SCHEME : J

Name : _____

Roll No. : _____ Year : 20___ 20___

Exam Seat No. : _____

LABORATORY MANUAL FOR
SOCIAL PHARMACY (20055)

FIRST YEAR D.PHARMACY

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI
(Autonomous) (ISO 9001: 2015) (ISO/IEC 27001:2013)

VISION

To ensure that the diploma level technical education constantly matches the latest requirements of technology and industry and includes the all-round personal development of students including social concerns and to become globally competitive, technology led organization.

MISSION

To provide high quality technical and managerial manpower, information and consultancy services to the industry and community to enable the industry and community to face the challenging technological & environmental challenges.

QUALITY POLICY

We, at MSBTE are committed to offer the best-in-class academic services to the students and institutes to enhance the delight of industry and society. This will be achieved through continual improvement in management practices adopted in the process of curriculum design, development, implementation, evaluation and monitoring system along with adequate faculty development programmes.

CORE VALUES

MSBTE believes in the following:

- ✓ Skill development in line with industry requirements.
- ✓ Industry readiness and improved employability of Diploma holders.
- ✓ Synergistic relationship with industry.
- ✓ Collective and Cooperative development of all stake holders.
- ✓ Technological interventions in societal development.
- ✓ Access to uniform quality technical education.

LABORATORY MANUAL OF

SOCIAL PHARMACY

(20055)

First Year

Diploma in Pharmacy

Maharashtra State Board of Technical Education, Mumbai.

(Autonomous)

(ISO 9001:2015) (ISO/IEC27001:2013)

PCI ER-2020/'J' Scheme Curriculum

Maharashtra State Board of Technical Education, Mumbai

(Autonomous) (ISO 9001:2015) (ISO/IEC27001:2013)

4th floor, Government Polytechnic Building, 49, Kherwadi, Bandra (E), Mumbai- 400 051

(Printed on – July 2024)

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI

CERTIFICATE

This is to certify that Mr. /Ms. _____

Roll No. _____ of First Year Diploma in Pharmacy studying at

_____

has completed the practical work satisfactorily in Social Pharmacy (20055)

for the academic year 20 - 20 as prescribed in the PCI ER 2020 syllabus.

Date: _____ Enrollment No.: _____

Place: _____ Exam Seat No.: _____

Course Teacher **Principal**

External Examiner

Seal of the Institute

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION MUMBAI

PROGRAM OUTCOMES

1. **Pharmacy knowledge:** Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy.
2. **Modern tool usage:** Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
3. **Leadership skills:** Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfilment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
4. **Professional identity:** Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
5. **Pharmaceutical ethics:** Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
6. **Communication:** Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
7. **The Pharmacist and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
8. **Environment and sustainability:** Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
9. **Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis

COMPETENCIES FOR THE INDIAN D. PHARM HOLDERS

Competency is defined as "A distinct composite of knowledge, skill, attitude and value that is essential to the practice of the profession in real life contexts".

The candidates who successfully complete the Diploma in Pharmacy (D. Pharm) program of Education Regulations 2020 (ER-2020), from the institutions approved by the Pharmacy Council of India are expected to attain the following professional competencies.

1. Review Prescriptions: The student should receive and handle prescriptions in a professional manner and be able to check for their completeness and correctness. Also, the prescribers should be contacted for any clarifications & corrections in the prescriptions with suggestions if any.

2. Dispense Prescription / Non-Prescription Medicines: The student should be able to dispense the various scheduled drugs / medicines as per the implications of the Drug & Cosmetic Act and Rules thereunder. Also, the non-prescription medicines (over-the-counter drugs) should be dispensed judicially to the patients as required.

3. Provide Patient Counselling / Education: The student should be able to effectively counsel / educate the patients / caretakers about the prescription / non-prescription medicines and other health related issues. Effective communication includes using both oral and written communication skills and various communication techniques.

4. Hospital and Community Pharmacy Management: The student be able to manage the drug distribution system as per the policies and guidelines of the hospital pharmacy, good community pharmacy practice and the recommendations of regulatory agencies. Also, be able to manage the procurement, inventory, and distribution of medicines in hospital / community pharmacy settings.

5. Expertise on Medications: The student should be able to provide an expert opinion on medications to health care professionals on safe and effective medication – use, relevant policies and procedures based on available evidence.

6. Proficiency on Pharmaceutical Formulations: The student should be able to describe the chemistry, characteristics, types, merits and demerits of both drugs and excipients used in pharmaceutical formulations based on her/his knowledge and scientific resources.

7. Entrepreneurship and Leadership: The student should be able to acquire the entrepreneurial skills in the dynamic professional environments. Also, be able to achieve leadership skills through teamwork and sound decision-making skills.

8. Deliver Primary and Preventive Healthcare: The student should be able to contribute to various healthcare programs of the nation including disease prevention initiatives to improve public health. Also contribute to the promotion of national health policies.

9. Professional, Ethical and Legal Practice: The student should be able to deliver professional services in accordance with legal, ethical, and professional guidelines with integrity.

10. Continuing Professional Development: The student should be able to recognize the gaps in the knowledge and skills in the effective delivery of professional services from time to time and be self-motivated to bridge such gaps by attending continuing professional development programs.

COMPETENCY MAPPING WITH THE COURSE

Competencies	Social Pharmacy
1.Review Prescriptions	
2. Dispense Prescription / Non-Prescription Medicines	✓
3.Provide Patient Counselling / Education	✓
4.Hospital and Community Pharmacy Management	✓
5.Expertise on Medications	✓
6.Proficiency on Pharmaceutical Formulations	
7.Entrepreneurship and Leadership	
8.Deliver Primary and Preventive Healthcare	✓
9.Professional, Ethical and Legal Practice	✓
10.Continuing Professional Development	✓

GRAPHICAL STRUCTURE OF SUBJECT AREA

SOCIAL PHARMACY (20055)

APPLICATION / PROBLEM

The pharmacist is promoting public health by participating in National Immunization Program (NIP), Reproductive and Child Health Program (RCHP), and National Health Programmes, promoting awareness about communicable diseases, and providing counselling on personal hygiene, menstrual hygiene, and tobacco deaddiction.

The pharmacist is also demonstrating a role in first aid treatment for Sudden Cardiac Arrest (SCA), Foreign Body Airway Obstruction (FBAO), dog bites, snake bites, fractures, burns, insecticide poisoning, disaster management, and balanced diet.

↑

PROCEDURE

Counselling on: Immunization, menstrual hygiene, pre-natal and post-natal care, Counselling on First aid treatment in Sudden Cardia Arrest, Foreign Body Airway Obstruction, fractures, burns and insecticide poisoning, Demonstrating role in disaster management, Counselling about prevention of communicable diseases, Chlorination process, Counselling on Balanced diet and tobacco de-addiction.

↑

PRINCIPLE

Prevention of diseases, Methods of family planning, Immunization, CPR, Emergency treatment, Awareness about communicable diseases, Water purification, Glycemic index, Cognitive behavioral Therapy, Deaddiction

↑

CONCEPT

Immunity, Reproductive and child health, Contraception, Prevention and control of diseases, Personal Hygiene, Menstrual Hygiene, First Aid, Basic Life Support, Spread of diseases, TDS, Chlorination, Balanced Diet, BMR, Tobacco Cessation.

↑

FACTS

Vaccine, Mortality rate, Millennium Development Goals, Infant Mortality Rate, Masks, PPE Gear, AED, Insecticides, Fracture, Brms. Disinfectants, Antiseptics, fumigating gent, Anti larval Agents, Mosquito Repellent, Communicable diseases, TDS meter, Nutrition, Tobacco containing products.

SOCIAL PHARMACY – PRACTICAL

Course Code: ER20-15P/20055 **75 Hours (3 Hours/week)**

Scope: This course is designed to provide simulated experience in various public health and social pharmacy activities.

Course Objectives: This course will train the students on various roles of pharmacists in public health and social pharmacy activities in the following areas:

1. National immunization programs
2. Reproductive and child health programs
3. Food and nutrition related health programs
4. Health education and promotion
5. General roles and responsibilities of the pharmacists in public health
6. First Aid for various emergency conditions including basic life support and cardiopulmonary resuscitation.

Course Outcomes: Upon successful completion of this course, the students will be able to

1. Describe the roles and responsibilities of pharmacists in various National health programs.
2. Design promotional materials for public health awareness.
3. Describe various health hazards including microbial sources.
4. Advice on preventive measures for various diseases.
5. Provide first aid for various emergency conditions.

Note: Demonstration / Hands-on experience / preparation of charts / models / promotional materials / role plays / enacting / e-brochures / e-flyers / podcasts / video podcasts / any other innovative activities to understand the concept of various elements of social pharmacy listed here. (At least one activity to be carried out for each one of the following)

Practicals

1. National immunization schedule for children, adult vaccine schedule, Vaccines which are not included in the National Immunization Program.
2. RCH – reproductive and child health – nutritional aspects, relevant national health programmes.
3. Family planning devices
4. Microscopical observation of different microbes (readymade slides)
5. Oral Health and Hygiene
6. Personal hygiene and etiquettes – hand washing techniques, Cough and sneeze etiquettes.
7. Various types of masks, PPE gear, wearing/using them, and disposal.
8. Menstrual hygiene, products used.
9. First Aid – Theory, basics, demonstration, hands on training, audio-visuals, and practice, BSL (Basic Life Support) Systems [SCA - Sudden Cardiac Arrest, FBAO - Foreign Body Airway Obstruction, CPR, Defibrillation (using AED) (Includes CPR techniques, First Responder).
10. Emergency treatment for all medical emergency cases viz. snake bite, dog bite, insecticide poisoning, fractures, burns, epilepsy etc.
11. Role of Pharmacist in Disaster Management.
12. Marketed preparations of disinfectants, antiseptics, fumigating agents, antilarval agents, mosquito repellents, etc.
13. Health Communication: Audio / Video podcasts, Images, Power Point Slides, Short Films, etc. in regional language(s) for mass communication / education / Awareness on 5 different communicable diseases, their signs and symptoms, and prevention.
14. Water purification techniques, use of water testing kit, calculation of Content/percentage of $KMnO_4$, bleaching powder to be used for wells/tanks.

15. Counselling children on junk foods, balanced diets – using Information, Education and Communication (IEC), counselling, etc. (Simulation Experiments).
16. Preparation of various charts on nutrition, sources of various nutrients from Locally available foods, calculation of caloric needs of different groups (e.g. child, mother, sedentary lifestyle, etc.). Chart of glycemic index of foods.
17. Tobacco cessation, counselling, identifying various tobacco containing products through charts/pictures.

Assignment

The students shall be asked to submit the written assignments on the following topics (One assignment per student per sessional period. i.e., a minimum of THREE assignments per student)

1. An overview of Women's Health Issues.
2. Study the labels of various packed foods to understand their nutritional contents.
3. Breastfeeding counselling, guidance – using Information, Education and Communication (IEC).
4. Information about the organizations working on de-addiction services in the region (city / district, etc.)
5. Role of a pharmacist in disaster management – A case study.
6. Overview on the National Tuberculosis Elimination Programme (NTEP).
7. Drug disposal systems in the country, at industry level and citizen level.
8. Various Prebiotics or Probiotics (dietary and market products).
9. Emergency preparedness: Study of local Government structure with respect to Fire, Police departments, health department.
10. Prepare poster/presentation for general public on any one of the Health Days. e.g. Day, AIDS Day, Handwashing Day, ORS day, World Diabetes Day, World Heart Day, etc.
11. List of home medicines, their storage, safe handling, and disposal of unused medicines.
12. Responsible Use of Medicines: From Purchase to Disposal.
13. Collection of newspaper clips (minimum 5) relevant to any one topic and its submission in an organized form with collective summary based on the news items.
14. Read a minimum of one article relevant to any theory topic, from Pharma /Science/ or other Periodicals and prepare summary of it for submission.
15. Potential roles of pharmacists in rural India.

Field Visits

The students shall be taken in groups to visit any THREE of the following facilities to witness and understand the activities of such centres/facilities from the perspectives of the topics discussed in theory and/or practical courses. Individual reports from each student on their learning experience from the field visits shall be submitted.

1. Garbage Treatment Plant
2. Sewage Treatment Plant
3. Bio-medical Waste Treatment Plant
4. Effluent Treatment Plant
5. Water purification plant
6. Orphanage / Elderly-Care-Home / School and or Hostel/Home for persons with disabilities
7. Primary health care centre

STRATEGY FOR IMPLEMENTATION

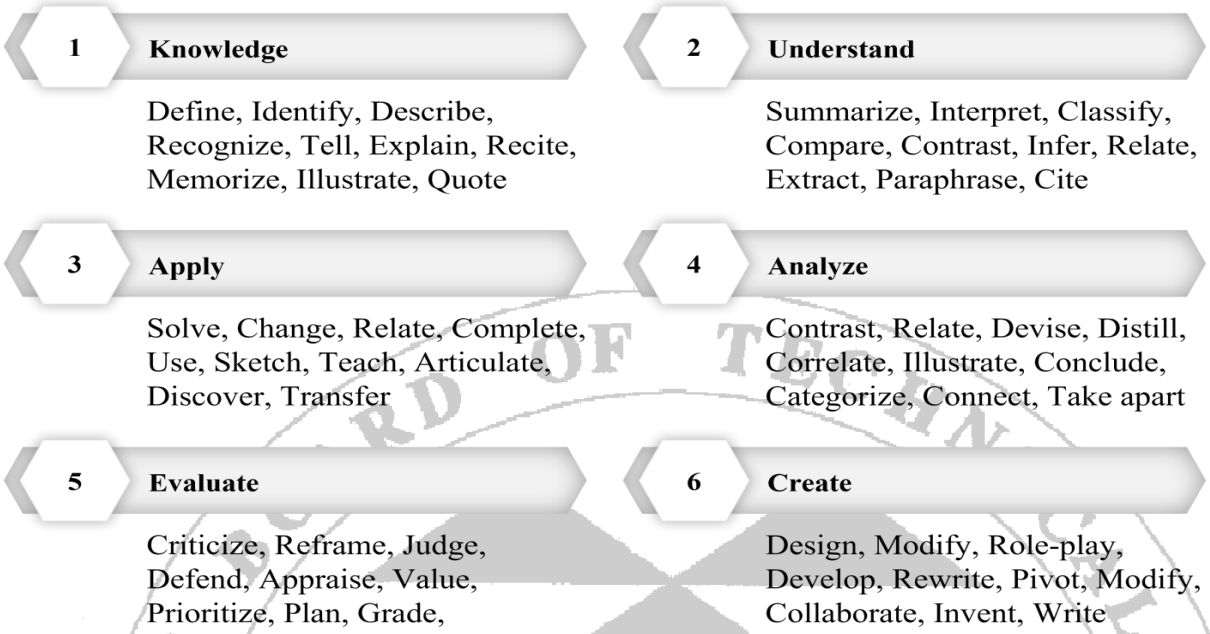
It is suggested that 32-35% of experiments should be completed before every sessional exam.

GUIDELINES FOR TEACHERS

Teachers shall explain the following points to the students before starting of the practicals:

1. Objectives of Learning: To foster better understanding of the subject and to inculcate the skills and attitude related to practicals.
2. Graphical Structure: In graphical structure, topics and subtopics are organized in a systematic way to achieve the ultimate purpose of learning the subject. This is arranged in the form of facts, concepts, principles, procedures, applications, and problems.
3. Before starting the practical, Teachers should explain the plan of the experiment.
4. Teachers should ensure the active participation of students while performing the experiment.
5. Observations should be checked individually, and each student should be given a chance to perform the experiment.
6. Teachers should ask the students to complete the questions which are given at the end of the experiment accordingly.
7. Assessment of manuals should be done according to the assessment norms. Proper marks should be distributed according to the performance of the individuals.
8. Teachers should explain the competencies that students should achieve, in detail with their importance to students after completion of their course.
9. Apart from the syllabus, teachers should provide and cover extra topics which are beneficial for the students.
10. Explanations about various equipment with some interesting videos, reagents, chemicals, glassware's should be given to students prior to commencing the practical.
11. Teachers should observe the students when students are performing practicals in groups, proper contributions of the individual student should be there, and record of observation should be noted by all of them.
12. Teachers may suggest the students refer to sources of information such as literature, research papers, books, websites, attending online/offline seminars for the updating of the knowledge.
13. According to the professional competencies given by PCI, teachers should develop the professional skills of the students.
14. Teachers should construct different types of active learning sessions for students such as quizzes, role plays, group discussions etc.
15. Teachers should ensure that revised CIAAN - 2017 norms or the latest norms given by MSBTE are followed simultaneously and implemented.
16. Teachers should follow the guidelines given by PCI & MSBTE from time to time.

BLOOMS TAXONOMY LEVELS



INSTRUCTIONS FOR STUDENTS

Students should follow the instructions given below for better understanding of the subject from a theoretical and practical concept of view.

1. As per the instructions, the students should wear an apron, cap, mask, gloves and slippers before entering the lab.
2. The students should keep their important things in the locker which is provided by the college.
3. While entering the laboratory, the students should carry manuals, rough book and practical requirements as instructed.
4. Students should attend the practical regularly throughout the year, so as to understand the subject properly, and to develop the skills for performing the experiments and attaining the competencies.
5. The students should carry out the experiment individually and perform the experiment at the allotted specific work area.
6. The practical applications of every experiment should be noted by the students.
7. Students should answer the questions asked in the practicals and should ask the teacher about their difficulties without any hesitation.
8. After completion of practicals students should write the answers to the question given at the end of the experiment.
9. Students should develop different types of competencies to become competent Pharmacists.
10. Students should actively participate in group discussions, activities, etc. and strive to achieve the knowledge, skills, and attitude.
11. Students should submit the manual for assessing regularly on the scheduled date.
12. After completing the practical, the student should clean the platform and glassware that he has used.

LABORATORY MANUAL OF SOCIAL PHARMACY
MAPPING OF COURSE OUTCOMES

Exp. No.	Title of Experiment	CO1	CO2	CO3	CO4	CO5
1	National Immunization Programme	✓	✓	✓		
2	Reproductive and Child Health	✓	✓	✓		
3	Family Planning Methods	✓	✓	✓		
4	Microscopical Observation of Different Microbes			✓		
5	Oral Health and Hygiene		✓	✓	✓	
6	Personal Hygiene and Etiquettes: Hand Washing Techniques, Coughing and Sneezing Etiquettes		✓		✓	
7	Handling of different PPE		✓		✓	
8	Menstrual Hygiene		✓		✓	
9	Demonstration of First Aid for Sudden Cardiac Arrest		✓		✓	✓
10	Demonstration of First Aid for Foreign Body Airway Obstruction		✓		✓	✓
11	Demonstration of Emergency Treatment for the Snake & Dog Bite		✓		✓	✓
12	Demonstration of Emergency Treatment for the Insecticide		✓		✓	✓
13	Demonstration of Emergency Treatment for the Fractures & Burns		✓		✓	✓
14	Role of Pharmacist in Disaster Management	✓				
15	Disinfectants and Antiseptics, Fumigating Agents, Antilarval Agents and Mosquito Repellents: Marketed Products and Its Use		✓	✓	✓	
16	Preparation of Educational Material for Awareness of Dengue		✓		✓	
17	Preparation of Educational Material for Awareness of Hepatitis		✓		✓	
18	Preparation of Educational Material for Awareness of Cholera		✓		✓	
19	Preparation of Educational Material for Awareness of Tuberculosis		✓		✓	
20	Preparation of Educational Material for Awareness of Malaria		✓		✓	
21	Determination of Total Dissolved Solids in Water				✓	✓
22	Water Purification using Bleaching Powder					✓
23	Promotion of healthy eating habits and nutrition awareness among children					
24	Preparation of a chart on the caloric needs of different groups and on the glycemic index of foods	✓	✓		✓	
25	Identification of various Tobacco Containing Products and Counselling on Tobacco Cessation Methods	✓	✓		✓	

LIST OF EXPERIMENTS AND RECORD OF PROGRESSIVE ASSESSMENT

Exp. No.	Title of Experiment	Page No.	Date of Performance	Date of Submission	Assessment Marks 10	Teacher's Signature
1	National Immunization Programme	1				
2	Reproductive and Child Health	6				
3	Family Planning Methods	13				
4	Microscopical Observation of Different Microbes	22				
5	Oral Health and Hygiene	28				
6	Personal Hygiene and Etiquettes: Hand Washing Techniques, Coughing and Sneezing Etiquettes	35				
7	Handling of different PPE	40				
8	Menstrual Hygiene	47				
9	Demonstration of First Aid for Sudden Cardiac Arrest	53				
10	Demonstration of First Aid for Foreign Body Airway Obstruction	59				
11	Demonstration of Emergency Treatment for the Snake & Dog Bite	64				
12	Demonstration of Emergency Treatment for the Insecticide	70				
13	Demonstration of Emergency Treatment for the Fractures & Burns	75				

LIST OF EXPERIMENTS AND RECORD OF PROGRESSIVE ASSESSMENT

Exp. No.	Title of Experiment	Page No.	Date of Performance	Date of Submission	Assessment Marks 10	Teacher's Signature
14	Role of Pharmacist in Disaster Management	82				
15	Disinfectants and Antiseptics, Fumigating Agents, Antilarval Agents and Mosquito Repellents: Marketed Products and It's Use	86				
16	Preparation of Educational Material for Awareness of Dengue	92				
17	Preparation of Educational Material for Awareness of Hepatitis	96				
18	Preparation of Educational Material for Awareness of Cholera	100				
19	Preparation of Educational Material for Awareness of Tuberculosis	104				
20	Preparation of Educational Material for Awareness of Malaria	108				
21	Determination of Total Dissolved Solids in Water	113				
22	Water Purification using Bleaching Powder	117				
23	Promotion of healthy eating habits and nutrition awareness among children	121				
24	Preparation of a chart on the caloric needs of different groups and on the glycemic index of foods	125				
25	Identification of various Tobacco Containing Products and Counselling on Tobacco Cessation Methods	130				

I) PRACTICAL RECORD MARKS*:

Sessional Exam	Experiment No.		Total no. of experiments conducted	Average marks obtained for the experiments conducted. (out of 10)	Teacher's Signature
	From	To			
First Sessional					
Second Sessional					
Third Sessional					

*Sessional wise marks should be considered for internal assessment of practical sessional examinations (out of 10M)

II) ASSIGNMENT MARKS#:

Sr. No.	Title of Assignment	Marks out of 05#	Assignment Marks (Average of three)	Teacher's Signature
1				
2				
3				

#Marks should be transferred from Appendix -1 A typical format for assessment of an assignment.

III) FIELD VISIT REPORT MARKS$:

Sr. No.	Title of Field Visit	Marks out of 05$	Field Visit Marks (Average of three)	Teacher's Signature
1				
2				
3				

$ Marks should be transferred from Appendix -2 A typical format for assessment of an assignment.

Average Sessional Mark out of 10	Assignments Mark out of 05 (Average of three)	Field Visit Mark out of 05 (Average for the reports)	Total Marks out 20	Teacher's Signature

Experiment No. 01

National Immunization Programme

1. Aim

To prepare a leaflet / poster on the vaccines included in the National Immunization Programme (NIP) of India

2. Practical Significance

Vaccines are pharmaceutical preparations used for preventing infectious diseases. Knowing the various types of vaccines and their administration schedules is essential for pharmacists to become professional healthcare providers. This practical will help students understand the vaccines included in the National Immunization Program (NIP) and their importance.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Recall the National Immunization schedule for children.	CO 1-3	BTL2
2	Prepare a poster or leaflet on NIP.	CO 1-3	BTL5
3	Counsel the public about vaccination.	CO 1-3	BTL6

4. Relevant Theoretical Background

Immunity

It is defined as a complex biological system that is capable of recognizing and tolerating what belongs to the self as well as recognizing and rejecting what is foreign (non-self). It is body's ability to fight against infections. Following are the type of immunities:

A. Innate immunity:

The defense system one is born with is called innate immunity, or nonspecific immunity. It shields against all antigens. Innate immunity is a set of defenses that prevent harmful materials from entering the body. In the immune response, these barriers act as the initial line of protection. E.g., skin

B. Acquired immunity:

Immunity acquired by infection or vaccination (active immunity) or by the transfer of antibody or lymphocytes from an immune donor (passive immunity) is called acquired immunity.

a. **Natural active**: Antibodies developed in response to an infection.

b. **Artificial active**: Antibodies developed in response to a vaccination.

c. **Natural passive**: Antibodies received from mother, e.g., through breast milk.

d. **Artificial passive**: Antibodies received from a medicine, e.g., from a gamma globulin injection or infusion.

Vaccination:

It is a simple, safe, and effective way of protecting ~~you~~ against harmful diseases. It strengthens the immune system by utilizing the body's own defenses to build resistance to certain pathogens. Vaccines train the immune system to create antibodies, just as it does when it's exposed to a pathogenic microbe causing a disease. On the other hand, vaccines do not cause disease or pose a

risk of complications because vaccines contain killed or weakened forms of pathogens like viruses or bacteria.

The Immunization Programme is one of the key interventions for the protection of children from life-threatening conditions that are preventable. It is one of the world's largest immunization programmes and a significant public health initiative in the country. The Expanded Programme of Immunization (EPI) was first implemented in India in 1978. In 1985, the initiative was expanded into the Universal Immunization Program (UIP), which was to be executed in phases to reach all districts in the country by 1989-90. In 1992, UIP became a part of the Child Survival and Safe Motherhood Program. Immunization has been an important component of the National Reproductive and Child Health Program since 1997, and it is now one of the core topics within the National Rural Health Mission (NRHM) since 2005. The Government of India is offering vaccination under UIP to prevent seven vaccine-preventable diseases: Diphtheria, Pertussis, Tetanus, Polio, Measles, Tuberculosis, Japanese encephalitis (Brain fever), Hepatitis B, Meningitis, and pneumonia caused by Haemophilus influenza type b (Hib).".

National Immunization Schedule under UIP

Vaccine	When to give	Dose	Route	Site	Disease
For Infants					
BCG Vaccine	At birth or as early as possible till one year of age	0.1 ml (0.05ml until 1 month of age)	ID- Intra Dermal	Left Upper Arm	Tuberculosis
Hepatitis B Vaccine Birth Dose	At birth or as early as possible within 24 hours	0.5ml	IM- Intramuscular	Anterolateral side of midthigh- LEFT	Hepatitis B (Jaundice)
OPV (Oral Polio Vaccine) Birth Dose	At birth or as early as possible within first 15 days	2 drops	Oral	-	Polio
OPV 1, 2 & 3	At 6 weeks, 10 weeks & 14 weeks	2 drops	Oral	-	Polio
IPV (Inactivated Polio Vaccine	14 weeks	0.5ml	IM- Intramuscular	Anterolateral side of midthigh- RIGHT	Polio
Pentavalent Vaccine 1, 2 & 3	At 6 weeks, 10 weeks & 14 weeks	0.5ml	IM- Intramuscular	Anterolateral side of midthigh- LEFT	Diphtheria, Pertusis, Tetanus, Influenza, Hepatitis
Rota Virus Vaccine	At 6 weeks, 10 weeks & 14 weeks	5 drops	Oral	-	Diarrhea, vomiting, fever, and

Vaccine	When to give	Dose	Route	Site	Disease
					abdominal pain
Measles Vaccine 1st Dose	9 completed months-12 months (can be give upto 5years if not received at 9-12 months)	0.5ml	SC-Sub Cutaneous	Right Upper Arm	Measles
Vitamin A 1st Dose This is **NOT** Vaccine	At 9 months with measles	1ml (1 lakh IU)	Oral	-	Reduces mortality and diarrhoea
For Children					
DPT 1st Booster	16 – 24 months	0.5ml	IM-Intramuscular	Anterolateral side of midthigh-LEFT	Diphtheria, Pertusis, Tetanus
OPV Booster	16 -24 months	2 drops	Oral	-	Polio
Measles 2nd Dose	16 -24 months	0.5 ml	SC-Subcutaneous	Right Upper Arm	Measles
Vitamin A (2nd to 9th Dose) This is **NOT** vaccine	16 months with DPT/OPV booster then one dose every 6 months upto age of 5 years	2ml (2 lakh IU)	Oral	-	Reduces mortality and diarrhoea
DPT 2nd Booster	5-6 years	0.5 ml	IM-Intramuscular	Left Upper Arm	Diphtheria, Pertusis, Tetanus
TT (Tetanus Toxoid)	10 years and 16 years	0.5 ml	SC-Sub Cutaneous	Upper Arm	Tetanus

Source: https://cdc.gov/vaccines/schedules

5. Requirements

A3 paper, Coloring material.

6. Requirements used

7. Procedure

A. Preparation of Leaflet or Poster.

a. Select the immunization schedule for infants.
b. Collect information from manuals and websites.
c. It should include the name, time, route, and disease prevented by the vaccine.
d. Use various figures and pictures to present textual information.

B. Counselling Activity: Write only points.

a. Tell the importance of vaccination in general or take an example of any one vaccine

b. Create awareness about vaccines that are not covered under UIP.

8. Result

The leaflet / poster of vaccines included/not included in the National Immunization Programme was prepared.

9. References

a. https://nhm.gov.in
b. https://cdc.gov/vaccines/schedules

10. Practical Related Questions

a. Define immunity.
b. Enlist types of immunity.
c. Name various vaccines given under NIP for infants.
d. List the vaccines that are not covered under UIP.
e. Write five sentences about 'Indradhanush Mission' of India.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 02

Reproductive and Child Health

1. Aim

To study the role of pharmacists in reproductive and child health and prepare a poster on any one stage of pregnancy or child development.

2. Practical Significance

The students should develop the following competencies in relation to reproductive and child health: preparing, obtaining, storing, securing, distributing, dispensing, administering, and disposing of medical products; providing effective medication therapy management; maintaining and improving professional performance; and contributing to the improved effectiveness of the healthcare system and public health.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Prepare a leaflet/podcast/audio/video on any one stage of mother or child development as a promotional material for parents depicting care of mother and child.	CO 1-3	BTL5
2	Counsel mother for maintaining her and child health.	CO 1-3	BTL6
3	Follow ethical practice.	CO 1-3	BTL5
4	Collaborate and communicate with fellow students.	CO 1-3	BTL5

4. Relevant Theoretical Background

Maternal, neonatal, and child health is a major global health issue that will have far-reaching consequences for future generations. Every year, an estimated 2.7 million babies die in their first 28 days of life, 2.6 million babies are stillborn, and 303,000 women die from pregnancy-related conditions. Sustainable Development Goal 3 aims to ensure healthy lives and promote well-being for all, at all ages. Health and well-being are important at every stage of one's life, starting from the beginning. This goal addresses all major health priorities: reproductive, maternal, newborn, child and adolescent health; communicable and non-communicable diseases; universal health coverage; and access for all to safe, effective, quality and affordable medicines and vaccines.

Pharmacists have a vast opportunity worldwide to play an important role in facilitating or providing products essential for maternal and child health. They should make these products easily available to people visiting the pharmacy. In this context, pharmacists should be able to promote maternal and child health through their education and scope of practice.

The following are roles that pharmacists can play in maternal and child health services:

- Prepare, obtain, store, secure, distribute, dispense, administer, and dispose of medical products.
- Provide effective medication therapy management.
- Maintain and improve professional performance.
- Contribute to the improved effectiveness of the healthcare system and public health.

There are numerous examples of pharmacists improving maternal and child health outcomes. In fact, pharmacists around the world are leading key health projects in community, hospital, and industrial settings, with positive economic and humanistic effects. Furthermore, many of the current

pharmacist roles are in accordance with WHO maternal, newborn, and child health interventions. These roles are summarized in the table below:

Table 2.1 Role of pharmacist in reproductive and child health care

Stage	WHO maternal, newborn and child health interventions	Current pharmacist contribution in line with the WHO suggested interventions to high-priority countries
Pre-Pregnancy	Contraception	Educate women and supply various contraceptive options. Prescribe and/or initiate emergency contraception.
Pregnancy	At least 4 antenatal visits	Educate mothers and supply nutritional supplements, including folic acid and iron supplements. Promote cessation of alcohol and nicotine use. Evaluation of potential teratogenic medicines, and advice on alternative drug regimens if teratogenicity of current treatment is known or a reduction in risk is required (e.g., in epilepsy).
	Prevention of mother-to-child disease transmission	Obtain, store and dispense appropriate antiretrovirals. Promote and facilitate medication adherence. Educate communities and/or patients at high risk of disease transmission.
	Intermittent preventive treatment of malaria for pregnant women	Recommend drug therapy, dosages, and duration of therapy. Promote prevention and early treatment. Promote medication adherence. Supplying non-pharmacological products (e.g., insecticide-treated bed nets). Educate communities at high risk.
	Neonatal tetanus protection	Although pharmacists are usually not involved in neonatal tetanus protection, there is a high potential for pharmacists' involvement.
Birth	Skilled attendant at birth	Make decisions regarding accessibility of critical medications in labor and delivery. Provide required sterile medical products during delivery. Support caregivers (e.g., midwives) through education on medicines and safe medication practices. Ensure safe and legal medicine use policies are in place in labour wards/birth centers/community services/ home birth.
Post-natal	Post natal visits for mother	Identify women at risk of postpartum depression.

Stage	WHO maternal, newborn and child health interventions	Current pharmacist contribution in line with the WHO suggested interventions to high-priority countries
		Ensure guidelines and appropriate medication in place to manage sepsis (maternal and neonatal) and prevent maternal venous thromboembolism.
	Early initiation of breastfeeding	Support breastfeeding (when replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by HIV-infected mothers is recommended).
Infancy	Exclusive Breastfeeding (less than age 6 months)	Assess pharmacokinetics and potential for medicine distribution into breast milk. Patient education on healthy diet and physical activity Recommend non-pharmacological products to facilitate breastfeeding. Ensure guidelines and appropriate medication in place to manage mastitis and other breastfeeding complications.
	Complementary breastfeeding (age 6-9 months)	Breastfeeding Support
	Immunization	Educate caregivers and parents on the importance of comprehensive vaccination (as per local protocols) Documentation of vaccination history.
	Vitamin A supplementation	Vitamin A supplementation is accessible through pharmacies.
Childhood	Children sleeping under insecticide treated nets	Supply insecticide-treated bed nets.
	Care seeking for Pneumonia	Although pharmacists are usually not involved in care seeking for pneumonia, it is our belief that there is a high potential for pharmacists' involvement.
	Antibiotics for Pneumonia	Ensure no deficiencies in quality, purity or potency of medicinal products. Alter dosage forms to improve adherence and ease of administration.
	Diarrhea Treatment	Supply effective drug therapy (including access to oral rehydration salts and zinc therapy). Ensure no deficiencies quality, purity or potency of medicinal products. Access to oral rehydration salts.
	Improved sanitation facilities	Guide the public on the proper disposal of medications.

Stage	WHO maternal, newborn and child health interventions	Current pharmacist contribution in line with the WHO suggested interventions to high-priority countries
	Improved drinking water facilities	Although pharmacists are usually not involved in improving drinking water, it is our belief that there is a high potential for pharmacists' involvement

Nutritional Aspects

The foundation stone in building a healthy family is good nutrition. Good nutritional status is one of the important determinants of health. To remain healthy, one should eat enough of the right food and not merely satisfy hunger. The nutrition of a family depends on factors such as:

a. Social status and religion
b. Family habits, such as a mother giving food to her child as she has seen in her family.
c. Knowledge about the principles of nutrition.
d. Availability of food and what the family can afford.

Pharmacists should counsel people to realize the importance of improving the health and nutritional status of their family. This will help prevent malnutrition, anemia, infectious diseases, eye problems, deficiency conditions, and mental dullness that may arise due to poor nutrition.

Pharmacists should provide nutrition education, including food and cooking instructions. They should also provide preventive healthcare, such as giving iron supplements to pregnant women and vitamin A to young children. Additionally, they should demonstrate the importance of washing hands before serving and eating food (healthy habits of eating and drinking).

Relationship of Nutrition to Health:

Nutrition is science of food and its relationship to health. Malnutrition refers to deficiencies, excesses, or imbalances in a person's intake of energy and/or nutrients.

Food, Nutrients, Functions of Food, and Caloric Requirements:

Food is defined as substances that the body can utilize for nourishment, growth, and health maintenance. Plants of various kinds, as well as birds, fish, and animals, provide food.

Nutrients:

Proteins, carbohydrates, lipids, oils, vitamins, and minerals are all examples of these substances. Many of these nutrients are found in most diets, but no single item includes all of them. Therefore, we need to eat a variety of foods for proper nutrition, understanding their nutrient contents and the importance of those nutrients.

Functions of Foods:

Proteins generally assist in tissue growth, bodybuilding, and repair, while staple foods aid in energy production. Vitamins and minerals contribute to the body's proper functioning and illness prevention. A person is in a condition of good nutrition when all of these functions are met in the body.

Calories:

A calorie is a unit of measurement used to measure the amount of energy in various foods as well as the energy requirements of a person.

Table 2.2. Calories /Energy requirement

Age	Calorie requirement
0-6 months	120 per kg of body weight per day
7-12 months	100 per kg of body weight per day
1-3 years	1200 per day
4-6 years	1600 per day
7-9 years	1800 per day
10-12 years	2100 per day
13-15 years	2300 per day
15-19 years (male)	2300 per day
15-19 years (female)	3000 per day
20 years and above	2800 per day
Moderately active female	2500 per day
Pregnant and Lactating women	2200 per day + 300-700 per day extra

1 gram of carbohydrates provide 4 calories
1 gram of proteins provides 4 calories
1 gram of fats provides 9 calories

Energy foods provide the body with the fuel it needs to function. The more energy you expend, the more energy you require; but even when you are at rest, your body requires energy to breathe, pump your heart, and think. We can stay warm in the winter by exercising and consuming more high-energy foods. Table 2.2 shows the calorie requirements for different age groups.

Role of Pharmacist in Nutrition Education:

a. Encourage parents to bring children for regular check-ups and record weight and height as part of healthcare services in Pharmacy.
b. Counsel for importance of balanced diet, fresh food and avoidance of junk food, ultra processed food items.
c. Display nutrition related information like Charts, tables on Health Information Display in Pharmacy.
d. Detect early cases of malnutrition and provide appropriate treatment and health teaching.
e. Identify cases of nutritional deficiencies, especially vitamin A, and refer all severe cases immediately.
f. Counsel parent hygiene while preparation, handling and storage of food.
g. Encourage families to plant kitchen gardens and use the foods they grow.
h. Guide them to enrich the family diet e.g. by sprouting gram, fermenting cereals, making cereal-pulse mixtures, preparing milk porridge, using green leaves in combination with cereals or pulses like nutritious chapati etc.
i. Participate in national nutrition programs like the Integrated Child Development Scheme, Nutritional Anemia Prophylaxis Programme, Mid-Day Meal Programme, and other nutrition supplementary programs.

5. Requirements

A3 paper, Coloring materials.

6. Requirements used

7. Procedure

a. Select a topic from the various stages of care given to mothers or children from the table provided.
b. Collect information from government websites, visit the Rural Health Center (RHC), discuss with healthcare workers like ASHA, nurses involved in programs, or contact physicians at the RHC or district hospital.
c. Arrange the information in sequence or a systematic manner using bullet points.
d. Create a catchy topic, slogan, or attention-grabbing sentence (could be the title of your poster/leaflet).
e. Use various figures and pictures to illustrate your ideas or data.
f. Ensure that this material is used for counseling people or as informative material (broadcasting material) for the program.

8. Result

The role of pharmacists in reproductive and child health was studied.

9. References

a. https://nhm.gov.in
b. https://nhp.gov.in

10. Practical Related Questions

a. Define antenatal care services.
b. Identify nutrients and related deficiency disease (at least 5).
c. List any 4 roles of ASHA worker in RCHP.
d. List any 4 diseases that could be transferred from mother to child during pregnancy.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 03

Family Planning Methods

1. Aim

To identify various family planning devices and prepare a poster on family planning methods.

2. Practical Significance

Family planning methods are useful for controlling the birth rate and population control. Knowledge of these methods and the devices used will make pharmacists confident in counseling the public about selection, use, as well as the advantages and disadvantages of these devices.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Identify the various family planning methods	CO 1-3	BTL1
2	Prepare a poster as a promotional material for family planning.	CO 1-3	BTL5
3	Collaborate and communicate with fellow students.	CO 1-3	BTL5

4. Relevant Theoretical Background

The family planning methods prevent the fertilization (meeting of the sperm and egg) to avoid pregnancy. These methods are divided into various types, but the following classification is based on their effectiveness.

A. More effective methods

a. Reversible methods

i. Intra Uterine Devices (IUD) (Hormonal method)
ii. Implant (Hormonal method)
iii. Shot (Hormonal method)
iv. Pills (Hormonal method)
v. Ring (Hormonal method)
vi. Patch (Hormonal method)

b. Irreversible/Terminal methods

i. Sterilization (non-hormonal method)

B. Less effective methods

a. Mechanical methods

i. Male condom
ii. Female condom
iii. Cervical cap
iv. Diaphragm

b. Chemical methods

i. Sponge
ii. Spermicide

c. Natural methods

i. Fertility awareness
ii. Withdrawal

d. Post-coital contraception

i. Emergency contraception

A. More effective methods:

a. Reversible methods

i. Intra Uterine Devices (IUD)

These are small T-shaped pieces of plastic placed in the uterus to interrupt the process of insemination and it is a reversible process of contraception. Usually, these devices are made up of polyethylene. There are two types of IUD: Non-hormonal or copper-based (Copper-T) and hormonal. They offer years of protection-between three and twelve months, depending on the type. It is a reversible method that means, if one decides to get pregnant, then the IUD can be removed at any time.

Advantages

- It is very easy to use.
- It offers super long-lasting protection without much effort.
- They do not change hormone levels.
- Women can use it while breastfeeding.

Disadvantages

- They may cause bleeding.
- Women may suffer from cramps and backaches.
- IUD may slip out of uterus.
- It may lead to infection.

ii. Implant

It is a tiny rod that is inserted under the skin of the upper arm. It is very small making it hard to notice after insertion. The implant releases hormones that inhibit ovaries from releasing eggs and thicken cervical mucus, which helps to block sperm from getting to the egg in the first place. It also causes thinning of endometrium and can prevent pregnancy up to three years.

Advantages

- The birth control is taken care of for up to 3 years.
- It can be used while breastfeeding.
- It can be used by women who can't take estrogen.
- It may improve premenstrual syndrome (PMS), depression, and symptoms from endometriosis.

Disadvantages

- It can cause irregular bleeding, especially for the first 6-12 months.
- Some women have irregular bleeding throughout the active period of implant.

iii. Shot

The shot is an injection that prevents women from becoming pregnant. It can control the birth for three months. The shot contains medroxyprogesterone acetate, a synthetic hormone that inhibits the release of eggs from the ovaries. It also thickens cervical mucus, which aids in preventing sperm from reaching the egg. The site of administration should not be rubbed to promote slow absorption,

Advantages

- It is easy to use.
- It might lead to shorter, lighter periods or no periods at all.
- The birth control is taken care of for 3 months at a time.
- It can be used by women who can't take estrogen.
- It's very effective at preventing pregnancy if the shots are taken on time.

Disadvantages

- It can cause irregular bleeding, especially for the first 6-12 months.
- It can cause change in appetite or weight gain.

iv. Pills

Pill is used as an oral contraceptive pill. There are numerous types of pills available in the market, and new ones are introduced on a regular basis. All of them act by releasing hormones that prevent the ovaries from producing eggs. The hormones also thicken the cervical mucus, which aids in the prevention of sperm reaching the egg in the first place. A pill can be either a combination pill or a mini pill.

Combination pill: These pills use a combination of estrogen and progestin (30-35 ~~g~~ estrogen/0.5-1.0 mg progestin) to inhibit ovulation in the body. Some examples include Mala-N (combination of norethisterone acetate and ethinylestradiol) and Mala-D (combination of D-norgestrel and ethinylestradiol).

Mini pill: It is also referred to as a progestin-only pill (POP). These pills contain no estrogen and are frequently administered if the female is sensitive to combination pills and experiencing side effects. These release a small quantity of progestin (norethisterone or levonorgesterol) every day of the month and prevents the period for a specific week.

Advantages

- It is easy to use.
- It might give the lighter periods.
- It gives control over when to have period.
- It can reduce menstrual cramps and premenstrual syndrome.
- Some pills offer protection against endometrial and ovarian cancer, iron deficiency anemia, ovarian cysts, and pelvic inflammatory disease.

Disadvantages

- It may cause bleeding in between periods.
- It may lead to sore breasts.
- It may cause nausea and vomiting.

v. Ring

It is a flexible, latex-free plastic ring that is inserted into vagina. Commonly available ring contains estrogen and progesterone, which are delivered over the course of three weeks. Women should wear the vaginal ring for three weeks. then remove it to enable menstruation, and then replace it after a week. The vaginal ring, like combination birth control pills, prevents conception by releasing hormones in the body.

Advantages

- It is easy to use.
- It may offer protection against endometrial and ovarian cancer, iron deficiency anemia, ovarian cysts, and pelvic inflammatory disease
- It might give the lighter periods.
- It can reduce menstrual cramps and PMS.

Disadvantages

- It can cause bleeding in between periods.
- It may cause breast tenderness.

- It may cause nausea and vomiting,
- It may increase the vaginal discharge which may lead to irritation or infection.

v. Patch

The patch is a thin, beige plastic square that resembles a Band-Aid. The patch can be applied on the buttocks, stomach, upper outside arm, and upper back. Hormones are released from the patch that hinder the ovaries from producing eggs. The hormones also thicken the cervical mucus, which aids in the prevention of sperm reaching the egg.

Advantages

- It is easy to use.
- It can give more regular and lighter periods.
- It can reduce menstrual cramps and PMS.
- It offers protection against endometrial and ovarian cancer, iron deficiency anemia, ovarian cysts, and pelvic inflammatory disease.

Disadvantages

- It can lead to bleeding in between periods.
- It can cause breast tenderness.
- It can cause nausea and vomiting.
- It can lead to an increase in vaginal discharge, irritation, or infection.

b. Irreversible methods

i. Sterilization

Sterilization is a surgery that prevents females from becoming pregnant by closing or blocking their fallopian tubes (tubectomy), and males by closing or blocking their vas deferens (vasectomy). It is a permanent solution for people who do not expect pregnancy in the future. These procedures are carried out in the hospital set up by a team of doctors and support staff.

Vasectomy: In this technique, a small hole or an incision is made in the scrotum, then know is put on the sperm canal or it is blocked off, thus preventing sperm from entering the ejaculate. It takes only a few minutes to recover and is approximately 100% effective in preventing pregnancy.

Tubectomy: In this technique, a small cut is made in the female's belly to reach the fallopian tubes while she is sedated or is under general anesthesia. Thereafter, fallopian tubes are closed, blocked, cut or removed. This keeps sperm from getting to the eggs.

Advantages

- There is no need to worry about pregnancy while having sex.
- It does not involve hormones to be introduced into the body.

Disadvantages

- In extremely rare cases, tubes may reconnect themselves leading to a pregnancy.

B. Less effective methods

a. Mechanical or Barrier methods

i. Male condom

A male condom is a thin latex rubber covering that unrolls over an erect penis. It keeps a man's sperm from getting into a woman's vaginal canal. It can also prevent the partner from sexually transmitted infections (STIs) and HIV. Condoms are 98% efficient in preventing pregnancy when used appropriately at every sexual act.

Advantages

- It protects against STIs, including HIV.
- It is cheap and easy to use.
- There is no need of prescription to purchase male condom.
- It may assist in prevention of premature ejaculation.

Disadvantages

- Side effects will only occur if people are allergic to the latex.

ii. Female condom

A female condom is a pouch with a small ring on one end and a larger ring on the other that is inserted into the vaginal canal during penetration. The small ring side of a female condom that protects the cervix is placed into the vagina, while the other ring is left out. They help to keep the sperms out of the vaginal canal.

Advantages

- It protects against STIs, including HIV.
- There is no need of prescription to purchase female condom.
- It can be used even if a person is allergic to latex.

Disadvantages

- It can cause irritation,
- Some people may be sensitive to certain brands of lubricants used with female condom.

iii. Diaphragm

Diaphragms are shallow, dome-shaped cups made of latex or silicone with a diameter of 5 to 10 cm. They are off-white in colour. Diaphragm is put into the vaginal canal prior to sex and covers the cervix, keeping sperm out of the uterus. One thing to keep in mind is that spermicide must be used for this approach to be effective. After sex, the diaphragm should be in place for at least 6 hours.

Advantages

- There is no need to worry about conception when the diaphragm is present in vagina.
- It does not affect the hormones in female.
- It reduces the risk of pelvic inflammatory disease and tubal infertility.

Disadvantages

- Some women might experience difficulty while inserting it.
- It can cause vaginal irritation.
- Some women might suffer from frequent urinary tract infections.
- It should not be used if the female is allergie to the spermicide or silicone.
- It requires a prescription.

b. Chemical methods

i. Sponge

The sponge is a circular piece of white plastic foam with a dimple on one side and a nylon loop that resembles shoelace material across the top. It is small and implanted way up in the vaginal canal before sex. The sponge acts in two ways: it seals the cervix, preventing sperm from entering the uterus, and it produces spermicide continually.

Advantages

- It can be inserted into the vagina well in advance (24 hours before having sex).
- It does not affect the hormones in female.
- It does not require a prescription.

Disadvantages

- Some women might experience difficulty while inserting it.
- It can cause vaginal irritation.
- Some women might be allergic to sulfa drugs, polyurethane, or spermicide.

ii. Spermicide

It refers to a variety of creams, films, foams, gels, and suppositories that include compounds that inhibit the movement of sperm. As it must be placed deep in the vaginal canal, it also prevents sperm from passing through the cervix and entering the uterus. The principal component in spermicides that inhibits sperm motility is nonoxynol-9. Spermicide can be used to improve the effectiveness of other devices (e.g. condoms).

Advantages

- It is easy to use.
- It does not affect hormones.
- It does not require a prescription.

Disadvantages

- It may leak out of vagina.
- It might irritate vagina or penis.
- Some people might be allergic to spermicide.

c. Natural methods: These methods do not require any devices or products but are less effective.

i. Fertility awareness

Fertility awareness-based strategies, often known as natural family planning, entail charting the menstrual cycle to determine the days when the female is most likely to become pregnant. Women must pay great attention to their bodies and routines in order to recognize those days. There are numerous ways to keep track of fertility on a daily basis as given below:

- Standard Days Method (SDM)
- Two Day Method (TDM)
- Cervical Mucus Method
- Basal Body Temperature (BBT)
- Symptothermal Method
- Lactational Amenorrhea Method (LAM)

ii. Withdrawal

It involves pulling of penis out of vagina during intercourse so that the ejaculation happens outside the vagina. Withdrawal is ineffective in comparison to most other approaches.

d. Post-coital contraception

i. Emergency contraception

Emergency contraceptive pills (ECPs) are commonly referred to as the "morning-after pill" as they are meant to be taken after unprotected sex. Like oral contraceptives, they include either progestin alone or combination of progestin and estrogen, which help to stop ovulation. The hormone dose in

ECPs is higher which may affect health of girls/women and so it should be ONLY used in Emergency contraceptive and NOT as a routine contraceptive.

Role of pharmacist in family planning

a. Pharmacist should provide free advice to customers and the public at ~~glance~~ large about the importance of family planning and spacing of the children.
b. Pharmacist should explain the methods of family planning and help in choosing the most appropriate of the available methods.
c. Pharmacist should refer the patients to family planning centers or to physicians when needed.
d. Pharmacists should counsel people asking frequently for ECPs and explain the risks involved in frequent use
e. Pharmacist should cooperate with physicians and other health professionals to provide family planning services.
f. Pharmacist should participate in elaboration of laws regulating the manufacture, storage, prices, and distribution of contraceptives.
g. Pharmacist should give publicity to the national family planning programs.
h. Pharmacists should display family planning related information on Health Information Display in Pharmacy.

5. Requirements

Various types of family planning devices, A3 paper, Coloring material.

6. Requirements used

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7. Procedure

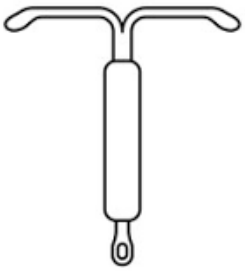
The teacher will explain the use of various family planning devices available in laboratory.

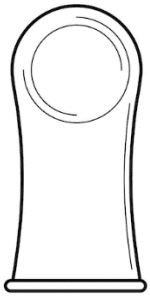
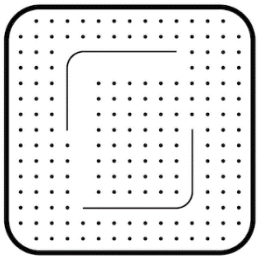
Activity I

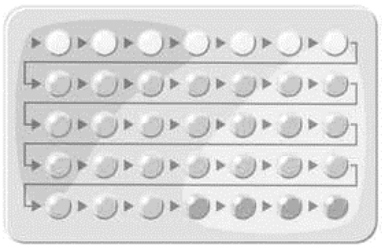
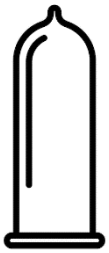
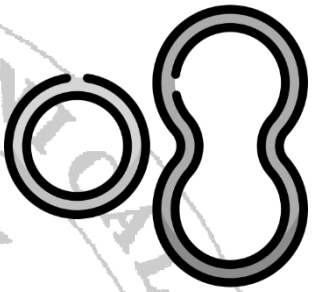
Prepare a poster on A3 paper with appropriate pictures containing information of any 5 family planning devices easily available in retail pharmacy.

Activity II

Identify the family planning devices given below and write a brand name of marketed device.



8. Result

Various family planning devices were identified and prepared a poster on family planning devices.

9. References

a. https://nhp.gov.in
b. https://who.int/news-room/factsheets/detail/family-planning-contraception

10. Practical Related Questions

a. Define the objectives of family planning.
b. Enumerate mechanical techniques used in family planning.
c. Describe four responsibilities of pharmacists in family planning.
d. Explain the mode of action of oral contraceptive pills.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 04

Microscopical Observation of Different Microbes

1. Aim

To examine the permanent slides of various microorganisms using compound microscope.

2. Practical Significance

Pathogens are microorganisms that cause diseases. Pharmacists should be familiar with various microorganisms, their microscopic features, and the diseases they cause. This knowledge will help them counsel patients regarding preventive measures, diagnosis, and treatment of diseases caused by these microorganisms.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Identify microorganisms in the give permanent slides.	CO 3	BTL1
2	Draw the microorganisms seen under compound microscope	CO 3	BTL2
3	Name the diseases caused by the identified microorganism	CO 3	BTL3
3	Collaborate and communicate with fellow students.	CO 3	BTL5

4. Relevant Theoretical Background

Microorganisms are microscopic organisms that occur as single cells, multicellular organisms, or clusters of cells. They aid in the production of oxygen, decomposition of organic matter, provision of nutrients to plants, and maintenance of human health, but some can be harmful and cause diseases in both plants and humans.

Types of microorganisms:

a. Bacteria
b. Archae
c. Protozoa
d. Algae
e. Fungi
f. Viruses
g. Helminths

a. Bacteria

Bacteria are single-celled microorganisms. The cells are prokaryotic in nature (lack of nucleus). Bacillus (rod), coccus (spherical), spirilla (spiral), and vibrio (curved) are the four primary forms. Most bacteria have peptidoglycan in their cell walls, divide by binary fusion, and possess flagella for motility. A fundamental characteristic used in identifying these species is the difference in their cell wall structure. When using Gram staining, bacteria can be categorized as Gram-positive or Gram-negative depending on how their cell wall structure stains. Bacteria are further categorized into three types based on their response to gaseous oxygen i.e. aerobic, anaerobic, and facultative anaerobes.

E.g *Escherichia coli, Staphylococcus aureus, Clostridium tetani.*

b. Archae

In contrast to true bacteria, Archaea or Archaebacteria lack peptidoglycan in their cell wall structure. They are prokaryotic cells with an affinity for harsh environments. Hydrogen gas, carbon dioxide, sulfur, and sunlight (in some cases) serve as energy sources for Archaea.

E.g. *Sulfolobus acidocaldarius and Thermococcus litoralis.*

c. Fungi

Fungi (mushrooms, moulds, and yeasts) are eukaryotic cells. Most fungi are multicellular, with chitin as their cell wall. They absorb nutrients from the material with the help of filamentous tubes called hyphae.

E.g. *Candida albicans, Cryptococcus gattii, Aspergillus niger.*

d. Protozoa

Protozoa are aerobic unicellular eukaryotes. They have a nucleus, complex organelles, and specialized structures for absorption or ingestion of nutrients. Their cell walls are comprised of cellulose. Based on mode of locomotion, they are classified as flagellates, ciliates, amoeboids, sporozoans (non-motile).

E.g. *Plasmodium vivax, Amoeba, Euglena.*

e. Algae

Algae, commonly known as cyanobacteria or blue-green algae, are unicellular or multicellular eukaryotes that depend on sunlight. They can be found in water, damp soil, and rocks, and they produce oxygen and carbohydrates that are used by other organisms.

E.g. *Karenia brevis, a species of blue-green algae.*

f. Virus

Viruses are noncellular microorganisms that have a nucleic acid core (DNA or RNA) and a protein coat. Viruses are categorized as microorganisms; however, they are not classified as living organisms. Viruses cannot multiply or metabolize on their own outside of a host cell. They infect both prokaryotic and eukaryotic cells, resulting in disease.

E.g. Rhino virus, Dengue virus, and HIV.

g. Helminths

The helminths are a family of eukaryotic organisms that includes flatworms and roundworms. Although they are not microorganisms, they do spend part of their life in a tiny form.

E.g. *Trichuris trichiura, Necator americanus,* and *Ancylostoma duodenale*.

5. Requirements

Permanent slides of the microorganisms, Compound microscope with oil immersion lens, Cedarwood oil.

6. Requirements used

_____

_____

7. Procedure

a) Place a permanent slide from the slide box on the stage of the microscope.
b) Focus on the area of the slide containing the smear with a low-power objective.
c) After focusing on the specified area, switch the objectives to 10X and then 40X. Adjust the light and focus as needed.
d) Now, rotate the nosepiece so that there is no objective over the stage.
e) Place 1-2 drops of immersion oil on the slide directly above the area to be viewed.
f) Rotate the nosepiece to bring the lens of the 100X objective in contact with the oil drop.
g) Rotate the fine knob slowly to bring the microbial cells into view.
h) Draw the observed microbial cells in the spaces provided.

(Note: Students can also take photographs of the observed slides and paste the color prints of these photographs in the space provided.)

i) At the end, wipe the slide clean and place it back in the slide box.

8. Observations

Permanent Slide 1

Name of Microorganism: _____

Diagram:

Morphological Description:

_____

_____

_____

Examples of Diseases Caused: _____

_____

Permanent Slide 2

Name of Microorganism: _____

Diagram:

Morphological Description:

_____

_____

_____

Examples of Diseases Caused: _____

_____

Permanent Slide 3

Name of Microorganism: _____

Diagram:

Morphological Description:

_____

_____

_____

Examples of Diseases Caused: _____

_____

Permanent Slide 4

Name of Microorganism: _____

Diagram:

Morphological Description:

_____

_____

_____

Examples of Diseases Caused : _____

_____

Permanent Slide 5

Name of Microorganism: _____

Diagram:

Morphological Description:

_____

_____

_____

Examples of Diseases Caused : _____

_____

9. Result

Following microorganisms were observed _____

_____.

10. References

a. http://bio.libertexts.org/Bookshelves/Microbiology/.
b. Microbiology textbook By Pelczar, M.J.

11. Practical Related Questions

a. Define microorganism.
b. Enlist different types of microorganisms.
c. State difference between Gram-positive and Gram-negative bacteria and give examples of each type.
d. Enlist parts of microbes that assist in their mobility.
e. Write disease caused by following microorganisms:

a. Escherichia coli	*b. Staphylococcus aureus*	*c. Clostridium tetani*
d. Vibrio cholerae	*e. Mycobacterim tuberculosis*	*f. Plasmodium vivax*
g. Rota virus	*h. Candida albicans*	

(Space for Answers)

12. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 05

Oral Health and Hygiene

1. Aim

To study and counsel, the public about various teeth brushing techniques and flossing to maintain oral hygiene.

2. Practical Significance:

As per WHO Fact Sheet, Oral diseases, while largely preventable, pose a major health burden for many countries. Maintaining good oral health is important for overall health and a good quality of life. Pain, suffering, loss of productivity, and low self-esteem are all consequences of poor oral health. Most cases are dental caries (tooth decay), tooth loss, periodontal diseases, and oral cancers. Therefore, it is the responsibility of pharmacists to gain knowledge about various aspects of maintaining oral health and hygiene, and educate the public about them.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Identify various techniques to maintain oral hygiene.	CO 2-4	BTL1
2	Counsel the public about importance of oral hygiene and ways to maintain it.	CO 2-4	BTL5
3	Collaborate and communicate with fellow students.	CO 2-4	BTL5

4. Relevant Theoretical Background

Oral, dental, and gum health are all important aspects of our general health and well-being. The practice of keeping the mouth, teeth, and gums clean and healthy to prevent disease is known as oral hygiene. Dental hygiene and dental health are often overlooked, but they are crucial aspects of our daily lives. Poor oral hygiene can cause tooth cavities and gum disease, and it has also been linked to heart disease, cancer, and diabetes.

Factors contributing to the poor oral hygiene: Overall, there is less health literacy in the society and same is the case when it comes to Oral Health and Hygiene

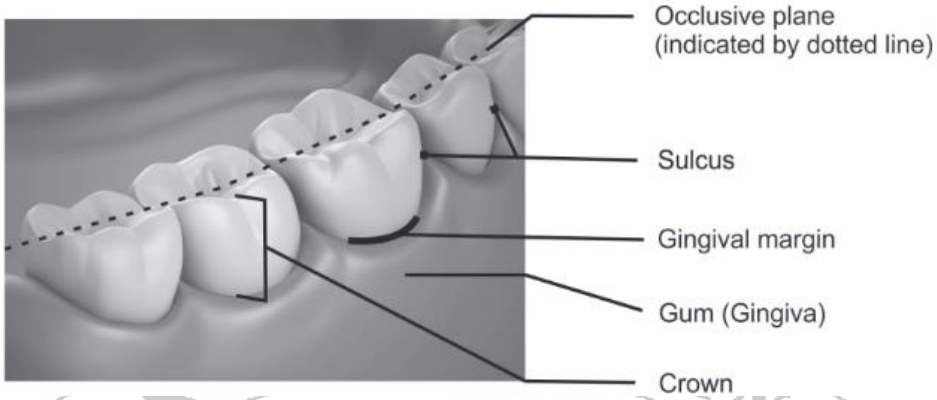
a. Smoking and chewing tobacco products: Smoking leads to dental plaque and gum disease.
b. Poor brushing habits: Inaccurate brushing without proper methods impacts oral hygiene.
c. Consuming sugar: Sugar containing foods and drinks reduces the amount of saliva in the mouth which may lead to oral health issues.
d. Negligence: People often do not visit dentists for regular and preventive checkups.
e. Parents' educational and occupational status: Socioeconomic conditions such as illiteracy and occupation of parents can greatly affect the oral hygiene of their children.

Maintenance of oral health and hygiene:

Effective plaque removal is the primary strategy for preventing numerous oral disorders such as dental caries, gingivitis, and periodontitis. According to the WHO, dental plaque is a specific but highly variable structural entity resulting from the sequential colonization of microorganisms on tooth surfaces, restorations, and other parts of the oral cavity. It is composed of salivary components like mucin, desquamated epithelial cells, debris, and microorganisms, all embedded in an extracellular gelatinous matrix. Tooth brushing, mouth rinses, and flossing are the pillars of self-care

oral hygiene. It is essential that a person understands the right brushing method to maintain dental hygiene and remove plaque effectively.

External parts of teeth and gum



A. Tooth brushing techniques.

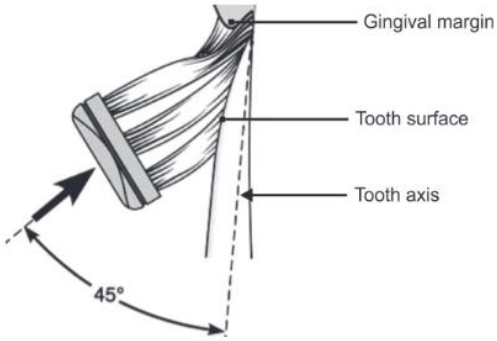
Various brushing techniques have been reported as given below:

a. Bass method
b. Modified bass/sulcus cleaning method
c. Stillman's method
d. Charter's method
e. Fone's technique
f. Leonard's technique
g. Horizontal scrub technique
h. Modified Stillman's technique
i. Hirsfield's brushing technique
j. Smith-Bell (Physiologic) Brushing Technique

Three conventional brushing techniques are discussed below:

a) Bass method

i. The brush head is kept parallel to the occlusal plane, and the brush head covers nearly 3-4 teeth starting from the distal most tooth of arch.
ii. The bristles are placed at a 45° angle to the tooth's long axis near the gingival margin.
iii. Short back and forth or circular movements are used to apply gentle vibratory pressure for 15 to 20 counts, dislodging the bristle tips.



Advantages

a. Effectively removes the plaque beneath gingival margin, cervical areas and sulcus.
b. Provides good gingival stimulation.

Disadvantages

a. Can cause injury to the gingival margin.
b. Time consuming.
c. Can cause laceration of the gingiva.

b) Stillman's method

i. In this method, the bristles are placed at a 45° angle to the tooth's long axis but unlike Bass method, bristles v. Cur are placed half in the sulcus and half on the gingiva.
ii. The stroke applied is same as that of Bass method.

c) Charter's method

i. In this method, bristles are placed at a 45-degree angle on the gumline, directed toward the chewing surface or crown of the tooth. This is exactly opposite to the Bass and Stillman technique.
ii. Brief circular strokes or short back and forth motions are used to gently vibrate the brush for 15 to 20 counts.
iii. All the teeth are brushed in the same direction, making sure that all surfaces and sides are cleaned.

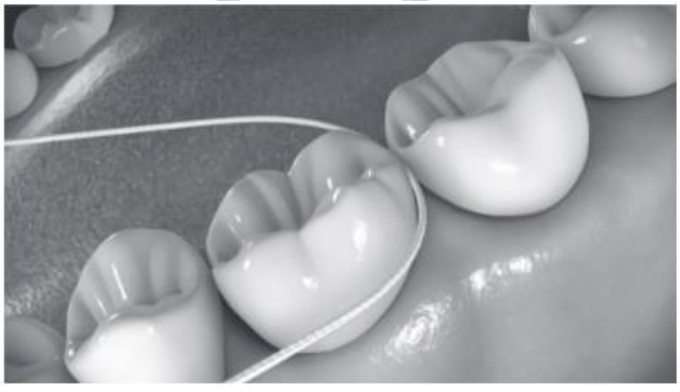
Advantages

a. The technique is preferred for patients with orthodontic and prosthodontic appliances.
b. Removes plaque effectively.
c. Suitable after periodontal surgery.

B. Flossing

Flossing is an important dental hygiene practice. It cleans and dislodges food lodged between the teeth, lowering bacteria and plaque levels in the mouth. Flossing aids in the removal of food and plaque lodged between the teeth, whereas brushing removes these particles from the mouth. If a person brush first and then flosses afterward, food and plaque can remain in the mouth.

Steps involved in flossing:



i. Take around 18 to 24 inches of dental floss and cut it off. To handle the floss properly, wrap the majority of it around both middle fingers, leaving only around 1 to 2 inches of floss for the teeth.
ii. With your thumbs and index fingers, pull the floss taut.
iii. Insert the dental floss between two teeth. Glide the floss up and down the length of each tooth, rubbing it on both sides. Glide the floss between the teeth rather than into the gums to avoid scratching or bruising the gums.
iv. Curl the floss at the base of the tooth to create a C shape as it reaches the gums. This allows the floss to get between the gums and the teeth.
v. Repeat these instructions for every tooth, and use a new, clean section of floss for each tooth.

C. Mouth-rinsing

Mouthwash, also known as mouth rinse, can be a useful complement to daily oral hygiene practices for certain people, but it is not a replacement for brushing and flossing. Like interdental cleansers, mouthwash has the advantage of accessing places that are difficult to reach with a toothbrush. It contains active chemicals meant to control or minimize conditions such as bad breath, gingivitis, plaque, and tooth decay.

The active ingredients in most mouthwashes include:

a. Cetylpyridinium chloride: Stops bad breath.
b. Chlorhexidine and essential oils: Control plaque and gingivitis.
c. Fluoride: Prevents tooth decay.
d. Peroxide: Whitens the teeth.

The decision to rinse before or after brushing depends on the components of the dentifrices. Some dentifrice constituents, such as calcium hydroxide or aluminum hydroxide, can form a compound with fluoride ions, reducing the efficiency of mouthwash. If these substances are present, vigorous rinsing with water may be recommended after brushing and before using mouthwash.

5. Requirements

Human teeth model, Toothbrush, Floss thread, Marketed mouth-wash preparation

6. Requirements used

_____

_____

7. Procedure

Demonstration of brushing techniques and flossing

The subject teacher must demonstrate the Bass, Stillman's, and Charter's brushing techniques followed by flossing to the students, using a human teeth model, toothbrush, and floss thread. The demonstration can also be given with the help of YouTube videos.

Activity I: Identify the oral hygiene techniques given below:

1. _____ **2.** _____

3. _____ **4.** _____

Activity II

The subject teacher will form groups of 4-5 students and assign the following counseling tasks to the students. After enacting the counseling task, students will note down key points of counseling.

a. Counsel the customer on Bass / Stillman's / Charter's Brushing techniques or on regular and proper brushing techniques

_____

_____

_____

_____

_____

b. Counsel the customer about flossing technique.

_____

_____

_____

_____

_____

_____

c. Counsel the customer about use and importance of mouthwash.

8. Result

Various brushing and flossing techniques were studied, and customer counselling regarding oral health was done.

9. References

a. https://www.who.int/news-room/fact-sheets/detail/oral-health
b. https://healthline.com/health/how-to-floss
c. https://da.org/resources/research/science-and research-institute/oral-health-topics

10. Practical Related Questions

a. Provide a definition of oral care.
b. List the factors that lead to inadequate oral care.
c. Identify four methods for brushing teeth.
d. Discuss the significance of using dental floss.
e. Describe the process of plaque development.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 6

Personal Hygiene Etiquettes: Hand Washing Techniques, Coughing and Sneezing Etiquettes

1. Aim

To prepare a poster and counsel the public about hand washing techniques and etiquettes to be followed while coughing and sneezing.

2. Practical Significance

Improper hand washing techniques and coughing/sneezing in public spaces without covering the mouth and nose can lead to the spread of mild to severe respiratory infections. Therefore, to prevent the spread of such infections, pharmacists must guide society about hand washing techniques and the etiquettes to be followed during coughing and sneezing.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Prepare a poster/leaflet as an educational material for hand washing techniques and etiquettes to be followed during coughing and sneezing.	CO 2,4	BTL5
2	Counsel the public about techniques of hand washing and etiquettes to be followed during coughing and sneezing.	CO 2,4	BTL6
3	Collaborate and communicate with fellow students.	CO 2,4	BTL5

4. Relevant Theoretical Background

Personal hygiene measures are critical for avoiding illness and transferring germs to others. Some of the most critical aspects of personal hygiene include covering coughs and sneezes and keeping hands clean. Regular hand washing and following proper etiquette while coughing and sneezing can prevent diarrhea, as well as serious respiratory infections like influenza, respiratory syncytial virus (RSV), whooping cough, and COVID-19. The transmission of germs can readily occur through:

a. Coughing, sneezing, or talking.
b. Touching the face with unclean hands after touching contaminated surfaces or objects.
c. Touching surfaces or items that are likely to be touched by others.

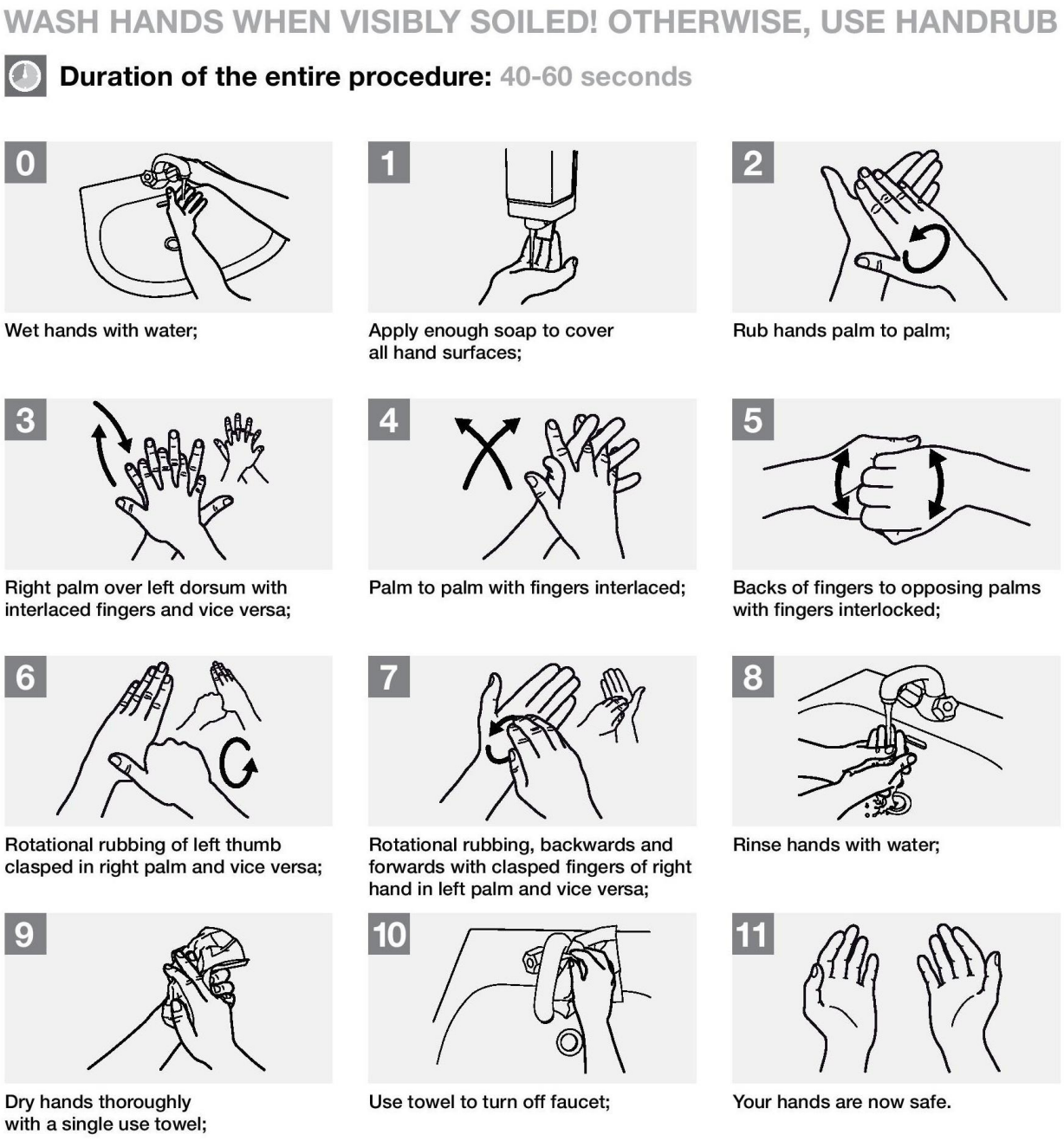
Hand washing techniques

One of the most cost-effective strategies to prevent the spread of germs is frequent hand washing. Simple handwashing can prevent most infectious diseases.

Hands should be washed:

a. When they are dirty.
b. After using the restroom.
c. Before eating, serving, or preparing food.
d. Following contact with pets or other animals.
e. Following outdoor activities.
f. Before and after visiting someone, who is ill.
g. After sneezing, coughing, or blowing the nose.
h. After touching the garbage.

Steps for Hand Washing (As per WHO guidelines).



Coughing and sneezing etiquettes

Infectious respiratory droplets present in a cough or sneeze are the major means by which viral respiratory diseases spread from person to person. These droplets can cause illness through:

a. Inhaling the droplets.
b. Contaminating surfaces that are frequently touched.
c. Coming into contact with a person's eyes, nose, or mouth.

Practicing proper coughing and sneezing etiquette can prevent the spread of infection.

Steps to be followed to cover the cough/sneeze in right manner:

a) Get a tissue for face

Consider bringing travel packs of facial tissue while going out of the house.

b) Get away from the crowd

Try to turn away from everyone in a crowded area.

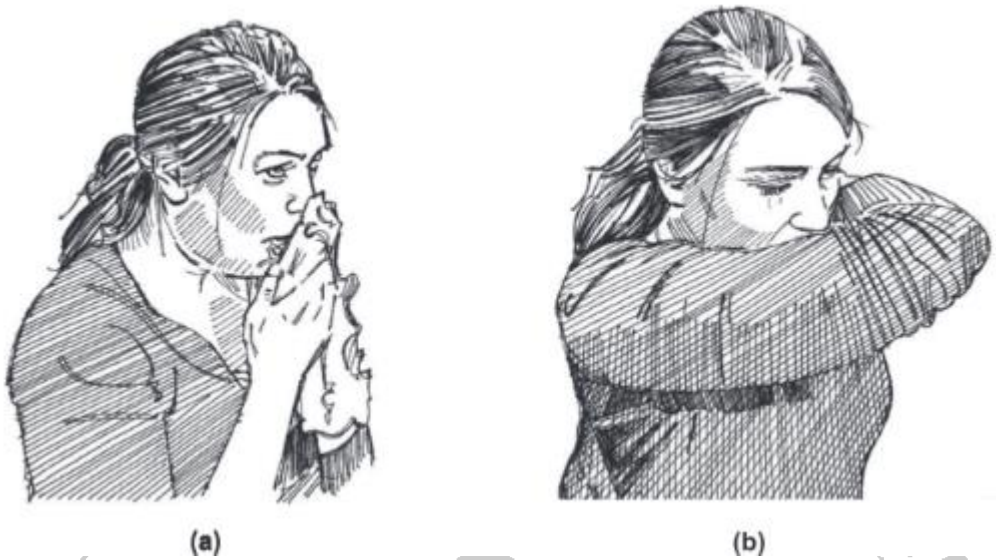


Figure 6.2: Coughing and sneezing etiquettes

c) Cough/sneeze onto the tissue

One must close the entire mouth and nose with tissue while coughing/sneezing (Figure A). The used tissue must be disposed into the trash container. If trash container is not available, keep a disposable, sealable plastic bag within reach.

d) Wash your hands

If soap and water are not accessible, hand sanitizer should be used.

e) Cough/sneeze into the crook of elbow

If face tissue is not available (Figure B). Keep in mind that coughing/sneezing into hands should be the last option, after which the hands should be washed for 20 seconds using soap. Also, if coughing/sneezing is continuous, one must stay at home. Avoiding carrying the cough/sneeze out of the house in the first place is the best approach to help others avoid getting sick.

If cough/sneeze continues, wear mask.

5. Requirements

Tissue paper, Liquid soap with dispenser, A3 Paper, Colour pen and pencils.

6. Requirements used.

_____

_____

7. Procedure

The teacher will demonstrate hand washing technique and etiquette for coughing and sneezing. Individual students will demonstrate hand washing technique etiquette for coughing and sneezing in front of all other students.

Activity I

The subject teacher will form a group of 4-5 students. S/he will assign following counselling activities to each group.

a) Counsel a school student about the importance of hand washing.

_____

_____

_____

_____

b) Educate a group of people about coughing etiquettes at a public place.

_____

_____

_____

_____

Activity II

Prepare a poster containing pictorial and textual information about hand washing technique.

8. Result

Hand washing technique and etiquette to be followed during coughing and sneezing were demonstrated and poster of hand washing was prepared.

9. References

a. www.nhp.gov.in/hand-washing_pg
b. https://who.int/

10. Practical Related Questions

a. State reasons for handwashing.
b. List any four communicable diseases.
c. When should we wash our hands?
d. Name two diseases spread through coughing or sneezing (Air).
e. Explain how soap or liquid soap kills the microorganism?

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 07

Handling of different PPEs

1. Aim

To identify different types of masks and prepare a poster on the handling of Personal Protective Equipment (PPE).

2. Practical Significance

As frontline workers in epidemic and pandemic situations, pharmacists should have complete knowledge about different types of masks and PPE to prevent themselves from getting infected. This will help them provide services to the community without fear. Additionally, pharmacists can educate healthcare workers about the proper use and disposal of masks and PPE.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Identify different types of masks.	CO 2,4	BTL1
2	Demonstrate the proper use of masks and PPE gear followed by its disposal.	CO 2,4	BTL3
3	Collaborate and communicate with fellow students.	CO 2,4	BTL5

4. Relevant Theoretical Background

A. Personal Protective Equipment (PPE)

PPE refers to protective gear such as helmets, gloves, face shields, goggles, facemasks, and respirators, as well as other equipment designed to keep the wearer safe from harm or the spread of infection or illness. In healthcare environments such as hospitals, clinics, and labs, PPE is routinely used. When worn correctly, PPE acts as a barrier between infectious microbes and the wearer's skin, mouth, nose, and eyes (mucous membranes). This barrier prevents contaminants from being transmitted through blood, bodily fluids, or respiratory secretions.

Components of PPE

a. **Gloves**: Gloves provide protection from potentially infectious microorganisms or contaminated surfaces when the wearer is directly handling them.

b. **Gowns or Suits with hoodie**: Gowns prevent the clothes from getting contaminated from infectious microorganisms. Suits with hoodie also prevent head from getting contaminated.

c. **Shoe cover and headcover**: Shoe/shoe leggings and headcovers (in case of gowns) provide protection against probable contamination in a hazardous area.

d. **Respirators and mask**: Respirators filter the air before breathing it, while surgical masks protect the nose and mouth from droplets of body fluids.

e. **Additional Eye and Face Protection**: Goggles protect the eyes from splatters whereas face shield protects the facial skin, eyes, nose and mouth from spatters of biological fluids.

Fig 7.1: Components of PPE

B. Masks

Masks are intended to contain the respiratory droplets and particles which are exhaled out during respiration. Masks also give some protection against the droplets and particles expelled by others. Cloth masks, surgical masks, and N95 respirator masks are the most common types of masks.

a. Cloth masks

Non-medical or social masks are designed to serve as a first line of defense by preventing droplets from entering the air and infecting others. They can be used regularly, but their effectiveness is lower than that of other masks because cloth masks do not filter bacterial particles from the air. Using a cloth mask is generally preferable to not using any mask at all. They come in various shapes and sizes, made of cloth, fabrics, and other materials.

b. Surgical masks

A surgical or disposable mask is a piece of personal protective equipment worn by health professionals during medical procedures. It blocks air, particle droplets, and sprays containing viruses. Due to its loose fit, it does not prevent small airborne particles from entering the nose and mouth. Surgical masks are strongly suggested for individuals caring for infected people, as well as frontline workers and healthcare providers. Depending on the number of protective layers, they are classified as 3-ply and 4-ply surgical masks.

c. N95 Respirators

This mask contains respirators that filter approximately 95% of very small particles and can trap viruses and bacterial particles as small as 0.3 microns in size. The public should not use this polypropylene mask regularly. These masks are highly recommended for doctors, frontline workers, and those who meet COVID-19 patients.

a. Cloth masks

b. Surgical masks

c. N95 Respirators

Steps for using cloth masks (as per WHO)

a. Wash your hands before touching the mask.
b. Check whether the mask is damaged or dirty.
c. Wear the mask and adjust it properly on your face without leaving gaps on the sides.
d. Ensure that the mask covers your mouth, nose, and chin.
e. Avoid touching the mask while wearing it.
f. Clean your hands before removing the mask.
g. Remove the mask by holding the straps behind your ears or head.
h. Pull the mask away from your face.
i. If the mask is not dirty or wet, store it in a clean, resealable plastic bag for reuse.
j. When reusing, remove the mask from the bag by holding the straps.
k. Wash the mask with soap or detergent using hot water once a day.

Steps for using surgical masks (as per WHO)

a. Wash your hands before touching the mask.
b. Check whether the mask has tears or holes.
c. Identify the top side, which usually has a metal piece or stiff edge.
d. Wear the mask with the colored side facing outward and position the metal piece or stiff edge over your nose.
e. Use both hands to mold the metal piece to fit snugly against your nose and face below your eyes.
f. Ensure that the mask covers your mouth, nose, and chin.
g. Adjust the mask properly on your face to eliminate gaps on the sides.
h. Avoid touching the mask unnecessarily.
i. Remove the mask by holding the straps behind your ears or head.
j. Keep the mask away from your body and surfaces while removing it.
k. Discard the mask immediately after use into a closed dustbin.
l. Wash your hands after discarding the mask.

Steps for using N95 respirator (as per CDC)

a. Position the respirator in your hands with the nose piece at your fingertips.
b. Cup the respirator in your hand, letting the headbands dangle below your hand. Keep the nosepiece up and the respirator beneath your chin.
c. Pull the top strap over your head and allow it to rest at the top back. Similarly, pull the bottom strap and place it below your ears and around your neck. Ensure that the straps are not crisscrossed.
d. Place your fingertips from both hands at the top of the metal nose clip. Slide your fingertips down both sides of the metal strip so that it molds to the shape of your nose.

e. To ensure a satisfactory fit, perform a user seal check:
   i. Place both hands over the respirator and take a quick breath in to see if it seals firmly to your face.
   ii. Exhale while placing both hands completely over the respirator. If there is leakage, the seal is improper.
   iii. If air leaks around the nose, make the necessary adjustments to the nosepiece. If air leaks around the borders of the mask, re-adjust the straps along the sides of your head until you achieve a proper seal.
f. When removing the respirator, do not touch the front as it may be contaminated.
g. Remove the respirator by pulling the bottom strap over the back of your head, followed by the top strap, without touching the respirator. Discard the respirator if (1) it becomes more difficult to breathe through, (2) it becomes dirty, or (3) the respirator gets damaged.
   (Note: Users should follow the instructions provided on the product container or its leaflet by the manufacturer, as the above information is generally applicable to conventional N95 masks.)

Steps to wear PPE kit:

a. The dressing and undressing of PPE should be supervised by another trained member of the team.
b. Remove all personal items (jewelry, watches, cell phones, pens, etc.).
c. Put on rubber boots. If not available, make sure you have closed, puncture-resistant, and fluid-resistant shoes and put on overshoes.
d. Perform hand hygiene (as per experiment no. 6).
e. Put on gloves (over the cuff).
f. Put on a disposable gown made of fabric that is tested for resistance to penetration by blood or body fluids or to blood-borne pathogens.
g. Put on face protection: Put on a medical mask. Put on goggles or a face shield.
h. Put a head cover on, covering the ears too.
i. If an impermeable gown is not available, place a waterproof apron over the gown.
j. Put on a second pair of (preferably long-cuff) gloves over the cuff.

Precautions while wearing the PPE gear

a. Avoid touching or adjusting PPE.
b. Remove gloves if they get damaged.
c. Change gloves while moving from one patient to the other.
d. Perform hand hygiene before putting on new gloves.

Steps to remove PPE gear

a. Remove PPE gear under supervision of a trained member. Ensure that infectious waste containers are available in the doffing area for safe disposal of PPE. Separate containers should be available for reusable items.
b. Perform hand hygiene (as per experiment no. 6).
c. Remove apron leaning forward and taking care to avoid contaminating hands. When removing disposable apron, tear it off at the neck and roll it down without touching the front area. Then untie the back and roll the apron forward.
d. Perform hand hygiene on gloved hands.
e. Remove the outer pair of gloves and dispose of them safely.
f. Perform hand hygiene on gloved hands.

g. Remove head and neck covering taking care to avoid contaminating your face by starting from the bottom of the hood in the back and rolling from back to front and from inside to outside and dispose of it safely.
h. Perform hand hygiene on gloved hands.
i. Remove the gown by untying the knot first, then pulling from back to front rolling it from inside to outside and dispose of it safely.
j. Perform hand hygiene on gloved hands.
k. Remove eye protection by pulling the string from behind the head and dispose of it safely.
l. Perform hand hygiene on gloved hands.
m. Remove the mask from behind the head by first untying the bottom string above the head and leaving it hanging in front, and then the top string next from behind head and dispose of it safely.
n. Perform hand hygiene on gloved hands.
o. Remove rubber boots without touching them (or overshoes if wearing shoes). If the same boots are to be used outside of the high-risk zone, keep them on but clean and decontaminate appropriately before leaving the doffing area.
p. Perform hand hygiene on gloved hands.
q. Remove gloves carefully with appropriate technique and dispose them of safely.
r. Perform hand hygiene.

C. Disposal of masks and PPE

Discarded masks and used PPE from healthcare facilities should be separated and sent to common facilities for disposal according to the Bio-medical Waste Management regulations of the city. However, used PPEs like masks and gloves from common households, commercial establishments, institutions, etc., should be stored separately (in a special biohazard-designated dustbin) for a minimum of 72 hours before disposal along with solid waste, after cutting or shredding.

5. Requirements

Cloth mask, surgical mask, N95 respirator, PPE gear with disposable bag, A3 Paper, Coloring material.

6. Requirements used

_____

_____

7. Procedure

The teacher will explain and demonstrate use of various types of masks, as well as different components of PPE, including wearing and disposal procedures.

Activity I

"Wear any one type of mask and teach the technique to a dummy patient/customer".

(We can ask students to get their own mask like surgical masks, some can get N95)

Activity II

Prepare a colorful flow diagram on A3 paper about handling of PPE gear. The student can add small pictures wherever necessary.

8. Result

Different types of masks were identified, correct technique of wearing the masks and PPE gear was learnt.

9. References

a. https://cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/types-of-masks.html.
b. https://who.int/emergencies/diseases/novel-coronavirus-2019/

10. Practical Related Questions

a. Define surgical mask.
b. List various categories of masks.
c. Describe the functionality of an N95 respirator.
d. Identify the elements comprising personal protective equipment (PPE).
e. Explain the procedure for disposing of PPE gear.
f. State the full forms of WHO, COVID, SARS, and MERS.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 08
Menstrual Hygiene

1. Aim

To study and demonstrate various menstrual hygiene products and prepare an educational poster on menstrual hygiene.

2. Practical Significance

In India, menstrual health remains a low-priority issue due to taboos, shame, ignorance, and poor hygiene. Pharmacists must promote menstrual hygiene, especially in rural areas/uneducated masses and encourage females to use menstrual hygiene products. In this experiment, students will understand various menstrual products and prepare posters to increase awareness about menstrual hygiene.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Identify different types of menstrual hygiene products.	CO 2,4	BTL1
2	Classify the menstrual hygiene products.	CO 2,4	BTL2
3	Prepare an educational poster on menstrual hygiene.	CO 2,4	BTL6
4	Collaborate and communicate with fellow students.	CO 2,4	BTL5

4. Relevant Theoretical Background

Menstruation (also known as menses, menstrual period, menstrual cycle, or periods) is the shedding of a woman's uterine lining once a month. The menstrual blood, a mixture of blood and uterine tissue, flows from the uterus to the vagina and then out of the body.

Menstrual hygiene is a sanitary technique that protects women from infections in their reproductive and urinary tracts during menstruation. Poor menstrual hygiene significantly contributes to female morbidity and the high prevalence of reproductive tract infections in the country. In India, taboo and socio-cultural constraints continue to surround menstruation and menstrual habits, leading to a lack of awareness among adolescent girls regarding scientific facts and sanitary health practices. This lack of awareness can result in negative health effects. Poor attitudes and practices stem from a lack of information about menstruation and menstrual hygiene.

Several concerns must be addressed simultaneously to promote menstrual hygiene, including knowledge, availability, and quality of napkins, regular supply, privacy, water supply, napkin disposal, reproductive health education, and family support.

Unhealthy menstruation practices can have negative consequences:

a. Irritation of the skin can lead to dermatitis, a medical condition characterized by swelling, redness, and sometimes painful blisters.
b. Urinary tract infections (UTIs) can result from bacterial infections in the urethra.
c. UTIs can occur anywhere in the urinary tract and pose a risk to kidney health if left untreated. These infections can also increase the risk of bacterial vaginosis, particularly impacting women trying to conceive.

Frequent occurrence of these infections can have long-term consequences, including difficulties in conceiving, higher chances of miscarriage, and premature birth. Therefore, maintaining proper menstrual hygiene is crucial to safeguarding a woman's reproductive health.

Healthy practices to be followed during menstruation:

a) Change napkins frequently: The cardinal rule for maintaining vaginal cleanliness is to change sanitary napkins every 4-6 hours. When menstrual blood is shed, it attracts various organisms from our bodies, which multiply in the warm blood and can cause discomfort, rashes, and urinary tract infections. Changing sanitary napkins regularly slows the growth of these germs and helps prevent infections.

b) Wash the vagina properly: It's crucial to wash the vaginal area regularly due to the germs that remain on the body after removing the sanitary napkin. Proper washing should be done from the vagina to the anus, not the other way around.

c) Avoid using soaps: Overusing vaginal hygiene products daily should be avoided. During menstrual cycles, the vaginal cavity has its own cleansing mechanism, and using too many artificial hygiene products may interfere with this natural process, leading to infections and bacterial growth.

d) Dispose of the sanitary napkin properly: Properly disposing of sanitary napkins is essential. Before disposal, wrap it properly to prevent the spread of infections. Do not flush it, as this can clog the toilet and cause water backup, spreading bacteria. After wrapping and discarding used sanitary napkins, wash hands thoroughly.

e) Stick to one sanitation method: Using multiple methods can sometimes give the impression of lower menstrual blood loss and prolonged use of items, increasing the risk of infection due to extended contact. Stick to one method to maintain hygiene and reduce infection risks.

Menstrual hygienic products:

The menstrual hygiene products can be classified based on environmental impact as follows:

A. Reusable products
   a. Cloth or cloth-pads
   b. Menstrual cups
B. Non-reusable products
   a. Compostable
      i. Compostable sanitary pads
      ii. Tampons with plastic applicator
   b. Non-compostable
      i. Cellulose-based sanitary pads
      ii. Cellulose-based panty liners

Cloth or Cloth Pads:

Cloth pads are worn in underwear to collect menstrual fluid. These are reusable menstrual hygiene product that can be used instead of disposable sanitary napkins or menstrual cups. These are cheap, readily available, and easy to use. However, washing should be done with caution to avoid infection.

Menstrual Cups:

A menstrual cup is another type of reusable menstrual hygiene product. It is a small, flexible, funnel-shaped cup made of rubber or silicone that goes inside the vaginal canal to trap and collect menstrual blood. Since cups can hold more blood than other methods, many women prefer them as an eco-friendly option. They can be used for up to 12 hours depending on flow and do not require frequent changing. However, they are not as readily available, require training to use, and are more expensive than cloth or cloth pads.

Cloth pads

Menstrual cup

Compostable sanitary pads

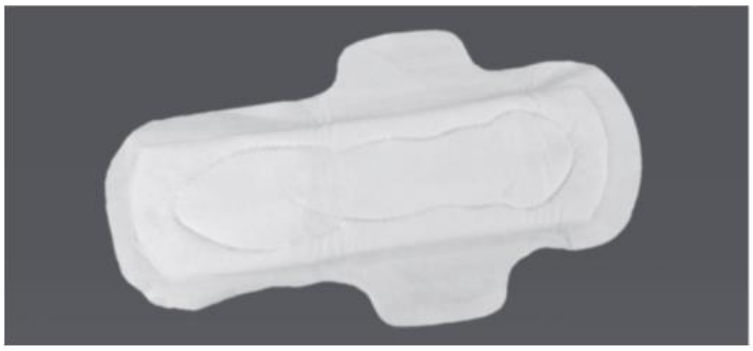
Compostable sanitary pads:

These are single-use disposable sanitary pads made of cotton that are sterile. Fragrance and anti-microbial agents can be incorporated. These are available in various sizes. They are inexpensive, although they are more costly than cloth pads.

Tampons:

Tampons are single-use disposable items that are sterile and can be reused if made of cotton. Some tampons use cellulose material. A single tampon can absorb up to 4 ml of menstrual blood and can last for 4-6 hours. Tampons are more expensive than sanitary pads. They come with a built-in applicator, which can be cardboard or plastic. Tampons with a cardboard applicator are biodegradable, but those with a plastic applicator take longer to disintegrate (sometimes non-degradable). Their use is simple, although they may sometimes require training.

Tampons



Cellulose based sanitary pads

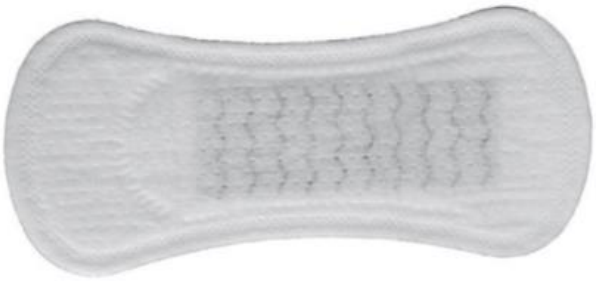
Cellulose based sanitary pads

These are disposable sanitary pads made of bleached rayon (cellulose derived from wood pulp), cotton, and polymers. Fragrance and antimicrobial substances can also be added. The backing sheet is made of plastic and consists of polymer powder, which acts as an additional powerful absorbent (super absorbent polymers) that turns into a gel when wet. An absorbent core material is sandwiched between a flexible liquid-pervious top sheet and a liquid-impervious plastic back sheet with adhesive on the outside for attaching the napkin to an undergarment. Recycling these pads is difficult and rarely done due to cost constraints. They are more expensive, single-use, and take longer to degrade.

Cellulose based panty liner

A panty liner is a thin, absorbent piece of cloth worn inside underwear that is used only once. It is a thinner form of a cellulose-based sanitary pad. Panty liners are designed to act as a barrier against daily vaginal discharge or light menstrual flow because they are lighter and thinner. They are not suitable for high-volume discharge. When used with tampons or a menstrual cup, panty liners

provide additional protection. Like cellulose-based pads, panty liners are disposable and require more time to degrade. Panty liners must be changed regularly, and it is recommended to change them every 3-4 hours.



Cellulose based panty liner

5. Requirements

Various types of sanitary pads, website of Central Council for Research in Ayurvedic Sciences (CCRAS) and Ministry of women and child development of Government of India, A3 paper, Colouring material.

6. Requirements used

_____

_____

7. Procedure

The subject teacher must show various types of menstrual hygiene products and explain their use and disposal procedure to the students. The product information leaflets can be used if required.

Activity I

Draw the following menstrual hygiene products in the space provided below:

1. Menstrual cup 2. Tampon 3. Cellulose based sanitary pad 4. Cellulose based panty liner

Activity II

Prepare a poster containing pictorial and textual information about maintenance of menstrual hygiene.

8. Result

Various menstrual hygiene products were studied and an educational poster on menstrual hygiene was prepared.

9. References

a. https://mdpi.com/1600-4601/15/11/2562/s1
b. https://www.unicef.org/media/91346/file/UNICEF-Guide-menstrual-hygiene-materials-2019.pdf

10. Practical Related Questions

a. Define menstrual hygiene.
b. Give details of the adverse effects of poor menstrual hygiene practices.
c. Categorize menstrual hygiene items.
d. Provide an explanation of a tampon.
e. Enumerate five recommended healthy habits for menstruation.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 09

First Aid-Basic Life Support for Sudden Cardiac Arrest

1. Aim

To demonstrate the first aid- Basic Life Support (BLS) for sudden cardiac arrest and prepare a poster or leaflet about Cardiopulmonary resuscitation (CPR).

2. Practical Significance

Sudden cardiac arrest (SCA) is a primary cause of death that can strike anyone at any age. Pharmacists must create awareness in the society about the first aid measures to be taken if someone suffers from SCA. In this practical session, students will learn about the steps to perform cardiopulmonary resuscitation (CPR) and operate an automated external defibrillator (AED) so that they can educate society about these procedures.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Use CPR technique and AED to revive anyone suffering from SCA.	CO 2,4,5	BTL3
2	Prepare an educational material on CPR.	CO 2,4,5	BTL6
3	Demonstrate the CPR.	CO 2,4,5	BTL3
4	Collaborate and communicate with fellow students.	CO 2,4,5	BTL6

4. Relevant Theoretical Background

Sudden cardiac arrest (SCA) is a condition in which the heart stops beating suddenly and unexpectedly. Blood flow to the brain and other essential organs is cut off as a result. SCA usually results in death if not addressed within minutes.

The heart has a self-regulating electrical mechanism that ensures proper heart function. The pacemaker cell (SA node) and latent pacemaker (AV node, bundle of his) send out a signal that causes electrical activity, which regulates the rate and rhythm of the heartbeat. Problems with the electrical system of the heart can lead to irregular heartbeats and arrhythmia. SCA is caused by certain arrhythmias which cause the heart to stop pumping blood to the body.

SCA is not the same as a heart attack. When blood supply to a segment of the heart muscle is blocked, a heart attack ensues. Usually during a heart attack, the heart does not stop beating suddenly. SCA, on the other hand, can occur after or during the recovery from a heart attack.

SCA is more common in people with heart disease (ventricular fibrillation, ischemic heart disease, coronary artery disease, significant physical stress, certain hereditary abnormalities, and anatomical alterations in the heart). SCA can, however, occur in persons who appear to be healthy and have no documented cardiac disease or other risk factors.

Symptoms of SCA

a. Loss of consciousness (be unresponsive) b) No breathing (be not breathing normally)
b. No pulse
c. No movement or signs of life.
d. Before fainting, some people experience a racing heart, dizziness, or light-headedness. Some people experience chest pain, shortness of breath, nausea (feeling sick to the stomach), or vomiting an hour before SCA.

First Aid in SCA

Sudden cardiac arrest is a life-threatening situation. A person with SCA should be treated with a defibrillator as soon as possible. An electric shock is delivered to the heart using this device. An electric shock can help a heart that has stopped beating regain its regular rhythm. Defibrillation must be performed within minutes after SCA for it to be effective. The chances of surviving SCA gradually decrease with each passing minute. One must immediately call the medical emergency service if he/she finds a person suffering from SCA. A person with SCA should receive cardiopulmonary resuscitation (CPR) until defibrillation can be performed.

Cardio-Pulmonary Resuscitation (CPR)

CPR is a life-saving procedure performed when a person's breathing or heartbeat has stopped. This could happen because of a medical emergency, such as an electric shock, a heart attack, or drowning. CPR is a technique that combines rescue breathing with chest compressions. Rescue breathing supplies oxygen to the person's lungs. Chest compressions keep oxygen-rich blood moving until the heartbeat and breathing can be restored.

Steps before performing CPR

a. First and foremost, assess the situation and the individual. Once the scenario is safe, tap the person on the shoulder and ask, "Are you OK?" to see whether the person requires assistance.
b. If it's clear that the person needs assistance, call medical emergency (or ask someone nearby to call), and send someone to get an automated external defibrillator (AED).
c. Make sure the airway is clear. Tilt the head back slightly to elevate the chin while the person is lying on his or her back.
d. Check whether the person is breathing. Listen for sounds of breathing for no longer than 10 seconds. (Gasping sounds are not the same as breathing.) Start CPR if the person is not breathing.

Figure 9.1: Checking whether person requires assistance

Figure 9.2: Checking whether person is breathing

Steps to be followed for CPR (As per National Health Portal)

A. Compression

a. Place the heel of one hand on the lower half of the person's breastbone.
b. Place the other hand on top of the first hand and interlock your fingers.
c. Press down firmly and smoothly (compressing to 5-6 cm) 30 times.
d. Administer 2 breaths as described below in mouth-to-mouth.

Figure 9.3: Compression followed by mouth-to-mouth respiration.

e. The ratio of 30 chest compressions followed by 2 breaths is the same, whether CPR is being performed alone or with the assistance of a second person.
f. Aim for a compression rate of 100 per minute.

B. Mouth-to-mouth respiration

a. If the patient is not breathing normally, make sure he is lying on his back on a firm surface.
b. Open the airway by tilting the head back and lifting his chin.
c. Close his nostrils with your finger and thumb.
d. Put your mouth over the patient's mouth and blow into his mouth.
e. Give two full breaths to the patient (this is called 'rescue breathing'). Make sure there is no air leak and the chest is rising and falling. If patient's chest does not rise and fall, check that you're pinching his/her nostrils tightly and sealing his/her mouth with your mouth. If still no breathing, check airway again for any obstruction.
f. Continue CPR, repeating the cycle of 30 compressions followed by two breaths until availability of AED or arrival of medical help.

Usually, CPR should be stopped, when:

a. The patient revives and starts breathing on his/her own.
b. When medical help arrives.
c. When the person giving CPR is exhausted.

Points to remember during CPR:

a. Maintain as much straightness in your arms as possible. Arm muscles fatigue faster than your body weight. Maintaining adequate depth by keeping the arms straight helps the body weight drive the compression down.
b. During compressions, keep your hands continuously in touch with the person's chest.

c. The shoulders of the person given CPR should be up over the person. This position guarantees that compressions are directed downward and that the heart is compressed between the sternum and the spine.
d. The hands must be straight over each other to increase the compression force.
e. Interlace the fingers or place one hand on top of the other with fingers extended away from the patient's chest.
f. Full recoil of the chest is as important as the depth and rate of chest compressions.
g. Without proper depth (at least 2 inches), compressions are not effective.

Automated External Defibrillator (AED)

Figure 9.4: Automated External Defibrillator

AED is a unique defibrillator that may be used by unskilled observers. Ambulances frequently have this portable equipment. If an AED detects a serious arrhythmia, such as ventricular fibrillation, it is set to deliver an electric shock. This prevents giving a shock to someone who has fainted but not suffering SCA. A person with SCA should receive cardiopulmonary resuscitation (CPR) until defibrillation can be performed.

Steps to use AED

a. Start the AED and follow the visual and/or audio instructions.
b. Take off the person's shirt and dry his or her bare chest. If the person is using medication patches, carefully remove them before wiping the person's chest.
c. Attach the AED pads as shown below and plug in the connector (if necessary).

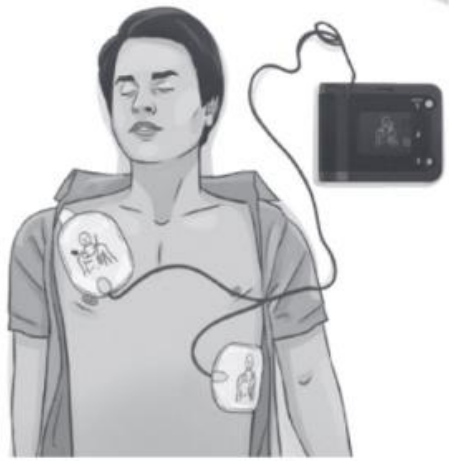


Figure 9.5: Attachment of AED pads

d. Make sure no one touches the person, including yourself. Tell everyone to stay away.
e. Press the "analyze" button to have the AED assess the person's heart rhythm.

f. If the AED suggests delivering the shock, ensure sure no one touches the person, including yourself, and tell everyone to "Stand clear".
g. Press the "shock" button once everything is clear.
h. After the shock has been delivered, begin CPR. Alternatively, if no shock is required, start CPR. Perform two minutes (about 5 cycles) of CPR and continue to follow the prompts of AED. If you notice that the person is regaining consciousness, stop CPR and keep an eye on the breathing of person for any changes.

5. Requirements

CPR training Mannequin, Automated External Defibrillator (if Available), A3 Paper, Coloring Material.

6. Requirements used

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7. Procedure

The subject teacher must demonstrate the CPR technique and the operation of an AED to the students. If a mannequin is not available, teachers can use YouTube videos for demonstration purposes.

Activity

Prepare a poster or leaflet about Cardiopulmonary resuscitation (CPR) indicating steps to be followed.

8. Result

The first aid- Basic Life Support (BLS) -CPR for sudden cardiac arrest was demonstrated on mannequin and a poster about CPR was prepared.

9. References

a. https://nhp.gov.in/miscellaneous/first-aid.
b. https://redcross.org/take-a-class/cpr/performing-cpr/cpr-steps

10. Practical Related Questions

a. Define Sudden Cardiac Arrest.
b. List the signs of SCA.
c. Define Cardiopulmonary Resuscitation (CPR).
d. Describe the purpose of rescue breathing.
e. Explain the importance of chest compressions.
f. Outline four preliminary steps prior to administering CPR.
g. Explain the function of Automated External Defibrillator (AED).

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 10

First Aid for Foreign Body Airway Obstruction

1. Aim

To study and demonstrate the first aid measures to be taken if an adult/child/infant suffers from foreign body airway obstruction (FBAO) and prepare the poster on steps to be taken to remove the airway obstruction.

2. Practical Significance

An airway obstruction caused by a foreign body is a medical emergency that can be fatal. Pharmacists must create awareness in society about the first aid measures to be taken if someone suffers from foreign body airway obstruction. In this practical, students will learn how to provide first-aid treatment and save the life of an adult, child, or infant suffering from foreign body airway obstruction, enabling them to educate society about these measures.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Use "Five and Five" technique as first aid for foreign body airway obstruction.	CO 2,4,5	BTL5
2	Prepare an educational video on steps to be taken to remove the airway obstruction.	CO 2,4,5	BTL6
3	Demonstrate the "Five and Five" technique.	CO 2,4,5	BTL3
4	Collaborate and communicate with fellow students.	CO 2,4,5	BTL5

4. Relevant Theoretical Background

Asphyxia caused by foreign body airway obstruction (FBAO) is a serious condition that arises suddenly, leaving the patient unable to describe their distress. Without prompt and effective first aid, it can lead to rapid loss of consciousness and death. Therefore, quick recognition and response are crucial.

Choking typically occurs when a person ingests a foreign object while eating. To ascertain if someone is choking, it's important to ask them directly, as they may be unable to communicate verbally. Observing specific cues can also help determine the cause:

a) Choking often happens during a meal with a sudden onset.
b) Adults may clutch their neck or point to their throat.
c) Children may exhibit clues such as playing with small objects before symptoms appear.

The "Five and Five" technique are recommended as first aid for foreign body airway obstruction, involving five back blows followed by five abdominal thrusts. This method is highly effective in clearing blocked airways.

Here are the steps to relieve choking in adults (according to the First Aid manual of the Indian Red Cross Society):

a) Encourage the person to keep coughing. Stay with them until they can breathe normally.
b) If coughing doesn't help or the person can't cough or breathe, stand behind them and slightly to one side.
c) Support their chest with one hand and lean them forward.

d) Deliver five firm blows between their shoulder blades using the heel of your free hand. Check if the object has been dislodged and the person can breathe again.
e) If the object is still lodged and the person is still choking, stand behind them and place both hands around their waist so they meet in front of the person.
f) Make a fist and position it between the navel and lower tip of the breastbone. Hold onto this fist with your other hand.

Figure 10.1: "Five and Five" technique for adults- Back blow (a) and abdominal thrust (b)

g) Bend the choking person forward and pull your fist firmly toward you and upward.
h) Give five abdominal thrusts.
i) If the air passage is clear, stop giving further abdominal thrusts, but always stop after five abdominal thrusts.
j) If the object does not come out and the person is still choking, administer another five back blows followed by five abdominal thrusts.
k) Repeat this process until the object is dislodged or until the choking person loses consciousness.
l) If the person becomes unconscious, carefully lay them on the floor.
m) The person requires urgent assistance. Shout for help or call for assistance if you are alone, but do not leave the person unattended. Ask a bystander to seek help or arrange immediate transportation to the nearest healthcare facility. Instruct them to return to you to confirm if help has been obtained.
n) Kneel down beside the person. If they are not on their back, turn them onto their back.
o) Initiate the CPR procedure.

Do not interrupt the resuscitation until:

a) The victim starts to wake up, moves, opens eyes, and breathes normally;
b) Medical emergency arrives and takes over;
c) You are too exhausted to continue; or
d) The scene becomes unsafe for you to continue.

Steps to relieve choking for children (age>1 year):

a) If the child can cough effectively, encourage him/her to cough and monitor continuously.
b) If coughing is ineffective, shout for help and assess the child's level of consciousness.
c) If the child is conscious, give up to five back blows, followed by five abdominal thrusts. Repeat the sequence until the obstruction is relieved or the child becomes unconscious. If the child becomes unconscious, follow steps 'l' to 'o' as for adults.

Steps to relieve choking in infants (age <1 year)

a) The baby urgently needs help. Shout or call for help if you are alone but do not leave the child unattended. Ask a bystander to seek help or to arrange urgent transport to the nearest healthcare facility. Tell them to come back to you to confirm if help has been secured.
b) Kneel down so that you can use your thighs to prevent the baby from falling.
c) Lay the baby down along your forearm (see Figure 10.2). If you are right-handed, use your left forearm; if you are left-handed, use your right forearm.
d) Support the baby's head and neck with one hand without covering the mouth so the baby lies face down with the head below the trunk, over your forearm, supported by your thigh

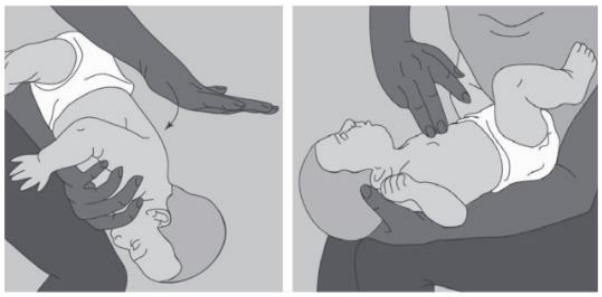

Figure 10.2: Back blow (a) and chest thrust (b) for relieving choking in infants.

e) With your free hand, give five firm blows with the base of your palm to the area between the baby's shoulder blades.
f) Quickly turn the baby, while supporting the head, onto their back to face you, resting on your arm.
g) Check if the object has come out and the baby can breathe freely.
h) Place two fingers (the two after your thumb or two after your index finger) in the middle of the baby's chest and deliver five thrusts (pushing inwards and upwards). Stop after five thrusts.
i) If the object does not come out and the baby is still choking, give another five blows on the back followed by five thrusts.
j) Repeat this until the object is released or the choking baby loses consciousness.
k) If the baby loses consciousness, lay them down on the floor or on a hard and safe surface.
l) Start CPR on the baby.

Do not interrupt the resuscitation until

a) The baby starts to wake up, moves, opens his eyes, and breathes normally; or
b) Medical emergencies arrive and takes over.

Complications

a) Foreign material may remain in the upper or lower airways following effective choking treatment, causing problems such as bronchiectasis or lung abscess later. Anyone who has a prolonged cough, trouble swallowing, or the sense that something is still lodged in their throat should see a doctor.
b) The use of abdominal thrusts can result in serious injuries (e.g., gastric and splenic rupture). All victims of abdominal thrusts should have their abdomens examined, especially for internal damage.
c) Hypoxic brain injury and death.

Preventive measures for avoiding foreign body airway obstruction.

a) Avoid eating during exercise.
b) Chew food properly.

c) Avoid giving peanuts or very small objects to children.
d) Increase public awareness of choking and confidence in initiating first aid.

5. Requirements

Baby mannequin, A3 paper, Colouring material.

6. Requirements used

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7. Procedure

Demonstration of steps to relieve choking in adults and infants.

The subject teacher must demonstrate the “Five and Five” technique to relieve choking in adults and steps to relieve choking in infants (using a baby manikin/doll) to the students. If a manikin is not available, teachers can use YouTube videos for demonstration. The students will observe the demonstration of five blows and five thrusts given by the teacher. Each student will prepare a poster on first aid measures to be taken if an adult suffers from Foreign Body Airway Obstruction (FBAO).

Activity I

Organize students into groups and instruct them to act out a scenario of choking, followed by demonstrating the first aid steps to alleviate the choking. The teacher should assess if the students have correctly applied the "Five and Five" technique on their partners and provide guidance if any errors are noted.

Activity II

Prepare the poster on first aid measures to be taken if an adult suffers from Foreign Body Airway Obstruction (FBAO). The poster should serve as an efficient educational/counselling material to the people.

8. Result

The first aid measures for foreign body airway obstruction were studied, and educational materials on how to clear airway obstruction were prepared.

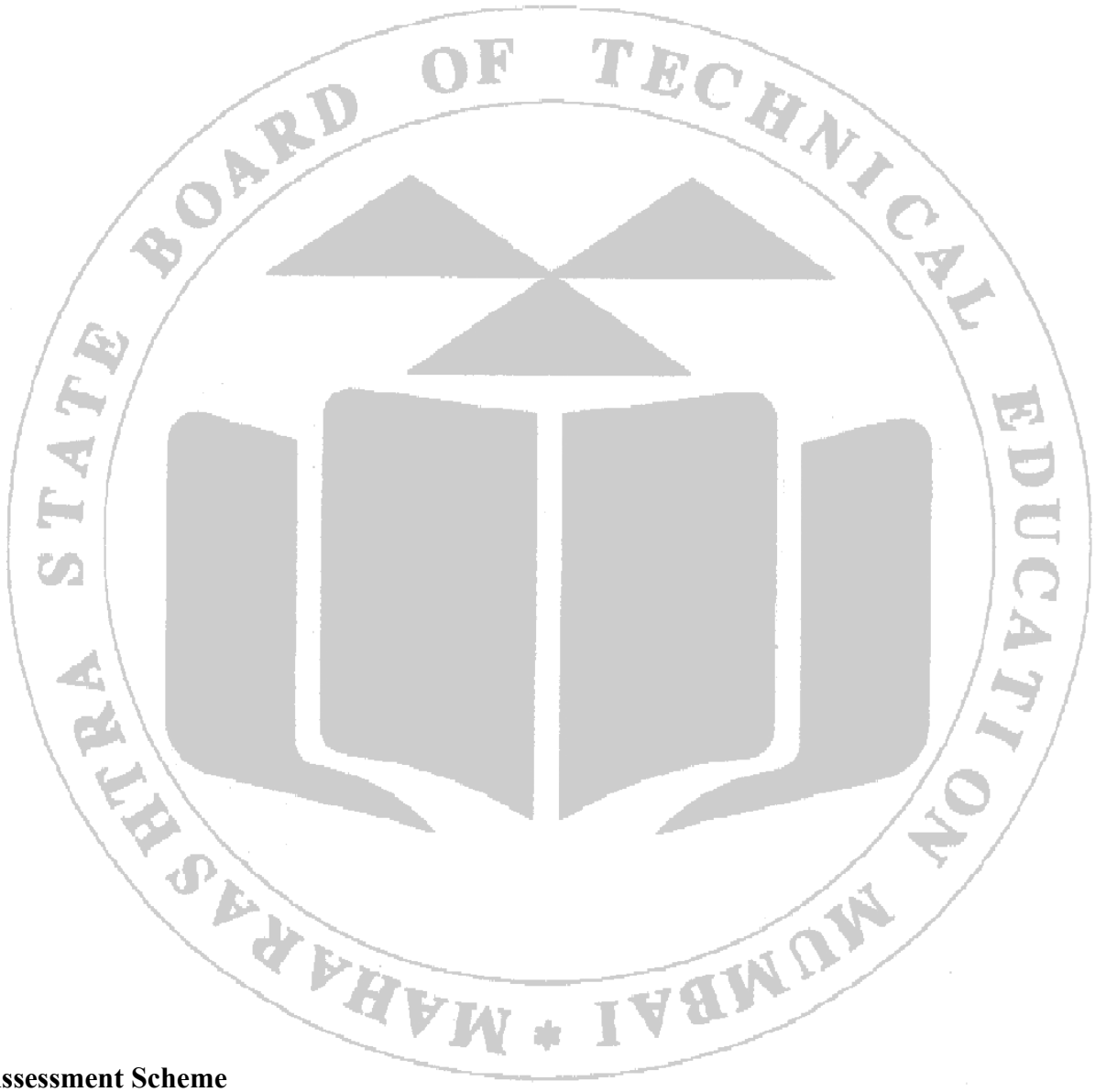
9. References

a. https://indianredcross.org/publications/FA-manual.pdf
b. https://nhs.uk/common-health-questions/accidents-first-aid-and-treatment

10. Practical Related Questions

a. Define asphyxia.
b. Detail the "Five and Five" method.
c. Identify factors that lead to airway blockages.
d. List four preventative actions to prevent foreign body airway obstruction (FBAO).

(Space for Answers)



11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 11

Emergency Treatment for Snake Bite and Dog Bite

1. Aim

To study and demonstrate emergency treatment for snake bites and dog bites and prepare a poster of Do's and Don'ts after experiencing a snake bite or dog bite.

2. Practical Significance

As a health professional, pharmacists should have knowledge of managing snake bites and dog bites, both of which are life-threatening emergencies requiring prompt treatment. The pharmacist's role includes educating the community on first aid measures for snake bites and dog bites, ensuring that victims can quickly reach medical facilities in optimal condition. In this practical, students will learn about emergency treatment for snake bite and dog bite victims, and they will also create educational materials to raise awareness about these treatments in society.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Use the proper first aid treatment for snake and dog bite.	CO 2,4,5	BTL4
2	Prepare an educational material to educate people about emergency treatment for snake and dog bite.	CO 2,4,5	BTL6
3	Demonstrate the first aid for snake and dog bite.	CO 2,4,5	BTL3
3	Collaborate and communicate with fellow students.	CO 2,4,5	BTL5

4. Relevant Theoretical Background

A. Snake Bite

There are approximately 2500 different varieties of snakes, and snake bites can have varying effects depending on the species involved. While not all snakes are venomous, and not all venomous snakes are necessarily dangerous, it's crucial for those living in areas with snakes to exercise caution. Snake bites should always be treated as potentially poisonous, as snakes typically bite when they feel threatened or disturbed.

Symptoms of a snake bite can include bleeding, swelling, bruising, pain, numbness, weakness, confusion, impaired vision or speech, nausea or vomiting, cardiac arrest, or difficulty breathing.

Emergency steps for snake bite

a) Ensure the area is safe before assisting the victim.
b) Provide immediate aid to the injured person. If you're alone, call for help loudly, but do not leave the person unattended. Ask a bystander for assistance or arrange for urgent transportation to the nearest medical facility. Instruct them to inform you once medical help has been secured.
c) Comfort the victim by helping them lie down and advising them not to move. Offer reassurance and encourage the victim to remain calm, avoiding forceful restraint. Explain that remaining still can slow the spread of venom. If safe, identify the type of snake that bit the victim. If possible, take a photograph of the snake. Do not waste time trying to track down the snake, as the priority is getting immediate help. Always assume the snake is poisonous.
d) Monitor the person for any changes in their condition, such as consciousness level or breathing.
e) If available, wear gloves. If not, use a clean plastic bag to protect your hands.
f) Remove any rings, watches, or tight clothing that could hinder blood flow due to swelling.
g) Avoid moving the bitten limb.

h) Apply a tight pressure bandage over the bite site, extending it as high as possible on the limb without removing clothing (refer to Figure 11.1-a, b, c). Use a splint to immobilize the limb while applying the bandage (refer to Figure 11.1-d, e). If the snake bit the forearm, immobilize the arm with a splint or cloth sling after applying the bandage (refer to Figure 11.1-f).

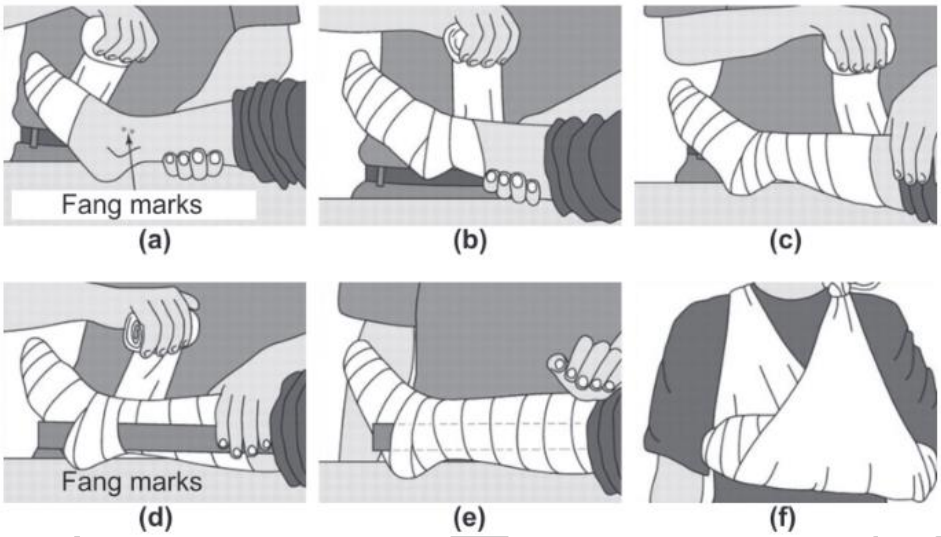


Figure 11.1: Use of pressure bandage, splint and sling as first aid for snake bite.

i) After calling for medical assistance, remain with the injured person until help arrives.
j) Monitor the person's condition, including their level of consciousness and breathing.
k) If the victim loses consciousness but is still breathing, place them in the recovery position and continue to monitor their breathing.
l) If the person stops breathing, administer CPR.
m) Organize immediate transportation to the nearest medical facility or hospital. If the snake has been killed, bring it along to the dispensary or hospital with the patient for identification by the doctor.

Steps to avoid while treating a snake bite victim:

a) Avoid direct contact with the person's blood.
b) Do not wash the wound.
c) Refrain from attempting to suck out the venom.
d) Do not cut the bitten area.
e) Avoid applying traditional herbs directly on the wound.
f) Do not use a tourniquet.
g) Avoid applying heat or cold to the affected area.
h) Do not give any food or drink to the victim by mouth.
i) Avoid elevating the bite site above the level of the victim's heart.
j) Remember that even a severed snake head can still deliver a bite, so do not handle the snake with bare hands.

Preventive measures for avoiding snake bites:

a) Avoid areas where snakes are commonly found.
b) Do not disturb or provoke snakes if encountered.
c) Wear closed shoes when in snake-prone areas.
d) Maintain well-mowed grass and clear vegetation around living spaces.
e) Use a flashlight or torch when walking outdoors, especially at night, to spot snakes and avoid surprises.

B. Dog Bite

Any bite that breaks the skin, whether from an animal or human, requires immediate medical attention due to the high risk of infection. Several animals, including dogs, cats, monkeys, foxes, bats, cows, horses, and jackals, can carry the rabies virus. However, in India, dog bites are the primary cause of rabies infections. Rabies is a viral disease that affects the brain and nervous system. When bitten or scratched by an infected dog, a person can contract rabies. Without prompt treatment, the disease is fatal.

Complications that can arise from dog bites include bacterial infections, damage to nerves and muscles, fractures, rabies infection, tetanus, scarring, and in severe cases, death. Therefore, all individuals bitten or scratched by dogs should seek medical attention immediately and follow up with appropriate treatment.

Emergency steps for a dog bite:

a) Ensure that the area is safe, and that the animal cannot bite you or the victim again.
b) Wash your hands thoroughly before and after assisting the victim with soap and water. If soap is not available, ash can be used. Alcohol-based sanitizers are also suitable.
c) If gloves are available, use them. Otherwise, a clean plastic bag can be used to avoid direct contact with the blood or wounds.
d) Flush the wound with plenty of clean water to remove the rabies virus and wash it with soap, water, or detergent for 10-15 minutes. If possible, use povidone-iodine solution for washing. This applies to licks, scratch, or abrasion wounds as well.

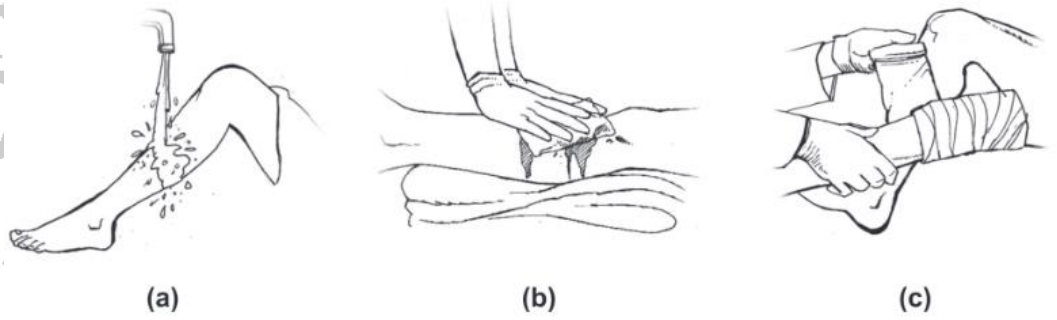


Figure 11.2: First aid treatment for dog bites.

e) Apply pressure to the wound to stop severe bleeding.
f) Cover the wound with a dry, clean cloth or bandage.
g) Immediately refer the person to a healthcare facility for further treatment.

Steps to avoid while treating a dog bite victim:

a) Do not enlarge the wound by cutting it.
b) Avoid putting herbs or unclean materials like chilies, oil, or petrol on or in the wound.

Preventive measures:

a) Avoid approaching unfamiliar dogs.
b) Refrain from screaming and running away from dogs.
c) Stay still if approached by an unfamiliar dog.
d) If a dog knocks you over, curl up into a ball and remain still.
e) Supervise children when playing with dogs.
f) Report strays or suspicious dogs to adults immediately.
g) Avoid direct eye contact when interacting with a dog.
h) Respect a dog's space when sleeping, eating, or caring for puppies.
i) Allow a dog to see and smell you before petting it.

5. Requirements

Pressure bandage, splint (wooden strip), Bandage, Povidone iodine solution, A3 paper and colouring material.

6. Requirements used

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7. Procedure

Demonstration of emergency treatment of snake bite and dog bite

The subject teacher must demonstrate the measures to be taken for emergency treatment of snake bite and dog bite to the students. Teachers can also use YouTube videos for demonstrations.

Activity I: Snake Bite

The subject teacher must form groups of students and assign following counselling tasks to the students. After enacting the counselling task, students must note down the key points which must be considered while counselling.

Counsel villagers about emergency treatment measures for snake bite and complications that can occur if the dog bite wound is left untreated or not treated properly.

_____

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Activity II: Dog Bite

The subject teacher must form groups of students and assign following counselling tasks to the students. After enacting the counselling task, students must note down the key points which must be considered while counselling.

Counsel villagers about emergency treatment measures for dog bite and complications that can occur if the dog bite wound is left untreated or not treated properly.

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Activity III:

Create a chart/poster (on card-sheet/ A3 or A4 paper) containing pictorial and textual information about do's and don'ts during snake or dog bite first aid treatment.

8. Result

First aid measures or snake and dog bite were studied and educational material was prepared.

9. References

a. https://indianredcross.org/publications/FA-manual.pdf.
b. https://nhm.gov.in/images/pdf/guidelines/snakebite_full.pdf

10. Practical Related Questions

a. List the main symptoms of a snake bite.

b. Name four poisonous snakes found in India.
c. Describe four preventive measures for snake bites.
d. Explain why a tourniquet is avoided during snake bite treatment.
e. List five animals that can transmit rabies.
f. Describe the steps to avoid while treating a victim of a dog bite.
g. Enumerate the complications resulting from a dog bite.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 12
Emergency Treatment for Insecticide Poisoning

1. Aim

To study and demonstrate the emergency treatment for insecticide poisoning and prepare an educational poster of emergency treatment for insecticide poisoning.

2. Practical Significance

Insecticides, if ingested, inhaled, or absorbed through the skin, can be toxic. This poisoning may occur unintentionally or intentionally. Thus, it's crucial to educate individuals about first aid steps for handling insecticide poisoning until professional medical assistance is available. During this practical session, students will learn about these first aid procedures and create educational materials to enhance public awareness about treating insecticide poisoning.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Use the proper first aid treatment for insecticide poisoning.	CO 2,4,5	BTL3
2	Prepare an educational material to educate people about emergency treatment for insecticide poisoning.	CO 2,4,5	BTL6
3	Collaborate and communicate with fellow students.	CO 2,4,5	BTL5

4. Relevant Theoretical Background

Insecticide is a pesticide that kills insects. When an insecticide is swallowed, breathed in, or absorbed via the skin, it can cause poisoning. The majority of household bug sprays contain pyrethrin, which are plant-derived compounds. These compounds were found in chrysanthemum flowers and are generally non-toxic.

If breathed in, however, they can induce life-threatening breathing issues. Stronger insecticides, such as those used in commercial greenhouses or kept in one's garage, contain a variety of hazardous chemicals. Some of these include:

a) Carbamates
b) Organophosphates
c) Paradichlorobenzenes (mothballs)

Symptoms of insecticide poisoning

Eve tearing, impaired vision, salivation, sweating, coughing, vomiting, frequent bowel movements and urination are all symptoms of organophosphates and carbamates. Blood pressure levels can drop. Heart rate can decrease and become irregular and seizures can occur. Breathing can become difficult, and muscles can twitch and weaken. Shortness of breath or muscle weakness can be fatal in rare cases. Following exposure to carbamates, symptoms last for hours to days, whereas after exposure to organophosphates, symptoms can last for weeks. Pyrethrins can cause sneezing, eye tears, coughing, and shortness of breath. Severe symptoms occur only in rare cases.

Steps for emergency treatment of insecticide poisoning

If insecticide is in mouth or swallowed

a) If a pesticide is in someone's mouth but they haven't ingested it, give them plenty of water to rinse it out. Then give the victim a substantial amount of milk or water to drink (up to a quart).
b) When a pesticide is swallowed, one of the most important first aid considerations is whether or not to induce vomiting. Only induce vomiting if the label of insecticide container directs you to.

The decision to induce vomiting must be taken fast and precisely since the victim's life could be at stake.

Vomiting procedure

a) Ask the victim to bend with the head lower than the chest. Touch or ask him to touch the back of his throat with a finger or a spoon.
b) If this does not cause vomiting, give 2 teaspoons of salt in a glass of water (250 ml) or give syrup of ipecacuanha (5 ml in a 20 ml of water). This medicine can be repeated after 15 minutes.
c) Then, after the victim has finished vomiting, give him/her plenty of clean water or tea to drink. Give him/her activated charcoal powder (1-2 tablespoons in water) or the white of a raw egg or some milk.
d) If the victim is unconscious, do not give him/her anything to eat or drink.
e) If the victim is not breathing, give him/her artificial respiration (mouth-to-mouth resuscitation).
f) Arrange for a Doctor, Community Nurse, or Health Worker or transport the person to a doctor, clinic, or hospital right away.

If skin is exposed to insecticide

a) Remove any contaminated clothes as soon as possible.
b) To dilute the insecticide and prevent skin absorption, rinse the exposed area with water. Make use of the purest water available.
c) With water and soap, wash the affected region, including the hair. After that, give it a thorough rinse. To avoid prolonged contact with pesticide residues, showering is preferable to bathing. Scrubbing too hard might harm the skin and increase pesticide absorption. If required, gently dry the affected area, and wrap it in a soft towel or blanket.
d) If the victim has chemical burns on the skin, cover it with a clean, soft towel. Unless directed by a medical authority, do not use ointments, greases, powders, or other drugs.
e) Arrange for a Doctor, Community Nurse, or Health Worker or transport the person to a doctor, clinic, or hospital right away.

If insecticide is inhaled

a) Carry the victim to fresh air as soon as possible (do not allow him or her to walk).
b) Allow the victim to lie down and loosen his or her garments.
c) Maintain a warm and peaceful environment for the victim. Do not allow the victim to become chilly or overheated.
d) If the victim is convulsing, shield his or her head by turning it to the side and keeping an eye on his or her respiration. During a seizure, do not attempt to put anything into the victims' mouth.
e) Maintain the victims' chin up, to keep the airways open for breathing.
f) If the victim is unconscious, do not give him/her anything to eat or drink.
g) If the victim is not breathing, give him/her artificial respiration (mouth-to-mouth resuscitation).
h) Arrange for a Doctor, Community Nurse, or Health Worker or transport the person to a doctor, clinic, or hospital right away.

If eyes are exposed to insecticide

a) As eyes can easily absorb the chemicals, quick action is essential.
b) Hold the eyelid open and begin gentle washing of eye with clean water drips. Unless directed otherwise by a medical expert or a poison control center, do not use chemicals or medications in the wash water.
c) Drip the water across your face rather than directly into your eyes or use an eyewash dispenser.

d) Rinse the eye continuously for 15 minutes. If only one eye is affected, take care that another eye must not get exposed.
e) To remove the debris, run water beneath the eyelid.
f) Cover the eye with a clean cloth and seek medical help as soon as possible.

Preventive measures for accidental insecticide poisoning

a) Insecticides should be kept in locked cabinets out of reach of children and pets.
b) Before using any insecticide in or around the house, read the full label and follow all of the instructions.
c) Keep children and pets away from places where insecticide is being applied. While the product is being applied, make sure the containers are kept safely out of reach.
d) To avoid inadvertent spillage, close insecticide containers immediately after use.

5. Requirements

Marketed household insecticide, A3 paper, colouring material.

6. Requirements used

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7. Procedure

Demonstration of steps for emergency treatment of insecticide poisoning

The subject teacher must demonstrate the measures to be taken for emergency treatment of insecticide poisoning to the students. Teachers can also use YouTube videos for demonstrations. Also, the teacher must guide the students about safe use of marketed household insecticides (Anti-mosquito coils, Anti-mosquito liquids, Anti-cockroach gels/chalks, Anti-cockroach and Anti-mosquito sprays etc.)

Activity I

The subject teacher must form groups of students and assign following counselling tasks to the students. After enacting the counselling task, students must note down the key points which must be considered while counselling.

Counsel villagers about emergency treatment measures for insecticide poisoning and guide them for preparation of a first aid kit for insecticide poisoning.

Key points to be considered while counselling:

_____

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_____

Items suggested for the first aid kit:

_____

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Activity II

Create a poster containing pictorial and textual information about emergency measures to be taken to treat insecticide poisoning. (Teachers should assign a specific type of insecticide poisoning to students for this activity).

8. Result

Emergency treatment for insecticide poisoning was studied and a poster was prepared.

9. References

a. https;//medlineplus.gov/emergency/article/002832.html.
b. https://msdmanuals.com/en-in/home/injuries-and-poisoning/poisoning/insecticide-poisoning

10. Practical Related Questions

a. Define the terms "insecticide" and "pesticide."
b. List the symptoms of insecticide poisoning.
c. Enumerate the hazardous chemicals found in insecticides.
d. Specify the insecticides present in Baygon spray, Kala Hit, and All-Out liquid.
e. Describe four preventive measures for accidental insecticide poisoning.
f. Give the toll-free number of the National Poison Information Center (NPIC) of India.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 13
Emergency Treatment for Fractures and Burns

1. Aim

To study and demonstrate the emergency treatment for fractures and prepare an educational poster of emergency treatment for fractures and burns.

2. Practical Significance

Proper identification and management of suspected fractures necessitate transporting individuals to a clinic or hospital. When moving a patient with a fractured bone, extreme care is vital to avoid exacerbating the injury. Pharmacists should have knowledge of initial fracture care to educate the community, thus reducing complications during emergencies. Conversely, burns present a major public health issue, with India experiencing a higher mortality rate from burns than from malaria and tuberculosis combined. Immediate administration of appropriate first aid for burns or scalds is essential to minimize skin damage. In this practical, students will be taught emergency procedures for treating fractures and burns, and they will create educational materials to enhance public awareness.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Use the proper first aid treatment for fractures and burns.	CO 2,4,5	BTL3
2	Prepare an educational material to educate people about emergency treatment for fractures and burns.	CO 2,4,5	BTL6
3	Collaborate and communicate with fellow students.	CO 2,4,5	BTL5

4. Relevant Theoretical Background

Fractures

A fracture is defined as a break, bend, or crack in a bone. Unless a bone is diseased or old, it usually takes a lot of force to break it. Bones that are still growing are fragile and susceptible to splitting, bending, and cracking. Fractures can occur when a bone is subjected to direct (blow) or indirect (twist, wrench) force Types of forces causing bone fracture.

a) Direct force

A severe fall on a protruding stone, a bullet travelling through bones, or a wheel passing over the body, for example, cause the bone to break at the point of application of the force.

b) Indirect force

The bone breaks away from the point where force is applied, such as a collar-bone fracture after a fall on outstretched hands.

c) Muscular force

A fracture happens when a set of muscles contracts violently (for example, rib fractures after a strong cough). This sort of fracture occurs seldom and is usually caused by other disorders (e.g. weakened bone structure).

Types of fractures

A. Open and closed fractures

a) Closed fractures

In this type of fracture, the skin above the fracture is unaffected but the bone ends may have damaged neighboring tissues and blood vessels:

b) Open fractures (Compound fractures)

In open fractures, the skin above the fracture is not intact. There is extensive bleeding. The surface of the bone is exposed to the outside air, allowing dirt, dust, and bacteria to enter the incision. In such cases, infection is very likely.

B. Simple and complex fractures

A "complex fracture" is a shattered bone that is more serious than a "common fracture." In complex fractures, bones are broken into multiple parts, the fracture is considered complicated. The soft tissues as well as the essential organs get seriously damaged. In a single bone, there are many fractures at various levels. There is also a possibility of a joint dislocation or damage. On the other hand, fracture can be characterized as a 'simple fracture' if everything else is normal.

Signs and symptoms of bone fracture

a) Pain in the region of the fracture or its surrounding area.
b) Tenderness or discomfort when touching the injured site.
c) Swelling in the vicinity of the fracture.
d) Bleeding at the site of the fracture may occur.
e) The bone may protrude from the skin.
f) Discoloration may be present in the fractured area.
g) Limited mobility or difficulty in normal movements of the affected part.
h) Deformity may be noticeable in the injured limb.
i) Irregular bone structure can be felt.
j) The victim may experience unusual movements at the site of the fracture.

First aid steps for bone fracture

a) Ensure that you and the victim are not in any immediate danger.
b) The victim requires assistance. If you are alone, shout for help or call for aid, but do not leave the person unattended. Ask a bystander to seek help or arrange transportation to the nearest medical facility. Request that they report back to you once medical assistance has been secured.
c) Major accidents often result in fractures, along with other potential injuries. Therefore, other injuries must also be assessed and treated accordingly. The first responder should prioritize treating the most critical injury.
d) Administering CPR to a victim who is not breathing or addressing severe bleeding takes precedence and should be addressed first.
e) Multiple fractures can occur in the same patient or limb. Avoid unnecessary movement of the injured or dislocated limb unless absolutely necessary. Refrain from moving the victim until the injured part has been stabilized. If movement or repositioning is necessary, do so with extreme caution. It is advisable to seek assistance from bystanders if available.
f) Provide reassurance to the victim.
g) Encourage the victim to remain calm.
h) Immobilize the injured part to prevent further damage.

In case of closed fracture, follow the steps given below:

For broken leg bone:

a) Splint the whole of both legs. If a splint is not available, a broken thigh or leg will be kept from moving by tying both the legs together at four or more points with sufficient padding (cotton, towel, etc.) between the legs at the upper thighs, the knees, the ankles, and the feet so that they cannot move (see Figure 13.1a), If wooden sticks/folded cardboard/umbrella are available, they

can be used as splints. Don't forget to apply padding between a splint and the injured leg (see Figure 13.1b).

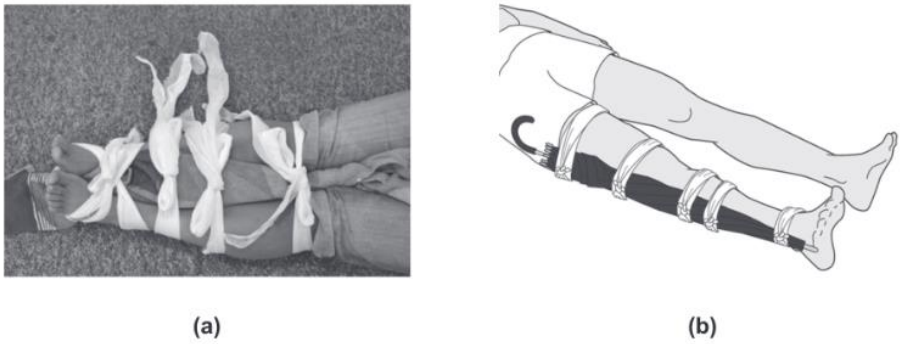

Figure 13.1: Immobilization of broken leg in absence (a) and in presence (b) of splint

b) Do not tie the legs together if the pelvis is injured.
c) Send the patient to the hospital or a help center, strapped to a wooden board or stretcher.
d) The patient may drink water if he wishes to, but he should not eat if he is going to the hospital, in case he needs an operation.

For broken arm or forearm bone:

a) In case of forearm fracture, put the arm in a sling and fix it to the chest with a bandage (sling and swathe method) round the chest so that the broken arm cannot move (see Figure 13.2a).
b) If the arm of victim cannot bend or wrist is injured then use splint (Figure 13.2-b, c) and send the patient to the hospital.
c) If another part of the body is broken (ribs, back, pelvis, head) then send the patient to the hospital on a hard stretcher.

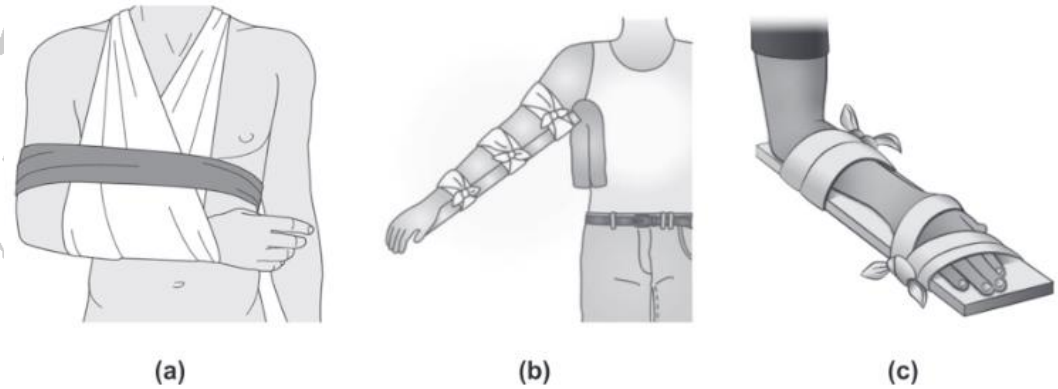

Figure 13.2: First aid for arm fracture: Sling and swathe method (a), splint for immovable elbow (b) and splint for wrist injury (c)

In case of open fracture, follow the steps given below:

a) First treat the wound as follows-
   i. Clean the wound with warm boiled water and soap.
   ii. Cover it with a very clean dressing.
   iii. Do not try to push back the bone.
   iv. Make a firm precure bandage and raise the limb to stop or decrease the bleeding
   v. Give Aspirin tablets to relieve pain.
b) Then treat the fracture as described above depending on where the fracture is.
c) Send the victim to the hospital or health centre without delay.

Care to be taken while carrying the victim with to the hospital:

a) When an arm is broken, put it in a sling fixed to the chest. Thereafter, the victim may walk and sit in the vehicle.
b) When a thigh or leg is broken, the victim should not be moved before a splint has been put on the injured limb. The patient should be carried on a hard stretcher. This may be a board or door.
c) When thinking that there may be an injury to the back, neck, chest, or pelvis, do not try to move the patient until you have at least three other people to help you. Then get a board (stretcher or door) quickly. With the help of the other people, lie the patient on the board. Do not move the patient more than is necessary to put him on the board. Also, make sure the board is wide enough and at least as long as the patient's height. Then carefully carry the board with the patient to the health centre or hospital.

Burns

Burns are damage to the skin and underlying tissue caused by the sun, heat sources, fire, hot items, boiling liquids, chemicals, irradiation, and so on. Cold, on the other hand, can also cause burn wounds. The degree of damage to the skin and underlying tissues is used to classify burns. Depending on the degree of the burn wound, distinct indications and symptoms are observed in the victim.

Types of Burns:

a) **First-degree burns:** These are epidermal burns that cause redness (erythema) like sunburn. They are painful but manageable, with no blisters, healing within 3-5 days without scarring.
b) **Second-degree burns:** These affect the epidermis and part of the dermis but not the entire dermis. They are more severe than first-degree burns, often causing blisters, swelling, and intense pain. There are two types: superficial, healing in less than three weeks, and deep, taking longer to heal and more likely to scar.

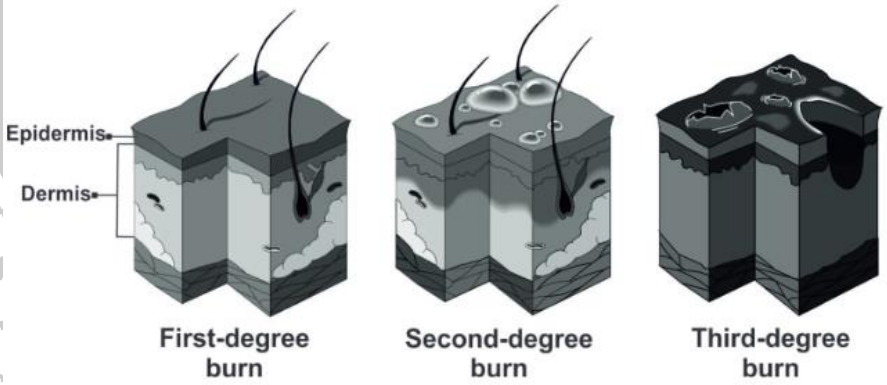

Figure 13.3: Degrees of burn wound

c) **Third-degree burns (Full thickness burns):** These involve all skin layers, appearing white (like fried skin) and initially less painful. They require skin grafting due to extensive damage.

Causes of Burns:

a) **Hot liquids (Scalds):** Commonly caused by hot water, oil, or steam, primarily affecting young children.
b) **Hot solids (Contact burns):** Occur in children and can result from hot surfaces like oven containers, coal, irons, and culinary utensils.
c) **Flames:** Result from gas leaks, kerosene accidents, firecrackers, or fires in tents.
d) **Chemical burns:** From household chemicals or deliberate acid attacks, causing severe damage.
e) **Electrical burns:** Caused by exposed live wires or short circuits, especially near homes or play areas.

f) **Inhalational burns:** Result from inhaling superheated gases or toxic fumes, common in fire burns.

Emergency Treatment of Burns:

For thermal burns:

a) Remove the victim from the burning area.
Lay them down with the burned side up to prevent spreading.
Prevent running to avoid fanning the flames.
If unconscious or unable to walk, carefully move them.
Stay low if there's smoke and use wet cloth for breathing.
Use water to douse flames and cool the burn.

For chemical burns:

a) Wash the affected area with water to dilute the chemical.
b) Follow the S.A.F.E. approach: Shout for help, Assess the scene, Free from danger, Evaluate the casualty.
c) Transport to a medical facility promptly.

For electrical burns:

a) Turn off the power before removing the victim.
b) Use non-conducting objects and avoid high-voltage situations.
c) Check for airway, breathing, and circulation issues.
d) Seek immediate assistance.

For lightning injury:

Similar treatment to electrical burns, including CPR if needed. These patients can tolerate apnoea (breathing cessation) for long periods of time. It is sometimes necessary to do prolonged resuscitation using cardiac massage and ventilation.

Avoid the following during treatment:

a) Ensure personal safety before providing aid.
b) Avoid ice, prolonged water cooling, and applying substances like oil or turmeric.
c) Do not pop blisters with a needle.
d) Primary preventive measures include fire safety education, safe handling of chemicals, and caution during thunderstorms.

5. Requirements

Bandages, Splint, Cloth to prepare sling, Fire Extinguisher, A 3 paper, Colouring material.

6. Requirements used

_____

_____

7. Procedure

Demonstration of steps for emergency treatment of fractures

The subject teacher must demonstrate the measures to be taken for emergency treatment of fractures and burns to the students. Teachers can also use YouTube videos for demonstrations. Teachers, with the help of lab technicians/assistants, should also demonstrate the use of fire-extinguishers to the students.

Activity I

The subject teacher must form groups of students and assign following counselling tasks to the students. After enacting the counselling task, students must note down the key points which must be considered while counselling.

Counsel factory workers about emergency treatment measures for burns.

Key points to be considered while counselling: _____

_____

_____

_____

_____

Activity II

Create a poster containing pictorial and textual information about do's and don'ts during emergency treatment of fracture or burns.

8. Result

Emergency treatment for fractures and burns was demonstrated, and a poster about fractures and burns was prepared.

9. References

a. https://indinredcross.org/publications/FA-manual.pdf.

10. Practical Related Questions

a. Define a fracture?
b. What are the various forces that can lead to a fracture?
c. List the different categories of fractures?
d. Explain second-degree burn is?
e. What are the factors that can cause burns?
f. Describe some early signs of a bone fracture?
g. What does the S.A.F.E. approach entail?

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 14

Role of Pharmacist in Disaster Management

1. Aim

To identify the role of pharmacist in Disaster Management and prepare a poster specifying the role of pharmacist in the management of a recent disaster.

2. Practical Significance

Disasters are occurrences, or series of occurrences, that result in large-scale casualties, damage, or loss. It could be natural disasters like cyclones, flood, earthquakes or human caused disasters like wars, terrorisms, mass violence, accidents etc This can affect property, infrastructure, the environment, essential services, and livelihoods, making it difficult for affected communities to cope. As disasters have a negative impact on the health of victims, pharmacists have a moral responsibility to take on non-traditional roles. FIP has a statement of policy on role of pharmacist in disaster management and emergency management. Pharmacists in different countries are involved in humanitarian work. This allows them to assist affected people and other health professionals in overcoming the challenges presented by disasters. In this practical, students will learn about the roles of pharmacists in disaster management.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Identify the role of pharmacist in the disaster management.	CO 1	BTL1
2	Prepare an educational material specifying the role of pharmacist in the management of a recent disaster.	CO 1	BTL6
3	Collaborate and communicate with fellow students.	CO 1	BTL5

4. Relevant Theoretical Background

When sudden and destructive events strike, causing widespread damage, displacement, and social chaos, they're considered disasters by the World Medical Association. These emergencies present healthcare professionals with unique challenges and opportunities to make a difference. How well healthcare workers respond to unexpected situations significantly impacts health outcomes during disasters.

Pharmacists, especially those in hospitals, play a vital role in such situations. They can directly support patients and staff by providing medication advice, managing patient medication histories, distributing drugs, and restocking supplies. Their unique position allows them to aid emergency teams treating new patients while ensuring existing patients continue receiving necessary care.

Beyond direct patient care, pharmacists can step up as coordinators and leaders. They can take charge of preparing the hospital for emergencies by designing disaster response plans and protocols. These plans would cover critical aspects like managing medication logistics, creating clear instructions, and ensuring patients receive the right medications.

Disaster management refers to the organized effort of allocating resources and assigning responsibilities to address all humanitarian aspects of a crisis. This includes preparing for disasters, responding to them effectively, and helping communities recover.

Phases of disaster management: there are four phases for disaster management.

A. **Prevention/Mitigation phase**: It focuses on reducing the negative consequences of a disaster or decreasing the probability of it happening.

Role of pharmacist in the preventive/mitigation phase:

a. Medication supply optimization for chronic illness management.
b. Providing vaccines.
c. Educate the population to help reduce the spread of communicable diseases or infections.
d. Assessing patients' understanding of potential health risks during disasters.
e. Personalized point-of-care messaging for chronic disease patients.

B. Preparedness phase: This phase focuses on planning, training, and educating people for disasters that cannot be entirely prevented or lessened.

Role of pharmacist in the preparedness phase:

a. In the event of a disaster, ensuring a continuous supply of necessary medications.
b. Implement systems for safe medication storage, such as cold chain protocols.
c. Participating in local community disaster management teams to include pharmacy in a coordinated response.
d. Gain knowledge of how national medication stockpiles are assessed.
e. Advising on medication management.

C. Response phase: This phase focuses on taking necessary actions to minimize death, illness, and property damage after a disaster strikes.

Role of pharmacist in the response phase:

a. Dispense medications, including prescriptions, over-the-counter drugs, and inhalers, to those affected by the disaster.
b. Manage the logistics of medication and medical supplies for chronic disease patients.
c. During a declared disaster, providing one-time medicine emergency supply refills for up to 30 days.
d. If a pandemic or emergency occurs, assist in the release and distribution of national stockpiles.

D. Recovery phase: This phase focuses on rebuilding and recovering from a disaster to return to normalcy.

Role of pharmacist in the recovery phase:

a. Refill regular medication stock and properly dispose of any contaminated medications.
b. Assess the community's ongoing health needs.
c. Identify the most vulnerable patients in the community and prioritize their care.

5. Requirements

Reading material / Literature on disaster management.

6. Requirements used

_____

_____

7. Procedure

The teacher will explain how pharmacists help communities during disasters.

Activity I

Create a poster specifying the role of pharmacist in the management of a recent disaster.

Activity II

Write the role of pharmacist in the management of any recent disaster after discussing with your teacher and colleagues.

Name/Type of Disaster: _____

Role of pharmacist in the preventive/mitigation phase

Role of pharmacist in the preparedness phase

Role of pharmacist in the response phase

Role of pharmacist in the recovery phase

8. Result

The role of pharmacist in disaster management was studied and a poster role of pharmacist in the management of a recent disaster was prepared.

9. References

a. Watson KE, Singleton JA, Tippett V, Nissen LM (2019). Defining pharmacists' roles in disasters: A Delphi study, PLOS ONE, 14 (12): e0227132.
b. https://nidm.gov.in/PDF/Disaster_about.pd
c. International Pharmaceutical Federation. Title: FIP statement of policy on the role of pharmacists in disaster and emergency management. The Hague: FIP, 2023. Available at: www.fip.org/statements

10. Practical Related Questions

a. Define disaster management.
b. Enlist different phases of disaster management.
c. Discuss the roles of pharmacists in the various phases of disaster management.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 15

Disinfectants, Antiseptics, Fumigating agents, Antilarval agents and Mosquito repellents: Marketed products and their use

1. Aim

To prepare a chart of marketed preparations of disinfectants, antiseptics, fumigating agents, antilarval agents and mosquito repellents along with composition and use.

2. Practical Significance

In order to control infections, antiseptics and disinfectants are commonly used. These chemical compounds kill microorganisms such as bacteria, viruses, and fungi. In this session, students will learn about various disinfectants, antiseptics, fumigating agents, larvicides, and mosquito repellents, including their commercial preparations.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Give different groups of disinfectants, antiseptics, fumigating agents, antilarval agents and mosquito repellents	CO 2,3,4	BTL3
2	State the composition of various marketed products of fumigating agents, antilarval agents and mosquito repellents.	CO 2,3,4	BTL1
3	Prepare an educational material indicating composition and use of various marketed disinfectants, antiseptics, fumigating agents/ antilarval agents/mosquito repellents.	CO 2,3,4	BTL6
4	Collaborate and communicate with fellow students.	CO 1	BTL5

4. Relevant Theoretical Background

A. Disinfectants and antiseptics

Germicide is a chemical that is used to kill or prevent the growth of microorganisms (bacteria, virus, fungi, and protozoa) on contact without being selective. There are two types of germicides:

a) **Disinfectants**: Disinfectants are the chemical agents that are used to disinfect inanimate objects. They cannot kill the bacterial spores. Some of the disinfectants do not kill all bacteria, but they do diminish their number.

b) **Antiseptics**: An antiseptic is a germicide that stops or slows the growth or action of germs on living tissue either by destroying them or suppressing their activity.

Ideal properties of disinfectant:

i. It must be chemically stable, inexpensive, and easily accessible.
ii. It should be antibacterial and effective against all pathogens.
iii. It should be able to kill spores.
iv. In the presence of blood, pus, or tissue exudates, it should be active.
v. It should be non-irritating, non-allergic, non-staining, and non-corrosive to the skin.
vi. It should be water-compatible.
vii. It must be capable of penetrating fissures, cavities, and organic matter films.

Mechanism of action of disinfectants/antiseptics

a) Oxidation of microbial cellular components.
b) Denaturation of microbial protein or enzyme.
c) Interference with the cellular permeability of microorganisms.

Categories of disinfectants/antiseptics

a) Phenol derivatives
b) Alcohols
c) Aldehydes
d) Quaternary ammonium compounds
e) Halogens
f) Biguanides
g) Ether derivatives

a) **Phenol derivatives**: Joseph Lister was the first person to utilize phenol as a disinfectant and antiseptic. Phenols have a broad spectrum of antibacterial, antiviral, and antifungal activity, although they have little sporicidal activity. Phenol and its derivatives are active against the cytoplasmic membrane of bacteria. They function as a cytoplasmic toxin and denature the protein. They destroy viral lipids in viruses. They are germicides that are categorized as intermediate to low-level. Due to their toxicity, phenols no longer play a significant role as antibacterial agents. Examples: Carbolic acid, hexachlorophene, chloroxylenols, para-chloro-meta-xylenol etc. Concentration for disinfectant activity: 1-2% (Solution), Concentration for antiseptic activity: 0.5% (Dusting powder), 1.3% (Solution).

b) **Alcohols**: Alcohols exhibit bactericidal action against vegetative forms. They are readily available, affordable, and nontoxic when applied topically. Alcohol can be used alone or in conjunction with other germicides such as phenols, chlorhexidine, iodines, and quaternary ammonium compounds. Alcohol exhibits an antimicrobial effect by denaturing proteins. Although some microbes may undergo lysis, the bacteriostatic action of alcohols is due to the inhibition of cell metabolites. Alcohol requires some water to be effective, therefore concentrations below 99% are used. Alcohol shows intermediate level of germicidal action. Examples: Ethyl alcohol, propyl alcohol Concentration for disinfectant activity: 50-90% (Clean surface preparation), Concentration for antiseptic activity: 50-90% (Skin preparation).

c) **Aldehydes**: Aldehydes exhibit antibacterial, antifungal, antiviral and sporicidal action. Formaldehyde and glutaraldehyde are the commonly used aldehydes. Formaldehyde inactivates microorganisms by alkylating the amino and sulfhydryl groups of proteins and ring nitrogen atoms of purine bases, whereas, glutaraldehyde causes alkylation of sulfhydryl, hydroxyl, carboxyl, and amino groups of microorganisms, which alters nucleic acids and protein synthesis. Formaldehyde is effective as gas or as an aqueous solution. Concentration for disinfectant activity: 2% (Solution for instruments), Concentration for antiseptic activity: 10% (Gel for warts).

d) **Quaternary ammonium compounds:** Quaternary ammonium compounds are surface-active cations with limited germicidal action. They bind irreversibly to the phospholipids and proteins found in microbe cell membranes and decrease the cell permeability. Quaternary ammonium compounds are usually more effective at preventing the growth of bacteria than killing them. Also, they are far more efficient against gram-positive bacteria than gram-negative bacteria. At high concentrations they may cause skin irritation and chemical burns. Examples: Cetyltrimethyl ammonium bromide, Concentration for disinfectant activity: 1% (Instruments), Concentration for antiseptic activity: 0.1% (Solution for wounds and burns), 0.5% (Cream).

e) **Halogens**: Chlorine and iodine are both commonly used disinfectants. Chlorine is used to treat drinking water all around the world. Even at low concentrations, chlorine and hypochlorites react quickly with organic matter and are effective bactericides. Drinking water with a chlorine

concentration of 0.2-1.0 parts per million has a large margin of safety. Chlorine is sporicidal and fungicidal, but some spores are resistant to it. In aqueous or alcoholic solution, iodine is a good disinfectant. Iodine penetrates microbial cell walls and disrupts protein and nucleic acid structure and synthesis, which results in bactericidal effect. It is utilized as a skin disinfectant in concentrations of 2.5% and 5% (Lugol's solution), Concentration for disinfectant activity: 1-10% (Solution for surfaces and instruments), Concentration for antiseptic activity: ≤0.5% $AvCl_2$ (i.e. available chlorine) (Solution for wounds and skin).

f) **Biguanides**: Chlorhexidine, which comes in the forms of digluconate, diacetate, and dihydrochloride, is a frequently used disinfectant in this category. Salts of chlorhexidine dissociate to form a positively charged cation. The bactericidal action is due to the binding of this cation to the negatively charged bacterial cell walls. Chlorhexidine shows a bacteriostatic action at low concentrations whereas at high concentrations, membrane rupture results in cell death. It is used on skin that is either damaged or intact. It is also used to remove plaque from teeth, in mouthwashes, and to clean urinary catheters. Concentration for disinfectant activity: 0.05% (Disinfect instruments), Concentration for antiseptic activity: 0.02% (Bladder irrigation), 0.2% (Mouth wash), 0.5% in 70% alcohol (Skin preparations), 1% (Dusting powder, cream, dental gel).

g) **Ether derivatives**: Triclosan (chemical name 2,4,4'–trichloro-2'-hydroxydiphenyl ether) is a nonionic, colourless compound used as a disinfectant in soaps. Triclosan enters bacterial cells and affects RNA, fatty acid, and protein synthesis as well as the cytoplasmic membrane. Antimicrobial action can be seen at concentrations ranging from 0.2-2%.

B. Fumigation

Fumigation is a method of pest management that involves entirely filling an area with gaseous insecticides or fumigants. It is used to control pests in soil, grain, food, buildings, and containers, as well as to prevent the transfer of uncommon organisms during the processing of goods to be imported or exported. Fumigation is a dangerous procedure. As the chemicals employed are hazardous to most of the living organisms, including humans, it is generally a legal requirement that the individual who performs the fumigation procedure has been certified to do so. Fumigating agents are chemicals that can exist in a gaseous state in sufficient concentrations to kill a pest. Fumigants are commonly employed for insect and pest management. It can provide an effective, cost-efficient treatment in situations where other methods of pest control are ineffective.

The fumigation procedure is divided into three stages:

a) **First phase**: Cover the area to be fumigated in order to establish a sealed environment.

b) **Second phase**: The fumigating agent is introduced into the area which is to be fumigated. The fumigant gas percolates through the space for a specific amount of time, killing any infestation in the region.

c) **Third phase:** The area is finally vented, allowing the dangerous gases to escape and making the space safe for humans to enter. If the entire process was successful, the fumigated area can be considered as safe and pest-free.

Fumigating agents that are mostly used include methyl bromide, 1,3-dichloropropane, formaldehyde, iodoform, methyl isocyanate, phosphine, DBCP (1,2-Dibromo-3-chloropropane), and others.

C. Antilarval agents

Larvicides, also known as anti-larval agents, are insecticides that are used to keep mosquitoes away, both inside as well as outside the house. They kill mosquito larvae and pupae before they develop into biting adults. Some formulations function when they come into contact with the larvae, whereas others work when the mosquitoes consume them. People, pets, and the environment are not harmed when larvicides are used according to the directions given on the product label. Larvicides should be used at the places where mosquitoes lay eggs (stagnant water) to help reduce the number of mosquitoes in an area.

Types of larvicides

a) **Insect growth regulators**: These larvicides inhibit mosquito larvae from reaching adulthood by preventing them from completing their immature stage. E.g. Methoprene and pyriproxyfen.

b) **Bacterial larvicides / Biological agents:** This type of larvicide is made from natural substances.

i. **Bti**: The bacterium Bacillus thuringiensis subspecies israelensis is found in the soil and is toxic to mosquito larvae, blackflies, and fungus gnats. Bti has been used for mosquito control for more than 30 years.

ii. **Spinosad**: This is a commercial larvicide derived from this bacterium Saccharopolyspora spinosa. This bacterium is found in soil and is toxic to mosquitoes, ants, fruit flies, and other insects.

iii. **Oils and films**: Some mineral oils and films are used to eliminate mosquito larvae and pupae. When applied to water, mineral oils and films form a thin coating on the surface of water. As a result, mosquito larvae and pupae that breathe at the surface of the water will drown. The only efficient method for killing pupae is to use mineral oils and films. Larvicides come in many forms: Liquids, Tablets, Pellets, Granules, Briquettes, Bits etc.

D. Mosquito repellent

Mosquito repellents are chemical substances that are applied to skin, clothing, or other surfaces to prevent mosquitoes from approaching or landing on that surface. These substances can aid in the prevention of mosquito bites and the diseases they transmit. The most efficient mosquito repellents are DEET and Picaridin.

DEET: DEET (N, N-diethyl-meta-toluamide) is the active ingredient in many repellent products. It is often used to repel biting pests like mosquitos. This repellent is available in various forms, including liquids, lotions, sprays, and other sprays.

Picaridin: Picaridin is a reliable and powerful mosquito repellent that provides long-lasting protection against mosquito bites. It is a good alternative to DEET products. Picaridin is practically odourless as compared to DEET. It does not cause skin irritation and has no negative effects on plastics.

5. Requirements

Marketed products containing at least one disinfectant, antiseptic, fumigating, antilarval and mosquito repellents agents from above mentioned categories.

6. Requirements used

_____

_____

7. Procedure

The subject teacher must show and explain the use and direction of various marketed products of disinfectant, antiseptic, fumigating agents, antilarval agents and mosquito repellents product to the students.

Activity I

Create a chart of well-known products of disinfectants, antiseptic, fumigating, and antilarval agents or mosquito repellents marketed in India. The chart must include: name of product, image of product, name of fumigating agent/antilarval agent/mosquito repellent (with concentration), use and direction.

8. Result

The chart detailing marketed preparations of disinfectants, antiseptics, fumigating agents, larvicides, and mosquito repellents, including their composition and usage, was prepared.

9. References

a. http://www.pharmacy180.com/article/types-of-compound-623/
b. https://www.in.gov/health/files/Tab_1_Resource_CD.pdf
c. https://www.cdc.gov/mosquitoes/mosquito-control/community/larvicides.html
d. https://www.cdc.gov/mosquitoes/pdfs/larvicides-508.pdf

10. Practical Related Questions

a. How do disinfectants and antiseptics differ?
b. List four desirable characteristics of disinfectants.
c. Explain the process of fumigation.
d. Name the fumigating agents.
e. What do bacterial larvicides do?
f. Find and provide the name of the mosquito repellent used in Odomos Advanced Mosquito Repellent cream.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 16

Awareness of Dengue

1. Aim

To prepare chart/poster/powerpoint presentation on the awareness of Dengue.

2. Practical Significance

Dengue fever, a virus transmitted by mosquitoes, is prevalent in tropical and subtropical regions. Individuals who contract the virus for a second time face a significantly greater risk of developing severe illness. Pharmacists play a crucial role in raising awareness about communicable diseases and how to prevent them within society. During this practical, students will gain knowledge about Dengue's transmission, symptoms, treatment, and prevention, equipping them to educate the community on these aspects.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Explain the mode of transmission, symptoms, treatment, and prevention of Dengue.	CO 2-4	BTL3
2	Prepare an educational chart/poster/powerpoint presentation on awareness of Dengue.	CO 2-4	BTL6
3	Collaborate and communicate with fellow students.	CO 2-4	BTL5

4. Relevant Theoretical Background

Dengue fever is a viral infection transmitted through the bite of an infective Aedes mosquito. Dengue viruses are part of the Flaviviridae family and encompass serotypes 1, 2, 3, and 4. An individual contracts the illness around 5-6 days after being bitten by an infective mosquito. There are two main types of Dengue fever: Classical Dengue fever, commonly known as "break bone" fever (Haddi Tod Bukhaar), and Dengue Haemorrhagic Fever (DHF), which can be life-threatening. The disease is particularly common after the rainy season.

National Dengue Day is marked on May 16th each year.

The Dengue virus can be detected in the blood of Dengue fever patients. When a mosquito bites a person with Dengue fever, it ingests both blood and the Dengue virus. Over a few days, the virus multiplies within the mosquito's body. When this infected mosquito subsequently bites a healthy person, it transfers the virus into their body, leading to Dengue fever symptoms. The onset of Dengue symptoms typically occurs 5-6 days after being bitten by an infected mosquito, although this timeframe can range from 3-10 days.

Symptoms of Dengue

Symptoms of Dengue depend upon the type of Dengue fever. There are three types of Dengue fever:

a) Classical (Simple) Dengue Fever
b) Dengue Haemorrhagic Fever (DHF)
c) Dengue Shock Syndrome (DSS)

The classic (Simple) form of Dengue fever is a self-limiting disease that does not result in death. However, the other forms (such as DHF and DSS) can be fatal if treatment is not started immediately. Therefore, it is necessary to recognize the type of Dengue fever which can be diagnosed through symptoms.

a) Classical (Simple) Dengue Fever

a. Sudden onset of high fever with feeling of chills.
b. Severe Headache, pains in muscles and joints.
c. Pain behind the eyeballs especially on pressing the eyes or on moving the eyeballs.
d. Extreme weakness, loss of appetite, feeling of nausea.
e. Loss of taste.
f. Pain in abdomen by itself or on touching.
g. Mild throat pain.
h. Feeling of depression and extreme sickness

b) Dengue Haemorrhagic Fever (DHF)

Along with the symptoms of Classic (Simple) Dengue Fever, following symptoms occur in DHF:

a. Bleeding from nose, gums.
b. Blood in the stools or in vomiting.
c. Bleeding spots on the skin which are seen as dark bluish-black, small or large patches.
d. Tourniquet Test is positive.
e. DHF is also confirmed by certain laboratory tests performed on a blood sample.

c) Dengue Shock Syndrome (DSS)

In case of DSS, following symptoms accompany the symptoms DHF:

a. Restlessness
b. Despite a high fever, the skin feels cold and clammy.
c. Loss of consciousness.
d. Weak and rapid pulse rate.
e. Low blood pressure.

Treatment of Dengue

a) For Classical (Simple) Dengue Fever

a. Keep the fever low by giving paracetamol tablet or syrup as per the doctor's advice.
b. Do not give Aspirin or Dispirin tablets to the patient.
c. If the fever is higher than 102°F, use hydrotherapy to lower the temperature.
d. Give the patient plenty of fluids, such as water, shikanji, and so on.
e. Continue to feed as usual. When you have a fever, your body wants more nourishment.
f. Allow the patient to rest.

b) For DHF and DSS

Take the patient to the nearest hospital as soon as possible, where appropriate tests will be performed and required treatment, such as fluid or platelet transfusions, will be given.

Prevention of Dengue

a. Place all used cans and bottles in covered dustbins.
b. Replace plant water at least once a week, ensuring that there is no water in the saucers beneath flowerpots.
c. Ensure that all water containers, wells, and storage tanks are completely covered.
d. Make sure all drains are clear of clogs.
e. Replace any damaged ground surfaces to prevent stagnant water from accumulating.
f. Wear long-sleeved shirts and pants.
g. Apply insect repellent to any exposed areas of your body.
h. When the room isn't air-conditioned, use mosquito screens or netting.

5. Requirements

Reading material / Literature on Dengue, colouring materials, A3 paper, PCs/Laptop.

6. Requirements used

_____

_____

7. Procedure

The subject teacher must explain mode of transmission, symptoms, treatment, and prevention of Dengue to the students. Teachers can make use of readymade Charts/ PowerPoint presentation /YouTube videos for this purpose.

Activity I

Create chart/poster/powerpoint presentation on the awareness of Dengue.

8. Result

Educational material chart/poster/powerpoint presentation was prepared for public awareness of dengue.

9. References

a. https://nvbdcp.gov.in/WriteReadData/l892s/Clinical%20Guidelines.pdf
b. https://www.cdc.gov/dengue/transmission/index.html
c. https://www.aiims.edu/aiims/dengue-2007/Dengue%20English-colour.pdf
d. https://www.chp.gov.hk/en/features/240.html Wats

10. Practical Related Questions

a. What are the various forms of Dengue fever?
b. List the symptoms of DHF.
c. Find and explain why it's recommended to avoid Aspirin in patients with dengue.
d. Identify the pathogen responsible for causing dengue.
e. Describe how dengue infection is transmitted.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 17

Awareness of Hepatitis

1. Aim

To prepare chart/poster/powerpoint presentation on the awareness of Hepatitis.

2. Practical Significance

Hepatitis refers to liver inflammation, often triggered by hepatitis viruses but can also stem from infections, toxins like alcohol, or autoimmune disorders. Pharmacists play a vital role in raising awareness about communicable diseases and preventive measures in society. This practical session will educate students on the transmission, symptoms, treatment, and prevention of hepatitis, empowering them to educate the community on these topics.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Explain the mode of transmission, symptoms, treatment, and prevention of hepatitis.	CO 2-4	BTL3
2	Prepare an educational chart/poster/powerpoint presentation on awareness of hepatitis.	CO 2-4	BTL6
3	Collaborate and communicate with fellow students.	CO 2-4	BTL5

4. Relevant Theoretical Background

The term hepatitis refers to the inflammation (swelling) of the liver. It can be caused by a viral infection or by exposing the liver to toxic substances like alcohol. Hepatitis may exhibit little or no symptoms, but it frequently causes jaundice, anorexia (a lack of appetite), and malaise. Acute and chronic hepatitis are the two kinds of hepatitis. Hepatitis is classified as acute if it lasts less than six months and chronic if it lasts longer.

Viruses causing hepatitis:

a) Hepatitis A virus (HAV)
b) Hepatitis B virus (HBV)
c) Hepatitis C virus (HCV)
d) Hepatitis D virus (HDV)
e) Hepatitis E virus (HEV)

Mode of transmission

a. **Hepatitis A virus (HAV):** Hepatitis A virus (HAV) is found in the faeces of infected people and is spread by drinking contaminated water or eating contaminated food. HAV can also be disseminated through certain sex activities.

b. **Hepatitis B virus (HBV):** The hepatitis B virus (HBV) is spread through contact with infectious blood, semen, and other bodily fluids. HBV can be passed down from infected moms to their babies at birth or from a family member to a newborn in early infancy. Transfusions of HBV-infected blood and blood products, contaminated injections during medical operations, and injectable drug use can all lead to transmission of HBV.

c. **Hepatitis C virus (HCV):** Hepatitis C virus (HCV) is primarily transmitted by direct contact with infective blood. This can occur as a result of transfusion of blood and blood products contaminated with HCV, contaminated injections during medical procedures, and injectable drug use. Sexual transmission is also a possibility, but it is uncommon.

d. **Hepatitis D virus (HDV):** Hepatitis D is only found in patients who have previously been infected with the hepatitis B virus. Hepatitis D is transmitted when blood or other bodily fluids from a virus-infected person enter the body of an uninfected person.

e. **Hepatitis E virus (HEV):** The hepatitis E virus (HEV) is primarily transmitted by contaminated water or food.

Symptoms of hepatitis

a) Muscle and joint pain
b) A high temperature ($\geq 38^0$C)
c) Feeling unwell
d) Headache
e) Occasionally yellowing of the eyes and skin (jaundice)
f) Loss of appetite
g) Unexplained weight loss
h) Dark urine

Symptoms of chronic hepatitis can include:

- Fatigue
- Depression
- Jaundice
- A general sense of feeling unwell

Treatment of hepatitis

a) Patients must take bed rest and avoid alcohol.
b) Medication should be taken to relieve symptoms.
c) After a few weeks, most people with hepatitis A and E recover on their own.
d) Drugs like lamivudine and adefovir dipivoxil are used to treat hepatitis B.
e) Peginterferon and ribovarin are used in the treatment of hepatitis C.
f) Liver transplant in case of liver failure due to HBV, HCV and HDV.

Prevention of hepatitis

a) Immunization

Hepatitis A: Two or three doses of the vaccine are given to children aged in between 1 to 18 years. Adults require a booster dosage, six to twelve months after receiving their first dose of vaccination. The vaccine's effect is expected to last 15–20 years or longer.

Hepatitis B: Hepatitis B vaccines are safe and effective, providing protection for at least 15 years and beyond. The Center for Disease Control and Prevention currently recommends that all newborns, children under the age of 18, and adults who are at risk of infection be vaccinated. Hepatitis B vaccination is available in India as part of the Universal Immunization Programme (UIP). The hepatitis B vaccine also protects against infection with the hepatitis D virus (HDV). The Hepatitis B vaccine is a series of shots that can prevent the disease. The immunization schedule depends on the age of the recipient:

- Infants: 6, 10, and 14 weeks, or 0, 6, and 14 weeks
- Children, adolescents, and adults: 0, 1, and 6 months
- Rapid protection: 0, 1, and 2 months

b) General preventive measures

a) Wash your hands after using the lavatory and before handling or eating the food.

b) Latex condoms can help reduce the chance of transmission.
c) Drug needles should not be shared.
d) Do not share personal things with an infected person, such as toothbrushes, razors, or nail clippers.

5. Requirements

Reading material / Literature on hepatitis, PC/Laptop, Coloring material A3 paper.

6. Requirements used

_____

_____

7. Procedure

The subject teacher must explain mode of transmission, symptoms, treatment and prevention of hepatitis to the students. Teachers can make use of readymade Charts/ PowerPoint presentation /YouTube videos for this purpose.

Activity I

Create chart/poster/powerpoint presentation on the awareness of hepatitis.

Activity II

Students should check their immunization records or search for them if they're not easy to find, to see if they have gotten the Hepatitis B vaccine.

8. Result

Educational material chart/poster/powerpoint presentation was prepared for public awareness of hepatitis.

9. References

a. https://www.who.int/news-room/questions-and-answers/item/hepatitis
b. https://www.nhp.gov.in/disease/digestive/liver/hepatitis
c. https://www.cdc.gov/hepatitis/hdv/index.htm
d. https://main.mohfw.gov.in/sites/default/files/41016395871489662752.pdf

10. Practical Related Questions

a. What are the signs of chronic hepatitis?
b. Describe the method through which HBV is transmitted.
c. How does hepatitis D virus differ from other hepatitis-causing viruses?
d. Identify the agent responsible for hepatitis.
e. Create a concept map illustrating hepatitis.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 18

Awareness of Cholera

1. Aim

To prepare chart/poster/powerpoint presentation on the awareness of Cholera.

2. Practical Significance

Cholera is an infectious disease that causes severe watery diarrhoea and, if left untreated, dehydration and death. It is the responsibility of pharmacists to create awareness in the society about communicable diseases and their prevention. In this practical, students will learn about mode of transmission, symptoms, treatment, and prevention of cholera so that they can educate the society about the same.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Explain the mode of transmission, symptoms, treatment, and prevention of cholera.	CO 2-4	BTL3
2	Prepare an educational chart/poster/powerpoint presentation on awareness of cholera.	CO 2-4	BTL6
3	Collaborate and communicate with fellow students.	CO 2-4	BTL5

4. Relevant Theoretical Background

Cholera is an intestinal disease caused due to consumption of contaminated food or water. It is primarily caused by the bacterium Vibrio cholerae. The incubation period is short, ranging from one to five days. After infection, bacteria produce an enterotoxin that leads to copious, painless, watery diarrhoea which further results in severe dehydration and death, if not treated on immediate basis. The majority of patients also exhibit vomiting.

Mode of transmission

Cholera can be caused by drinking contaminated water or eating contaminated food. The source of contamination in an epidemic is frequently the faeces of an infected person, which contaminates water or food. In locations where sewage and drinking water are not properly treated, the disease can spread quickly.

Symptoms of cholera

a. Profuse watery diarrhea
b. Vomiting
c. Leg cramps.

In people, rapid loss of body fluids leads to dehydration and shock. If not treated it can lead to death within hours.

Dehydration:

Dehydration occurs when the body loses more fluids than it takes in. This imbalance can lead to various symptoms and, if severe, can be life-threatening. Symptoms of dehydration include:

a. Thirst
b. Dry mouth and throat
c. Dark yellow or amber-colored urine
d. Decreased urine output
e. Dry skin

f. Headache
g. Dizziness or lightheadedness
h. Fatigue
i. Confusion

The World Health Organization (WHO) categorizes dehydration into three stages based on the percentage of body weight lost due to fluid loss:

- Mild Dehydration: Up to 5% loss of body weight.
- Moderate Dehydration: 6-9% loss of body weight.
- Severe Dehydration: More than 10% loss of body weight.

Treatment of cholera

a) Increase fluid intake

To avoid dehydration, it is essential to drink plenty of fluids. Oral Rehydration Salt (ORS) is used to prevent dehydration. Standard home remedies can be administered, such as salted rice water, salted yoghurt drinks, and salted vegetable and chicken soups. Home remedies include cereal-cooked water, unsalted soup, green coconut water, weak (unsweetened) tea, and unsweetened fresh fruit juices.

b) Medications

Antibiotics can help to decrease the illness's duration and intensity, but rehydration is far more important.

c) Eating

A kid with diarrhoea should be fed consistently. The restoration of normal intestinal function is accelerated by continued feeding. Children who have their diet restricted, on the other hand, suffer diarrhoea that lasts longer and recovers their digestive function more slowly.

Prevention of cholera

a. Drink safe and clean water.
b. Wash your hands frequently with soap and clean water.
c. Proper hygiene and sanitation.
d. Cook food well and cover it properly.
e. Vaccination: There are two main types of vaccines available for cholera:
   i. **Inactivated Oral Vaccines:**
      - These vaccines contain killed cholera bacteria (Vibrio cholerae).
      - Administered orally, usually in liquid form.
   ii. **Live-attenuated Oral Vaccines:**
      - These vaccines contain weakened (attenuated) live cholera bacteria.
      - Also administered orally.

Both types of vaccines aim to stimulate the immune system to produce antibodies against Vibrio cholerae, providing protection against cholera infection. The choice of vaccine may depend on factors such as availability, local epidemiology, and recommendations from health authorities.

5. Requirements

Reading material / Literature on cholera, PC/Laptop, Coloring material A3 paper.

6. Requirements used

_____

_____

7. Procedure

The subject teacher must explain mode of transmission, symptoms, treatment and prevention of cholera to the students. Teachers can make use of readymade Charts/ PowerPoint presentation /YouTube videos for this purpose.

Activity I

Create chart/poster/powerpoint presentation on the awareness of cholera.

Activity II

List various vaccines available in the market with its types and brand names.

_____

_____

_____

_____

8. Result

Educational material chart/poster/powerpoint presentation was prepared for public awareness of cholera.

9. References

a. https://www.nhp.gov.in/disease/digestive/intestines/cholera
b. https://www.who.int/news-room/fact-sheets/detail/cholera

10. Practical Related Questions

a. What is the different ways cholera can be transmitted?
b. What treatment options exist for cholera?
c. How can cholera infection be prevented?
d. What is the microorganism responsible for causing cholera?
e. What are the signs and symptoms of cholera?

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 19

Awareness of Tuberculosis

1. Aim

To prepare chart/poster/powerpoint presentation on the awareness of Tuberculosis.

2. Practical Significance

Tuberculosis (TB) is a serious airborne bacterial infection that poses a threat to life and mainly targets the lungs. There are estimated 27.8 Lac cases of TB in India as per India TB Report 2024. More than one fourth of the global TB burden is in India. The bacteria responsible for TB spread through the air when an infected person coughs or sneezes. Pharmacists have a role in raising community awareness about TB with respect to its prevention, symptoms, also can help in referrals of symptomatic for early detection, medication counselling and treatment monitoring for ensuring adherence. In this practical, students will explore how TB spreads, its symptoms, treatment options, and prevention measures, equipping them to educate others about TB.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Explain the mode of transmission, symptoms, treatment, and prevention of tuberculosis.	CO 2-4	BTL3
2	Prepare an educational chart/poster/powerpoint presentation on awareness of tuberculosis.	CO 2-4	BTL6
3	Collaborate and communicate with fellow students.	CO 2-4	BTL5

4. Relevant Theoretical Background

Tuberculosis (TB) is an illness caused by Mycobacterium tuberculosis bacteria. While it primarily affects the lungs, it can also impact other organs. The disease spreads when individuals with TB cough, sneeze, or release respiratory fluids into the air. Fortunately, TB can be cured with proper treatment. India accounts for a quarter of global TB cases.

World TB Day is marked on 24th March each year.

Mode of transmission

TB spreads person to person through the air (Figure 1.2). When a person with infectious TB disease (TB that can be spread) coughs, sneezes, speaks, or sings, tiny particles containing M. tuberculosis may be expelled into the air. These particles, called droplet nuclei, can remain suspended in the air for several hours, depending on the environment. If another person inhales air that contains these droplet nuclei, infection may result from this transmission.

The immunocompromised people (e.g. HIV patients) are at high risk of getting infected with TB. The other factors that can increase the susceptibility towards TB infection are:

i. Tobacco use
ii. Malnutrition
iii. Alcoholism

Symptoms of TB

a) A cough that has lasted more than two weeks and occasionally brings up phlegm and blood
b) Breathlessness, which is usually minor at first but worsens over time
c) Lack of appetite and weight loss.
d) a high temperature or night sweats

e) Extreme tiredness or fatigue.
f) Chest pains
g) Extrapulmonary tuberculosis (EPTB): It is a contagious disease caused by the Mycobacterium tuberculosis bacteria that affects organ systems other than the lungs. It can affect many organs, including Lymph nodes, bones and joints, digestive system, nervous system, bladder, reproductive system etc. Symptoms of EPTB vary depending on the part of the body infected, but common symptoms include: Fever, Chills, Night sweats, Weight loss, Not wanting to eat, Tiredness, Dyspnea, Cough, and Hemoptysis.

Treatment of TB

The diagnosis and treatment of individuals who are smear-positive for TB microorganisms is a top priority. To guarantee proper treatment and cure of TB patients, full adherence to the DOTS plan (a WHO- recommended TB control strategy) is critical.
There are primarily three types of regimen:

Category 1: new smear positive (infectious) pulmonary cases

Category 2: re-treatment cases

Category 3: smear-negative pulmonary or extra pulmonary cases

The chemotherapeutic approach is based on standardized combinations of five important drugs: rifampicin (R), isoniazid (H), pyrazinamide (P), ethambutol (E) and streptomycin (S).
Each of chemotherapeutic approach regimens consist of two phases:

a. **Initial phase**: 2-3 months, with 3-5 drugs given daily under direct observation.
b. **Continuation phase**: 4-6 months, with 2-3 drugs given three times a week under direct observation, or in some cases 2 drugs for 6 months given daily unsupervised, but in fixed-dose combination form.

Multi-drug resistant TB (MDR-TB)

MDR-TB is a type of drug-resistant tuberculosis caused by bacteria that are resistant to at least isoniazid and rifampicin, the two most powerful anti-TB drugs.
DOTS-Plus is a second-line anti-TB treatment developed to cure MDR-TB. This is necessary in locations where MDR-TB has emerged as a result of earlier TB control programmes that were ineffective.

Prevention of TB

a. Patients must be diagnosed as soon as possible and treated appropriately.
b. Vaccinate (BCG vaccine)
c. Minimize contact with others in case of active tuberculosis.
d. Cover the mouth while laughing, sneezing, or coughing. During the first few weeks of treatment, wear a surgical mask when people are around.
e. In cases of latent infection, it is recommended that all treatments should be taken so that the infection does not become active and communicable.

5. Requirements

Reading material / Literature on tuberculosis, PC/Laptop, Coloring material A3 paper.

6. Requirements used

7. Procedure

The subject teacher must explain mode of transmission, symptoms, treatment and prevention of tuberculosis to the students. Teachers can make use of readymade Charts/ PowerPoint presentation /YouTube videos for this purpose.

Activity I

Create chart/poster/powerpoint presentation on the awareness of tuberculosis.

8. Result

Educational material chart/poster/powerpoint presentation was prepared for public awareness of tuberculosis.

9. References

a. https://www.nhp.gov.in/disease/respiratory/lungs/tuberculosis
b. https://www.who.int/health-topics/tuberculosis
c. India TB Report 2024 www.tbcindia.nic.in
d. Pharmacists at the Frontline: Novel Approach at combating TB, Indian Pharmaceutical Association, https://ipapharma.org/ipa-resources-hand-books-and-reports, Year 2018

10. Practical Related Questions

a. Write the microorganism responsible for TB.
b. What are the methods through which TB is transmitted?
c. What does DOTS stand for?
d. Which medications are not effective for MDR-TB?
e. Classify antitubercular agents.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 20

Awareness of Malaria

1. Aim

To prepare chart/poster/powerpoint presentation on the awareness of malaria.

2. Practical Significance

Malaria is a severe parasitic illness transmitted through bites from Anopheles mosquitoes that are infected. Pharmacists have a responsibility to raise awareness in society about infectious diseases and their prevention. In this practical session, students will acquire knowledge about the transmission mode, symptoms, treatment, and prevention of malaria to effectively educate the community about these aspects.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Explain the mode of transmission, symptoms, treatment, and prevention of malaria.	CO 2-4	BTL3
2	Prepare an educational chart/poster/powerpoint presentation on awareness of malaria.	CO 2-4	BTL6
3	Collaborate and communicate with fellow students.	CO 2-4	BTL5

4. Relevant Theoretical Background

Malaria is an illness caused by parasitic infection, marked by recurring symptoms like fever, chills, and headaches. These symptoms typically follow a pattern where the fever subsides temporarily before returning. In severe cases, malaria can lead to unconsciousness or even death. The disease is caused by Plasmodium parasites and is prevalent in tropical and subtropical regions near the equator, including much of Sub-Saharan Africa and Asia. In India, malaria is present throughout the year and is more widespread during and after the rainy season due to increased mosquito breeding. According to the World Health Organization (WHO), India accounts for 77 percent of all malaria cases in Southeast Asia. The disease is particularly common in states like Rajasthan, Gujarat, Karnataka, Goa, Southern Madhya Pradesh, Chhattisgarh, Jharkhand, Odisha, and the northeastern states.

World Malaria Day is observed each year on 25th April.

Mode of transmission

Malaria is caused by the Plasmodium parasite. Infected female Anopheles mosquitoes can transmit the parasite to humans through bites. There are five types of plasmodium parasites that can cause malaria in humans.

a) ***Plasmodium falciparum***– It is the most common type of malaria parasite and is responsible for the majority of malaria deaths globally. It is mostly found in Africa.
b) ***Plasmodium vivax***– This parasite causes milder symptoms than Plasmodium falciparum, but it can persist in the liver for up to three years, causing relapses. It is mostly found in Asia and South America.
c) ***Plasmodium ovale***– It is a rare parasite that is mostly found in West Africa, and it can survive in the liver for years without causing symptoms.
d) ***Plasmodium malariae***– This is a rare species and usually found only in Africa.
e) ***Plasmodium knowlesi***– This is a very rare species that can only be found in Southeast Asia.

Steps of transmission

a) When a mosquito bites a person who has malaria, it becomes infected.
b) This mosquito transmits malaria parasites to humans by biting.
c) Once the parasite enters inside the body, it migrates to the liver, where some varieties can remain latent for up to a year.
d) The parasites exit the liver when they reach adulthood and infect the red blood cells. This is when most people start to experience symptoms of malaria.
e) If an infected person is bitten by an uninfected mosquito at this stage in the cycle, it will get infected with the malaria parasites and potentially transfer them to other people.

Malaria can also be transmitted through contact with infected blood because the parasites that cause the disease attack red blood cells.

– From the mother to the foetus.
– By using blood transfusions.
– By sharing drug-injecting needles.

Symptoms of malaria

Symptoms of malaria usually develop in seven days after the bite from an infected mosquito. General symptoms include:

a) Fever, headache, vomiting and other flu-like symptoms, (The fever comes and goes every four to eight hours).
b) The parasite infects red blood cells and destroys them, causing exhaustion, convulsions and loss of consciousness.

Treatment of malaria

Once malaria has been diagnosed, the appropriate antimalarial treatment must be started immediately.

Treatment depends upon the four main factors:

a) **Infecting Plasmodium species**: *Plasmodium falciparum* and *Plasmodium knowlesi* infections can cause fast escalating severe illness or death, whereas *Plasmodium vivax, Plasmodium ovale,* and *Plasmodium malariae* infections are less likely to produce severe disease. Therefore, prompt commencement of adequate medication for *P. falciparum* and *P. knowlesi* infections is necessary. The hypnozoites from *P. vivax* and *P. ovale* infections must be treated because they might remain dormant in the liver and produce relapses. Drug resistance patterns differ between P. falciparum and P. vivax species in different parts of the world.

b) **Clinical status of the patient**: Malaria patients are often classified as having either uncomplicated or severe malaria. Oral antimalarials can be used to treat patients who have uncomplicated malaria whereas the patients with severe malaria require intravenous antimalarial therapy.

c) **Drug susceptibility of the infecting parasite**: Antimalarial treatment effective against chloroquine- resistant *P. falciparum* must be started immediately if the diagnosis of malaria is suspected and cannot be confirmed, or if the diagnosis of malaria is confirmed but species confirmation is not possible.

d) **Previous use of antimalarials**: It is critical to assess if malaria developed while a person was receiving a malaria chemoprophylaxis drug. Unless there are no other options, the treatment plan should not include the drug or drug combination employed for prophylaxis.

Prevention of malaria

a) Control Insect Breeding (Larval and Pupa Stage)

i. All breeding places should be filled and covered.
ii. Avoid storage of water in types, pots, coolers, and tanks. Regular cleaning (weekly) of such articles is important to prevent mosquito breeding.
iii. Use of larvivorous fish like gambusia or guppy in ornamental tanks, fountains, and other places.
iv. Use of chemical pesticides like Abate in potable water.

b) Individual Protection

i. Use an intact mosquito net while sleeping.
ii. Use mosquito repellent creams, liquids, coils, and mats.
iii. Use Indoor Residual Spray (IRS) with insecticides.
iv. Use Aerosol space spray during daytime.
v. Use biocides.
vi. Get houses fitted with wire mesh.
vii. Use bed nets treated with insecticide.
viii. Cover your body properly.

c) Prevention in Community

i. Malathion fogging during outbreaks.
ii. The place around the Hand Pump should be properly cemented, along with a drainage system.
iii. Sensitizing and mobilizing the community to eradicate Anopheles breeding sites.

d) Prevention during Travel

Before planning your travel, find out the malaria risk in that area and take the advice from doctor before visiting that area.

e) Prevention of Malaria during Pregnancy

i. Use of treated nets/LLINs (Long Lasting Insecticidal Nets).
ii. Take all personal preventive measures as mentioned above.

5. Requirements

Reading material / Literature on malaria, PC/Laptop, Coloring material A3 paper.

6. Requirements used

_____

_____

7. Procedure

The subject teacher must explain mode of transmission, symptoms, treatment and prevention of malaria to the students. Teachers can make use of readymade Charts/ PowerPoint presentation /YouTube videos for this purpose.

Activity I

Create chart/poster/powerpoint presentation on the awareness of malaria.

8. Result

Educational material chart/poster/powerpoint presentation was prepared for public awareness of malaria.

9. References

a. https://www.nhp.gov.in/disease/malaria

b. https://www.who.int/health-topics/malaria#tab=tab_3
c. https://www.mayoclinic.org/diseases-conditions/malaria/symptoms-causes/syc-20351184

10. Practical Related Questions

a. Name the Plasmodium parasites responsible for malaria.
b. Describe the symptoms associated with malaria.
c. Enumerate four factors influencing the treatment of malaria.
d. List the personal preventive measures against malaria.
e. Classify antimalarial agents.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 21

Determination of total dissolved solids in water

1. Aim

To determine total dissolved solids (TDS) of drinking water using TDS meter.

2. Practical Significance

Total dissolved solids (TDS) or total dissolved salts refer to the quantity of dissolved minerals found in water. When these minerals are present in elevated concentrations, they can pose potential harm. This practical will educate students on how to measure the TDS of drinking water, a crucial aspect of water safety analysis.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Determine the TDS of drinking water.	CO 3,4	BTL3
2	Decide whether the water is suitable for drinking.	CO 3,4	BTL4
3	Collaborate and communicate with fellow students.	CO 3,4	BTL5

4. Relevant Theoretical Background

The importance of water in our lives cannot be overstated. Without water, life on our planet would not be possible. We rely on water for various purposes, including drinking, industrial processes, irrigation, swimming, fishing, and more. Depending on its intended use, water must meet specific composition and purity standards. It is essential to regularly assess the suitability of each body of water.

One key indicator of water quality in lakes, rivers, and streams is the total amount of dissolved solids in the water. Elevated levels of dissolved solids can signify poor water quality. This also applies to drinking water, where any minerals, salts, metals, cations, or anions dissolved are termed "dissolved solids." Total dissolved solids (TDS) refer to the overall concentration of dissolved substances in water. Water with high TDS levels may have reduced palatability and could have adverse effects on those consuming it. For this reason, a recommended TDS limit of 500 mg/L is set for drinking water. As per the Bureau of Indian Standards (BIS) table, the TDS dependent acceptability of water for human consumption is as follows:

- Less than 50 mg/L: Unacceptable – Lack of minerals required for healthy human growth.
- 50-150 mg/L: Acceptable- Minor industrial contamination.
- 150-250 mg/L: Acceptable - Healthiest water and good for cardiovascular health.
- 250 - 350 mg/L: Acceptable - Contains essential minerals.
- 350-500 mg/L: Fair - TDS limit for human consumption is 500.
- Above 500 – 1200 mg/L: Not Acceptable- Unfit for human consumption. However, such water can be purified using Reverse Osmosis (RO) technology to eliminate TDS and bring it down to acceptable levels.
- Above 1200 mg/L: Not Acceptable-Unfit for human consumption.

TDS can be determined by gravimetric method or electrical conductivity method. The electrical conductivity method is very easy and convenient to determine TDS of water. The total dissolved solids can be determined quickly by measuring electrical conductivity with a meter. There are two types of such meters: An electrical conductance meter (EC meter) and a TDS meter. A TDS meter is an electrical conductivity meter (EC meter) that calculates TDS from the siemens value and reports

the TDS concentration in parts per million (ppm) which can also be considered as milligram per litre (mg/L).

TDS meter

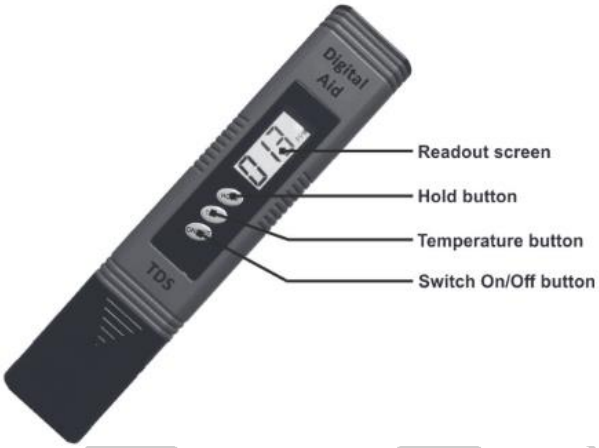

Figure 21.1: TDS meter

TDS meters are widely used because they are simple to operate. It consists of a readout screen which displays TDS in ppm (same numbers can also be read as mg/L). There are three buttons on the meter. "On/Off" button is used to turn the meter on and off. "Temp" button is used to measure the temperature of water. "Hold" button is used to freeze the reading when the metal probes are in contact with water. This helps to note down the reading once the meter is removed from water. Most of the TDS meters are calibrated at particular temperature (i.e. 25^0C). If the temperature of water is greater than 25^0C, the TDS reading will be higher than the original value and vice versa. Therefore, correction formulae are used to get actual TDS reading as given below:

For temperature greater than 25^0C, TDS (ppm) = Reading - [0.0190 × Reading × (Temp-25)]

For temperature less than 25^0C, TDS (ppm) = Reading + [0.0190 × Reading × (25-Temp)]

5. Requirements

TDS meter, drinking water, beaker (250 mL)

6. Requirements used

_____

_____

7. Procedure

a) Take 50 mL of drinking water in a 250 mL beaker.
b) Remove the cap from the TDS meter. Switch on the TDS meter using the "On/Off" button.
c) Dip the probes of the meter into the water. Take care to ensure that while submerging the meter in water, the water level does not exceed the provided marking on the TDS meter (Note: The TDS meter is not waterproof).
d) Gently stir the meter to dislodge any bubbles sticking to the metal probes.
e) If the reading on the readout screen is stable, note the reading; otherwise, press the "Hold" button and note the reading. Also, press the "Temp" button to record the temperature of the water (Note: If the "Temp" button is not available, use a thermometer from the laboratory to record the temperature).

f) Use the appropriate formula from the theory section to calculate the actual TDS value of the water. Compare the value with the BIS table (refer to the Theory section) and state whether the water is acceptable for human consumption in the conclusion.

8. Observation

a) TDS reading displayed on the readout screen = _____.

b) Temperature reading = _____ ^{0}C

9. Calculation

10. Result

a. TDS value displayed on the screen of TDS meter = _____ ppm.
b. Actual TDS value obtained from calculation = _____ ppm.

11. References

a. http://www.chemistryland.com/CHM130FieldLab/Lab2/Lab2.html
b. https://vlab.amrita.edu/?sub=2&brch=193&sim=575&cnt=1

12. Practical Related Questions

a. Define TDS.
b. What is the recommended range of TDS in water for safe human consumption?
c. Find and explain one drawback of using a TDS meter.

(Space for Answers)

13. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 22

Water Purification Using Bleaching Powder

1. Aim

To determine the amount of bleaching powder required to purify the given sample of contaminated water.

2. Practical Significance

The increasing global population has significantly increased the demand for potable water, emphasizing the necessity of identifying suitable water sources for drinking purposes. As many existing water sources are not naturally suitable for consumption, the purification and distribution processes must be carefully managed and organized to fulfill this demand. This practical will focus on teaching students the water purification technique using bleaching powder.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Purify water using bleaching powder.	CO 4	BTL3
2	Calculate the quantity of bleaching powder required for purification of water.	CO 4	BTL4
3	Collaborate and communicate with fellow students.	CO 4	BTL5

4. Relevant Theoretical Background

Water Purification

Water purification involves the removal of common impurities harmful to human and domestic use, making water safe, clear, colorless, and odorless. Groundwater from deep wells typically requires minimal treatment, whereas surface water sources like rivers need purification to ensure safety.

Chlorination

Polluted water requires disinfection to eliminate pathogenic microorganisms, often achieved through chlorination. Chlorine, in forms such as liquid sodium hypochlorite, gas, or bleaching powder, is a widely used and cost-effective disinfectant. It functions by halogenation, acting as an oxidizing agent that targets microorganisms, iron, manganese, and hydrogen sulfides. Chlorine also neutralizes substances causing taste and odor issues.

Upon adding chlorine to water, it reacts with pollutants, including microorganisms, during a specified contact time. The remaining chlorine, termed residual chlorine, serves as a disinfectant until the water reaches consumers, safeguarding it against potential pathogens. Water's chlorine demand, indicating the required chlorine amount for microbial and organic matter oxidation, should be assessed:

Chlorine demand = Amount of chlorine added - Residual chlorine

Bleaching powder, or chlorinated lime, is a white powder with a distinctive odor used for disinfecting wells, tanks, rivers, and canals. The Horrock's Test quantifies the bleaching powder needed for effective water disinfection, employing a specialized apparatus with cups for the powder and water samples, along with a starch-iodide indicator solution.

5. Requirements

Contaminated water sample, black cup (200 mL), 6 white cups (200 mL), 7 glass rods, pipette, droppers, starch-iodide indicator solution, bleaching powder, two metal spoons.

6. Requirements used

_____

_____

7. Procedure

a. Take 1 level spoonful (2 gm) of bleaching powder in the black cup and make it into a thick paste. Add water up to the circular mark. Allow it to settle. This is the Chlorine Stock Solution.
b. Fill all six white cups with water to be tested and label them from 1 to 6.
c. Add one drop of chlorine stock solution to cup No. 1, 2 drops to cup No. 2, 3 drops to cup No. 3, and so on (Use a special pipette for adding the stock solution).
d. Stir each cup with a separate glass rod.
e. Allow them to stand for 30 minutes for the chlorine to take effect.
f. Add a drop of starch-iodide indicator solution to each white cup and stir again (Starch-iodide solution: Dissolve 0.5 gm of soluble starch in 10 mL of water containing 0.5 gm of potassium iodide).
g. A blue color will develop in some cups, indicating the presence of free residual chlorine.
h. Note the first cup number showing a distinct blue color. For example, if cup No. 3 shows the color first, then 3rd level, i.e., 6 gm of bleaching powder, is required to disinfect 455 liters of water (1 level = 2 gm of bleaching powder).
i. Calculate the amount of bleaching powder required to disinfect the given volume of contaminated water.

8. Observation Table

Cup Number	Appearance of blue colour
1	Yes / No
2	Yes / No
3	Yes / No
4	Yes / No
5	Yes / No
6	Yes / No

i. Volume of contaminated water given (V) = _____ mL

ii. First cup number in which blue colour appeared (N) = _____

9. Calculations:

Amount of bleaching powder required to disinfect 455 litre of water (A) grams.

A = N × 2

A = _____× 2

A = _____ gm.

Amount of bleaching powder required to disinfect V litre of contaminated water (X)

X = (A x V) /455

X =

X = _____ gm

10. Result

The amount of bleaching powder required to disinfect a given volume of contaminated water is _____gm.

11. References

a. http://www.ihatepsm.com/blog/horrock%E2%80%99s-apparatus
b. https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=80015

12. Practical Related Questions

a. List various origins of water contamination.
b. Explain the terms "contact time," "breakpoint chlorination," and "residual chlorine."
c. Describe how chlorine disinfects water.
d. Provide a compilation of various chemicals utilized for purifying water.

(Space for Answers)

13. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 23

Healthy Eating Habits and Nutrition Awareness Among Children

1. Aim

To prepare an educational chart/poster to promote healthy eating habits and nutrition awareness among children.

2. Practical Significance

Children require a balanced diet comprising meals from all food groups to maintain good health and obtain essential nutrients. An unbalanced diet lacking proper nutrients can result in health problems. Consistent consumption of junk food can lead to lasting issues such as obesity, emotional disturbances, and chronic illnesses. A chart or poster can help raise awareness about healthy eating by highlighting the advantages of a balanced diet and the detrimental effects of junk food. This practical aim is to teach students how to differentiate between a balanced diet and junk food, comprehend the health advantages of a balanced diet, and effectively educate children about the adverse impacts of junk food.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Identify sources of nutrients from locally available foods.	CO 1,2,4	BTL4
2	Describe the advantages of a well-balanced diet.	CO 1,2,4	BTL2
3	Explore the negative consequences of consuming junk foods.	CO 1,2,4	BTL2
4	Create educational chart / poster to promote healthy eating habits and nutrition awareness among children.	CO 1,2,4	BTL4
5	Collaborate and communicate with fellow students.	CO 1,2,4	BTL5

4. Relevant Theoretical Background

I. Nutrition

Nutrition is the branch of science that deals with nutrients and nutrition. It is the physiological and biochemical process by which an organism uses food to support its growth, development, and maintenance. Nutrition is essential to our bodies as water is to plants. An unhealthy diet increases the risk of many diets related diseases.

Good nutrition means “maintaining a nutritional status that enables us to grow well and enjoy good health.” Good nutrition is important in preventing deficiency diseases and chronic diseases. Undernutrition means a shortage of essential nutrients in the diet caused by an insufficient supply of food. Malnutrition means incorrect nutrition whether due to excess or deficiency of one or more nutrients.

Nutrient

Nutrients are the substances that are present in food and consumed for its vital functions. According to the WHO, the nutrients must come from food, and they are essential for disease prevention, growth, and good health.

Classification of Nutrients

A. Macronutrients: Consumed in relatively large quantities.

a. Proteins
b. Carbohydrates
c. Fats and fatty acids

B. Micronutrients: Consumed in smaller quantities but are essential for body processes.

a. Vitamins
b. Minerals

II. Balanced diet

A balanced diet is one that contains all the nutrients in required amounts and proper proportions so that energy, amino acids, vitamins, minerals, fats, and carbohydrates is adequate, and a small provision reserved for extra nutrients to endure the short duration of leanness. The amounts of foods required to meet the nutrient requirements differ with age, gender, physiological status, and physical activity. A balanced diet should give around 50-60% of total calories from carbohydrates, about 10-15% from proteins and 20-30% from both visible and invisible fat. In addition, a balanced diet should provide other non-nutrients such as dietary fibre, antioxidants and phytochemicals which impart positive health benefits.

Health benefits of balanced diet:

a) A balanced diet provides essential nutrients that are required for normal growth and development of the body.
b) Healthy eating improves the body functions, increases energy, boosts the immune system, and prevents weight gain.
c) Nutritious eating provides the nutrients that are required to avoid nutritional deficiencies.
d) A balanced diet protects individuals from non-communicable diseases such as obesity, heart disease, diabetes, and some types of cancer. It is also helpful in managing hypertension and diabetes.
e) Following a special/balanced diet can reduce symptoms and may help patients better manage a disease and promotes healthy ageing
f) A healthy diet will assist individuals to feel energetic and manage weight.
g) Balanced foods eating uplifts emotional and mental well-being.

III. Junk Food

Junk foods are unhealthy and contain little or no nutritional value (proteins, vitamins, or minerals) but are rich in salt, sugar, fats and are high in energy (calories). Some examples are chocolates, artificially flavoured aerated drinks, potato chips, ice creams, french fries etc. Fast foods are ready-to-eat foods served promptly after ordering.

All fast foods are not junk food. Some fast foods are high in calories and low in nutritional value, while other fast foods, such as salads, may be low in calories and high in nutritional value. Regular consumption of junk food increases calorie intake without providing any nutrients, vitamins, and minerals. Junk foods contain chemical additives. Chemical additives consumed beyond permissible limits may have adverse effects on health. Thus, consumption of processed / unhealthy foods may not only affect intake of nutrients, but in addition, increase the risk of exposure to various chemical additives.

School canteens are offering foods high in fat and sugar which contribute to childhood weight gain along with other problems like food poisonings, dental diseases, and infections. Consuming junk food may stop children from taking healthy meals either at home or at school. The practice of high consumption of junk foods like biscuits, toast, samosa, maggi noodles, pav bhaji, burgers, chocolates, sandwiches, popcorn, hot dogs, potato chips, patties, muffins, pastries, carbonated drinks, kulcha-chana, etc. have become common aspect of youth's diet throughout the world.

Harmful effects of junk food:

a) Excess consumption of junk foods leads to inadequate growth and development of the body.
b) Junk foods contribute to an increased risk of obesity, diabetes, cardiovascular disease, and many other chronic health conditions.
c) High intake of junk foods tends to suppress the function of the brain that helps in learning and memory formation.
d) One of the bad effects of junk food is overeating. It may lead to loss of appetite and problems in digestion.
e) Junk food has a negative impact on energy level and emotional well-being.
f) Junk food also has a mental impact which leads to mental depression.

5. Requirements

List of locally available foods, internet facility.

6. Requirements used

_____

_____

7. Procedure

The subject teacher must explain to the students the importance of nutrition, sources of various nutrients, the significance of a balanced diet, and the harmful effects of junk food.

Activity-I

Create a chart containing pictorial and textual information about the balanced diet, importance of balanced diet and harmful effect of junk food.

8. Result

An educational chart/poster to promote healthy eating habits and nutrition awareness among children was prepared.

9. References

a. https://www.nin.res.in/downloads/DietaryGuidelinesforNINwebsite.pdf
b. https://www.narayanahealth.org/blog/how-to-maintain-a-balanced-diet/

10. Practical Related Questions

a. Explain the advantages of a well-rounded diet compared to consuming junk food.
b. Enlist some good/healthy eating habits.
c. Provide guidance on how to sustain a nutritious diet.
d. List different nutrients along with the diseases caused by their deficiencies.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 24

Caloric Needs of Different Groups and The Glycemic Index of Foods

1. Aim

To prepare an educational chart/poster on caloric intake for children and mothers and glycemic index of foods that are available locally.

2. Practical Significance

Calories serve as a measure of the energy released when food is broken down in the body. Maintaining a healthy weight relies on finding the right balance between the calories consumed and the calories burned. The glycemic index is a value assigned to foods based on how quickly and significantly they raise blood glucose levels. Understanding the glycemic index of foods is crucial for individuals who have diabetes, obesity, or heart disease. Pharmacists plays an important role in health promotional activities focused on nutrition. In this practical, students will be able to explain the specific caloric needs of different groups, such as children, mothers, and individuals leading sedentary lifestyles. Moreover, they will emphasize the significance of the glycemic index in promoting healthy dietary habits.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Calculate how many calories are required for different groups.	CO 1,2,4	BTL4
2	Prepare an educational chart/poster to educate society about caloric intake as per locally available foods for child and mother.	CO 1,2,4	BTL6
3	Explain the significance of the glycemic index of food.	CO 1,2,4	BTL2
4	Prepare an educational chart/poster to educate people/diabetic patients about glycemic index of foods that are available locally.	CO 1,2,4	BTL6
5	Collaborate and communicate with fellow students.	CO 1,2,4	BTL5

4. Relevant Theoretical Background

Calorie

Calorie – A unit of energy in food.

Every human being requires energy for normal functioning. Energy is obtained from the foods we consume, in the form of calories. Calories are a measuring unit of energy that is required by the human body to perform any function/activity. The amount of energy contained in foods is expressed in calories. Energy (calories) is provided to the body by eating or drinking food. Then this energy is used as a fuel by the body to run various activities and functions. If a person is physically active, more calories are used up than the one who leads sedentary life. The commonly used measure of a food calorie refers to a kilocalorie (Kcal) or 1000 cal. It is advised that 45–65% of your calories come from carbohydrates, 10–35% from proteins and 20–35% from fat. An adequate amount of food (calorie) intake is needed for the body to function properly. Lack of food (calorie) intake can lead to lessened immunity, muscle atrophy, lethargy and sometimes organ failure. The calorie requirement of an individual depends on various factors as given below.

Factors affecting calorie requirement of individuals:

a) Age
b) Sex
c) Height
d) Weight

e) Basal metabolic rate
f) Level of physical activity

Age and gender influence basal metabolic rate and therefore, affects one's caloric allowance. In general, male require more calories than females of the same age to maintain a healthy body weight and energy level. An active person requires more calories to remain fit and perform at the optimum level. If the calorie intake is less than adequate, the person might feel lethargic. If the calorie intake exceeds the recommended requirement, it might lead to obesity. Due to the growing awareness among the people about healthy eating habits, many people avoid eating high calorie foods to stay lean and thin. But some people exaggerate it.

Advantages of maintaining adequate calorie levels in the body:

a. Growth and development of the body
b. Proper functioning of body organs
c. Maintaining ideal body weight
d. Maintaining physiological process in the body
e. Building body immunity

Calorie requirement calculation

Basal Metabolic Rate (BMR) is equal to the amount of energy essential for the body to function if it were to rest for 24 hours. BMR is the minimum number of calories that ~~your~~ body requires for basal functions like digesting, breathing, and keeping the body temperature steady over a day. Determination of BMR is very easy; all you need to measure is your height and weight. The formula to calculate BMR of both sexes are as follows:

For Men:

BMR = 10 × Weight (kg) + 6.25 × Height (cm) – 5 × Age (years) + 5

For Women:

BMR = 10 × Weight (kg) + 6.25 × Height (cm) – 5 × Age (years) - 161

Harris Benedict Equation is a formula that uses Basal Metabolic Rate (BMR) and then applies a physical activity factor to determine total daily requirement of calorie / energy expenditure.

Calorie requirement = BMR × Your Physical activity factor.

Physical Activity type	Physical Activity Factor
Sedentary (little or no exercise)	1.2
Light exercise	1.375
Moderately active	1.55
Very active – hard exercise	1.725
Extra active – very hard exercise	1.9

Glycemic index

The glycemic index (GI) is a number from 0 to 100 assigned to a food, which represents the relative rise in the blood sugar/glucose level two hours after eating that food.GI is used to measure how much a specific food can affect blood glucose levels. Foods are grouped as low, medium, or high glycemic foods and ranked on a scale of 0–100 (Table 24.1). Foods with a high GI are rapidly digested and absorbed, causing a rapid rise in blood glucose. The higher the GI, the greater the effect on blood glucose levels. Foods with a low GI are digested and absorbed at a slower rate, and subsequently, cause a slower rise in blood glucose levels. These foods are rich in protein, fiber, and/or fat. Examples of Low GI foods: apples with a GI of 28, peanuts at 7 and Greek-style yogurt at 11 but a low GI

doesn't mean a food is high in all nutrients. One needs to eat healthy foods from all types of food groups. Dietary management according to GI is especially essential for fitness for people with diabetes or those over 35 years of age.

Table 24.1: Classification of Foods based on GI value

Type of Food	GI rating	Physical Activity Factor
High GI	≥70	Rapid increase in blood glucose level
Medium GI	56-69	Moderate increase in blood glucose level
Low GI	≤ 55	Slow increase in blood glucose levels

The GI of a specific food depends mainly on the type and quantity of carbohydrate present in it; but also, is affected by the fat and protein content of the food, the amount of organic acids, the amount of entrapment of the carbohydrate molecules within the food. The variations in GI of specific foods are possible due to:

a) **Ripeness**: Riper fruits contain a higher amount of sugars, which increases their glycemic index (GI).
b) **Processing**: Whole grains have a lower glycemic index (GI) compared to their flour counterparts, as grinding breaks the grain's protective coat and reduces its storage length.
c) **Cooking methods**: Overcooked food has a higher glycemic index (GI) because cooking breaks down its cellular structure, causing it to digest very quickly and leading to an increase in blood sugar levels.

Benefits of diet with low GI value

a) **Improved weight loss**: Lowering the glycemic load of the diet appears to be an effective method of promoting weight loss and improving lipid profiles and can be simply incorporated into a person's lifestyle.
b) **Reduced Cholesterol level**: Following a low GI diet may help lower levels of both total and LDL (bad) cholesterol, both of which are risk factors for heart disease.
c) **Increased blood glucose regulation**: Low GI diet may reduce blood glucose level.
d) **Improved athletic performance**: Athletes may benefit from eating low-GI foods before exercise, as these foods will provide exogenous carbohydrates during exercise, which can help maintain blood glucose levels.

High-GI foods may be useful during lengthy exercise to promote carbohydrate usage and help maintain adequate blood glucose levels, as well as after exercise, to help promote muscle glycogen resynthesis.

5. Requirements

Internet facility, List of locally available foods.

6. Requirements used

_____

_____

7. Procedure

The subject teacher must explain the calorie requirement and calorie intake for child and mother to the students. (Refer Experiment no. 2)

Activity I

Create a chart/poster containing pictorial and textual information about chart on caloric intake as per locally available foods for child and mother.

Activity II

Create a chart/poster containing pictorial and textual information about chart on glycemic index of foods that are available locally.

8. Result

An educational chart/poster on caloric intake for children and mothers and glycemic index of foods that are available locally was prepared.

9. References

a. https://www.parentcircle.com/daily-calorie-requirement-chart-for-girls-by-age/article
b. https://www.healthline.com/nutrition/glycemic-index#low-glycemic-die
c. International Pharmaceutical Federation (FIP). Diabetes prevention, screening, and management: A handbook for pharmacists. The Hague: International Pharmaceutical Federation; 2021 www.fip.org.
d. International Pharmaceutical Federation (FIP) Nutrition and Weight Management Services: A Toolkit for Pharmacists The Hague: International Paramaceutical Federation;2021, www.fip.org.

10. Practical Related Questions

a. Discuss benefits of a low glycemic diet?
b. What makes calorie requirements vary from person to person?
c. What constitutes a healthy Basal Metabolic Rate (BMR)?
d. Enumerate low glycemic index (GI) foods and note their corresponding glycemic index values.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 25

Identification of various Tobacco Containing Products and Counselling on Tobacco Cessation Methods

1. Aim

To identify various tobacco-containing products through charts or pictures and to counsel tobacco addicts on tobacco cessation.

2. Practical Significance

Tobacco products include substances that are harmful to the human body. It is necessary for pharmacists to recognize tobacco-containing products and understand their harmful effects. Tobacco cessation is crucial to reducing tobacco-related morbidity and mortality among addicts. Pharmacists world over are taking up active role in tobacco cessation services. WHO and FIP have drawn a joint statement on the role of pharmacist in tobacco cessation. Through this practical, students will be able to identify various tobacco-containing products and provide the most effective behavioral modification strategies for tobacco cessation.

3. Practical Outcomes (PrOs)

After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Identify various tobacco containing products.	CO 1,2,4	BTL2
2	Explain various methods of tobacco cessations.	CO 1,2,4	BTL2
3	Counsel the tobacco addicts on tobacco cessation.	CO 1,2,4	BTL2
4	Collaborate and communicate with fellow students.	CO 1,2,4	BTL2

4. Relevant Theoretical Background

Tobacco is a plant whose leaves are dried and fermented before being used to make tobacco products. Tobacco contains nicotine, a substance that can lead to addiction, which is why so many smokers struggle to quit. Tobacco can be smoked, chewed, or sniffed. Examples of smoked tobacco products include cigarettes, cigars, bidis, and kreteks. Some individuals also use a pipe or hookah to smoke loose tobacco. Chewing tobacco, snuff, dip, and snus are all chewed tobacco products; snuff can also be sniffed.

Tobacco-Containing Products

a) **Bidis**: Bidis (pronounced "bee-dees") are small, thin hand-rolled cigarettes imported mostly from India and other Southeast Asian countries to the United States. They are made of tobacco wrapped in a tendu or temburni leaf (both Asian plants) and tied at one or both ends with a colorful string. Bidis can be flavored or unflavored (for example, chocolate, cherry, or mango). Bidis are carcinogenic. There is no proof that bidis are less harmful than regular cigarettes. Nicotine, tar, and carbon monoxide levels are higher in bidis than in traditional cigarettes.

b) **Cigarettes**: A cigarette is made up of cured and finely sliced tobacco, reconstituted tobacco, and other additives that are rolled or stuffed into a paper cylinder. Many cigarettes have a filter on one end. Studies indicate that smoking cigarettes causes cancers of the bladder, oral cavity, pharynx, larynx (voice box), esophagus, cervix, kidney, lung, pancreas, and stomach, and causes acute myeloid leukemia. It also causes heart disease and stroke.

c) **Cigars, Cigarillos, and Little Cigars**: A single variety of air-cured or dried tobacco is used in the majority of cigars. Tobacco leaves are aged for roughly a year before being fermented in a multi-step process that can take anywhere from 3 to 5 months. Fermentation changes the tobacco by causing chemical and bacterial reactions, distinguishing cigars from cigarettes in terms of

taste and smell. Regular cigars are larger and do not have filters, unlike cigarettes. Little cigars, also known as cigarillos, are small cigars that resemble cigarettes in size and shape, have filters, and are filled with pipe tobacco. Small cigars are frequently flavored (e.g., chocolate, cherry, apple, mango) and are available in packs of 20 or individually, much like cigarettes. Cigar smoking has been related to cancers of the mouth, lips, tongue, throat, larynx, lung, pancreas, and bladder. It is also associated with gum disease, tooth loss, and increased risk of teeth falling out.

d) Dissolvable Tobacco: This type of tobacco has been finely processed so that it can dissolve on the tongue or in the mouth. Strips, sticks, orbs, and compressed tobacco lozenges are some of the options. They are free of smoke and spit, contain food-grade binders, and resemble breath mints or candy. Because this product is so new to the market, there hasn't been much research done on its health consequences.

e) Electronic Cigarette or E-Cigarette: The electronic cigarette is a battery-operated device with a cartridge containing nicotine, flavor, and other compounds. The e-cigarette is a nicotine delivery technology, not a tobacco product. The e-cigarette converts nicotine and other chemicals into vapor, which the user inhales. The user inhales a vaporized solution of propylene glycol/nicotine, similar to that of a cigarette. There is no tobacco or tobacco burning in the e-cigarette, and no smoke is produced. It emits a delicate, warm mist, but its safety is not confirmed.

f) Hookah: Hookah is a pipe used to smoke Shisha, a mixture of tobacco, fruit, or vegetable that is heated and filtered through water. A hookah consists of three parts: a head, a body water bowl, and a hose. The hookah heats tobacco or Shisha, commonly using charcoal. Hookah smoking has been linked to cancers of the lungs, mouth, and other parts of the body, as well as heart problems and respiratory infections.

g) Kreteks: Clove cigarettes, also known as Kreteks (pronounced "cree-techs"), are imported from Indonesia and often contain a blend of tobacco, clove, and other ingredients. Kreteks, like bidis, deliver more nicotine, carbon monoxide, and tar than ordinary cigarettes, according to standardized machine-smoking assessments. Smoking Kretek is linked to an increased risk of acute lung injury, especially in people with asthma or respiratory infections.

h) Pipe: Pipes are made up of three parts: a chamber or bowl, a stem, and a mouthpiece. The bowl is filled with tobacco, which is then lit. The smoke is then sucked into the mouthpiece and inhaled via the stem. Gum disease and tooth loss have been linked to pipe smoking, as well as cancers of the mouth, lip, tongue, throat, larynx, lung, pancreas, kidney, bladder, colon, and cervix, leukemia, and disorders such as chronic obstructive pulmonary disease, stroke, and coronary heart disease. Pipe smoking can also create "hairy tongue," characterized by furry-looking lumps on the tongue that become stained by tobacco and appear discolored or black.

i) Smokeless Tobacco: Chewing tobacco and snuff are the two most common varieties of smokeless tobacco. Chewing tobacco is available in three different forms: loose leaf, plug, and twist. Snuff is finely ground tobacco that comes in a variety of forms, including dry, moist, and sachets (tea bag-like pouches). Although some types of snuff can be inhaled or sniffed, most people who use smokeless tobacco insert it in their cheek or between their gum and cheek. Smokeless tobacco is often referred to as spit or spitting tobacco because users suck on the tobacco and spit out the tobacco juices. Nicotine is absorbed predominantly through the skin in the mouth when using this tobacco. There are 28 cancer-causing chemicals in smokeless tobacco (carcinogens). It raises the risk of oral cancer and is linked to leukoplakia (a soft-tissue disease

in the mouth characterized by a white patch or plaque that cannot be scraped off) and gum recession.

Tobacco use is a leading preventable cause of premature death and disease worldwide. According to the World Health Organization (WHO), there are 1.1 billion smokers worldwide. Globally, tobacco is responsible for 5 million deaths each year. India is the world's third largest tobacco-growing country and second largest consumer of tobacco products. India reports the highest tobacco-related mortality, with about 700,000 annual deaths in the last ten years, and an expected increase to one million in the coming ten years.

Tobacco Cessation

Tobacco cessation is essential to reduce the mortality and morbidity related to tobacco use. Given the significant mortality and morbidity burden due to tobacco use, it is crucial to take urgent steps to mitigate the growing threat of tobacco. Reducing the prevalence of tobacco can be effectively achieved through a two-pronged approach: large-scale promotions to educate the public about the harmful effects of tobacco use and the benefits of quitting, alongside providing adequate facilities for those who want to quit. It is important to publicize the various methods available for quitting, as many people are unaware of the resources at their disposal. Tobacco cessation measures should be a regular part of the healthcare delivery system.

Healthcare providers are very effective change agents for individuals who use tobacco. A fifteen-minute, one-on-one tobacco cessation session is generally better accepted by patients than other non-pharmaceutical methods. Specific programs that increase tobacco cessation rates benefit the individual's health and are cost-effective. “World No Tobacco Day,” observed on May 31st, highlights the adverse effects of tobacco on health.

Tobacco Cessation Methods

a) Cognitive Behavioral Therapy (CBT):

CBT is a type of psycho-social therapy that aims to improve mental health. It helps tobacco users become aware of inaccurate or negative thinking, enabling them to view tough situations more clearly and respond more effectively. Simple advice offered by a physician or other healthcare provider, or counselors has been shown to be effective for tobacco cessation. One of the most effective non-pharmacological therapies for highly motivated tobacco users is providing behavioral support beyond scheduled clinical care by appropriately trained counselors.

The Five A's (Ask, Advise, Assess, Assist, and Arrange) is a five-to-fifteen-minute research-based counseling tool that has proven global success. After assessing a patient's willingness to quit using the Behavioral Change Model, healthcare providers should apply the Five A's to assist their clients in staying tobacco-free.

For patients not ready to make a quit attempt, healthcare providers should offer a brief intervention designed to promote motivation to quit and provide information about the harmful effects of tobacco. Clients may have fears about quitting or may be discouraged due to previous relapses. Such patients may respond to a motivational intervention designed to educate, reassure, and motivate them. The components of this motivational intervention are built around the five R's: Relevance, Risk, Rewards, Roadblocks, and Repetition.

b) Pharmacotherapy:

Various types of pharmacological medications are available for smoking cessation. These methods can be used in conjunction with behavioral support.

a. **First Line of Drugs**: Nicotine replacement therapy, Bupropion, Varenicline.

b. **Second Line of Drugs**: Nortriptyline, Clonidine.

5. Requirements

Internet facility, Charts / Pictures of tobacco containing products.

6. Requirements used

_____

_____

7. Procedure

The subject teacher must explain the tobacco containing products and the tobacco cessation methods to the student using chart or pictures.

Activity-I

Identify the tobacco containing products given below:

Product A: _____

Product B: _____

Product C: _____

Product D: _____

Product E: _____

Product F: _____

Activity-II

The subject teacher must form groups of students and assign following counselling tasks to the students. After performing the counselling task, students must note down the key points which must be considered while counselling.

Counsel the tobacco addicts on tobacco cessation.

Key points to be considered while counselling:

_____

_____

_____

_____

8. Result

Various tobacco-containing products were successfully identified using charts and pictures, and counseling on tobacco cessation was conducted.

9. References

a. National guidelines of Tobacco cessation by Ministry of Health & Family Welfare, Govt of India.

b. Tobacco Use Cessation and Prevention – A Review, Sabiha Shaheen Shaik et al, J Clin Diagn Res. 2016 May; 10(5).

c. International Pharmaceutical Federation (FIP). Pharmacist-led tobacco cessation services: Evidence of impact and country highlights. The Hague: International Pharmaceutical Federation; 2024

10. Practical Related Questions

a. What is an e-cigarette?
b. What are the harmful effects of smokeless tobacco?
c. Why is tobacco cessation necessary?
d. What are the Five A's and the Five R's used in tobacco cessation?
e. What is passive smoking and its ill effects?
f. Which NRT products are available in the market? Enlist the products.

(Space for Answers)

11. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Activities (Motor skill)	Discipline (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

GUIDELINES FOR CONDUCTING SESSIONAL PRACTICAL EXAMINATION

Course Name: Social Pharmacy – Practical (SPP)

Course Code: 20055 Year: First Year (PH1J)

Max Time: 3 Hrs Max. Marks: 80

Q. 1. Synopsis **(10 M)**

Q. 2. Experiments **(50 M)**

a. Spotting (10 M)

b. Major experiment (25 M)

c. Minor experiment (15 M)

Q. 3. Viva-voce **(10 M)**

Q. 4 Practical Record Maintenance **(10 M)**

Internal assessment: The marks secured by the students out of the total of 80 shall be reduced to 10 in each sessional, and then the internal assessment shall be calculated based on the best two averages for 10 marks from the sessional; 05 marks shall be awarded based on the average of all three assignments and 05 marks awarded for based on average of field visit reports.

GUIDELINES FOR CONDUCTING ANNUAL PRACTICAL EXAMINATION

Course Name: Social Pharmacy – Practical (SPP)

Course Code: 20055 Year: First Year (PH1J)

Max Time: 3 Hrs Max. Marks: 80

Q. 1. Synopsis **(10 M)**

5 questions of 2 marks each or 10 questions of 1 mark each based on basic techniques (first aid, vaccination, nutrition disease prevention, causative agents, etc.,) in social pharmacy practical can be asked.

Q. 2. Experiments **(60 M)**

a. Spotting (Give 5 spots) **(10 M)**

Different vaccine containers, family planning devices, mosquito repellants, pictures of patient with disease symptoms, tobacco products etc., can be asked.

b. Major experiment **(30 M)**

Prepare and submit a leaflet or poster containing pictorial and textual information about

- Cardiopulmonary resuscitation (CPR) indicating steps to be followed **OR**
- First aid measures to be taken if an adult suffers from FBAO. **OR**
- Do's and don'ts during Snake or Dog bite first aid treatment

c. Minor experiment **(20 M)**

i. Counsel the peers for the following (10 M)
Measures to be taken in insecticide poisoning **OR**
Emergency Treatment for the Fractures or Burns **OR**

ii. Prepare educational material in the form a chart or diagram or poster on (10M)
Awareness of Dengue or Cholera or Malaria or Hepatitis or Tuberculosis

OR

Hand washing technique OR Maintenance of menstrual hygiene

OR

Balanced diet, importance of balanced diet and harmful effect of junk food.

OR

ii. Measure the TDS of given water sample (10 M)

Q. 3. Viva-voce **(10 M)**

(Viva should be conducted on practical and theory-based questions)