SCHEME : J

Name : _____

Roll No. : _____ Year : 20___ 20___

Exam Seat No. : _____

LABORATORY MANUAL FOR
PHARMACOTHERAPEUTICS (20059)

SECOND 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

A Laboratory Manual for

PHARMACOTHERAPEUTICS

(20059)

Second Year

Diploma in Pharmacy (PH)

Maharashtra State

Board of Technical Education,Mumbai.

(Autonomous)

(ISO 9001:2015)(ISO/IEC 27001:2013)

PCI ER-2020/'J' Scheme Curriculum

Maharashtra State Board of Technical Education, Mumbai

(Autonomous) (ISO 9001:2015)(ISO/IEC 27001:2013)

4th floor, Government Polytechnic Building, 49, Kherwadi,

Bandra (East), 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 Second Year Diploma in Pharmacy studying at _____has completed the practical work satisfactorily in Pharmacotherapeutics (20059) for the academic year 20 - 20 as prescribed in 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 fulfillment 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:** Honor 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-access 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 (as per ER-2020)

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 expectedto 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 there under. 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 evidences.

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.

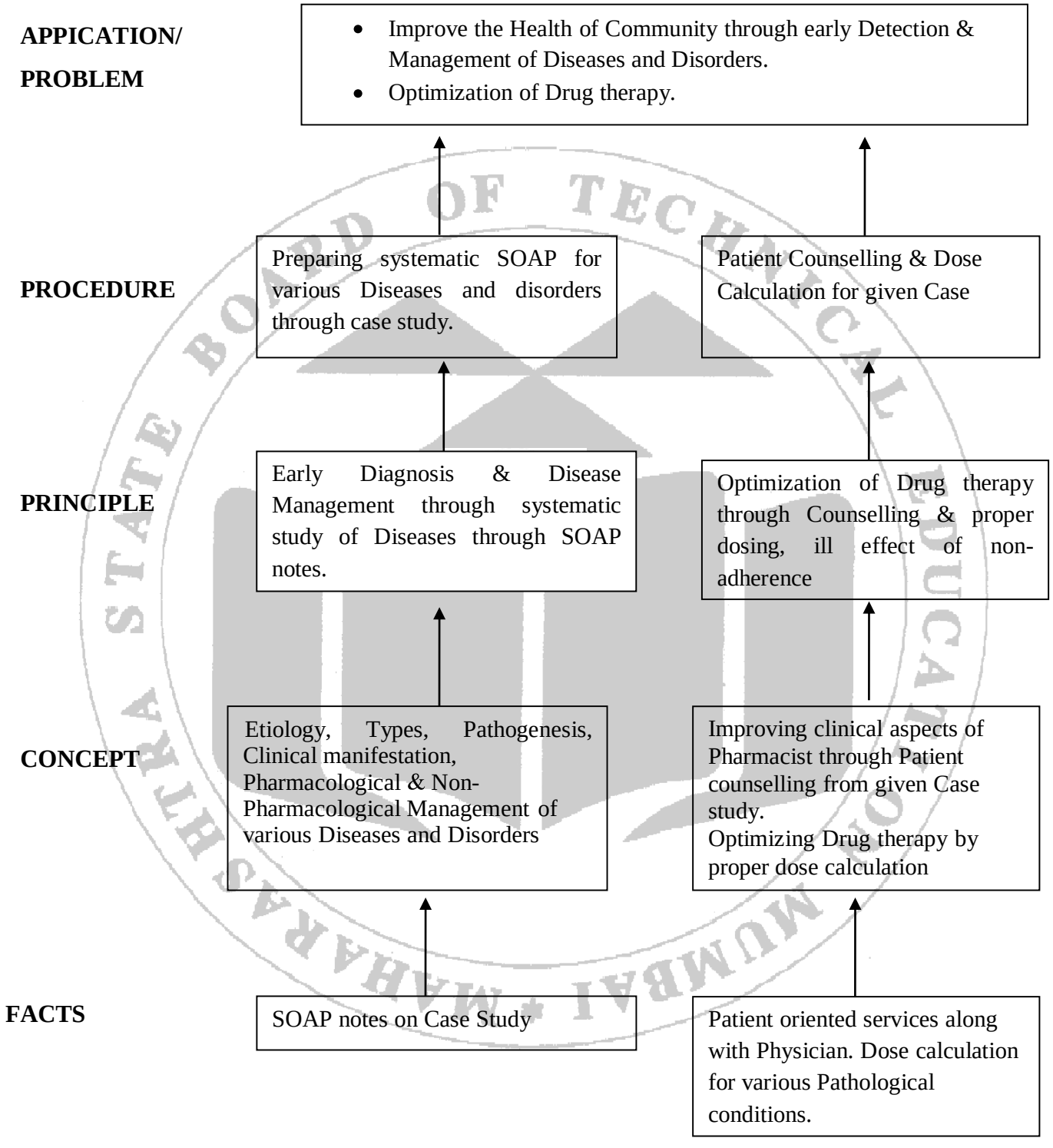
10. Continuing Professional Development: The student should be able to recognize the gaps in the knowledge and skills in the effective delivery of professional services from time to time and be self-motivated to bridge such gaps by attending continuing professional development programs.

COMPETENCY MAPPING WITH THE COURSE

Competencies	Pharmacotherapeutics
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

PHARMACOTHERAPEUTICS (20059)



PHARMACOTHERAPEUTICS – PRACTICAL

Course Code: ER20-24P/20059 **25 Hours (1Hours / Week)**

Scope: This course is designed to train the students in the basic skills required to support the pharmaceutical care services for selected common disease conditions.

Course Objectives: This course will train the students on

1. How to prepare a SOAP (Subjective, Objective, Assessment and Plan) note for clinical cases of selected common diseases
2. Patient counselling techniques/methods for common disease conditions

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

CO1 - Write SOAP (Subjective, Objective, Assessment and Plan) notes for the given clinical cases of selected common diseases

CO2 - Counsel the patients about the disease conditions, uses of drugs, methods of handling and administration of drugs, life-style modifications, and monitoring parameters.

Practicals

I. Preparation and discussion of SOAP (Subjective, Objective, Assessment and Plan) notes for at least SIX clinical cases (real / hypothetical) of the following disease conditions.

1. Hypertension
2. Angina Pectoris
3. Myocardial Infarction
4. Hyperlipidemia
5. Rheumatoid arthritis
6. Asthma
7. COPD
8. Diabetes
9. Epilepsy
10. Stroke
11. Depression
12. Tuberculosis
13. Anemia (any one type as covered in theory)
14. Viral infection (any one type as covered in theory)
15. Dermatological conditions (any one condition as covered in theory)

II. Patient counselling exercise using role plays based on the real / hypothetical clinical case scenarios. The students are expected to provide counselling on disease condition, medications, life-style modifications, monitoring parameters, etc. and the same shall be documented. (Minimum 5 cases)

III. Simulated cases to enable dose calculation of selected drugs in pediatrics, and geriatrics under various pathological conditions. (Minimum 4 cases)

STRATEGY FOR IMPLEMENTATION

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

GUIDELINES FOR TEACHERS

Teacher shall explain the following points to the students before starting of the practical:

1. **Learning Objectives:** To foster better understanding of the subject and to inculcate the skills and attitude related practical.
2. **Graphical structure:** In graphical structure topics and subtopics are organized in systematic way so that ultimate purpose of learning the subject is achieved. This is arranged in the form of fact, concept, principle, procedure, application and problem.
3. **Elementary Guide to work in Laboratory:** The methods and other finer details of the equipment including equipment specifications should be explained to avoid equipment breakages, create conducive environment for proper organizing of the practical work with the time schedule.
4. Teachers should verify and check the work conditions of the equipment and request the students to follow the standard operating procedures (SOP).
5. Before starting the practical, Teachers should explain the strategies of the experiment.
6. Teachers should ensure the active participation of students while performing the experiment.
7. Observations should be checked individually and each student should be given a chance to perform the experiment.
8. Teachers should ask the students to complete the questions which are given at the end of the experiment accordingly.
9. Assessment of manuals should be done according to the assessment norms. Proper marks should be distributed according to the performance of the individuals.
10. Teachers should explain the competencies that student should achieve, in detail with their importanceto students after completion of their course.
11. Apart from the syllabus, teachers should provide and cover extra topics which are beneficial for the students.
12. Explanation about various equipment with some interesting videos, reagents, chemicals, glasswares should be given to students prior to commencing of the practical.
13. 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.
14. Teachers may suggest the students to refer to sources of information such as literature, research papers, books, attending conferences, seminars for the updation of knowledge.
15. According to the professional competencies given by PCI, teachers should develop the professional skills of the students.
16. Teacher should conduct different types of sessions for students such as quiz, group discussions projects on different topics, etc.
17. Teachers should ensure that revised CIAAN – 2017 norms or the latest norms given by MSBTE are followed simultaneously and implemented.
18. Teachers should follow the guidelines given by PCI & MSBTE from time to time.

GUIDELINES OF BLOOMS TAXONOMY LEVELS

1 Knowledge

Define, Identify, Describe, Recognize, Tell, Explain, Recite, Memorize, Illustrate, Quote

2 Understand

Summarize, Interpret, Classify, Compare, Contrast, Infer, Relate, Extract, Paraphrase, Cite

3 Apply

Solve, Change, Relate, Complete, Use, Sketch, Teach, Articulate, Discover, Transfer

4 Analyze

Contrast, Relate, Devise, Distill, Correlate, Illustrate, Conclude, Categorize, Connect, Take apart

5 Evaluate

Criticize, Reframe, Judge, Defend, Appraise, Value, Prioritize, Plan, Grade,

6 Create

Design, Modify, Role-play, Develop, Rewrite, Pivot, Modify, Collaborate, Invent, Write

INSTRUCTIONS TO 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 manual, rough book and practical requirementsas 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 thecompetencies.
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 practical and should ask the teacher about their difficulties without any hesitation.
8. After completion of practical students should write the answers of the question given at the end of theexperiment.
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. Student 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 PHARMACOTHERAPEUTICS

MAPPING OF COURSE OUTCOMES

Sr.No.	Title of Experiment	CO1	CO2
1	Preparation and discussion of SOAP- Hypertension	✓	
2	Preparation and discussion of SOAP- Angina Pectoris	✓	
3	Preparation and discussion of SOAP- Myocardial Infarction	✓	
4	Preparation and discussion of SOAP- Hyperlipidemia	✓	
5	Preparation and discussion of SOAP- Diabetes	✓	
6	Preparation and discussion of SOAP- Asthma	✓	
7	Preparation and discussion of SOAP- COPD	✓	
8	Preparation and discussion of SOAP- Rheumatoid Arthritis	✓	
9	Preparation and discussion of SOAP- Epilepsy	✓	
10	Preparation and discussion of SOAP- Stroke	✓	
11	Preparation and discussion of SOAP- Depression	✓	
12	Preparation and discussion of SOAP- Anemia	✓	
13	Preparation and discussion of SOAP- Tuberculosis	✓	
14	Preparation and discussion of SOAP- AIDS	✓	
15	Preparation and discussion of SOAP- Scabies	✓	
16	Patient counselling exercise-I (Hypertension)		✓
17	Patient counselling exercise-II (Epilepsy)		✓
18	Patient counselling exercise-III (COPD)		✓
19	Patient counselling exercise-IV (Depression)		✓
20	Patient counselling exercise-V (Tuberculosis)		✓
21	Dose Calculation of Selected Drug in Pediatric	✓	✓
22	Dose calculation of Selected Drug in Pediatric	✓	✓
23	Dose Calculation of Selected Drug in Geriatric	✓	✓
24	Dose calculation of Selected Drugs in Renal Failure Patient	✓	✓
25	Dose calculation of Selected Drugs in Hepatic Dysfunction	✓	✓

LIST OF EXPERIMENTS AND RECORD OF PROGRESSIVE ASSESSMMENT

Sr. No.	Title of Experiment	Page No.	Date of Performance	Date of Submission	Assessment Marks	Teacher's Signature
1	Preparation and discussion of SOAP- Hypertension	1				
2	Preparation and discussion of SOAP- Angina Pectoris	6				
3	Preparation and discussion of SOAP- Myocardial Infarction	11				
4	Preparation and discussion of SOAP- Hyperlipidemia	16				
5	Preparation and discussion of SOAP- Diabetes	21				
6	Preparation and discussion of SOAP- Asthma	27				
7	Preparation and discussion of SOAP- COPD	33				
8	Preparation and discussion of SOAP- Rheumatoid Arthritis	39				
9	Preparation and discussion of SOAP- Epilepsy	44				
10	Preparation and discussion of SOAP- Stroke	50				
11	Preparation and discussion of SOAP- Depression	55				
12	Preparation and discussion of SOAP- Anemia	61				
13	Preparation and discussion of SOAP- Tuberculosis	66				
14	Preparation and discussion of SOAP- AIDS	71				
15	Preparation and discussion of SOAP- Scabies	78				
16	Patient counselling exercise-I (Hypertension)	86				
17	Patient counselling exercise-II (Epilepsy)	93				
18	Patient counselling exercise-III (COPD)	98				

19	Patient counselling exercise-IV (Depression)	104				
20	Patient counselling exercise-V (Tuberculosis)	107				
21	Dose Calculation of Selected Drug in Pediatric	117				
22	Dose calculation of Selected Drug in Pediatric	122				
23	Dose Calculation of Selected Drug in Geriatric	127				
24	Dose calculation of Selected Drugs in Renal Failure Patient	131				
25	Dose calculation of Selected Drugs in Hepatic Dysfunction	136				

1) PRACTICAL RECORD MARKS:

Sessional Exam	**Experiment No.**		**Total no. of Experiment conducted**	**Marks Obtained (out of 20)**	**Teacher's Signature**
	From	To			
First Sessional					
Second Sessional					
Third Sessional					

Experiment No. 1

SOAP Notes for Hypertension

1. Aim:

To prepare and discuss the SOAP notes for the given case of hypertension.

2. Practical Significance:

A SOAP note is a standardized note-taking method used by healthcare professionals to document important information about a patient. In this practical, the students will be able to prepare SOAP notes which can record and organize patient information clearly as per Subjective, Objective, Assessment, and Plan. It can be used as a communication medium or references to other members to interpret it.

3. Practical Outcomes (PrOs):

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Summarize signs and symptoms of the given clinical case of hypertension.	CO 1	BTL 2
2	Conduct efficient search for hypertension using available resources (applying).	CO 1	BTL 3
3	Optimize drug therapy of hypertension (identify).	CO 1	BTL 4
4	Prepare the SOAP notes of the given clinical case of hypertension (use information to make judgments).	CO1	BTL 5
5	Communicate with other members to interpret.	CO1	BTL 6

4. Relevant Theoretical Background:

The force of blood on artery walls is called blood pressure. Normal B.P is 120/80mm Hg. Systolic B.P. means blood pressure in the arteries during heartbeat, it is about 120mm Hg. Diastolic B.P .i.e B.P. in arteries when heart rests. It is about 80 mm Hg. High Blood Pressure i.e., Hypertension is defined as systolic B.P. is greater than 140 mmHg and diastolic B.P. is greater than 90 mm Hg.

Types of Hypertensions with risk factors

On the basis of causes or etiology, Hypertension is divided into 2 types

Primary/ Essential Hypertension	Secondary Hypertension
Causes are not known	Occur due to other diseases
Causes- Genetic or family History, Age Stress, Life style- Lack of exercise Increase salt intake, Excess alcohol/Tobacco intake, Unhealthy dietary habits (tea/coffee/fat diet), overweight,	Causes- kidney diseases, Endocrine diseases i.e., Cushingsyndrome, Hyperthyroidism, Pheochromocytoma

Risk factors of Hypertension

Hereditary, Age factor, Obesity, stress, high intake of salt and saturated fat, smoking, alcohol Consumption, tobacco, Lack of Physical activity or sedentary life style.

Clinical manifestations or Symptoms of Hypertension-

a) Difficulty in breathing
b) Severe headaches, fainting (a brief loss of consciousness)
c) Dizziness or vertigo
d) Blurred Vision & Palpitation
e) Nausea and vomiting

Prevention and control to treat risk factors of Hypertension-

1. Life style changes- Weight Reduction Physical activity – Regular aerobic activity, brisk walking for 30 min, Stress Management-Yoga, Avoid alcohol, tobacco and smoking
2. Dietary changes- Reduce dietary Sodium intake, Including fat-free or low-fat dairy products, fish, poultry, beans, nuts, and vegetable oils.

DASH diet (Dietary Approaches to stop Hypertension)- The DASH eating plan requires no special foods and instead provides daily and weekly nutritional goals. This plan recommends: Eating vegetables, fruits, and whole grains. Avoid smoking

Pharmacological/Medical Treatment for Hypertension

a) **Diuretics**- These increases urination to excrete sodium from the body. e.g. Hydrochlorothiazide,Chlorthalidone, Furosemide.
b) **Alpha blockers** –These reduces effects of natural chemicals that narrow blood vessels and causesPeripheral vasodilation of blood vessels e.g. Prazosin, Terazosin
c) **Beta blockers** – reduce workload of heart and blood vessels, causing heart to beat slowly and withless force. E.g. Propranolol, Atenolol.
d) **Calcium channel blockers**- block movement of extracellular calcium into the cells and causing vasodilation and decreased heart rate. e.g. Amlodipine, Nifedipine, Nicardipine
e) **ACE inhibitors** –prevents vasoconstriction e.g. Captopril, Ramipril, Enalapril.
f) **Angiotensin II receptors blockers**- Losartan, Saralasin block the action of Angiotensin II
g) **Vasodilators**- These prevent narrowing of arteries causes dilatation or relaxation of arteries. e.g.-Hydralazine, Nitroglycerin, Sodium Nitroprusside
h) **Centrally acting drugs –** Methyl Dopa, clonidine

5. **Requirements:** Template for SOAP notes, Internet facility
6. **Resources used:** _____

_____

7. **Precautions**: SOAP note should be clear, properly written so that it can use by others for reference purposes, SOAP note should be signed with name.
8. **Procedure:** Read and understand the case properly and then complete the report.

Activity:

Case- Mr. SK, a 55 years old man of African Caribbean origin visited to the hospital having headache in the morning for the last week, sometimes dizziness & have episodes of fainting. He has a sedentary occupation (sitting job). He has consistently increased B.P. over several weeks, his

lowest reading being 155/98. He is overweight and diabetic and being treated with Metformin. He eats excessive quantity of saturated fat and salt. He smokes 25 cigarettes daily and drinks 2 units of alcohol per weeks. His renal function and urine analysis are both normal.

9. SOAP note template:

A) **Subjective** (what Patient tells about problem)	
Personal Details Name of the Patient with age, gender, weight.	
Chief complaint (CC)	
History of Present illness	
Family History	
Medical History	
Allergies	
Review of systems (symptoms)	
Current Medications, Allergies	
B) **Objective data–**	
C) **Assessment** -diagnosis of disease condition	
Problem i.e., Diagnosis of the disease	
Differential Diagnosis i.e., Different possible diagnosis	

D) **Plan-** Medications, surgeriesor therapies Patient education/advice	

10. Conclusion:_____

11. References –

- Clinical Pharmacy and Therapeutics Roger Walker, Clive Edwards Third Edition .page no-275

12. Practical related questions

a) Define B.P & Hypertension with its symptoms.
b) Give Types of Hypertensions with causes.
c) Discuss Pharmacotherapy for hypertension.
d) Write Prevention and control for hypertension.
e) Which antihypertensive agents offer advantages to Mr. SK as he has diabetes.

(Space for Answers)

13. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness &Handling (Affective domain)	Viva-voce /Answers Written	Total	Signature of Teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 2
SOAP Notes for Angina Pectoris

1. Aim:

To prepare and discuss the SOAP notes for given case of Angina Pectoris

2. Practical Significance:

Angina is a condition in which chest pain occur due to inadequate blood supply to the heart. In this practical, the students will be able to prepare SOAP notes which can record and organize information of anginal patient clearly as per Subjective, Objective, Assessment, and Plan. It can be used as a communication medium or references to other members to interpret it.

3. Practical Outcomes (PrOs):

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Summarize signs and symptoms of the given clinical case of Angina pectoris.	CO1	BTL 2
2	Conduct efficient search for hypertension using available resources (applying).	CO1	BTL 3
3	Optimize drug therapy for Angina pectoris (identify).	CO1	BTL 4
4	Prepare the SOAP note of the given clinical case of Angina pectoris (use information to make judgments).	CO1	BTL 5
5	Communicate with other members to interpret.	CO1	BTL 6

4. Relevant Theoretical Background:

Angina means pain and pectoris chest. Angina Pectoris is a condition in which sudden chest pain occurs due to decreased oxygen supply to the heart (ischemia) due to narrowed or blocked coronary artery.

Etiology / Risk factors / Causes

1) Obesity & Hyperlipidemia due to excess intake of fat which results in atherosclerosis of coronary artery (i.e. accumulation of excess fat causes coronary artery blockage).

2) Lack of Physical activity and Hypertension or increased Blood Pressure (Due to hypertension, heart works more so it needs more oxygen).

3) Alcohol intake and Smoking (alcohol and smoking irritate blood vessels).

4) In addition to this extreme cold exposure, Physical exertion, intense emotions illicit drugs can precipitate the angina.

Types of Angina

1) Stable Angina- Occurs with the physical exertion like exercise but can be improved after rest. It is dueto atherosclerosis of coronary artery.

2) Unstable angina- occurs at rest due to blood clot and partial blockage of coronary artery. It is a dangerous and requires emergency treatment.

3) Vasospastic or Variant angina or Prinzmetal Angina- It is rare form that is caused due to sudden vasospasm of a coronary artery. i.e. coronary spasm (narrowing of coronary artery) which temporarily reduced blood flow to the heart. It is occurring at rest or at night due to emotional stress, dysfunctional coronary vascular endothelium.

Clinical manifestations or symptoms of Angina

a) Chest Pain- or sense of tightness or pressure in the chest. Occasionally, the chest pain may radiate to neck. Jaw, teeth and rarely down the arms.

b) A Feeling of heaviness in the hands is also reported.

c) Difficulty in breathing and sweating.

Prevention and control of Angina

a) Life style changes- Weight Reduction, regular exercise Stress Management-Yoga, avoid alcohol, tobacco and smoking, extreme heat, cold, avoid exertion.

b) Dietary changes-, Reduction in fat/cholesterol intake

Pharmacological/Medical Treatment

1. **Organic nitrates**- e.g. Nitroglycerine or Glyceryl trinitrate (GTN), Nitrates dilates coronary artery.
2. **Antiplatelet or Anticoagulant drugs**- e.g. Aspirin, Heparin, Clopidogrel. These drugs prevent clot formation.
3. **β-blockers** –. e.g. Propranolol, Atenolol It decreases heart rate and workload of the heart
4. **Calcium channel blockers** -e. g Nifedipine, Amlodipine, Verapamil, Diltiazem. These drugs blockcalcium of cardiac muscles causes its vasodilation.
5. **Potassium channel activators** –e.g. Nicorandil, Minoxidil, Diazoxide. These cause relaxation of coronary arteries.
6. **Cholesterol lowering agents**- e.g. Statins. These drugs prevent fat deposition in the body.
7. **Surgery** -1. Coronary angioplasty 2. Coronary artery bypass surgery

5. **Requirements:** Template for SOAP notes, Internet facility
6. **Resources used:**_____

_____

7. **Precautions:** SOAP note should be clear, properly written so that it can use by others for reference purposes, SOAP note should be signed with name.
8. **Procedure:** Read and understand the case properly and then complete the report

Activity

Case- A 62-years-old male smoker with type 2 diabetes mellitus and hypertension presents with a 4- month history of exertional chest pain. Physical examination shows a blood pressure of 152/90 mm Hg but is otherwise unremarkable. The ECG is normal, and laboratory tests show a fasting blood glucose value of 110 mg/dL, glycosylated hemoglobin 6.0%, creatinine 1.1 mg/dL, total cholesterol 160, LDL 120, HDL 38, and triglycerides 147 mg/dL. He exercises for 8 minutes, experiences chest pain, and is found to have a 2-mm ST-segment depression in the inferolateral leads at the end of exercise.

9. SOAP note template

A) **Subjective** (what Patient tells about problem)	
Personal Details Name of the Patient with age, gender, weight.	
Chief complaint (CC)	
History of Present illness	
Family History	
Medical History	
Allergies	
Review of systems (symptoms)	
Current Medications, Allergies	
B) **Objective data–**	
C) **Assessment** -diagnosis of disease condition	
Problem i.e., Diagnosis of the disease	
Differential Diagnosis i.e.,Different possible diagnosis	
D) **Plan-** Medications, surgeriesor therapies Patient education/advice	

10. Conclusion:_____

_____

11. References:

- Therapy of stable Angina
  https://www.ahajournals.org/doi/full/10.1161/circulationaha.104.526699

12. Practical related questions:

a) Define Angina Pectoris and discuss its types.
b) Give risk factors or causes for Angina.
c) What are the therapeutic goals in treating 62 years old male smoker?
d) Classify antianginal drugs with examples.
e) Give the Prevention and control of Angina.
f) Name the surgeries to treat Angina.

(Space for answers)

13. Assessment Scheme:

Particular	Understanding thebasic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness &Handling (Affective domain)	Viva-voce /Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 3
SOAP Notes for Myocardial infarction

1. **Aim:**
   To prepare and discuss the SOAP notes for the given case of Myocardial infarction.
2. **Practical Significance:**
   Myocardial infarction or heart attack happens when heart muscles die due to lack of blood supply**.** In this practical, the students will be able to prepare SOAP notes which can record and organize information of heart attack or MI patient clearly as per Subjective, Objective, Assessment, and Plan. It can be used as a communication medium or references to other members to interpret it.
3. **Practical Outcomes (PrOs):**
   After completion of this practical, the students will be able to:

PrO	Practical Outcomes	Mapped CO	BTL
1	Summarize signs and symptoms of the given clinical case of MI or heart attack patient.	CO1	BTL 2
2	Conduct efficient search for hypertension using available resources (applying).	CO1	BTL 3
3	Optimize drug therapy of Myocardial infarction (identify).	CO1	BTL 4
4	Prepare the SOAP note of the given clinical case of MI (use information to make judgements).	CO1	BTL 5
5	Communicate with other members to interpret.	CO1	BTL 6

4. **Relevant Theoretical Background**
   Myocardial infarction or heart attack is the condition in which death of myocardial tissue of the heart caused due to ischemia i.e. lack of oxygen to the heart. A heart attack occurs when a coronary artery that sends blood and oxygen to the heart is blocked. Fatty, cholesterol-containing deposits build up over time, forming plaques in the heart's arteries. If a plaque ruptures, a blood clot can form. The clot can block arteries, causing a heart attack. During a heart attack, a lack of blood flow causes the tissue in the heart muscle to die**.**

Causes or Risk factors for Myocardial infarction

- Age. Above 40
- Tobacco, Alcohol, smoking –damages blood vessels
- High blood pressure damage blood vessels
- Intake of High cholesterol or triglycerides and obesity
- Coronary artery diseases- atherosclerosis, thrombus, embolus
- Diabetes. –excess sugar damages blood vessels
- Family history of heart attacks.

Symptoms of Myocardial infarction

- Chest pain that may feel like pressure, tightness, pain, squeezing or aching
- Pain or discomfort that spreads to the shoulder, arm, back, neck, jaw, teeth or sometimes the upper belly
- Cold sweat
  - Fatigue
  - Heartburn or indigestion
  - Lightheadedness or sudden dizziness

- Nausea
- Shortness of breath

Prevention and control to treat risk factors of Myocardial infarction-

1) Life style changes- Weight Reduction, Stress Management-Yoga, Avoid alcohol, tobacco and smoking,

2) Dietary changes-, low cholesterol & low-fat diet

Goals of Management

1. To improve blood supply to the heart
2. To minimize myocardial damage
3. To prevent formation of blood clot in the coronary blood vessel
4. To dilate the coronary artery.

Pharmacological Management

Immediate treatment- As heart attack is a medical emergency, prompt and proper treatment increases the chances of survival.

1. Oxygen therapy using face mask or tube inserted into nostrils or nasal canula.
2. Administer B-blockers e.g. Propranolol, Esmolol to reduce cardiac work load and oxygen demand.
3. Antiplatelet /Antithrombotic or anticoagulants e.g. Aspirin or Heparin toprevent platelet aggregation and clot formation
4. Thrombolytic agents e.g. Streptokinase or Urokinase to dissolve (break) the formed clot within 06 hour.
5. Coronary vasodilators e.g. Nitroglycerine/ Glyceryl trinitrate (GTN),
6. ACE Inhibitors-to prevent vasoconstriction and decrease B.P -e.g. Captopril, Ramipril, Enalapril
7. Morphine injection to relive chest pain and anxiety

5. **Requirements:** Template for SOAP notes, Internet facility
6. **Resources used:** _____

_____

7. **Precautions:** SOAP note should be clear, properly written so that it can use by others for reference purposes, SOAP note should be signed with name.
8. **Procedure:** Read and understand the case properly and then complete the report

Activity

Case- Mrs., AP 50 Years old female visited to hospital, complaining a sharp pain on the left side of her chest started yesterday morning while she was exercising at the gym. She rates her pain a 6 on the 0-10 pain scale and states that she always gets nauseated and short of breath while she is having pain. The pain does not radiate to any other parts of her body but lasts about an hour once it starts. She was diagnosed with stage 2HTN, hyperlipidemia five years ago and is currently not experiencing complications related to her disorder. No other childhood or adult disease and immunization UTD. She received the Flu vaccination on 10/2014.She had no psychiatric history, no surgical history. Currently she is on Lisinopril / HCTZ 20-12.5 mg PO daily, Lipitor 20mg PO daily, Cyanocobalamin 1000 mcg IM once a monthly, Ibuprofen 600

mg every 6 hours as needed. She reported no any allergies. Mrs. AP works as a nurse 36 hours per week at a local clinic. AP and her husband are active members in their Vishnu temple have a good support system. Her husband is a petroleum engineer and works locally. AP and her husband just joined a local gym close to their home. AP walks 3 miles 4 times a week and considers herself in good health. She did not use illegal drug, alcohol or tobacco. Her mother had HTN, hypothyroidism, DM Type2, doing well and her father HTN died of MI in 2006 at age 71. No siblings. General examination reports being very healthy. Her vital signs B/P 142/94 O2-96%, Ht- 5;5 Wt- 145 lbs BMI 24.5.

9. SOAP note template:

A) **Subjective** (what Patient tells about problem)	
Personal Details Name of the Patient with age, gender, weight.	
Chief complaint (CC)	
History of Present illness	
Family History	
Medical History	
Allergies	
Review of systems (symptoms)	
Current Medications, Allergies	
B) **Objective data–**	
C) **Assessment** -diagnosis of disease condition	
Problem i.e. Diagnosis of the disease	

Differential Diagnosis i.e. Different possible diagnosis	
D) **Plan-** Medications, surgeries or therapies Patient education/advice	

10. Conclusion: _____

_____

11. References:

- Caroline S. Zeind, Michel G. Carvalho, Applied Therapeutics, The clinical use of drugs, Eleventh edition, Wolters Kluwer.
- Burgunda Sweet, Handbook of Applied Therapeutics, Ninth edition, Wolters Kluwer.

12. Practical related questions:

a) What is Myocardial Infarction /Heart attack.

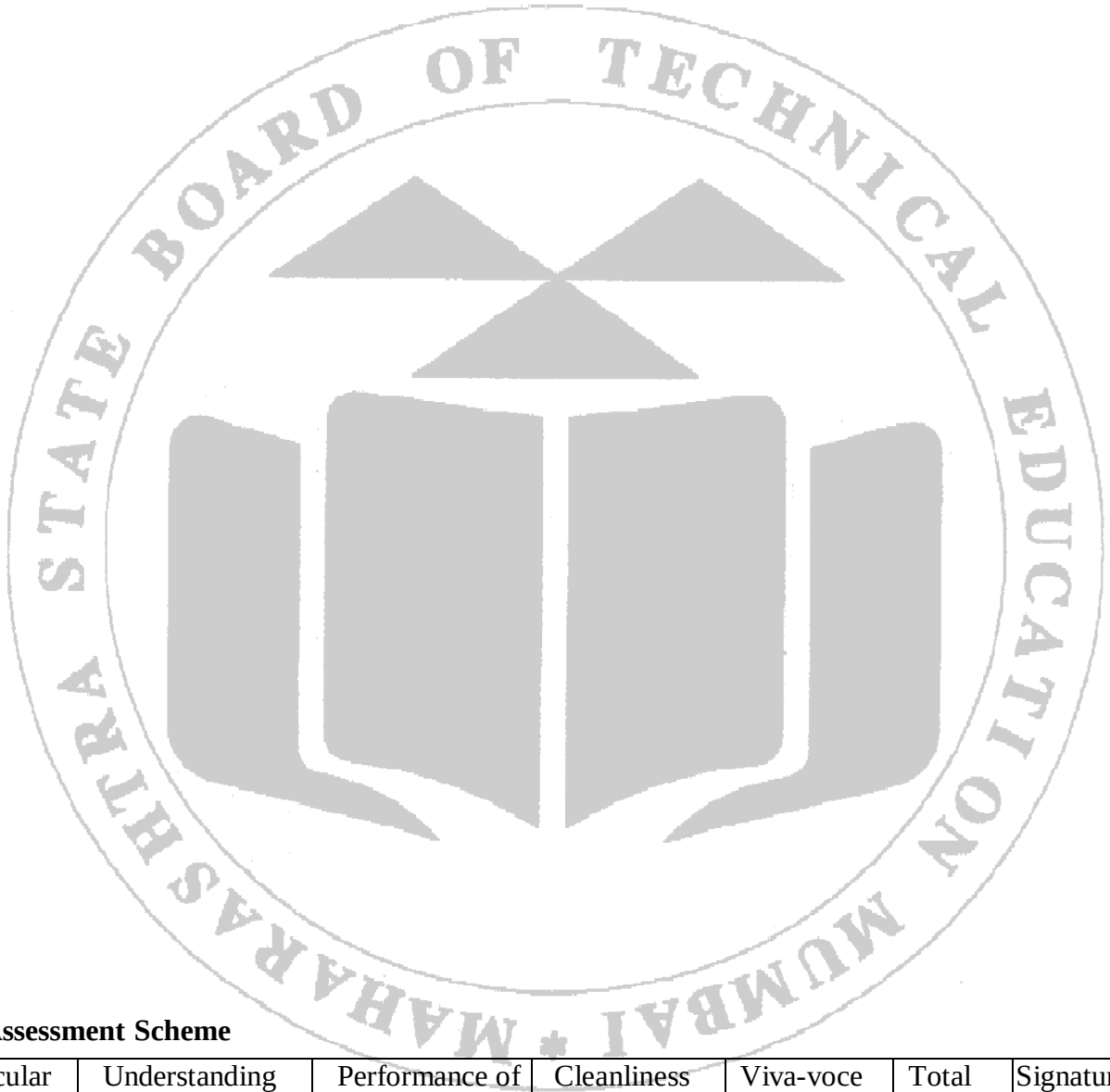
b) Give the risk factors or causes for Myocardial Infarction.

c) Give the symptoms of Myocardial Infarction.

d) Write about the treatment for Myocardial Infarction.

e) What are Surgeries for Myocardial Infarction?

(Space for Answers)



13. Assessment Scheme

Particular	Understanding thebasic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness &Handling (Affective domain)	Viva-voce /Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 4
SOAP Notes for Hyperlipidemia

1. **Aim:**

   To prepare and discuss the SOAP notes for the given case of Hyperlipidemia

2. **Practical Significance:**

   Hyperlipidemia means excess lipids or fats in the blood. It is one of the major causes of coronary artery diseases which causes angina pain or heart attack. In this practical, the students will be able to prepare SOAP notes which can record and organize information of hyperlipidemic patient clearly as per Subjective, Objective, Assessment, and Plan It can be used as a communication medium or references to other membersto interpret it.

3. **Practical Outcomes (PrOs):**

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Summarize signs and symptoms of the given clinical case of Hyperlipidemia.	CO1	BTL 2
2	Conduct efficient search for hyperlipidemia using available resources (applying).	CO1	BTL 3
3	Optimize drug therapy of hyperlipidemia (identify).	CO1	BTL 4
4	Prepare the SOAP note of the given clinical case of hyperlipidemia (use information to make judgements).	CO1	BTL 5
5	Communicate with other members to interpret.	CO1	BTL 6

4. **Relevant Theoretical Background:**

   Hyperlipidemia or dyslipidemia means excess lipids or fats in the blood. Cholesterol and Triglycerides are lipids or fats. Lipoproteins are round particles made of fat (lipids) and proteins that carry Cholesterol and Triglycerides to cells in your body.

   Hyperlipidemic

   Patient's shows –

   Blood cholesterol greater than 200mg/dL triglycerides greater than 150mg/dL

   LDL-cholesterol is greater than 100 mg/dLHDL-cholesterol is less than 40 mg/Dl

Low density lipoproteins (LDL) or bad cholesterol (Low portion of proteins)	**High density lipoproteins (HDL) or good cholesterol. (High portion of proteins)**
LDL increases your risk of coronary artery disease,heart attacks and stroke. LDL carries cholesterol that accumulates as plaque inside blood vessels. Due to Plaque, blood vessel becomes narrow andharden is called Atherosclerosis.	It carries cholesterol back to your liver to be flushed out (remove) of your body. High levels of HDL reduce your risk of cardiovascular (heart) disease.

Types & causes of Hyperlipidemia

1. Primary Hyperlipidemia- It is also called familial hyperlipidemia because it is caused by specific genetic abnormalities.
2. Secondary hyperlipidemia- It is also called acquired because it is caused by unhealthy lifeStyle and disorders like diabetes, kidney diseases, chronic alcoholism, Hypothyroidism.

Clinical Manifestations or symptoms of Hyperlipidemia

Usually, People with hyperlipidemia do not experience any symptoms. However, those with familial or inherited hyperlipidemia, may develop yellow, fatty growths around the eyes (xanthelasma) or joints (lipomas). An excessive buildup of fat over time can cause atherosclerosis

Other symptoms-

1. Obesity
2. Diabetes
3. Heart attack or Myocardial infarction
4. Stroke (brain damage due to lack of blood supply)
5. Coronary artery disease: Blocked blood flow to your heart.
6. Peripheral artery disease: Blocked blood flow to your legs and arms.
7. Carotid artery disease: Blocked blood flow to your brain

Prevention and control

1) Life style changes- Weight Reduction, Increase Physical activity/movements e.g. walking, running, swimming, avoid alcohol, tobacco and smoking.
2) Dietary changes-, low cholesterol & low-fat diet.

Pharmacological/Medical Treatment

1. Statins or First line lipid lowering drugs- e.g Atorvastatin, Lovastatin, Fluvastatins, Simvastatin, Pravastatin, Pitavastatin.
2. Non statins or second line lowering drugs-

- Cholesterol absorption inhibitors- e.g Ezetimibe
- Lipolysis and Triglyceride synthesis inhibitors- e.g Niacin
- Bile acid binding resins- e.g Cholesterol, Cholestyramine, Colesevelam
- Fibrates- Fenofibrate, Gemfibrozil

5. Requirements: Template for SOAP notes, Internet facility

6. Resources used:_____

_____

7. **Precautions-** SOAP note should be clear, properly written so that it can use by others for reference purposes, SOAP note should be signed with name.
8. **Procedure-** Read and understand the case properly and then complete the report

Activity

Case- A 60-year-old Caucasian man is referred for management of elevated cholesterol. He has history of obesity, hypertension, and hyperlipidemia. He had a non–ST-segment elevation myocardial infarction (NSTEMI) one year ago with drug-eluting stent placement in his right coronary artery. His current medications include aspirin 81 mg daily, lisinopril 20 mg daily, and metoprolol XL 50 mg daily. His physical exam is notable for a body mass index (BMI) of 32 kg/m^2 but is otherwise unremarkable. His blood pressure is 135/85 mm Hg.

A recent lipid panel shows the following:

- Total Cholesterol: 226 mg/dL
- Triglycerides: 154 mg/dL
- High-Density Lipoprotein Cholesterol (HDL-C): 39 mg/dL
- Friedewald-Estimated Low-Density Lipoprotein Cholesterol (LDL-C): 156 mg/dL

He has a normal creatinine and normal liver enzymes. His TSH and vitamin D levels are within normal limits. He was advised to lose weight and referred to a weight loss counselor. He also started rosuvastatin 20 mg daily but developed severe aching in his thighs and calves muscles. He discontinued the medication with resolution of his aches. Then, he started atorvastatin 20 mg daily but again developed aching in his thighs. Similar aches occurred on a red yeast rice/CoQ10 combination and intermittent dosing of simvastatin 20 mg weekly and rosuvastatin 5 mg weekly. His creatine kinase levels were never elevated during his episodes of muscle aches. He is not willing to try any more statin therapy.

9. SOAP note template:

A) **Subjective** (what Patient tells about problem)	
Personal Details Name of the Patient with age, gender, weight.	
Chief complaint (CC)	
History of Present illness	
Family History	
Medical History	
Allergies	
Review of systems (symptoms)	
Current Medications, Allergies	
B) **Objective data–**	

C) **Assessment** -diagnosis of disease condition	
Problem i.e. Diagnosis of the disease	
Differential Diagnosis i.e. Different possible diagnosis	
D) **Plan-** Medications, surgeriesor therapies Patient education/advice	

10. Conclusion: _____

_____

11. References:

- Caroline S. Zeind, Michel G. Carvalho, Applied Therapeutics, The clinical use drugs Eleventh edition, Wolters Kluwer.
- Burgunda Sweet, Handbook of Applied Therapeutics, Ninth edition, Wolters Kluwer.

12. Practical related questions-

a) What is Hyperlipidemia?

b) Give the risk factors or causes for Hyperlipidemia.

c) Give the symptoms of Myocardial Infarction.

d) Write about the medications to treat Hyperlipidemia.

e) What are lipoproteins and describe their types.

(Space for Answers)

13. Assessment Scheme

Particular	Understanding thebasic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness &Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 5

SOAP Notes for Diabetes Mellitus

1. Aim:

To prepare and discuss the SOAP notes for the given case of Diabetes Mellitus.

2. Practical Significance:

Diabetes is a endocrine disorder in which excess sugar/glucose in the blood due to lack of insulin. In this practical, the students will be able to prepare SOAP notes which can record and organize information of diabetic patient clearly as per Subjective, Objective, Assessment, and Plan. It can be used as a communication medium or references to other members to interpret it.

3. Practical Outcomes (PrOs):

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Summarize signs and symptoms of the given clinical case of Diabetes.	CO 1	BTL 2
2	Conduct efficient search for diabetes using available resources(applying).	CO 1	BTL 3
3	Optimize drug therapy of Diabetes(identify).	CO 1	BTL 4
4	Prepare the SOAP note of the given clinical case of diabetes (Use information to make judgements).	CO 1	BTL 5
5	Communicate with other members to interpret.	CO 1	BTL 6

4. Relevant Theoretical Background:

Diabetes is a chronic, metabolic disorder characterized by elevated levels of blood glucose (or blood sugar)due to lack of insulin production or function.

Types of Diabetes

1) Type 1 diabetes occurs when the pancreas is unable to produce insulin. Type 1 diabetes is an autoimmune disease in which the body's own immune system attacks the insulin-producing cells of the pancreas. As a result, the pancreas produces little to no insulin and blood glucose levels will increase.

2) Type 2 diabetes occurs when the pancreas does not produce enough insulin i.e. impaired insulin secretion or when the body does not effectively use the insulin which is produced by pancreas that is insulin resistance. leads to high blood glucose level.

3) Gestational diabetes is a type of diabetes that is occur during pregnancy

Causes of Diabetes

1. Infections
2. Autoantibodies -Type 1 diabetes due to autoantibodies against beta cell of Pancreas.
3. Genetics- Mutations in genes HLA-DR3 (Human Leukocyte Antigen) and HLA-DR4

Risk Factors for Diabetes

Family History-Family history of other autoimmune diseases (hypothyroidism, pernicious anaemia, celiac disease, etc.) will increase the risk of developing type 1 diabetes

Environmental Factors-In genetically susceptible individuals, some environmental factors can trigger thedevelopment of type 1 diabetes, Obesity, Diet, and Lack of vitamin D exposure

Symptoms of Diabetes

- Polyuria i.e. Urinate a lot, often at night.
- Polydipsia i.e. very thirsty.
- Polyphagia i.e. very hungry.
- Lose weight without trying
- Have blurry vision.
- Have numb or tingling hands or feet.
- Feel very tired.
- Have very dry skin.

Diagnosis tests of Diabetes

1) Hemoglobin A1C test

Hemoglobin A1C (HbA1c) is a simple blood test that measures the patient's average blood sugar levels over the past 2-3 months (8-12 weeks). It measures the amount of blood glucose attached to hemoglobin (the protein in red blood cells that carries oxygen). An A1C level of 6.5% or higher on 2 separate occasions suggests diabetes.

2) Random Blood Sugar Test

A blood sample can also be taken at random to assess a patient's blood sugar level. Regardless of when the last meal was, a blood glucose level of 200 mg/dL (11.1 mmol/L) or higher could be suggestive of diabetes.

3) Fasting Blood Sugar Test

A blood sample can also be taken after a period of fasting (usually overnight since midnight) to assess the blood glucose level.

Fasting blood glucose levels can be interpreted as:

- Less than 100 mg/dL (5.6 mmol/L) = Normal
- 100-125 mg/dL (5.6-6.9 mmol/L) = Prediabetes
- 126 mg/dL (7 mmol/L) or higher on 2 separate tests = Diabetes

4) Oral Glucose Tolerance Test (OGTT)

The oral glucose tolerance test (OGTT) involves taking a fasting blood glucose level first, followed by the patient drinking a beverage containing 75g of glucose. The blood glucose is then measured again, 2 hours after drinking the sugary beverage to analyze how the blood sugar level has changed.

This test is more commonly used to test pregnant patients.

- A 2-hour blood glucose level of less than 140 mg/dL (7.8 mmol/L) = Normal
- A 2-hour blood glucose level of 140-199 mg/dL (7.8-11.0 mmol/L) = Prediabetes
- A 2-hour blood glucose level of 200 mg/dL (11.1 mmol/L) or higher = Diabetes

The treatment and management involves the following:

1.Education / advice to Patient-Maintain a healthy weight. Exercise regularly, relax with yoga. Use fat-free or low-fat milk and yogurt. Eat as little added sugar as possible each day.

Use less fat and/or oil when cooking and baking. Add satisfying, protein-rich foods to all meals and snacks.

2.Careful Glucose Monitoring

3.Medications include:

1. **Insulin for Type 1 diabetes**

2. **Oral Diabetes Medications - Hypoglycemic Agents**

Oral diabetes medications are routinely used before insulin for the treatment of type 2 diabetes. Examples of oral diabetes medications include:

- **Biguanides** (metformin) It works mainly by lowering glucose production in the liver and improving the body's sensitivity to insulin so it uses insulin more effectively.
- **Thiazolidinediones** (Pioglitazone, Rosiglitazone)
- **Sulfonylureas** (Glimepiride, Glyburide, Glipizide)
- **SGLT-2 Inhibitors** (Dapagliflozin, Canagliflozin, Empagliflozin)
- **DPP-4 Inhibitors** (Alogliptin, Linagliptin, Saxagliptin, Sitagliptin)
- **GLP-1 Mimetics/Agonists** (Exenatide, Liraglutide)
- **Meglitinides/Glinides** (Nateglinide, Repaglinide)
- **Alpha-Glucosidase Inhibitors** (Acarbose, Miglitol)

5. Requirements: Template for SOAP notes, Internet facility

6. Resources used: _____

_____

7. Precautions- SOAP note should be clear, properly written so that it can use by others for reference purposes, SOAP note should be signed with name.

8. Procedure- Read and understand the case properly and then complete the report

Case- A 46-year-old obese businessman (body mass index - 32 kg/m^2) with essential hypertension and type 2 diabetes mellitus (T2DM) of 8 years' duration presented with poor glycemic control (glycated hemoglobin [HbA1c] - 9.4%). He was on maximal dosage of metformin and sulphonylureas and has been following his diet and exercise schedule very strictly. He is also concerned about his weight and wants advice on which class of oral antidiabetic drug would be best suited in his case that may provide efficacious glycemic control, weight loss, and cardiovascular protection.

He also wanted to know the side effects of these drugs and what measures he could follow to prevent these adverse events.

9. SOAP note template:

A) **Subjective** (what Patient tells about problem)	
Personal Details Name of the Patient with age, gender, weight.	
Chief complaint (CC)	
History of Present illness	

Family History	
Medical History	
Allergies	
Review of systems (symptoms)	
Current Medications, Allergies	
B) **Objective data**–	
C) **Assessment** -diagnosis of disease condition	
Problem i.e. Diagnosis of thedisease	
Differential Diagnosis i.e. Different possible diagnosis	
D) **Plan-** Medications, surgeriesor therapies Patient education/advice	

10. Conclusion: _____

_____

11. References:

- Caroline S. Zeind, Michel G. Carvalho, Applied Therapeutics, The clinical use of drugs, Eleventhedition, Wolters Kluwer.
- Burgunda Sweet, Handbook of Applied Therapeutics, Ninth edition, Wolters Kluwer.

12. Practical related questions:

a) What is Diabetes Mellitus.?

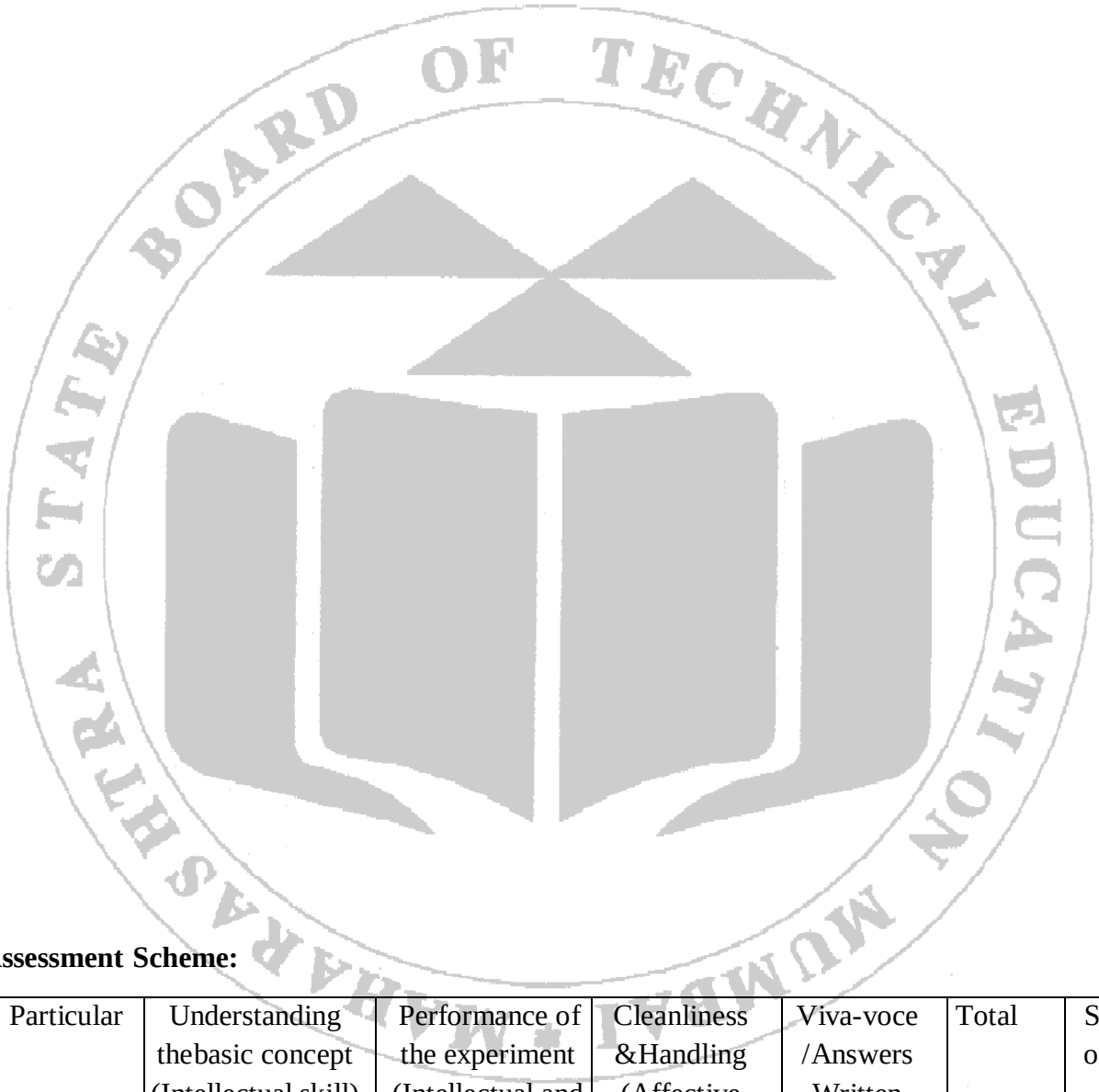
b) Give the symptoms, risk factors or causes for DM.

c) Give the symptoms of DM.

d) Write about the medication to treat Diabetes.

e) What tests are needed to confirm the diagnosis of Diabetes Mellitus.

(Space for Answers)



13. Assessment Scheme:

Particular	Understanding thebasic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness &Handling (Affective domain)	Viva-voce /Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 6

SOAP Notes for Asthma

1. Aim

To prepare and discuss the SOAP notes for the given case of Asthma

2. Practical Significance

Asthma is a respiratory track disorder in which difficulty in breathing due to bronchospasm. In this practical, the students will be able to prepare SOAP notes which can record and organize information of asthmatic patient clearly as per Subjective, Objective, Assessment, and Plan. It can be used as a communicationmedium or references to other members to interpret it.

3. Practical Outcomes (PrOs)

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Summarize signs and symptoms of the given clinical case of asthma.	CO 1	BTL 2
2	Conduct efficient search for asthma using available resources (applying).	CO 1	BTL 3
3	Optimize drug therapy of asthma (identify).	CO 1	BTL 4
4	Prepare the SOAP note of the given clinical case of asthma (use information to make judgments).	CO1	BTL 5
5	Communicate with other members to interpret.	CO1	BTL 6

4. Relevant Theoretical Background:

Asthma is a chronic (long-term) lung disease. It affects airways, the tubes that carry air in and out off lungs. In asthma, airways can become inflamed and narrowed. This can cause wheezing, coughing, and tightness in the chest. When these symptoms get worse than usual, it is called an asthma attack or flare-up.

Causes of Asthma

Trigger Factors of Asthma- Combination of Environmental and genetic factors

1. Some food material (egg albumin), food preservatives animals, cockroaches etc.
2. Air pollutants- Exhaust fumes, oxidants, Cigarette smoking
3. Weather changes like Cold and heat
4. Emotional stress
5. Strenuous exercise
6. Certain drugs- Aspirin, NSAID, B-adrenergic blockers.
7. Occupational exposure- Industrial chemicals and plastic, Metal salts, wood, vegetable dust.
8. Family history.

The symptoms of asthma include

- Chest tightness
- Coughing, especially at night or early morning
- Shortness of breath
- Wheezing, which causes a whistling sound when you breathe out

Types of Asthma

1. On the basis of sources of the stimulus

a) Allergic or Extrinsic asthma- as it caused by exposure to allergens like house dust, pollen grains, pet dander, feathers.
b) Non allergic or intrinsic asthma-. It is usually develop beyond the age of 40. Irritant in air that are not related to allergies such as air pollution, cold, heat , weather changes, smoking ,respiratory infections infections stress or emotions, room deodorants , medicines like Aspirin and Ibuprofen , preservatives of food triggers asthma.
c) Mixed Asthma- It is the combination of both allergic and non-allergic asthma. Many patients do not clearly fit into either of the above two categories and have mixed features of both. This is the most common form of asthma.

2. On the basis of duration

a) Acute Asthma- it develops suddenly. People with acute asthma will able to get comfortable soon and no further problems will take place.
b) Chronic Asthma-(Long term) – It develops gradually or slowly. People with chronic asthma cause a lot of problems for people and they cannot get comfortable with a few minutes. Symptoms are more intense and last for a longer period of time.

3. On the basis of severity –(Mild, Moderate , Severe)

Type of Asthma	Week	Night time attack	Duration
Mild intermittent Asthma	Not more than twice a week	No more than twice a month	Not more than a few hours. Symptoms are mild
Mild Persistent Asthma	More than twice a week	More than twice amonth	Sometimes severe enough to interrupt daily activities
Moderate Persistent Asthma	Daily attack	More than once a week	More severe attacks twice a week lasts 2 days to interrupt daily activities
Severe Persistent Asthma	Frequent severe attack	Frequent (Attacks occursmany times)	interrupt daily activities Hospitalization requires

Diagnosis of Asthma

1. Physical examination of the Patient
2. Lung function test- a. Spirometry b. Peak airflow test
3. Lung volume test- It shows how much air the lungs can hold.
4. Exhaled nitric oxide test (FeNo test)
5. Sputum eosinophil count

6. Blood test - WBCs count (Leuckocytosis-WBCs count increases if have infection).
7. Chest X- ray- To check chest infection.

Treatment of Asthma

Currently there is no cure for asthma, but the treatment can control the symptoms so the patient can live anormal and active life.

1. Treatment of Asthma

i) Identification and avoidance of allergens such as dust, mist, pollens to prevent attack.
ii) Avoid smoking and perform regular breathing exercise such as Pranayama.
iii) Avoid exposure to extreme cold condition.
iv) In emergency, oxygen therapy should be given.
v) Patient should be hospitalized with acute severe asthma.
vi) Chest Physiotherapy to remove mucus

2. Medication of Asthma- It involves 2 types of medications

a. Quick relief medications which are used to relieve acute asthma attack.
b. Long term asthma control medications are used as Prophylactic measures. These are preventive that is these are used to prevent attack and protect the patient against future attack.

Quick relief medications	**Long term asthma control medications**
1. Bronchodilators or Short acting B2 agonist –e.g Salbutamol, Terbutaline These can dilate the bronchial smooth muscle & relieve attack immediately. These can be taken using hand held inhaleror nebulizer. 2.Corticosteriods-Taken orally or IV E.g-Prednisolone & Methyl PrednisoneThese relieve air way inflammation & Prevent mucus production. 3. Anticholinergic or Antimuscarinics – Eg Ipratropium bromide These are inhaled. These drugs block bronchial smooth muscle contraction and mucus production by blocking cholinergic/ muscarinic receptors. These are indirect bronchodilators. 4. Xanthines – Taken by IV. These relaxbronchial smooth muscle and relive bronchial spasm. E.g Aminophylline, Theophylline.	1. Long acting B2 agonist- Salmeterol, Formoterol. 2. Inhaled corticosteroids- These are most effective preventers. Fluticasone, Budesonide, Beclomethasone 3. Leukotriene inhibitors- Montelukast. Zafirlukast. 4. Mast cell stabilizers-Sodium cromoglycate, Nedocromil, Ketotiphen.

5. Requirements: Template for SOAP notes, Internet facility

6. Resources used:_____

7. Precautions: SOAP note should be clear, properly written so that it can use by others for reference purposes, SOAP note should be signed with name.

8. Procedure: Read and understand the case properly and then complete the report

Activity

Case- Q.C., a 6-year-old, 20-kg girl, presents to the ED (emergency department) with complaints of dyspnea and coughing that have progressively worsened during the past 2 days. These symptoms were preceded by 3 days of symptoms of a viral upper respiratory tract infection (sore throat, rhinorrhea, and coughing). She has experienced several bouts of bronchitis in the last 2 years and was hospitalized for pneumonia 3 months ago. Q.C. is not being treated with any medications at present. Physical examination reveals an anxious-appearing young girl in moderate respiratory distress with audible expiratory wheezes; occasional coughing; a prolonged expiratory phase; a hyperinflated chest; and suprasternal, supraclavicular, and intercostal retractions. Bilateral inspiratory and expiratory wheezes with decreased breath sounds on the left side are heard on auscultation. Q.C.'s vital signs are as follows: respiratory rate (RR), 30 breaths/minute; blood pressure (BP), 110/83 mm Hg; heart rate, 130 beats/minute; temperature, 37.8°C; and pulsus paradoxus, 18 mm Hg. Her arterial oxygen saturation (Sao2) by pulse oximetry is 90%. Q.C. is given O2 to maintain Sao2 greater than 90% and 2.5 mg of albuterol by nebulizer every 20 minutes for three doses. After the initial treatment,

Q.C. claims some subjective improvement and appears to be more comfortable; however, wheezing on auscultation becomes louder.

9. SOAP note template:

A) **Subjective** (what Patient tells about problem)	
Personal Details Name of the Patient with age, gender, weight.	
Chief complaint (CC)	
History of Present illness	
Family History	
Medical History	
Allergies	
Review of systems (symptoms)	
Current Medications, Allergies	

B) **Objective data–**	
C) **Assessment** -diagnosis of disease condition	
Problem i.e. Diagnosis of the disease	
Differential Diagnosis i.e. Different possible diagnosis	
D) **Plan-** Medications, surgeriesor therapies Patient education/advice	

10. Conclusion: _____

_____

11. References:

- Caroline S. Zeind, Michael G. Carvalho (editors) - Applied therapeutics_ the clinical use of drugs-Wolters Kluwer Health (2017) Page no. 1050.

12. Practical related questions:

a) Define Asthma with its symptoms.
b) Describe different types Asthma.
c) Give Diagnostic tests for Asthma.
d) Give Anti-asthmatic drugs with examples.
e) Give the causes and preventions of Asthma.

(Space for answers)

13. Assessment Scheme:

Particular	Understanding the basic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness &Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 7

SOAP Notes for Chronic Obstructive Pulmonary Disease

1. Aim:

To prepare and discuss the SOAP notes for the given case of Chronic Obstructive Pulmonary Disease. (COPD)

2. Practical Significance:

COPD is group of diseases includes chronic bronchitis and Emphysema. COPD is mainly caused by smoking. In this practical, the students will be able to prepare SOAP notes which can record and organize information of COPD patient clearly as per Subjective, Objective, Assessment, and Plan. It can be used as a communication medium or references to other members to interpret it.

3. Practical Outcomes (PrOs):

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Summarize signs and symptoms of the given clinical case of COPD	CO 1	BTL 2
2	Conduct efficient search for COPD using available resources(applying)	CO 1	BTL 3
3	Optimize drug therapy of COPD (identify)	CO 1	BTL 4
4	Prepare the SOAP note of the given clinical case of COPD (use information to make judgments)	CO1	BTL 5
5	Communicate with other members to interpret	CO1	BTL 6

4. Relevant Theoretical Background

Chronic obstructive pulmonary disease is chronic obstruction of the flow of air through the air ways and out of the lungs, which is progressive &irreversible. (permanent damage)

COPD is mainly caused by smoking while asthma is mainly by allergens.

Main symptoms of COPD are breathlessness, constant cough with mucus. There is no cure for COPD. Cigarette smokers are most at the risk of COPD.

COPD is group of diseases includes chronic bronchitis and Emphysema. These conditions occur separately ortogether.

Chronic bronchitis	Emphysema
1. It is inflammation (swelling) of the bronchial tree. Excess accumulationof mucus. 2. Constant cough for at least 3 monthsa year for 2 continuously years	1. Enlargement of the alveoli, destruction of the alveolar sac,alveoli become hard to breath. 2. Breathlessness occurs. (impaired gas exchange)

Causes of COPD

1. **Smoking-** Prolonged Cigarette smoking appears to act on the lungs causes obstruction (block) of small airways and also it stimulates the vagus nerve causes bronchoconstriction**.**
2. **Air Pollution -** Exposure to poor air quality can irritate the lungs, worsen symptoms, and increase the risk of COPD attacks.

3. **Occupation –** Workers engaged in the certain occupation such as cotton mills, plastic factories are exposed to various organic or inorganic dust which contribute to chronic bronchitis in such workers.
4. **Infections-** Repeated infection of respiratory tract (bacterial/viral, cold) especially in infants may lead to COPD.
5. **Family History & Genetic factors-** alpha -1 antitrypsin is a body protein that protects lungs. Deficiency of a such protein can damage alveoli to develop emphysemas and increases the risk of lung damage.

Clinical manifestations or symptoms of COPD

1. Constant cough
2. Difficulty in breathing i.e. dyspnea.
3. Wheezing and tightness in the chest.
4. Shortness of breath during normal activity like dressing, toileting.
5. Respiratory infections are common.
6. Fatigue
7. Cyanosis (bluish discoloration of the skin due to poor oxygenation of the blood.)
8. Severe weight loss & edema.
9. Weight loss
10. Chest X-ray shows enlarged heart.
11. Hemoptysis (blood in cough)

Diagnosis of COPD

1. Physical examination-
2. Chest X-ray
3. Pulmonary Function test
4. Lung function test
5. Blood test-Blood level Alpha-1 antitrypsin is estimated to check its involvement in the disease.

Prevention or Non- Pharmacological Treatment of COPD

1. Stop Smoking
2. Avoid tobacco smoke.
3. Pneumonia vaccination
4. Avoid cold locations or area with air pollution.
5. Pulmonary rehabilitation Program – It works with a respiratory therapist to help breathing

Pharmacological Treatment of COPD

1. **Nicotine replacement therapy.**
2. **Antibiotics-** to prevent microbial infections. E.g.- Amoxycillin, Azithromycin, Ampicillin or Cotrimoxazole.
3. **Bronchodilators-** These medicines open the bronchial tube and clear out mucus.

i) Inhaled bronchodilators-

a. Salbutamol-1-2 puffs 3 times a day
b. Terbutaline -1-5 mg 3 times a day
c. Salmeterol, Formoterol
d. Ipratropium- 1-2 puffs 2-3 times a day

e. Tiotropium 1-2 puffs once a day.

ii) Xanthines-

a. Aminophylline – 250mg in 500ml of 5% Dextrose slowly over 8-10 hours in acute attacks

b. Tab Theophylline 100-300mg 3 times a day.

iii) Corticosteroids- to relieve inflammation

a. Inhaled corticosteroids- Fluticasone-1-2 puff twice a day.Budesonide 1-2 puffs twice a day.

b. Systemic corticosteroids –Tab Prednisolone 30-40mg/day for 8-10 days**.**

4. **Mucolytics-** They thin mucus so that it can easily discharge from throat (expectorate.) e.g. Acetylcysteine, Carbocysteine, Fudosterine.
5. **Oxygen therapy-** helps to improve oxygen intake when breathing is difficult**.**
6. **Alpha-1 antitrypsin deficiency treatment-** given by outside.

5. **Requirements:** Template for SOAP notes, Internet facility
6. **Resources used:**_____

_____

7. **Precautions-** SOAP note should be clear, properly written so that it can use by others for reference purposes, SOAP note should be signed with name.
8. **Procedure-**Follow the six steps systematic approach to prepare SOAP notes as given in Experiment no 1

Activity

Case- A 28-year-old woman presented to the respiratory clinic with a history of progressive cough and breathlessness over the preceding 2–3 years. Her exercise capacity on initial presentation was consistent with an MRC Dyspnea score of 4. She also described associated wheeze, chest tightness and a nocturnal cough. The patient smoked

20 cigarettes per day and had a twelve-year pack history. She is a college student withthree children and pet dog and no relevant employment. She denied any illicit drug use including cannabis. Her other past medical history was that of Hypothyroidism. She was a term delivery at birth. There appeared to be a significant family history of early diagnosis COPD with her mother and maternal grandmother diagnosed with the condition in their thirties. Furthermore, one of her sons is an asthmatic. A Chest X-ray was reported as showing hyper inflated lungs and possible upper zone emphysema.

9. SOAP note template:

A) **Subjective** (what Patient tells about problem)	
Personal Details Name of the Patient with age, gender, weight.	
Chief complaint (CC)	
History of Present illness	
Family History	
Medical History	
Allergies	
Review of systems (symptoms)	
Current Medications, Allergies	
B) **Objective data–**	
C) **Assessment** -diagnosis of disease condition	
Problem i.e. Diagnosis of the disease	
Differential Diagnosis i.e. Different possible diagnosis	
D) **Plan-** Medications, surgeriesor therapies Patient education/advice	

10. Conclusion:_____

_____

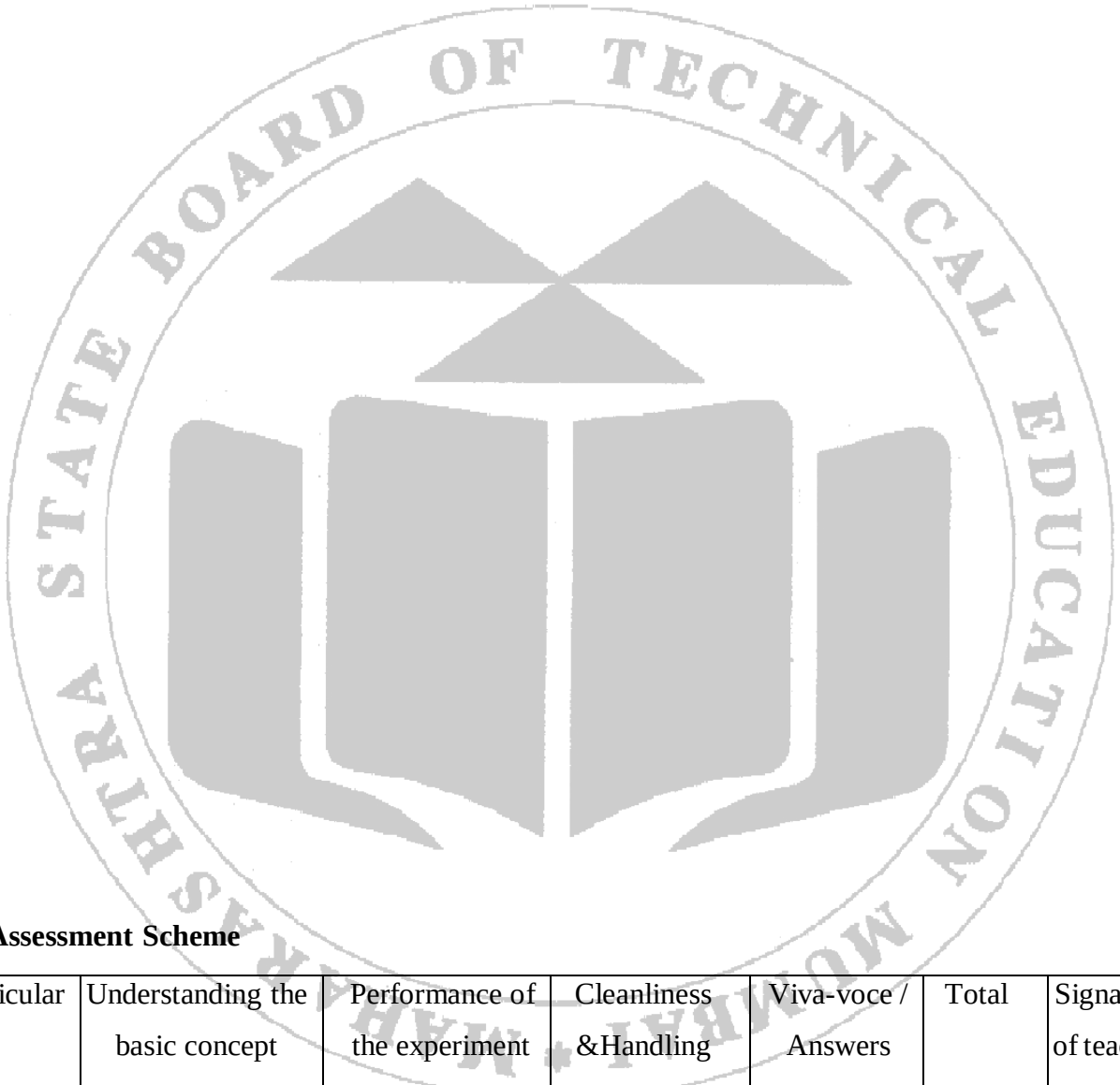
11. References

- Emphysema and COPD in a young woman
  https://www.sciencedirect.com/science/article/pii/S22130071
  14000239
- Caroline S. Zeind, Michel G. Carvalho, Applied Therapeutics, The clinical use of drugs, Eleventhedition, Wolters Kluwer.
- Burgunda Sweet, Handbook of Applied Therapeutics, Ninth edition, Wolters Kluwer.

12. Practical related questions:

a) Define COPD with its types.
b) Describe risk factors of COPD
c) Give Dignostic tests for COPD.
d) Give Medications for COPD
e) What smoking cessation products are currently available both over the counter and on prescription?

(Space for Answers)



13. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness &Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 8

SOAP Notes for Rheumatoid Arthritis

1. **Aim:**

   To prepare and discuss the SOAP notes for the given case of Rheumatoid Arthritis.

2. **Practical Significance:**

   Rheumatoid arthritis **is** *a* musculoskeletal disorder that can cause pain, swelling and stiffness in joints**.** In this practical, the students will be able to prepare SOAP notes which can record and organize information of rheumatic patient clearly as per Subjective, Objective, Assessment, and Plan. It can be used as a communication medium or references to other members to interpret it.

3. **Practical Outcomes (PrOs):**

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Summarize signs and symptoms of the given clinical case of Rheumatoid Arthritis.	CO1	BTL 2
2	Conduct efficient search for Rheumatoid Arthritis using available resources(applying).	CO1	BTL 3
3	Optimize drug therapy of Rheumatoid Arthritis (identify).	CO1	BTL 4
4	Prepare the SOAP note of the given clinical case of Rheumatoid Arthritis (use information to make judgments).	CO1	BTL 5
5	Communicate with other members to interpret.	CO1	BTL 6

4. **Relevant Theoretical Background:**

   Rheumatoid Arthritis is a chronic autoimmune disorder that causes inflammation, swelling, stiffness, pain in and around the joints & can affect other parts of the body. (Autoimmune disorders is a condition in which our immune system mistakenly attack on our healthy cells.) Most commonly hands and wrist are affected. In RA, synovial membrane becomes thickened, inflamed and invade in joint space.

   Risk factors /causes

   - Genetic, Defective immune system, Autoimmune responses,
   - Age (between 40 to 60),
   - Family History, Obesity, smoking, Environment
   - Sex - New cases of RA are typically two-to-three times higher in women than men.

   Signs and symptoms

   Stiffness and warmness of joints, (wrist, joints in hands and feet are affected first) inflammation i.e.swelling, pains, redness of joints numbness and tingling of joints, fatigue and loss of appetite.

   Diagnostic Test and investigation of RA-from clinical symptoms, lab tests, imaging

   - Rheumatoid factors (RF)- blood protein
   - Anti-Cyclic citrullinated peptide antibodies (anti-CCP)- This test is highly specific and useful.
   - Inflammatory markers- ESR, CRP elevated
     - X-ray, MRI, Ultrasonography.

Management of RA

There is no curative therapy for RA.

Non-Pharmacological treatment

Exercise, Physiotherapy, Occupational therapy, Nutrition therapy and weight management, Splints Exercise-it increases muscle strength, joint stability,

Physiotherapy-A Physiotherapist may help to improve fitness and muscle strength and make joints moreflexible.

Occupational therapy- Occupational therapist can provide training and advice to protect joints while at home and at work.

Nutrition therapy -avoid dairy products. alcohol processed foods refined sugars preservatives and artificial flavors meats, and weight management

Splints – Using support as a splint provide pain relief, increases joint stability**.**

Pharmacological Treatment-common treatments for RA perform different roles:

- **Nonsteroidal anti-inflammatory drugs** like Ibuprofen Naproxen, Aspirin and corticosteroids like Cortisone, Prednisolone. can reduce inflammation.
- **Disease-modifying antirheumatic drugs** like Methotrexate, Hydroxychloroquine, Sulfasalazine, Leflunomide can help protect joint tissue by suppressing your body's immune and inflammatory responses, which slows RA progression.
- **Biologic drugs** Infliximab, Rituximab, Golimumab, Tocilizumab work specifically on the immune system to change the body's inflammatory response.
- **Surgery** i.e. joint replacement may be an option in later stages of RA

5. **Requirements:** Template for SOAP notes, Internet facility
6. **Resources used:**_____
7. **Precautions-** SOAP note should be clear, properly written so that it can use by others for reference purposes, SOAP note should be signed with name.
8. **Procedure:** Read and understand the case properly and then complete the report.

Activity

Case- A 24-year-old white male with no known medical history presented to the hospital with chief complaints of 2 weeks of progressively worsening pain and swelling of his right wrist and left ankle joints. He did not report any fevers, chills, night sweats, weight loss or rash. He was employed as a fireman. He denied alcohol use disorder, smoking cigarettes, or any recreational drugs. Family history was significant for hypertension in father and ovarian cancer in the mother. His vital signs were within normal limits on presentation. On physical examination, the patient had significant swelling of multiple joints including the right wrist, right elbow, and left ankle. The joints were erythematous and tender to touch. Due to severe pain, he had limited range in the involved joints.

9. SOAP note template:

A) **Subjective** (what Patient tells about problem)	
Personal Details Name of the Patient with age, gender, weight.	
Chief complaint (CC)	
History of Present illness	
Family History	
Medical History	
Allergies	
Review of systems (symptoms)	
Current Medications, Allergies	
B) **Objective data–**	
C) **Assessment** -diagnosis of disease condition	
Problem i.e. Diagnosis of the disease	
Differential Diagnosis i.e. Different possible diagnosis	
D) **Plan-** Medications, surgeriesor therapies Patient education/advice	

10. Conclusion:_____

_____

11. References

- https://www.ncbi.nlm.nih.gov/books/NBK482205/
- Caroline S. Zeind, Michel G. Carvalho, Applied Therapeutics, The clinical use of drugs, Eleventhedition, Wolters Kluwer.
- Burgunda Sweet, Handbook of Applied Therapeutics, Ninth edition, Wolters Kluwer.

12. Practical related questions:

a) Define RA with its types.

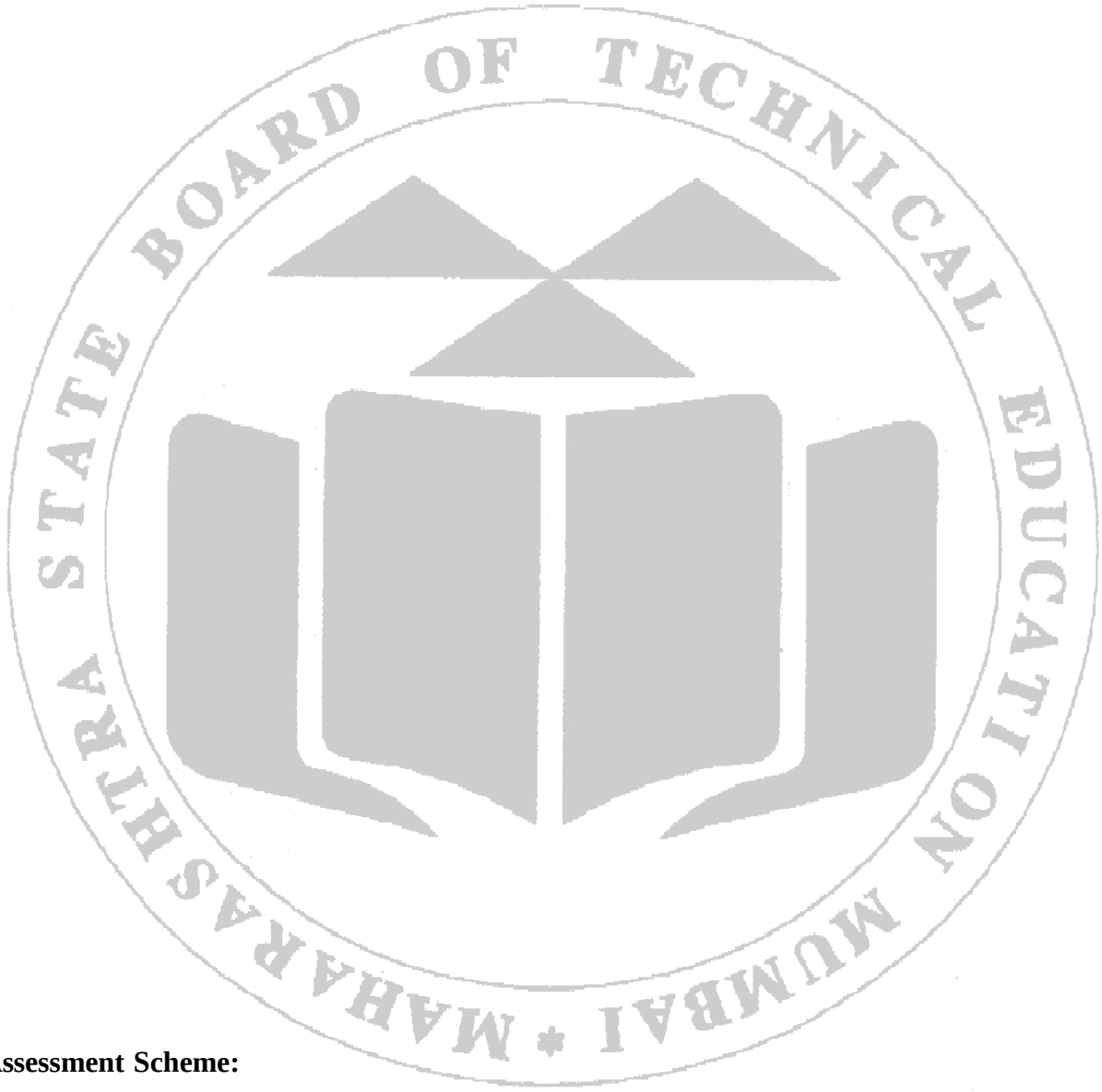
b) Describe risk factors of RA.

c) What tests are needed for diagnosis of RA.

d) Give medications for RA.

e) Give the steps for the preventions of RA.

(Space for Answers)



13. Assessment Scheme:

Particular	Understanding the basic concept (Intellectual skill)	Performance ofthe experiment (Intellectual and motor skill)	Cleanliness &Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 9

SOAP Notes for Epilepsy

1. Aim:

To prepare and discuss the SOAP notes for the given case of Epilepsy.

2. Practical Significance:

Epilepsy is the brain disorder characterized by seizures. In this practical, the students will be able to prepare SOAP notes which can record and organize information of epileptic patient clearly as per Subjective, Objective, Assessment, and Plan. It can be used as a communication medium or references to other membersto interpret it.

3. Practical Outcomes (PrOs):

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Summarize signs and symptoms of the given clinical case of epilepsy.	CO1	BTL 2
2	Conduct efficient search for epilepsy using available resources(applying).	CO 1	BTL 3
3	Optimize drug therapy of epilepsy (identify).	CO 1	BTL 4
4	Prepare the SOAP note of the given clinical case of epilepsy (use information to make judgements).	CO1	BTL 5
5	Communicate with other members to interpret.	CO1	BTL 6

4. Relevant Theoretical Background:

Epilepsy is abnormal, recurrent(repeatedly), sudden abnormal electrical discharge in the brain that causes alteration or changes in sensations, muscle control (movement), behavior and consciousness and awareness. Seizure is a symptom of an electrical disturbances in the brain which lead to loss of consciousness, disturbance of movement, muscle spasms.

Types of Epilepsy

A) Focal /Partial epilepsy-seizures (abnormal electrical discharge) that begin on one side of the brain. Focal epilepsies are common. About 60 percent epilepsy is focal.

Seizures in this category include:

I) Simple focal seizures

II) Complex focal seizures

Simple focal seizures	Complex focal seizures
i)Lasts for 20-60 seconds ii)muscle contraction/jerking iii)Person is conscious and aware of surrounding	i)Lasts for2-5 minutes. ii) Purposeless movements and walking iii) altered consciousness, but not necessarilycomplete loss of consciousness

B) Generalized epilepsy-Generalized epilepsy involves generalized onset seizures. These seizures begin on both sides of the brain and immediate loss of consciousness. Approximately 23 to 35 percent of epilepsies are generalized.

It includes the following seizures:

1) **Absence seizures-** An absence seizure, called a petit mal seizure, lasts for about 15 seconds and affects the whole brain. Absence seizures are most common in children and typically don't cause any long-termproblems. It characterized by staring into space and eye blinking or lipSmacking.
2) **Myoclonic seizures-**sudden brief jerks or twitches in arms or legs. There may be violent fall without loss of consciousness.
3) **Tonic-clonic seizures-**Generalized tonic-clonic (GTC) seizures were previously called grand mal seizures. Symptoms include, loss of consciousness, falls, muscle stiffening (tonic phase) and jerking (clonic phase), Biting of tongue or crying out
4) **Tonic seizures-**A tonic seizure causes muscle stiffening of back, arms and legs may cause fall to theground.
5) **Clonic seizure-**A clonic seizure causes muscle spasms and jerking for several minutes. These seizures usually affect the muscles of neck, face and arms.
6) **Atonic seizures-these** seizures cause a sudden loss of muscle tone (muscle strength). These seizures arealso called akinetic seizures, drop attacks or drop seizures. The sudden lack of muscle tone (abnormal muscle relaxation) can cause the person to collapse or fall down. The person usually remains conscious, and may not always fall down.
7) Status epilepticus-seizures occurs repeatedly with no recovery of consciousness between attacks.

Causes/Etiology of epilepsy

Most of the time (in up to 70% of cases), the cause of seizures is not known. Known causes include:

1) **Genetics-**Genetic mutations affecting ion channels or transmitter receptors, chromosomal abnormalities.
2) **Mesial temporal sclerosis.** This is a scar that forms in the inner part of your temporal lobe (part of your brain near your ear) that can give rise to focal seizures.
3) **Head injuries.** Head injuries can result from vehicular accidents, falls or any blow to the head.
4) **Brain infections.** Infections can include brain abscess, meningitis, encephalitis and neurocysticercosis. **5)autoimmune disorders.** Conditions that cause your immune system to attack brain cells (also called autoimmune diseases) can lead to epilepsy.
5) **Developmental disorders/disability (mental or physical impairment).** – Epilepsy associated with developmental disorders like autism and neurofibromatosis.
6) **Metabolic disorders.** People with a metabolic condition (how your body obtains energy for normal functions) can have epilepsy.
7) **Brain conditions and brain vessel abnormalities.** Brain health issues that can cause epilepsy include brain tumors, strokes, dementia and abnormal blood vessels, such as arteriovenous malformation.

Clinical manifestations or signs and symptoms of epileptic seizures

The main symptom of epilepsy is recurring seizures. Your symptoms, however, vary depending on the typeof seizure you have.

Seizure signs and symptoms include:

- Temporary loss of awareness or consciousness.
- Uncontrolled muscle movements, muscle jerking, loss of muscle tone.
- Blank stare or “staring into space” look.
- Temporary confusion, slowed thinking, problems with talking and understanding.
- Changes in hearing, vision, taste, smell, feelings of numbness or tingling.

- Problems talking or understanding.
  - Upset stomach, waves of heat or cold, goose bumps.
  - Lip-smacking, chewing motion, rubbing hands, finger motions.
  - Psychic symptoms, including fear, dread, anxiety or déjà vu.
  - Faster heart rate and /or breathing.

Most people with epilepsy tend to have the same type of seizure, so have similar symptoms with eachseizure.

Management and Treatment Treatments to control epilepsy include

- Antiepileptic drugs
- Keto Diet (usually in addition to anti-seizure medications)
- Surgery.
- Vagus nerve stimulation
- Deep brain stimulation.

Primary Generalized Tonic–Clonic Seizures	**Partial Seizures**	**Absence Seizures**	**Atypical Absence Myoclonic,and Atonic Seizures**
First-line agents			
Valproic acid Lamotrigine Topiramate	Carbamazepine Phenytoin Oxcarbazepine Valproic Acid	Valproic acid Ethosuximide	Valproic acid Lamotrigine Topiramate
Second line agents /Alternative agents			
Phenytoin Phenobarbital	Levetiracetam Topiramate Tiagabine Gabapentin Phenobarbital	Lamotrigine Clonazepam	Clonazepam Felbamate

5. **Requirements**: Template for SOAP notes, Internet facility
6. **Resources used:**

_____

_____

7. **Precautions**-
   SOAP note should be clear, properly written so that it can use by others for reference purposes, SOAP note should be signed with name.
8. **Procedure**: Read and understand the case properly and then complete the report.

Activity

Case-The patient is a 25-year-old woman with a history of febrile seizures as a child who presented six months ago with absence spells brought on by a particular memory from her past. The patient had a full work-up at that time which showed a right temporal spike focus on EEG and a normal brain MRI scan. The patient was started on phenytoin. She reports no further spells on treatment but

complains that the medication sedates her and causes "foggy thinking." The patient has no other medical problems. The patient's physical examination and neurological examination are entirely normal.

9. SOAP note template:

A) **Subjective** (what Patient tells about problem)	
Personal Details Name of the Patient with age, gender, weight.	
Chief complaint (CC)	
History of Present illness	
Family History	
Medical History	
Allergies	
Review of systems (symptoms)	
Current Medications, Allergies	
B) **Objective data–**	
C) **Assessment** -diagnosis of disease condition	
Problem i.e. Diagnosis of the disease	
Differential Diagnosis i.e. Different possible diagnosis	

D) **Plan-** Medications, surgeriesor therapies Patient education/advice	

10. Conclusion:_____

_____

11.References

- Caroline S. Zeind, Michel G. Carvalho, Applied Therapeutics, The clinical use of drugs, Eleventh edition, Wolters Kluwer.
- Burgunda Sweet, Handbook of Applied Therapeutics, Ninth edition, Wolters Kluwer.

12. Practical related questions:

a) What is Epilepsy with symptoms.

b) What are the Types of Epilepsy?

c) Differentiate between Generalized and Petit Mal Epilepsy.

d) Give Diagnostic tests of Epilepsy.

e) What are Medications to treat Epilepsy?

(Space for Answers)

13. Assessment Scheme:

Particular	Understanding thebasic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No.10

SOAP Notes for Stroke

1. Aim:

To prepare and discuss the SOAP notes for the given case of Stroke.

2. Practical Significance:

A stroke occurs when a blood vessel in the brain ruptures and bleeds, or when blood supply to the brain is blocked. In this practical, the students will be able to prepare SOAP notes which can record and organize information of stroke patient clearly as per Subjective, Objective, Assessment, and Plan. It can be used as a communication medium or references to other members to interpret it.

3. Practical Outcomes (PrOs):

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Summarize signs and symptoms of the given clinical case of stroke.	CO1	BTL 2
2	Conduct efficient search for stroke using available resources(applying).	CO1	BTL 3
3	Optimize drug therapy of stroke(identify).	CO1	BTL 4
4	Prepare the SOAP note of the given clinical case of stroke (use information to make judgements).	CO1	BTL 5
5	Communicate with other members to interpret.	CO1	BTL 6

4. Relevant Theoretical Background:

A stroke, sometimes called a brain attack, occurs when blood supply to the brain is stopped due to burst orthe blockage of blood vessel in the brain and within minutes brain cells begin to die. It is an emergency situation. There are3 kinds of stroke: ischemic and hemorrhagic.

- **Ischemic stroke.** This is the most common type of stroke. It happens when a major blood vessel in the brain is blocked. It may be blocked by a blood clot or plaque (deposition of fat and cholesterol.) May cause permanent damage.
- **Hemorrhagic stroke.** This occurs when a blood vessel in bursts, spilling blood into nearby tissues. With a hemorrhagic stroke, pressure builds up in the nearby brain tissue. This causes even more damage and irritation.
- **TIAs (transient ischemic attacks).** TIAs are often called mini-strokes. A temporary decrease in blood supply to the part of the brain due to blood clot. It lasts for 5 min. but there is no permanent damage

Causes and risk factors

- High blood pressure: This is the primary cause of stroke.
- Diabetes: People with diabetes are four times more likely to have stroke.
- Atherosclerosis or carotid artery disease: Having either of these conditions or a family history of these conditions can increase the risk of stroke.
- Atrial fibrillation: strokes occur in people who have atrial fibrillation.
- Cholesterol levels: High levels of “bad” low-density lipoprotein (LDL) cholesterol or low

levels of "good" high-density lipoprotein (HDL) cholesterol can contribute to plaque buildup in the arteries.

Stroke symptoms

- Loss of muscle movement, known as paralysis
- numbness or weakness in the arm, face, and leg, especially on one side of the body
- trouble speaking or understanding others
- slurred speech
- confusion, disorientation, or lack of responsiveness
- sudden behavioral changes, especially increased agitation
- vision problems, such as trouble seeing in one or both eyes with vision blackened or blurred, or double vision
- trouble walking
- loss of balance or coordination

Prevention or Non-Pharmacological treatment

- Control high blood pressure
- Lower the amount of cholesterol and saturated fat in your diet. Eating less cholesterol and fat, especially saturated fats and trans fats, may reduce buildup in the arteries.
- Manage diabetes. Diet, exercise and losing weight can help you keep your blood sugar in a healthy range.
- Maintain a healthy weight. Being overweight contributes to other stroke risk factors, such as high blood pressure, cardiovascular disease and diabetes.
- Exercise regularly.
- Avoid alcohol
- Don't use illicit drugs

Pharmacological treatment

1. Anti-platelet drugs - Aspirin, Clopidogrel

2. Blood thinning agents or Anticoagulants- Heparin, Warfarin.

3, Tissue plasminogen activator (tPA)

This emergency medication can be given during a stroke to break up the blood clot causing the stroke

4.Statins -Statins help lower high blood cholesterol levels. Common statins include:- Rosuvastatin, Simvastatin, Atorvastatin

5.Antihypertensive Drugs- Labetalol, Hydralazine, Esmolol, Nicardipine, Enalapril, Nitroglycerin,Nitroprusside.

5. **Requirements:** Template for SOAP notes, Internet facility
6. **Resources used:**_____

_____

7. **Precautions:** SOAP note should be clear, properly written so that it can use by others for referencepurposes, SOAP note should be signed with name.
8. **Procedure:** Read and understand the case properly and then complete the report

Activity

Case- D.B. is a 72-year-old African American female who presented to the ED with complaints of headache, altered mental status as evidenced by confusion and lethargy, slurred speech, right sided

weakness, and a facial droop. Symptoms were first noted when patient woke up from a nap approximately one hour ago. Patient's daughter is at bedside. Vital signs on arrival: HR 92 irregular, RR 12, BP 172/91, Temp 99.3, blood glucose 163.Her Past Medical History

- Hypertension-diagnosed at 50 years old
- Diabetes Mellitus, Type II-diagnosed at 50 years old
- Hypercholesterolemia- diagnosed at 60 years oldHer Pertinent Family History
- Mother, deceased at 75 years old- CVA, heart disease
- Father, deceased at 62 years old- diabetes, heart disease

9. SOAP note template:

A) **Subjective** (what Patient tells about problem)	
Personal Details Name of the Patient with age, gender, weight.	
Chief complaint (CC)	
History of Present illness	
Family History	
Medical History	
Allergies	
Review of systems (symptoms)	
Current Medications, Allergies	
B) **Objective data–**	
C) **Assessment** -diagnosis of disease condition	
Problem i.e. Diagnosis of the disease	
Differential Diagnosis i.e. Different possible diagnosis	

D) **Plan-** Medications, surgeriesor therapies Patient education/advice	

10. Conclusion:_____

_____

11. References:

- Caroline S. Zeind, Michel G. Carvalho, Applied Therapeutics, The clinical use of drugs, Eleventhedition, Wolters Kluwer.
- Burgunda Sweet, Handbook of Applied Therapeutics, Ninth edition, Wolters Kluwer.

12. Practical related questions:

a) What is Stroke? Give its symptoms.
b) What are the Types of Strokes?
c) State the risk factors Stroke and Give Diagnostics tests for Stroke.
d) Give the medications to treat Stroke.
e) What are preventive measures to treat Stroke.

(Space for Answers)

13. Assessment Scheme:

Particular	Understanding the basic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 11

SOAP Notes for Depression

1. **Aim:**

   To prepare and discuss the SOAP notes for given case of Depression.

2. **Practical Significance:**

   Depression is a mood disorder that causes a persistent feeling of sadness and loss of interest. In this practical, the students will be able to prepare SOAP notes which can record and organize information of depressive patient clearly as per Subjective, Objective, Assessment, and Plan. It can be used as a communication medium or references to other members to interpret it.

3. **Practical Outcomes (PrOs):**

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Summarize signs and symptoms of the given clinical case of Depression.	CO1	BTL 2
2	Conduct efficient search for depression using available resources(applying).	CO 1	BTL 3
3	Optimize drug therapy of depression(identify).	CO 1	BTL 4
4	Prepare the SOAP note of the given clinical case of depression (use information to make judgements).	CO1	BTL 5
5	Communicate with other members to interpret.	CO1	BTL 6

4. **Relevant Theoretical Background:**

   Depression is a chronic, episodic, and relapsing(recurrence) mood disorder characterized by depressed or sad mood and anhedonia for at least 2 weeks. Anhedonia is an inability to feel pleasure (happiness) in normally pleasurable activities. Depression is the leading cause of suicide. Depression in females is almost twice than in males. There are different types of depressions, some of which develop due to specific circumstances.

   - **Atypical or Major depression** includes symptoms of depressed mood or loss of interest, most of the time for at least 2 weeks, that interfere with daily activities.
   - **Persistent depressive disorder** (also called dysthymia or dysthymic disorder) consists of less severesymptoms of depression that last much longer, usually for at least 2 years.
   - **Perinatal & postpartum depression** is depression that occurs during or after pregnancy. Depression that begins during pregnancy is prenatal depression and depression that begins after the baby is born is postpartum depression.
   - **Seasonal affective disorder** or **winter depression** that depression comes in winter when there is lessnatural sunlight and going away during the spring and summer.
   - **Psychotic Depression** is a severe form of depression in which a person experiences psychosis symptoms, such as delusions (disturbing false fixed beliefs or break with reality) or hallucinations(hearing or seeing things others do not hear or see).
   - **Bipolar Depression-**extreme mood swings. Includes emotional highs(mania) and lows(depression).

Causes or risk factors

Depression is a depletion of the neurotransmitters serotonin, norepinephrine and dopamine in the central nervous system

1. Brain chemistry: Abnormalities in brain chemicals levels may lead to depression. Low level of neurotransmitters, including serotonin, norepinephrine and dopamine contributes to the development ofdepression.

2. Genetics: Depression is more common in people whose blood relatives (family members) also have this condition.

3. Hormonal changes- sometimes hormonal changes during and after pregnancy may lead to depression. 4.Stressful life events: Difficult experiences, such as the death of a loved one, trauma, divorce, isolation and lack of support, can trigger depression.

5. Medical conditions: Chronic pain and chronic conditions like diabetes, heart diseases, Parkinson's diseasecan lead to depression.

6. Drug abuse: Some medications of abuse can cause depression as a side effect. Recreational drugs (chemical substances taken for enjoyment) and alcohol, can also cause depression or make it worse.

7. Personality and thoughts- Person having negative thinking, negative speech, less confidence are easily got depressed.

Clinical Manifestations/ Symtoms of Depression

1. Emotions- sadness, Anxiety, Guilt, Anger, Mood swings, Irritability, Anhedonia.
2. Thoughts- self-criticism, impaired memory, confusion, thoughts of death or suicide.
3. Physical- Chronic fatigue, lack of energy. Sleeping too much or too little, weight gain or loss, loss of motivation, drug abuse.
4. Behavoiur-withdrawl from others, neglect of responsibility, changes in personal appearance

Pharmacological Treatment for Depression

1. Selective serotonin reuptake inhibitors (SSRIs)-- e.g Sertraline, citalopram, Fluoxetine, Fluvoxamine Paroxetine.

2. Serotonin and norepinephrine reuptake inhibitors (SNRIs) - Duloxetine, Venlafaxine, Desvenlafaxine.

3. Atypical antidepressants- Mianserine, Mirtazapine, Trazodone, Bupropion.

4 Monoamine oxidase inhibitors (MAOIs)- Selegiline, Tranylcypromine, Phenelzine.

5. Tricyclic antidepressants- Amitriptyline, Imipramine, Doxepin, Dothiepin.

Non-Pharmacological Treatment for Depression

1) Psychotherapy or Counseling-

There are many different types of psychotherapy. Some examples are:

a) Supportive psychotherapy

b) Cognitive behavior therapy

c) Psychodynamic psychotherapy

d) Interpersonal therapy

e) Acceptance and commitment therapy

f) Family therapy

2) Brain stimulation therapy: Types of brain stimulation therapy include

i) electroconvulsive therapy (ECT)

ii) transcranial magnetic stimulation (TMS) and

iii) vagus nerve stimulation (VNS)

iv) Light therapy

5. **Requirements:** Template for SOAP notes, Internet facility
6. **Resources used:**_____
7. **Precautions:** SOAP note should be clear, properly written so that it can use by others for referencepurposes, SOAP note should be signed with name.
8. **Procedure:** Read and understand the case properly and then complete the report.

Activity

Case: R.A. is a 58-year-old married man seen by his primary physician for scheduled care of diabetes. Diagnosed 4 years ago with type 2 diabetes, he is mildly obese (5 feet, 11 inches, 218 lb, body mass index 30.4 kg/m^2) and hypertensive (blood pressure 165/92 mmHg), but otherwise has no evidence of coronary heart disease or other complications of diabetes. He uses insulin and has insufficient control of hyperglycemia (recent hemoglobin A1c [A1C] concentrations range from 10 to 11.5%). He does not perform blood glucose testing.

Six months ago, the patient started having difficulty falling and staying asleep. As a result, he felt tired and fatigued most of the time. He became less physically active, stopped exercising, and gained 12 lb. Then he gradually stopped socializing and eventually lost interest in most things, including sexual activity. During this time, he earnestly denied feeling sad or depressed. He has continued to work but has trouble concentrating, frequently forgets things, and feels impatient, irritable, and frustrated. For the past month, the constellation of symptoms has been persistent and interfering.

Physical examination was remarkable only for mild obesity. Routine laboratory and CT scan of the head were normal. R.A. was treated with alprazolam (Xanax), 0.25 mg at bedtime, which relieved the insomnia but had no effect on his other symptoms.

9. SOAP note template:

A) **Subjective** (what Patient tells about problem)	
Personal Details Name of the Patient with age, gender, weight.	
Chief complaint (CC)	
History of Present illness	
Family History	
Medical History	
Allergies	
Review of systems (symptoms)	
Current Medications, Allergies	
B) **Objective data–**	
C) **Assessment** -diagnosis of disease condition	
Problem i.e. Diagnosis of the disease	
Differential Diagnosis i.e. Different possible diagnosis	
D) **Plan-** Medications, surgeriesor therapies Patient education/advice	

10. Conclusion:_____

11. References:

- Caroline S. Zeind, Michel G. Carvalho, Applied Therapeutics, The clinical use of drugs, Eleventhedition, Wolters Kluwer.
- Burgunda Sweet, Handbook of Applied Therapeutics, Ninth edition, Wolters Kluwer.

12. Practical related questions:

a) Define Depression.
b) Describe types of depression.
c) Give symptoms of depression.
d) Give Treatment for Depression.
e) Give the causes or risk factors of depressions.

(Space for Answers)

13. Assessment Scheme:

Particular	Understanding the basic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 12

SOAP Notes for Anemia

1. **Aim:**

   To prepare and discuss the SOAP notes for the given case of Anemia.

2. **Practical Significance:**

   Anemia is a condition where there are less number of RBCs, less hemoglobin and less oxygen carrying capacity of blood. In this practical, the students will be able to prepare SOAP notes which can record and organize information of anemic patient clearly as per Subjective, Objective, Assessment, and Plan. It can be used as a communication medium or references to other members to interpret it.

3. **Practical Outcomes (PrOs):**

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Summarize signs and symptoms of the given clinical case of Anemia.	CO1	BTL 2
2	Conduct efficient search for hypertension using available resources (applying).	CO1	BTL 3
3	Optimize drug therapy of Anemia (identify).	CO1	BTL 4
4	Prepare the SOAP note of the given clinical case of Anemia (use information to make judgments).	CO1	BTL 5
5	Communicate with other members to interpret.	CO1	BTL 6

4. **Relevant Theoretical Background:**

   Anemia is a blood disorder in which there are less no. of RBCs, low hemoglobin and oxygen carryingcapacity of blood becomes less

   Symptoms of anemia include

   - Tiredness/Fatigue.
   - Weakness.
   - Shortness of breath.
   - Pale or yellowish skin, which might be more obvious on white skin than on Black or brown skin.
   - Irregular heartbeat.
   - Dizziness or lightheadedness.
   - Chest pain.
   - Cold hands and feet.
   - Headaches.

   Risk factors of Anemia

   A diet that doesn't have enough of certain vitamins and minerals. Not getting enough iron, vitamin B-12 and folate increases the risk of anemia.

   - **Problems with the small intestine.** Examples are Crohn's disease and celiac disease.
   - **Menstrual periods.** In general, having heavy periods can create a risk of anemia.
   - **Pregnancy.** Pregnant women who don't take a multivitamin with folic acid and iron are at an increased risk of anemia.
   - **Chronic conditions.** Having cancer, kidney failure, diabetes.

- Family history.
- **Other factors.** A history of certain infections, blood diseases and autoimmune conditions, drinking too much alcohol, being around toxic chemicals, and taking some medicines can affect the making of red blood cells and lead to anemia.
- **Age.** People over age 65 are at increased risk of anemia.

Prevention and control of Anemia

Most anemias cannot be prevented. However, iron-deficiency and vitamin-deficiency anemia can be prevented by consuming the right diet, about which a dietician can guide you well.

- **Iron**: Sources include red meat, dark-green leafy vegetables, beans and lentils, dried-fruits andiron-fortified cereals.
- **Folate/Folic acid**: Sources include dark-green leafy vegetables, whole fruits or fruit juices, kidney beans, green peas, peanuts and fortified products such as bread, cereal, pasta and rice.
- **Vitamin B-12**: Sources include dairy products, meat, soy products and fortified cereal.
- **Vitamin C:** Sources include all citrus fruits – whole or juiced, strawberries, peppers, broccoli,melons and tomatoes. All of these help the body absorb iron better.

Goal of Anemia therapy –To normalize Hb, to treat underlying cause of Anemia

Treatment for Anemia

Treatment options are largely medication or drug-based, and supplements. They vary depending onthe type of anemia.

- **Iron-deficiency anemia:** Oral iron or IV iron supplements are given, and in very severecases, the person may require intravenous transfusion of blood.
- **Vitamin deficiency anemia**: The first line of treatment involves improving the diet so thatmore of natural Vitamin B12 or folate can be ingested by the body.
- **Anemia of chronic disease:** Synthetic erythropoietin is given initially to increase
- RBCproduction and if that is not working, blood transfusions are the only option.
- **Aplastic anemia**: Blood transfusions or a bone marrow transplant are the solution.
- **Bone-marrow related anemias**: Medication is the first line of treatment, Finally, bone-marrow transplant is explored.
- **Hemolytic anemia:** Infections are treated first. Then, some medications taken by the patientare cut down. Finally, drugs are given to suppress the immune system.
- **Sickle-cell anemia:** s folic-acid supplements, antibiotics, blood-transfusion.
- **Thalassemia** medication, blood transfusion and folic-acid supplements. Severe condition is treated with splenectomy (removing the spleen) and stem-cell transplant of the blood or bone-marrow.

5. **Requirements:** Template for SOAP notes, Internet facility

6. **Resources used:**_____

_____

7. **Precautions-** SOAP note should be clear, properly written so that it can use by others for referencepurposes, SOAP note should be signed with name.

8. **Procedure:** Follow the six steps systematic approach to prepare SOAP notes as given in Experiment no 1.

Activity

Case- H.P is a 31 years old woman seen in the clinic. Her chief complaints include weakness, dizziness and epigastric pain. She has a 5-year history of peptic ulcer diseases, a 10-year history of heavy menstrual bleeding and a 15-year history of chronic headaches. she has two children who are 1 and 3 years of age. H.P is currently taking minocycline 100mg twice daily (BID) for acne, ibuprofen 400mg as needed for headaches and esomeprazole 40 mg daily. Her review of systems is positive for decreased exercise tolerance. Physical examination reveals a pale, lethargic white woman appearing older than her stated age. Her vital signs are within normal limits. Her heart rate is regular at 100 beats/minute. Her examination is notable for pale nail beds and splenomegaly. Significant lab tests include Hb-8g/dl, Hct 26%, Platelet count 5lakh/microlitre Serum iron 40 mcg/dl, Serum ferritin 9 ng/ml ,MCV 75femtoliyers(Fl),MCHC 300g/L,Total binding capacity (TIBC)450g/dl

9. SOAP note template:

A) **Subjective** (what Patient tells about problem)	
Personal Details Name of the Patient with age, gender, weight.	
Chief complaint (CC)	
History of Present illness	
Family History	
Medical History	
Allergies	
Review of systems (symptoms)	
Current Medications, Allergies	
B) **Objective data–**	
C) **Assessment** -diagnosis of disease condition	
Problem i.e. Diagnosis of the disease	

Differential Diagnosis i.e. Different possible diagnosis	
D) **Plan-** Medications, surgeriesor therapies Patient education/advice	

10. Conclusion:_____

11. References:

- CarolineS. Zeind, Michel G Carvalho, Applied Therapeutics, The clinical use of drugs, Eleventhedition, Wolters Kluwer Page no- 4977
- Burgunda Sweet, Hand book of Applied therapeutics, Nineth Edition, Wolters Kluwer.

12. Practical related questions:

a) Define Anemia with its types.
b) What factors predispose H.P.to iron deficiency anemia.
c) State risk factors and symptoms. of Anemia.
d) Give the medications to treat different types of Anemia's.
e) What are diagnostic tests and preventive measures of Anemia

(Space for Answers)

13. Assessment Scheme:

Particular	Understanding the basic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 13
SOAP Notes for Tuberculosis

1. Aim:

To prepare and discuss the SOAP notes for the given case of Tuberculosis.

2. Practical Significance:

TB is an infectious bacterial disease caused by Mycobacterium tuberculosis, which most commonly affects the lungs**.** In this practical, the students will be able to prepare SOAP notes which can record and organize information of tuberculosis patient clearly as per Subjective, Objective, Assessment, and Plan. It can be used as a communication medium or references to other members to interpret it.

3. Practical Outcomes (PrOs):

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Summarize signs and symptoms of the given clinical case of T.B.	CO 1	BTL 2
2	Conduct efficient search for T.B. using available resources(applying).	CO 1	BTL 3
3	Optimize drug therapy of T.B. (identify).	CO 1	BTL 4
4	Prepare the SOAP note of the given clinical case of T.B. (use information to make judgments)	CO1	BTL 5
5	Communicate with other members to interpret.	CO1	BTL 6

4. Relevant Theoretical Background:

Tuberculosis (TB) is an infectious disease that most often damages your lungs, but can affect any part of your body. TB is caused by the bacterium M*ycobacterium tuberculosis*. There are 2 types of TB

- Latent TB infection — this is when someone is infected with TB but does not get sick, because their immune system is able to control the infection.
- Active TB disease — this is when the TB bacteria multiply and the immune system is not able tocontrol them. Active TB causes symptoms.

Symptoms of TB-If you have pulmonary (lung) TB, you might have:

- Cough that lasts at least 3 weeks
- Sputum (phlegm) containing blood
- chest pain
- Feel tired
- Lose weight without trying to
- Have a fever
- Sweat in bed at night
- Lose appetite

TB is spread through the air when a person with active TB in their lungs or throat coughs, sneezes, speaks,laughs or sings.

Risk factors for tuberculosis-

1) HIV Infection - HIV attacks the immune system, it puts people at greater risk of getting sick

from otherbacteria and viruses

2) Taking Medication That Weakens the Immune System Autoimmune disorders, such as rheumatoidarthritis, psoriasis, and Crohn's disease, cause the body's immune system to attack itself

3) Kidney Disease and Diabetes Chronic conditions, such as kidney disease and diabetes, weaken your immune system

4) Organ Transplants The drugs people take to prevent the rejection of an organ transplant can weaken the immune system.

Goals of tuberculosis (TB) treatment include-To eradicate mycobacterium infection, to prevent transmission,to prevent relapse of disease, to prevent drug resistance.

Non-Pharmacological Management of T.B.

1) Isolation of the patient
2) Cover the mouth with disposable mask
3) Maintain good cough hygiene
4) Take rest and nutritious diet
5) Avoid smoking, alcohol

Pharmacological Management of T.B.

1) **First Line Drugs:** These drugs have high antitubercular activity e.g. Isoniazid, Rifampicin, Pyrazinamide, Ethambutol, Streptomycin.
2) **Second Line Drugs:** Low antitubercular activity e.g. Ethionamide, Thioacetazone, Cycloserine, Kanamycin, Amikacin, PAS (Para amino salicylic acid.)
3) **Newer Drugs**: Ciprofloxacin, ofloxacin, clarithromycin, Azithromycin
4) **DOT (Direct observation therapy)-**Government health care providers handle DOT to ensure that apatient safely take his or her medication exactly as prescribed.
5) **BCG vaccine**

5. **Requirements:** Template for SOAP notes, Internet facility
6. **Resources used:**_____

_____

7. **Precautions:** SOAP note should be clear, properly written so that it can use by others for referencepurposes, SOAP note should be signed with name.
8. **Procedure:** Read and understand the case properly and then complete the report.

Activity

Case- A 63 years old male presents to the emergency department with complaints of cough/ shortness of breath which he attributes to a nagging cold. He states he fears this may be something worse after experiencing hemoptysis for the past 3 days. He also admits to walking up in the middle of the night was screened several years ago. His chart indicates he was in the emergency department last week with similar symptoms and was diagnosed with community acquired Pneumonia and discharged with Azithromycin. He has past medical history of hypertension, dyslipidemia, COPD, atrial fibrillation, generalized anxiety disorder, allergies of sulfa(hives), Penicillin(nausea/vomiting), shellfish(itching). Her father passed away from a myocardial infarction 4 years ago and mother had type 2 DM and passed away from a ruptured abdominal aortic aneurysm. His prescription record reveals Aspirin 81 mg PO daily and Atorvastatin 40 mg

PO daily Lisinopril 20 mg PO daily Metoprolol succinate 100 mg PO daily. Vital signs100.8^{0}F, P 96, RR 24 breaths per minute, BP 150/84 mm Hg, pO2 92%, Ht 5' 10''Wt 56.4kg

9. SOAP note template:

A) **Subjective** (what Patient tells about problem)	
Personal Details Name of the Patient with age, gender, weight.	
Chief complaint (CC)	
History of Present illness	
Family History	
Medical History	
Allergies	
Review of systems (symptoms)	
Current Medications, Allergies	
B) **Objective data**–	
C) **Assessment** -diagnosis of disease condition	
Problem i.e. Diagnosis of the disease	
Differential Diagnosis i.e. Different possible diagnosis	
D) **Plan-** Medications, surgeriesor therapies Patient education/advice	

10. Conclusion: SOAP was prepared and submitted**.**

11.References:

- Caroline S. Zeind, Michel G. Carvalho, Applied Therapeutics, The clinical use of drugs, Eleventhedition, Wolters Kluwer.
- Burgunda Sweet, Handbook of Applied Therapeutics, Ninth edition, Wolters Kluwer.

12. Practical related questions:

a) What is Tuberculosis.
b) What are the Types of Tuberculosis.
c) c). State risk factors and symptoms. of Tuberculosis.
d) Give the medications to treat Tuberculosis.
e) What are diagnostic tests and preventive measures of Tuberculosis.

(Space for Answers)

13. Assessment Scheme:

Particular	Understanding the basic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce /Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 14

SOAP Notes for AIDS

1. Aim:

To prepare and discuss the SOAP notes for given case of acquired immunodeficiency syndrome (AIDS).

2. Practical Significance:

HIV has emerged as a global pandemic. AIDS/HIV infection leads to progressive immune deficiency that characterizes the disease and is responsible for the opportunistic infections that complicate the illness. The rate of disease progression is highly variable between individuals, ranging from 6 months to more than 20 years. The median time to develop AIDS after transmission is 10 years in the absence of antiretroviral therapy (ART). The availability of antiretroviral therapy (ART) has dramatically changed the outcome of the patients with HIV infection and has significantly reduced the disease mortality and morbidity. In this practical, the students will be able to prepare the SOAP notes for AIDS and discuss them with each other to organize it in a structured and organized way.

3. Practical Outcomes (PrO):

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

PrO	PrO statements	Mapped CO	BTL
1	Identify the signs and symptoms of the given clinical case ofAIDS.	CO1	BTL 2
2	Optimize drug therapy of AIDS.	CO1	BTL 3
3	Prepare SOAP notes of the given clinical case of AIDS.	CO1	BTL 4
4	Conduct efficient search for AIDS using available resources.	CO1	BTL 5
5	Collaborate and communicate with fellow students.	CO1	BTL 6

4. Relevant Theoretical Background:

Acquired Immunodeficiency Syndrome (AIDS)

Human immunodeficiency virus (HIV) type is the major cause of AIDS. HIV is a virus that attacks cells that help the body fight infection, making a person more vulnerable to other infections and diseases. It is spread by contact with certain bodily fluids of a person with HIV, most commonly during unprotected sex (sex without a condom), or through sharing injection drug equipment. AIDS is the late stage of HIV infection that occurs when the body's immune system is badly damaged because of the virus. A person with HIV is considered to have progressed to AIDS when:

- The number of their CD4 cells falls below 200 cells per cubic millimeter of blood (200 cells/mm^3). (In someone with a healthy immune system, CD4 counts are between 500 and 1,600 cells/mm3.)
- They develop one or more opportunistic infections regardless of their CD4 count.

Stages of HIV

Stage 1: Acute HIV Infection

Within 2 to 4 weeks after infection with HIV, about two-thirds of people will have a flu-like illness. This is the body's natural response to HIV infection

Stage 2: Chronic HIV infection

- This stage is also called asymptomatic HIV infection or clinical latency.
- HIV is still active and continues to reproduce in the body.
- People may not have any symptoms or get sick during this phase but can transmit HIV.

Stage 3: AIDS.

- The most severe stage of HIV infection.
- People with AIDS can have a high viral load and may easily transmit HIV to others.
- People with AIDS have badly damaged immune systems. They can get an increasing number of opportunistic infections or other serious illnesses.
- Without HIV treatment, people with AIDS typically survive about three years.

Patient Assessment

I) Case Definition of AIDS in Children (up to 12 years of age)

The positive tests for HIV infection by ERS (ELISA/RAPID/SIMPLE) in children above 18 months or confirmed maternal HIV infection for children less than 18 months. AND Presence of at least two major and two minor signs in the absence of known causes of immunosuppression.

II) Case Definition of AIDS in adults (for persons above 12 years of age)

Two positive tests for HIV infection by ERS test (ELISA/RAPID/SIMPLE) AND any one of the followingcriteria

(a) Significant weight loss (>10% of body weight) within last one month.

(b) Tuberculosis: Extensive pulmonary, disseminated, miliary, extrapulmonary tuberculosis.

(c) Neurological impairment preventing independent daily activities, not known to be due to the conditionsunrelated to HIV infection (e.g. trauma).

(d) Candidiasis of the oesophagus (diagnosable by oral candidiasis with odynophagia).

(e) Clinically diagnosed life-threatening or recurrent episodes of pneumonia, with or without aetiological confirmation.

Essential laboratory investigations: HIV serology, CD4+, T lymphocyte counts (if available) or total lymphocytes count (TLC), complete blood count and chemistry profile, pregnancy test.

Supplementary tests indicated by history and physical examination: Chest X-ray, urine for routine and microscopic examination, hepatitis C virus (HCV) and hepatitis B virus (HBV) serology (depending on test availability and resources).

Goals of Therapy

The most important goals of antiretroviral therapy are to decrease HIV-related morbidity and mortality,improve quality of life, restore, and preserve the strength of the immune system, and prevent further transmission. The most important and effective way to achieve these goals is maximal and durable suppression of viral load (HIV replication).

Treatment

HIV Treatment as Prevention

People with HIV should take medicine to treat HIV as soon as possible. HIV medicine is called antiretroviraltherapy, or ART. If taken as prescribed, HIV medicine reduces the amount of HIV in the body (viral load) to a very low level, which keeps the immune system working and prevents illness; it prevents transmission to others through sex or syringe sharing, and from mother to child during pregnancy, birth, and breastfeeding.

Antiretroviral therapy

Highly active antiretroviral therapy (HAART) decreases viral replication and dramatically alters the natural course of infection by prolonging the time to opportunistic infection and death. ARV regimens may improve quality and duration of life, but they are not without risks. Once therapy is initiated, therapy is a lifetime commitment.

Treatment is strongly recommended for any patient who has a T-cell count <350 cell/mL or who is symptomatic.

Classification of antiretroviral drugs

1. **Nucleoside reverse transcriptase inhibitors (NRTIs):** Zidovudine (AZT, ZDV); Stavudine (d4T); Lamivudine (3TC); Didanosine (ddI); Zalcitabine (ddC); Abacavir (ABC); Emtricitabine (FTC); Tenofovir (TDF).
2. **Non-nucleoside reverse transcriptase inhibitors (NNRTI):** Nevirapine (NVP); Efavirenz (EFV);Delavirdine (DLLV)
3. **Protease inhibitors (PIs):** Saquinavir (SQV); Ritonavir (RTV); Nelfinavir (NFV); Amprenavir (APV);Indinavir (INV); Lopinavir/ritonavir (LPV); Fosamprenavir (FPV); Atazanavir (ATV); Tipranavir (TPV).
4. **Fusion inhibitors (FI):** Enfuviritide (T 20).
5. **CCR5 antagonist:** Maraviroc
6. **Integrase inhibitor:** Raltegravir

Table 14.1: The ART regimen approved for use by NACO

National ART regimen	Regimen	Indications
Regimen I	Zidovudine + Lamivudine +Nevirapine	"Preferred regimen"
Regimen I(a)	Stavudine + Lamivudine + Nevirapine	For patients with Hb < 9 g/dl
Regimen II	Zidovudine + Lamivudine +Efavirenz	Preferred for patients on anti-tuberculosis treatment and Hb > 9 g/dl
Regimen II (a)	Stavudine + Lamivudine + Efavirenz	For patients on antituberculosis treatment and Hb < 9g/dl
Regimen III	Tenofovir + Lamivudine + Nivirapine	For patients not tolerating ZDV or d4T on an NVP-based regimen.
Regimen III (a)	Tenofovir + Lamivudine +	For patients not tolerating ZDV or d4T on an EFV-based regimen

	Efavirenz	
Regimen IV	Zidovudine + Lamivudine +Atazanavir/Ritonavir	For patients not tolerating both NVP and EFV, and Hb > 9 g/dl
Regimen IV (a)	Stavudine + Lamivudine + Atazanavir/Ritonavir	For patients not tolerating both NVP and EFV, and Hb < 9 g/dl
Regimen V	Tenofovir + Lamivudine + Atazanavir/Ritonavir	

Dosages

Stavudine – 30 mg twice daily; Zidovudine – 300 mg twice daily; Lamivudine – 150 mg twice daily; Nevirapine – 200 mg once daily as lead in dose for 2 weeks followed by 200 mg twice daily; Efavirenz – 600 mg once daily

5. Requirement:

Real or hypothetical case, template for SOAP notes, detailed information cause, information of stages of HIV, internet facility, searching resources.

6. Resourcesused:_____

_____

7. Precautions:

- SOAP notes should be clear, well-written, and easy to follow so that the team can find the needed information.
- Don't include excessive details; focus on the quality and clarity of patient's notes.

8. Procedure:

Read and understand the case properly and then complete the report.

Activity

Case: Mr. T.K. is a 27-year-old man who presents with new complaints of fevers, night sweats, weight loss, and white patches in his mouth. He states that these symptoms have been present for the past 4 to 6 weeks. Mr. T.K. admits to intravenous drug use in the past; however, he states that he has been "clean" for 3 years. Mr. T.K. is diagnosed with thrush caused by Candida albicans. HIV infection is suspected and consent for an HIV test is obtained. Mr. T.K.'s HIV-1/2 antigen/antibody combination immunoassay is reactive, and the antibody differentiation immunoassay detects HIV-1 antibodies. Mr. T.K.'s T-cell count, Hb count, and viral load measurement return at 225 cells/μL, 8 mg/dl and 145,000 copies/mL (by RT-PCR assay), respectively.

9. SOAP note template:

A) **Subjective** (what Patient tells about problem)	
Personal Details Name of the Patient with age, gender, weight.	

Chief complaint (CC)	
History of Present illness	
Family History	
Medical History	
Allergies	
Review of systems (symptoms)	
Current Medications, Allergies	
B) **Objective data–**	
C) **Assessment** -diagnosis of disease condition	
Problem i.e. Diagnosis of the disease	
Differential Diagnosis i.e. Different possible diagnosis	
D) **Plan**- Medications, surgeriesor therapies Patient education/advice	

10. Conclusion:_____

_____

11. References:

- Caroline S. Zeind, Michel G. Carvalho, Applied Therapeutics, The clinical use of drugs, Eleventhedition, Wolters Kluwer.
- Burgunda Sweet, Handbook of Applied Therapeutics, Ninth edition, Wolters Kluwer.
- Sangeeta Sharma, GR Sethi, Usha Gupta, Standard Treatment guidelines, Fourth Edition, Delhi Society for Promotion of Rational Use of Drugs, Wolters Kluwer.

12. Practical related questions:

a) What is the difference between HIV and AIDS?
b) Who is at risk for HIV?
c) Classify anti-HIV medications?
d) How can HIV infection be prevented?

(Space for answers)

13. Assessment Scheme:

Particular	Understanding the basic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 15

SOAP Notes for Scabies

1. Aim:

To prepare and discuss the SOAP notes for given case of Scabies.

2. Practical Significance:

Scabies is one of the commonest dermatological conditions, accounting for a substantial proportion of skin disease in developing countries. Scabies infestation may be complicated by bacterial infection, leading to the development of skin sores,that in turn, may lead to the development of more serious consequences such as septicaemia, heart disease and chronic kidney disease. In this practical, the students will be able to prepare the SOAP notes for scabies and discuss them with each other to organize it in a structured and organized way, so that it can be used for reference purposes.

3. Practical Outcomes (PrO):

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

PrO	PrO statements	Mapped CO	BTL
1	Identify the signs and symptoms of the given clinical case ofscabies.	CO1	BTL 2
2	Optimize drug therapy of scabies.	CO1	BTL 3
3	Prepare SOAP notes of the given clinical case of scabies.	CO1	BTL 4
4	Conduct efficient search for scabies using available resources.	CO1	BTL 5
5	Collaborate and communicate with fellow students.	CO1	BTL 6

4. Relevant Theoretical BackgroundScabies:

Scabies is an infestation of the skin by the human itch mite (Sarcoptes scabiei var. hominis). The microscopic scabies mite burrows into the upper layer of the skin where it lives and lays its eggs. The most common symptoms of scabies are intense itching and a pimple-like skin rash. Scabies is contagious and can spread quickly through close physical contact in a family, childcare group, school class, nursing home or prison. Because scabies is so contagious, doctors often recommend treatment for entire families or contact groups.

Crusted (Norwegian) scabies

Crusted scabies is a severe form of scabies that can occur in some persons who are immune compromised (have a weak immune system) including people living with HIV/AIDS, elderly, disabled, or debilitated. It is also called Norwegian scabies. Crusted scabies is a hyper-infestation with thousands to millions of mites, producing widespread scale and crust, often without significant itching. This condition has a high mortality if untreated due to secondary sepsis.

Signs and symptoms of scabies include

- Itching, mainly at night: Itching is the most common symptom. The itch can be so intense that itkeeps a person awake at night.

- Rash: Many people get the scabies rash. This rash causes little bumps that often form a line. The bumps can look like hives, tiny bites, knots under the skin, or pimples. Some people develop scaly patches that look like eczema.
- Sores: Scratching the itchy rash can cause sores. An infection can develop in the sores.
- Thick crusts on the skin: Crusts form when a person develops a severe type of scabies called crusted scabies. Another name for crusted scabies is Norwegian scabies. With so many mites burrowing inthe skin, the rash and itch become severe.

Diagnosis

Diagnosis of a scabies infestation usually is made based upon the customary appearance and distribution of the rash and the presence of burrows. Whenever possible, the diagnosis of scabies should be confirmed by identifying the mite or mite eggs or faecal matter (scybala).

Patient Education

- Disinfestation of bedding and clothing by ordinary laundering and/or sun exposure is required.
- In lactating mothers, before feeding, areola should be washed thoroughly with soap and water. After the feed, permethrin cream should be reapplied on breasts and hands.
- Itching will persist for a few days but usually resolves within 1-2 weeks. The overuse/repeated treatment with topical antiscabetic is not required for persisting itching alone.
- All family members and close physical contacts, symptomatic or not, should be treated simultaneously to prevent recurrences.
- Repeated topical application of Gamma Benzene Hexachloride (GBHC) or accidental ingestion maylead to adverse neurological effects such as seizures.
- Adequate contact period of 8-10 hours/overnight must be ensured.

Treatment

In addition to the infested person, treatment also is recommended for household members and sexual contacts, particularly those who have had prolonged direct skin-to-skin contact with the infested person. Both sexual and close personal contacts who have had direct prolonged skin-to-skin contact with an infected person within the preceding month should be examined and treated. All persons should be treated at the same time to prevent reinfestation.

Nonpharmacological

- Maintenance of adequate personal hygiene by daily bath with soap and water.
- Bedding, clothing, and towels used by infested persons or their household and close contacts anytime during the three days before treatment should be disinfected by washing in hot water and drying in a hot dryer, by dry-cleaning, or by sealing in a plastic bag for at least 72 hours.

Pharmacological

Secondary bacterial infection, when present, should be treated with antibiotics before specific antiscabetictherapy.

1. **Specific therapy**

   Scabicides: Products used to treat scabies are called scabicides because they kill scabies mites; some also kill mite eggs. Scabicide lotion or cream should be applied to all areas of the body from the neck down to the feet and toes. In addition, when treating infants and young children, scabicide lotion or cream also should be applied to their entire head and neck because scabies can affect their face, scalp, and neck, as well as the rest of their body.

a. For infants, neonates, children, pregnant and lactating mothers: Permethrin cream 5% - Minimum contact period 8-12 hours; single application required and is to be washed off next morning

b. For children >5 years and adults: Permethrin cream 5% or Gamma Benzene Hexachloride (GBHC)lotion 1% or Tab Ivermectin 200 mcg/kg as a single dose to be repeated after 2 weeks.

2. Supportive therapy

a. Antibiotic: To wipe out an infection.

b. Steroid cream: To ease the redness, swelling, and itch.

c. Antihistamine: To control the itch and help you sleep.

i. Tab. Cetirizine 10 mg at night for 10-15 days. In children: 0.3 mg/kg/day single dose for 2 weeks. OR

ii. Tab. Pheniramine maleate 25 mg 3 times a day for 10-15 days.In children: 0.5 mg/kg/day divided in 3 doses.

5. Requirement:

Real or hypothetical case, template for SOAP notes, detailed information of mite's infection, internet facility, searching resources.

6. Resources used:

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7. Precautions:

- SOAP notes should be clear, well-written, and easy to follow so that the team can find the neededinformation.
- Don't include excessive details; focus on the quality and clarity of patient's notes.

8. Procedure:

Read and understand the case properly and then complete the report.

Activity

Case: A. S. a 26-year-old nurse weighing 50 kg, working at a nursing home, presents to her primary care physician (PCP) with a pruritic rash with excoriations in the interdigital webs of her hands and wrists. She is taking cetirizine 5 mg OD for last 5 days to ease the itching because of rash. She does not have any known allergies, her family history revealed mother was suffering from diabetes. Several patients and nurses in the same nursing home have similar symptoms as well as her 5-year-old son. Burrows were present in her finger webs with a definitive diagnosis made from a skin scraping test.

Her blood reports were normal and all cell count well within the limits. Her fasting blood glucose was 90 mg/dl

Microscopic examination revealed eggs of S. scabiei and scybala.

9. SOAP note template:

A) **Subjective** (what Patient tells about problem)	
Personal Details Name of the Patient with age, gender, weight.	
Chief complaint (CC)	
History of Present illness	
Family History	
Medical History	
Allergies	
Review of systems (symptoms)	
Current Medications, Allergies	
B) **Objective data–**	
C) **Assessment** -diagnosis of disease condition	
Problem i.e. Diagnosis of the disease	
Differential Diagnosis i.e. Different possible diagnosis	
D) **Plan-** Medications, surgeriesor therapies Patient education/advice	

10. Conclusion:

The SOAP note for scabies was prepared and submitted.

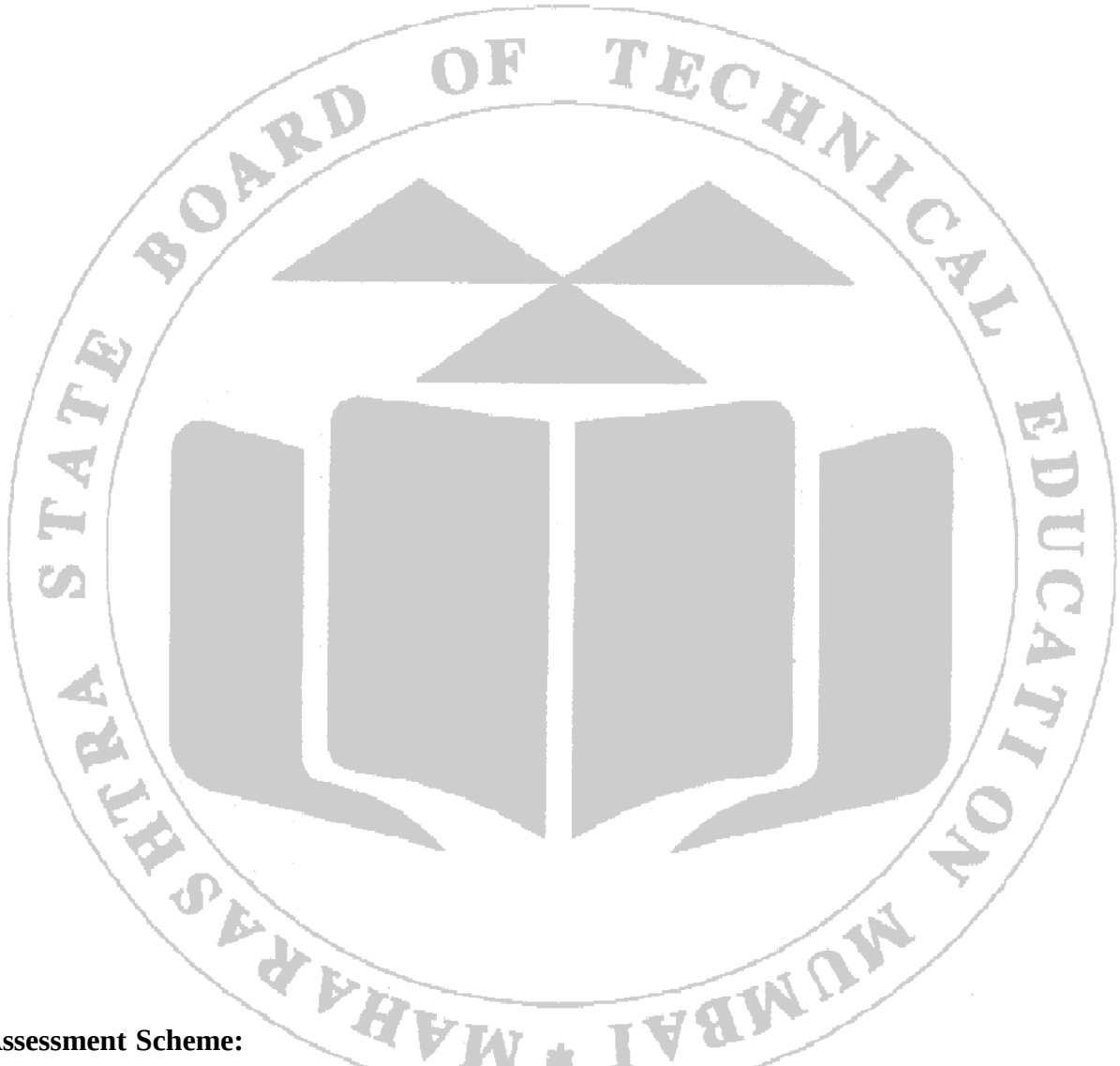
11. References:

- Caroline S. Zeind, Michel G. Carvalho, Applied Therapeutics, The clinical use of drugs, Eleventh edition, Wolters Kluwer.
- Burgunda Sweet, Handbook of Applied Therapeutics, Ninth edition, Wolters Kluwer.
- Sangeeta Sharma, GR Sethi, Usha Gupta, Standard Treatment guidelines, Fourth Edition, Delhi Society for Promotion of Rational Use of Drugs, Wolters Kluwer.

12. Practical related questions:

a) Describe crusted (Norwegian) scabies?
b) How scabies is diagnosed?
c) Explain the treatment for scabies?
d) How can mites' infection be prevented?

(Space for answers)



13. Assessment Scheme:

Particular	Understanding the basic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Introduction Patient Counseling

Definition: Patient counselling is defined as providing medical information in written, pictorial, or verbalform to the patients or their relatives to increase patient compliance.

Objectives of patient counseling:

- To recognize importance of medication.
- To improve medication adherence and better compliance.
- To understand strategy to deal with the medication side effects and drug interactions should beimproved.
- To reduce incidences of medication errors, adverse effects and unnecessary healthcare cost.
- To improve quality of life of the patients.
- To receive professional pharmaceutical care

Qualities required:

Pharmacists must have up-to-date understanding of pharmacotherapeutics, but they also need to have theskills and knowledge to educate and counsel patients. In addition to this, pharmacists should be familiar with the cultural ideas, attitudes, and practises of their patients, particularly with regard to health and illness. He should be aware of how the patients feel about the healthcare system as well as how they see their own roles and responsibilities in making decisions and directing their own care.

Active listening and effective, open-ended questions are crucial abilities for learning from and communicating with patients. Pharmacists must modify their communications to patients' primary languages and language proficiency, if needed, by using teaching aids, translators, or cultural advisors. Pharmacistsmust also be aware of and comprehend nonverbal cues, such as (e.g., eye contact, facial expressions, body movements, vocal characteristics) during education and counselling sessions.

Pharmacists should assess patient's cognitive abilities, learning style, and sensory and physical status that enables him to adapt information and educational methods to meet the patient's needs. A patient may learn best by hearing spoken instructions; by seeing a diagram, picture, or model; or by directly handling medications and administration devices. In addition, pharmacists should try to comprehend patients' attitudes and probable actions regarding medicine use, if patients know how to utilise their prescriptions. The patient's willingness to use a drug and his or her intention to do so must be ascertained by the pharmacist.

Steps for patient education and counselling

- Establish caring relationships with patients
- Assess the patient's knowledge
- Provide information orally and use visual aids or demonstrations
- Verify patients' knowledge and understanding of medication use

The content of an education and counselling session

The content of an education and counselling session may include the information listed below, as appropriate for each patient's pharmacotherapeutic regimen and monitoring plan. The decision to discuss specific pharmacotherapeutic information with an individual patient must be based on the pharmacist's professional judgment.

1. The medication's trade name, generic name, common synonym, or other descriptive name(s) and, when appropriate, its therapeutic class and efficacy.

2. The medication's use and expected benefits and action. This may include whether the medication is intended to cure a disease, eliminate or reduce symptoms, arrest or slow the disease process, or prevent the disease or a symptom.

3. The medication's expected onset of action and what to do if the action does not occur.

4. The medication's route, dosage form, dosage, and administration schedule (including duration of therapy).

5. Directions for preparing and using or administering the medication. This may include adaptation to fit patients' lifestyles or work environments.

6. Action to be taken in case of a missed dose.

7. Precautions to be observed during the medication's use or administration and the medication's potential risks in relation to benefits. For injectable medications and administration devices, concern about latex allergy may be discussed.

8. Potential common and severe adverse effects that may occur, actions to prevent or minimize their occurrence, and actions to take if they occur, including notifying the prescriber, pharmacist, or other health care provider.

9. Techniques for self-monitoring of the pharmacotherapy.

10. Potential drug–drug (including non-prescription), drug–food, and drug–disease interactions orcontraindications.

11. The medication's relationships to radiologic and laboratory procedures (e.g., timing of doses andpotential interferences with interpretation of results).

12. Prescription refill authorizations and the process for obtaining refills.

13. Instructions for 24-hour access to a pharmacist.

14. Proper storage of the medication.

15. Proper disposal of contaminated or discontinued medications and used administration devices.

16. Any other information unique to an individual patient or medication.

These points are applicable to both prescription and non-prescription medications. Pharmacists should counsel patients in the proper selection of non-prescription medications.

References:

- ASHP guidelines on pharmacist-conducted patient education and counselling. Am J Health Syst Pharm. 1997 Feb 15;54(4):431-4. doi: 10.1093/ajhp/54.4.431.
- Mondal S. Patient Counseling- General Considerations, Important Steps Procedures Involved . Research Gate publication. 2018. DOI:10.13140/RG.2.2.17621.73441.

Experiment No. 16

Patient Counselling for Hypertension (Case 1)

1. Aim

To counsel the patient using a role play on the clinical case scenario of Hypertension.

2. Practical Significance

Hypertension is a chronic illness and requires lifelong treatment to maintain good condition of patient. Due to longer duration of treatment, cost of medication, and limited information about the effects of drugs prescribed, patients are partially compliant or non-compliant towards therapy. Effective patient counselling will improve patient education and make them aware about medications and disease condition, making the therapy successful. In this practical, the students will be able to perform the role play on clinical case of hypertension and prepare themselves for the effective patient counselling.

3. Practical Outcomes (PrO):

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

PrO	PrO statements	Mapped CO	BTL
1	Counsel the patient to achieve full compliance towards therapy of hypertension.	CO2	BTL 2
2	Discuss pharmacotherapeutics of hypertension.	CO2	BTL 3
3	Identify the factors affect the compliance.	CO2	BTL 4
4	Follow ethical practice while performing practical.	CO2	BTL 5
5	Collaborate and communicate with fellow students.	CO2	BTL 6

4. Relevant Theoretical Background:

Hypertension:

Hypertension (HTN) can be defined as a condition in which blood pressure (BP) is elevated to a level likely to lead to adverse consequences. There is no clear-cut blood pressure threshold separating normal blood pressure from high blood pressure, with hypertension arbitrarily defined as a systolic blood pressure equal to or greater than 140 mmHg and/or diastolic blood pressure to or greater than 90 mmHg. The risk of complications is related to the degree to which blood pressure is elevated.

HTN is one of the most prevalent non-communicable diseases in India, with a prevalence of 29.8% overall and a greater prevalence in urban. India's demographic transition with an increasing proportion of elderly people and a sedentary lifestyle and obesity associated with increasing urbanisation, and other lifestyle factors like high levels of salt intake, alcohol, and tobacco consumption, are contributing to this burden of HTN.

The complications of HTN include stroke, myocardial infarction, heart failure, renal failure and dissecting aortic aneurysm. Modest reductions in BP result in substantial reductions in the relative risks of these complications.

The factors and causes are given as follows:

Primary hypertension (90-95%): essential hypertension because cause not known.

Secondary hypertension (5-10%): certain known causes like Renal diseases; endocrine diseases

like steroid excess (hyperaldosteronism- Cohn's syndrome, hyper glucorticoidism- Cushing's syndrome); growth hormone excess (acromegaly); catecholamine excess (pheochromocytoma); pre-eclampsia; Vascular causes; Renal artery stenosis like fibromuscular hyperplasia; renal artery atheroma; coarctation of the aorta; Drugs like sympathomimetic amines, oestrogens (combined oral contraceptive pills), ciclosporin, erythropoietin, NSAIDs, steroids, etc.

The classification of HTN as per Indian medical association is given as follows:

Category	**Systolic BP (mm Hg)**	**Diastolic BP (mm Hg)**
Optimal	< 120	< 80
Normal	120 – 129	80 – 84
High Normal	130 – 139	85 – 89
Grade 1 Hypertension and/or	140 – 159	90 – 99
Grade 2 Hypertension	160 – 179	100 – 109
Grade 3 Hypertension	≥ 180	≥110
Isolated Systolic Hypertension	≥ 140	< 90
Hypertensive urgency	>180	>110
	Severe asymptomatic hypertension with no evidence of acutetarget organ damage	
Hypertensiveemergency	>180	>110-120
	Severe hypertension associated with cardiovascular (e.g. left ventricular failure), cerebral (e.g. hypertensive encephalopathy, stroke), renal (acute renal failure), Grade III-IV retinopathy	

Assessing the lifestyle related and other cardiovascular risk factors in patients with hypertension and the capability each patient's capacity or willingness to change these factors. Assess lifestyle factors and other cardiovascular risk factors like,

History: Smoking history; Dietary consumption of salt, saturated fats; Exercise pattern; Alcohol consumption; Family history of premature coronary artery disease.

Examination: Weight & Height and calculation of BMI, abdominal circumference.

Laboratory evaluation: Blood glucose, Lipids.

Assessment of overall cardiovascular risk of a patient. As seen in the table below the overall cardiovascularrisk increases with the grade of HT, number of risk factors, presence of organ damage, diabetes, symptomatic cardiovascular disease or chronic kidney disease.

Table 16.1 The classification of HTN as per Indian Medical Association

	Grade 1 HT	**Grade 2 HT**	**Grade 3 HT**
No risk factor	Low risk	Moderate risk	High risk
1-2 risk factor	Moderate risk	Moderate to high	High risk
>3 risk factor	Moderate toHigh risk	High risk	High risk
Target Organ damage, DM, CKD stage 3	High risk	High risk	Very high risk

Symptomatic CVD (Stroke, coronary arterydisease), diabetes with organ damage,CKD>stage 4	Very high risk	Very high risk	Very high risk

CKD- Chronic Kidney Disease; DM- Diabetes Mellitus.

Pharmacological treatment includes various drugs acting through various mechanism. The class, examples and major adverse effects are given below:

Table 16. 2 The class, examples and major adverse effects

Class	**Examples**	**Major adverse effects**
Angiotensin-converting enzyme inhibitors	Ramipril,Lisinopril,Perindopril, enalapril	Cough, rash, taste disturbance, dysfunction, angioedema
Angiotensin receptor blockers	Candesartan, irbesartan, losartan, valsartan	Headache, rash, renal failure
Calcium channel blockers	**Dihydropyridine:** Amlodipine, Felodipine, Lacidipine, lercanidipine. **Non-dihydropyridine:** Diltiazem, verapamil	Flushing, ankle swelling, headache Bradycardia/heart block, constipation (verapamil only)
Diuretics	**Thiazide type:** Indapamide, chlortalidone **Thiazide;** Bendroflumethiazide, hydrochlorothiazide, **Loop:** Furosemide, bumetanide	Hypokalaemia, gout, glucose intolerance,hyperlipaemia, impotence, uraemia, dehydration
Aldosteroneantagonists	Spironolactone, eplerenone	Hyperkalaemia, renal dysfunction, dehydration, hyponatraemia, gynecomastia(spironolactone only),
Beta blockers	Bisoprolol, atenolol, metoprolol, nebivolol, labetalol	Tiredness/fatigue, reduced exercise tolerance, bradycardia, cold peripheries, claudication,wheezing, impotence
Alpha blockers	Doxazocin, prazosin	Postural hypotension, headache, rash
Centrally acting vasodilators	Methyldopa, moxonidine	Tiredness, depression

Non-pharmacological interventions are important and include weight reduction, avoidance of excessive salt and alcohol, increased intake of fruit and vegetables and regular physical activity. Other cardiovascular risk factors, such as smoking, dyslipidaemia and diabetes, should be addressed.

Patient education will consist of awareness about:

a. **Nature of disease:** Hypertension is an asymptomatic condition which can lead to disabling and life- threatening complications like stroke, heart attack and renal failure

b. **Therapy**: Emphasise need for long-term therapy with regularity of drug intake to prevent damage to targetorgans and prevent adverse events.

c. **BP control:** Educate about the targets for BP control and encourage patients to monitor efficacy of therapythrough regular check-ups which can include home based monitoring of BP.

d. **Lifestyle measures:** It is important to highlight the important role of lifestyle measures in reducing hypertension and reducing risks of cardiovascular disease.

Lifestyle measures including adopting a heart-healthy diet with reduced salt and saturated fat intake, stopping use of tobacco products, regular exercise, and reduction of body weight in those who are obese, are part of management of all patients with hypertension. These lifestyle measures may be sufficient for treatment of Grade 1 hypertension, may reduce the doses required for control of hypertension, and will also reduce the cardiovascular risk in all grades of hypertension.

A trial of lifestyle measures should be monitored for 1-3 months following diagnosis of Grade 1 hypertension. The lower range of durations should be considered in the presence of other risk factors like age, obesity, lipid levels, and smoking status.

Physical activity includes daily activity like walking and cycling, household work, work related activity, and leisure activity. Moderate intensity physical activity of 30 minutes per day or at least 2.5 hours (150 mins) per week, which can be performed in bouts of 10 minutes or more in 4-7 sessions per week, should be advised to all individuals for its cardio-protective effect. Moderate intensity physical activity includes any activity which can increase the heart rate, make the breathing rapid and make the body warmer such as brisk walking (at 3-4 mph), stair-climbing, light swimming, walking the treadmill at 3-4 mph, or. 45 minutes (accumulated) exercise per day is recommended for cardiovascular fitness, while 60 minutes (accumulated) per day is recommended for weight reduction. The specific form of physical activity chosen by or for the patient should be enjoyable and sustainable. Regular aerobic exercises can reduce the systolic blood pressure average of 4 mmHg and diastolic BP by an average of 2.5 mmHg. Epidemiologic evidence suggests that physical activity reduces cardiovascular morbidity and mortality. There is strong evidence that regular physical activity has an independent cardio protective effect. Physical activity improves cardiorespiratory fitness, lowers Systolic BP and Diastolic BP, improves insulin sensitivity and glycaemic control, helps reduce and control weight, and lowers markers of inflammation.

Overweight or obesity is assessed by measuring body mass index (BMI), which is calculated as weight in kg/height in meter^2. For Indian population 18.5 to 22.9 BMI is normal, 23 to 24.9 is considered as overweight and BMI of $\geq$25 kg/m^2 is considered as obesity in Indians.

Alcohol Consumption: Reducing alcohol intake can lower the blood pressure substantially. On other hand moderate drinking and binge drinking increases the blood pressure and risk of developing hypertension.

Tobacco cessation: Non-smokers should be encouraged not to start smoking. All smokers should be encouraged to quit smoking and should be supported by the health professional in their efforts to do so. Patients who use other forms of tobacco should be motivated to stop doing so.

Dietary Recommendations: All patients should be encouraged to adopt a heart healthy diet. Fat: All individuals should be strongly encouraged to reduce total fat and saturated fat intake.

Salt: All individuals should be strongly encouraged to reduce daily salt intake by at least one third and, if possible, to < 5 g salt (or 90 mmol) per day as per WHO recommendations.

Stress Management: In hypertensive patients in whom stress may be contributing to blood pressure elevation, stress management should be considered as an intervention. A recent systematic review and meta- analysis of Yoga concluded that there were clinically important effects on cardiovascular disease risk factors and that Yoga could be considered an ancillary intervention to reduce cardiovascular risk.

5. Requirement:

Real or hypothetical case, various pictorial diagrams on hypertension, Chart of hypertension, Internet facility, Searching resources.

6. **Resources used:**_____

_____

7. **Precautions:**
   - Don't recommend a program of vigorous activity suddenly to chronically sedentary individuals.
   - Patients with decompensated heart failure and acute coronary syndromes should not embark on anexercise program.
   - Provide Privacy and Confidentiality
8. **Procedure:**

The success of therapy is dependent on the patient education and counselling. There is no any fix criteria for the patients counselling, but following 8 simple steps will educate patients and counsel on disease conditions.

Step 1: The opening. During the initial conversation with the patient, it is important that he or she receives a warm welcome to the practice. Ask them, "Who should we thank for the referral to our practice?" This can be used to create a connection with the patient and also provide insight into interest and opinion of the patient towards therapy. Open the file of patient and go over specific treatment plans offered.

Step No. 2: Ask a follow-up question. That simple statement— "Because I want to get rid of my symptoms."—does not provide enough information to select the best procedure for the patient. Therefore, it is important to follow-up with, "Can you tell me why?" During this point in the patient counselling process, the patient should be doing 80% of the talking, and the pharmacist should listen and only lead the conversation when necessary. Throughout the process, the pharmacist must encourage positive thinking and provide a safe space for the patient to talk freely.

Step No. 3: Gauge the patient's knowledge base. Has the patient done research on the internet? Has he orshe heard about disease and treatment from family or friends?

Step No. 4: Introduce the therapy in more detail. Give the information about the therapy to the patient. Tell them how to take, storage, measure, administer the medication with the help of verbal communication or pictorial methods. Use the language that is understand by the patient. Tell them how to monitor the parameters of disease to check the effects of therapy.

Step No. 5: Identify the risks. Identify the risk if any towards the noncompliance and suggest changes.

Step No. 6: Suggests lifestyle modification. Advice lifestyle modifications that would be helpful.

Step No. 7: Take time to answer any questions. All patients have some fear surrounding disease and/or therapy. Taking the time to ask if the patient has any questions and to acknowledge that it is OK to feel nervous or anxious about it. Talking about the reality of fear with the patient and letting him or her voice any specific concerns is a great way to reinforce the trust that has been built between pharmacist.

Step No. 8: Closing. Close the counselling by asking the question about information passed on whetherhe/she understood or not? Give a smile to encourage the patient and ask them to give phone numbers and provide the monitoring details, drugs effects or side effects details on call.

Case: Mr. DAK 58-year-old man presented to his general practitioner for a routine chekup. He had been feeling low from few weeks. His past medical history included hypertension. His regular medications were amlodipine 10 mg OD and atorvastatin 20 mg ON. He had no known drug

allergies or intolerances. He was a shopkeeper in shoe shop and lived with his partner. He was a smoker with a 2-pack a month history and he drink approximately 10 units of alcohol per week.

Examination

The patient appeared generally well. His heart rate was 70 bpm and his blood pressure was 160/88 mmHg. His heart sounds were dual with no murmurs. There was no peripheral oedema. Systems examination was otherwise unremarkable.

Results

Bloods: WCC 8.8, Hb 149, Plt 320, Na 140, K 4.0, Creat 67

Which one of the options below would be the most appropriate management plan for this patient?

- Add in doxazosin 4 mg OD
- Add in indapamide (modified release) 1.5 mg PO OD
- Add in ramipril 2.5 mg PO OD
- Continue on his current medications.

Answer:_____

_____

_____

_____

9. **Activity:**

Teacher should ask to the students to form group where student can play role of pharmacist, patients, otherscan take notes, keep points, markings, etc. (use cooperative learning strategy).

10. **Conclusion:**

The given case of hypertensive patient was counselled using activity

11. **References:**

- Misra A, Chowbey P, Makkar B, et al. Consensus statement for diagnosis of obesity, abdominal obesity and the metabolic syndrome for Asian Indians and recommendations for physical activity, medical and surgical management. JAPI. 2009;57(2):163-170.
- Mohanty SK, Pedgaonkar SP, Upadhyay AK, Kämpfen F, Shekhar P, Mishra RS, Maurer J, O'Donnell O. Awareness, treatment, and control of hypertension in adults aged 45 years and over and their spouses in India: A nationally representative cross-sectional study. P LoS Med. 2021; 18(8): e1003740.

12. **Practical related questions:**

a) Define hypertension.
b) Explain the factors that elevate hypertension.
c) Suggest lifestyle modification (exercise, diet, habits) for the patient in above given case.
d) Evaluate the above given case and identify the type of hypertension.
e) How one can prevent hypertension by changing lifestyles?

(Space for answers)

13. Assessment Scheme:

Particular	Understanding the basic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 17

Patient Counselling for Epilepsy (Case 2)

1. Aim:

To counsel the patient using a role play on the clinical case scenario of Epilepsy.

2. Practical Significance:

Management of epilepsy is challenging. It includes antiepileptic drugs, diets, immunotherapies, hormone therapies, surgeries, and neurostimulation therapies, which are used to modify behavior. Patients who suffer from epilepsy worry about things like starting a family, getting a driver's license, going out with friends, and other parts of life. Therapy adherence is crucial for treatment success. A critical issue that has an impact on both the patient and the healthcare system is noncompliance. Many factors influence the compliance of the regimen. Patients who fail to take their medications worsen their condition, mortality, and experience higher medical expenses. In this practical, the students will be able to play a role for counselling on clinical case of epilepsy and prepare themselves for the effective patient counselling.

3. Practical Outcomes (PrO):

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

PrO	PrO statements	Mapped CO	BTL
1	Counsel the patient to achieve full compliance towards therapy of epilepsy.	CO2	BTL 2
2	Discuss pharmacotherapeutics of epilepsy.	CO2	BTL 3
3	Identify the factors affect the compliance.	CO2	BTL 4
4	Follow ethical practice while performing practical.	CO2	BTL 5
5	Collaborate and communicate with fellow students.	CO2	BTL 6

4. Relevant Theoretical Background:

Epilepsy is central nervous system disorder characterised by spontaneously recurring seizures.

Seizures can arise from a focal area of the brain (focal or partial seizures) or arise diffusely from both brain hemispheres (primary generalised seizures). A seizure is the transient occurrence of signs and /or symptoms due to abnormal excessive or synchronous neuronal activity in the brain. These signs and symptoms may include alteration of consciousness, motor, sensory autonomic, or psychic events. A commonly used classification of epileptic seizures is given in Experiment No. 9.

Treatment

Use of AEDs is mainstay of treatment for epilepsy. Therefore, patient education regarding medication is important to quality patient care. Optimization of drug therapy depends on several factors, with the choice of appropriate AED, individualization of dosing, and adherence being the most important.

The preferred drugs for specific types of seizures and common epileptic syndrome are given in the experiment No. 9.

Nonpharmacologic treatment of epilepsy

Alternative or adjuncts to pharmacotherapy may be beneficial in some patients. Surgery is an extremely effective treatment in selected patients. Depending on the epilepsy syndrome and procedure performed, up to 90% of patients treated surgically may improve or become seizure-free. Surgery is advised to some epileptic syndrome patients such as mesial temporal sclerosis. Early surgical intervention may prevent or lessen neurologic deterioration and developmental delay.

Dietary modification may be used for patients who cannot tolerate AEDs or to treat seizures that are not completely responsive to AEDs. In most circumstances, dietary modification consists of a ketogenic diet. This low-carbohydrate, high-fat diet results in persistent ketosis, which is believed to play a major role in the therapeutic effect. Ketogenic diets seem to be most beneficial in children.

The vagus nerve stimulant is an implant device approved for treatment of intractable partial seizures. This device uses electrodes attached around the left branch of the vagus nerve. The electrodes are attached to a programmable stimulator that delivers stimuli on a regular cycling basis; patients can also use on demand stimulation on the onset of seizures by swiping the magnet over the subcutaneously implanted stimulator.

Avoidance of potential seizure precipitants: It is impossible to generalize about environmental and lifestyle precipitants of seizures activity in persons with epilepsy. Individual patients or caregivers may identifyspecific circumstances such as stress, sleep deprivation, acute illness, or ingestion of excessive amounts of caffeine or alcohol, which may increase the likelihood of a recurrent seizure event. Some women experiencean increase in the frequency and/or severity of seizures around the time of menstruation or ovulation. Patients with epilepsy should avoid activities that seem to precipitate seizures; as always, the goal is complete seizure control with as little alteration in quality of life as possible.

Self-management by the patient

It is better to manage the triggers for seizures. The following points will prevent but not sure the episodes of seizures.

- Avoid any known seizure trigger
- Avoid alcohol drinking
- Know when seizures are most likely to occur
- Get enough sleep
- Be healthy
- Manage stress

For relative or near by persons: when any person had an epileptic attack or a tonic-clonic seizure (where the body stiffens, followed by general muscle jerking), and if the relatives or new person is there then try to:

- Stay calm and remain with the person
- If patient have food or fluid in their mouth, roll them onto their side immediately.
- Keep them safe and protect them from injury.
- Place something soft under their head and loosen any tight clothing.
- Reassure the person until they recover.
    - Time the seizure, if you can.

- Gently roll the person onto their side after the jerking stops.
- Do not put anything into their mouth or restrain or move the person, unless they are in danger.

5. **Requirements:**

   Real or hypothetical case, various pictorial diagrams on epilepsy, Chart of epilepsy, Internet facility, Searching resources.

6. **Resources used:**

   _____

   _____

7. **Precautions:**
   - Provide privacy and confidentiality
8. **Procedure:**

   The success of therapy is dependent on the patient education and counselling. See the previous experiment (Experiment No. 16) for the procedure and steps involved in counselling.

   Case: A 30-year-old man Mr. DK was brought to hospital with generalized tonic clonic seizures. The seizure had commenced 5 min earlier and he had already received treatment with intravenous lorazepam (4 mg) and was given 5 mg diazepam intravenously upon arrival to the emergency department. There was evidence of tongue biting and he had been incontinent of urine. The patient was accompanied by his partner who reported that he had a known history of epilepsy, for which he usually took levetiracetam 500 mg BD. He worked as a civil servant and lived with his partner. He did not smoke cigarettes, drank approximately 5–6 units ofalcohol per week and did not use recreational drugs.

   Examination

   On examination, the patient was unresponsive. There were jerking movements of the upper and lower limbs, consistent with a generalized tonic-clonic seizure.

   Question

   After 25 min, the patient's seizure continued. Prescribe an appropriate medication to treat this ongoing seizure. The patient is estimated to weigh 80 kg.

   Answer:

ONCE ONLY MEDICATIONS									
Date	Medication	Dose	Route	Time of administration	Signature	Prescriber	Givenby	Timegiven	Pharmacy

9. Activity:

Teacher should ask to the students to form group where student can play role of pharmacist, patients, otherscan take notes, keep points, markings, etc. (use cooperative learning strategy).

10. Conclusion:

The given case of epileptic patient was counselled using activity.

11. References:

- Noe K. Counseling and Management of the Risks of Living With Epilepsy. Continuum (Minneap Minn). 2019 Apr;25(2):477-491.
- https://www.epilepsy.com/complications-risks/moods-behavior/cognitive-therapies

12. Practical related questions

a) Define epilepsy.
b) Suggest lifestyle modification (exercise, diet, habits) for the patient in above given case.
c) Evaluate the above given case and identify the type of epilepsy.
d) Prepare a table of AEDs along with their adverse effects?

(Space for answers)

13. Assessment Scheme:

Particular	Understanding thebasic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 18

Patient Counselling for Chronic Obstructive Pulmonary Disease (Case 3)

1. Aim:

To counsel the patient using a role play on the clinical case scenario of Chronic Obstructive Pulmonary Disease (COPD).

2. Practical Significance

Chronic obstructive pulmonary disease refers to a group of diseases that includes chronic bronchitis and emphysema. Over time, COPD makes it harder to breathe. The disease can't reverse lung damage, butlifestyle changes and medication changes can help patient to manage the symptoms. In this practical, the students will be able to play a role for counselling on clinical case of COPD and prepare themselves for the effective patient counselling.

3. Practical Outcomes (PrO):

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

PrO	PrO statements	Mapped CO	BTL
1	Counsel the patient to achieve full compliance towards therapy of COPD.	CO2	BTL 2
2	Discuss pharmacotherapeutics of COPD.	CO2	BTL 3
3	Identify the factors affect the compliance.	CO2	BTL 4
4	Follow ethical practice while performing practical.	CO2	BTL 5
5	Collaborate and communicate with fellow students.	CO2	BTL 6

4. Relevant Theoretical Background:

Chronic obstructive pulmonary disease (COPD)

COPD is a chronic inflammatory lung disease that causes airway obstruction in the lungs. The two most frequent diseases that contribute COPD are emphysema and chronic bronchitis.

Emphysema is a condition in which the alveoli at the end of the smallest air passages (bronchioles) of the lungs are destroyed as a result of damaging exposure to cigarette smoke and other irritating gases and particulate matter.

Although COPD is a progressive disease that gets worse over time, with proper management, most patient with COPD can achieve good symptom control and quality of life, as well as reduced risk of other associated conditions.

Signs and Symptoms

The symptoms of COPD frequently don't show up until there has been severe lung damage, and they typically get worse with time, especially if smoking exposure persists. Wheezing, chest tightness, a chronic cough that may produce mucus (sputum) that is clear, white, yellow, or greenish, recurrent respiratory infections, a lack of energy, difficulty taking a deep breath, shortness of breath performing regular daily activities or even on mild exercise, unintentional weight loss (in later stages), and swelling in the ankles, feet, or legs can all be signs and symptoms of COPD.

Causes

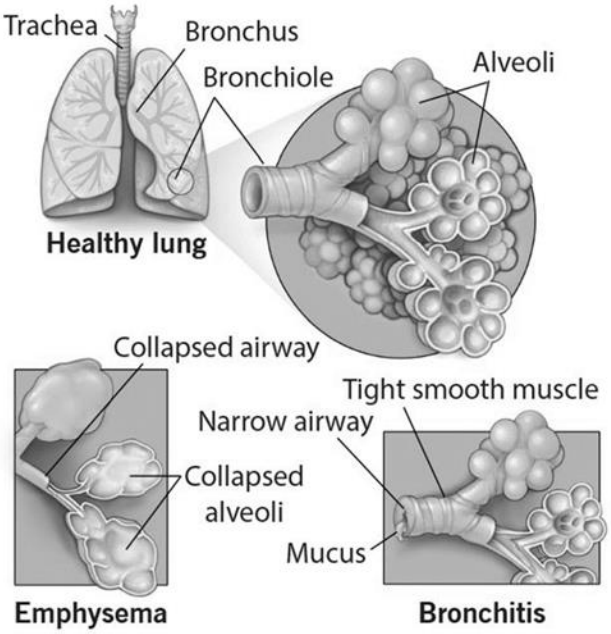
Smoking tobacco causes up to 90% of COPD cases. Other causes include Alpha-1 antitrypsin (AAT)deficiency, a genetic disorder, second-hand smoke, air pollution, and work place dust and fumes.

Smoking: The discomfort caused by tobacco smoke narrows the airways by causing inflammation (irritation and swelling). Smoke also harms cilia, preventing them from performing their function of clearing mucus and debris from the airways.

AAT deficiency: Alpha-1 antitrypsin deficiency (AAT) is a rare hereditary condition that can cause emphysema. The most prevalent serine protease inhibitor in circulation is AAT (serpin). Emphysema and liver failure can be brought on by a systemic AAT deficit caused by genetic abnormalities. Considered the prototypic serpin, the emphysema observed in patients with AATD, consisting of progressive destruction of the alveoli and small airway structures, formed the basis of the protease/anti-protease imbalance theory of chronic obstructive pulmonary disease (COPD).

Risk factors: Smoking, indoor and outdoor pollution, including biomass fuel and occupational inhalants.

Figure 18.1. Healthy lungs have open airways versus the collapsed and narrow



airways of emphysemaand bronchitis, conditions grouped under COPD

Stages of COPD

COPD is gradually progressing disease. The progress of disease varies from person to person.

Mild COPD (stage 1 or early stage): The first sign of COPD is often feeling out of breath with light exercises, like walking up stairs. Many people don't realize this. Another sign is a phlegmy cough (a cough with mucus) that's often particularly troublesome in the morning. These are early warning signs of COPD. **Moderate to severe COPD (stages 2 and 3):** In general, shortness of breath is more evident with more advanced COPD. Patients have shortness of breath even during everyday activities. Also, exacerbations of COPD —increased phlegm, discoloration of phlegm, and more shortness of breath — are generally more common in higher stages of COPD. Patient also become prone to lung infections like bronchitis andpneumonia.

Very severe COPD (stage 4): When COPD becomes severe, patients have shortness of breath

even at rest, needs supplemental oxygen.

Spirometer test: A spirometer measures Forced Expiration volume in 1 second (FEV1). It has a tube that must be sealed at lips tightly over. Once it's in position, patient instructed to inhale as deeply as possible and exhale as forcefully as he can. The exhaled air volume will be measured at one second that called as FEV1. This is a very important parameter, for predicting clinical outcomes such as mortality and hospitalizations, or prompting consideration for non-pharmacologic procedures such as lung volume reduction or lung transplantation.

Nonpharmacologic interventions

Smoking cessation is a key intervention, and healthcare professionals are therefore encouraged to deliver smoking cessation messages and interventions to patients, such as using counselling,

financial incentive programs and patient education. Reducing exposure to indoor and outdoor pollution may require public policy to be changes as well as protective actions taken by individuals.

Pulmonary rehabilitation should be considered an important component of integrated patient management in combination with pharmacologic therapies.

Patients who undertake regular physical activity have a lower risk of exacerbations, COPD hospital admissions and all-cause mortality. Health education can also help patients cope with their illness, and it may be effective in influencing behavioural changes (e.g. smoking cessation) and attainment of certain treatment goals. Influenza and pneumococcal vaccinations are recommended for patients with COPD particularly toolder patients. Vaccination can reduce serious illness as well as reductions in the total number of exacerbations

Pharmacologic treatment

Refer Experiment No. 7.

5. **Requirements:**

Real or hypothetical case, various pictorial diagrams on COPD, chart of COPD, internet facility, searching resources.

6. **Resources used:**_____

_____

7. **Precautions:**

- Provide privacy and confidentiality

8. **Procedure:**

The success of therapy is dependent on the patient education and counselling. See the previous experiment (Experiment No. 16) for the procedure and steps involved in counselling.

Case: A 38-year-old female Mrs. AA, all the while knowing better, has smoked since she was 18 years old. She has been having trouble for years with the smoke and the light of the cigarette impairing her ability tosee the more distant galaxies through her telescope, but she has not been willing to quit yet. Additionally, she has noticed a mild, occasionally productive cough for the past 3-4 months. The cough is worse whenever she spends the night out in the country taking astrophotos where she is exposed to the smoke of the nearby wildfires. She finally decides to visit her family physician who, after making appropriate patient-centred inquiries as to how her astrophotography hobby is going, finds that she has been smoking about one pack per day for the past 20 years. The cough has been present for almost a year. She has had no fever or chills. She

does admit to more shortness of breath when she exercises over the past six months.
Spirometry examination reveals: FEV1: 85% of predicted an FEV1/FVC: 65%

I. At this point, what further investigations do you think would be appropriate?

a) Chest radiograph (CXR)
b) Computed axial tomography (CT) of the chest
c) Complete blood count (CBC) and thyroid stimulating hormone (TSH) level
d) Spirometry
e) A and D

II. Which one of the following would be the best option to improve her symptoms and slowprogression?

a) Begin inhaled medications to treat her pulmonary symptoms.
b) Begin counselling about the importance of tobacco cessation.
c) Offer to buy her a new telescope.
d) Begin counselling and start varenicline at this visit.

III. Of the following, which would be the wrong decision for you to make?

a) Encourage her to enrol in the tobacco cessation group counselling program at your clinic.
b) Begin a short acting inhaled beta agonist to be used as needed.
c) Start nicotine replacement therapy in addition to the varenicline.
d) Refer her to a quit line for further assistance.

Answer:_____

_____

_____

_____

9. Activity:

Teacher should ask to the students to form group where student can play role of pharmacist, patients, otherscan take notes, keep points, markings, etc. (use cooperative learning strategy).

10. Conclusion:

The given case of COPD was counselled using activity.

11. References:

- Vogelmeier CF, Román-Rodríguez M, Singh D, Han MK, Rodríguez-Roisin R, Ferguson GT. Goals of COPD treatment: Focus on symptoms and exacerbations. Respir Med. 2020;166:105938. doi: 10.1016/j.rmed.2020.105938.
- GBD Disease Injury Incidence Prevalence Collaborators, Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017, Lancet 392 (10159) (2018) 1789–1858. https://doi.org/10.1016/S0140-6736(18)32279-7.
- World Health Organization, COPD management, accessed 16 December 2019, https://www.who.int/respiratory/copd/management/en/, 2016.

12. Practical related questions:

a) Differentiate between bronchial asthma and COPD.
b) Suggest the treatment for the above given case.
c) Evaluate the above given case and identify the type of COPD.
d) How one can prevent emphysema or chronic bronchitis by changing lifestyles?

(Space for answers)

13. Assessment Scheme:

Particular	Understanding thebasic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 19

Patient Counselling for Depression (Case 4)

1. **Aim:**

   To counsel the patient using a role play on the clinical case scenario of Depression.

2. **Practical Significance:**

   Depression is one of the affective disorders, that affects the mood. The person chronically has low mood, isolated, insomniac is said to be depressed. There are many reasons to get depressed. Adherence to medication in patients with affective disorder may prove challenging. A patient with severe depression may feel that no treatment can help. Moreover, mental condition stigma is associated with affective disorders. In such patient suicidal tendency is common. Hence, effective counselling and patient as well as relative education is necessary. In this practical, the students will be able to play a role for counselling on clinical case of depression and prepare themselves for the effective patient counselling.

3. **Practical Outcomes (PrO):**

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

PrO	PrO statements	MappedCO	BTL
1	Counsel the patient to achieve full compliance towards therapy ofDepression.	CO2	BTL 2
2	Discuss pharmacotherapeutics of Depression.	CO2	BTL 3
3	Identify the factors affect the compliance.	CO2	BTL 4
4	Follow ethical practice while performing practical.	CO2	BTL 5
5	Collaborate and communicate with fellow students.	CO2	BTL 6

4. **Relevant Theoretical BackgroundDepression:**

   Depression (a major depressive disorder) is a common and serious medical illness that negatively affects mood. Depression causes feelings of sadness and/or a loss of interest in activities that are enjoyed in past. It can lead to a variety of emotional and physical problems and can decrease ability to function at work and at home. It is more than just sadness or unhappiness in response to life event. A diagnosis of depression is only made when a key signs and symptoms are present.

   For signs, symptoms, causes and treatment refer Experiment No. 11.

5. **Requirements:**

   Real or hypothetical case, various pictorial diagrams on depression, Chart of depression, internet facility, searching resources.

6. **Resources used:**_____

   _____

7. **Precautions:**

   - Provide privacy and confidentiality

8. **Procedure:**

   The success of therapy is dependent on the patient education and counselling. See the previous experiment(Experiment No. 16) for the procedure and steps involved in counselling.

Case: A shop owner Mr. SK, 35 years old suffered tremendous loss and his employees left. He became very depressed and stopped taking interest in the shop anymore. Gradually, he stopped going out and withdrew socially. He felt guilty, worthless and tired all the time, lost interest in pleasure and sex, stopped eating, and get early from the bed. When he showed no signs of recovery even after 3 months, the family members consulted a doctor, who diagnosed him to be a case of major depression and prescribed fluoxetine tablet 20 mg BID and a multivitamin syrup.

After one week, family members complains that there is no any recovery or improvement. On questioning the patient revealed that he felt more restless, had nausea, pain in upper abdomen, headache and no desire to eat.

Question

1. What could be the reason for no improvement in the depressive symptoms?
2. Is drug choice being inappropriate?
3. Does medication need to be change or another should be added?

Answer:_____

_____

_____

_____

_____

_____

9. Activity:

Teacher should ask to the students to form group where student can play role of pharmacist, patients, otherscan take notes, keep points, markings, etc. (use cooperative learning strategy).

10. Conclusion:

The given case of depressive patient was counselled using activity.

11. References:

- Depression. (2018). https://www.nimh.nih.gov/health/topics/depression/index.shtml.
- Depression [Fact sheet]. (2020). https://www.who.int/news-room/fact-sheets/detail/depression.

12. Practical related questions:

a) Define depression and enlist symptoms.
b) Suggest the treatment for the above given case.
c) Explain types of depression.
d) How one can prevent depression by changing lifestyles?

(Space for answers)

13. Assessment Scheme:

Particular	Understanding the basic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 20

Patient Counselling for Tuberculosis (Case 5)

1. Aim:

To counsel the patient using a role play on the clinical case scenario of Tuberculosis.

2. Practical Significance:

Tuberculosis (TB) is one of the most prevalent chronic infections in India and is responsible for high morbidity and mortality. TB is caused by Mycobacterium tuberculosis, and affects the lungs most commonly. In one-third or more, extrapulmonary involvement is seen. Tubercular lymphadenopathy is the commonest form of extrapulmonary tuberculosis. All cases of TB, requires longer treatment and hence adherence to the therapy is problem. Due to noncompliance new form of TB is emerged as multi drug resistant tuberculosis (MDRTB). To avoid resistance and protect others from getting infection, counselling is most important. In this practical, the students will be able to play a role for counselling on clinical case of Tuberculosis and prepare themselves for the effective patient counselling.

3. Practical Outcomes (PrO)

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

PrO	PrO statements	Mapped CO	BTL
1	Counsel the patient to achieve full compliance towards therapy oftuberculosis.	CO2	BTL 2
2	Discuss pharmacotherapeutics of tuberculosis.	CO2	BTL 3
3	Identify the factors affect the compliance.	CO2	BTL 4
4	Follow ethical practice while performing practical.	CO2	BTL 5
5	Collaborate and communicate with fellow students.	CO2	BTL 6

4. Relevant Theoretical Background Tuberculosis:

Tuberculosis (TB) is caused by a bacterium Mycobacterium tuberculosis. Although the TB germs usuallyattack the lungs, they can also attack the kidney, spine, and brain. Not every person who contracts the TB bacteria gets ill. Latent TB infection (LTBI) and active TB disease are consequently two TB-related diseases. TB disease can be lethal if it is not adequately treated.

Transmission

The TB bacterium can be transferred from person to person through the air. TB bacteria can enter the air when a person who has TB disease of the lungs or throat coughs, speaks, or sings. People nearby could inhale these microorganisms and acquire an infection.

Table 20.1. Difference between Latent TB Infection (LTBI) and TB Disease

Latent TB Infection	Active TB Disease
Has no symptoms	Has symptoms that may include a bad cough that lasts 3 weeks or longer pain in the chest, coughing up blood or sputum, weakness or fatigue, weight loss, no appetite, chills, fever,

	sweating at night
Does not feel sick	Usually feels sick
Cannot spread TB bacteria to others	May spread TB bacteria to others
Usually has a skin test or blood testresult indicating TB infection	Usually has a skin test or blood test resultindicating TB infection
Has a normal chest x-ray and a negative sputum smear	May have an abnormal chest x-ray, orpositive sputum smear or culture
Needs treatment for latent TB infectionto prevent TB disease	Needs treatment to treat TB disease

Those at high risk for developing TB disease include:

- People with HIV infection
- People who became infected with TB bacteria in the last 2 years
- Babies and young children
- People who inject illegal drugs
- People who are sick with other diseases that weaken the immune system
- Elderly people
- People who were not treated correctly for TB in the past

Testing of TB

Two tests used to detect TB bacteria in the body: the TB skin test (TST) and TB blood tests.

Treatment

A. **Latent TB infection (LTBI)** – If patient have become infected with TB, but do not have the active TB disease, patient should get preventive therapy. This treatment kills germs that could cause problems if the disease becomes active. The most common preventive therapy is a daily dose of the antibiotic isoniazid (INH) taken as a single daily pill for 6 months and twice weekly for 6 to 9 months.

B. **Active TB disease** – Treatment of active pulmonary disease requires use of multidrug therapy for a minimum of 26 weeks. Current guidelines for active disease recommend four drugs for the initial 8- week treatment phase (Table 20.1)

Table 20.1: Treatment Regimens for Tuberculosis Caused by Drug-Susceptible Organisms

Initial Phase			**Continuation Phase**		
Regimen	**Drugs**	**Interval and Doses**	**Regimen**	**Drugs**	**Interval and Doses**
1	INH	7 day/week for 56 doses (8 weeks) OR 5 day/week for 40 doses (8 weeks)	1a	INH /RIF	7 day/week for 126 doses (18 weeks) OR 5 day/week for 90 doses (18 weeks)
	RIF		1b	INH /RIF	Twice weekly for 36doses (18 weeks)
	PZA		1c	INH / RPT	Once weekly for 18 doses(18 weeks)
	EMB				
2	INH	7 day/week for 14 doses (2 weeks) then twice weekly for 12 doses (6 weeks) OR 5 day/week for 10 doses (2 weeks) then twice weekly for 12 doses (6 weeks)	2a	INH /RIF	Twice weekly for 36doses (18 weeks)
	RIF				
	PZA		2b	INH / RPT	Once weekly for 18 doses(18 weeks)
	EMB				
3	INH	Three times weekly for24 doses (8 weeks)	3a	INH/ RIF	Three times weekly for 54 doses (18 weeks)
	RIF				
	PZA				
	EMB				
4	INH	7 day/week for 56 doses (8 weeks) OR 5 day/week for 40 doses (8 weeks)	4a	INH/ RIF	7 d/week for 217 doses (31 weeks) OR 5 d/week for 155 doses (31 weeks)
	RIF		4b	INH/ RIF	Twice weekly for 62 doses (31 weeks)
	EMB				
EMB - Ethambutol; INH - Isoniazid; PZA - Pyrazinamide; RIF - Rifampin; RPT - Rifapentine.					

C. **Directly observed therapy** (DOT) is a program used by public health departments to ensure that a patient safely takes his or her medication exactly as prescribed. This requires daily interaction with a health care worker who makes sure medications are taken appropriately by watching the patient swallow the medications and assesses the patient for symptoms and signs of an adverse reaction to the medication or clinical worsening. This minimizes the risk of serious side effects. DOT may help to improve cure rates.

D. **BCG (Bacilli Calmette Guerin) Vaccine** is a live vaccine used in many countries with a high prevalence of TB to prevent disease in persons who are tuberculin negative. BCG vaccination is contraindicated in pregnancy and in patients who are or will become immunocompromised.

Inadequate treatment of TB is a primary reason for treatment failure and development of acquired drug resistance.

- MDR-TB—resistance to both isoniazid and rifampin.
- Extensive drug-resistant TB (XDR-TB)—resistance to isoniazid and rifampin among first line agents, resistance to any fluoroquinolone, and resistance to at least one second-line injectable drug.
- Totally drug-resistant TB (TDR-TB)—resistance to all first- and second-line agents.

5. Requirements:

Real or hypothetical case, various pictorial diagrams on tuberculosis, chart of tuberculosis, internet facility, searching resources.

6. Resources used:_____

_____

_____

7. Precautions:

- Provide privacy and confidentiality

8. Procedure:

The success of therapy is dependent on the patient education and counselling. See the previous experiment(Experiment No. 16) for the procedure and steps involved in counselling.

Case: A 67-year-old male Mr. PA presented to a hospital emergency department with a three-week history of night sweats, weight loss, nausea, shortness of breath, and a productive cough. A chest x-ray (CXR) was done and revealed extensive bilateral cavitary disease. As per hospital protocol, sputum specimens were collected and resulted in positive Acid-Fast Bacilli (AFB) with >10 organisms per high power field. He was diagnosed with active pulmonary TB.

Further evaluation revealed a medical history of hepatitis C, and a social history that included previous intravenous drug use (heroin), cigarette and alcohol use, and a hospitalization 30 years ago with a caraccident wound that resulted in a nephrectomy and colostomy, which was later re-anastomosed. Six weeks into treatment his isolate was reported to be susceptible to all first line drugs and EMB was discontinued. The remaining three drugs were changed to twice weekly dosing by DOT. After 2 months of therapy the PZA was discontinued and sputum collected were AFB smear and culture positive. The patient was adherent to his medication, tolerated the drug regimen, and had resolution of symptoms. He was cooperative with the public health worker and requested to self-administer his medications.

DOT is the standard of care for all patients diagnosed with TB disease regardless of circumstances; however the nurse case manager provided this patient with a one-month supply of medications to self-administer and instructed him to return to the clinic every month to refill his

prescription. After 2½ months of self- administered treatment, sputa were obtained and smears and cultures were reported as positive. The culture grew Mycobacterium tuberculosis (M. tuberculosis) and susceptibility studies continued to show that the isolate was sensitive to all first-line medications.

Questions:

1) What are some potential barriers to completion of treatment for this patient?

A. Cigarette and alcohol use.

B. Previous history of heroin addiction.

C. Hepatitis C positivity.

D. All of the above

2) Should the patient be taken off DOT and allowed to self-administer?

A. Yes, allowing him to self-administer will help build trust and rapport with the patient.

B. Yes, it is general practice to allow most patients to self-administer during the continuation phase oftreatment.

C. No, explain to him that all patients stay on DOT because no one trusts TB patients.

D. No, explain that DOT is the standard of care for all TB patients.

3) What were the reasons for resistance to first-line medications?

Answer:

Activity:

Teacher should ask to the students to form group where student can play role of pharmacist, patients, otherscan take notes, keep points, markings, etc. (use cooperative learning strategy).

9. Conclusion:

The given case of TB patient was counselled using activity.

10. References:

- Das J et al, In Urban and Rural India, A Standardized Patient Study Showed Low Levels of Provider Training And Huge Quality Gaps. Health Affairs 31, No. 12 (2012): 2774–2784.
- Das J et al, Use of standardised patients to assess quality of tuberculosis care: a pilot, cross-

sectionalstudy. The Lancet, S1473-3099(15)00077-8.

- Medicines Sans Frontieres. HIV/TB Counselling: Who is doing the job? Time of recognition of laycounsellors.URL: http://www.msf.org/sites/msf.org/files/final_web_counsellor_report._one_page.pdf
- Ministry of Health and Family Welfare, Revised National Tuberculosis Control Programme (RNTCP) Annual Status Report 2015.

11. Practical related questions

a) Define TB and explain risk factors.
b) Suggest the treatment for the above given case.
c) Evaluate the above given case and identify the type of TB.
d) How one can prevent TB by changing lifestyles?

(Space for answers)

12. Assessment Scheme:

Particular	Understanding the basic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Introduction

Dose calculation for paediatric and geriatric

The average doses given in the official books such as IP, USP, NF etc. are for the adults. Since children cannot tolerate adult dose of drugs, it is necessary for the pharmacist or physician to have standard method by which safe doses of drugs for children of various sizes and ages may be calculated. 'Individualized dosage regimen' is required for

- Neonates.
- Paediatric patient.
- Elderly patient with diminished biological functions.
- All patients with impaired kidney &/or liver function.
- Critically ill-patients.
- Terminally ill-patients.
- Cancer patients on chemotherapy.

The drugs that have narrow therapeutic window eg. digoxin quite often requires individualized dosing regimen based on blood-level determination and close therapeutic monitoring.

Paediatric relates to the branch of medicine which specifically deals with various types of disease conditions occurring in children from birth to adolescence age. Furthermore, patients are divided according to age groupas given below.

- Neonates: Birth to 4 weeks
- Infants: 1 month to 1 year
- Early childhood: 1 year to 5 years
- Late childhood: 6 years to 12 years
- Adolescence: 13 years to 17 years

Adequate dosing profile of the paediatric patient depend upon critical as well as important aspects such as

- Patient's age and body weight.
- General/overall health condition.
- Specific biologic parameters such as circulation and respiration.
- Critical stage of development of various body systems needed for drug metabolism (liver enzymes), and drug elimination (renal system).

It is important to note that particularly in the neonate, the above cited biological systems and functions are still in an undeveloped stage.

In elderly (geriatrics) are subjected to varying definitions with regard to chronologic age, it is clear that the functional capacities o most organ systems decline throughout adulthood, and important changes in drug response occur with advancing age.

In addition to medical conditions affecting all age groups, some conditions shall be kept in considerationwhile treating elderly, such as:

- Degenerative osteoarthritis.
- Congestive heart failure.
- Venous and arterial insufficiency.
- Stroke.
- Urinary incontinence.

- Prostatic carcinoma.
- Parkinsonism.
- Alzheimer's disease.

Kidney and Liver function is a major consideration in drug dosing of the elderly because reduced function results in reduced drug metabolism and elimination respectively.

It is advised to determine kidney function before the actual dosing in elderly patients.

There are following rule-based formula on age, weight and surface area of patient for calculation of the dosing

$$\text{Young's Rule } (1-12 \text{ years}) = \frac{\text{Age}}{\text{Age}+12} \times \text{Adult dose} = \text{Dose for child}$$

$$\text{Cowling's rule} = \frac{\text{Age at the next birthday (in years)}}{24} \times \text{Adult dose} = \text{Dose for child}$$

$$\text{Friend's rule (upto 24 months)} = \frac{\text{Age in months} \times \text{Adult dose}}{150}$$

$$\text{Clark's rule (Based on weight)} = \frac{\text{Weight (in lb)} \times \text{Adult dose}}{150}$$

$$\text{Dilling's rule (up to } 4-20 \text{ years)} = \frac{\text{Age in years} \times \text{Adult dose}}{20}$$

$$\text{Patient's Dose (mg)} = \text{Patient's weight (kg)} \times \frac{\text{Drug Dose(mg)}}{1 \text{ (kg)}}$$

$$\text{Patients Dose (mg)} = \frac{\text{Patient's body surface area}(m^2)}{1.73} \times \text{Drug Dose(mg)}$$

Body surface area (BSA) can be calculated based on height and weight of the patient, following equation is used for calculation of body surface area.

$$\text{BSA } (m^2) = \sqrt{\frac{\text{Height (cm)} \times \text{weight(kg)}}{3600}}$$

Appropriate formula shall be selected based on patient condition before dosing the patient. Each formula hasits own advantages and disadvantages. Calculation of dose based on BSA can be useful for children as well as special patients such as patient on chemotherapy, neonates, infants, obese, and elderly patients etc. normalizing the drug dose per unit weight may not always be a safe approach. In general, weight-based dosing, body surface area-based dosing, age-based dosing, and other special population dosing strategies are dependent on complicated physiological factors, types of medications, and clinical indications.

Example 1:

If the usual adult dose of a drug is 120 mg or 1.64 mg/kg, what would be the dose for a person age 70 years measuring 6 feet tall and weight 200 lb?

1 Feet = 30.48 cm, 1 lb = 0.4535 kg

Therefore, 6 feet = 6×30.48 = 182.88 cm, 200 lb = 200×0.4535 = 90.71 kg

Solution 1:

Calculate BSA using formula

$$\text{BSA } (m^2) = \sqrt{\frac{\text{Height (cm)} \times \text{weight(kg)}}{3600}}$$

$$\text{BSA } (m^2) = \sqrt{\frac{182.88 \times 90.71}{3600}} = 2.144 \text{ m}^2$$

Calculate dose using formula

$$\text{Patients Dose (mg)} = \frac{\text{Patient's body surface area}(m^2)}{1.73} \times \text{Drug Dose(mg)}$$

Patients dose (mg) = 2.144 / 1.73 *120 = **148.71 mg**

Solution 2:

Using formula

$$\text{Patient's Dose (mg)} = \text{Patient's weight (kg)} \times \frac{\text{Drug Dose(mg)}}{1 \text{ (kg)}}$$

Patient's Dose (mg) = 90.71 × 1.64 = **148. 7 mg**

Example 2:

If the adult dose of drug is 80 mg, what would be the dose for a child weighing 30 lb and measuring 30inches in height?

Solution

30 lb = 13.60 kg, 30 inches = 76.2 cm Using BSA formula, calculate BSA of child

Therefore, BSA (m^2) = 0.50 m^2 Calculate dose using the formula

$$\text{Patients Dose (mg)} = \frac{\text{Patient's body surface area}(m^2)}{1.73} \times \text{Drug Dose(mg)}$$

$$\text{Patients Dose (mg)} = \frac{0.5}{1.73} \times 80$$

Therefore, Patients Dose (mg) = **23.12 or 23 mg**

Experiment No. 21

Dose Calculations of Selected Drug in Paediatric Patients

1. Aim

To calculate the dose of azithromycin for 2-year-old child suffering from pneumonia.

2. Practical Significance

It is self-evident that the change in body size associated with the growth is the factor to be considered in determining dosage and response. Paediatric patients cannot be treated as small adults because ofdevelopment of organs is still under progress. However, even when the effect of size is accommodated, age and other factors also exert profound effect on the pharmacotherapy. While working in the hospital, pharmacist will come across paediatric patients requiring appropriate dose adjustment. According to the case the drug dosing shall be individualized. In this practical, the students will learn to calculate the dose for paediatric patients by using appropriate formula.

3. Practical Outcomes (PrOs)

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Recall the formulas used for calculating pediatric dose.	CO1 & 2	BTL 2
2	Calculate the pediatric dose using suitable formula.	CO1 & 2	BTL 3
3	Follow ethical practice while performing practical.	CO1 & 2	BTL 6
4	Collaborate and communicate with fellow students.	CO1 & 2	BTC 6

4. Relevant Theoretical Background:

Azithromycin belongs to the category of macrolide antibiotic. Other drugs from the same category include erythromycin, roxithromycin, clarithromycin etc. Macrolide antibiotic acts by inhibiting bacterial protein synthesis. Azithromycin is useful in patients with pharyngitis, tonsillitis, sinusitis, otitis media. community-acquired pneumonia (CAP), acute exacerbations of chronic bronchitis. In combination with at least one other drug, it is effective in the prophylaxis and treatment of MAC (Mycobacterium avium complex) infection in AIDS patients.

Azithromycin do not require dosing modification in the patients with renal impairment and altered liver function, however, it should be used with caution in patients with <10 glomerular filtration rate (GFR). No supplemental dose or dosage is required for patients on haemodialysis.

Dose: Adult dose 500 mg once daily 1 hour before or 2 hours after food (food decreases bioavailability).

Paediatric dose

General dosing, Mild-moderate infection: 5-12 mg/kg /oral dose typically administered as 10-12mg/kg/dose on day 1 followed by 5-6 mg/kg OD for remainder of the treatment duration. Maximum dose for the total course: 1500-2000 mg.

Pneumonia, Community acquired: Oral immediate release suspension 10 mg/kg on day 1 (Max Dose: 500 mg/dose), followed by 5 mg/kg (Max dose: 250 mg/dose) OD on days 2-5. OR

IV 10 mg/kg OD for 2 days, follow IV therapy by oral route with single daily dose of 5 mg/kg for next 3 days(Max dose 500 mg).

Brand Names: AZITHRAL 250, 500 mg cap and 250 mg/5 mL syrup. AZIWOK 250 mg cap., 100 mg kid tab, 100 mg/5 mL and 200 mg/5 mL suspension.

5. **Resources Required:**

   Real or hypothetical case, Dosing of azithromycin in children, Drug index, Internet facility, Searching resources.

6. **Resources used:**_____

   _____

7. **Precautions**

   - Calculate and document the dose carefully.
   - Liquid dose is preferred in child than tablet.
   - Ensure the parents of child patient use measuring cups for exact dosing.

8. **Procedure:**

   Step 1: Read the case, diagnosis and prescription carefully written by doctor.

   Step 2: Calculate and document the dose of drug given to patient.

   Step 3: Inform the patient (Parent in case of child) regarding use of measuring cups, dose timing, andfrequency.

   Step 4: Sign the form.

   Case: Ms. RN, 2-year-old female child, of body weight 11 kg and height 85 cm, was diagnosed of pneumonia by the doctor. The daily dose of the azithromycin injection prescribed was 10 mg/kg OD for first two days. The injection vial containing 50 mg/mL of the prescribed medication on subsequent 3 days she was prescribed Azithral suspension, the strength of the suspension was 250 mg/5 mL.

   Questions

   a. How many millilitres of medication shall be administered by parenteral route?
   b. Calculate the dose, millilitres of Azithral suspension administered to the patient.
   c. Note down the instructions for parents.

9. **Calculation of the dose**

   a. Azithromycin Injection

   Dose: 10 mg/Kg and Patient weight: 11 Kg

   We know child's dose can be calculated by following formula

$$\text{Young's Rule } (1-12 \text{ years}) = \frac{\text{Age of child}}{\text{Age of child} + 12} \times \text{Adult dose}$$

   =

   =_____mg

   Since, Injection is 50 mg/mL, so for_____mg dose mL of injection = (_____× 1) / 50 =____mL

   b. Azithral Suspension

Calculate BSA using formula

$$\text{BSA } (m^2) = \sqrt{\frac{\text{Height (cm)} \times \text{weight(kg)}}{3600}}$$

$$\text{BSA } (m^2) = \sqrt{\frac{85 \times 11}{3600}}$$

$$= 0.5 \text{ m}^2$$

Calculate dose using formula

$$\text{Patients Dose (mg)} = \frac{\text{Patient's body surface area}(m^2)}{1.73} \times \text{Drug Dose(mg)}$$

$$\text{Patients Dose (mg)} = \frac{0.5}{1.73} \times \_\_\_\_\_$$

Therefore, Patients Dose =_____mg
The suspension is 250 mg/5 mL, so_____mg is containing in __?__ mL
Dose of suspension = (250 ×___) / 5 =_____mL

c. Instructions for the parents

10. Result: Dose of azithromycin for 2-year-old child suffering from pneumonia was found to be _____

11. Conclusion:

The pediatric dose was calculated for the given case.

12. References:

- Essentials of Medical Pharmacology, K. D. Tripathi, Eighth edition, Jaypee publication
- Caroline S. Zeind, Michel G. Carvalho, Applied Therapeutics, The clinical use of drugs, Eleventhedition, Wolters Kluwer.
- Pocket Book of Clinical Care Pharmacotherapy, Bart Chernow, Third edition, Williams & Wilkins.
- Calculations in Pharmacy, Rouse and Webber, Third edition, Lippincott.

13. Practical related questions:

a) An adult patient weighing 124 lb was given 1.95 g of drug that supposed to be dosed at 30 mg/kg. Was the dose correct?

b) If the dose of paclitaxel in ovarian cancer is 135 mg/m^2 Calculate the dose for patient who is 155 cm talland weighs 53 kg.

c) If the adult dose is 250 mg calculate the dose for 8-year-old child.

(Space for answers)

13.Assessment Scheme:

Particular	Understanding the basic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce /Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 22

Dose Calculations of Selected Drug in Paediatric Patients

1. Aim:

To calculate the dose of levocetirizine for 4-year-old child suffering from allergic rhinitis.

2. Practical Significance:

It is self-evident that the change in body size associated with the growth is the factor to be considered indetermining dosage and response. Paediatric patients cannot be treated as small adults because of development of organs is still under progress. However, even when the effect of size is accommodated, age and other factors also exert profound effect on the pharmacotherapy. While working in the hospital, pharmacist will come across paediatric patients requiring appropriate dose adjustment. According to the case the drug dosing shall be individualized. In this practical, the students will learn to calculate the dose for paediatric patients by using appropriate formula.

3. Practical Outcomes (PrOs):

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Recall the formulas used for calculating pediatric dose.	CO1 & 2	BTL 2
2	Calculate the pediatric dose using suitable formula.	CO1 & 2	BTL 3
3	Follow ethical practice while performing practical.	CO1 & 2	BTL 6
4	Collaborate and communicate with fellow students.	CO1 & 2	BTL 6

4. Relevant Theoretical Background:

Levocetirizine is second generation H-1 receptor blocker. It is R enantiomer of cetirizine and has higher affinity for H-1 receptor than cetirizine. It is indicated in upper respiratory allergies, pollinosis, urticaria and atopic dermatitis; also used as adjuvant in seasonal asthma.

Second generation anti-histaminics (SGAs) like cetirizine are marketed after 1980. They have advantages over conventional anti-histaminic agents.

- High affinity for H-1 receptor.
- Not impairing psychomotor performance.
- Absence of CNS depressant property.
- Additional antiallergic mechanisms apart from histamine blockade i.e. modifying release of leukotrienes, platelet activating factor (PAF) and cytokines etc.
- Do not potentiate alcohol or benzodiazepines.
- One of the disadvantages over conventional drug is they have narrow spectrum of therapeuticusefulness.

Dose: Adult dose 5-10 mg oral mg once daily in the evening.

Brand Names: LEVOSIZ, LEVOAID, TECZINE 5, 10 mg tab LEVOCET 5 mg tab, 2.5 mg/5 mL syrup

5. Resources Required:

Real or hypothetical case, dosing of levocetirizine in children, drug index, internet facility, searching resources.

6. Resources used:_____

_____

7. Precautions:

- Calculate and document the dose carefully.
- Ensure the parents of child patient use measuring cups for exact dosing.

8. Procedure:

Step 1: Read the case, diagnosis and prescription carefully written by doctor.

Step 2: Calculate and document the dose of drug given to patient.

Step 3: Inform the patient (Parent in case of child) regarding use of measuring cups, dose timing, andfrequency.

Step 4: Sign the form.

Case: Ms. LV, 4-year-old male child, was suffering from running and itchy nose, bouts of sneezing, partial nasal blockage, redness and watering from the eyes, but no fever, body-ache or malaise. His parents gave history of similar episodes occurring off and on during the last spring season. A diagnosis of seasonal allergic rhinitis was made and the doctor prescribed an oral antiallergic medication – Levocetirizine.

Questions

a) Find out the dose for the drug from the literature.
b) Write dosage form, duration and time of administration.
c) Fill out instructions for the parents.
d) Apart from levocetirizine that give symptomatic relief, will you suggest any prophylactic drug?

9. Calculation of the dose:

a. Levocetirizine Dose from literature

b. Dosage form, duration and time of administration

c. Fill the following prescription

Rx Prescription
Name of patient: _____ Age:_____Weight:_____Sex: _____ Sign of Pharmacist

d. Instructions for the parents

_____

_____

e. Prophylactic medication- Dosage form and Route of administration

_____

_____

10. Result:

Dose of levocetirizine for 4-year-old child suffering from allergic rhinitis was found to be_____.

11. Conclusion:

The pediatric dose was calculated for the given case.

12. References:

- Essentials of Medical Pharmacology, K. D. Tripathi, Eighth edition, Jaypee publication
- Caroline S. Zeind, Michel G. Carvalho, Applied Therapeutics, The clinical use of drugs, Eleventh edition, Wolters Kluwer.
- Pocket Book of Clinical Care Pharmacotherapy, Bart Chernow, Third edition, Williams & Wilkins.
- Calculations in Pharmacy, Rouse and Webber, Third edition, Lippincott.

13. Practical related questions:

a) If the adult dose of drug having narrow therapeutic range is 5-10 mg. Calculate the dose for 4-year- old child, BSA of child 0.7 m2 using different formula.

b) From the answers obtained in above question, describe which is correct method to calculate dose in above case and why?

c) If the creatinine clearance of the adult is 30-50 mL/min, how much dose adjustment of levocetirizine shall be done? Find out from the literature.

(Space for answers)

14. Assessment Scheme:

Particular	Understanding thebasic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 23

Dose Calculation of Selected Drug in Geriatric Patients

1. Aim:

To calculate the dose alprazolam for 70-year-old (Geriatric) patient suffering from panic disorder.

2. Practical Significance:

Unlike paediatric, no specific formula can guide through the safe geriatric dosage. Defining "elderly" is difficult. The geriatric population is often arbitrarily defined as patients who are older than 65 years, and many of these people live active and healthy lives. Physiologic and cognitive functions tend to change with the aging process and can affect compliance, therapeutic safety, and efficacy of a prescribed drug. The elderly also tend to be on multiple drug therapy due to concomitant illness(es). In the treatment and dosing of an elderly, pharmacist have to consider pharmacokinetic as well as pharmacodynamic aspects. In this experiment, the pharmacist will find out and calculate dosage of the prescribed medicine from literature for elderly.

3. Practical Outcomes (PrOs):

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Discuss the management of disease condition for optimization of drug therapy.	CO1 & 2	BTL 2
2	Calculate the geriatric dose using suitable formula by considering various conditions of patient.	CO1 & 2	BTL 3
3	Follow ethical practice while performing practical.	CO1 & 2	BTL 6
4	Collaborate and communicate with fellow students.	CO1 & 2	BTL 6

4. Relevant Theoretical Background:

Before treatment of an elderly patient some of the considerations shall be kept in mind for the appropriatedosing.

- Therapy is often initiated with a lower-than-usual adult dose.
- Dose adjustment may be required based on the therapeutic response.
- The patient's physical condition may determine the drug dose and the route of administration used.
- The dose may be determined, in part, on the patient's weight, body surface area, health and disease status, and pharmacokinetic factors.
- Concomitant drug therapy may affect drug/dose effectiveness.
- A drug's dose may produce undesired adverse effects and may affect patient adherence.
- Complex dosage regimens of multiple drug therapy may affect patient adherence.

Use of benzodiazepines such as diazepam, alprazolam in elderly is not prohibited but these medications areinappropriate in geriatrics and have to be used with caution because of risk of fall and fracture.

Dose: Adult dose for panic disorder 0.5 mg TID, titrate dose every 3-4 days, if necessary, in increments of ≤1 mg/day, Mean effective dosage 5-6 mg/day in divided doses.

Dose adjustment for geriatric patient: review the literature.

Brand Names: Alprax tab, Trika tab.

5. **Resources Required:**

Real or hypothetical case, dosing of alprazolam in elderly, Indian Drug index, internet facility, searching resources.

6. **Resources used:**

_____

_____

7. **Precautions:**
   - Calculate and document the dose carefully.
   - Frequency of dosing need to be reduced in elderly for better compliance.
   - Child-resistant containers shall be avoided for dispensing medication to elderly living alone.
8. **Procedure:**

As per the Experiment No. 21.

Case: Ms. SN, 70-year-old patient living with adult son in his house. He does not have medical complication and no known drug allergies. He is non-alcoholic and non-smoker. He has complaints of panic attacks for last 2 days. Doctor has prescribed Alprazolam for 3 days.

Questions

a. How will you fix dosing for this patient? Find out from literature.

b. Which dosage form is suitable for this patient? Mention with reason.

c. Describe instructions and precautions conveyed to the patient.

9. **Calculation of the dose:**

a. Alprazolam Dose, Duration, and time of administration

b. Alprazolam dosage form, container for dosage form with reason

c. Fill the following prescription

Rx Prescription
Name of patient: _____ Age:_____Weight:_____Sex: _____ Sign of Pharmacist

d. Instructions:

_____

_____

10. Result:

Dose of alprazolam for 70-year-old (Geriatric) patient suffering from panic disorder was found to be_____.

11. Conclusion:

The geriatric dose was calculated for the given case.

12. References:

- Essentials of Medical Pharmacology, K. D. Tripathi, Eighth edition, Jaypee publication
- Calculations in Pharmacy, Rouse and Webber, Third edition, Lippincott.
- Pocket Book of Clinical Care Pharmacotherapy, Bart Chernow, Third edition, Williams & Wilkins.
- Calculations in Pharmacy, Rouse and Webber, Third edition, Lippincott.

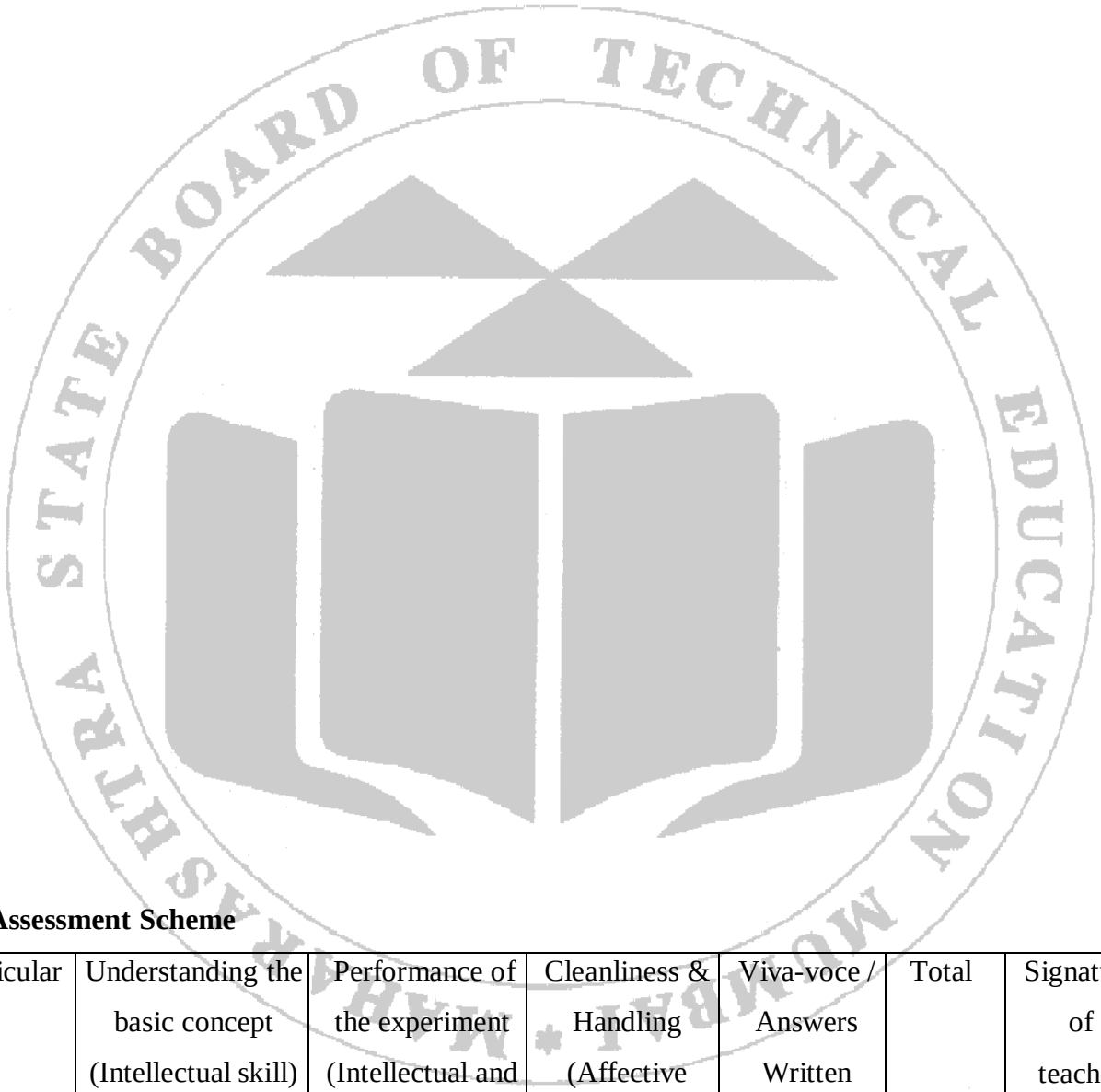
13. Practical related questions:

a) Give reason- Why formula-based calculations for dose have little significance in geriatrics?

b) Enlist the inappropriate drugs for the elderly.

c) What are common complications in the treatment of geriatric patients?

(Space for answers)



14. Assessment Scheme

Particular	Understanding the basic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 24

Dose Calculation in Patient with Impaired Renal Function

1. Aim:

To calculate the dose of given drug for patients with impaired renal function.

2. Practical Significance:

Chronic kidney disease affects renal drug elimination and other pharmacokinetic processes involved in drug disposition. Drug dosing errors are common in patients with renal impairment and can cause adverse effects and poor outcomes. Dosages of drugs cleared renally should be adjusted according to creatinine clearance or glomerular filtration rate. In this practical, the students will be able to calculate the creatine clearance of patient and determine dose of given drug for patient with impaired renal function.

3. Practical Outcomes (PrOs):

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Recall the formula used for calculating the dose for patients with renal impairment.	CO1 & 2	BTL 2
2	Calculate the dose for the patients with renal impairment.	CO1 & 2	BTL 3
3	Follow ethical practice while performing practical.	CO1 & 2	BTL 6
4	Collaborate and communicate with fellow students.	CO1 & 2	BTL 6

4. Related Theoretical Background:

Drug Dosing in Patients with Renal Impairment

Renal disease alters the effects of many drugs, particularly when active drug moieties are renally cleared. Drug doses should usually be altered in renal disease in accordance with the predicted reduction in the clearance of the drug moiety. Patient factors to consider in adjusting drug doses include the degree of renal impairment and patient size. Drug factors to consider in adjusting doses include the fraction of the drug excreted unchanged in urine and the drug's therapeutic index. Estimation of renal function is useful to guide dosing of renally excreted drugs.

Renal disease alters the effects of many drugs, sometimes decreasing their effects but more often increasing their effects and thus potential toxicity. Many of these changes are predictable and can be mitigated by changing drug doses.

Renal disease interacts with drugs in three main ways:

1. **Patient susceptibility**: Patients with renal disease may be more vulnerable to a given drug effect.
2. **Pharmacodynamic change:** A drug effect may be exaggerated or attenuated in patients with renaldisease.
3. **Pharmacokinetic changes:** Some drugs have higher steady-state concentrations when given at usualdoses to patients with renal disease.

This can be concise in one sentence:

The drug dose should be reduced proportionally to the predictedreduction in drug clearance.

Dosage Calculations Based on Creatinine Clearance

The kidneys receive about 20% of the cardiac output (blood flow) and filter approximately 125

mLof plasma per minute. As kidney function is lost, the quantity of plasma filtered per minute decreases, with an accompanying decrease in drug clearance. The filtration rate of the kidney can be estimated by several methods. One of the most useful methods is the estimation of the creatinine clearance rate (CrCl) using the following formulas based on the patient's age, weight, and serum creatinine (Scr) value.

Creatinine, which is a breakdown product from creatine produced in muscle metabolism, is generally produced at a constant rate and in quantities that depend on the muscle mass of the patient. Females usually have a lower serum creatinine than males due to less muscle mass. Because creatinine is eliminated from the body essentially through renal filtration, reduced kidney performance results in a reduced CrCl. The normal adult value of serum creatinine is 0.6 to 1.3 mg/dL (the range varies with the laboratory used as the reference source). The CrCl represents the volume of blood plasma that is cleared of creatinine by kidney filtration and usually expressed in millilitres per minute.
Jelliffe and Cockcroft-Gault equations are used to estimate creatinine clearance

The Jelliffe equation:

$$\text{CrCl} = \frac{98 - 0.8 \times (\text{Patient's age in years} - 20)}{\text{Serum creatinine in mg/dl}} \times [0.9 \text{ incase of female}]$$

The Cockcroft-Gault equation:

$$\text{CrCl} = \frac{(140 - \text{ Patient's age in years}) \times \text{Body weight in Kg}}{72 \times \text{Serum creatinine in mg/dl}} \times [0.85 \text{ incase of female}]$$

Example of calculation of dose using creatine clearance.:

Case: Mr. R.D. is a 67-year-old male patient who is 6 feet 1 inch tall and weighs 212 lb. He is receiving an oral dose of meperidine hydrochloride 200 mg per day (two 100-mg meperidine hydrochloride tablets every 4 hours to manage his pain). Mr. R. D. has a serum creatinine of 2.4 mg/dL. Using the Cockcroft-Gault equation, determine creatinine clearance and calculate the dose of meperidine based on the creatinine clearance as follows

CrCl = 10 − 50 mL/min, give 75% of usual dose CrCl < 10 mL/min, give 50% of usual dose:

Solution:

The Cockcroft-Gault equation for determination of creatine clearance is

$$\text{CrCl} = \frac{(140 - \textit{ Patient's age in years}) \times \textit{Body weight in Kg}}{72 \times \textit{Serum creatinine in mg/dl}} \ (for\ male)$$

$$\textit{Patient's weight in kg} = 212\ lb \times \frac{1\ kg}{2.2\ lb} = 96.36\ kg$$

$$CrCl = \frac{(140 - 67) \times 96.36}{72 \times 2.4} = 40.70\ ml/min$$

According to the dosing information, 75% of the dose should be given. Since the dose of drug is 200 mg, the patient should receive 200 mg × 75% = 150 mg based on his renal function.

Student may calculate creatine clearance using online calculator – https://globalrph.com/medcalcs/creatinine- clearance-adult/

5. **Resources Required:**

   Real or hypothetical case, Dosing of meperidine, Indian Drug index, Internet facility, Searching resources.

6. **Resources used:**_____

7. **Precautions:**
   - Calculate and document the dose carefully.

8. **Procedure:**

   Refer Experiment No. 21

   Case: The usual adult dose of levofloxacin is a 500 mg initial dose followed by subsequent doses of 250 mg every 24 hours for 10 days. How many 250 mg levofloxacin tablets should be dispensed to a 75-year-old, 160-lb female patient with a serum creatinine of 1.32 mg/dL? (Use the Cockcroft-Gault equation to determine creatinine clearance).

   For patients with a CrCl of less than 19 mL/min, doses following the initial dose are administered every 48 hours.

9. **Calculation of the dose:**

   a. Creatinine Clearance (CrCl)

   The Cockcroft-Gault equation for determination of creatine clearance is

$$\text{CrCl} = \frac{(140 - \text{ Patient's age in years}) \times \text{Body weight in Kg}}{72 \times \text{Serum creatinine in mg/dl}} \times 0.85$$

$$\text{CrCl} = \frac{(140 \ -) \times}{72 \ \times} \times 0.85$$

Therefore,

CrCl =_____mL/min

According to the dosing,_____% should be given. Since, the dose of drug is 500 mg The patient should receive_____% of 500 mg = 500 x_____/_____=_____mg

b. Dose of drug following the initial dose are administered every_____hours.

c. Number of 250 mg levofloxacin tablets for required for 10 Days =_____tablets.

d. Instructions for the patient

_____

_____

10. Result:

Dose of given drug for patients with impaired renal function was found to be_____

11. Conclusion:

_____

_____

12. References:

- Pharmaceutical Calculations, Howard C. Ansel & Shelly J. Stockton, Fifteenth edition, Wolters Kluwer.
- Renal Failure Drug Dose Adjustments, Chris Kyriakopoulos, Vikas Gupta, StatPearls (internet). Treasure Island: Statpearls Publishing.

13. Practical related questions

a) Calculate the creatinine clearance rate for Mr. R. D., 24 yrs old male patient weighing 70 kg with a serum creatinine of 1 mg/dl. (Use Cockcroft-Gault equation to calculate / use online

b) calculator to solve this example. Create PDF online, print and paste page/report).

c) Using following table, what would be the dose and dosage schedule of ceftazidime for 74-year-old male patient weighing 86 kg, measuring 66 inches in height, and having a serum creatinine level of 4.22 mg/dL? (Use the Cockcroft-Gault equation to determine creatinine clearance.)

Table: Creatinine Clearance dosing guidelines for ceftazidime

Renal Function	Creatinine Clearance (mL/Min)	Dose	Frequency
Normal to mild impairment	100-51	1 g	q8-12h
Moderate impairment	50-31	1 g	q12h
Severe impairment	30-16	1 g	q24h
Very severe impairment	15-6	15-6	q24h
Essentially none	<5	<5	q48h

(Space for answers)

14. Assessment Scheme:

Particular	Understanding the basic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Experiment No. 25
Dose Calculation in Patients with Hepatic Dysfunction

1. Aim:

To calculate the dose of selected drugs in patients with liver dysfunction.

2. Practical Significance:

Ageing decreases the functioning of various organs. Liver functioning also gets decreased, and if the patient is on chronic medication in the past that would also be responsible for the decrease in liver function. As liver is the main metabolizing organ, decrease in its metabolizing power will also decrease the liver extraction of the drugs and increase the bioavailability. This could lead to increase in the risk of side effects or adverse drug events in geriatrics. In this practical, the students will be able to find and optimize the drug dosage in patients with liver dysfunction.

3. Practical Outcomes (PrOs):

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

PrO	Practical Outcomes	Mapped CO	BTL
1	Recall the formula used for calculating the dose for patients with liver dysfunction.	CO1 & 2	BTL 2
2	Calculate the dose for the patients with liver dysfunction.	CO1 & 2	BTL 3
3	Follow ethical practice while performing practical.	CO1 & 2	BTL 6
4	Collaborate and communicate with fellow students.	CO1 & 2	BTL 6

4. Relevant Theoretical Background:

Liver dysfunction

Liver is the main metabolising organ that metabolizes the drug apart from the other organs like kidney, intestine, heart, etc. Various disease conditions like liver cirrhosis, fatty liver is responsible to decrease liver functions. Moreover, chronic consumption of the drugs for previous ailments affects liver function due to either oxidative stress related factors or itself due to drugs treatment. The metabolism of drug in such condition is altered that will change the pharmacokinetics of the drugs.

It is commonly observed that patients with liver cirrhosis also have gastritis or ulcers. This could lead to the alteration in the absorption of the drug taken orally. Moreover, liver cirrhosis who have oedema and/or ascites, can able to change the volume of distribution of hydrophilic drugs is increased.

The drug metabolism is depending on the passing the drugs to the liver that present to elimination called as liver clearance and amount of blood flow, this determines the hepatic extraction of the drug. Any decrease in the blood flow or hepatic clearance will affects the hepatic extraction of the drug. Therefore, the pharmacologic effects of the drug may be increased due to increase in the bioavailability of the drug.

The drugs with high liver extraction produce increased bioavailability on liver cirrhosis patient. The examples of such high liver extraction drugs are morphine, pentazocine, praziquantel, nitro-glycerine, imipramine, promethazine, etc. Unfortunately, there is no endogenous marker for

hepatic clearance that can be used as a guide for drug dosing. In order to predict the kinetic behaviour of drugs in cirrhotic patients, agents can be grouped according to their extent of hepatic extraction. Considering these scenarios, the initial and maintenance dose shall be reduced considering that there is increase in bioavailability. So, the reduced dose can be calculated by the following equation:

$$\text{Reduced dose} = \frac{\text{Normal dose} \times \text{Bioavailability}}{100}$$

The drugs having low hepatic extraction with low protein binding such as paracetamol, doxycycline, carbamazepine, diphenhydramine, cyclophosphamide etc. have high bioavailability >70%, and low hepatic clearance because of liver cirrhosis. For such drugs therapy can be started with normal dose and maintenance dose can be reduced.

5. **Resources Required:**

   Real or hypothetical case, Indian Drug Index, internet facility, searching resources.

6. **Resources used:**

   _____

   _____

7. **Precautions:**
   - Calculate and document the dose carefully.
   - Be cautious with drugs having low liver extraction and narrow therapeutic index
8. **Procedure:**

   Refer Experiment No. 21

   Case: Mr. DK, 55 years old, has signs of liver cirrhosis, admitted to the hospital having seizure. He is being treated with intravenous temazepam for the seizure, after that he is treated with oral clomethiazole (dose: 384 mg) as a prophylaxis for delirium tremens. After the first dose of clomethiazole, the patient experiences hypoventilation that results in global respiratory failure and eventually necessitates intubation and artificial ventilation. No further doses of clomethiazole are administered and sedation is achieved with IV midazolam. On examination it is found that patient have increased bioavailability of clomethiazole (90%) due to high hepatic clearance.

   Question

   Calculate the reduced dose of clomethiazole required to be given to this patient.

9. **Calculation of the dose:**

10. **Result:**

    The reduced dose of the clomethiazole was calculated to be_____.

11. **Conclusion:**

    It can be concluded that the dose of the drug should be_____in liver cirrhosis patient

12. References:

- Delcò F, Tchambaz L, Schlienger R, Drewe J, Krähenbühl S. Dose adjustment in patients with liverdisease Drug Saf. 2005;28(6):529-45. doi: 10.2165/00002018-200528060-00005.

13. Practical related questions:

a) Define hepatic extraction of drug and hepatic clearance of drug.

b) Describe maintenance dose and initial dose.

c) Find out the reduced dose of methotrexate and paracetamol from the Indian drug index for liver cirrhosis patient.

(Space for answers)

14. Assessment Scheme:

Particular	Understanding the basic concept (Intellectual skill)	Performance of the experiment (Intellectual and motor skill)	Cleanliness & Handling (Affective domain)	Viva-voce / Answers Written	Total	Signature of teacher
Marks Obtained						
Max Marks	**02**	**05**	**01**	**02**	**10**	

Guidelines to conduct Sessional Practical Examination

Course Name & Abbr : Pharmacotherapeutics Practical (PTP) Course Code:PH-2-J

Subject Code: 20059 **Year**: Second Year

Max Time: 3 hrs **Max. Marks**: 80

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

(5 questions of 2 marks each based on may be asked as per the sessional syllabus.)

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

a. Major experiment **(**30 M)

A case should be given for the preparing SOAP notes OR a case should be given for patient counselling.

b. Minor experiment **(**20 M)

Dose calculation in pediatrics or geriatrics can be asked.

Q.3. Viva voce **(10 M)**

(Viva should be conducted on practical and theory-based questions)

Q.4. Practical Record Maintenance **(10 M)**

Guidelines to conduct Annual Practical Examination

Course Name & Abbr: Pharmacotherapeutics Practical (PTP) Course Code: (PH-2-J)

Subject Code: 20059 **Year**: Second Year

Max Time: 3 hrs **Max. Marks**: 80

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

(5 questions of 2 marks each based on may be asked as per the sessional syllabus.)

Q. 2. Experiments **(60 M)**

a. Major experiment **(**40 M)

A case should be given for the preparing SOAP notes OR a case should be given for patient counselling.

b. Minor experiment **(**20 M)

Dose calculation in pediatrics or geriatrics can be asked.

Q.3. Viva voce **(10 M)**

(Viva should be conducted on practical and theory-based questions)

PHARMACIST'S OATH

- I swear by the code of Ethics of Pharmacy Council of India in relation to the community and shall act as an integral part of health care team.
- I shall uphold the laws and standards governing my profession.
- I shall strive to perfect and enlarge my knowledge to contribute to the advancement of pharmacy and the public health.
- I shall follow the system which I consider best for pharmaceutical care and counseling of patients.
- I shall Endeavour to discover and manufacture drugs of quality to alleviate sufferings of humanity.
- I shall hold in confidence the knowledge gained about the patients in connection with my professional practice and never divulge unless compelled to do so by the law.
- I shall associate with organizations having their objectives for betterment of the Profession of Pharmacy and make contribution to carry out the work of those organizations.
- While I continue to keep this oath unviolated, may it be granted to me to enjoy life and the practice of pharmacy respected by all, at all times!
- Should I trespass and violate this oath may the reverse be my lot!