

**Student Handbook
For
Home Health Aide- Trainee**

Class - X

Author:

Prof. Nirmali Gogoi
HOD, Faculty of Nursing
Vice Principal, College of Nursing
Assam down town University

About

This book is developed, based on the curriculum of PSSCIVE for the Job Role **Home Health Aide** under **Healthcare** Sector of Class X. This book covers all the unit aligned to the curriculum. The Home Health Aide course is designed to deliver training to students for providing individualized healthcare to the convalescents, elderly or the people with disabilities by visiting their homes. The Home Health Aide course aims at providing extensive medical/physical care to these patients than their families can provide. Under the Home Health Aide Training, students are trained to monitor as well as report changes taking place in the health status of these patients. In addition, they are also responsible for providing personal care in basic daily activities such as dressing, grooming, and bathing to these patients.

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Unit 1	Immunization
Unit 2	Drug Administration and Physiotherapy
Unit 3	Geriatric and Child Care
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Unit 1: IMMUNIZATION

Learning outcomes

- ✓ Differentiate between various types of immunity.
- ✓ Prepare immunization scheduled chart.
- ✓ Identify the key components of Universal Immunization Program.
- ✓ Prepare a list of national health programs.
- ✓ Identify the key components of Pulse Polio Immunization program.

Unit at a glance

- ❖ IMMUNITY
 - Types of Immunity
 - Difference between various types of immunity
- ❖ IMMUNIZATION
 - Importance of Immunization
 - Side effects of Immunization
 - Immunization Scheduled chart
- ❖ UNIVERSAL IMMUNIZATION PROGRAMMES
 - Key components of UIP
- ❖ NATIONAL HEALTH PROGRAMMES
- ❖ PULSE POLIO IMMUNIZATION PROGRAMME
 - Key components of Pulse Polio Immunization Program
- ❖ *PRACTICAL*

IMMUNITY

The Latin term “immunis” means the state of protection from infectious disease.

It is the ability of an organism to resist a particular infection or toxin by the action of specific antibodies or sensitized white blood cells.

Types of immunity

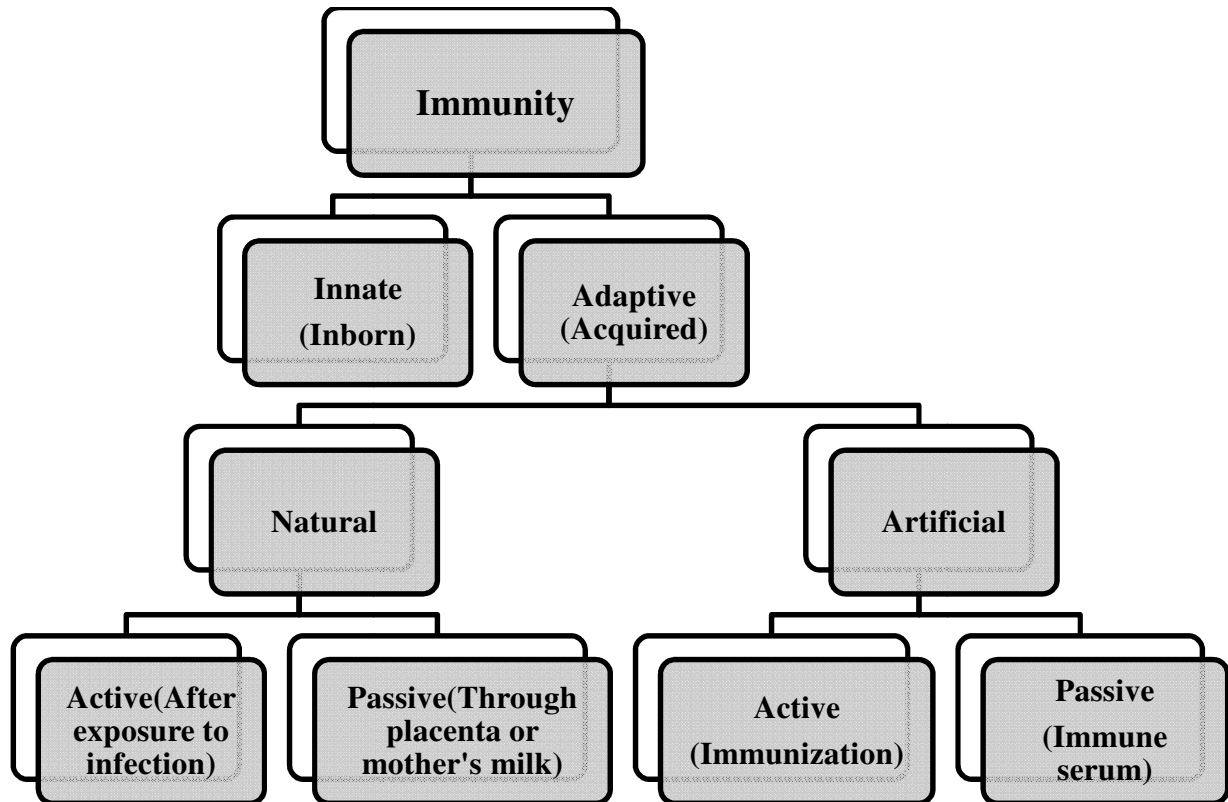


Fig 1: Flow Chart: Types of Immunity

Table 1: Difference between innate and adaptive immunity

Innate Immunity	Adaptive Immunity
Innate Immunity refers to a naturally occurring immunity by the genetic constituents and the physiology of a person.	Adaptive Immunity refers to an acquired immunity, mediated by T cells and B cells and characterized by an immunological memory.
Known as natural immunity	Known as acquired immunity
Generates a non-specific immune response	Generates a specific immune response
Always present in the body	Generated in response to exposure to an external factor
Generates a rapid response	Delayed 5-6 days
Plasma proteins, phagocytes, physical and chemical barriers are the components	Humoral and cell mediated immunity are the components
Temperature, pH, skin and mucous membranes are the barriers	Lymph nodes, spleen and lymphoid tissues are the barriers
Does not develop memory cells	Develops memory cells
Possesses a less diversity	Possesses a higher diversity
Less potent	Exhibits a higher potency
Does not produce allergic reactions	Develops allergic reactions, immediate and delayed hyper reactivity

Table : Difference between passive and active immunity

Active Immunity	Passive Immunity
Active immunity refers to immunity, which results from the production of antibodies by the person's own immune system in response to a direct contact of an antigen	Passive immunity refers to a short-term immunity which results from the introduction of antibodies from the outside
It includes both cell mediated and humoral immunity	Already produced antibodies are transferred in the body
Mediated by the antibodies produced by the person's own cells	Mediated by the antibodies produced outside the body
The pathogen has direct contact with the	The pathogen doesn't have direct contact

body	with the body
Does not generate a rapid response	Generates a rapid response
May last for a long time	May not last for a long time
Generates an immunological memory	Does not generate an immunological memory
More effective	Less effective
Not applicable in immunodeficient	Applicable even in immunodeficient
Negative phase may occur	No negative phase

Table 1: Difference between innate and adaptive immunity

IMMUNIZATION

Immunization is the process of protecting an individual from a disease through introduction of live or killed attenuated organisms in the individual system to create immunity.

Importance of Immunization

- Immunization has helped reduce the impact of communicable disease on health and wellbeing.
- Immunization helps protect future generations by eradicating diseases.
- Immunization protects a large number of people through mass vaccination.
- Immunization reduces mortality, morbidity and also reduces direct and indirect medical costs.
- Immunization protects children from serious illness and complications of vaccine preventable diseases.
- Immunization is the only solution that eradicated Polio in infants.
- Immunization is safe and effective. All vaccines undergo long and careful trial before being administered.
- Immunizations are cheap, cost-effective, and easily administered.
- Immunization also protects those around you who cannot get immunized.
- Immunization helps you protect from diseases you may encounter in other countries.

Side-effects of Immunization

The most common mild side effects are:

- Fatigue
- Headache

- Tenderness, redness, pain or swelling at the site of injection
- Nausea
- Fever
- Mild rash
- Dizziness
- Unusual severe side effects are:
 - Anaphylaxis-severe immediate allergic reaction
 - Sepsis
 - Seizures
 - Severe local reaction
 - Toxic Shock Syndrome (TSS)-abrupt onset of fever, vomiting and watery diarrhea within a few hours of immunization.

Table 3 : Immunization scheduled

Vaccine Name	Due age	Dose	Route
<i>For Infants</i>			
BCG	At birth	0.05ml	Intra dermal (ID)
Hep B-0		0.5ml	Intra muscular (IM)
bOPV-0		2 drops	Oral
bOPV-1	At 6 weeks	2 drops	Oral
Pentavalent-1		0.5ml	Intra muscular
Fractional IPV		0.1ml	Intra dermal
Rotavirus		5 drops	Oral
Pneumococcal Conjugate Vaccine (PCV)		0.5ml	Intra muscular
bOPV-2	At 10 weeks	2 drops	Oral
Pentavalent-2		0.5ml	Intra muscular
Rotavirus		5 drops	Oral

bOPV-3	At 14 weeks	2 drops	Oral
Pentavalent-2		0.5ml	Intra muscular
Rotavirus		5 drops	Oral
Fractional IPV		0.1ml	Intra dermal
Pneumococcal Conjugate Vaccine (PCV)		0.5 ml	Intra muscular
Pneumococcal Conjugate Vaccine Booster (PCV-B) (Given at 9 completed months)	At 9-12 months	0.5ml	Intra muscular
Measles/Rubella 1 st dose		0.5ml	Sub-cutaneous
Japanese Encephalitis 1 st dose		0.5ml	Sub-cutaneous
Vitamin A 1 st dose (Given at 9 completed months)		1ml	Oral
<i>For Children</i>			
DPT booster-1	At 16-24 months	0.5ml	Intra-muscular
Measles/Rubella 2 nd dose		0.5ml	Sub-cutaneous
bOPV Booster		2 drops	Oral
Japanese Encephalitis 2 nd dose		0.5ml	Sub-cutaneous
Vitamin A (2 nd dose)	At 16 months, then	2ml	Oral

to 9 th dose)	one dose every 6 months		
DPT Booster-2	At 5-6 years	0.5ml	Intra-muscular
Td	At 10 years & 16 years	0.5ml	Intra-muscular
<i>For Pregnant Women</i>			
Td-1	Early in pregnancy	0.5ml	Intra muscular
Td-2	4 weeks after Td-1	0.5ml	Intra muscular
Td Booster	If received Td doses in a pregnancy within the last 3 years	0.5ml	Intra muscular

UNIVERSAL IMMUNIZATION PROGRAMME

Universal Immunization program is a vaccination program launched by the government of India on November 19, 1985 and was dedicated to the memory of Smt. Indira Gandhi.

Vaccines under UIP

- Under UIP, following vaccines are provided:
 1. BCG (Bacillus Chalmette Guerin)
 2. DPT (Diphtheria, Pertussis and Tetanus Toxoid)
 3. OPV (Oral Polio Vaccine)
 4. Measles
 5. Hepatitis B
 6. TT (Tetanus Toxoid)
 7. JE vaccination (in selected high disease burden districts)
 8. Hib containing Pentavalent vaccine (DPT+HepB+Hib) (In selected states)

Diseases Protected by Vaccination under UIP

1. Diphtheria
2. Pertussis.
3. Tetanus

4. Polio
5. Tuberculosis
6. Measles
7. Hepatitis B
8. Japanese Encephalitis (commonly known as brain fever)
9. Meningitis and Pneumonia caused by Homophiles Influenza type b

VPD surveillance

- ❖ Vaccine Preventable Diseases (VPD) surveillance system is needed to create evidence base to enable planning and deployment of effective interventions.
- ❖ India has different surveillance models. Integrated Disease Surveillance Project (IDSP) is one of those surveillance systems.
- ❖ IDSP is a case-based surveillance system for detection of early warning signals of outbreaks. There are other sentinel surveillance systems which falls under different vertical national health programs for diseases targeted for control, elimination or eradication.
- ❖ Another source is the National Polio Surveillance Project (NPSP), which has done extremely well in acute flaccid paralysis (AFP) and measles surveillance in India.
- ❖ WHO/NPSP provides needed technical and training support for AFP and measles surveillance.
- ❖ New vaccines to be introduced as per National Technical Advisory Group on Immunization (NTAGI) recommendation
- ❖ Injectable Polio Vaccine (IPV): National Technical Advisory Group on Immunization (NTAGI) recommended Injectable Polio Vaccine (IPV) introduction as an additional dose along with 3rd dose of DPT in the entire country in the first quarter of 2016.
- ❖ Rota virus vaccine: NTAGI recommended the introduction of rotavirus vaccine in Universal Immunization Programme in a phased manner.
- ❖ Rubella vaccine is to be introduced as MR vaccine replacing the measles containing vaccine first dose (MCV1) at 9 months and second dose (MCV2) at 16-24 months.



Fig 1: Key components of Universal Immunization program (UIP)

Strategy and policy

- Directed towards achieving an acceptable, affordable and sustainable standard of health through an appropriate health system.
- Provision of universal immunization of children against vaccine preventable disease is one of the major goals under this policy.
- Country developed a comprehensive Multi Year strategic plan for immunization in 2005 with an addendum in 2010 to achieve these targets of improving access and utilization of immunization in the country.
- Ministry of Health and Family Welfare also revised the National Vaccine Policy in 2011.
- Cold Chain System, Vaccines and Logistics
- Cold chain is a system of storing and transporting vaccine at the recommended temperature range from the point of manufacture to point of use.
- To track the cold chain equipment inventory, availability and functionality.

- The vaccines are supplied directly to four Government Medical Store Depots (at Karnal, Mumbai, Chennai and Kolkata) and state and regional vaccine stores.
- Transportation of vaccines from States/Regional stores to divisions and district is done in cold boxes using insulated vaccine vans.
- Vaccines carriers with icepacks are used to transport vaccines from PHCs to the outreach sessions in the village.
- At the PHCs and CHCs, cold chain handlers, who are health personnel have been tasked with the proper storage and handling of vaccines and daily upkeep of Ice Lined Refrigerators (ILRs) and Deep Freezers (DFs) including temperature charting.
- The performance and efficiency of the cold chain system at different levels is monitored continuously, through supervisory visits, review meeting.
- Injection safety and waste disposal
- To ensure safe injection practices, Government of India endeavors to ensure continuous supply of injection safety equipment's (AD syringes, hub cutters and waste disposal bags)
- Disposal of immunization waste is strictly as per Central Pollution Control Board (CPCB) guidelines for biomedical waste disposal.

AEFI Surveillance System in India

The WHO defines AEFI as a “medical incident that takes place after an immunization, causes concern, and believed to be caused by immunization.

AEFI surveillance in country monitors immunization safety, detects and responds to adverse events following immunization, corrects unsafe immunization practices, reduces the negative impact of the event on health and contributes to the quality of immunization activities.

Strategic communication

Strategic communication refers to policy-making and guidance for consistent information activity through coherent messaging.

The issue of media advocacy, proactive planning and effective media response is emerging as one of the key elements of strategic communication support to achieving full Routine Immunization coverage in the country.

Development of RI Logo

The new logo of the baby holding the syringe, indicating RI as his right, has been developed in purple color. This will give RI a distinct identity.

Immunization Trainings

The Immunization Program runs due to the coordinated efforts of different cadres of health staff working in the states at different levels (states, districts, PHCs and CHCs)

In the year of intensification of Routine Immunization (2012-2013), the government of India has supported the training of approximately 12,50,000 frontline workers in 9 high priority states-UP, MP, Rajasthan, Bihar, Chhattisgarh, Jharkhand, Haryana, Gujarat and West Bengal.

The objective is to motivate and strengthen the capacity of frontline workers to reduce dropouts and left outs and improve the quality of services.

Monitoring and Evaluation

UIP performs monitoring and evaluation at three levels.

There is regular reporting system from the health sub-centre to PHC, district, state and national level.

To evaluate immunization coverage, country conducts period population-based surveys. These include National Family Health Survey (NFHS), District Level Health Survey (DLHS), Annual Health Survey (AHS) and UNICEF Coverage Evaluation Survey (CES)

In between periodic surveys and administrative reporting, country also plans targeted studies and surveys to evaluate the performance of various components under UIP.

Schemes:

Routine Immunization:

Objectives: The stated objectives of UIP are:

To rapidly increase immunization coverage.

To improve the quality of services.

To establish a reliable cold chain system to the health facility level.

Monitoring of performance.

To achieve self-sufficiency in vaccine production.

Scope and eligibility:

India has one of the largest Universal Immunization Programs (UIP) in the world in terms of the quantities of vaccines used, number of beneficiaries covered, geographical spread and human resources involved.

Under the UIP, all vaccines are given free of cost to the beneficiaries as per the National Immunization Schedule.

All beneficiaries' namely pregnant women and children can get themselves vaccinated at the nearest Government/Private health facility or at an immunization post (Anganwadi centers/ other identified sites) near to their village/urban locality on fixed days.

The UIP covers all sections of the society across the country with the same high-quality vaccines.

Achievements:

The biggest achievement of the immunization program is the eradication of small pox.

One more significant milestone is that India is free of Poliomyelitis caused by Wild Polio Virus (WPV) for more than 33 months.

Besides, vaccination has contributed significantly to the decline in the cases and deaths due to the Vaccine Preventable Diseases (VPDs)

NATIONAL HEALTH PROGRAMS

The National Health Program has been launched by the Central government for the control or eradication of communicable diseases, improvement of environmental sanitation, raising the standard of nutrition, control of population and improving rural health.

Program related to communicable diseases

1. National Vector Borne Diseases Control Program (NVBDCP)
2. Revised National Tuberculosis Control Program (RNTCP)
3. National Leprosy Eradication Program
4. National AIDS Control Program
5. Universal Immunization Program
6. National Guinea worm Eradication Program
7. Program related to non-communicable diseases
8. National Cancer Control Program
9. National Iodine Deficiency Control Program
10. National Blindness Control Program
11. National Diabetes Control Program
12. National Mental Health Program
13. Nutritional Program
14. Vitamin A Prophylaxis Program
15. Prophylaxis Against Nutritional Anemia
16. IDD's Program
17. Special Nutritional Program

18. Balwadi Nutritional Programme
19. ICDS Programme
20. Mid-Day Meal Program
21. Other Welfare Programme
22. National Family Welfare Programme
23. Reproductive and Child Health Programme
24. National Water supply and Sanitation Programme
25. Social Welfare Programme
26. Integrated Rural Development Programme (IRDP)
27. National Rural Employment Programme (NREP)
28. Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)
29. Special Employment Programme

PULSE POLIO IMMUNIZATION PROGRAMME

Pulse Polio Immunization program was launched in India in 1995. It is an immunization campaign established by government of India to eliminate poliomyelitis (polio) in India by vaccinating all children under the age of five years against the polio virus. The last polio case in the country was reported from Howrah district of West Bengal with the date of onset from 13th January 2011. WHO on 24th February 2012 removed India from the list of countries with active endemic wild polio virus transmission.

KEY COMPONENTS OF PULSE POLIO IMMUNIZATION PROGRAMME

Polio has been eradicated from most of the world using several key strategies. Each of the following strategies is important components in the National Polio Eradication Programme:

Routine Immunization: Sustaining high levels of coverage with 3 doses of oral polio vaccine in the 0–1-year age group.

Supplementary Immunization Activities (SIAs): Simultaneous administration of oral polio vaccine to all children in the age group of 0-5 years, 4-6 weeks apart to interrupt wild poliovirus transmission and to increase immunity amongst children. SIAs include:

National Immunization Days (NIDs) when the entire country is covered.

Sub National Immunization Days (SNIDs) where some states or parts are covered.

Mop-ups are conducted, as soon as possible after identification of the virus as an end game strategy to interrupt transmission.

Surveillance and investigation of cases of Acute Flaccid Paralysis (AFP)

Surveillance data is used to identify areas of wild poliovirus transmission and to guide immunization activities.

IMMUNIZATION (CARD) CALENDAR FOR AN INFANT BASED ON DATE OF BIRTH



ENLIST THE DISEASES COVERED UNDER UIP

The program now consists of vaccination for 12 diseases. Those 12 diseases are:

- Tuberculosis
- Diphtheria
- Pertussis (Whooping cough)
- Tetanus
- Poliomyelitis
- Measles
- Hepatitis B
- Diarrhea
- Japanese Encephalitis
- Rubella
- Pneumonia (Homophiles Influenza Type B)
- Pneumococcal diseases (Pneumococcal Pneumonia and Meningitis)

Unit 2: DRUG ADMINISTRATION AND PHYSIOTHERAPY

Learning outcome

- ✓ *Demonstrate the knowledge of basic principles of drug administration*
- ✓ *Demonstrate the knowledge of forms and routes of medication*
- ✓ *Classify the drugs*
- ✓ *Demonstrate the knowledge of principles and techniques of body mechanics*
- ✓ *Demonstrate the knowledge of breathing and coughing exercises*

Unit at a glance

- ✓ **Drug administration**
- ✓ *Classify medicine group*
- ✓ *Legal aspects of record keeping and documentation*
- ✓ *Enlist different forms of medicine*
- ✓ *Importance of forms v/s route in drug administration*
- ✓ *Read the instruction on the level of the medicine*
- ✓ *Various signs of allergy*
- ✓ *Meaning of standard abbreviation used in the medication chart*
- ✓ *Common side effects of anti-depressant*
- ✓ *Classify the drugs*
- ✓ *Techniques of disposing medicine*
- ✓ *Preventive measures to control the mistake in drug administration*
- ✓ *Introduction of physiotherapy*
- ✓ *Basic principles of physiotherapy*
- ✓ *Introduction of body mechanics*
- ✓ *Moving and positioning of patient*
- ✓ *Procedure of breathing and coughing exercises*
- ✓ *Working of trifle*

INTRODUCTION

The administration of a medicine is a common but important clinical procedure. It is the manner in which a medicine is administered that will determine to some extent whether or not the patient gains any clinical benefit, and whether they suffer any adverse effect from their medicines.

DEFINITION

This is the process of giving out medication to the patients in order to treat or prevent disease or complication.

Table 1: CLASSIFICATION OF MEDICATION GROUP

Classifications drugs
<ul style="list-style-type: none"> • Drugs can be categorized in a number of ways. In pharmacology, a drug can be classified by its chemical activity or by the condition that it treats. • In general, drugs are classified based on <ul style="list-style-type: none"> – Therapeutic classification – Pharmacologic classification (based on mechanism of action and mode of action) – Chemical classification – Amalgamated classification – Legal classification (Controlled Substances, Drug Schedules, and Teratogenic Risks)

USP Drug Classification

- a) Analgesics, including opioids and non-opioid –Analgesic also called pain killers are the medication that relieves different type of pain.
- b) Anesthetics -These are the drugs that can be used intravenously to produce anesthesia or sedation.
- c) Antibacterials –These are the drugs that able to destroy or to inhibit the development / growth of bacteria.
- d) Anticonvulsants-A drug or other substance used to prevent or stop seizures or convulsion.
- e) Antidementia agents –These are the pharmaceutical agent that are used not only to improve cognitive function but also to treat behavioural symptoms .
- f) Antidepressants –These are drugs used to treat the major depressive disorder.

- g) Antidotes and antitoxins.-Antidote is a substance that can counteract a form of poisoning and antitoxins is an antibody that counteracts a toxins.
- h) Antiemetics - It is the group of drug that is effective against vomiting and nausea

LEGAL ASPECT OF RECORD KEEPING AND DOCUMENTATION

DEFINITION

The legal health record is the documentation of healthcare services provided to an individual during any aspect of health care delivery in any type of healthcare organization. It is consumer or patient-centric. The legal health record contains individually identifiable data, stored on any medium and collected and directly used in documenting healthcare or health status.

LEGAL ASPECTS

- Police authorities and court can summon medical records under the due process of law.
- Limitation period for filing a case paper is maximum up to 3 years under limitation Act
- .According to the consumer protection act it is up to 2 years.

Legal aspects of medical record in India

- Confidentiality
 - A .Identification data
 - B .Clinical data
- Ownership and recording
- Students focus on legal ethics
- Property law
- Employment law
- Environmental law
- Avoid negligence

SEVEN RIGHTS DURING ASSISTING THE DRUG ADMINISTRATION

7 Rights of Medication Administration

- Right Medication. ...
- Right Child. ...
- Right Dose. ...
- Right Time. ...
- Right Route. ...
- Right Reason. ...
- Right Documentation.

DIFFERENT FORMS OF MEDICINE

- Liquid- The active part of the medicine is combined with a liquid to make it easier to take or better absorbed.
- Tablet.-The active ingredient is combined with another substance and pressed into a round or oval solid shape.
- Capsules.- it includes medication that's enclosed in an outer shell.
- Topical medicines.- It's a medication that is applied to a particular place on or in the body.
- Suppositories - These are solid medication that enter the body through the rectum, vagina or urethra.
- Drops.
- Inhalers.- An inhaler is a device that gets medicine directly into a person's lungs.
- Injections- An injection is the act of administering a liquid, specially a drug, into a person's body using needle and a syringe .

IMPORTANCE OF FORMS AND ROUTE IN DRUG ADMINISTRATION-

1. To provide drug products that bypass the first-pass metabolism e.g., injections, topical dosage forms etc.
2. To protect the drug substance from the destructive influence of atmospheric oxygen or humidity e.g., coated tablets.
3. To protect the active pharmaceutical ingredients (APIs) from the destructive influence of gastric acid following oral administration of the dosage form e.g., enteric-coated tablets.
4. To mask the bitter, salty, or undesirable taste or odor of drug substances e.g., capsules, coated tablets, taste-masked suspensions, and flavored syrup.
5. To provide useful dosage form for administering substances that are either insoluble or unstable in the desired vehicle e.g., suspensions.
6. To provide rate-controlled drug action e.g., various controlled-release tablets, capsules, and suspensions.
7. To provide drug products that are stable, effective, and safe for consumption under specified suitable storage conditions e.g., powders for reconstitution.
8. To provide optimal drug action from topical administration sites g., creams, transdermal patches, ointments, and ophthalmic, ear, and nasal preparations.
9. To provide sterile, clear, and particulate-free liquid dosage forms of substances e.g., injections and eye drops.
10. To provide site-specific and local drug delivery e.g., rectal and vaginal suppositories.
11. To target the drug at the desired site of action e.g., liposomes, etc.

12. To achieve rapid onset of action through inhalation therapy e.g., inhalants and inhalation aerosols.

VARIOUS SIGNS OF ALLERGY

Drug allergy signs and symptoms may include:

- Skin rash.
- Hives.
- Itching.
- Fever.
- Swelling.
- Shortness of breath.
- Wheezing.
- Runny nose.

STANDARD ABBREVIATION USED IN MEDICATION CHART

FREQUENCIES

- OD- once daily
- BID- twice daily
- TID- thrice daily
- QID- four times a day
- QHS- before bed time
- Q4H- every 4 hours
- STAT- immediately
- PRN- as needed
- AC-before meals
- PC- after meals

ROUTES

- PO- by mouth
- IM-intramuscular
- IV- intravenous
- IVP-intravenous push
- SC-subcutaneous
- PR-rectal
- ID-intradermal
- TPN-total parenteral nutrition
- NPO-nothing by mouth

COMMON- SIDE OF ANTIDEPRESSANT

- Feeling agitated, shaky.
- Feeling and being sick.
- Indigestion and stomach aches.
- Diarrhoea or constipation.
- Loss of appetite.
- Dizziness.
- Not sleeping well (insomnia), or feeling very sleepy.
- Headaches

CLASSIFICATION OF DRUG

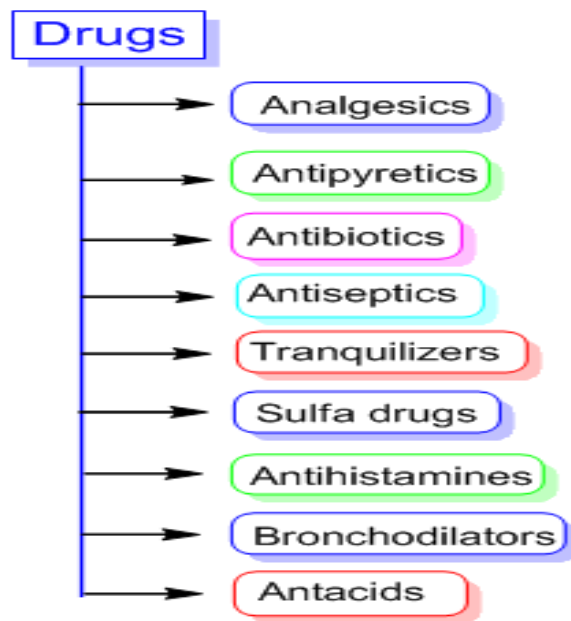


Fig 1: Classification of drugs

DRUGS OF DIFFERENT CATEGORY

- Depressants. Some of the most commonly found types of drugs in society are depressants.
- Stimulants. Stimulants, such as caffeine or nicotine, work in the opposite manner.
- Opioids. The opioid addiction crisis has affected our society to a grave degree.

TECHNIQUE OF DISPOSING MEDICINE

Apart from incineration (used for pathological and pharmaceutical waste disposal), there are other biomedical waste disposal methods, like autoclave chambers (sharps and infectious waste disposal), or the use of a medical wasteshredder. Here at Celitron, you can find autoclaves in different sizes. And follow the bio-medical waste management process.

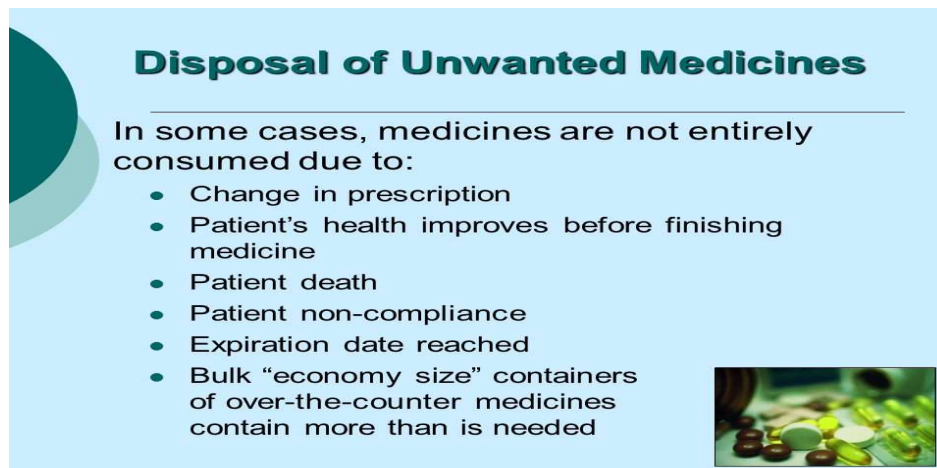


Fig 2: Disposal of Unwanted Medicine

METHODS OF DISPOSING MEDICINE

Tablets and capsules can be destroyed disposing them in a bucket of water. Using landfill procedure as per medical waste disposal method. Pouring the liquids into the sink and washing away with sufficient water. Keeping a record of all such disposal with full details of medicines destroyed.

How to Safely Dispose Medicine

- Mix medicines (do not crush tablets or capsules) with an unpalatable substance such as kitty litter or used coffee grounds.
- Place the mixture in a container such as a sealed plastic bag.
- Throw the container in your household trash.



Fig 3: Disposal of medicine in household trash

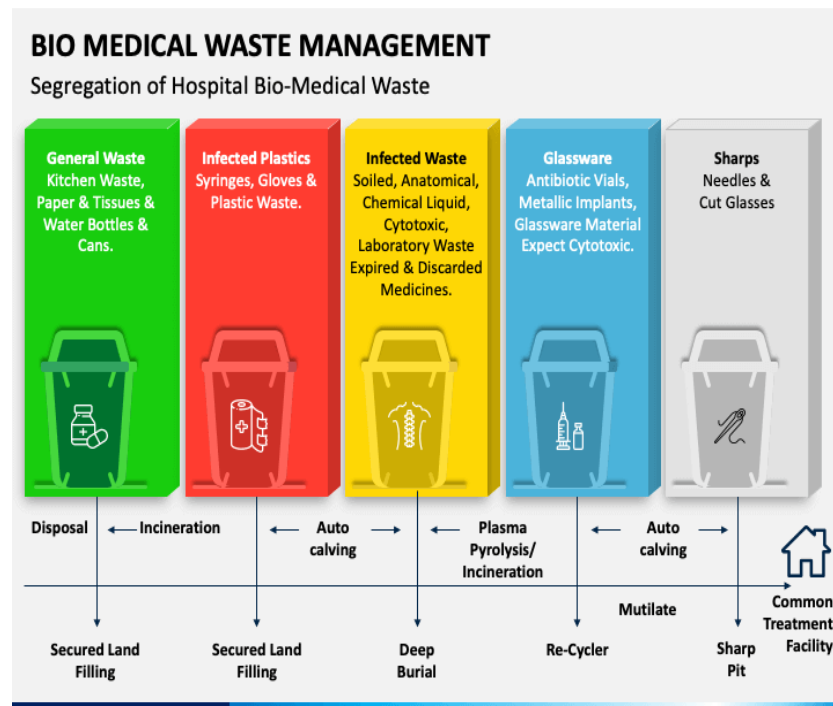


Fig 4: Biomedical Waste Management showing the disposal of used medicine packets and vials

PREVENTIVE MEASURES TO CONTROL THE MISTAKE IN DRUG ADMINISTRATION

One of the recommendations to reduce medication errors and harm is to use the “five rights”: **the right patient, the right drug, the right dose, the right route, and the right time.**

Here are some drug safety tips:

- Know the various risks and causes for medication errors.
- Find out what drug you're taking and what it is for.
- Find out how to take the drug and make sure you understand the directions.
- Check the container's label every time you take a drug.
- Keep drugs stored in their original containers.

PHYSIOTHERAPY

INTRODUCTION

"Physiotherapy is a dynamic profession, which uses a range of treatment techniques to restore movement and function within the body." The aim of physiotherapy is to **optimize someone's range of movement and function** whilst at the same time reducing pain and preventing recurrence.

DEFINITION

The treatment of disease, injury, or deformity by physical methods such as massage, heat treatment, and exercise rather than by drugs or surgery.

HOLISTIC APPROACH USED IN PHYSIOTHERAPY

A holistic approach utilizes the traditional methods of injury recovery and combines them with other techniques such as chiropractic care, massage, nutrition and a structured fitness routine.

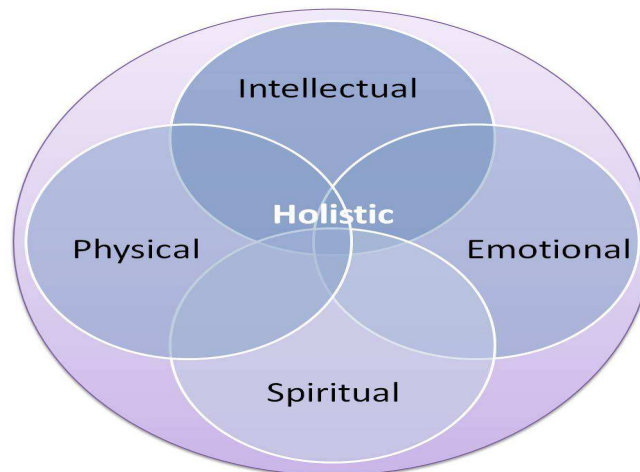


Fig 5 (a): Holistic Approach used in Physiotherapy

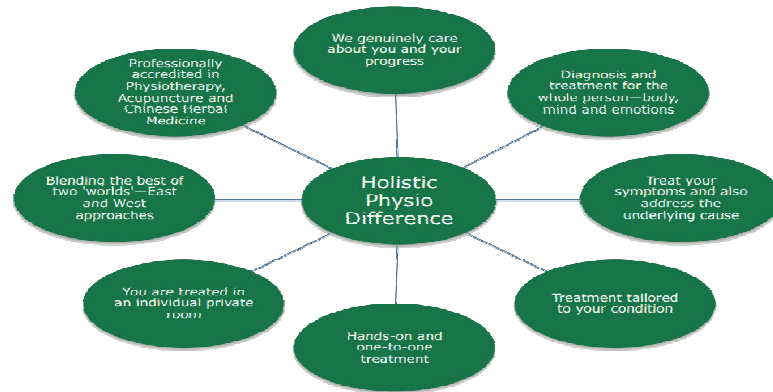


Fig 5 (b): Holistic Approach used in Physiotherapy

BASIC PRINCIPLE OF PHYSIOTHERAPY

The basic principle of physical therapy-

Physical therapist practice is guided by a set of seven core values: accountability, compassion/caring, excellence, integrity, professional duty, and social responsibility. Throughout the document the primary core values that support specific principles are indicated in parentheses.

Table 2: Principles of Physiotherapy

<u>PRINCIPLES OF PHYSIOTHERAPY</u>
• Decrease pain & facilitates healing of inflamed & injured neurological & musculoskeletal tissues.
• Maintain normal range of motion in affected joints, i.e. hind & fore limb.
• Prevent soft tissue contracture & fibrosis in weak or paralyzed limbs.
• Prevent further disuse atrophy of affected musculature of hind limb/fore limb during the healing process.
• Improve strength & function of weak or paralyzed limbs.
• Maximize post-surgical recovery & function of the patient.
• Provide +ve psychological effects for the patient & owner.

BODY MECHANISM

INTRODUCTION

Body mechanics is a term used to describe the ways we move as we go about our daily lives. It includes how we hold our bodies when we sit, stand, lift, carry, bend, and sleep. Poor body mechanics are often the cause of back problems.

DEFINITION

Body mechanics refers to the way you hold your body when you move around. Proper body mechanics help you avoid muscle fatigue and injuries as you walk, bend over, lift objects, or perform other activities of daily living.

MOVING AND POSITION OF THE PATIENTS

MOVING OF PATIENTS

Moving or repositioning patients within their beds, from bed to bed, bed to chair, or otherwise from one posture or surface to another.

Technique of moving of patients-

Put one of your arms under the patient's shoulders and one behind the knees. Bend your knees. Swing the patient's feet off the edge of the bed and use the momentum to help the patient into a sitting position. Move the patient to the edge of the bed and lower the bed so the patient's feet are touching the ground.eg-

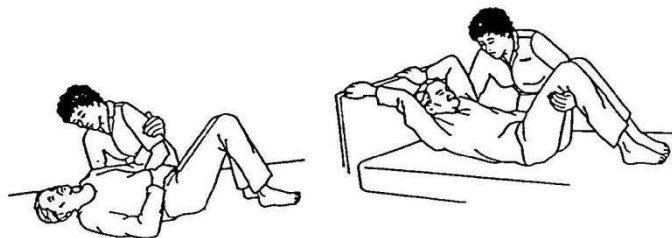


Fig 6 : Techniques of moving a patient

POSITIONING OF PATIENTS

Patient positioning involves properly maintaining a patient's neutral body alignment by preventing hyperextension and extreme lateral rotation to prevent complications of immobility and injury.eg-

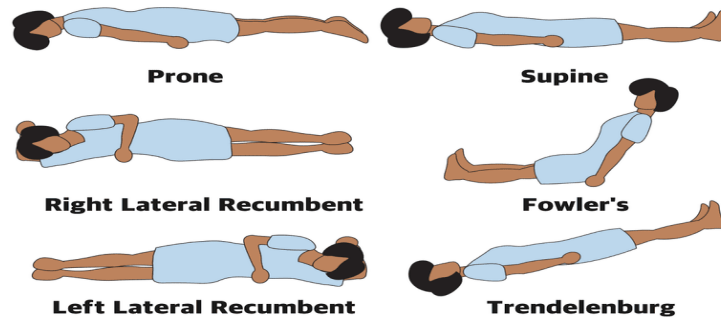


Fig 7(a): Types of position

DIFFERENT POSITION OF PATIENTS MEDICAL TREATMENT

Common Patient Positions-

- Fowler's Position. Fowler's position, also known as sitting position, is typically used for neurosurgery and shoulder surgeries.
- Supine Position.
- Prone Position.
- Lithotomy Position.
- Sim's Position.
- Lateral Position.



Fig 7(b): Types of position

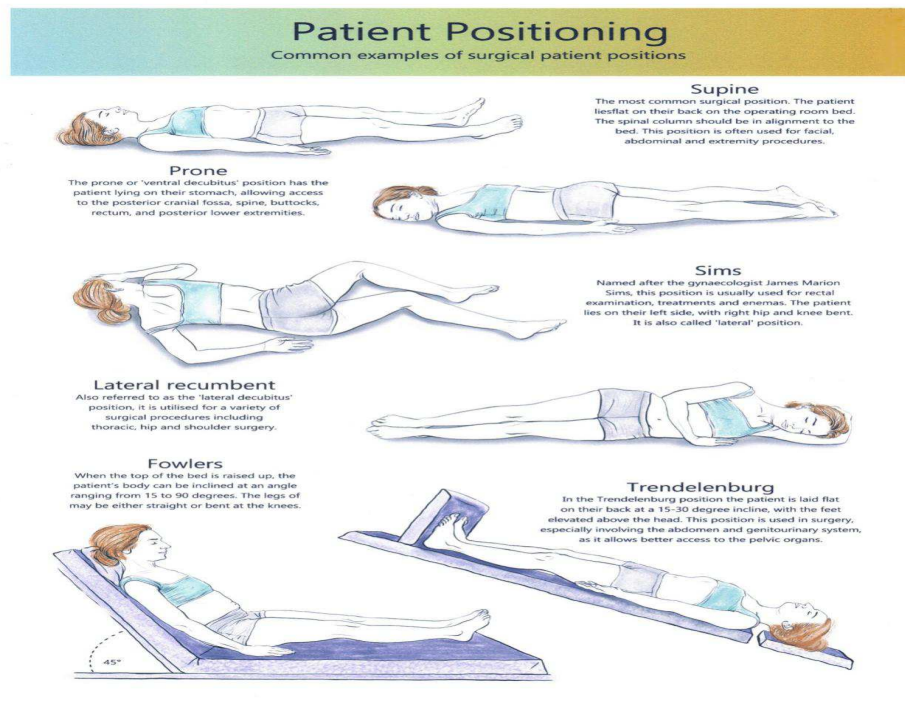


Fig 7(c): Types of position

TECHNIQUES OF BODY

MECHANICS

LIFTING:

1. Use the stronger leg muscles for lifting.
2. Bend at the knees and hips; keep your back straight.
3. Lift straight upward, in one smooth motion.

REACHING:

1. Stand directly in front of and close to the object.
2. Avoid twisting
3. Overstretching.
4. Use a stool or ladder for high objects.
5. Maintain a good balance and a firm base of support.
6. Before moving the object, be
7. Ensure that it is not too large or too heavy.

PIVOTING:

1. Place one foot slightly ahead of the other.
2. Turn both feet at the same time, pivoting on the heel of one foot and the toe of the other.
3. Maintain a good center of gravity while holding or carrying the object.

AVOID STOOPING:

1. Squat (bending at the hips and knees).
2. Avoid stooping (bending at the waist).
3. Use your leg muscles to return to an upright position

GENERAL CONSIDERATIONS FOR PERFORMING PHYSICAL TASKS

1. It is easier to pull, push, or roll an object than it is to lift it.
2. Movements should be smooth and coordinated rather than jerky.
3. Less energy or force is required to keep an object moving than it is to start and stop it.
4. Use the arm and leg muscles as much as possible, the back muscles as little as possible.
5. Keep the work as close as possible to your body. It puts less of a strain on your back, legs, and arms.
6. Rock backward or forward on your feet to use your body weight as a pushing or pulling force.
7. Keep the work at a comfortable height to avoid excessive bending at the waist.
8. Keep your body in good physical condition to reduce the chance of Injury.

REASONS FOR THE USE OF PROPER BODY MECHANICS

Use proper body mechanics in order to avoid the following:

1. Excessive fatigue.
2. Muscle strains or tears.
3. Skeletal injuries.
4. Injury to the patient.
5. Injury to assisting staff members.

Steps Involved in Properly Moving an Object to a New Location

- Identify the object to be moved.
- Adopt a stable base of support.
 - Your feet are separated.
 - One foot is behind the other.
 - Your back is straight

- Grasp the object at its approximate center of gravity.
- Pull the object toward your body's center of gravity using your arm and leg muscles.
- Re-establish your base of support and appropriate body alignment.
 - Your back is straight.
 - You have a stable base of support.
 - You are holding the object approximately at waist height and close to your body
- Pivot toward the desired direction of travel.
 - Turn on both feet at the same time.
 - Maintain a stable balance.
- Re-establish a stable base of support and appropriate body alignment.
 - Your back is straight.
 - Your feet are apart, one slightly behind the other.
 - The object is at hip level, close to your body.
- Squat and place the object onto the lower area.
 - Bend at the knees and hips.
 - Maintain a straight back.
 - Maintain a stable base of support.
 - Use your arm and leg muscles (as needed) for guidance.
- Use your leg muscles to resume an upright position

PROCEDURE OF COUGHING AND BREATHING EXERCISE

Instruct your patients:

- Hold a pillow against the stomach.
- Take a slow, deep breath. ...
- Breathe out through the mouth and concentrate on feeling the chest sink downward and inward.
- Take a second breath in the same manner.
- Take a third breath.
- Repeat the exercise.

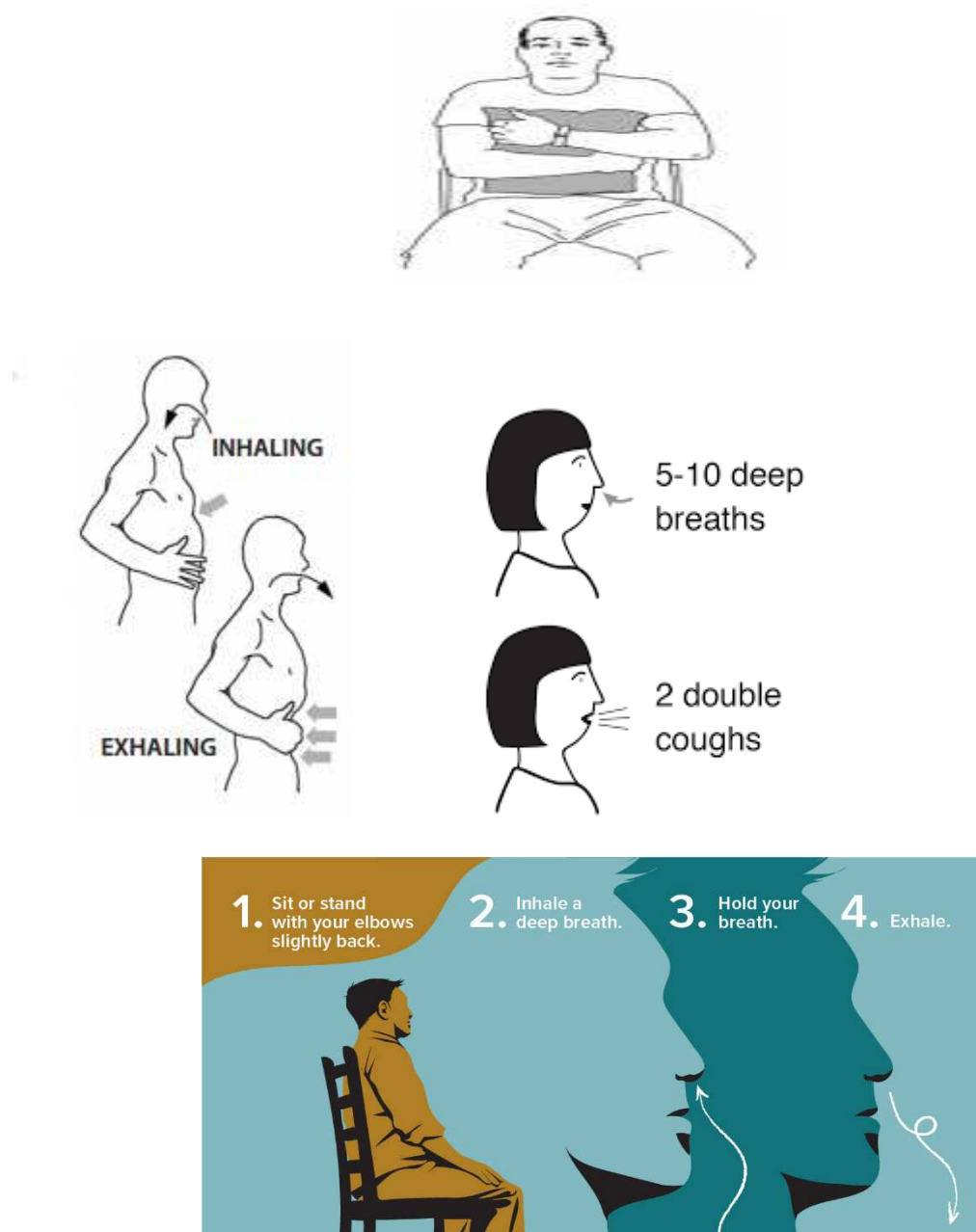


Fig 8(a): Coughing and Breathing Exercise

WORKING OF TRIFLE

How to do the breathing exercises?

To do it:

1. Choose a comfortable seated position.
2. Breathe in and out through the nose.
3. Count during each inhale and exhale to make sure they are even in duration. ...
4. Ask the patient to add a slight pause or breath retention after each inhale and exhale if he or she feels comfortable. ...
5. Continue practicing this breath for at least 5 minutes.

DEEP BREATHING AND COUGHING EXERCISE-



Fig 8(b): Coughing and Breathing Exercise

PERFORMED PURSED LIP BREATHING, DIAPHRAGMATIC BREATHING, ABDOMINAL BREATHING AND BELLY BREATHING EXERCISE-

❖ LIP BREATHING EXERCISE

To practice pursed lip breathing, breathe in slowly through the nose for two counts, keeping the mouth closed. Take a normal breath. Pucker or "purse" the lips as if patient were going to whistle and breathe out. Pursed lip breathing is one of the simplest ways to control shortness of breath.

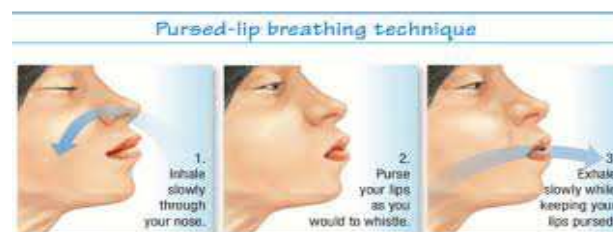


Fig 9: PURSE LIP BREATHING EXERCISE

❖ DIAPHRAGMATIC BREATHING EXERCISE

Diaphragmatic breathing technique

Instruct your patients:

1. Sit comfortably, with your knees bent and your shoulders, head and neck relaxed.
2. Place one hand on your upper chest and the other just below your rib cage. ...
3. Breathe in slowly through your nose so that your stomach moves out against your hand.

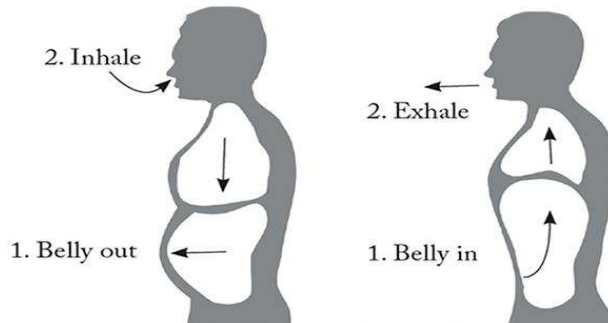


Fig 10: DIAPHRAGMATIC BREATHING EXERCISE

CONCLUSION

“Prevention is better than cure”. The differences in routes of administration of different drugs, and the regional differences in routes of use, have implications for the provision of preventive and treatment services. Interventions to prevent transitions to injecting may be especially appropriate in areas where injecting is not prevalent.

Physical therapy is an important component in the treatment of back pain syndromes. More judicious use of physical therapy, both in terms of patient profile and in terms of timing of referral, is the goal in order to achieve the most favorable results and reduce morbidity.

ASSESSMENT:

- ✓ *Enlist the different forms of medication.*
- ✓ *What are the rights of medication administration?*
- ✓ *What is body mechanics?*
- ✓ *What are the basic principles of body mechanics?*
- ✓ *Explain the reasons for the use of proper body mechanics.*
- ✓ *Explain physiotherapy.*
- ✓ *What are the basic principles of physiothera*

Unit 3: GERIATRIC AND CHILD CARE

Learning outcome

- ✓ *Demonstrate the knowledge of facts related to old age*
- ✓ *Identify the normal changes that occur at old age*
- ✓ *Demonstrate the knowledge of accomplishing basic needs of elderly people*
- ✓ *Demonstrate the knowledge of significance, purpose and techniques of the physical assessment of the patient*
- ✓ *Provide assistance in various examinations of the patient viz. eyes, ears, nose, throat, neck, chest, etc*
- ✓ *Demonstrate the knowledge of caring infant and children*

Unit at a glance

- ✓ *Introduction different age group and biological aging.*
- ✓ *Common health problems in old age people.*
- ✓ *Changes that occur in different systems of body during old age.*
- ✓ *Legal needs of the elderly & Reasons for caring elderly.*
- ✓ *Security and safety needs of an elderly people & enlist any five requisites for better feeding during old age.*
- ✓ *Food and fluid needs of elderly people & Significance and purpose of physical examination*
- ✓ *Techniques of physical examination.*
- ✓ *Enlist different age group of children & stages of learning and thinking ability among infants and children*
- ✓ *Importance of nutrition and hydration Safety needs of the children.*
- ✓ *Measure physical examination.*

INTRODUCTION

Regardless of one's role in the healthcare setting, understanding age-specific issues is essential to providing quality patient care and ensuring patient satisfaction. The age groups are:

Neonate	Adolescents
Toddlers	Young Adults
Preschoolers	Middle Adults
School age	Older Adults

THE NEONATE

- Neonates are 1/3 the length, 1/9th the BSA, and 1/21st the weight of an adult.
- Difficulty breathing is one of the most common complications and emergencies associated with this population.
- They experience the world through their senses of see, hear, smell, taste, touch
They respond well to: Rocking, cuddling, cooing, smiling.
- Care must also be given to parents or caregivers because they are often stressed when a child is in the hospital or ill.

TODDLERS (1-3Years)

- Become upset and stressed if separated from their primary caregiver.
- Difficult to understand because of developing communication skills.
- Dependent: Beginning to develop sense of self.

PRESCHOOLERS (3-6 Years)

- Begin to develop more independence and improved communication skills.
- Fearful of disfigurement and pain □ Understand simple explanations, but take things literally.
- Primary caregiver should be with them as much as possible.
- Need plenty of opportunities to play.

SCHOOL AGE (6-12 Years)

- May not voice their needs or complain of pain.
- May fear repercussions from complaints.
- Becoming increasingly independent and responsible for their own care and actions.
- Explain things clearly and thoroughly.
- Allow them to participate in decision-making.
- Parental involvement, presence important.
- Also contact with friends.
- Greater sense of self; focuses on “fitting in”.

ADOLESCENCE (12-20 Years)

- Period of transition from childhood to adulthood.
- Many physical as well as psychological changes.
- Physically, looks and responds like an adult.
- Psychologically, behaves like children.
- Behavior fluctuates from dependence to independence, idealism to realism, confidence to uncertainty.
- Important to respect the need for privacy and involve in planning and decision-making.

YOUNG ADULTS (21-45 Years)

- A time when individuals are generally basically healthy.
- Trying to establish relationships and careers, start families, may be caring for aging parents.
- May be shopping for healthcare services.
- Concerned with cost and employment issues.
- May need social service referral to help balance family responsibilities during hospitalization/recovery.

MIDDLE ADULTS (45-65 Years)

- More established-financially, personally.
- Time when many common health problems such as heart disease, diabetes, and cancers begin to occur.
- Physiological and psychological conditions more accurately determined by how the person acts and feels than by his or her age.

- Encourage regular checkups and preventive exams; monitor health risks; update immunizations.

OLDER ADULTS (65+ Years)

- Age more appropriately defined not by chronology, but by function.
- More prone to developing health problems.
- Reflexes are slowed, sensations diminished.
- Care should reflect respect for physical, psychological changes.
- Slow speech down and speak clearly.
- Sense of smell/taste diminished - honor special meal requests whenever possible.

AGING

Aging is the process of becoming older. Ageing represents the accumulation of changes in a human being over time, encompassing physical, psychological, and social changes. Reaction time, for example, may slow with age, while knowledge of world events and wisdom may expand.

THEORIES OF AGING

- Biological theories
- Psychological theories
- Environmental theories
- Developmental theories

BIOLOGICAL THEORIES

Cellular theory:

Cells has been subject of much scientific inquiry in exploring aging phenomena.

Cells has three distinct components:

- Cells that can reproduce
- Cells that cannot produce
- Intercellular substance/materials.

Programmed theory:

According to this theory aging and death are natural and necessary part of genetics. The human are programmed to age and die.

Error theory:

Aging is a result of internal and external assaults that damage cells or organs so they can no longer function properly. Mistranscription and mistranslation of certain genes roducts results in self amplifying error producing derangement.

Somatic theory:

The theory states that aging is an imbalance between DNA's ability to repair itself and accumulating DNA damage. When the damage exceeds the repair, the cell mutation, this lead to senescence.

Wear and tear theory:

Years of damage to cells, tissue and organs eventually wears them out. Wear and tear can be viewed as a result of aging and not the cause of it.

Auto immune theory:

Postulates that with age, immune system produces auto anti-bodies that causes cell death or changes that foster the aging process.

Free radical theory:

During aging, damage produced by free radicals cause cells and organs to stop functioning. Molecules that are damaged by free radicals are proteins and DNA. This theory purpose that little by little small damage accumulates and contributes to detoriation of tissue and organs.

Cross linkage theory:

Also known as collagen theory. With age, protein, DNA and other structured molecules develop inappropriate cross links to one another which decreases the elasticity of protein and other molecules. Damage and unneeded protein stick around and can cause problem.

PSYCHOLOGICAL THEORIES

Activity theory (Havighrust 1963):

The activity theory basically says: the more you do, the better you will age. The activity theory occurs when individuals engage in a full day of activities and maintain a level of productivity to age successfully.

Disengagement theory(Cumming & Henry 1961):

This theory viewed aging as a process through which society and the individual gradually withdraw or disengage from each other.

Continuity theory(Negatron 1964):

The continuity theory states that individual who age successfully continue habits, preferences, lifestyle and relationship through midlife and later.

Social exchange theory:

Postulates that social interaction between individuals and groups continues as long as everyone profits from the interaction. The decrease in the social interaction of the aged is the result of exchange relationship that gradually erodes the power of the aged.

ENVIRONMENTAL THEORIES

Radiation theory:

Excessive exposure to the sun's radiation puts the skin at risk during the somatic mutation process.

Stress theory:

According to Perlman(1954) 'Human aging is a disease syndrome arising from a struggle between environmental stress and biological resistance and relative adaption to the effects of stressor agents. These stressors agents might include air, pollutant, chemical, psychological and sociological events.'

DEVELOPMENTAL THEORY

Erikson theorized that person's life consists of eight stages. Each stage represents a crucial turning point in life stretching from birth to death, with its own developmental conflicts to be resolved.

RISK OF DISEASES IN ELDERLY

- Prone for infections
- Prone for injuries
- Prone for psychological problems
- Prone for degenerative disorders
- Increased risk for disease
- Increased risk of disability
- Increased risk of death

HEALTH PROBLEMS OF THE OLD AGE

Classify on the basis of:

- (1) Problems due to the ageing process
- (2) Problems associated with long-term illness
- (3) Psychological problems

PROBLEMS DUE TO THE AGEING PROCESS:

- Senile cataract
- Glaucoma
- Nerve deafness
- Osteoporosis
- Emphysema
- Failure of special senses
- Change in mental outlook

PROBLEMS ASSOCIATED WITH LONG-TERM ILLNESS:

- Degenerative diseases
- Cancer
- Accidents
- Diabetes
- Diseases of loco-motor system

- Respiratory illness
- Genitourinary system

PSYCHOLOGICAL PROBLEMS

- MENTAL CHANGES

Impaired memory, rigidity of outlook, dislike of change are some of them.

- SEXUAL ADJUSTMENT
- EMOTIONAL DISORDERS

Social maladjustment leads to bitterness, inner withdrawal, depression, weariness of life, and even suicide.

CHANGES IN DIFFERENT ORGANS & ORGAN SYSTEM

1. Kidney- they becomes less efficient at extracting waste from blood; bladder capacity declines; urinary consistency which may occur, often tissues atrophy can also be managed through exercise.
2. Heart- it grows slightly larger with age, maximal oxygen consumption during exercise decline on man by about 10% with each decade of adult life .
3. Lungs- maximum breathing capacity may decline by about 40% between the age of 20 & 70.
4. Brain-it losses some cells and others becomes damaged .it adopts by increasing the number of connection between neuron – synapse and by regrowing the brand like extension Dendron and axon that carry message to brain.
5. Sight- difficulty in focusing close up may begin in the 40s , the s ability to distinguish fine details may begins to decline in the 70s..
6. Body fat –the body does not lose fat with age but redistribute it from just under the skin likely to store it in the lower body hips and thighs .
7. Hearing- It becomes more difficult to near higher frequencies with age .
8. Muscles- without exercise estimated muscle mass declines 22% for woman and 23% for man in age of 30-70%.

REASONS OLDER ADULTS NEED IN-HOME CARE

As your elderly loved one grows older, he or she may begin to experience mental, emotional, and physical changes that cause him or her to depend on others for assistance. However, these changes do not prevent your loved one from living at home as long as he or she has help from a caregiver. Here are some of the top reasons seniors need in-home care.

1. Difficulty Aging In Place Independently

Leaving home to live in an assisted living facility is difficult for many seniors to do. They feel as though they are losing their independence, which could cause them to experience cognitive decline at a faster rate. Hiring an in-home caregiver is a way for your loved one to age in place, surrounded by personal belongings, neighbors, and other familiar people, places, and things. Many seniors prefer aging in place over moving to an assisted living facility. If your senior loved one needs assistance to remain safe and comfortable while living at home, reach out to Home Care Assistance, a leading Cedar Falls, Iowa, home care company. Our dedicated in-home caregivers can assist with meal prep, bathing and grooming, exercise, medication reminders, and many other important tasks.

2. Poor Nutrition

If your loved one seems weak, a home caregiver may need to be hired to monitor his or her nutritional needs. The caregiver can go grocery shopping, making sure the refrigerator is stocked with nutritious foods that can boost your loved one's health. Having an in-home caregiver to help with meal prep could lead to stronger bones, healthy weight loss, a boost in memory, and other health benefits.

3. Inability To Complete Household Chores

Cognitive decline can cause seniors to stop taking care of their homes. If the standards for your loved one's home seem a little lax, it might be time to get him or her some much-needed assistance. An in-home caregiver can make sure clutter in the home is moved, messes and spills are cleaned up, and unwanted odors are taken care of.

4. Frequent Accidents Occurring

Scratches and bruises on your loved one's body or dents in his or her car are signs he or she might need assistance inside and outside of the home. An in-home caregiver can help your loved one remove clutter from the home and drive him or her to appointments and other places, which can prevent issues such as slips, falls, broken bones, and fractures.

5. Recovering From An Illness Or Injury

Seniors who need to recover from an illness or surgical procedure may prefer to do so from the comfort of their homes. With in-home care, you can hire a qualified professional who specializes in recovery care. Living with a serious health condition can make it challenging for seniors to age in place. However, they can maintain a higher quality of life with the help

of professional live-in care. Cedar Falls seniors can benefit from assistance with meal prep, bathing, transportation to the doctor's office, medication reminders, and much more.

6. Lack Of Companionship

Seniors who isolate themselves from others often experience loneliness, boredom, and depression, which is why you should hire an in-home caregiver to provide your loved one with companionship. A caregiver can also encourage your loved one to remain social by taking him or her to family functions and community events.

7. Limited Mobility

Seniors who have weak muscles, joint pain, or issues moving around likely need a caregiver to help with their mobility devices. An in-home caregiver can help your loved one do physical activities that have been approved by the doctor to strengthen his or her bones and increase his or her balance.

TOP 5 SAFETY ISSUES FOR THE ELDERLY AND ITS PREVENTION

Listed below are five safety issues for the elderly, with tips on how to decrease the risks of each accident.

SLIPS AND FALLS:

Slips and falls are the main cause of injury in a home, and the complications that can result are usually much worse than a scrape or a bruise. With careful planning and periodic home checkups, though, injuries can easily be avoided.

- Keep cords away from walkways
- Make sure all rugs, runners, and mats are slip resistant
- Provide adequate lighting in all areas of the house
- Keep exits and passageways free of miscellaneous debris
- Equip bathtubs and showers with non-slip surfaces, such as textured strips or mats
- Install one or two grab bars in the shower
- Stairs should have a handrail, decent lighting, and light switches at both ends. If the stairs need to be renovated, touch up the edges, carpet, and make sure the wood is even
- Remove all objects from stairways
- Keep a stable step-stool nearby
- Use a suitable visual aid if needed to prevent trips
- Check for dry floors, and immediately clean up spills

FIRES:

Fires are one the primary safety issues for the elderly. They may be deadly, but thankfully there are lots of ways to prevent, put out, and escape from their wrath. Burns are a high threat to the senior community, and they should be prevented at all costs.

- Make sure the smoke detectors work, and that there is one on each floor of the building
- Store paint, gasoline, and any other item that gives off a fume away from ignition sources
- Keep lids tightly closed on volatile substances
- Check the fuse box/circuit breaker. It is imperative that the box is the correct size. If you are unsure of whether the fit is perfect, don't hesitate to ask for assistance. An incorrect fuse box size will lead to an overloaded outlet or house wiring system, and a potential fire
- Keep ashtrays and other smoking materials away from the bedroom. Smoking in the bedroom is dangerous and not worth the risk
- If using a heating device (such as an electric blanket or heater), make sure to follow the manufacturer's instructions to prevent mishaps
- Never sleep with a heating pad while it is turned on. Even at low settings, a heating pad can cause serious burns
- Always un-plug an electrical appliance when it is not in use
- Avoid resting furniture on top of cords. If a cord becomes damaged, it will become a fire and shock hazard
- Keep cords in good condition
- Do not overload cords.
- Make sure ventilation systems are up to date and in proper condition. Beware of improper venting, as it is the most frequent cause of carbon monoxide poisoning
- Roll up sleeves while cooking, and avoid wearing loose clothing or jewelry near any form of flame. If you wear your hair long, tie it back
- Keep all non-cooking items (curtains, hand towels, pot holders, etc.) away from the fire range area
- If you have wood-burning heat equipment, make sure it is installed properly

ELECTRIC SHOCK:

A very real safety issue for the elderly that we don't often give much thought to is electric shock. There aren't many things more surprising than an accidental shock! New technological devices are constantly being integrated into the average American home, as well as innovative sources of unwanted electrical contact. Listed below are some easy ways to take caution against the Age of Technology.

- Keep cords intact and in proper working condition. Frayed and damaged cords may cause electric shock or fire
- To ensure that no wiring is exposed, make sure all outlets and switches have cover plates
- Turn all small electrical appliances off when they are not in use
- Make sure all power tools equipped with a three-prong plug are double-insulated.

MEDICINE AND ACCIDENTAL POISONING:

- Mixing up prescription medicines can be deadly.
- Make sure all medicines are stored in their original containers
- Outdated medications should be disposed of
- Store medicines beyond the reach of children
- Do not buy over-the-counter pills. If unwell, ask your doctor
- Keep a written calendar of what medications should be taken when and check them off as you do so
- Improper Lighting:
- A very simple-to-fix safety issue for the elderly is improper lighting. Fixing lighting can help in many ways – falling, taking the wrong medications, even electric shock. A well-lit house will prevent stumbles, showcase loose wire, prevent cuts and burns, and assist in label and calendar reading. Here are some of the best ways to ensure proper lighting.
- Make sure there is a source of light at both ends of all staircases
- Never walk in the dark. If an area is dark, provide lighting.
- There should be lamps and/or light switches within reach of the bed
- Night lights can be installed almost anywhere, and are extremely helpful around bathrooms, hallways, and other frequented evening areas
- Provide adequate lighting over the stove and food preparation counters.

GUIDE TO GOOD NUTRITION AND HYDRATION IN OLDER AGE

1. THE EAT WELL GUIDE

- Eat at least five portions of a variety of fruit and vegetables every day.
- Base meals on potatoes, bread, rice, pasta or other starchy carbohydrates; choosing wholegrain versions where possible.
- Have some dairy or dairy alternatives (such as soya drinks); choosing lower fat and lower sugar options.
- Eat some beans, pulses, fish, eggs, meat and other proteins (including two portions of fish

every week; one of which should be oily).

- Choose unsaturated oils and spreads and eat in small amounts.
- Drink six to eight glasses of fluid a day.
- Reduce fat, salt and sugar – if consuming foods and drinks high in fat, salt or sugar have these less often and in small amounts.

2. CALORIE (ENERGY) REQUIREMENTS IN OLDER AGE

An individual's nutritional needs may change when they age. As people get older, energy (calorie) needs may decrease due to reduced muscle bulk (lean body mass), increased fat stores and reduced physical activity. This can reduce basal metabolic rate, which can lower energy (calorie) requirements. Many people say they don't need to eat a lot, as they are less active. However, it's likely the decrease in energy (calories) is only 100-400 calories per day. It is therefore important that people still eat regular nutritious meals. Energy requirements can increase due to acute or chronic disease. For example, chronic obstructive pulmonary disease (COPD) can increase the effort to breathe and cause inflammation, which can cause more energy to be used up. In Parkinson's disease, people may experience involuntary movements, which can increase energy expenditure. The best way to find out if you are having too much or too little calories (energy) is to establish if your weight is stable or if you are losing or gaining weight.

3. GOOD NUTRITION

Malnutrition

We know that older people can be at higher risk of developing malnutrition. The reasons for this are dependent on a number of factors. In the general population, it is estimated that one in seven people aged 65 years and over has a medium or high risk of malnutrition. The prevalence is higher in people who are in residential or nursing care homes, than those who live in their own homes. Malnutrition increases the risk of disease, delays recovery from illness, and adversely affects body function, well being and clinical outcome.

How can I avoid malnutrition

If you or someone you know has a reduced appetite or is losing weight without trying, you should:

- Try to eat three small meals and three small snacks each day
- Consider having more calorific nourishing foods, for example: full fat milk, hot chocolate made with full fat milk, crackers with butter or cheese, full fat yogurts, rice puddings, and custards
- Monitor your weight weekly

There is widespread agreement that exercise improves both muscle strength and

performance and continues to be possible in older age.

The ability of the older body to absorb and use some nutrients may be reduced therefore increasing the needs for some nutrients, for example Vitamin D, Calcium and B Vitamins

VITAMIN D

Why is it important?

Vitamin D helps your body absorb calcium for healthy bones and teeth. Even if you have a calcium-rich diet, without enough vitamin D, you cannot absorb the calcium into your bones and cells where it is needed. The Department of Health recommends everyone over the age of four takes a 10ug (0.01mg) vitamin D supplement, especially 'at risk' groups, which include those over 65 years of age. Vitamin D supplements containing 10ug can be bought over the counter at pharmacies. Evidence now suggests most people do not attain enough vitamin D from sunlight and vitamin D is beneficial for musculoskeletal health. This includes preventing rickets, bones becoming less hard, falls and improving muscle strength.

Which foods contain vitamin D

Help your body get more vitamin D by eating plenty of vitamin D rich foods, including:

- Oily fish such as salmon, sardines, pilchards, trout, herring, kippers and eel
- Cod liver oil contains a lot of vitamin D, but women who are pregnant should not take this
- Egg yolk, meat, offal and milk
- Margarine, some breakfast cereals, infant formula milk and some yoghurts are 'fortified' with vitamin D

VITAMIN B

Why is it important?

B vitamins have a range of important functions in the body, including contributing to healthy red blood cells, metabolism, nerve function, healthy skin, vision and reducing tiredness.

Which foods contain vitamin B?

- Folate/Folic acid: green vegetables, such as broccoli, brussel sprouts and asparagus, and fortified grains and grain products.
- Vitamin B6: fortified cereals, peanuts, pork, poultry, fish, milk and vegetables.
- Vitamin B12: animal products (such as fish, meat, eggs, or dairy), fortified breakfast cereals and other fortified foods such as soya drinks.

CALCIUM

Why is it important?

Calcium is important for the development and maintenance of the skeleton. We lose bone mass as we age, so it is important that we consume plenty of calcium. After the menopause, women are particularly susceptible to osteoporosis (thinning of the bones) and reduced bone density.

Which foods contain calcium?

The best sources of easily absorbable calcium are dairy products: Milk, cheese, Non-dairy products are sometimes fortified with calcium: Soya milk/yogurts, rice milk/yogurts

Other sources:

- Fish, which have bones, such as sardines and mackerel
- Pulses (beans and lentils)
- Leafy greens (spinach)

4. GOOD HYDRATION

Older people can be vulnerable to dehydration due to physiological changes in the ageing process. This can be complicated by many disease states, as well as mental and physical frailty, which can further increase risk of dehydration. Age-related changes include a reduced sensation of thirst, and this may be more pronounced in those with Alzheimer's disease or in those who have had a stroke. This indicates that thirst in older people may not be relied on as an indicator of dehydration

Common risk factors for dehydration

- Older age
- Residing in long-term care
- Requiring assistance with foods and fluids
- Incontinence
- Cognitive impairment/confusion
- Impaired functional status and assistance required for feeding
- Inadequate numbers of appropriately trained staff to assist
- Depression
- Multiple medications, particularly diuretics

- Decreased thirst
- Acute illness, diarrhoea and vomiting

Consequences of dehydration

Dehydration is associated with poor health outcomes such as:

- Increased risk of hospital stays and death.
- Even mild dehydration can negatively affect mental performance and can increase feelings of tiredness. Mental functions affected include memory, attention, concentration and reaction time.
- Low blood pressure, weakness, dizziness and increased risk of falls.
- Increased risk of developing pressure sores and skin conditions.
- Increased risk of urinary tract infections. Inadequate hydration is one of the main causes of acute kidney injury.
- Inadequate fluid intake is also one of the most common causes of constipation. In individuals who are not adequately hydrated, drinking more fluid can increase stool frequency and enhance the beneficial effect of fibre intake.

Many older people are reluctant to drink to avoid the need to go to the toilet, particularly at night. But restriction of overall fluid intake does not reduce urinary incontinence frequency or severity.

Tips to prevent dehydration

There are a variety of potential ways to help reduce the risk of dehydration. Strategies may include:

- Aim for six to eight glasses of fluid each day (a minimum of 1.5 litres)
- Drink fluids you enjoy
- Have fluid available at all times to drink
- Make sure water is fresh and looks palatable — perhaps by adding a few slices of lemon or orange or ice cubes.
- Have a variety of hot and cold fluids
- Use aids for drinking if needed, such as special cups with handles

- Have a full glass of fluid with medications
- Include more soups, tinned fruit in juice, jelly, ice lollies and yogurts.

PHYSICAL EXAMINATION OF ELDERLY

Observing patients and their movements (eg, walking into the examination room, sitting in or rising from a chair, getting on and off an examination table, taking off or putting on socks and shoes) can provide valuable information about their function. Their personal hygiene (eg, state of dress, cleanliness, smell) may provide information about mental status and the ability to care for themselves. If patients become fatigued, the physical examination may need to be stopped and continued at another visit. Elderly patients may require additional time to undress and transfer to the examining table; they should not be rushed. The examining table should be adjusted to a height that patients can easily access; a footstool facilitates mounting. Frail patients must not be left alone on the table. Portions of the examination may be more comfortable if patients sit in a chair. Clinicians should describe the general appearance of patients (eg, comfortable, restless, undernourished, inattentive, pale, dyspneic, cyanotic). If they are examined at bedside, use of protective padding or a protective mattress, bedside rails (partial or full), restraints, a urinary catheter, or an adult diaper should be noted.

VITAL SIGNS

Weight should be recorded at each visit. During measurement, patients with balance problems may need to grasp grab bars placed near or on the scale. Height is recorded annually to check for height loss due to osteoporosis. Temperature is recorded. Hypothermia can be missed if the thermometer cannot measure temperatures more than a few degrees lower than normal. Absence of fever does not exclude infection. Pulses and BP are checked in both arms. Pulse is taken for 30 sec, and any irregularity is noted. Because many factors can alter BP, BP is measured several times after patients have rested > 5 min. BP may be overestimated in elderly patients because their arteries are stiff. This rare condition, called pseudohypertension, should be suspected if dizziness develops after antihypertensives are begun or doses are increased to treat elevated systolic BP. All elderly patients are checked for orthostatic hypotension because it is common. BP is measured with patients in the supine

position, then after they have been standing for 3 to 5 min. If systolic BP falls ≥ 20 mm Hg after patients stand, orthostatic hypotension is diagnosed. Caution is required when testing hypovolemic patients. A normal respiratory rate in elderly patients may be as high as 25 breaths/min. A rate of > 25 breaths/min may be the first sign of a lower respiratory tract infection, heart failure, or another disorder.

Skin

Initial observation includes color (normal rubor, pale, cyanotic). Examination includes a search for premalignant and malignant lesions, tissue ischemia, and pressure ulcers. In the elderly, the following should be considered. Ecchymoses may occur readily when skin is traumatized, often on the forearm, because the dermis thins with aging. Uneven tanning may be normal because melanocytes are progressively lost with aging. Longitudinal ridges on the nails and absence of the crescent-shaped lunula are normal age-related findings. Nail plate fractures may occur because with aging, the nail plate thins. Black splinter hemorrhages in the middle or distal third of the fingernail are more likely to be due to trauma than to bacteremia. A thickened, yellow toenail indicates onychomycosis, a fungal infection. Toenail borders that curve in and down indicate ingrown toenail (onychocryptosis). Whitish nails that scale easily, sometimes with a pitted surface, indicate psoriasis. Unexplained bruises may indicate abuse.

Head and Neck

Face

Normal age-related findings may include the following:

- Eyebrows that drop below the superior orbital rim
- Descent of the chin
- Loss of the angle between the submandibular line and neck
- Wrinkles
- Dry skin
- Thick terminal hairs on the ears, nose, upper lip, and chin

The temporal arteries should be palpated for tenderness and thickening, which may indicate giant cell arteritis.

Nose

Progressive descent of the nasal tip is a normal age-related finding. It may cause the upper and lower lateral cartilage to separate, enlarging and lengthening the nose.

Eyes

Normal age-related findings include the following:

- Loss of orbital fat: It may cause gradual sinking of the eye backward into the orbit (enophthalmos). Thus, enophthalmos is not necessarily a sign of dehydration in the elderly. Enophthalmos is accompanied by deepening of the upper eyelid fold and slight obstruction of peripheral vision.
- Pseudoptosis (decreased size of the palpebral aperture)
- Entropion (inversion of lower eyelid margins)
- Ectropion (eversion of lower eyelid margins)
- Arcussenilis (a white ring at the limbus)

With aging, presbyopia develops; the lens becomes less elastic and less able to change shape when focusing on close objects.

The eye examination should focus on testing visual acuity (eg, using a Snellen chart). Visual fields can be tested at the bedside by confrontation—ie, patients are asked to stare at the examiner so that the examiner can determine differences between their and the examiner's visual field. However, such testing has low sensitivity for most visual disorders. Tonometry is occasionally done in primary care; however, it is usually done by ophthalmologists or optometrists as part of routine eye examinations or by ophthalmologists when a patient is referred to them because glaucoma is clinically suspected. Ophthalmoscopy is done to check for cataracts, optic nerve or macular degeneration, and evidence of glaucoma, hypertension, or diabetes. Findings may be unremarkable unless a disorder is present because the retina's appearance usually does not change much with aging. In elderly patients, mild to moderate elevated intracranial pressure may not result in papilledema because cortical atrophy occurs with aging; papilledema is more likely when pressure is markedly increased. Areas of black pigment or hemorrhages in and around the macula indicate macular degeneration. For all elderly patients, an eye examination by an ophthalmologist or optometrist is recommended every 1 to 2 yr because such an examination may be much more sensitive for certain common eye disorders (eg, glaucoma, cataracts, retinal disorders)

Ears

Tophi, a normal age-related finding, may be noted during inspection of the pinna. The external auditory canal is examined for cerumen, especially if a hearing problem is noted during the interview. If a patient wears a hearing aid, it is removed and examined. The ear mold and plastic tubing can become plugged with wax, or the battery may be dead, indicated by absence of a whistle (feedback) when the volume of the hearing aid is turned up. To evaluate hearing, examiners, with their face out of the patient's view, whisper 3 to 6 random words or letters into each of the patient's ears. If a patient correctly repeats at least half of these words for each ear, hearing is considered functional for one-on-one conversations. Patients with presbycusis (age-related, gradual, bilateral, symmetric, and predominantly high-frequency hearing deficits) are more likely to report difficulty in understanding speech than in hearing sounds. Evaluation with a portable audioscope, if available, is also recommended because the testing sounds are standardized; thus, this evaluation can be useful when multiple providers are caring for a patient. Patients are asked whether hearing loss interferes with social, work, or family functioning, or they may be given the Hearing Handicap Inventory for the Elderly (HHIE), a self-assessment tool designed to determine the effects of hearing loss on the emotional and social adjustment of the elderly. If hearing loss interferes with functioning or if the HHIE score is positive, they are referred for formal audiologic testing.

Mouth

The mouth is examined for bleeding or swollen gums, loose or broken teeth, fungal infections, and signs of cancer (eg, leukoplakia, erythroplakia, ulceration, mass). Findings may include

Darkened teeth: Due to extrinsic stains and less translucent enamel, which occur with aging

Fissures in the mouth and tongue and a tongue that sticks to the buccal mucosa: Due to xerostomia

Erythematous, edematous gingiva that bleeds easily: Usually indicating a gingival or periodontal disorder

Bad breath: Possibly indicating caries, periodontitis, another oral disorder, or sometimes a pulmonary disorder

The dorsal and ventral surfaces of the tongue are examined. Common age-related changes include varicose veins on the ventral surface, erythema migrans (geographic tongue), and atrophied papillae on the sides of the tongue. In edentulous patients, the tongue may enlarge

to facilitate chewing; however, enlargement may also indicate amyloidosis or hypothyroidism. A smooth, painful tongue may indicate vitamin B 12 deficiency.

Dentures should be removed before the mouth is examined. Dentures increase risk of oral candidiasis and resorption of the alveolar ridges. Inflammation of the palatal mucosa and ulcers of the alveolar ridges may result from poorly fitting dentures.

The interior of the mouth is palpated. A swollen, firm, and tender parotid gland may indicate parotitis, particularly in dehydrated patients; pus may be expressed from Stensen duct when bacterial parotitis is present. The infecting organisms are often staphylococci.

Painful, inflamed, fissured lesions at the lip commissures (angular cheilitis) may be noted in edentulous patients who do not wear dentures; these lesions are usually accompanied by a fungal infection.

Temporomandibular joint

This joint should be evaluated for degeneration (osteoarthritis), a common age-related change. The joint can degenerate as teeth are lost and compressive forces in the joint become excessive. Degeneration may be indicated by joint crepitus felt at the head of the condyle as patients lower and raise their jaw, by painful jaw movements, or by both.

Neck

The thyroid gland, which is located low in the neck of elderly people, often beneath the sternum, is examined for enlargement and nodules.

Carotid bruits due to transmitted heart murmurs can be differentiated from those due to carotid artery stenosis by moving the stethoscope up the neck: A transmitted heart murmur becomes softer; the bruit of carotid artery stenosis becomes louder. Bruits due to carotid artery stenosis suggest systemic atherosclerosis. Whether asymptomatic patients with carotid bruits require evaluation or treatment for cerebrovascular disease is unclear.

The neck is checked for flexibility. Resistance to passive flexion, extension, and lateral rotation may indicate a cervical spine disorder. Resistance to flexion and extension can also occur in patients with meningitis, but unless meningitis is accompanied by a cervical spine disorder, the neck can be rotated passively from side to side without resistance.

Chest and Back

All areas of the lungs are examined by percussion and auscultation. Basilar rales may be heard in the lungs of healthy patients but should disappear after patients take a few deep breaths. The extent of respiratory excursions (movement of the diaphragm and ability to

expand the chest) should be noted. The back is examined for scoliosis and tenderness. Severe low back, hip, and leg pain with marked sacral tenderness may indicate spontaneous osteoporotic fractures of the sacrum, which can occur in elderly patients.

Breasts

In men and women, the breasts should be examined annually for irregularities and nodules. For women, monthly self-examinations are also recommended, as is annual screening mammography, especially for women who have a family history of breast cancer. If nipples are retracted, pressure should be applied around the nipples; pressure everts the nipples when retraction is due to aging but not when it is due to an underlying lesion.

Heart

Heart size can usually be assessed by palpating the apex. However, displacement caused by kyphoscoliosis may make assessment difficult. Auscultation should be done systematically. In elderly patients, a systolic murmur most commonly indicates

Aortic valve sclerosis: Typically, this murmur is not hemodynamically significant, although risk of stroke may be increased. It peaks early during systole and is rarely heard in the carotid arteries. However, systolic murmurs may be due to other disorders, which should be identified:

Aortic valve stenosis: This murmur, in contrast to that of aortic valve sclerosis, typically peaks later during systole, is transmitted to the carotid arteries, and is loud (greater than grade 2); the 2nd heart sound is dampened, pulse pressure is narrow, and the carotid upstroke is slowed. However, in elderly patients, the murmur of aortic valve stenosis may be difficult to identify because it may be softer, a 2nd heart sound is rarely audible, and narrow pulse pressures are uncommon. Also, in many elderly patients with aortic valve stenosis, the carotid upstroke does not slow because vascular compliance is diminished.

Mitral regurgitation: This murmur is usually loudest at the apex and radiates to the axilla.

Hypertrophic obstructive cardiomyopathy: This murmur intensifies when patients do a Valsalvamanuever. Fourth heart sounds are common among elderly people without evidence of a cardiovascular disorder and are commonly absent among elderly people with evidence of a cardiovascular disorder. Diastolic murmurs are abnormal in people of any age. Unexplained and asymptomatic sinus bradycardia in apparently healthy elderly people may not be clinically important. If new neurologic or cardiovascular symptoms develop in patients with a pacemaker, evaluation for variable heart sounds, murmurs, and pulses and for hypotension and heart failure is required. These symptoms and signs may be due to loss of atrioventricular synchrony.

GI System

The abdomen is palpated to check for weak abdominal muscles, which are common among elderly people and which may result in hernias. Most abdominal aortic aneurysms are palpable as a pulsatile mass; however, only their lateral width can be assessed during physical examination. In some patients (particularly thin ones), a normal aorta is palpable, but the vessel and pulsations do not extend laterally. Screening ultrasonography of the aorta is recommended for all older men who have ever smoked. The liver and spleen are palpated for enlargement. Frequency and quality of bowel sounds are checked, and the suprapubic area is percussed for tenderness, discomfort, and evidence of urinary retention. The anorectal area is examined externally for fissures, hemorrhoids, and other lesions. Sensation and the anal wink reflex are tested. A digital rectal examination (DRE) to detect a mass, stricture, tenderness, or fecal impaction is done in men and women. Fecal occult blood testing is also done.

Male GU System

The prostate gland is palpated for nodules, tenderness, and consistency. Estimating prostate size by DRE is inaccurate, and size does not correlate with urethral obstruction; however, DRE provides a qualitative evaluation.

Female Reproductive System

Regular pelvic examinations, with a Papanicolaou (Pap) test every 2 to 3 yr until age 65, are recommended. At age 65, testing can be stopped if results of the previous 2 consecutive tests were normal. If women ≥ 65 have not had regular Pap tests, they should have at least 2 negative tests, 1 yr apart, before testing is stopped. Once Pap testing has been stopped, it is restarted only if new symptoms or signs of a possible disorder develop. If women have had a hysterectomy, Pap tests are required only if cervical tissue remains. For pelvic examination, patients who lack hip mobility may lie on their left side. Postmenopausal reduction of estrogen leads to atrophy of the vaginal and urethral mucosa; the vaginal mucosa appears dry and lacks rugal folds. The ovaries should not be palpable 10 yr after menopause; palpable ovaries suggest cancer. Patients should be examined for evidence of prolapse of the urethra, vagina, cervix, and uterus. They are asked to cough to check for urine leakage and intermittent prolapse.

Musculoskeletal System

Joints are examined for tenderness, swelling, subluxation, crepitus, warmth, redness, and other abnormalities, which may suggest a disorder:

Heberden nodes (bony overgrowths at the distal interphalangeal joints) or Bouchard nodes (bony overgrowths at the proximal interphalangeal joints): Osteoarthritis

Subluxation of the metacarpophalangeal joints with ulnar deviation of the fingers: Chronic RA

Swan-neck deformity (hyperextension of the proximal interphalangeal joint with flexion of the distal interphalangeal joint) and boutonnière deformity (hyperextension of the distal interphalangeal joint with flexion of the proximal interphalangeal joint): RA

These deformities may interfere with functioning or usual activities.

Active and passive range of joint motion should be determined. The presence of contractures should be noted. Variable resistance to passive manipulation of the extremities (gegenhalten) sometimes occurs with aging.

Feet

Diagnosis and treatment of foot problems, which become common with aging, help elderly people maintain their independence. Common age-related findings include hallux valgus, medial prominence of the 1st metatarsal head with lateral deviation and rotation of the big toe, and lateral deviation of the 5th metatarsal head. Hammer toe (hyperflexion of the proximal interphalangeal joint) and claw toe (hyperflexion of the proximal and distal interphalangeal toe joints) may interfere with functioning and daily activities. Toe deformities may result from years of wearing poorly fitting shoes or from RA, diabetes, or neurologic disorders (eg, Charcot-Marie-Tooth disease). Occasionally, foot problems indicate other systemic disorders (see Table: Foot Manifestations of Systemic Disorders) Patients with foot problems should be referred to a podiatrist for regular evaluation and treatment.

Neurologic System

Neurologic examination for elderly patients is similar to that for any adult. However, nonneurologic disorders that are common among elderly people may complicate this examination. For example, visual and hearing deficits may impede evaluation of cranial nerves, and periartthritis (inflammation of tissues around a joint) in certain joints, especially shoulders and hips, may interfere with evaluation of motor function.

Signs detected during the examination must be considered in light of the patient's age, history, and other findings. Symmetric findings unaccompanied by functional loss and other neurologic symptoms and signs may be noted in elderly patients. Clinicians must decide whether these findings justify a detailed evaluation to check for a neurologic lesion. Patients should be reevaluated periodically for functional changes, asymmetry, and new symptoms.

Cranial nerves

Elderly people often have small pupils; their pupillary light reflex may be sluggish, and their pupillary mitotic response to near vision may be diminished. Upward gaze and, to a lesser extent, downward gaze are slightly limited. Eye movements, when tracking an examiner's

finger during evaluation of visual fields, may appear jerky and irregular. Bell phenomenon (reflex upward movement of the eyes during closure) is sometimes absent. These changes occur normally with aging.

In many elderly people, sense of smell is diminished because they have fewer olfactory neurons, have had numerous upper respiratory infections, or have chronic rhinitis. However, asymmetric loss (loss of smell in one nostril) is abnormal. Taste may be altered because the sense of smell is diminished or because patients take drugs that decrease salivation. Visual and hearing deficits may result from abnormalities in the eyes and ears rather than in nerve pathways.

Motor function

Patients can be evaluated for tremor during handshaking and other simple activities. If tremor is detected, amplitude, rhythm, distribution, frequency, and time of occurrence (at rest, with action, or with intention) are noted.

Muscle strength

Elderly people, particularly those who do not do resistance training regularly, may appear weak during routine testing. For example, during the physical examination, the clinician may easily straighten a patient's elbow despite the patient's effort to sustain a contraction. If weakness is symmetric, does not bother the patient, and has not changed the patient's function or activity level, it is likely to be clinically insignificant. Increased muscle tone, measured by flexing and extending the elbow or knee, is a normal finding in elderly people; however, jerky movements during examination and cogwheel rigidity are abnormal.

Sarcopenia (a decrease in muscle mass) is a common age-related finding. It is insignificant unless accompanied by a decline or change in function (eg, patients can no longer rise from a chair without using chair arms). Sarcopenia affects the hand muscles (eg, interosseous and thenar muscles) in particular. Weak extensor muscles of the wrist, fingers, and thumb are common among patients who use wheelchairs because compression of the upper arm against the armrest injures the radial nerve. Arm function can be tested by having patients pick up an eating utensil or touch the back of their head with both hands.

Coordination

Motor reaction time and motor coordination are tested. Reaction time often increases with age, partly because conduction of signals along peripheral nerves slows. Coordination decreases because of changes in central mechanisms, but this decrease is usually subtle and does not impair function.

Gait and posture

All components of gait should be assessed; they include initiation of walking; step length, height, symmetry, continuity, and cadence (rhythm); velocity (speed of walking); stride width; and walking posture. Sensation, musculoskeletal and motor control, and attention, which are necessary for independent, coordinated walking, must also be considered.

Normal age-related findings may include the following: Shorter steps, possibly because calf muscles are weak or because balance is poor

Reduced gait velocity in patients > 70 because steps are shorter

Increased time in double stance (when both feet are on the ground), which may be due to impaired balance or fear of falling

Reduced motion in some joints (eg, ankle plantar flexion just before the back foot lifts off, pelvic motion in the frontal and transverse planes)

Slight changes in walking posture (eg, greater downward pelvic rotation, possibly due to a combination of increased abdominal fat, abdominal muscle weakness, and tight hip flexor muscles; a slightly greater turn-out of the toes, possibly due to loss of hip internal rotation or to an attempt to increase lateral stability)

In people with a gait velocity of < 1 m/sec, mortality risk is significantly increased.

Aging has little effect on walking cadence or posture; typically, the elderly walk upright unless a disorder is present (Some Causes of Gait Dysfunction).

Some Causes of Gait Dysfunction

Overall postural control is evaluated using Romberg test (patients stand with feet together and eyes closed). Safety is paramount, and a clinician doing the Romberg test must be in position to prevent the patient from falling. With aging, postural control is often impaired, and postural sway (movement in the anteroposterior plane when patients remain stationary and upright) may increase.

Reflexes

The deep tendon reflexes are checked. Aging usually has little effect on them. However, eliciting the Achilles tendon reflex may require special techniques (eg, testing while patients kneel with their feet over the edge of a bed and with their hands clasped). A diminished or absent reflex, present in nearly half of elderly patients, may be normal. It occurs because tendon elasticity decreases and nerve conduction in the tendon's long reflex arc slows. Asymmetric Achilles tendon reflexes usually indicate a disorder (eg, sciatica).

Cortical release reflexes (known as pathologic reflexes), which include snout, sucking, and palmomental reflexes, commonly occur in elderly patients without detectable brain disorders (eg, dementia). Babinski reflex (extensor plantar response) in elderly patients is abnormal; it

indicates an upper motor neuron lesion, often cervical spondylosis with partial cord compression.

Sensation

Evaluation of sensation includes touch (using a skin prick test), cortical sensory function, temperature sense, proprioception (joint position sense), and vibration sense testing. Aging has limited effects on sensation. Many elderly patients report numbness, especially in the feet. It may result from a decrease in size of fibers in the peripheral nerves, particularly the large fibers. Nonetheless, patients with numbness should be checked for peripheral neuropathies. In many patients, no cause of numbness can be identified. Many elderly people lose vibratory sensation below the knees. It is lost because small vessels in the posterior column of the spinal cord change. However, proprioception, which is thought to use a similar pathway, is unaffected.

CARE OF GERIATRIC PATIENTS

- Consider patients preferences and their needs.
- Be kind, patient, and sympathetic towards them. Communicate with each other on a friendly level while showing respect to their feelings.
- Support their decision-making skill and encourage them for independence in making choices for themselves.
- Help adults to achieve emotional stability. On overcoming emotional blockage and expressing themselves to their loved ones.
- Stimulate mental acuity and sensory input and physical activity to uplift their mood, self-esteem, and confidence.
- Make the elders feel homely at their home. Help them stay lively and happily involved with the family members.
- Offer diversion/ occupational therapy.
- Maintain privacy. Make them feel safe and secure to openly talk about their physical and emotional needs.
- Handle them gently.
- Offer utmost comfort with the facilities you provide such as a comfortable bed, clean bed sheet, dry bed that's smooth and unwrinkled. Keep their surroundings neat, clean and fresh.
- Teach and encourage them to maintain body hygiene thus regulate body temperature.
- Assist them for taking care of their vision, auditory and dental aid.
- Prevent them from any risk of injuries, falls and accidents. Provide a much safer surrounding.
- Ensure a healthy, and nutritional meal.
- Facilitate elimination. Support them in maintaining external genitalia hygiene.
- Support them in participating in active range of motion exercise for maintaining body alignment and posture. Ensure 100% mobility.
- Help them achieve a healthy sleeping pattern.

- Caution elders from any type of drug use.
- Get them a routine physical checkup to avoid any problem.
- Closely observe any psychophysical changes in their body and behaviour.

With increasing age, the number of people living well past 80 grows in turn growing the need for those with an aging expertise. Gerontology nurses are nurses who specialize in gerontology and work in many different settings including private practices, personal homes, and nursing homes. These nurses specialise in geriatric care and geriatric medicine both to provide the older adults with specialized care and geriatric nursing and a high quality of life.

Functionally and cognitively fit elderly are physically and mentally fit to be independent and may be fit enough to even work and earn. Main concern for these elderly is the need for more health promotional activities. These include geriatric medicine, nutrition, physical activity, social contact, psychological support, and activities for the brain.

For elderly with mild functional limitations or mild cognitive impairment, assistance for living is needed. They usually fall in the age group of 70–80 years. Geriatric care in many forms like support with Meals on Wheels, special transport, need for assistance for hospital visits or support for physical rehabilitation is required for these people.

Since their healthcare needs are enormous they need special geriatric clinics where they are comprehensively assessed and rehabilitated. Other helpful aids to their betterment are physiotherapy, psychological support, and constant medical help. In case of decline in functional or cognitive status, they may need hospitalization and full time geriatric nursing.

Elderly with severe functional limitations or cognitive limitations are absolute candidates for receiving home geriatric care or hospice care. Home members need to be trained in caregiving and also it is almost essential to hire training home care providers for geriatric nursing. A need for home health care programs for these elderly with doctors, geriatric medicine specialists, nurses, physiotherapists, laboratory services, and pharmacy services at home for these elderly.

TECHNIQUES OF PHYSICAL EXAMINATION

When you perform a physical assessment, you'll use four techniques: inspection, palpation, percussion, and auscultation. Use them in sequence—unless you're performing an abdominal assessment. Palpation and percussion can alter bowel sounds, so you'd inspect, auscultate, percuss, then palpate an abdomen.

1. Inspection

Inspect each body system using vision, smell, and hearing to assess normal conditions and deviations. Assess for color, size, location, movement, texture, symmetry, odors, and sounds as you assess each body system.

2. Palpation

Palpation requires you to touch the patient with different parts of your hands, using varying degrees of pressure. Because your hands are your tools, keep your fingernails short and your hands warm. Wear gloves when palpating mucous membranes or areas in contact with body fluids. Palpate tender areas last.

Types of palpation

Light palpation

- Use this technique to feel for surface abnormalities.
- Depress the skin $\frac{1}{2}$ to $\frac{3}{4}$ inch (about 1 to 2 cm) with your finger pads, using the lightest touch possible.
- Assess for texture, tenderness, temperature, moisture, elasticity, pulsations, and masses.

Deep palpation

- Use this technique to feel internal organs and masses for size, shape, tenderness, symmetry, and mobility.
- Depress the skin $1\frac{1}{2}$ to 2 inches (about 4 to 5 cm) with firm, deep pressure.
- Use one hand on top of the other to exert firmer pressure, if needed.

3. Percussion

Percussion involves tapping your fingers or hands quickly and sharply against parts of the patient's body to help you locate organ borders, identify organ shape and position, and determine if an organ is solid or filled with fluid or gas.

Types of percussion

Direct percussion

This technique reveals tenderness; it's commonly used to assess an adult's sinuses.

- Using one or two fingers, tap directly on the body part.
- Ask the patient to tell you which areas are painful, and watch his face for signs of discomfort.

Indirect percussion

This technique elicits sounds that give clues to the makeup of the underlying tissue. Here's how to do it:

- Press the distal part of the middle finger of your nondominant hand firmly on the body part.

- Keep the rest of your hands off the body surface.
- Flex the wrist of your nondominant hand.
- Using the middle finger of your dominant hand, tap quickly and directly over the point where your other middle finger touches the patient's skin.
- Listen to the sounds produced.

4. Auscultation

Auscultation involves listening for various lung, heart, and bowel sounds with a stethoscope.

Getting ready

- Provide a quiet environment.
- Make sure the area to be auscultated is exposed (a gown or bed linens can interfere with sounds.)
- Warm the stethoscope head in your hand.
- Close your eyes to help focus your attention.

How to auscultate

- Use the diaphragm to pick up high-pitched sounds, such as first (S1) and second (S2) heart sounds. Hold the diaphragm firmly against the patient's skin, using enough pressure to leave a slight ring on the skin afterward.
- Use the bell to pick up low-pitched sounds, such as third (S3) and fourth (S4) heart sounds. Hold the bell lightly against the patient's skin, just hard enough to form a seal. Holding the bell too firmly causes the skin to act as a diaphragm, obliterating low-pitched sounds.
- Listen to and try to identify the characteristics of one sound at a time.

STAGES OF LEARNING AND THINKING ABILITY AMONG INFANTS AND CHILDRENS

What are children capable of learning at various stages in their development? How do children develop their intellectual skills to react and interact with their environment? How do these cognitive abilities develop, and in what order? These were some of the questions that were answered by French psychologist Jean Piaget in 1952 when he published his groundbreaking theory on cognitive development in children. Piaget began his research simply interested in how children react to their environments, but his observations countered the current thinking of the day (which said that children have no cognition until they are old enough to learn to speak), and have, in fact, become the most well-known and influential theory of cognitive development to date.

Here are the four stages of cognitive development as identified by Jean Piaget:

Sensorimotor Stage: Birth through about 2 years. During this stage of cognitive development, children learn about the world through their senses and the manipulation of objects.

Preoperational Stage: Ages 2 through 7. During this stage, children develop memory and imagination. They are also able to understand things symbolically and to understand the ideas of the past and future.

Concrete Operational Stage: Ages 7 through 11. During this stage, children become more aware of external events, as well as feelings other than their own. They become less egocentric and begin to understand that not everyone shares their thoughts, beliefs, or feelings.

Formal Operational Stage: Ages 11 and older. During this stage, children are able to use logic to solve problems, view the world around them, and plan for the future.

IMPORTANCE OF NUTRITION

Proper infant nutrition is fundamental to a child's continued health, from birth through adulthood. Correct feeding in the first three years of life is particularly important due to its role in lowering morbidity and mortality, reducing the risk of chronic disease throughout their life span, and promoting regular mental and physical development. Although every infant and child has the right to good nutrition under the Convention on the Rights of the Child, in many countries less than a fourth of infants have access to the required dietary diversity and feeding frequency. Inappropriate feeding practices contribute up to a third of all cases of child malnutrition. This is compounded by the proliferation of processed foods like infant formula and products rich in salt, free sugars and trans fats. This causes an increase in poor diets, obesity and a marked reduction in the number of mothers breastfeeding their babies. Breastfeeding has been shown to be of critical importance to a child's development, including increased IQ, school performance and higher income in adult life.

Getting children to eat healthy foods can sometimes feel like fighting an uphill battle. The leafier and greener the food, the greater the struggle. Child nutrition is incredibly important, however. Don't cave in and let them eat nothing but fast food and sweets. It's worth the struggle.

Why is child nutrition important?

Nutrition is important at every age. Your children need proper nutrients stay healthy and strong, and grow up healthy and strong. Nutrition for children can also help establish a foundation for healthy eating habits and nutritional knowledge that your child can apply throughout life.

What nutrients do children need?

An easy way to ensure that children get the nutrients they need is by choosing healthy foods for them to eat.

Choose lean protein from sources such as poultry, beans, seafood, nuts and seeds.

Eat fresh, canned, or frozen fruits and vegetables every day. Look for canned and frozen options without added fats or sugars. Fruits should be in 100% juice or water.

Choose whole grain foods such as breads, cereals, and pastas that are high in fiber.

Look for low fat dairy such as milk, cheese, and yogurt for adults and kids in your family. Babies should not have dairy products till they're one year old. The American Academy of Pediatrics recommends whole milk for babies 12 to 24 months, unless your infant is gaining too much weight. Ask your doctor if you're not sure.

It's also important to limit added and refined sugars, refined grains, sodium, trans, fats, saturated fats, and foods that are low in nutrients.

Dietary Guidelines for Americans 2015-2020 can help you determine the amount of nutrients and calories your child needs each day.

Tips for child nutrition

Teach the importance of good nutrition, and help your children establish healthy eating habits. The more your child understands about nutrition, the more excited he will be about eating healthy.

NEEDS OF CHILDRENS

Children are humans and have human needs. They also have additional needs unique to their particular situation. It is a profound responsibility of parents and carers to provide for these needs.

Basic needs

Food and shelter

Children cannot acquire their own food or sustain any reasonable shelter. The initial responsibility of their parents or carers is this to provide a roof over their heads and food in their stomachs.

Physical safety

Children cannot protect themselves from aggressive adults (and other, stronger, children). They thus need others to provide physical safety, keeping them from harm and defending them when they are threatened or attacked.

Emotional security

As their minds are developing, there is much that children do not understand and even the most innocent situations can be deeply distressing.

Developmental needs

Beyond the basic needs, in order to become functioning members of society, children need support in developing and learning important and useful skills.

Social skills

Children develop into people who must live and work with others. For this they need to learn the rules of society. They need to be able to communicate their ideas and desires. They need to persuade and change minds.

Career abilities

To become functioning adults, children need to learn all kinds of things, both at school and outside -- many abilities that are useful in developing careers are not taught at school.

This can be very much an exploratory activity as children discover their talents and the things that motivate them (unsurprisingly, these often overlap).

Internal skills

Children also need to learn to be happy in themselves and to cope with the difficulties and traumas of life. They thus need to learn self-confidence and emotional maturity.

Unit-4 Prevention and Control of Infection in Home Setting

Learning outcome

- ✓ Describe the diseases causes by microorganism
- ✓ Demonstrate the knowledge of common human diseases and their causal agents
- ✓ Demonstrate the knowledge of process of disinfection
- ✓ Demonstrate the knowledge of care of articles
- ✓ Provide assistance in disinfection

Unit at a glance

- ❖ Definition of disease
- ❖ Process of infection
- ❖ Pathogen
- ❖ Three vertices of the epidemiological triangle
- ❖ Differentiate between different types of microorganisms
- ❖ Common diseases
- ❖ Enlist the names of bacteria and viruses causing diseases in human
- ❖ Types of disinfection
- ❖ Differentiate between concurrent and terminal disinfection 3. Process of fumigation with sulphur
- ❖ Importance of care of rubber goods.
- ❖ Procedure to undo the contaminated gloves
- ❖ Procedure of removing different kinds of stains
- ❖ Ways of care of syringes and needles
- ❖ Cleaning techniques of different areas of hospital
- ❖ Various cleaning techniques used

INTRODUCTION

The principles of best practice in infection control are based on extensive research, and should be adopted in order to help prevent avoidable infections and to control existing ones. Infection control is especially important within healthcare settings, where the risk of infection to patients is greatly increased. An understanding of the infection process should lead to appropriate actions which help to protect patients, and healthcare workers themselves. Good infection control techniques adopted

during patient care can assist greatly in preventing or reducing avoidable hospital-acquired infections. There are important public health issues in the prevention and control of infection, including the general health and nutritional status of the public, and their living conditions, such as housing, water and sanitation facilities. These influence the level of infectious disease in the community, which in turn affects the level of infection of those both in and outside of hospitals, thus affecting the burden on healthcare facilities. Local infection control policy manuals should be produced within individual settings in order to give guidance to staff on the implementation of important measures and procedures. In addition, national and local regulations or guidance should be clearly documented and followed where appropriate. If guidance is not followed, there may be an increased risk of cross infection of both patients and staff.

DESCRIBE THE DISEASE CAUSED BY MICROORGANISM:

Microbiology

Cycle of infection

To begin to understand why we must undertake infection control measures we must first consider aspects of microbiology. Microbiology is broadly described as the study of bacteria, fungi, protozoa, viruses, and helminths. We share our world, including our bodies, with millions of microscopic organisms and we need to understand how best we can live with them. In studying these groups of organisms, including their many subgroups and families, we can learn how:

- they live within us;
- they live in our environment;
- they can cause harm; and
- we can treat infections caused by them.

Within healthcare settings, many microorganisms have the perfect living and breeding conditions, due to the numbers of susceptible patients gathered in an ideal environment. For examples of common microorganisms found in healthcare settings

CYCLE OF INFECTION:

The term cycle of infection is used to describe the processes leading to patients acquiring infection within healthcare settings. Knowledge of this cycle is essential in order to understand how infection can occur. All precautions and measures taken in order to prevent and control infection are based on the interruption of this cycle.

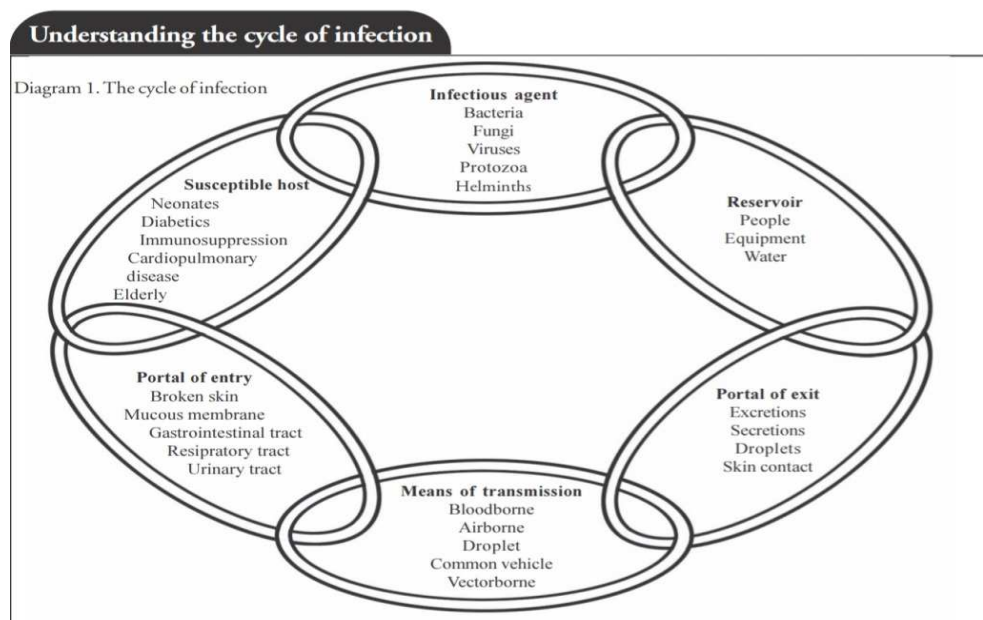


Diagram 1. The cycle of infection

Portals of entry are the same as the portals of exit and are either natural or artificial.

Means of transmission:

1. *Bloodborne*: through sexual transmission, injury or inoculation. The main concerns in healthcare settings are the transmission of HIV, Hepatitis B and C through sharp injuries or blood splashes.

2. *Airborne*: through inhalation of small particles that remain suspended in the air for long periods of time and can be widely dispersed by air currents.

3. *Droplet*: also through inhalation. Droplet transmission differs as the particles are larger and therefore do not remain suspended in the air. Spread is therefore through close contact with infected persons who may be sneezing, coughing, talking, or undergoing airway procedures such as intubation or bronchoscopy.

4. *Contact*: through direct or indirect contact. Direct is the transfer of organisms by contact with contaminated hands. Indirect is the transfer of organisms through fomites 5. *Common vehicle*: through food, water, drugs, blood or other solutions

6. *Vectorborne*: usually through arthropods such as mosquitoes and ticks but cockroaches, ants and flies can also transmit infection. (Note: certain organisms can be transmitted through more than one of the above routes. Examples of organisms that can be spread by all of these routes are found in Appendix

Reservoir: where microorganisms can be found. Within healthcare settings this may include:

1. The environment e.g. dust, bedding, equipment, furniture, sinks or washbowls, bedpans, surfaces)
2. Humans, including patients, staff and visitors, especially from hands.

Susceptible host: Factors that affect the body's natural ability to fight infection include:

1. Presence of underlying disease (diabetes)
 2. Immunocompromised status (HIV, chemotherapy treatment)
 3. Nutritional status
 4. Age (the very young and the very old)
- Portals of exit are required for microorganisms to be transmitted from human sources. Portals of exit within healthcare settings include: intravenous lines, urinary catheters, wound sites, open skin lesions, invasive devices, the respiratory system, skin, and mucous membranes.

Essential measures should be taken to help prevent and control this cycle of infection, including limiting sources, preventing the routes of transmission, minimising portals of entry, and protecting susceptible patients. If measures are not taken, patients and staff may be exposed unnecessarily to pathogenic microorganisms.

INTRODUCTION OF DISINFECTION OF ARTICLES:

In this session, you will learn about the types of disinfection, fumigation with sulphur and, management of isolation unit. You will also study good housekeeping practices and purpose of cleaning.

Concurrent Disinfection

Concurrent disinfection means the immediate disinfection of all contaminated articles and bodily discharge during the course of the disease. It includes the following:

1. Cleaning the isolation unit daily, including the floor, using an effective disinfectant.
2. Disinfection of all articles, including the soiled linen, contaminated articles, etc. before they are sent out of the unit.
3. Disposal of all wastes by incineration.
4. Safe disposal of excreta.

The stool and urine in enteric isolation should be mixed with equal quantity of freshly prepared lime (1 part of lime to 4 parts of water) and allowed to stand for 2 to 4 hours. Then it is dispensed by burial. The stools can be burned after mixing it with saw dust. In hospital practice, however, the septic tanks are in use and they are the best means of the disposal of excreta. No stool with any disinfectant should be discarded in a septic tank because the disinfectant will hinder the natural biological action. The sputum can be collected in a sputum cup with a lid. The containers need to contain either water or disinfectant lotion so that the sputum will not stick to the sides. When the container is full, it needs to be boiled or burned.

Terminal Disinfection

The terminal disinfection is the disinfection of the client's unit with all the articles used on discharge, transfer or death of a client who had been suffering from an infectious disease. Fumigation is often used for this purpose. The commonly used agents are sulphur and formalin. The doors and windows, including all crevices, are closed prior to fumigation.

Fumigation with Sulphur

The room should be filled with steam by boiling a kettle of water in the room as the sulphur fumes act better on a damp surface. A small room of 100 placed in an earthenware which stands in a large oven containing water. A little methylated spirit is poured over the sulphur to ensure burning the sulphur completely. Lit fire to the sulphur and close the door. The room

is opened after 24 hours.

The effectiveness of this method depends upon several factors, such as gas concentration, temperature of the room, exposure time and humidity. All articles should be kept open for thorough penetration by the sulphur fumes.

Management of the Isolation Unit

A unit that is set up for the isolation of clients needs to have the following equipment:

1. Hand washing facilities – skin, water tap, soap, brush, etc.
2. Paper napkins.
3. One table should be kept to place necessary supplies for the care of the client e.g. thermometer, dressing trays, etc.
4. Toilet facilities for the client – water closet, bathing facilities, etc.
5. Garbage receptacle with paper lining.
6. Personal articles for toilet, food serving, etc.
7. An area outside the client's room for keeping clean supplies e.g. Gloves, Gowns, Masks etc.
8. Vessels for disinfection of articles with disinfection solution.
9. Door cards stating "ISOLATION" on the door.

The GDA before entering the room, washes his/her hands, puts on clean gowns and mask and enters the room. He/she then closes the door and attends to the client. She makes use of all medical aseptic practices to prevent the spread of infection. After attending to the client's needs he/she leaves the room, closes the door, removes the gown and mask and discard them in the containers with the disinfectant lotion. He/she then washes his/her hands thoroughly.

Good Housekeeping

The housekeeping department has the function of keeping the hospital clean. A well – managed housekeeping department can reduce the cost of hospital operation considerably. For the smooth functioning of the housekeeping department, the cooperation of all the hospital staff is necessary. If the hospital housekeeping is of poor quality, nursing care suffers, efficiency is lowered and the morale of the staff and patient is lowered. In many hospitals, the housekeeping responsibility is vested with the head nurse, while in others it is delegated to the housekeeping department, which is managed by a Housekeeper. Sometimes this responsibility is shared by both. The person who is responsible for the

hospital housekeeping must have an interest in housekeeping and give a considerable place in the nursing service. He/she must possess high standards of workmanship and good organizing ability. To be successful, she must have an interest in the people, an appreciation of the fundamental worth of mental task and an ability to direct and supervise people.

Cleanliness and Orderliness

Clean equipment, clean linen, clean floors and walls are relatively free from pathogenic organisms. Principles of good housekeeping and the best methods of caring for the equipment and physical environment of the client including the floors, furnishings, painted surfaces and sinks should be implemented thoroughly. Cleanliness and orderliness go hand in hand. Where there is order there is peace and harmony. One can imagine the disorder created in the hospital ward by the equipment scattered here and there, the rubbish thrown on the floor, the soiled linen piled up in the corridors or in the corners of the ward. On the other hand, if the beds neatly made, furniture in line, equipment clean and in order and conveniently placed it will create an attractive surrounding and clean environment. An attractive surrounding creates confidence in the clients and visitors and increase the morale among the workers.

Purpose of Cleaning

- To leave a clean polished surface wherever possible, so that dirt may not be accumulated.
- To remove all dust, dirt and breeding places of microorganisms with least disturbance to the client.
- To prolong the life of articles.
- To keep the articles in such a condition that they are ready for use at any time.
- To maintain the aesthetic factors.

CARE OF ARTICLE:

In this session, you will learn about care of various rubber based articles, ward articles and instruments used in a hospital. You will also study the procedures of removing different kind of stains.

Care of Rubber Goods

The rubber goods in common use are air cushions, mackintoshes, hot water bottles, ice caps, ice collars, rubber tubes catheters, rectal tubes, gloves and rubber beds. The GDA should

make all efforts to prolong the life of the rubber goods. Natural and synthetic rubbers deteriorate with age, exposure to heat, light, moisture and by chemicals. They should not be creased or folded, never use any pins to fix rubber goods in any place. Never expose them to sunlight. Boiling water ruins rubber. Rubber goods should never be dried by artificial heat, nor by contact with a radiator or stove. They should be free from grease and acids. These should not come in contact with metal goods. Any fluid split on them should be wiped off immediately. When storing, care must be taken so that no two surfaces come in contact with each other. They should not be pressed out of shape by any weight. They should not be tied in knots. They should not be hung on hooks or nails. If boiling process is used, put them in boiling water. If autoclaving is used, short period of exposure is recommended (10 to 15 min) with less pressure.

Cleaning of Rubber Mackintosh

1. Spread the mackintosh on a table or a flat surface and wet it with cold water.
2. Rub the upper surface with soap and water using a clean cloth or towel.
3. Turn the other side and repeat the process as above.
4. Wash both surfaces under running water.
5. If stains are present, care should be taken to remove them by appropriate methods.
6. For disinfection, use Lysol or Dettol 1 : 40.
7. Hang them on a horizontal cylindrical pole in shade to dry. Spread them without wrinkles.
8. When both surfaces are absolutely dry, powder them lightly with French chalk powder.
9. Store them either flat or rolled and never folded, taking care to see that two mackintosh surfaces do not lie together, but are separated by old linen or paper. Store them in a dark cool place in airtight containers, whenever possible.

Care of Rubber Gloves

1. The wearer of the gloves should wash them on their hands just before they are removed to prevent adherence of blood and other organic materials.
2. After removing from the hands, they are washed with soap and cold water, first on the outside, then invert and repeat on the inside.

3. Rinse well with water both inside and outside as described above.
4. Holes and tears are discovered by submerging the glove filled with air in the water. If there are holes the bubbles will pass up through the water.
5. Hang them to dry. When the outside is dried, turn inside out and dry.
6. When both sides are dried. They are powdered inside and outside and packed in pairs of the same size, right and left gloves in glove wrapper. A small lump of gloves powder in a gauze mesh for powdering the hands is kept in the cuff of the gloves.
7. Steam under pressure is the best method of sterilizing gloves. The pressure is kept minimum to prevent melting of the gloves.

Care of the Rubber tubes

Catheters vary in size and quality according to the special need. Sizes of the catheters are marked on it either in French or English scales.

1. After use wash rubber tubes under running water, holding the eye end upwards and allowing the water to run through
2. A small quantity of organic matter may be lodged at the eye end. Remove them using a swab stick.
3. Clean them with soap and warm water to remove the dirt and grease.
4. Wash them again under running water.
5. Boil the tubes for 5 min by putting them in the boiling water. Dry them by hanging.
6. When dried, powder and store them in airtight containers.
7. Reboil or autoclave them before use.

Rubber tubing used for the parenteral therapy requires special attention. It must be washed by forcing detergent solution through it first then by water and finally by distilled water. Infusion solution flowing through new rubber tubing, have been found to contain products from the rubber that are toxic to the client. To correct the toxic factor, the tubing's are boiled in 10% soda bicarb solution for 30 min. It is essential that the soda bicarb should be thoroughly removed from the tubing before it is used for the client. Rubber tubing used for the blood transfusion should be rinsed immediately after use. It is recommended that the tubing which contained blood should never be used again for any kind of intravenous infusions since they cannot be cleaned properly. It is better to use disposable type of tubes which are available in the market. Certain catheters e.g.

ureteric catheters which are easily destroyed by heat and moisture are disinfected using formalin tablets. Hard rubber tips used in cleaning and medicating the body cavities (e.g. douche nozzle) also need special care. They are moulded into special shapes. It is essential that the original shapes of the tips be maintained. Heat softens the rubber, reduces the curved up to a straight tip and roughens the polished surface. For these reasons such instruments are disinfected with chemicals.

Cleaning of the Air cushion, Rubber Beds, Hot water bottles, Ice caps and Ice collars

To clean the air cushion and airbeds, do not pour water into them. It is sufficient to clean the outside. During cleaning it should not be filled with air, because while rubbing there is a tendency to exert pressure on the seams at the sides of the articles and they may crack. The valves of the air cushions or beds should never be immersed in water as it spoils them, and is one of the reasons why they get out of order. Cleaning and storing are done like other rubber goods except that they should be slightly inflated to prevent the two surfaces to come in contact with each other. In case of hot water bottles, ice caps and ice collars, empty the contents immediately after use. Wash and dry as in the case of other rubber goods. Hang the bags upside down to drain the water. The ice bags, which cannot be hung, are dried with a piece of cloth. When the bags are completely dried inflate them with air. The covers of the air cushion, ice bags and ice collars are disinfected and sent to the laundry for washing.

Care of Enamelware

The articles commonly used are bedpans, urinals, kidney trays, sputum cups, feeding cups and trays. The polishing on the enamelware gets eroded by heat, mercuric salt, acids, alkalis and by chemicals. They are subject to chipping if dropped on the floor or handled carelessly. Scraping with sharp instruments also result in chipping.

Care of Bedpans

1. Before Emptying the bedpan, inspect the contents. If there are cotton spongesanitary pads thrown into bedpans, they are removed by using forceps kept for that purpose only.

2. Empty the bedpan into a lavatory pan. Care should be taken to avoid soiling the sides of the basin.

3. Rinse the bedpan with cold water under force. Wash with soap and warm water using a brush. Vim may also be used to remove the stains. Rinse it well.

4. To disinfect the bedpans, soak them in Lysol 1:40 for 1 hour or they are sterilized in bedpan sterilizers. Bedpans may be placed in direct sunlight for few hours to deodorize and to disinfect.

Care of Urinals

The urinal should not be left standing for a long time with urine because a deposit will form on the inside, which is almost impossible to remove. Cleaning and disinfection are done in the same way as for the bedpans.

Care of Kidney Trays

Kidney trays are treated in the same way as the bedpans.

Care of Sputum Cups

Non-infectious sputum may be emptied into the lavatory pan. Care should be taken not to soil the sides of the pan. Infectious sputum (e.g. the sputum of a tuberculosis client) should be rendered harmless by boiling or disinfection by chemicals or it may be disposed by burning. Cleaning and disinfection of the sputum cup is done as for the bedpans. Before the sputum cups are given to the client, add a small quantity of antiseptic lotion, main purpose of which is to prevent the sputum sticking to the sides.

Care of Sharp Instruments

The knives and scissors are the most commonly used sharp instruments. The sharp instruments are sterilized by hot air sterilizer, exposing them to a temperature of 160. Disinfection can be done by submerging them fully under pure Dettol or other disinfectants which are not corrosive. The effect of any chemical disinfectant should be carefully investigated before it is used.

Care of Other Instruments

A wide variety of instruments are used in the operation theatre which may be dangerously contaminated. The soiled instruments may be unhinged (opened) with gloved hands and dropped into a basin or bucket. Rinse the instruments thoroughly with cold water to remove the blood and other organic matter. Clean the instruments with sodium carbonate (to make 2% solution) and hot water. All instruments should be examined for cleanliness and orderliness before they are sent to sterilization.

Those instruments which are not clean should be treated separately. Abrasives and soaps tend to remove the protective film of corrosion resistant metal put on by the manufacturer and their removal shortens the life of the instruments. Steam under pressure should be used to sterilize instruments whenever possible. When the steam under pressure is not available, boiling water is the best agency for sterilizing instruments. The longer the boiling period, the greater is the probability of all organisms to be killed. Remember the rules for boiling.

Care of Glassware

When buying glassware, it is important to select a hard glass that is resistant to heat and mechanical shock. To facilitate cleaning, the glassware should have a hard smooth surface. Ground glass is very susceptible to erosion by water or steam. Therefore, it should be sterilized with dry heat. Abrasives of all sorts are to be avoided in cleaning glass as they cause streaking. Immediate rinsing under cold running water to remove organic matter from the glass articles is essential in prolonging their usefulness, lest they dry on the glass and can be removed with difficulty. Rinsing with force is preferred in cleaning glass. Glassware used for the parenteral therapy should be rinsed with freshly distilled water. If the distilled water leaves an unbroken film on the glass surface, it shows that the glass is clean. If any grease is present, the film will be broken and droplets will form. When sterilizing glass containers, they are to be kept inverted in the autoclave. If they are kept in penetration of all surfaces, a small amount of distilled water in the vessel will force out the air. When the glass goods are sent for boiling or autoclaving, they should be adequately padded to prevent breaking by rubbing with hard surfaces.

Care of Syringes and Needles

Syringes make an expensive and common item of the glassware used in the hospital. Rinsing immediately after use is important to prevent the pistons sticking to the barrels, thus prolonging the life of syringes. Stuck syringes may be placed in 25% aqueous solution of glycerine and boiled for 10 minutes or soaked in weak solution of nitric acid to separate the parts. If the needle is stuck to the hub of the syringes, immersing it in the boiling water will make the metal expand and separate them. Some syringes are interchangeable. Others will have same number on the barrel and the piston, in order that they can be easily matched. When cleaning and sterilizing syringes, the barrels and pistons of the same number should be kept together to avoid wasting time later in matching the parts.

Sterilization by hot air is the best method of sterilization for glass syringes, if the glass has the same expansion coefficient. The syringe may be placed in the hot air sterilizer with the piston in place. Steam or chemical sterilization is with the piston in place. Steam or chemical sterilization is more effective, if the parts are separated, because the contact with the sterilizing agent is more complete. If the syringes are boiled in distilled water, silicate is taken from the glass and it results in a slow deterioration of the syringes. Never put glass in boiling water. Put the glassware in cold water and bring to the boiling point. In sterilizing aseptic syringes, remove the rubber bulb from the glass barrel. This facilitates the penetration of the sterilizing agent and keeps the rubber from sticking to the glass, as it is very likely to do so when it is very hot. The bulb and the glass portion should be wrapped in the same package to avoid the loss of one part. No instrument requires more meticulous attention than the needles. The bore is so fine that it becomes blocked badly unless cleaned each time it is used. The points of the needles are so delicate that the slightest contact with a hard surface may bend them backwards and produce a "hook". The important points to remember are as follows: 1. After use, cold water is forced through the needle with a syringe followed by a detergent solution.

2. Again wash it with warm water.

3. Examine the point a magnifying glass or by drawing the point over the skin to discover the "hooks". If hooks are present is corrected in a sharpening device. Take care to preserve the bevel.

4. If the needles are blocked, wire stillets are used to remove them.
5. Needles are sterilized by boiling them for 10 to 20 min or by dry heat at a high temperature or by autoclaving.
6. Chemical disinfection is unsatisfactory, because it is difficult to remove the chemical from the bore of the needle completely. Suture needles are treated in the manner described for other sharp instruments.

Care of Stainless Steel Goods

Stainless steel utensils are suitable for almost every other purpose, because they are easily cleaned, heat resistant and unbreakable. When storing these utensils it is to be kept dry lest the water on them leaves a mark.

Care of Crockery's and Cutleries

The Crockery's and cutleries, used for the clients need special attention. They should be rinsed in cold water and then washed with soap and warm water. Disinfect them by boiling, store them after drying.

Care of Linen

Care of linen is important as it is an expensive item, in the running of a hospital. It costs much to buy and much to launder it. Spoiling and wastage of linen will be avoided if the following rules are observed:

The linen cupboard should be kept in perfect order, with different items stocked separately and labelled to prevent confusion and loss of item.

2. The cupboard should be locked when not in use.
3. Care should be taken to avoid linen being taken home by the clients on their discharge
4. Stocks should be checked at regular intervals, the inventory properly kept and losses reported promptly.
5. All items should be used for the purpose for which they were made.
6. Torn linen should not be used on the bed but sent for mending.
7. Soiled linen should not be placed on the floor.

8. Damp linen should be dried. If they are not immediately washed, lest it becomes mildewed.
9. If soiled with urine or motion, these should be rinsed with cold water first to remove the stain.
10. If there are stains remove them by using an appropriate stain remover.
11. The linen used for an infectious client, should be disinfected first before they are sent to the laundry.
12. Use of mackintosh, wherever it is necessary can economize the use of linen.

General Instructions for Removal of Stains from Linen

1. Note the kind and the colour of the material stained. The nature of the stain and select the correct stain removed and follow an appropriate method.
2. Try the simplest method first.
3. Remove stains as soon as possible
4. Try first whether stains can be removed with cold water.
5. For coloured material, always test the remover first on a small part.
6. The stains which contain protein, such as blood, excreta, milk, pus from the wound, etc, are coagulated by the application of heat. So for all stains of this nature, the articles should be soaked in cold water for sometime to remove the stains.
7. If the stains contain fatty material, hot water and soap should be used.
8. Any stains of medicine may be treated by water or methylated spirit, as many drugs are soluble in spirit and some other in plain water.
9. The application of some absorptive material, such as salt, starch or borax will prevent any liquid from spreading and thus reduce the ultimate damage to the material.
10. When the stains do not respond to the simple methods, bleaching agents may be used such as lemon juice, hydrogen peroxide and bleaching powder. When bleaching powder is used, make it into a solution and apply a weak solution first on the stained area and then gradually increase the strength of the solution. Bleaching agents are destructive to linen and discolor the coloured material.
11. When using boiling water for removal, stretch the stained part over a bowl and pour the boiling water with force until the stain disappears.
12. When using an acid, stretch the part over a bowl of boiling water and apply acid by means

of a medicine dropper, applying the acid. When the stain disappears, rinse the cloth thoroughly in cold water.

13. When bleaching by the sunlight wet the stained area and lay it in the sunlight.

14. Use equal parts of hydrogen peroxide and dilute ammonia and moisten the stain until it disappears. This is particularly useful in case of woollen articles.

15. Strong chemicals are used only as a last resort because of the injurious effect caused by them.

1. Cleaning Blood Stains Soak immediately in cold water. Hot water coagulates and leaves a mark. When the stains disappear, wash them in warm soapy water. If it is an old blood stain, soak it in a mixture of hydrogen peroxide and ammonia for several hours and then wash it in cold water and then with soap and warm water. For the thick blood stains on the mattress, apply a thick paste of starch and water, and allow standing in the sun. When the paste is dry and discoloured, brush off the stain.

2. Cleaning Tea and Coffee Stains Linen, as soon as it is stained with tea, coffee and cocoa, remove it by pouring milk over it. Washing them in cold water or washing them in hot water and sodium carbonate will remove the stain. If not completely gone, lemon juice may be rubbed or hydrogen peroxide may be applied.

3. Cleaning Aniline Dyes, Gention Violet, Methylene Blue Stains Wet the cloth and bleach them in the sunlight. Chlorine water bleaches the dyes. If chlorine water is used, rinse the bleach thoroughly with warm water after the stain disappears.

DISINFECTION OF THE WARDS:

In this session you will learn about disinfection procedures, cleaning levels, cleaning frequencies and cleaning agents. You will also study about chemical disinfectants used for various cleaning techniques in the hospital.

Transmission of healthcare associated

pathogens most frequently occurs via the hands of healthcare workers, who inadvertently contaminate their hands during various patient care activities. Less frequently, contaminated surfaces in healthcare facilities may contribute to the spread of healthcare-associated pathogens. Contaminated surfaces can act as sources from which healthcare workers contaminate their hands, and in some instances, patients acquire pathogens following direct

contact with contaminated equipment or other surfaces. Providing patients with a safe environment of care requires a high level of compliance with recommended hand hygiene policies and appropriate cleaning and disinfection of medical equipment and environmental surfaces. Patients colonized or infected with healthcare-associated pathogens frequently contaminate items in their immediate vicinity with pathogens that may remain viable on surfaces for days to weeks. Healthcare workers can contaminate their hands by touching contaminated surfaces, and can transmit pathogens if hands are not cleansed appropriately. Routine cleaning of patient rooms is often suboptimal. Improved cleaning/disinfection of the environment can reduce the risk of patients acquiring multidrug-resistant pathogens. Monitoring the effectiveness of hospital housekeeping procedures is needed to assure that surface contamination is reduced to a minimum. Patients, staff, and visitors entering healthcare facilities carry with them bacteria, viruses, and other microbes. Because of this, cleaning and disinfecting are some of the most important steps in preventing the acquisition and spread of infectious disease in healthcare facilities. General cleaning involves dirt and dust removal using detergents, scouring powders, toilet bowl, and glass cleaners. This aspect of hospital cleaning is similar to that of an office building or hotel.

In some areas of the hospital, the use of disinfectants is necessary to reduce the risk of infection. Disinfection is generally defined as reducing the number of microbes on a surface to very low levels. Reducing microbial levels involves the use of chemicals, which are considered pesticides and vary in degree of toxicity. Disinfectants, are designed to be toxic, contain chemicals that are corrosive, irritants, and potentially carcinogenic. They are used to kill microbes and achieve an appropriate level of cleanliness. Implementing best management practices will encourage the use of justified amount of disinfectant necessary to do the job, thereby reducing worker and environmental exposure. Ultimately, incorporating best management practices for use of disinfectants protects patients, employees, and the environment.

Right Level of Clean

Different levels of cleanliness are needed for different activities. They are as follows:

1. Surface Cleaning: General surface cleaning physically removes all visible dirt, organic matter, and bacteria. It is normally accomplished with water, mechanical action like scrubbing, and detergents. Surface cleaning should always be followed by disinfecting and

sterilizing. If organic matter is not first removed it can inactivate disinfectants.

2. Disinfectant Wipes: Often disinfectant wipes dry before adequate contact time is achieved. They are also often used in applications where they are not needed, adding expense and pollution. A reusable wet cloth with the appropriate disinfectant applied for the recommended contact time is less expensive and more efficacious option.

3. Disinfecting: Disinfection reduces the risk of infection from microbial contamination. It is done to reduce the chance of infecting patients and others. Disinfecting is necessary for surfaces or equipment that may contact broken skin or mucous membranes. High-level disinfection is required for semi-invasive medical procedures like endoscopy. Lower levels of disinfection are used on high touch surfaces in surgery wards and kennels.

4. Sterilizing: Sterilization eliminates or destroys bacteria and viruses. Sterilization is accomplished with hot steam and pressure, toxic gases such as ethylene oxide, or hydrogen peroxide.

Cleaning Frequencies

Ideally, cleaning all areas should be done as soon as dirt becomes obvious. Therefore, hospital policy for cleaning should be laid down very clearly in the hospital manuals. Areas, such as OT and ICUs should be cleaned more often. The washing of walls and ceilings should be infrequent, not more often than once a month or two. However, where walls were splashed with blood or other organic material, the soiled patches should be washed as soon as possible.

Cleaning Agents

A cleaning agent should assist the removal of dirt from a surface without harming the user or damage the surface. The following cleaning agents are suggested for use in the hospital:

- An anionic liquid detergent is found to be most suitable for floors, ceilings, walls, work surfaces and baths;
- Scouring powder for cleaning sinks, baths, showers and lavatories;
- The presence of disinfectant does not increase the cleaning power of the product; and
- Chemical disinfectants are useful only on clean surfaces, therefore, the floor should be first cleaned with detergent and then disinfected.

Chemical Disinfectants

They are recommended for disinfection of baths after cleaning, disinfection of kitchen work surface after cleaning, disinfection of floors and work surfaces in OTs, special care units, high-risk areas during or after cleaning on some occasions and disinfection of floors after spillages.

Cleaning Techniques

1. *Floors*: In a busy ward, recontamination from airborne settlement or transfer from shoes and trolley wheels is very rapid. Levels of bacterial contamination on floors are usually restored to their original level within two hours of cleaning; whether disinfectants are used or not. Disinfectants should only be used on a clean surface. However, mops should be disinfected after use in the rooms of infected patients and also before use in rooms occupied by immunosuppressed patients. A neglected dry mop will redistribute microbes, which have been picked up. A neglected wet mop will grow pseudomonas on it, which will get distributed while cleaning.

2. *Carpet Care*: Usually bacteria have been found to be present in large numbers on the carpets and survive longer than on hard floors. Carpets should be first tested with the commonly used disinfectants to see their damaging capacity. Chlorine releasing agents could be used to clean blood spillage, but it damages most carpets. Therefore, peroxygen powder could be used as a substitute. In offices and administrative areas carpets could be maintained with a daily vacuuming and shampooing once a week.

3. *Walls and Ceilings*: It should be carried out sufficiently often to prevent the accumulation of visible dirt, but intervals between cleaning should not exceed 12- 24 months in patient care areas or 6 months in operating theaters.

4. *Bathroom and Lavatory Cleaning*: Sufficient amount of disinfectant solution should be sprayed on to the bathroom fixtures and surfaces and be allowed to remain for a period of maximum disinfection. The cleaning and flushing of toilet is enough to keep the microbes' level to the minimum. Brushes should be rinsed with water and shaken into the pan and stored dry. Baths could be a source of cross infection, therefore use of scouring powder or a liquid detergent (preferably anionic with hypochlorite solution) for thorough cleaning after

use. Daily use of bowl cleaners is not needed as they are acid and need to be handled carefully by an expert. It was more cost effective and safer to use a disinfectant detergent to clean toilet on a daily basis, saving the bowl cleaners for use on mineral deposits only.

5. *Ancillary areas*: This includes offices, solarium and waiting room. In a general sense, the same rule of cleaning is applied here also but in a much rigorous way with a lesser frequency. The objective is to provide a clean and safe environment.

6. *Corridors and Stairwells*: Two important things to be obeyed while working on stairwells and corridors were- first to use wet floor signs if the floor is wet and second, to mop only one-half of a corridor or stairwell at a time to avoid accidents.

7. *Kitchen Work Surface*: All disinfectants get inactivated to some extent by food, particularly proteins. A two-step process of cleaning with a detergent and then with disinfectant obtains the best results.

SURGICAL ASEPSIS:

You will learn about different methods of transmission of infection and asepsis practices. You will also study the method of opening a sterile wrapped package and use of gloves, gown and face masks.

Cross Infection

Cross infection is the infection transmitted between individuals infected with different pathogenic organisms. Cross infection occurs usually in the hospitals. It is the infection of a client with a disease other than that, for which he had been admitted. In other words, a client gets the infection from someone else during his stay in the hospital.

Method of Transmission of Infection

The following are the methods of transmission of cross infection:

1. Direct contact: The organisms can be transmitted directly from person to person through kissing, sexual contact, droplet infection and infected hands.
2. Indirect contact: Contact with the secretions and excretions of the infected persons.
 - Through fomites, e.g. instruments, utensils, etc.
 - Through contaminated food and water
 - Through insects
 - Through dust

- Through carriers

Medical Asepsis

Medical asepsis refers to all practices used to protect the clients and his environment from the transmission of disease producing organisms (prevention of cross infection).

Surgical Asepsis

Surgical asepsis refers to all the procedures used to keep objects or areas sterile or completely free from all microorganisms. In medical asepsis, all practices are directed to the prevention of pathogenic organisms entering into the body, but in surgical asepsis all practices are directed to the elimination of both pathogenic and non-pathogenic microorganisms. In medical asepsis, a “clean technique” is used, but in surgical asepsis a “sterile technique” is used.

Hand Washing

In surgical asepsis, the hands should be thoroughly cleaned for about 3 to 5 min. Hands are scrubbed up to 10 min. When washing hands, they are held above the level of the elbows (in surgical asepsis, the elbows are considered more contaminated than the hands), so the water should run from least contaminated area (hands) to the area of greatest contamination (elbows). It is important to put soap well and scrub with a brush and rinse thoroughly with water several times. A sterile towel is used to wipe the hands and arms, starting from the palms to the elbows. Prior to surgical scrubs, it will be necessary to put on the head caps and masks.

Opening a Sterile Wrapped Package

01. Wash hands thoroughly.
02. Choose a large, clean working area above waist level.
03. Place the package in such a way that it can be opened away from the body.
04. The flap farthest away is opened first, with care not to reach over the sterile field.

Then the side flaps are opened, and the flap nearest to the GDA is opened last. When opening the flaps, care must be taken not to touch the inside of the wrapper. When opening the last flap, it is important to stand well back from the package in order to avoid contamination from the GDA uniform. If an inner wrapper is present, it is opened in the same way, but using a sterile forceps. When trays need to be rewrapped (e.g. after solutions have been added to a dressing tray before it is taken to the bedside) it should be wrapped in the reverse order to that of unwrapping. The proximal flap is closed first to prevent reaching across the sterile field, the side flaps next, and the distal flap last.

Use of Gloves

To put on the first glove, GDA grasps the glove by its cuff, being careful to touch only the inside of the glove. The sterility of the outside of the glove must be maintained. Remember that the GDA hands are considered to be contaminated. To put on the second glove, the sterile gloved hand must be used. The second glove is picked up by inserting the gloved finger under its cuff. The second glove is then pulled. The cuff of both gloves may then be unfolded by touching only the sterile sides.

Gowning

Sterile gown are worn in the operating room and the delivery room and whenever open wounds are present which necessitate a sterile technique e.g. to attend to a client with burns.

To keep the gowns sterile, they are folded inside out and are touched only on

The points to remember when putting on a gown:

1. Put on the head cap and mask first.
2. Scrub hands thoroughly.
3. Dry the hands with sterile towel.
4. Pick up the gown by grasping the folded gown at the neck, stand well back about a foot from the sterile bundle and the table.
5. Unfold it by keeping the gown away from the body. Do not shake the gown.
6. Hold the gown at the shoulder seams (inside) and put each hand alternately in to the arm holes.
7. Extend the arms and hold hands upward at the shoulder height when putting them through

the arm hole.

8. The circulating staffs then assist his / her in pulling the sleeves by working from behind and holding the gown from the inside.

9. The gown is then fastened at the neck by the circulating nurse and the open edges are then folded or held together.

10. The waist ties are then fastened by the circulating staff behind.

Face Masks

Masks are generally used to prevent the spread of microorganisms through the respiratory tract. Masks should be worn only once and then discarded to ensure effective filtering of micro – organisms. Masks that become wet are less effective and should be discarded. A masks should not be worn more than 1 to 2 hours at a time. The mask is not worn outside the unit. Masks need to cover both mouth and nose, and fit snugly around the face to prevent the escape of microorganisms around the sides. There should be minimum layers of cloth for the effective filtration of air. The points to be remembered while wearing the mask:

- Wash hands.
- Remove the clean mask from the container with sterile forceps (the mask should be sterilized and kept for the use)
- Hold the mask by its teeing. Fit it to the face and tie the strings at the back of the head. Do not touch the mask that covers the face. It is important that both mouth To remove the mask:
- Wash hands.
- Remove the gown (if worn).
- Remove the mask and discard it in the container for “used masks”.
- Wash hands thoroughly.

Unit 5: BIO MEDICAL WASTE MANAGEMENT***Learning outcome***

Demonstrate the knowledge of bio-medical waste management

Demonstrate the knowledge of the sources and disposal methods of bio-medical waste

Identify the role of personnel involved in waste management

Unit at a glance

- ✓ *Define bio-medical waste*
- ✓ *Enlist the risk involved in poor waste management in hospital*
- ✓ *Importance of waste management with respect to hospital staff and general public*
- ✓ *Bio-medical waste management helps in environment protection*
- ✓ *Enlist the routes of transmission of infection in hospital*
- ✓ *Areas of bio-medical waste generation in hospital*
- ✓ *Importance of color coding criteria*
- ✓ *Functions of hospital waste management committee*
- ✓ *Importance of training on hospital waste management to different categories of staff in a hospital*

BIO MEDICAL WASTE MANAGEMENT

DEFINITION:

Waste generated during the diagnosis, treatment, testing , research or production of biological products for humans or animals .

RISK INVOLVED IN POOR WASTE MANAGEMENT:

Medical care is vital for our life and health , but the waste generated from medical activities represents a real problem of living nature and human world. Main purposes of waste management are to clean up the surrounding environment and to identify the appropriate methods for waste neutralization , recycling and disposal. Within waste management the health care waste management (HCWM) is a process that helps to ensure proper hospital hygiene and safety oh health care workers and communities.

Problems relating to biomedical waste

- A major issue – some hospitals are disposing of waste in a haphazard , improper and indiscriminate manner.
 - Lack of segregation practices, results in mixing of hospital wastes with general waste making the whole waste stream hazardous.
 - Inappropriate segregation ultimately results in an incorrect method of waste disposal.
- Inadequate Bio medical waste management will cause
- Environmental pollution
 - Unpleasant smell
 - Growth and multiplication of vectors like insects , rodents and worms and may lead to the transmission of diseases like typhoid ,cholera , hepatitis and AIDS through injuries from syringes and needles which are contaminated
 - Various communicable diseases, which spread through water , sweat , blood , body fluids and contaminated organs , are important to be prevented.
 - The Bio medical waste scattered in and around the hospitals invites flies, insects rodents , cats and dogs that are responsible for the spread of communication disease like plague and rabies.
 - Rag pickers in the hospital , sorting out the garbage are at a risk of getting tetanus.

Hazardous health care waste can result in

- Infection
- Genotoxicity and cytotoxicity
- Chemical toxicity
- Radioactivity hazards
- Physical injuries

Problem associated with BMW

Organism	Diseases caused	Related waste item
<u>Viruses</u> HIV , hepatitis B ,hepatitis A ,C, Arboviruses, enteroviruses	AIDS, Infectious Hepatitis , dengue, Japanese encephalitis , tick – borne fevers , etc .	Infected needles , body fluids , human excreta , soiled linen , blood , body fluids
<u>Bacteria</u> Salmonella typhi , vibrio cholerae, clostridium tetani , pseudomonas , streptococcus	Typhoid, cholera, tetanus wound infections , septicemia , rheumatic fever , endocarditis , skin and soft tissue infections	Human excreta and body fluid in landfills and hospital wards , sharps such as needles, surgical blades in hospital waste
<u>Parasites</u> <u>Plasmodium</u>	Cutaneous leishmaniasis ,kala azar , malaria	Human excreta , blood and body fluids in poorly managed sewage system of hospitals.

Environmental impact :

Treatment and disposal of healthcare waste may pose health risks indirectly through the release of pathogens and toxic pollutants into the environment .

- The disposal of untreated health care wastes in landfills can lead to the contamination of drinking , surface , and ground waters if those landfills are not properly constructed .
- The treatment of health care wastes with chemical disinfectants can result in the release of chemical substances into the environment if those substances are not handled , stored and disposed in an environmentally sound manner .
- Incineration of waste has been widely practiced , but inadequate incineration or the incineration of unsuitable materials results in the release of pollutants into the air and in the generation of ash residue.

IMPORTANCE OF HOSPITAL WASTE MANAGEMENT WITH RESPECT TO HOSPITAL STAFF & GENERAL PUBLIC :

Biomedical waste or also known as hospital waste is any waste that is both hazardous and infectious. It can be either in a solid – state as sharps (needles, used syringes , broken ampoules) and packaging used bandages , and even human body tissue

Improper biochemical waste management poses a lot of health risks to both hospital staff and non employees. That's why many organizations like US EPA and OSHA strictly impose proper waste management protocols. But aside from health risks, there are other reasons why these organizations should make sure their bio waste is handled correctly .

Benefits of proper Biomedical Waste Handling :

1. Reduction in the occurrence of fatal diseases

Illnesses and diseases such as HIV/AIDS , sepsis , and other diseases transmitted by infectious medical equipment by infectious medical equipment can be curtailed if hospitals and other healthcare organizations know the proper bio waste disposal procedure . There should be proper training in hospital waste management to maintain such practice in an organization such as hospitals, testing centers , laboratories , and even clinics both for humans and animals .

2. Prevents illegal trading of used medical tools :

One of the alarming concerns that are being mitigated by properly handling hospital waste is the illegal trading of used medical equipment and tools. This case is very popular as using disposed syringes is common news.

The health risks that come in using syringes and needles are the primary causes of widespread contraction of diseases . used syringes and needles are contaminated with an unknown substance , and it may lead to the contraction of different diseases once used again.

3. Low injury reports :

When healthcare organizations follow and practice proper health waste management , then is highly expected that there will be low injury reports of health staff incurring injuries at the workplace .

BIOMEDICAL WASTE MANAGEMENT HELPS IN ENVIRONMENT PROTECTION :

Since an important issue of environmental protection process is the biomedical waste management , this study focuses on responsible planning of collecting , transporting , processing and disposing of hazardous and non hazardous biomedical waste, with a special concern on effective management of biomedical waste.

ROUTES OF TRANSMISSION OF INFECTION IN HOSPITAL

The microorganism can be acquired by

- Contact transmission (direct and indirect)
- Droplet transmission (inhalation through respiratory tract)
- Airborne transmission
- Ingestion (through gastrointestinal tract)
- Inoculation (through accidental sharp injury or bites)
- Transplacental transmission(microbes may cross placenta from the mother to fetus).

SOURCES OF BIOMEDICAL WASTE

Major sources

- Hospitals
- Labs
- Research centers
- Animal research
- Blood banks
- Nursing homes

- Mortuaries
- Autopsy centers

Minor sources

- Clinics
- Dental clinics
- Home care
- Cosmetic clinics
- Paramedics
- Funeral services
- Institutions

AREAS OF BMW GENERATION IN HOSPITAL

1. Infectious waste : waste suspected to contain pathogens. E.g. laboratory cultures , tissue (swabs) materials, or equipments 's that have been in contact with infected patients.
2. Pathological waste : human tissue or fluid e.g. body fluids , fetuses.
3. Sharps : sharp waste e.g. needles , infection sets , scalpels , knives , blades , broken glass etc.
4. Pharmaceutical waste : waste containing pharmaceutical .
5. Genotoxic waste : waste containing substances with genotoxic properties . e.g. waste containing cytostatic (often used in cancer therapy .
6. Chemical waste : waste containing chemical substances. E.g. laboratory reagents
7. Waste with high content of heavy metals : e.g. batteries
8. Pressurized containers : e.g. gas cylinders , gas cartridges .
9. Radioactive waste : waste containing radioactive substance

METHODS OF DISPOSING OF MICROBIOLOGICAL AND BIOTECHNOLOGICAL WASTE IN HOSPITAL

1. Chemical technology :
2. Thermal technology
 - Autoclave
 - Hydroclave
 - Incinerator
 - Microwave
 - Screw feed
3. Mechanical technology
 - Compaction
 - Grinding /shredding
 - Pulverization
 - Inertization
4. Biological method
5. Plasma torch technology
6. Deep burial
7. Land filling
 - Open dumps
 - Sanitary land fill
8. Worm composting

IMPORTANCE OF COLOR CODING CRITERIA :

Cat.	Type of Bag/ Container used	TYPE OF WASTE	Treatment /Disposal options
Yellow 	non-chlorinated plastic bags Separate collection system leading to effluent treatment system →	a) Human Anatomical Waste b) Animal Anatomical Waste c) Soiled Waste d) Expired or Discarded Medicines e) Chemical Waste f) Micro, Bio-t and other clinical lab waste g) Chemical Liquid Waste	Incineration or Plasma Pyrolysis or deep burial*
Red 	non-chlorinated plastic bags or containers	Contaminated Waste (Recyclable) tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles) and gloves.	Auto/ Micro/Hydro and then sent for recycling, not be sent to landfill
White 	(Translucent) Puncture, Leak, tamper proof containers	Waste sharps including Metals	Auto or Dry Heat Sterilization followed by shredding or mutilation or encapsulation
Blue 	Cardboard boxes with blue colored marking	Glassware	Disinfection or auto/ Micro/hydro and then sent for recycling.

Importance of color coding is essential

1. It reduces the quantity of biomedical waste that needs handling special treatment
2. Prevent the reuse of sharps or other types of waste for illegal purpose
3. Provide more opportunities for recycling medical waste after proper stream sterilization
4. It provides safety .

FUNCTIONS OF HOSPITAL WASTE MANAGEMENT COMMITTEE :

Health care workers should have the knowledge of biomedical waste management , and comply with BMW rules to maintain a safe work place and sustainable hospital .

Heads of each hospital will have to take authorization for generation of waste from appropriate authorities as notified by the concerned government , well in time and to get it renewed as per time schedule laid down in the rules .

Each hospital should constitute a hospital waste management committee , chaired by the head of the institute and having wide representation from all major departments . this committee should be responsible for making hospital specific action plan for hospital waste management and its supervision , monitoring and implementation . The annual reports , accident reports , as required under BMW rules should be submitted to the concerned authorities as per BMW rules format .

IMPORTANCE OF TRAINING ON HOSPITAL WASTE MANAGEMENT TO DIFFERENT CATEGORIES OF STAFF IN HOSPITAL

Biomedical waste is any waste generated during the diagnosis , treatment or immunization of human beings or animals , in research activities pertaining to or in the production of or testing of biological , and all other categories waste generated by healthcare activities. It includes a broad range of materials from used needles and syringes , soiled dressings , body parts , diagnostic samples , blood

, chemicals, pharmaceuticals , medical devices , and radioactive materials and carries a higher potential for infection and injury than any other type of waste . therefore , it should be properly managed to protect the general public , healthcare and sanitation workers who are regularly exposed to biomedical waste as an occupational hazard .

Nurses , sanitary and hospital attendants , and clinicians spend maximum with patients , increasing their exposure and risk of the hazards present in a hospital environment , mainly biomedical waste. They need to be well equipped with the latest information , skills and practices for managing this waste to reduce hospital acquired infection infections , and to protect their own health . They are also responsible for preventing risk, due to waste , to the community at large . Inadequate and inappropriate knowledge of the handling of healthcare of the waste may have serious health consequences and a significant impact on the environment as well .