as well, and the needles should be bleached. The used syringes can be disposed of by melting and sterilization.

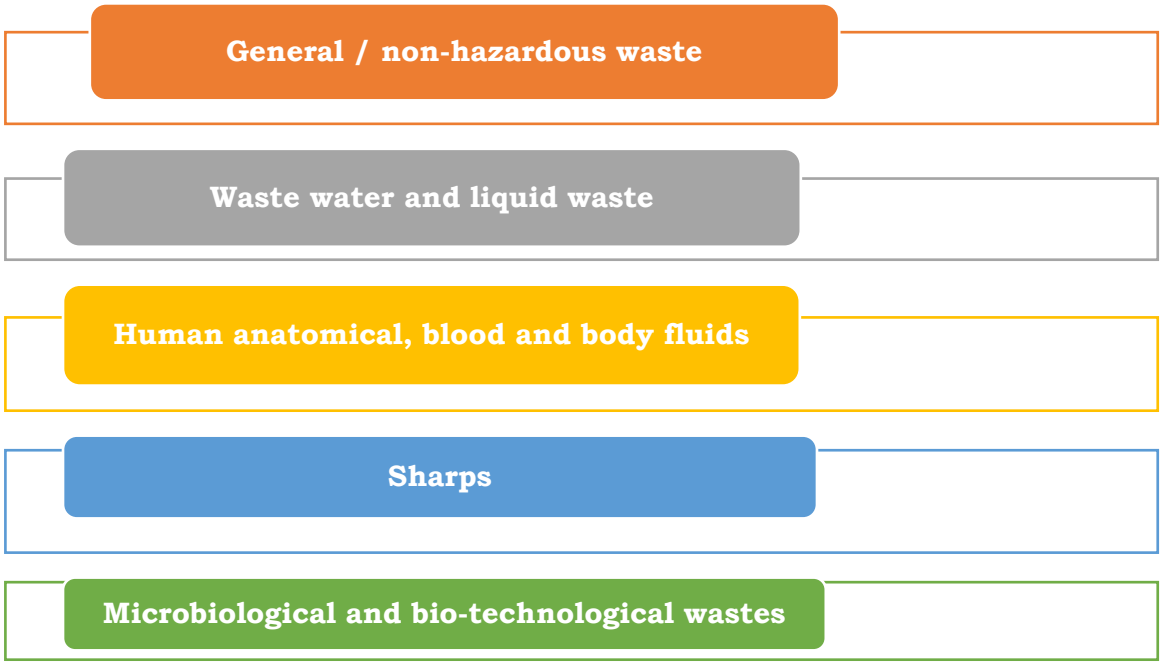
Fig: Disposal of sharps

- **Disposal of microbiological and bio-technological wastes**: This is done by autoclaving, hydroclaving, microwave, or incineration.

- **Disposal of pharmaceutical wastes**: The preferred method is by incineration, and the ash can be disposed of by land filling.

- **Disposal of infectious solid waste**: it is first treated and converted to non–hazardous waste, which is then disposed of as general waste.
- **Disposal of chemical waste**: Non-hazardous waste is disposed of as general waste, and the hazardous waste is first converted into non–hazardous waste and then disposed of as general waste.
- **Disposal of radioactive wastes**: This is done by the guidelines issued by the Bhaba Atomic Research Centre (BARC).
- **Disposal of pressurized containers**: This is disposed of with general waste in special landfills. All records should be subjected to inspection and verification by the prescribed authority at any time. The authorized person shall maintain records related to generation, collection, reception, storage, transportation, treatment, disposal, and/or any form of handling of bio-medical waste. No untreated biomedical waste should be kept beyond a period of 48 hours.

After the waste is treated, it is disposed of in the following categories:



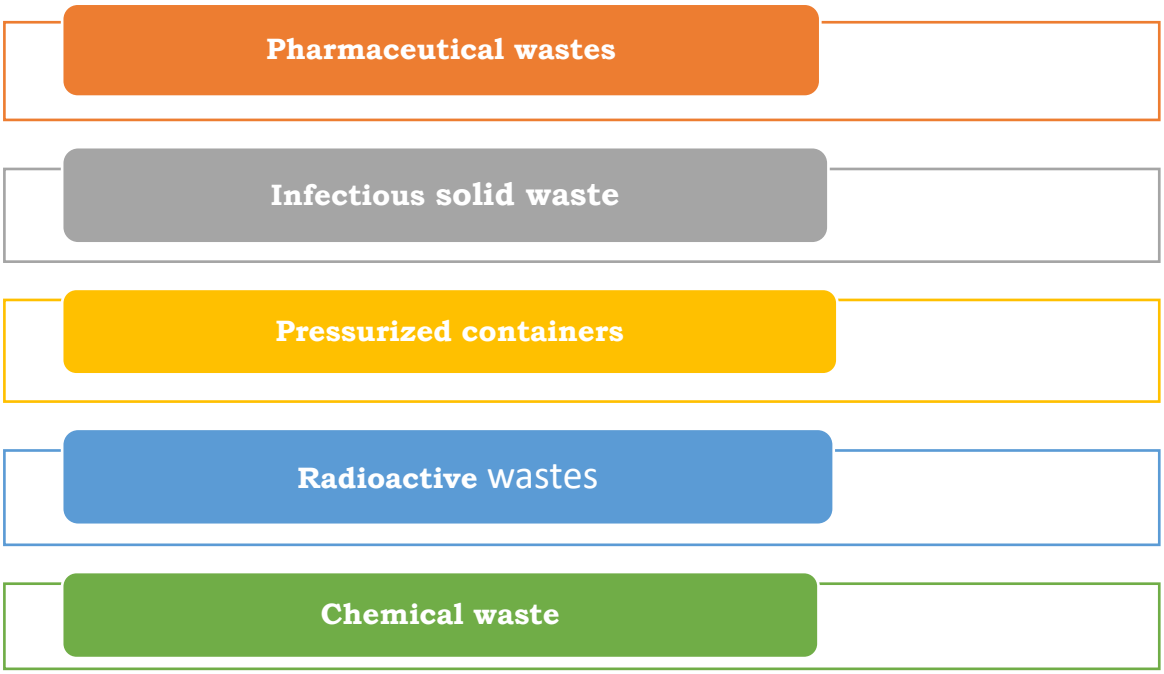


Fig. 5.6: Categories of waste disposal

Practical Exercise

1. Visit the nearest hospital and identify the different types and sources of biomedical waste and fill in the table below.

Name of garbage	Department generating waste
Human organ/tissue body fluids	
Sharp needle and instruments	
Infected dressing and bandage	
Plastic materials	

Check Your Progress

A. Multiple choice questions

1. Disposal of general non-hazardous waste for small quantities is done by which of the following methods -

a) Landfill
b) Use of pits
c) Composting
d) All the above

2. The following methods are used to dispose of large quantities of waste:

a) NADEP composting
b) Palletization technology

c) Biopress and manure
d) Pyrolysis
e) All the above

3. The Bio-Medical Waste Disposal Guidelines Standards are set out in Schedule V of the Bio-Medical Waste Rules -

a) Niti Aayog
b) Ministry of Health & Family Welfare
c) Ministry of Environment & Forest
d) None of the above

B. Tick the true and false in the following sentences:

1. The best disposal method of human organs, tissue, blood, and body fluids is incineration.
2. Radioactive waste is disposed of as per the guidelines issued by the Indian Atomic Council.

C. Write down the methods and techniques used for the disposal of bio-medical waste.

Waste	Methods/techniques
General/non-hazardous waste	
Waste water and liquid waste	
Human anatomical, blood and body fluids	
Sharps needle and instruments	
Microbiological and bio-technological wastes	
Pharmaceutical wastes	
Infectious solid waste	
Chemical waste	
Radioactive wastes	
Pressurized containers	

D. Write the following questions' answers -

1. List the departments of hospitals that generate bio-medical waste.
2. Write the methods of disposal of non-hazardous waste.
3. Describe the method of disposal of microbiological wastes in hospitals.

SESSION 3: SEGREGATION AND TRANSPORTATION OF BIO-MEDICAL WASTE

In this session, you will learn about segregation, packaging, transportation, and storage of bio-medical waste. You will study the color-coding criteria recommended by WHO for storing and disposing of different classes of biomedical wastes.

The following points should be remembered while segregating, packaging, transporting, and storage of biomedical wastes:
1. Biomedical waste is to be kept separate from other wastes.
2. Segregate the bio-medical waste at the point of generation of waste (i.e, wards) and put it in labeled containers before transportation for treatment and disposal.
3. The container should be labeled properly when being transported to other premises for disposal.
4. Untreated biomedical waste to be transported in a government vehicle authorized by a competent authority.
5. Untreated biomedical waste is not to be stored for more than 48 hours; if necessary, permission is to be taken by an authorized person.

Fig. 5.7: Transportation of bio-medical waste

Color Coding and Type of Containers for Bio-medical Wastes

Color coding is recommended for developing countries by the WHO.

S.N.	Category of Waste	Recommended color code
1	General non-hazardous waste	Black bag

2	Sharps (whether infected or not)	Yellow bag
3	Infected waste (Not containing sharps)	Yellow bag
4	Chemical and pharmaceuticals (other than Cytotoxic drugs, radioactive waste, high-pressure containers)	Red bag
5	Clinical waste that requires autoclaving	Blue bag

Types and Colors of Containers for the disposal of biomedical waste (as per Ministry of Environment and Forest Guidelines)

Waste Category	Waste Class	Type of container	Colour code
Category No.1	Human anatomical waste	Plastic Bag	Yellow
Category No.2	Animal waste	Plastic Bag	Yellow
Category No.3	Microbiological and biotechnological waste	Plastic Bag / disinfected container	Yellow / Red
Category No.4	Sharp	Plastic Bag	Blue/White translucent
Category No.5	Discarded medicines and cytotoxic drugs	Plastic Bag	Black
Category No.6	Solid waste	Disinfected container /plastic bag	Yellow / Red
Category No.7	Solid Waste	Disinfected containers/plastic bag/puncture proof containers	Red / blue / White
Category No.8	Liquid waste	Not Applicable	Not Applicable
Category No.9	Incineration Ash	Plastic Bag	Black
Category No.10	Chemical Waste	Plastic Bag for solid	Black

Fig. 5.8: Colored containers for disposal of bio-medical waste

Transportation of Biomedical Wastes

Methods of transportation of biomedical wastes are internal and external transportation.

Internal Transportation

The sanitation staff from the centralized waste management unit will transport the different colored polythene bags in garbage bins from the sluice room and different areas of the hospital. Push carts and garbage trolleys are designed for the purpose only to be used; the waste is to be routed by the main ramp to the ground floor, then to the area of the incinerator/mortuary. The General waste (in black polythene bags) is to be unloaded at the municipal dumps, opposite the mortuary, adjacent to the incinerator site. The sanitation inspector has to be informed in case of leakage or spillage, as they take responsibility for cleaning and disinfection of the trolleys.

External Transport

On request placed by the hospital authorities, the Municipal authority will send the vehicle to collect and transport the general waste packed in black colored plastic bags.

Fig. 5.9: Internal transportation of hospital waste

Treatment and Disposal of Hospital Waste

General Waste: About 80% waste generated in the hospitals is general waste, which is like the domestic waste; this is non-hazardous. The contents of this waste are peels of fruits, paper packages of tea/coffee, food articles, polythene bags, and wraps of disposable materials. This waste is emptied into black polythene bags that are disposed of in Municipal dumps, and subsequently, Municipal authorities collect the waste for final disposal.

Incineration: The waste carried in yellow bags is carried away for disposal in an incinerator.

Autoclaving and Shredding: This procedure is adopted for waste collected in blue gabs to the site where an autoclave facility is available.

Radioactive Waste: This waste is generated in radiological and imaging procedures in the Department of Radiotherapy. The solid waste as syringes, absorbent paper, and clothing, is stored in a drum/container for decay. The liquid radioactive waste is diluted and drained into sewers. The gaseous waste is diluted and dispersed in the atmosphere.

Liquid and Chemical Wastes: This type of waste is disinfected by 1% sodium hypochlorite solution, then emptied into the drainage or sewer.

Practical Exercise

Visit a nearby hospital and observe the segregation process of bio-medical waste. Do not forget to wear personal protective equipment. Identify the type of bio-medical waste and fill in the table given below:

Color code	Class of waste	Type of container	Waste category

Check Your Progress

A. Fill in the blanks

1. Waste collected in _____will be transported to the site of autoclaving and shredding for treatment.
2. _____ is generated during the process of imaging the body part.
3. Transportation of bio-medical wastes can be divided into _____and_____ transport.
4. Liquid and Chemical Wastes must be disinfected with at least _____ chemical solution.

B. Multiple Choice Questions

1. In which color bags the waste collected is taken to the incineration site.

a) Red bag
b) Yellow bag
c) Blue bag
d) Black bag

2. In - charge of coordinating waste disposal between hospital and municipal authorities.

a) Waste Officer
b) Municipal Officer
c) Sanitation Officer
d) None of the above

C. Write the following questions answer -

1. What should be kept in mind while transporting and storing biomedical waste.
2. Describe the treatment and disposal of hospital waste.

3. Explain the color code for the following types of waste:

a) General non-hazardous waste
b) Sharps
c) Infected waste
d) Chemicals
e) Human anatomical waste

ANSWER KEY

UNIT 1

Session 1

A: Fill in the Blanks

1. Preventive, Curative
2. State
3. Tertiary Care
4. Diagnostic, curative, rehabilitative
5. 30 to 50
6. Haematology laboratory
7. 1200 to 1500
8. Purchase department

B: Multiple Choice

1. d
2. b
3. a

Session 2

A: Fill in the Blanks

1. General Duty Assistant
2. Confidentiality

B: Multiple Choice

1. b
2. a
3. d
4. b

C:Match the following

1. b
2. d
3. a
4. c

Session 3

A: Multiple Choice

1. b
2. b
3. b

Session 4

A: Fill in the Blanks

1. Titivating or Preening.
2. Personal Grooming
3. Self image/identity.

B: Multiple Choice

1. a
2. d
3. b

C:Matchthe following

1. a
2. d
3. b
4. c

E: True or False

1. False
2. True
3. True

UNIT 2

Session 1

A: Fill in the Blanks

1. Medical receptionist
2. Politeness and good communication

B:Multiple Choice

1. d
2. d

Session 2

A: Fill in the Blanks

1. 37.0^0C (98.6^0F)
2. Heart
3. Number of breaths
4. Systolic and diastolic

Session 3

A: Fill in the Blanks

1. Vertex
2. Occipital
3. Ophthalmoscope
4. Tuning fork
5. Dorsal recumbent
6. Horizontal recumbent
7. Standing scale, shoes
8. Abnormal curvature

B:Multiple Choice

1. c
2. a
3. b
4. d

UNIT 3

Session 1

A: Fill in the Blanks

1. Admission
2. Emergency
3. Stretcher
4. Male
5. Routine
6. Policies, procedures

C: Tick the Correct

1. d

2. d
3. a

Session 2
A: Fill in the Blanks
1. Activities of daily living
2. Functional
3. Stretcher
B: Multiple Choice
1. d
2. b
3. a
4. d
5. d

Session 3
A:Multiple Choice

1. b
2. d
3. d

Session 4
A: Tick the Correct
1. a, b, & c
2. a & c

Session 5
A: Multiple Choice

1. d
2. d
3. b
4. c

UNIT 4
Session 1
A: Fill in the Blanks

1. First aid
2. White cross
3. Plasma and cells
4. Inhalation and exhalation

Session 2
A: Fill in the Blanks
1. Ambulance
2. Defibrillators
3. Sling
4. First aider
5. Oral rehydration salt
6. First aid room
7. First aid

Session 3
A: Fill in the Blanks
1. Low fever
2. High fever
3. Cool
4. Asthma
5. Pain
6. Asthma
7. Bacteria
8. First aider
9. Fever
10. Oral rehydration salt

UNIT 5
Session 1
A: Fill in the Blanks
1. Electrical shocks
2. Emergency exits
3. Smoking