MEDICAL PATHOLOGY

TEACHER BOOK SENIOR 6
ASSOCIATE NURSING PROGRAM

First Edition

FOREWORD

Dear Teacher,

Rwanda Education Board is honored to present teacher's guide for Medical Pathologies of eye, Year Six of Secondary School, Programme of Associate Nurse which serves as a guide to competence-based teaching and learning to ensure consistency and coherence in the learning of Medical pathologies of sensory organs topic. The Rwandan educational philosophy is to ensure that student-teachers achieve full potential at every level of education which will prepare them to be well integrated in society and exploit employment opportunities. In line with efforts to improve the quality of education, the government of Rwanda emphasizes the importance of aligning teaching and learning materials with the syllabus to facilitate their learning process. Many factors influence what they learn, how well they learn and the competences they acquire.

Those factors include the relevance of the specific content, the quality of teacher' pedagogical approaches, the assessment strategies and the instructional materials available .We paid special attention to the activities that facilitate the learning process in which student-teachers can develop ideas and make new discoveries during concrete activities carried out individually or with peers. With the help of the tutor student-teachers will gain appropriate skills and be able to apply what they have learnt in real life situations.

Hence, they will be able to develop certain values and attitudes allowing them to make a difference not only to their own life but also to the nation. This is in contrast to traditional learning theories which view learning mainly as a process of acquiring knowledge from the more knowledgeable who is mostly the teacher. In competence-based curriculum, learning is considered as a process of active building and developing of knowledge and understanding, skills and values and attitude by the student-teacher where concepts are mainly introduced by an activity, situation or scenario that helps the student-teacher to construct knowledge, develop skills and acquire positive attitudes and values. In addition, such active learning engages student-teachers in doing things and thinking about the things they are doing and they are encouraged to bring their own real experiences and knowledge into the learning processes. In view of this, your role is to: Plan your lessons and prepare appropriate teaching and learning materials

- Organize group discussions for student-teachers considering the importance of social constructivism suggesting that learning occurs more effectively when the student-teacher works collaboratively with more knowledgeable and experienced people.

Dr. MBARUSHIMANA Nelson

Director General of Rwanda Education Board

ACKNOWLEDGEMENTS

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Joan MURUNGI,

Head of Curriculum, Teaching and Learning Resources Department

Contents

PART I. GENERAL INTRODUCTION

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1.0 About the teacher's guide

This book is a teacher's guide for Medical Pathologies subject, for senior six in Associate Nursing program. It is designed to accompany student book and intends to help teachers in the implementation of competence-based curriculum specifically Medical Pathologies syllabus.

As the name says, it is a guide that teachers can refer to when preparing their lessons. Teachers may prefer to adopt the guidance provided but they are also expected to be more creative and consider their specific classes' contexts and prepare accordingly.

1.1. The structure of the guide

This section presents the overall structure, the unit and sub-heading structure to help teachers to understand the different sections of this guide and what they will find in each section.

Overall structure

The whole guide has three main parts as follows:

- **Part I: General Introduction.**

This part provides general guidance on how to develop the generic competences, how to integrate cross cutting issues, how to cater for students with special educational needs, active methods and guidance on assessment.

- **Part II: Sample lesson plan**

This part provides a sample lesson plan, developed, and designed to help the teacher develop their own lesson plans.

- **Part III: Unit development**

This is the core part of the guide. Each unit is developed following the structure below. The guide ends with references.

Each unit is made of the following sections:

- **Unit title:** from the syllabus
- **Key unit competence:** from the syllabus
- **Prerequisites (**knowledge, skills, attitudes and values)

This section indicates knowledge, skills and attitudes required for the success of the unit. The competence-based approach calls for connections between units/ topics within a subject and interconnections between different subjects. The teacher will find an indication of those prerequisites and guidance on how to establish connections.

♦ Cross-cutting issues to be addressed

This section suggests cross cutting issues that can be addressed depending on the unit content. It provides guidance on how to come up with the integration of the issue. Note that the issue indicated is a suggestion; teachers are free to take another cross-cutting issue taking into consideration the learning environment.

♦ Guidance on the introductory activity

Each unit starts with an introductory activity in the teacher's book. This section of the teacher's guide provides guidance on how to conduct this activity and related answers. Note that students may not be able to find the right solution but they are invited to predict possible solutions or answers. Solutions are provided by students gradually through discovery activities organized at the beginning of lessons or during the lesson.

♦ List of lessons/sub-heading

This section presents in a table suggestion on the list of lessons, lesson objectives copied or adapted from the syllabus and duration for each lesson. Each lesson / subheading is then developed.

♦ End of each unit

At the end of each unit the teacher provides the following sections:

- Summary of the unit which provides the key points of content developed in the teacher's book.
- Additional information which provides additional content compared to the student book for the teacher to have a deeper understanding of the topic.
- End unit assessment which provides answers to questions of the end unit assessment in the teacher's book and suggests additional questions and related answers to assess the key unit competence.
- Additional activities :(remedial, consolidation and extended activities). The purpose of these activities is to accommodate each student (slow, average, and gifted) based on the end of unit assessment results.

- **Structure of each subheading**

Each lesson/sub-heading is made of the following sections:

Lesson /Sub heading title 1: ……..

- **Prerequisites/Revision/Introduction:**

This section gives a clear instruction to teacher on how to start the lesson.

- **Teaching resources**

This section suggests the teaching aids or other resources needed in line with the activities to achieve the learning objectives. Teachers are encouraged to replace the suggested teaching aids by the available ones in their respective schools and based on learning environment.

- **Learning activities**

This section provides a short description of the methodology and any important aspect to consider. It provides also answers to learning activities with cross reference to student's book.

- **Exercises/application activities**

This provides questions and answers for exercises/ application activities.

1.2. Methodological guidance

1.2.1 Developing competences

Since 2015 Rwanda shifted from a knowledge based to a competence based curriculum for pre-primary, primary and general secondary education. For Secondary Schools, it is in 2019 that the competence based curriculum was embraced. This called for changing the way of learning by shifting from teacher centered to a learner centered approach. Teachers are not only responsible for knowledge transfer but also for fostering teacher's learning achievement and creating safe and supportive learning environment. It implies also that a student has to demonstrate what he/she is able to do using the knowledge, skills, values and attitude acquired in a new or different or given situation.

The competence-based curriculum employs an approach of teaching and learning based on discrete skills rather than dwelling on only knowledge or the cognitive domain of learning. It focuses on what learner can do rather than what learners know. Students develop basic competences through specific subject unit competences

with specific learning objectives broken down into knowledge, skills and attitudes. These competences are developed through learning activities disseminated in learner-centered rather than the traditional didactic approach. The students are evaluated against set standards to achieve before moving on.

In addition to specific subject competences, students also develop generic competences which are transferable throughout a range of learning areas and situations in life. Below are examples of how generic competences can be developed in Medical Pathologies:

Generic competence	Examples of activities that develop generic competences
Critical thinking	• Describe the relationship between Medical Pathologies and other subjects such as Anatomy and physiology of sensory system learnt in Biology, Fundamentals of Nursing and Pharmacology. • Observe, record, interpret data recorded during Health assessment. • Identify and use the applications of Medical Pathologies concepts to solve problems of life and society
Research and Problem solving	• Research using internet or books from the library • Design a questionnaire for data collection during field visit
Cooperation, Personal and Interpersonal management and life skills	• Work in Pairs • Small group work • Large group work
Communication	• Organise and present in writing and verbally a complete and clear report of group work • Observe, record, interpret the results of a measurement accurately. • Select and use appropriate formats and presentations, such as tables, graphs and diagrams.
Lifelong learning	• Exploit all opportunities available to improve on knowledge and skills. Reading scientific journals to keep updated.

1.2.2. Addressing cross cutting issues

Among the changes in the competence-based curriculum is the integration of cross cutting issues as an integral part of the teaching learning process-as they relate to

and must be considered within all subjects to be appropriately addressed. The eight cross cutting issues identified in the national curriculum framework are: genocide studies, environment and sustainability, gender, Comprehensive Sexuality Education (CSE), Peace and Values Education, Financial Education, standardization Culture and Inclusive Education.

Some cross cutting issues may seem specific to learning areas or subjects, but the teacher needs to address all of them whenever an opportunity arises. In addition, student should always be given an opportunity during the learning process to address these cross-cutting issues both within and out of the classroom to progressively develop related attitudes and values.

Below are examples on how crosscutting issues can be addressed in Medical Pathologies:

Cross-cutting issues	**Examples on how to integrate the cross-cutting issues**
Inclusive education	Involve all students in all activities without any bias. E.g.: Allow a student with physical disability (using wheelchair) to take notes or lead the team during field trip or classroom.
Gender	Involve both girls and boys in all activities: No activity is reserved only to girls or boys. Teacher should ensure equal participation of both girls and boys during practical course as well as during cleaning and tidying up related activities after demonstration in skills laboratory.
Peace and Values Education	During group activities, debates and presentations, the teacher will encourage students to help each other and to respect opinions of colleagues.
Standardization culture	• Some lessons involve carrying out practical sessions. Instruction should be clear for students to always check if they are using up dated checklists.
Environment and sustainability	• To avoid the environment pollution, before, during or after practical sessions students avoid throwing away chemicals anywhere; special places or appropriate containers should be used. • Students also must be aware of the impacts of the use of sharp objects and plastics on the environment.
Financial Education	When performing some nursing techniques, students are encouraged to avoid wasting chemicals by using the quantities that are just required. They are required to also avoid spoiling equipment and other materials…

1.2.3 Attention to special educational needs specific to each subject

In the classroom, students learn in different way depending to their learning pace, needs or any other special problem they might have. However, the teacher has the responsibility to know how to adopt his/her methodologies and approaches to meet the learning needs of each student in the classroom. Also, teacher must understand that students with special needs need to be taught differently or need some accommodations to enhance the learning environment. This will be done depending on the subject and the nature of the lesson.

To create a well-rounded learning atmosphere, teacher needs to:

- Remember that students learn in different ways, so they have to offer a variety of activities (e.g., role-play, music and singing, word games and quizzes, and outdoor activities).
- Maintain an organized classroom and limits distraction. This will help students with special needs to stay on track during lesson and follow instruction easily.
- Vary the pace of teaching to meet the needs of each student-teacher. Some students process information and learn more slowly than others.
- Break down instructions into smaller, manageable tasks. Students with special needs often have difficulty understanding long-winded or several instructions at once. It is better to use simple, concrete sentences to facilitate them understand what you are asking.
- Use clear consistent language to explain the meaning (and demonstrate or show pictures) if you introduce new words or concepts.
- Make full use of facial expressions, gestures, and body language.
- Pair a student who has a disability with a friend. Let them do things together and learn from each other. Make sure the friend is not overprotective and does not do everything for the student-teacher. Both students will benefit from this strategy
- Use multi-sensory strategies. As all students learn in different ways, it is important to make every lesson as multi-sensory as possible. Students with learning disabilities might have difficulty in one area, while they might excel in another. For example, use both visual and auditory cues.

Below are general strategies related to each main category of disabilities and how to deal with every situation that may arise in the classroom. However, the list is not exhaustive because each student is unique with different needs and that should be handled differently.

Strategy to help students with developmental impairment:

- Use simple words and sentences when giving instructions.
- Use real objects that the student can feel and handle, rather than just working abstractly with pen and paper.
- Break a task down into small steps or learning objectives. The student should start with an activity that s/he can do already before moving on to something that is more difficult.
- Gradually give the student less help.
- Let the student work in the same group with those without disability.

Strategy to help students with visual impairment:

- Help students to use their other senses (hearing, touch, smell and taste) to play and carry out activities that will promote their learning and development.
- Use simple, clear and consistent language.
- Use tactile objects to help explain a concept.
- If the student has some sight, ask them what they can see. Get information from parents/caregivers on how the student manages their remaining sight at home.
- Make sure the student has a group of friends who are helpful and who allow the students to be as independent as possible.
- Plan activities so that students work in pairs or groups whenever possible.

Strategy to help students with hearing impairment:

- Strategies to help students with hearing disabilities or communication difficulties
- Always get the students attention before you begin to speak.
- Encourage the student to look at your face.
- Use gestures, body language and facial expressions.
- Use pictures and objects as much as possible.
- Ask the parents/caregivers to show you the signs they use at home for communication use the same signs yourself and encourage other students to also use them.
- Keep background noise to a minimum.

Strategies to help children with physical disabilities or mobility difficulties:

- Adapt activities so that student who use wheelchairs or other mobility aids, or other students who have difficulty moving, can participate.

- Ask parents/caregivers to assist with adapting furniture e.g. The height of a table may need to be changed to make it easier for a student to reach it or fit their legs or wheelchair under.
- Encourage peer support friends can help friends.
- Get advice from parents or a health professional about assistive devices.

1.2.4 Guidance on assessment

Each unit in the teacher's guide provides additional activities to help students achieve the key unit competence. Results from assessment inform the teacher which student needs remedial, consolidation or extension activities. These activities are designed to cater for the needs of all categories of students; slow, average and gifted learners respectively.

Assessment is an integral part of teaching and learning process. The main purpose of assessment is for improvement. Assessment for learning/ Continuous/ formative assessment intends to improve student-teachers' learning and teacher's teaching whereas assessment of learning/summative assessment intends to improve the entire school's performance and education system in general.

Continuous/ formative assessment

It is an ongoing process that arises out of interaction during teaching and learning process. It includes lesson evaluation and end of subunit assessment. This formative assessment plays a big role in teaching and learning process. The teacher should encourage individual, peer and group evaluation of the work done in the classroom and uses appropriate competence-based assessment approaches and methods.

In Year two textbook, formative assessment principle is applied through application activities that are planned in each lesson to ensure that lesson objectives are achieved before moving on. At the end of each unit, the end unit assessment is formative when it is done to give information on the progress of students and from there decide what adjustments need to be done. Assessment standards are taken into consideration when setting tasks.

Summative assessment

The assessment done at the end of the term, end of year, is considered as summative. The teacher, school and parents are informed on the achievement of educational objectives and think of improvement strategies. There is also end of level/ cycle assessment in form of national examinations.

1.2.5. Student teachers' learning styles and strategies to conduct teaching and learning process

There are different teaching styles and techniques that should be catered for. The selection of teaching method should be done with the greatest care and some of the factors to be considered are: the uniqueness of subjects, the type of lessons, the particular learning objectives to be achieved, the allocated time to achieve the objective, instructional available materials, the physical/sitting arrangement of the classroom, individual student teachers' needs, abilities and learning styles.

There are mainly four different learning styles as explained below:

a) Active and reflective students

Active learners tend to retain and understand information best by doing something active with it, discussing or applying it or explaining it to others. Reflective learners prefer to think about it quietly first.

b) Sensing and intuitive students

Sensing learners tend to like learning facts while intuitive learners often prefer discovering possibilities and relationships. Sensors often like solving problems by well-established methods and dislike complications and surprises; intuitive learners like innovation and dislike repetition.

c) Visual and verbal students

Visual students remember best what they see (pictures, diagrams, flow charts, timelines, films, demonstrations, etc); verbal learners get more out of words (written and spoken explanations).

d) Sequential and global students

Sequential students tend to gain understanding in linear steps, with each step following logically from the previous one. Global learners tend to learn in large jumps, absorbing material almost randomly without seeing connections, and then suddenly "getting it."

1.2.6. Teaching methods and techniques that promote the active learning

The different student learning styles mentioned above can be catered for, if the teacher uses active learning whereby students are really engaged in the learning process.

What is Active learning?

Active learning is a pedagogical approach that engages students in doing things and thinking about the things they are doing. In active learning, students are encouraged to bring their own experience and knowledge into the learning process.

The role of the teacher in active learning

- The teacher engages students through active learning methods such as inquiry methods, group discussions, research, investigative activities and group and individual work activities.
- He/she encourages individual, peer and group evaluation of the work done in the classroom and uses appropriate competence-based assessment approaches and methods.
- He provides supervised opportunities for students to develop different competences by giving tasks which enhance critical thinking, problem solving, research, creativity and innovation, communication and cooperation.
- Teacher supports and facilitates the learning process by valuing student-teachers' contributions in the class activities.

The role of students in active learning

Learners are key in the active learning process. They are not empty vessels to fill but people with ideas, capacity and skills to build on for effective learning. A learner engaged in active learning:

- Communicates and shares relevant information with other learners through presentations, discussions, group work and other learner-centred activities (role play, case studies, project work, research and investigation)
- Actively participates and takes responsibility for their own learning
- Develops knowledge and skills in active ways
- Carries out research/investigation by consulting print/online documents and resourceful people, and presents their findings
- Ensures the effective contribution of each group member in assigned tasks through clear explanation and arguments, critical thinking, responsibility and confidence in public speaking
- Draws conclusions based on the findings from the learning activities.

Some active techniques that can be used in Medical Pathologies

The teaching methods strongly emphasised in the competence Based Curriculum (CBC) are active methods. Below are some active techniques that apply in Nursing sciences:

A. Practical work:

Many of the activities suggested in Associate Nursing curriculum as well as in the teacher'sbook are practical works.

Practical work is vital in learning Medical Pathologies; this method gives the student the opportunity to implement a series of activities and leads to the development of both cognitive and hands-on skills. The practical work and questions given should target the development of the following skills in student-teachers: observation, recording and report writing, manipulation, measuring, planning, and designing.

A practical lesson is done in three main stages:

- Preparation of practical work: Checking materials to ensure they are available and at good state; try the demonstration before the lesson; think of safety rules and give instructions to lab technician if you have any.
- Performance of practical work: Sitting or standing arrangement of student-teachers; introduction of the demonstration aims and objectives; setting up the apparatus; performing the nursing technique; write and record the data.
- Discussion: Observations and interpreting data; make generalisations and assignment: writing out the demonstration report and further practice and research.

In some cases, demonstration by the teacher is recommended when for example the nursing technique requires the use of sophisticated materials or very expensive materials or when safety is a major factor like dangerous practical work, and it needs specific skills to be learnt first.

In case your school does not have enough laboratory materials and chemicals, demonstration of nursing techniques can be done in groups but make sure every student participates. You can also make arrangements with the neighbouring science school and take your students there for a number of experiments.

Each student or group of students is given a research topic. They have to gather information from internet, available books in the library or ask experienced people and then the results are presented in verbal or written form and discussed in class.

B. Project work

Medical pathology teachers are encouraged to sample and prepare project works and engage their students, as many as possible. Students in groups or individually, are engaged in a self-directed work for an extended period of time to investigate and respond to a complex question, problem, or challenge. The work can be presented to classmates or other people beyond the school. Projects are based on real-world problems that capture learners' interest. This technique develops higher

order thinking as the students acquire and apply new knowledge in a problem-solving context.

C. Field trip

One of the main aims of teaching Fundamentals of Nursing in Rwanda is to apply its knowledge for development. To achieve this aim we need to show to students the relationship between classroom science lessons and applied sciences. This helps them see the link between science principles and technological applications.

To be successful, the field visit should be well prepared and well exploited after the visit:

Before the visit, the teacher and student:

- agree on aims and objectives
- gather relevant information prior to visit
- brainstorm on key questions and share responsibilities
- discuss materials needed and other logistical and administrative issues
- discuss and agree on accepted behaviours during the visit
- Visit the area before the trip if possible to familiarise yourself with the place

After the visit

When students come back from trip, the teacher should plan for follow-up. The follow-up should allow studentsto share experiences and relate them to the prior science knowledge. This can be done in several ways; either: Students write a report individually or in groups and give to the teacher for marking. The teacher then arranges for discussion to explain possible misconceptions and fill gaps. Or students write reports in groups and display them on the class notice board for everyone to read.

Main steps for a lesson in active learning approach

All the principles and characteristics of the active learning process highlighted above are reflected in steps of a lesson as displayed below. Generally, the lesson is divided into three main parts whereby each one is divided into smaller steps to make sure that students are involved in the learning process. Below are those main parts and their small steps:

1) Introduction

Introduction is a part where the teacher makes connection between the current and previous lesson through appropriate technique. The teacher opens short

discussions to encourage students to think about the previous learning experience and connect it with the current instructional objective. The teacher reviews the prior knowledge, skills and attitudes which have a link with the new concepts to create good foundation and logical sequencings.

2) Development of the new lesson

The development of a lesson that introduces a new concept will go through the following small steps: discovery activities, presentation of student-teachers' findings, exploitation, synthesis/summary and exercises/application activities, explained below:

Discovery activity

Step 1

- The teacher discusses convincingly with students to take responsibility of their learning
- He/she distributes the task/activity and gives instructions related to the tasks (working in groups, pairs, or individual to instigate collaborative learning, to discover knowledge to be learned)

Step 2

- The teacher let the students work collaboratively on the task.
- During this period the teacher refrains to intervene directly on the knowledge
- He/she then monitors how the students are progressing towards the knowledge to be learned and boost those who are still behind (but without communicating to them the knowledge).

Presentation of student-teachers' productions

In this episode, the teacher invites representatives of groups to present the student-teachers' productions/findings.

- After three/four or an acceptable number of presentations, the teacher decides to engage the class into exploitation of the student-teachers' productions.

Exploitation of student-teachers's productions

- The teacher asks the students to evaluate the productions: which ones are correct, incomplete or false
- Then the teacher judges the logic of the student-teachers' products, corrects

those which are false, completes those which are incomplete, and confirms those which correct.

Institutionalization (summary/conclusion/ and examples)

- The teacher summarises the learned knowledge and gives examples which illustrate the learned content.

Exercises/Application activities

- Exercises of applying processes and products/objects related to learned unit/ sub-unit
- Exercises in real life contexts
- Teacher guides students to make the connection of what they learnt to real life situations. At this level, the role of teacher is to monitor the fixation of process and product/object being learned.

3) Assessment

In this step the teacher asks some questions to assess achievement of instructional objective. During assessment activity, students work individually on the task/activity. The teacher avoids intervening directly. In fact, results from this assessment inform the teacher on next steps for the whole class and individuals. In some cases, the teacher can end with a homework assignment.

PART II. SAMPLE LESSON PLAN

Subject: MEDICAL PATHOLOGIES OF EYES

School Name: ……..

Teacher's name: …….

Term	Date	Subject	Class	Unit No	Lesson No	Duration	Class size
I	22th September 2021	BLEPHARITIS	S6	1	1 of 5	40 minutes	30 students
Type of Special Educational Needs to be catered for in this lesson and number of learners in each category				The students with mild hearing impairment will be assisted by ensuring that they occupy the front seats in the class to allow them to better hear the teacher. This one is requested to speak loudly to allow them capture the content taught. If there is any student with mild visual impairment, the student will also occupy the front seat in the classroom .The teacher will use big size letters during teaching session to allow the student to better visualize the content. The teacher will also use the charts, which are visible (e.g. Image of eyes).			

Unit title	Medical pathologies of Eyes
Key Unit Competence	Take appropriate decision on different common medical pathologies ofthe Eyes
Title of the lesson	Introduction of Medical Pathologies of Eyes (Definition ,causes, signs and symptoms, pathophysiology of blepharitis)

Instructional Objective	By the end of the lesson, the students should be able to correctly identify the main causes, risks factors, related pathophysiology, signs and symptoms of Blepharitis in 10 minutes given in assessment.
Plan for this Class (location: in / outside)	Inside the class
Learning Materials (for all learners)	The teacher could avail the Snellen chart and Ophthalmoscope. Also, the teacher should present to the students the library textbooks on medical-surgical nursing especially eye diseases and indicates the pages.
References	1. Sharon L. Lewis, Shannon Ruff Dirken, Margaret McLean Heitkemper, Linda Bucher (2014). Medical-surgical nursing. Assessment and management of clinical conditions. 2. Barbara K. Timby; Nancy E. Smith (2010). Introductory medical-surgical nursing 10th Edition. 3. Roni M Shtein (2021). Blepharitis. Retrieved from: https://www.uptodate.com/contents/blepharitis?search=blepharitis&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1#H1784841514, on 13th September 2021. 4. https://www.webmd.com/eye-health/blepharitis 5. Deborah S Jacobs (2020). Conjunctivitis. Retrieved from: https://www.uptodate.com/contents/conjunctivitis?search=CONJUNCTIVITIS&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1 on 13th September 2021. 6. https://www.aoa.org/healthy-eyes/eye-and-vision-conditions/conjunctivitis?sso=y 7. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7092688/ 8. https://www.allaboutvision.com/conditions/myopia.htm

<table>
<tr><td rowspan="3">Timing for each step</td><td colspan="2">Description of teaching and learning activity</td><td rowspan="3">Generic competences
and Cross cutting issues to be addressed
+ a short explanation</td></tr>
<tr><td colspan="2">The students will observe the picture and read the case study individually, then answer the questions provided. Through brainstorming, the teacher will orient and provide guidance to the answers provided.</td></tr>
<tr><td>Teacher activities</td><td>Learner activities</td></tr>
<tr><td>Introduction
5 min</td><td>The teacher will introduce the pathologies of Eyes by inviting students to observe the picture on introductory activity and ask them to answer the questions related:
1. From the anatomy and physiology you learnt, what is the importance of the eyes?
2. While observing the external parts of both above eyes, what are the differences between left and right eye?
3. What are some diseases do you know that affect the eyes?</td><td>Give answers to the questions from Introductory activity.
Listening how teacher orient their answers to the appropriate answers.</td><td>Competences:
Critical thinking in solving the medical condition
Decision making in management of pathologies of Eyes
Communication
Problem solving
Manipulation</td></tr>
</table>

Development of the lesson 25 minutes a) **Discovering Activity** **(5 minutes)**	• Give time to students for reading individually the case study from learning activity and prepare them to be able to answer the questions. • Monitor progress and be ready for clarifications when needed	Students carefully read the case study from learning activity1.1 in student book. Students participate through brainstorming in answering the questions: 1. What are different external parts of the eye structures have been affected? 2. What are the abnormal signs and symptoms the patient was presenting? 3. Do they represent which diseases among all eyes pathologies? 4. What are the risk factors of developing those signs and symptoms?	Competences: Critical thinking Decision making Communication
b) Exploitation of students' answers **(10 minutes)**	• Judge the logic of the answers provided by students and correct those, which are false. • Complete those which are incomplete and confirm those which are correct.	• Listen carefully the answers provided by other students. • Give comments on answers given by other students. • Follow the corrections of the teacher. • Ask questions whenever there is need for clarification.	Critical thinking

C) Synthesis (10 minutes)	• Summarize the main causes, risk factors and pathophysiology of blepharitis. Remind the important signs and symptoms of blepharitis. • Give more clarification on the learnt content.	• Participate actively in summarizing the content covered. • Make short notes	Writing skills Listening skills Decision making Critical thinking Communication
Conclusion and Assessment 10 min	• Conclude the lesson by asking some questions related to content covered • Engage students to work individually on questions of self-assessment 1.1 in student's book. • Select randomly five students to answer.	• Answer individually the questions as indicated in student 's book through reviewing by flashback, the content covered.	Decision making
Teacher self-evaluation	Write down the challenges encountered during the lesson.		

PART III. UNIT DEVELOPMENT

UNIT1: MEDICAL PATHOLOGIES OF EYE

(Blepharitis, Conjunctivitis, Myopia, Hyperopia/Hypermetropia, and Cataract).

1.1. Key unit competence:

Take appropriate decision on different common medical pathologies of the eyes.

1.2. Prerequisite (knowledge, skills, attitudes, and values)

To achieve the above competence, the associate nurse student needs the following prerequisites: human body anatomy and physiology, fundamentals of Nursing, pharmacology.

1.3. Cross-cutting Issues to be addressed

1.3.1. Standardization culture

In health care system, the most case of patients are presented with medical pathology of eye such conjunctivitis, blepharitis, myopia, hypermetropia and cataract. The learners have to learn eye diseases in order to handle and to manage the patients with eye related diseases.

1.3.2. Inclusive education

The teacher involves the students in all learning activities concerning the kind of learner or disabilities for example the slow learner should be reinforced in order to catch up others, and the teacher takes into consideration respective disability of learner.

Grouping students: Students with special educational needs are grouped with others and assigned roles basing on individual student's abilities. Providing earning resources earlier before teaching session so that students get familiar with them. After end lesson assessment, the identified slow learners are exposed to the remedial learning activities.

Every important point is written and spoken. The written points help students with hearing impairment and speaking aloud helps students with visual impairment. Remember to repeat the main points of the lessons.

1.3.3. Gender education

Emphasize to learners that anybody irrespective of their gender can have medical career mainly medical sciences. Give role models who are successful medical pathology of eye in the area where the learners come from. Make sure that during classroom teaching and skills lab demonstration both boys and girls shares and participate equally in practices, arranging and proper hygiene after classroom and skills lab teaching session.

1.4 Guidance on the introductory activity

This introductory activity helps you to engage learners in the introduction of medical pathology of eye and invite the learners to follow the next lessons.

Teacher's activity:

- Ask students to read the text and discuss the given questions.
- Engage students in working collectively the activity
- Help students with different problems

- Ask any four to present their findings while others are following.
- Prepare trip field to nearest health facility in order to be familiar with ophthalmic equipment, and health assessment for screening eye disorders
- Invite guest person who has specialty in ophthalmology domain to teach the learners

1.5. List of Lessons/sub-headings (including assessment)

#	Lesson Title	Learning Objectives	Number of Periods
1	Introduction of Medical Pathologies of Eyes.(definition, causes, signs and symptoms, pathophysiology of Blepharitis)	• List the common medical pathologies of eyes: Blepharitis, conjunctivitis, myopia, Hypermetropia and cataract • Define the term “blepharitis” • Describe causes, risk factors and pathophysiology of Blepharitis • Describe the signs and symptoms of Blepharitis.	1
2	Description of Blepharitis (investigations, diagnosis, treatment plan, evolution and complications)	• Enumerate the investigations requested for patient with Blepharitis • Identify the adequate medical diagnosis of Blepharitis • Develop a treatment plan of patient with Blepharitis • Explain the evolutionand complications of Blepharitis.	1

3	Description of Conjunctivitis(definition, causes, signs and symptoms, pathophysiology)	• Define the term “conjunctivitis” • Describe causes, risk factors and pathophysiology of different types of conjunctivitis. • Describe the signs and symptoms of different types of conjunctivitis.	1
4	Description of Conjunctivitis (investigation diagnosis, treatment plan, evolution and complication)	• Enumerate the investigations requested for patient different types of conjunctivitis. • Identify the adequate medical diagnosis of different types of conjunctivitis. • Develop a treatment plan of conjunctivitis. • Explain the evolutionand complications of different types of conjunctivitis.	1
5	**Description of Myopia (definition, causes, signs and symptoms, pathophysiology)**	• Define the term “myopia” • Describe causes, risk factors and pathophysiology of Myopia. • Describe the signs and symptoms of Myopia. • Enumerate the investigations requested for patient with Myopia. • Identify the adequate medical diagnosis of Myopia	1
6	**Description of Myopia (investigations,** **Medical diagnosis, treatment plan, evolution and complication)**	• Enumerate the investigations requested for patient different types of myopia • Describe the way used for adequate medical diagnosis of myopia. • Develop a treatment plan of patient with Myopia. • Explain the evolutionand complications of Myopia.	1

7	Description of Hypermetropia (definition, causes, signs and symptoms, pathophysiology)	• Define the term “hypermetropia” • Describe causes, risk factors and pathophysiology of Hypermetropia • Describe the signs and symptoms of Hypermetropia.	1
8	**Descri**ption of Hypermetropia (investigations, medical diagnosis, treatment plan, evolution and complication)	• Enumerate the investigations requested for patient with Hypermetropia • Describe the way used for the adequate medical diagnosis of Hypermetropia • Develop a treatment plan for patient with Hypermetropia • Explain the evolutionand complications of Hypermetropia.	1
9	Description of Cataract(definition, causes, signs and symptoms, pathophysiology)	• Define the term “cataract” • Describe causes, risk factors and pathophysiology of Cataract. • Describe the signs and symptoms of Cataract.	1
10	Description of Cataract (investigations, Medical diagnosis, treatment plan, evolution and complications)	• Enumerate the investigations requested for patient with Cataract. • Describe the way used for adequate medical diagnosis of Cataract. • Develop a treatment plan for patient with Cataract. • Explain the evolutionand complications of cataract.	1
11	End unit assessment	• Take appropriate decision on different common medical pathologies of eyes • Identify the strengths and gaps of learners on appropriate decision of different common medical pathologies of eyes • Prepare the feedback to individual and class • Organize different additional learning activities	1

Lesson 1: Introduction of Medical Pathologies of Eyes. (Definition, causes, signs and symptoms, pathophysiology of Blepharitis)

a) Prerequisites

This is the first lesson of the first unit on medical pathologies of eyes in sensory system. In this lesson you will be dealing with the common medical pathologies of eyes which are Blepharitis, Conjunctivitis, Myopia, Hypermetropia and Cataract. The first thing to do before starting teaching is to remind learners that they have learnt about structure and function of eyes in biology, health assessment of eyes from fundamentals of nursing, and let them discuss the questions as indicated in introductory activity. In addition, the students will read and try to answer the questions provided in the case study from learning activity 1.1 so that they can prepare themselves for this lesson.

b) Learning objectives

- List the common medical pathologies ofeyes: Blepharitis, conjunctivitis, myopia, Hypermetropia and cataract.
- Define the term “blepharitis”
- Describe causes, risk factors and pathophysiology of Blepharitis
- Describe the signs and symptoms of Blepharitis.

c) Teaching resources

The teacher could avail the Snellen chart, ophthalmoscope and ensure that the students are able to use them. Also, the teacher should present to the students the library textbooks on medical-surgical nursing especially eyes diseases and indicates the pages. All students must have their student’s books. The algorithm or protocols about eyes diseases management must be availed. There is a need of black board and chalks or flipcharts and markers.

d) Learning activities 1.1

Teacher ‘activities and methodology:

- Ask learners to do individually activity 1.1 in their student book and answer the question number 2 and 3.
- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide they answers
- Ask other students to follow carefully the answers provided by students

- Note on the blackboard, flipchart, and whiteboard the main students' ideas.
- Tick the correct responses and correct those ones which are incorrect and try again to complete those which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.

Student's activity

- The students answer the questions individually in learning activity 1.1 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully
- Summarize the content with the teacher and coming up with conclusion.

Expected answers to introductory activity 1.0

1. The human eye is an organ of vision. A vital organ of vision it plays a very important role not only in life but also the human body. The human eye is the organ which gives us the sense of sight, allowing us to learn more about the surrounding world than we do with any of the other four senses. The eye allows us to see and interpret the shapes, colors, and dimensions of objects in the world by processing the light they reflect or emit. The eye is able to see in bright light or in dim light, but it cannot see objects when there is no light
2. Left eye is not normal
3. The left eye is colored in blue while right eye is black pupil
4. The left is small then right
5. Conjunctivitis, cataract, glaucoma, blepharitis, myopia, and hypermetropia .

Expected Answers to Questions from Learning Activity 1.1

1. The different external parts of the eye structures that have been affected: Eyelid, iris, pupil, sclara, conjunctiva (palpebral and bulbar)
2. The signs and symptoms that patient present are discharges, swollen right eyelid, burning sensation causing itching of right eye, itching of right eye
3. Conjunctivitis, blepharitis, eye infection

Lesson 2: Description of Blepharitis (investigation diagnosis, treatment plan, evolution and complication)

a) Revision

This is the second lesson of the first unit on medical pathologies of eyes in sensory system. In this lesson you will be dealing with the description of blepharitis such its investigation, diagnosis treatment plan evolution and complication. The first thing to do before starting teaching is to remind learners that they have learnt about lesson one of blepharitis

b) Learning objectives

After completion of this lesson, the student will be to:

- Enumerate the investigations requested for patient with Blepharitis
- Identify the adequate medical diagnosis of Blepharitis
- Develop a treatment plan of patient with Blepharitis
- Explain the evolution and complications of Blepharitis.

c) Teaching resources

The teacher could avail the Snellen chart and slip lamp and ensure the students are able to use them. In addition, the teacher should present to the students the library textbooks on medical-surgical nursing especially Eyes Diseases and indicates the pages. All students must have their student's books. There is need of black board and chalks or flipcharts and markers. Algorithms about assessment and management of conjunctivitis must also be displayed

d) Learning activities

Teacher's activities and methodology

- Ask learners to do individually activity 1.2 in their student book and answer the questions related.
- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide they answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student's ideas.
- Tick the correct responses and correct those ones, which are incorrect and try again to complete those, which are incomplete.

- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.
- Use brainstorming while collecting the answers from different learners.
- Judge the answers from learners by conforming the right responses.

Student's activities

- The students answer the questions individually in learning activity 1.2 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully
- Summarize the content with the teacher and coming up with conclusion.
- Attempt to answer the self-assessment questions 1.1

Lesson 3: Description of conjunctivitis (definition, causes, signs and symptoms, pathophysiology)

a) Prerequisites

This is the fourth lesson of the first unit about medical pathologies of the Eyes. In this lesson, you will be dealing with the description of different types of conjunctivitis: viral conjunctivitis, bacterial conjunctivitis, and allergic conjunctivitis. The first thing to do before starting teaching is to remind learners what they have learnt about the anatomy and physiology of the visual system (Eyes), health assessment of visual system from fundamentals of nursing. The students will discuss the questions from the case study from learning activity 1.2 so that they can prepare themselves for this lesson.

b) Learning objectives:

After completion of this lesson, the student will be able to:

- Define the term "conjunctivitis"
- Describe causes, risk factors and pathophysiology of different types of conjunctivitis.
- Describe the signs and symptoms of different types of conjunctivitis.

c) Teaching resources

The teacher could avail the Snellen chart and Ophthalmoscope and ensure the students are able to use them. In addition, the teacher should present to the students the library textbooks on medical-surgical nursing especially Eyes Diseases and indicates the pages. All students must have their student's books.

There is need of black board and chalks or flipcharts and markers. Algorithms about assessment and management of conjunctivitis must also be displayed.

d) Learning activities

Teacher's activities and methodology

- Ask learners to do individually activity 1.2 in their student book and answer the questions related.
- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide they answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student's ideas.
- Tick the correct responses and correct those ones, which are incorrect and try again to complete those which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.
- Use brainstorming while collecting the answers from different learners.
- Judge the answers from learners by conforming the right responses.

Student's activities

- The students answer the questions individually in learning activity 1.3 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully
- Summarize the content with the teacher and coming up with conclusion.
- Attend the library for reading related book of eye condition
- Attempt to answer the self-assessment questions 1.3

The expected answers from Questions of learning activity1.2

1. The signs and symptoms that the patient was presenting are sticky eyelids, watery and green ocular discharge, redness, soreness and slightly blurred vision in both eyes for about 3 weeks.

Other additional information you would ask the patient to guide about the medical diagnosis:

- Is there anyone from the family who had same symptoms?
- Past medical and surgical history

2. Conjunctivitis, infection of the eye, inflammation of the eye, eye diseases etc
3. The risk factors that exposed the patient to develop that medical condition:

- Other medical condition: flu syndrome
- Poor hygiene
- Possible answers for the questions
- Risk factors include exposure to infected individuals, fomite contact (e.g., towels, napkins, pillow, slit-lamp, chin rests and handles), wear, sinusitis, immunodeficiency states, prior ocular disease, trauma, and exposure to agents of sexually transmitted disease at birth.
- Poor hygiene
- Contact lens misuse
- Contaminated personal articles
- Crowded living or social conditions (elementary schools, military barracks)
- History of ocular diseases including dry eye, blepharitis, and anatomic abnormalities of the ocular surface and lids
- Recent ocular surgery, exposed sutures, or ocular foreign bodies
- Chronic use of topical medications
- Immune compromise
- Winter/Summer months (bacterial conjunctivitis peaks in the winter and viral conjunctivitis peaks in the summer) etc.

Lesson 4: Description of Conjunctivitis (investigation, diagnosis treatment plan, evolution and complication)

a) Revision

This is the four lesson of the first unit about medical pathologies of the eyes. In this lesson, you will be dealing with the investigations, diagnosis, treatment plan, evolution and complications of conjunctivitis. The first thing to do before starting teaching is to remind learners what they have learnt in the lesson three.

b) Learning objectives:

After completion of this lesson, the student will be able to:

- Enumerate the investigations requested for patient different types of conjunctivitis.

- Describe the way used for adequate medical diagnosis of different types of conjunctivitis.
- Develop a treatment plan for patient with different types of conjunctivitis.
- Explain the evolution and complications of different types of conjunctivitis

c) Teaching resources

The teacher could avail the Snellen chart and Ophthalmoscope and ensure the students are able to use them. Also, the teacher should present to the students the library textbooks on medical-surgical nursing especially Eyes Diseases and indicates the pages. All students must have their student's books. There is need of black board and chalks or flipcharts and markers. Algorithms about assessment and management of conjunctivitis must also be displayed.

d) Learning activities

Teacher's activities and methodology

- Ask learners to do individually activity 1.2 in their student book and answer the questions related.
- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide they answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student's ideas.
- Tick the correct responses and correct those ones , which are incorrect and try again to complete those which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.
- Use brainstorming while collecting the answers from different learners.
- Judge the answers from learners by confirming the right responses.

Student's activities

- The students answer the questions individually in learning activity 1.3 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully

- Summarize the content with the teacher and coming up with conclusion.
- Attend the library for reading related book of eye condition
- Attempt to answer the self-assessment questions 1.2

The expected answers from Questions of learning activity1.3

1. Investigations requested to that patient: Polymerase chain reaction (PCR), Pus/swab culture.
2. The possible medical diagnosis the patient was having is conjunctivitis that might be bacterial, viral or allergic
3. Different treatments options to this patients' medical condition are: Hygiene: washing hands properly (frequent hand washing and keeping hands away from affected eyes), Cleaning the affected eye using warm compresses, Antibiotics and Corticosteroids (ointments or drops).
4. If not treated well, the complications might be: reduction of visual acuity/ blindness, ciliary flush, infectious keratitis, iritis, glaucoma, photophobia, severe foreign body sensation that prevents the patient from keeping the eye open, corneal opacity, hyperacute bacterial conjunctivitis or epidemic keratoconjunctivitis, dry eye, pterygium; blepharoconjunctivitis, etc.

♦ Answers for Self-Assessment 1.2

1. Difference between all types of conjunctivitis basing on their causes:

A. Bacterial conjunctivitis is commonly caused by some microorganisms (staphylococcus aureus, streptococcus pneumoniae, haemophilus influenzae, and moraxella catarrhalis). Staphylococcus aureus infection is more common in adults; the other pathogens are more common in children. It is highly contagious and is spread by direct contact with the patient and their secretions or with contaminated objects and surfaces.

B. Hyperacute bacterial conjunctivitis: Neisseria species, particularly Neisseria Gonorrhoeae, is the major cause of a hyperacute bacterial conjunctivitis that is severe and sight-threatening. The microorganism is usually transmitted from the genitalia to the hands and then to the eyes.

C. Conjunctivitis due to trachoma: most chronic keratoconjunctivitis are caused by recurrent infection with Chlamydia trachomatis.

D. Adult inclusion conjunctivitis: It is a sexually transmitted infection (STI) caused by certain serotypes of Chlamydia trachomatis. The microorganism is usually transmitted from the genitalia to the hands and then to the eyes.

E. Viral conjunctivitis: is typically caused by adenovirus, with many serotypes implicated. Viral conjunctivitis is highly contagious; it is spread by direct contact with the patient and their secretions or with contaminated objects and surfaces.

F. Allergic conjunctivitis: Is caused by airborne allergens contacting the eye that trigger a classic type I immunoglobulin E (IgE)-mediated hypersensitivity response specific to that allergen.

G. Noninfectious, non-inflammatory conjunctivitis: patients can develop a red eye and discharge that is not related to either an infectious or inflammatory process. Usually the cause is a transient mechanical or chemical insult.

1) Using a table, here is the difference between bacterial, viral, and allergic conjunctivitis basing on their symptoms:

Symptoms	**Bacteria**	**Viral**	**Allergic**
Systemic symptoms	Usually none	May be part of a viral prodrome followed by adenopathy, fever, pharyngitis, and upper respiratory tract infection. There may be an enlarged and tender pre-auricular node.	Nasal congestion, sneezing, wheezing.
Itching	Limited to none	Limited to none. Primary complaint is grittiness, burning or irritation.	Primary and major complaint. May also report grittiness, burning, or irritation.
Ocular discharge	Purulent, may be yellow, white, or green. Recurs at lid margins and corners of the eye within minutes of wiping lids.	Watery with strands of mucus.	Watery
Conjunctival appearance	Pink or red	Pink or red. Very rarely hemorrhagic. Palpebral conjunctiva may have a follicular appearance.	Pink. Bulbar conjunctiva may be chemotic (puffy). Palpebral conjunctiva may have a follicular or appearance

2) The rationale of taking swabs from discharges for laboratory analysis among the patients with conjunctivitis is:

It is important in cases of chronic conjunctivitis or when the condition is not responding/fail to improve or to respond to treatment. It also helps in guiding about the medications that must be taken as sensitive to any specific type of microorganisms. The management guide should come from the results from swabs culture.

3) The treatments modalities specific to each type of conjunctivitis:

Bacterial conjunctivitis: antibiotic treatment is required for acute conjunctivitis in contact lens wearers as well as for cases of adult inclusion conjunctivitis or hyperacute bacterial conjunctivitis. Preferred choices include erythromycin, azithromycin, chloramphenicol ophthalmic ointment or trimethoprim-polymyxin B drops. Common alternative therapies include bacitracin ointment and bacitracin-polymyxin B ointment. Fluoroquinolones are not first-line therapy for routine cases of bacterial conjunctivitis because of concerns regarding emerging resistance and cost.

Adult inclusion conjunctivitis treatment: Antibiotic treatment for adult inclusion conjunctivitis requires systemic therapy (typically with doxycycline, tetracycline, erythromycin, or azithromycin) to eradicate the Chlamidia trachomatis infection.

Viral conjunctivitis: there are no specific topical or systemic antiviral agents for the treatment of viral conjunctivitis. Symptomatic relief may be achieved with: topical antihistamine/decongestants, warm or cool compresses, nonantibiotic lubricating agents such as those used for noninfectious conjunctivitis.

Allergic conjunctivitis: The first step is to remove or avoid the irritant, if possible. Cool compresses and artificial tears sometimes relieve discomfort in mild cases. In more severe cases, nonsteroidal anti-inflammatory medications and antihistamines may be prescribed. People with persistent allergic conjunctivitis may also require topical steroid eye drops. Oral antihistamines may also be prescribed.

Toxic conjunctivitis: the primary approach to toxic conjunctivitis is recognition and removal of the offending agent. Stopping as many topical agents as feasible is a good first step.

Noninfectious noninflammatory: Symptoms relief with the use of topical lubricants might be useful.

Chemical conjunctivitis: careful flushing of the eyes with saline is a standard treatment for chemical conjunctivitis. People with chemical conjunctivitis also may need to use topical steroids. Severe chemical injuries, particularly alkali burns, flush the eye for several minutes with a lot of water before seeing your medical provider.

Persistent symptoms: patients with acute bacterial conjunctivitis usually respond to treatment within one to two days by showing a decrease in discharge, redness, and irritation. Patients who do not respond should be referred to an ophthalmologist.

Some effective behaviour change activities that are needed to prevent seriousness and complications of conjunctivitis:

- **Preventing contagion:** Infected individuals should not share handkerchiefs, tissues, towels, cosmetics, linens, or eating utensils. Frequent hand washing and keeping hands away from eyes also can make a difference, even when no problems are present.
- Avoid allergy triggers as much as possible
- Need for examination or consultation prior to therapy: Otherwise, the eye examination must be done carefully and rely on findings to decide the management. Complications of conjunctivitis are the major reasons for urgent ophthalmologic referral.

4) The warning signs and symptoms of eye diseases that must prompt urgent referral to ophthalmologist:

reduction of visual acuity; photophobia; severe foreign body sensation that prevents the patient from keeping the eye open; corneal opacity; fixed pupil; severe headache with nausea; suspicion for hyperacute bacterial conjunctivitis or epidemic keratoconjunctivitis (EKC); dry eye; medicamentosa; pterygium; blepharoconjunctivitis and adult inclusion conjunctivitis; etc.

♦ Answers to Application Activity 1.2

1. The medical condition that this patient was suffering from: Bacterial conjunctivitis or hyperacute bacterial conjunctivitis
2. The possible risk factors that contributed to the development of such medical condition: lack of water access, possible urinary tract infection (lower abdominal pain and dysuria), foreign body in the eye, flu like syndrome
3. Why chloramphenicol (0.5%) was stopped until the laboratory results are available: the Laboratory results were needed to guide the antibiogram basing on types of microorganisms identified from culture and the sensitivity test.
4. The warning signs that show that the patient had complications and different complications she should experience:

Warning signs: sticky eyelids, pus like discharge, lack of improvement after antibiotic uses, photophobia.

Complications: hyperacute bacterial conjunctivitis, keratoconjunctivitis, infectious keratitis

5. The elements that should constitute the management plan of this patient:
    - Health education about frequent hand washing and keeping hands away from the infected eyes
    - Health education about urinary tract infections screening
    - Health education about pathogenesis and complications of eyes diseases and relationship between eyes diseases with poor hygiene
    - To request all needed investigations (urine culture, eyes swabs culture, complete blood count, renal function tests, liver function tests, and
    - Antibiotics and other symptoms relief management (cool compresses in cleaning secretions
6. The interventions you would advise her to do in order to minimize the seriousness of complication and avoid cross-transmission to other family members:
    - Preventing contagion: Practice frequent hand washing and keeping hands away from eyes also can make a difference. Avoid touching the normal eye after touching infected eye.
    - Avoid allergy triggers as much as possible
    - Need for examination or consultation prior to therapy: Otherwise, the eye examination must be done carefully and rely on findings to decide the management. Complications of conjunctivitis are the major reasons for urgent ophthalmologic referral.
    - Effective use of antibiotics prescribed
    - Respect of appointment for follow up

Lesson 5: Description of Myopia (definition causes, signs and symptoms, pathophysiology)

This is the fifth lesson in the unit 1 of medical pathologies of eyes, lesson deals with definition of myopia, causes, pathophysiology, clinical manifestation, and medical investigation of myopia.

a) Prerequisite

For successful teaching and learning process of this lesson, learners should have enough knowledge of the different parts of the eye and the function of the eye that they have already studied in the previous lessons of biology, in addition the learners should have the overview of physic especially in optic lesson. They should be well skilled in drawing the structure of the eye.

- Students to recall the main parts of the structure of the eyes and their functions

- The knowledge and skills about optic principles in physic and eyes function (accommodation of the eyes)

b) Learning objectives

After completion of this lesson, the student will be able to:

- Define the key concepts of myopia
- List the common causes and pathophysiology of myopia
- List the different signs and symptoms of myopia
- Describe briefly medical investigations for myopia

c) Teaching resources

This lesson will be taught with different aids and methods in order to achieve learning objectives. The teaching materials are white board, flip chart, marker, computer, Snellen chart, tape measure, textbook, and videos. The teaching methods are interactive lecture, Group discussion, course work and trip field or guest teacher. In addition to the teacher's guide, the learners where they can find the supporting resources such computer lab, Nursing skills lab and Library.

d) Learning activities

Learning activities should be directly related to the learning objectives of the course and provide experiences that will enable students to engage in practice and gain feedback on specific progress towards those objectives. The various learning activities will be carried out such as: taking notes, course work and reading textbook related to the lesson, group assignment and summarize the content, engagement in debate and other clinical learning activities such as case study.

Teacher's activity:

- Ask learners to do individually activity 1.2 in their student book and answer the questions related.
- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide they answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student's ideas.
- Tick the correct responses and correct those ones, which are incorrect and try again to complete those, which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student

in making that conclusion.

- Use brainstorming while collecting the answers from different learners.
- Judge the answers from learners by confirming the right responses.

Student's activities

- The students answer the questions individually in learning activity 1.5 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully
- Summarize the content with the teacher and coming up with conclusion.
- Attend the library for reading related book of eye condition
- Attempt to answer the self-assessment questions 1.5

♦ Answer to activity 1.3

1. Difficulty reading road signs and seeing distant objects clearly, eye strain and headaches, trouble seeing things that are far away, needing to squint to see clearly, eye strain
2. Basing on those signs and symptoms, what could be the medical problem of this patient?
3. The medical problem of this patient could be myopia.
4. What medical investigations might you expect to be ordered to guide the confirmation of the medical problem?
   - The Snellen eye chart is considered one of the clinical standards for evaluating visual acuity
   - A retinoscopy and pinhole occlude could be performed by an ophthalmologist

Lesson 6: Description of Myopia (investigation, diagnosis, treatment plan, evolution and complication)

This is the Sixth lesson in the unit 1 of medical pathologies of eyes, lesson deals with the medical and nursing management of myopia.

a) Revision

This is the fifth lesson of the first unit about medical pathologies of the eyes. In this lesson, you will be dealing with the investigation, diagnosis, treatment plan,

evolution and complication of myopia. The first thing to do before starting teaching is to remind learners what they have learnt lesson five.

b) Learning objectives

After completion of this lesson, the learner will be able to:

- Enumerate the investigations requested for patient different types of myopia
- Describe the way used for adequate medical diagnosis of myopia.
- Develop a treatment plan of patient with Myopia.
- Explain the evolution and complications of Myopia.

c) Teaching resources

This lesson will be taught with different aids and methods in order to achieve learning objectives. The teaching materials are white board, flip chart, marker, computer, Snellen chart, and library textbook. The teaching methods are interactive lecture, Group discussion, and trip field or guest teacher. In addition to the teacher's guide, the learners can find the supporting resources such computer lab, Nursing skills lab, Library and clinical placement)

d) Learning activities

Learning activities should be directly related to the learning objectives of the course and provide experiences that will enable students to engage in practice and gain feedback on specific progress towards those objectives. The various learning activities will be carried out such as: taking notes, course work and reading textbook related to the lesson, group assignment and summarize the content, engagement in debate and other clinical learning activities such as case study.

Teacher's activity:

- Ask learners to do individually activity 1.2 in their student book and answer the questions related.
- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide they answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student's ideas.
- Tick the correct responses and correct those ones which are incorrect and try again to complete those which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student

in making that conclusion.

- Use brainstorming while collecting the answers from different learners.
- Judge the answers from learners by confirming the right responses.

♦ Answers to activity 1.3

1) The decision to treat refractive disorders depends on the individual patient's symptoms and needs. Treatment is aimed to improve visual acuity, visual comfort
2) First-line treatments include corrective lenses, such as glasses and contact lenses, or refractive surgery, Eyeglasses, Contact lenses, Refractive surgery
3) Cataract formation, retinal detachment from peripheral retinal tears, retinal detachment, dome-shaped macula, choroidal/scleral thinning, myopic choroidal, limitations in instrumental activities of daily living (IADLs) falls, decreased ability to drive or work, and depression etc.

♦ Answers for self-assessment 1.3

1) The Five signs and symptoms of myopia are:

- Difficulty seeing distant objects clearly
- Eye strain
- Frontal headaches
- Trouble seeing things that are far away,
- Squinting to see clearly
- Eye strain
- Being fatigued

2) The three preventive measures for myopia complications development are:

- Take breaks when using computers or cell phones.
- Prevent myopia from worsening, spend time outside and try to focus on objects that are in the distance.
- Vision therapy. .
- The use of progressive or bifocal lenses (spectacles or contact lenses) may yield a slowing of myopia by limiting eye accommodation.

3) The three cause and risk factors of myopia are:

- Genetic factors
- Increased intraocular pressure
- Prolonged reading or reading at close range
- Diabetes mellitus
- Trauma of the retina
- maternal smoking during pregnancy

4) The three main medical treatment options to correct nearsightedness are:

Prescription of eyeglasses, contact lenses or refractive surgery

Lesson7: Description of Hypermetropia (definition, causes, signs and symptoms, pathophysiology)

a) Preriquisites

This is the Seventh lesson of the first unit Medical pathologies of eyes. In this lesson you will be dealing with the meaning of Hypermetropia or Hyperopia. Before to do start thinking is to remind learners that they have learnt about structure and function of the eye in Biology and let the learners discuss the meaning of refractive errors so that they may get prepared for this lesson. Proceed with the lesson by introducing to them the learning activity 3.1 in the students 'books.

b) Learning objectives

On completion of this lesson, the learner will be able to:

- Define the term ''hypermetropia''
- Describe the signs and symptoms of hypermetropia.
- Describe causes, risk factors and pathophysiology of Hypermetropia
- Identify the adequate medical diagnosis of Hypermetropia
- Describe the investigations requested for patient with Hypermetropia

a) Teaching resources

This lesson will be taught with different aids and methods in order to achieve learning objectives. The teaching aids are white board, flip chart, markers, computers and projectors, Snellen chart, flipchart, and library textbook. The teaching methods are interactive lecture, Group discussion, and field trip. In addition to the teacher's guide, the learners can find the supporting resources such computer lab, Nursing

skills lab and Library.

Teacher's activity:

- Guide learners to form groups of five learners
- Provide learners with textbooks and guide them to brainstorm the concept related to the refractive errors (Hyperopia).
- Supervise the work where the learners are grouped in small group of five learners and teacher facilitates them to answer the questions by using the case study.
- Invite some of the learner's group members to present their findings.
- Judge the logic of the learners' products by correcting those that are false, complete those which are incomplete and confirming those which are correct
- Engage the learners to the clinical settings (Ophthalmology department)
- Help learners to summarize what they have learnt.

Student's activities

- The students answer the questions individually in learning activity 1.4 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully
- Summarize the content with the teacher and coming up with conclusion.
- Attend the library for reading related book of eye condition
- Attempt to answer the self-assessment questions 1.3

Answers for learning activity 1.4

1. The problem may be hypermetropia (hyperopia or farsightedness)
2. Headache, blurred vision, eye discomfort, difficult in reading his newspapers as he did before, he states that he could clearly read only the written scripture that are far from him
3. Eye muscle test and Visual Acute Test using Snellen chart

Lesson 8: Description of Hypermetropia (investigation diagnosis, treatment plan, evolution and complication)

a) Revision

This is the eight lesson of the first unit about medical pathologies of the eyes. In this lesson, you will be dealing with the investigation, diagnosis, treatment plan, evolution and complication of hypermetropia. The first thing to do before starting teaching is to remind learners what they have learnt lesson five

b) Learning objectives

On completion of this lesson, the learner will be able to:

- Enumerate the investigations requested for patient with Hypermetropia
- Describe the way used for the adequate medical diagnosis of Hypermetropia
- Develop a treatment plan for patient with Hypermetropia
- Explain the evolution and complications of Hypermetropia.

c) Teaching resources

This lesson will be taught with different aids and methods in order to achieve learning objectives. The teaching materials are white board, flip chart, markers, computers and projectors, Snellen chart, flipchart, and library textbook. The teaching methods are interactive lecture, Group discussion, and field trip. In addition to the teacher's guide, the learners can find the supporting resources such computer lab, Nursing skills lab and Library.

d) Learning activities

Teacher's activity:

- Guide learners to form groups of five learners
- Provide learners with textbooks and guide them to brainstorm the concept related to the refractive errors (Hyperopia).
- Supervise the work where the learners are grouped in small group of five learners and teacher facilitates them to answer the questions by using the case study and textbook from school library.
- Invite some of the learner's group members to present their findings.
- Judge the logic of the learners' products by correcting those that are false, complete those which are incomplete and confirming those which are correct
- Engage the learners to the clinical settings (Ophthalmology department)
- Help learners to summarize what they have learnt.

Student's activities

- The students answer the questions individually in learning activity 1.4 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully
- Summarize the content with the teacher and coming up with conclusion.
- Attend the library for reading related book of eye condition
- Attempt to answer the self-assessment questions 1.3

♦ Answers for learning activity 1.3

1. The current treatment of hyperopia evolves and can be corrected with eyeglasses, contact lenses, bifocal Glasses those includes:
   - Glasses: This the standard treatment for all children and adult for the majority
   - Contact lens: contacts are great option, you can change the color of the patient eyes and this could be tried during a contact lens examination.
   - Bifocal glasses: This is an excellent and effective treatment for moderate levels of hyperopia in you people as it enhances a young person's ability to see up and far away
2. Farsightedness can be associated with several problems, such as:
   - Crossed eyes: Some children with farsightedness may develop crossed eyes. Specially designed eyeglasses that correct for part or all of the farsightedness may treat this problem'
   - Reduced quality of life: With uncorrected farsightedness, the patient might not be able to perform a task as well as he/she wish. Moreover, the limited vision may detract from the patient enjoyment of day-to-day activities.
   - Eyestrain: Uncorrected farsightedness may cause the patient to squint or strain the eyes to maintain focus. This can lead to eyestrain and headaches.

♦ Answers to Self-assessment

1. The two signs of hypermetropia include blurred vision, the patient may need to squint to see clearly, eyestrain, burning sensation of the eyes and aching in or around the eyes, general eye discomfort or a headache after doing close tasks such as reading, writing, computer work or drawing
2. The causes of hyperopia include axial shortening of the eyeball. Flattening of the cornea, change in the refractive index of the crystalline lens, malposition or absence of the crystalline lens.
3. The investigations to confirm hypermetropia includes Visual acute Test, Visual field Test, Slit-lamp examination, ophthalmoscopy or Fundus copy.
4. The options of hyperrmetropia treatment are: Eye glasses, Contacts lens, bifocal glasses
5. The complications of hypermetropia includes Crossed eyes, reduced quality of life, eyestrain, impaired safety, financial burden.

Lesson 9: Description of Cataract (definition, causes, signs and symptoms, pathophysiology)

This is the Ninth lesson in the unit 1 of medical pathologies of eyes, lesson deals with definition of cataract, causes, pathophysiology, clinical manifestation, and medical investigation of cataract.

a) Prerequisite

For successful teaching and learning process of this lesson, learners should have enough knowledge of the different parts of the eye and the function of the eye that they have already studied in the previous lessons of biology. They should be well skilled in drawing the structure of the eye.

b) Learning objectives

On completion of this lesson, the learner will be able to:

- Define the term “cataract”
- Describe causes, risk factors and pathophysiology of Cataract.
- Describe the signs and symptoms of Cataract.

c) Teaching resources

This lesson will be taught with different aids and methods in order to achieve learning objectives. These teaching aids are white board, flip chart, marker, computer, Snellen chart, tape measure textbook, and videos. The teaching methods are interactive lecture, Group discussion, and course work. In addition to the teacher’s

guide, the learners where they can find the supporting resources such computer lab, Nursing skills lab and Library.

d) Learning activities

Learning activities should be directly related to the learning objectives of the course and provide experiences that will enable students to engage in practice, and gain feedback on specific progress towards those objectives. The various learning activities will be carried out such as: taking notes, course work and reading textbook related to the lesson, group assignment and summarize the content, engagement in debate and other clinical learning activities such as case study.

Teacher's activity:

- Ask the learners to brainstorm the meaning of myopia, identify the common signs and symptoms of the patient with cataract
- Teacher guide to use textbook in school library, computer lab.
- Supervise the work where the learners are grouped in small group of 5 learners and teacher facilitates them to find the books which are related the subjects
- After 30 minutes, ask learners to comeback and to present what they have done in their groups
- Help learners to summarize what they have learnt.
- Engage the learners to the clinical settings (Ophthalmology department)

Student's activities

- The students answer the questions individually in learning activity 1.4 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully
- Summarize the content with the teacher and coming up with conclusion.
- Attend the library for reading related book of eye condition
- Attempt to answer the self-assessment questions 1.4

♦ Answer to activity 1.4

1. Differentiate the normal and abnormal eye on the above observed diagram
   - Right eye is big than left eye,
   - Right eye has black color pupil, and
   - Left eye blue color
2. Which diseases do you think could affect the abnormal eyes?

Common Eye Disorders and Diseases

- Refractive Errors.
- Age-Related Macular Degeneration.
- Cataract.
- Diabetic Retinopathy.
- Glaucoma.
- Amblyopia.
- Strabismus.

♦ Answers to self-assessment 1.4

a) The most common symptoms of cataracts include:

- Clouded, blurred or dim vision
- Increasing difficulty with vision at night
- Sensitivity to light and glare
- Need for brighter light for reading and other activities
- Seeing “halos” around lights
- Frequent changes in eyeglass or contact lens prescription
- Fading or yellowing of colors
- Double vision in a single eye

1) The causes of cataract are:

Most cataracts develop when aging or injury changes the tissue that makes up the eye’s lens. Proteins and fibers in the lens begin to break down, causing vision to

become hazy or cloudy.

Some iherited genetic disorders that cause other health problems can increase your risk of cataracts. Cataracts can also be caused by other eye conditions, past eye surgery or medical conditions such as diabetes. Long-term use of steroid medications, too, can cause cataracts to develop.

2) The types of cataract are:

Cataract types include:

- Cataracts affecting the center of the lens (nuclear cataracts).
- Cataracts that affect the edges of the lens (cortical cataracts
- Cataracts that affect the back of the lens (posterior subcapsular cataracts
- Cataracts you're born with (congenital cataracts)

3) The complications of cataract are:

Over time, cataracts become worse and start to interfere with vision. Important skills can be affected, such as driving, and loss of vision can affect the overall quality of life in many ways including reading, working, hobbies and sports. If left untreated, cataracts will eventually cause total blindness.

1.6. Summary of the unit

Medical pathology is a branch of medical science primarily concerning the diseases affects different human organs such as respiratory tract organs, cardio-vascular organs, digestive organs, urino-genetal organs, sensory organs etc. This unit of medical pathology of the eye described the most common eye conditions that met in Rwanda such conjunctivitis, blepharitis, myopia, hypermetropia, and cataract. This unit describes the eye conditions by providing their definition, clinical features, investigation, treatment plan, evolution and complications. The student who learns this content will be able to take appropriate decision on different common medical pathologies of eyes in terms of diagnosing, treatment and prevent the complication of conjunctivitis, blepharitis, myopia, hypermetropia, and cataract.

1.7 Additional Information for teachers

Common additional eye disorders and diseases.

- Diabetic Retinopathy.
- Glaucoma.
- Amblyopia.

- Strabismus.

Age-Related Macular Degeneration.

Definition

Age-related macular degeneration (AMD) is a common condition that affects the middle part of your vision. It usually first affects people in their 50s and 60s.

It does not cause total blindness. However, it can make everyday activities like reading and recognizing faces difficult.

Without treatment, your vision may get worse. This can happen gradually over several years ("dry AMD"), or quickly over a few weeks or months ("wet AMD").

The exact cause is unknown. It has been linked to smoking, high blood pressure, being overweight and having a family history of AMD.

Symptoms

The first symptom is often a blurred or distorted area in your vision.

Other symptoms include:

- seeing straight lines as wavy or crooked
- objects looking smaller than normal
- colors seeming less bright than they used to
- seeing things that are not there (hallucinations)

Diagnosis

- Sometimes the patient may be referred to an eye doctor (ophthalmologist).
- This is usually only necessary if there is a possibility the patient will need to start treatment quickly within a day.
- The patient may have more tests, such as a scan of the back of the eyes.

If the patient is diagnosed with AMD, the specialist will give the information about the type of disease and the treatment options.

Treatment depends on the type of AMD you have.

- Dry AMD – there is no treatment, but vision aids can help reduce the effect on the patient life. Read about living with AMD.
- Wet AMD – you may need regular eye injections and, very occasionally, a light treatment called photodynamic therapy, to stop your vision getting worse.

1) Glaucoma

Definition

Glaucoma is a condition that damages your eye's optic nerve. It gets worse over time. It's often linked to a buildup of pressure inside your eye. Glaucoma tends to run in families. You usually don't get it until later in life.

The increased pressure in the eye, called intraocular pressure, can damage your optic nerve, which sends images to your brain. If the damage worsens, glaucoma can cause permanent vision loss or even total blindness within a few years..

If you lose vision, it can't be brought back. But lowering eye pressure can help you keep the sight you have. Most people with glaucoma who follow their treatment plan and have regular eye exams are able to keep their vision.

Glaucoma Causes

The fluid inside your eye, called aqueous humor, usually flows out of your eye through a mesh-like channel. If this channel gets blocked, or the eye is producing too much fluid, the liquid builds up. Sometimes, experts don't know what causes this blockage. But it can be inherited, meaning it's passed from parents to children

Less-common causes of glaucoma include a blunt or chemical injury to your eye, severe eye infection, blocked blood vessels inside your eye, and inflammatory conditions. It's rare, but eye surgery to correct another condition can sometimes bring it on. It usually affects both **eyes,** but it may be worse in one than the other.

Glaucoma Risk Factors

It mostly affects adults over 40, but young adults, children, and even infants can have it. African American people tend to get it more often, when they're younger, and with more vision loss.

- Are over 40
- Have a family history of glaucoma
- Are nearsighted or farsighted
- Have poor vision
- Have diabetes
- Take certain steroid medications such as prednisone
- Take certain drugs for bladder control or seizures, or some over-the-counter cold remedies
- Have had an injury to your eye or eyes

- Have corneas that are thinner than usual
- Have high blood pressure, heart disease, diabetes, or sickle cell anemia
- Have high eye pressure

Types of Glaucoma

There are two main kinds:

Open-angle glaucoma: this is the most common type. The doctor may also call it wide-angle glaucoma. The drain structure in your eye (called the trabecular meshwork) looks fine, but fluid does not flow out, as it should.

Angle-closure glaucoma: This is more common in Asia. The patient may also hear it called acute or chronic angle-closure or narrow-angle glaucoma. The eye does not drain, as it should because the drain space between iris and cornea becomes too narrow. This can cause a sudden buildup of pressure in your eye. It is also linked to farsightedness and cataracts, a clouding of the lens inside the eye.

Less common types of glaucoma include:

Secondary glaucoma. This is when another condition, like cataracts or diabetes, causes added pressure in the eye.

Normal-tension glaucoma. This is when the patient has blind spots in the vision or the optic nerve is damaged even though the eye pressure is within the average range. Some experts say it is a form of open-angle glaucoma.

Pigmentary glaucoma. With this form, tiny bits of pigment from your iris, the colored part of your eye, get into the fluid inside your eye and clog the drainage canals.

Glaucoma Symptoms

Most people with open-angle glaucoma do not have symptoms. If symptoms do develop, it is usually late in the disease. That is why glaucoma is often called the “sneak thief of vision.” The main sign is usually a loss of side, or peripheral, vision.

Symptoms of angle-closure glaucoma usually come on faster and are more obvious. Damage can happen quickly. If the patient has any of these symptoms, he/she may get medical care right away:

- Seeing halos around lights
- Vision loss
- Redness in your eye
- Eye that looks hazy (particularly in infants)

- Upset stomach or vomiting
- Eye pain

Glaucoma Diagnosis

Glaucoma tests are painless and do not take long. Your eye doctor will test your vision. They will use drops to widen (dilate) your pupils and examine your eyes.

They will check your optic nerve for signs of glaucoma. They may take photographs so they can spot changes at your next visit. They will do a test called tonometry to check the eye pressure. They may also do a visual field test to see if there is a loss of peripheral vision.

If the doctor suspects glaucoma, they may order special imaging tests of the optic nerve.

Glaucoma Treatment

Your doctor may use prescription eye drops, oral medications, laser surgery, or microsurgery to lower pressure in the eye.

Eye drops. These either lower the creation of fluid in the eye or increase its flow out, lowering eye pressure. Side effects can include allergies, redness, stinging, blurred vision, and irritated eyes. Some glaucoma drugs may affect the heart and lungs. Because of potential drug interactions, be sure to tell the doctor about any other medical problems.

Oral medication. The doctor might also prescribe medication to take by mouth, such as a beta-blocker or a carbonic anhydrase inhibitor. These drugs can improve drainage or slow the creation of fluid in the eye.

Laser surgery. This procedure can slightly raise the flow of fluid from the eye if the patient has an open-angle glaucoma. It can stop fluid blockage if the patient has an angle-closure glaucoma. Procedures include:

- Trabeculoplasty. This opens the drainage area.
- Iridotomy. This makes a tiny hole in the iris to let fluid flow more freely.
- Cyclophotocoagulation. This treats areas of the middle layer of the eye to lower fluid production.

2) Trachoma

Trachoma is an infectious disease caused by bacterium Chlamydia trachomatis. [2] The infection causes a roughening of the inner surface of the eyelids.[2] This roughening can lead to pain in the eyes, breakdown of the outer surface or cornea of the eyes, and eventual blindness.[2] Untreated, repeated trachoma infections

can result in a form of permanent blindness when the eyelids turn inward

Signs and symptoms of trachoma

The bacterium has an incubation period of 6 to 12 days, after which the affected individual experiences symptoms of conjunctivitis, or irritation similar to “pink eye”. Blinding endemic trachoma results from multiple episodes of reinfection that maintains the intense inflammation in the conjunctiva. Without reinfection, the inflammation gradually subsides.

The conjunctival inflammation is called “active trachoma” and usually is seen in children, especially preschool children. It is characterized by white lumps in the undersurface of the upper eyelid (conjunctival follicles or lymphoid germinal centres) and by nonspecific inflammation and thickening often associated with papillae. Follicles may also appear at the junction of the cornea and the sclera (limbal follicles). Active trachoma often can be irritating and have a watery discharge. Bacterial secondary infection may occur and cause a purulent discharge

Most commonly, children with active trachoma do not present with any symptoms, as the low-grade irritation and ocular discharge is just accepted as normal, but further symptoms may include:

- Eye discharge
- Swollen eyelids
- Trichiasis (misdirected eyelashes)
- Swelling of lymph nodes in front of the ears
- Sensitivity to bright lights
- Increased heart rate
- Further ear, nose, and throat complications

Cause of trachoma

Trachoma is caused by Chlamydia trachomatis, serotypes (serovars) A, B, and C. It is spread by direct contact with eye, nose, and throat secretions from affected individuals, or contact with fomites (inanimate objects that carry infectious agents), such as towels and/or washcloths, that have had similar contact with these secretions. Flies can also be a route of mechanical transmission. Untreated, repeated trachoma infections result in entropion (the inward turning of the eyelids), which may result in blindness due to damage to the cornea. Children are the most susceptible to infection due to their tendency to get dirty easily, but the blinding effects or more severe symptoms are often not felt until adulthood.

Blinding endemic trachoma occurs in areas with poor personal and family hygiene. Many factors are indirectly linked to the presence of trachoma including lack of

water, absence of latrines or toilets, poverty in general, flies, close proximity to cattle, and crowding.The final common pathway, though, seems to be the presence of dirty faces in children, facilitating the frequent exchange of infected ocular discharge from one child's face to another. Most transmission of trachoma occurs within the family.

Diagnosis

McCallan's classification

Mc Callan in 1908 divided the clinical course of trachoma into four stages:

Stage 1 (incipient trachoma)	Stage 2 (established trachoma)	**Stage** 3 (cicatrising trachoma)	Stage 4 (healed trachoma)
Hyperaemia of palpebral conjunctiva	Appearance of mature follicle & papillae	Scarring of palpebral conjunctiva	Disease is cured or is not markable
Immature follicle	Progressive corneal pannus	Scars are easily visible as white bands	Sequelae to cicatrisation cause symptoms

WHO classification

The World Health Organization recommends a simplified grading system for trachoma. The Simplified WHO Grading System is summarized below:

Trachomatous inflammation, follicular (TF)—Five or more follicles of >0.5 mm on the upper tarsal conjunctiva

Trachomatous inflammation, intense (TI)—Papillary hypertrophy and inflammatory thickening of the upper tarsal conjunctiva obscuring more than half the deep tarsal vessels

Trachomatous scarring (TS)—Presence of scarring in tarsal conjunctiva.

Trachomatous trichiasis (TT)—At least one ingrown eyelash touching the globe, or evidence of epilation (eyelash removal)

Corneal opacity (CO)—Corneal opacity blurring part of the pupil margin

Management

Azithromycin (single oral dose of 20 mg/kg) or topical tetracycline (1% eye ointment twice a day for six weeks). Azithromycin is preferred because it is used as a single

oral dose. Although it is expensive, it is generally used as part of the international donation program organized by Pfizer. Azithromycin can be used in children from the age of six months and in pregnancy. As a community-based antibiotic treatment, some evidence suggests that oral azithromycin was more effective than topical tetracycline, but no consistent evidence supported either oral or topical antibiotics as being more effective. Antibiotic treatment reduces the risk of active trachoma in individuals infected with chlamydial trachomatis.

Surgery

For individuals with trichiasis, a bilamellar tarsal rotation procedure is warranted to direct the lashes away from the globe. Evidence suggests that use of a lid clamp and absorbable sutures would result in reduced lid contour abnormalities and granuloma formulation after surgery.Early intervention is beneficial as the rate of recurrence is higher in more advanced disease.

Lifestyle measures

The WHO-recommended SAFE strategy includes:

- Surgery to correct advanced stages of the disease
- Antibiotics to treat active infection, using azithromycin
- Facial cleanliness to reduce disease transmission
- Environmental change to increase access to clean water and improved sanitation

Children with visible nasal and eyes discharge, or flies on their faces are at least twice as likely to have active trachoma. The children with clean faces can also have it. Intensive community-based health education programs to promote face washing can reduce the rates of active trachoma, especially intense trachoma. If an individual is already infected, washing one's face is encouraged, especially a child, to prevent reinfection. Some evidence shows that washing the face combined with topical tetracycline might be more effective in reducing severe trachoma compared to topical tetracycline alone. The same trial found no statistical benefit of eye washing alone or in combination with tetracycline eye drops in reducing follicular trachoma amongst children

3) Strabismus

Strabismus is a condition in which the eyes do not properly align with each other when looking at an object the eye that is focused on an object can alternate. The condition may be present occasionally or constantly. If present during a large part of childhood, it may result in amblyopia or lazy eyes and loss of depth perception. If onset is during adulthood, it is more likely to result in double vision.

Signs and symptoms

When observing a person with strabismus, the misalignment of the eyes may be quite apparent. A person with a constant eye turn of significant magnitude is very easy to notice. However, a small magnitude or intermittent strabismus can easily be missed upon casual observation. In any case, an eye care professional can conduct various tests, such as cover testing, to determine the full extent of the strabismus.

Symptoms of strabismus include double vision and eye strain. To avoid double vision, the brain may adapt by ignoring one eye. In this case, often no noticeable symptoms are seen other than a minor loss of depth perception. This deficit may not be noticeable in someone who has had strabismus since birth or early childhood, as they have likely learned to judge depth and distances using monocular cues. However, a constant unilateral strabismus causing constant suppression is a risk for amblyopia in children. Small-angle and intermittent strabismus are more likely to cause disruptive visual symptoms. In addition to headaches and eye strain, symptoms may include an inability to read comfortably, fatigue when reading, and unstable or “jittery” vision.

The extraocular muscles control the position of the eyes. Thus, a problem with the muscles or the nerves controlling them can cause paralytic strabismus. The extraocular muscles are controlled by cranial nerves III, IV, and VI. An impairment of cranial nerve III causes the associated eye to deviate down and out and may or may not affect the size of the pupil. Impairment of cranial nerve IV, which can be congenital, causes the eye to drift up and perhaps slightly inward. Sixth nerve palsy causes the eyes to deviate inward and has many causes due to the relatively long path of the nerve. Increased cranial pressure can compress the nerve as it runs between the clivus and brain stem. In addition, if the doctor is not careful, twisting of the baby’s neck during forceps delivery can damage cranial nerve VI.

Pathophysiology

Evidence indicates a cause for strabismus may lie with the input provided to the visual cortex. This allows for strabismus to occur without the direct impairment of any cranial nerves or extraocular muscles.

Strabismus may cause amblyopia due to the brain ignoring one eye. Amblyopia is the failure of one or both eyes to achieve normal visual acuity despite normal structural health. During the first seven to eight years of life, the brain learns how to interpret the signals that come from an eye through a process called visual development. Development may be interrupted by strabismus if the child always fixates with one eye and rarely or never fixates with the other. To avoid double vision, the signal from the deviated eye is **suppressed,** and the constant suppression of one eye causes a failure of the visual development in that eye.

In addition, amblyopia may cause strabismus. If a great difference in clarity occurs between the images from the right and left eyes, input may be insufficient to correctly reposition the eyes. Other causes of a visual difference between right and left eyes, such as asymmetrical cataracts, refractive error, or other eye disease, can also cause or worsen strabismus.

Accommodative esotropia is a form of strabismus caused by refractive error in one or both eyes. Due to the near triad, when a person engages accommodation to focus on a near object, an increase in the signal sent by cranial nerve III to the medial rectus muscles results, drawing the eyes inward; this is called the accommodation reflex. If the accommodation needed is more than the usual amount, such as with people with significant hyperopia, the extra convergence can cause the eyes to cross

Diagnosis

During an eye examination, a test such as cover testing or the Hirschberg test is used in the diagnosis and measurement of strabismus and its impact on vision. Retinal birefringence scanning can be used for screening of young children for eye misalignment. A Cochrane review to examine different types of diagnosis test found only one study. This study used a photoscreener which was found to have high specificity (accurate in identifying those without the condition) but low sensitivity (inaccurate in identifying those with the condition)

Management

Strabismus is usually treated with a combination of eyeglasses, vision therapy, and surgery, depending on the underlying reason for the misalignment. As with other binocular vision disorders, the primary goal is comfortable, single, clear, normal binocular vision at all distances and directions of gaze.

Whereas amblyopia (lazy eye), if minor and detected early, can often be corrected with use of an eye patch on the dominant eye or vision therapy, the use of eye patches is unlikely to change the angle of strabismus.

Glasses

In cases of accommodative esotropia, the eyes turn inward due to the effort of focusing far-sighted eyes, and the treatment of this type of strabismus necessarily involves refractive correction, which is usually done via corrective glasses or contact lenses, and in these cases surgical alignment is considered only if such correction does not resolve the eye turn.

In case of strong anisometropia, contact lenses may be preferable to spectacles because they avoid the problem of visual disparities due to size differences (aniseikonia) which is otherwise caused by spectacles in which the refractive power is very different for the two eyes. In a few cases of strabismic children with anisometropic amblyopia, a balancing of the refractive error eyes via refractive surgery has been performed before strabismus surgery was undertaken.

Early treatment of strabismus when the person is a baby may reduce the chance of developing amblyopia and depth perception problems. However, a review of randomized controlled trials concluded that the use of corrective glasses to prevent strabismus is not supported by existing research. Most children eventually recover from amblyopia if they have had the benefit of patches and corrective glasses. Amblyopia has long been considered to remain permanent if not treated within a critical period, namely before the age of about seven years; however, recent discoveries give reason to challenge this view and to adapt the earlier notion of a critical period to account for stereopsis recovery in adults.

Eyes that remain misaligned can still develop visual problems. Although not a cure for strabismus, prism lenses can also be used to provide some temporary comfort and to prevent double vision from occurring.

Glasses affect the position by changing the person's reaction to focusing. Prisms change the way light, and therefore images, strike the eye, simulating a change in the eye position.

Surgery

Strabismus surgery does not remove the need for a child to wear glasses. Currently it is unknown whether there are any differences for completing strabismus surgery before or after amblyopia therapy in children.

Strabismus surgery attempts to align the eyes by shortening, lengthening, or changing the position of one or more of the extraocular eye muscles. The procedure can typically be performed in about an hour, and requires about six to eight weeks for recovery. Adjustable sutures may be used to permit refinement of the eye alignment in the early postoperative period. It is unclear if there are differences between adjustable versus non-adjustable sutures as it has not been sufficiently studied. An alternative to the classical procedure is minimally invasive strabismus surgery (MISS) that uses smaller incisions than usual.

1.8 Answers to end unit 1 assessment

Section A: Short Answer Questions

1. BLEPHARITIS
2. CONJUNCTIVITIS
3. KERATITIS
4. CATARACT
5. CONVEX

Section B: Multiple Choice Questions

1. D	9. D
2. D	10. D
3. D	11. D
4. C	12. B
5. D	13. D
6. D	14. D
7. C	15. C
8. A	16. B

1.9 Additional activities

1.9.1 Remedial activities

a. Using different literature define the following medical pathology eye condition

- Conjunctivitis
- Blepharitis
- Myopia
- Hypermetropia
- Cataract

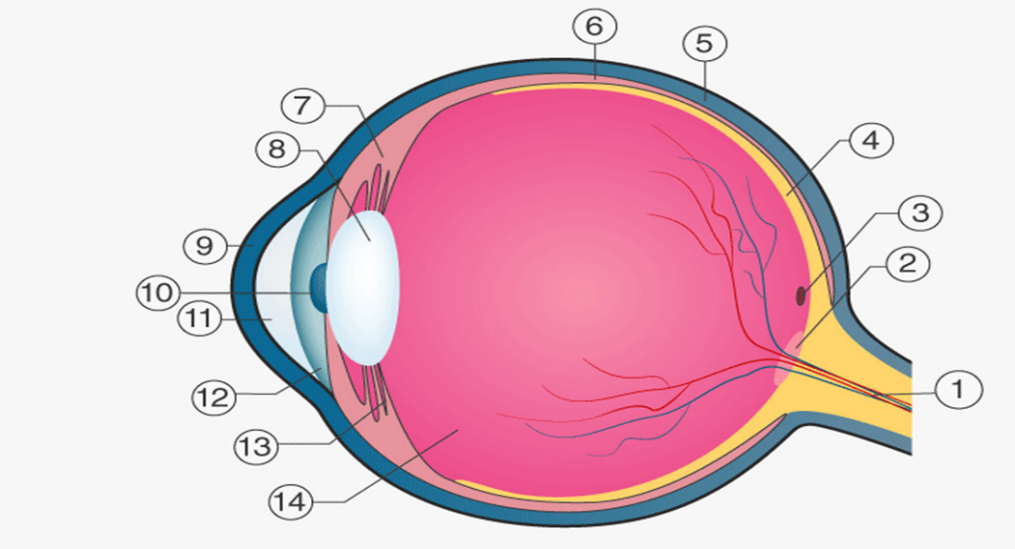
b. Complete the following table

Eye conditions	Causes and risk factors	Clinical features	Treatment
• Conjunctivitis			

• Blepharitis			
• Myopia			
• Hypermetropia			
• Cataract			

1.9.2 Consolidation activities

1. Label the following diagramme of eye



Answers

1 Optic nerve	2 Optic disc	3 Fovea centralis	4 Retina
5 Sclera	6 Choroid	7 Ciliary body	8 Lens
9 Cornea	10 Pupil	11 Aqueous body	12 Iris
13 Suspensory ligament		14 Vitreous body	

2. What are the functions of human eye?

The human eyes are the most complicated sense organs in the human body. From the muscles and tissues to nerves and blood vessels, every part of the human eye is responsible for a certain action. Furthermore, contrary to popular belief, the eye is not perfectly spherical; instead, it is two separate segments fused together. It is made up of several muscles and tissues that come together to form a roughly spherical structure. From an anatomical perspective, the human eye can be broadly classified into external structure and internal structure.

The External Structure of an Eye

The parts of the eye that are visible externally include the following:-

Sclera: It is a white visible portion. It is made up of dense connective tissue and protects the inner parts.

Conjunctiva: It lines the sclera and is made up of stratified squamous epithelium. It keeps our eyes moist and clear and provides lubrication by secreting mucus and tears.

Cornea: It is the transparent, anterior or front part of our eye, which covers the pupil and the iris. The main function is to refract the light along with the lens.

Iris: It is the pigmented, coloured portion of the eye, visible externally. The main function of the iris is to control the diameter of the pupil according to the light source.

Pupil: It is the small aperture located in the centre of the Iris. It allows light to enter and focus on the retina.

The Internal Structure of an Eye

The internal components of an eye are:

Lens: It is a transparent, biconvex, lens of an eye. The lens is attached to the ciliary body by ligaments. The lens along with the cornea refracts light so that it focuses on the retina.

Retina: It is the innermost layer of the eye. It is light sensitive and acts as a film of a camera. Three layers of neural cells are present in them, they are ganglion, bipolar and photoreceptor cells. It converts the image into electrical nerve impulses for the visual perception by the brain.

Optic nerve: It is located at the posterior portion of the eyes. The optic nerves carry all the nerve impulses from the retina to the human brain for perception.

Aqueous Humour: It is a watery fluid present between the cornea and the lens. It nourishes the eye and keeps it inflated.

Vitreous Humour: it is a transparent, jelly-like substance present between the lens and the retina. It contains water (99%), collage, proteins, etc. The main function of vitreous humour is to protect the eyes and maintain its spherical shape

1.9.3. Extended activities

1. What are the common eye problems according the age

Common eye problems by age:

♦ **Answers**

Babies' eye infections need to be treated. Some of these are prevented by cleaning the baby's eyes and using eye ointment at birth (see page 33).

Young children's vision problems may be hard to notice. Starting at 6 months old, see if the child's eyes move and follow a light or a toy when you move it around. A child with a wandering or crossed eye can be helped (page 24) and glasses may help with poor vision. For children with very limited or no vision, Hesperian's book Helping Children Who Are Blind shows many ways to help a blind child develop her skills.

School-age children who cannot see clearly cannot tell you they need eyeglasses because they do not know what good vision would be like. A child who has headaches, squints a lot or is having difficulty in school or playing games may have a vision problem and need eyeglasses. It is also a good idea to learn what to do if there is an eye injury from sports or fighting at school.

Any child can get eye injuries. Keep chemicals and sharp objects locked away and out of reach of children. Adult vision may change at any age and sometimes eyeglasses can help. If a person has diabetes or high blood pressure, treatment to manage these problems will help prevent further harm to the eyes. Different kinds of work make some eye injuries or eye conditions more likely. Older adults are more likely to develop cataracts and need reading glasses.

2. What are the illnesses that can affect the eyes

♦ **Answers**

Some infections or illnesses affecting the whole body can harm the eyes. When someone has eye problems, it is wise to consider if the cause could be another illness.

Tuberculosis can infect the eyes and cause redness or poor vision. Most often, signs of tuberculosis will appear first in the lungs or other parts of the body. HIV and AIDS: Eye problems and loss of vision in people with HIV are prevented by treatment with HIV medicines, called ART. Get tested so you can start treatment if you need it.
Herpes (cold sores) occasionally spreads to the eye, causing an ulcer of the cornea with pain, blurred vision, and watery eyes. Antiviral medicines are helpful. Do not use steroid eye drops—they make the problem worse.

Problems in the liver: Jaundice, when the white part of the eye is yellow (or the skin of a light-colored person gets yellow), can be a sign of hepatitis. People with diabetes may develop vision problems. As the disease advances, diabetes can damage their eyes (a serious condition called diabetic retinopathy). Without treatment, diabetes can lead to blindness. Blurred vision can be an early sign that blood sugar is high and a person may have diabetes. If someone with blurred vision also is very thirsty and has to urinate a lot, it is likely they have diabetes. Inexpensive tests can let them know for sure.

Help people with diabetes get treatment to bring down their blood sugar levels and encourage them to visit an eye specialist once a year to check their eyes for damage from diabetes. Eye disease from diabetes can be treated if found early.

High blood pressure can affect the eyes and vision by damaging the blood vessels inside the eye. Checking blood pressure during health care visits is the best way to know if it is too high. Preventing and treating high blood pressure will help protect the eyes.

1. What are the treatment of following eye conditions
    - Cataract
    - Glaucoma
    - Fleshy growth across eye (pterygium)
    - Blood in the white of the eye
    - Vitamin A deficiency (night blindness, xerophthalmia)
    - Crossed eyes, wandering eye, squint (strabismus)

♦ **Answers**

Cataract

Non-Surgical Cataract Treatment

Early cataract treatment is aimed at improving the quality of vision. When cataract symptoms appear, client may experience cloudy or blurry vision, light sensitivity, poor night vision, double vision, and changes the eyewear prescription. Certain changes can significantly reduce these symptoms.

Cataract symptoms may be improved with new eyeglasses, anti-glare sunglasses, or magnifying lenses. Certain tints and coatings also can be added to lenses to reduce symptoms.

a) Surgical Cataract Treatment

If non-surgical measures do not help, surgery is the only effective treatment. It is considered when a cataract progresses and decreases vision to a point that it interferes with the lifestyle and daily activities.

♦ Glaucoma

The treatment will largely depend on which type of glaucoma. The most common type, primary open angle glaucoma, is usually treated with eye drops. Laser treatment or surgery may be offered if drops do not help.

Treatment for other types of glaucoma may include:

- primary angle closure glaucoma (immediate treatment in hospital with medicine to reduce the pressure in the eye, followed by laser treatment)
- secondary glaucoma (eyedrops, laser treatment or surgery, depending on the underlying cause)
- childhood glaucoma (surgery to correct the problem in the eye that led to the build-up of fluid and pressure)

The main treatments are described below.

- Eye drops are the main treatment for glaucoma. There are several different types that can be used, but they all work by reducing the pressure in your eyes.
- Eye drops can cause unpleasant side effects, such as eye irritation, and some are not suitable for people with certain underlying conditions.

Laser treatment

Laser treatment may be recommended if eye drops do not improve your symptoms.

This is where a high-energy beam of light is carefully aimed at part of your eye to stop fluid building up inside it.

Types of laser treatment include:

- laser trabeculoplasty – a laser is used to open up the drainage tubes within your eye, which allows more fluid to drain out and reduces the pressure inside
- cyclodiode laser treatment – a laser is used to destroy some of the eye tissue that produces the liquid, which can reduce pressure in the eye
- laser iridotomy – a laser is used to create holes in your iris to allow fluid to drain from your eye

Surgery may be recommended in rare cases where treatment with eyedrops or

laser have not been effective.

The most common type of surgery for glaucoma is called trabeculectomy. It involves removing part of the eye-drainage tubes to allow fluid to drain more easily.

Glaucoma surgery may be carried out under local anaesthetic (while the patient is awake) or general anaesthetic (while the patient is asleep).

Most people will not need to take eye drops any more after trabeculectomy, and you should not be in a lot of pain after surgery.

Fleshy growth across eye (pterygium)

Treatment

A pterygium often does not cause problems or require treatment. However, two main treatment approaches can be considered if the pterygium causes discomfort or affects vision. Medication Short-term use of topical corticosteroid eye drops may be used to reduce redness and inflammation. Where dryness of the eye is a problem, artificial tears are used to keep the eye well lubricated.

Surgery

Surgery may be recommended if vision is affected or symptoms are particularly problematic.

During surgery, the pterygium is carefully removed and a section of the conjunctiva is taken from under the eyelid and is grafted onto the area where the pterygium was. Surgery is performed using a local anaesthetic and takes approximately 30 minutes to perform.

It is possible for pterygia to recur after surgical removal, though this only happens in a small percentage of cases.

Prevention

To reduce the risk of developing pterygia:

- Use sunglasses that block out UV light (close-fitting, wrap around styles are best)
- Wear sunglasses and a hat with a wide brim when outdoors
- Avoid exposure to environmental irritants, e.g.: smoke, dust, wind, and chemical pollutants
- Use appropriate eye safety equipment in work environments.

Blood in the white of the eye

Treatment for hyphemas and other types of eye bleeding may include:

- laser surgery to bring eye pressure down
- eye surgery in severe cases, such as non-clearing hyphemas that surgeons need to evacuate in the operating room
- eye drops to control inflammation, pain, and pressure

The type of eye drop an ophthalmologist prescribes will depend on the cause of the bleeding. Some examples include antibiotic, antiviral, and steroid eye drops.

Sub conjunctival hemorrhages do not usually require treatment. The healing time can vary from a few days to a few weeks, depending on the size of the spot.

People can use artificial tears to relieve irritation or dryness. Artificial tears are available in drug stores, pharmacies, and online.

A doctor may prescribe antibiotic eye drops if the red spot is the result of a bacterial infection.People should not be alarmed if the red spot changes colors from red to yellow or orange. This is a sign that the hemorrhage is healing. Like a bruise, it may slowly fade over time.

Treatments for diabetic retinopathy include:

- injectable medications to reduce swelling
- laser eye surgery to close leaking blood vessels
- vitrectomy, or surgery that involves removing vitreous gel and blood from the back of the eye

Floaters (seeing small spots)

Fortunately, two different treatments can be performed to reduce the presence of eye floaters, and sometimes even eliminate them:

1. Vitrectomy
2. Vitreolysis

What is a vitrectomy?

A vitrectomy is the primary treatment for eye floaters.

This procedure involves removing the vitreous in order to eliminate the collagen fibers that are causing the eye floaters.

What to expect during a vitrectomy procedure

A vitrectomy is a safe and relatively quick procedure that is generally performed under local anesthesia. During this procedure, a small incision is made and the vitreous is removed. A new fluid made of saline or silicone oil is then inserted into the space of the vitreous.

What to expect following a vitrectomy

Following this procedure, an antibiotic ointment is applied to the eye to prevent infection, and an eye patch is placed over the eye to protect it while it heals.

It may take a couple of weeks to notice total vision improvement, though it is important to speak with your doctor to find out what is to be expected in your individual circumstances.

Are there any complications associated with vitrectomy?

As with any surgical procedure, there are some risks to consider before undergoing a vitrectomy. The most common risks include eye damage, infection, bleeding, high eye pressure, retinal detachment, cataracts, and changes to any pre-existing refractive error.

If you are not a candidate for a vitrectomy, your eye doctor may recommend a laser procedure, called a vitreolysis, to treat your eye floaters.

If you suspect you have eye floaters, contact an eye doctor near you, who can diagnose and treat the condition.

Vitreolysis uses a laser to diminish the size and thickness of eye floaters.

This reduces the retinal shadows and visual disturbances caused by eye floaters in order to restore clear vision and allow patients to return to their daily activities with improved functioning and quality of life.

What to expect during a vitreolysis procedure

This in-office procedure is performed under local anesthesia, and typically takes around 20-30 minutes to perform. Some patients require up to three laser treatments over the course of four to six weeks in order to gain the full benefits of the procedure.

- **Vitamin A deficiency (night blindness, xerophthalmia)**

Treatment for night blindness will vary depending on the cause.

Treatment may include wearing specific types of glasses or contact lenses, which can help to support correct vision.

Wearing sunglasses can also protect the eye from ultraviolet light, which can cause further eye damage. When the cause is a lack of vitamin A, treatment involves

adding more Vitamin A to the diet. Good sources of vitamin A include:

- eggs
- fortified cereals
- fortified milk
- orange and yellow vegetables and fruits
- cod liver oil
- dark, leafy green vegetables

Treatment can occur in two ways: treating symptoms and treating the deficiency. Treatment of symptoms usually includes the use of artificial tears in the form of eye drops, increasing the humidity of the environment with humidifiers, and wearing wraparound glasses when outdoors. Treatment of the deficiency can be accomplished with a Vitamin A or multivitamin supplement or by eating foods rich in Vitamin A. Treatment with supplements and/or diet can be successful until the disease progresses as far as corneal ulceration, at which point only an extreme surgery can offer a chance of returning sight

♦ **Crossed eyes, wandering eye, squint (strabismus)**

Strabismus is usually treated with a combination of eyeglasse, vision therapy, and surgery, depending on the underlying reason for the misalignment. As with other binocular vision disorders, the primary goal is comfortable, single, clear, normal binocular vision at all distances and directions of gaze.

Whereas amblyopia (lazy eye), if minor and detected early, can often be corrected with use of an eye patch on the dominant eye or vision therapy, the use of eye patches is unlikely to change the angle of strabismus.

(Otitis, Cerumen plug/ear wax, Deafness, Hearing loss and hearing impairment, and Ear trauma).

2.1. Key unit competence:

Take appropriate decision on different common medical pathologies of ear.

2.2. Prerequisite (knowledge, skills, attitudes, and values)

To achieve the above competence, the associate nurse student needs the following prerequisites: human body anatomy and physiology, fundamentals of Nursing and

pharmacology.

2.3. Crosscutting Issues to be addressed

2.3.1. Standardization culture

In health care system, the most case of patients is presented with medical pathology of Otitis, Cerumen plug (earwax), Deafness, Hearing and hearing impairment). The learners have to learn oral diseases and esophagus in order to handle and to manage the patients with oral cavity and esophagus related diseases.

2.3.2. Inclusive education

The teacher involves the students in all learning activities concerning the kind of learner or disabilities for example the slow learner should be reinforced in order to catch up others, and the teacher takes into consideration respective disability of learner.

Grouping students, Students with special educational needs are grouped with others and assigned roles basing on individual student's abilities. Providing earning resources earlier before teaching session so that students get familiar with them. After end lesson assessment, the identified slow learners are exposed to the remedial learning activities.

Every important point is written and spoken. The written points help students with hearing impairment and speaking aloud helps students with visual impairment. Remember to repeat the main points of the lessons.

2.3.3. Gender education

Emphasize to learners that anybody irrespective of their gender can have medical career mainly medical sciences. Give role models who are successful medical pathology of oral and esophagus in the area where the learners come from. Make sure that during classroom teaching and skills lab demonstration both boys and girls shares and participate equally in practices, arranging and proper hygiene after classroom and skills lab teaching session.

2.4. Guidance on the introductory activity

This introductory activity helps you to engage learners in the introduction of medical

pathology of oral and esophagus and invite the learners to follow the next lessons.

Teacher's activity:

- Ask students to read the text and discuss the given questions.
- Engage students in working collectively the activity
- Help students with different problems
- Ask any four students to present their findings while others are following.
- Prepare trip field to nearest health facility in order to be familiar with Ear, Nose and Throat (ENT) department equipment, and health assessment for oral cavity disorders.
- Invite guest person who has specialty in Ear, Nose and Throat department domain to teach the learners.

2.5. List of Lessons/sub-headings (including assessment)

#	Lesson Title	Learning Objectives
1	Introduction of medical pathologies of ear (definition, causes, pathophysiology, signs and symptoms of otitis)	• List the common medical pathologies of ea Plug, Deafness, Hearing impairment. • Define the term "Otitis" • Describe causes, risk factors and pathopl • Describe the signs and symptoms of otitis
2	Description of otitis (investigation diagnosis, treatment plan, evolution and complication)	• Enumerate the investigations requested fo • Identify the adequate medical diagnosis o • Develop a treatment plan of patient with o • Explain the evolution and complications of

3	Description of CERUMEN PLUG(Ear Wax) (definition, causes, signs and symptoms, pathophysiology ,investigation, treatment plan, evolution and complication)	• Define the term “Ear PLUG (EAR Wax)” • Describe causes, risk factors and pathophys Cerumen PLUG. • Describe the signs and symptoms of Cerum • Enumerate the investigations requested for p types of Cerumen Plug. • Identify the adequate medical diagnosis of C • Develop a treatment plan of Cerumen Plug. • Explain the evolution and complications of C

4	Description of Deafness, hearing loss and Hearing impairment (definition, causes, pathophysiology, signs and symptoms, investigation diagnosis, treatment plan, evolution and complication)	• Define the term “Deafness, hearing loss and Hearing impairment” • Describe causes, risk factors and pathophysiology of deafness. • Describe the signs and symptoms of deafness. • Enumerate the investigations requested for patient with deafness. • Identify the adequate medical diagnosis of deafness. • Enumerate the investigations requested for patient of deafness • Describe the way used for adequate medical diagnosis of deafness. • Develop a treatment plan of patient with deafness. • Explain the evolution and complications of deafness.	1
5	Description of ear injury or trauma (definition, causes, pathophysiology, signs and symptoms, investigation diagnosis, treatment plan, evolution and complication)	• Define the term “EAR INJURY” • Describe causes, risk factors and pathophysiology of Ear injury • Describe the signs and symptoms of Ear injury. • Enumerate the investigations requested for patient with Ear injury. • Describe the way used for the adequate medical diagnosis of Ear injury • Develop a treatment plan for patient with Ear injury • Explain the evolution and complications of Ear injury.	1

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06	End unit assessment	• Take appropriate decision on different common medical pathologies of Ear • Identify the strengths and gaps of learners on appropriate decision of different common medical pathologies of ear • Prepare the feedback to individual and class • Organize different additional learning activities	1

Lesson 1: Introduction of medical Pathologies of ear (definition, causes, pathophysiology, signs and symptoms of otitis)

a) Prerequisites

This is the first lesson of the Second unit of medical pathologies of the Ear. In this lesson, you will be dealing with the common medical pathologies of the ear which are acute and chronic otitis (definition, causes, pathophysiology, signs and symptoms of otitis). The first thing to do before starting teaching is to remind learners that they have learnt about structure and function of ear in biology. In addition, it is important to what see what they learnt in health assessment of ear from fundamentals of nursing and let them discuss the questions as indicated in introductory activity and from the case study from learning activity 2.1 so that they can prepare themselves for this lesson.

b) Learning objectives

- List the common medical pathologies of ear. (Definition, causes, pathophysiology, signs and symptoms of otitis).
- Define the term “acute and chronic otitis”
- Describe causes, risk factors and pathophysiology of acute and chronic otitis
- Describe the signs and symptoms of acute and chronic otitis.

c) Teaching resources

The teacher could avail the anatomical model of the normal ear and abnormal ear whenever possible and ensure that the students are able to interpret. In addition, the teacher should present to the students the library textbooks on medical-

surgical nursing, especially ear disease and indicates the pages. All students must have their student's books. The algorithm or protocols about ear diseases management must be available. There is a need of black board and chalks or flipcharts and markers.

d) Learning activities 2.1

Teacher 'activities and methodology:

- Ask learners to do individually activity 2.1 in their student book and answer the question number 1, 2 and 3.

- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide their answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard, flipchart and whiteboard to take note of the main students' ideas.
- Tick the correct responses and correct those ones, which are incorrect and try again to complete those, which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.

Student's activity

- The students answer the questions individually in learning activity 2.1 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully.
- Summarize the content with the teacher and coming up with the conclusion.

Expected answers to introductory activity 2.0

1. These persons are complaining with severe ear pain, itching and irritability of the ear
2. Possible medical problems that the patients might complaint with otitis media, ear trauma or injury.

Expected Answers to Questions from Learning Activity 2.1

1. The abnormal signs and symptoms that the patient was presenting are ear pain, fever, drainage from the ear, trouble hearing, and inflammation of drum and other surrounding membrane with the pus, body temperature of 38.5oc, White Blood Cells (WBC) of 130000.
2. The medical problem of this patient was acute or chronic otitis

Lesson 2: Description of acute and chronic otitis (investigation diagnosis, treatment plan, evolution and complication)

a) Prerequisite

This is the second lesson of the Second unit of medical pathologies of ear in sensory organs. In this lesson, you will be dealing with the description of otitis such as its investigation, medical diagnosis, treatment plan, evolution and complications. The first thing to do before starting teaching is to remind learners that they have learnt about lesson one of acute and chronic otitis.

b) Learning objectives

After completion of this lesson, the student will be able to:

- Enumerate the investigations requested for patient with acute and chronic otitis
- Identify the adequate medical diagnosis of acute and chronic otitis
- Develop a treatment plan of patient with acute and chronic otitis
- Explain the evolution and complications of acute and chronic otitis.

c) Teaching resources

The teacher could avail the anatomical model of the normal ear and abnormal ear whenever possible and ensure the students are able to interpret them. In addition, the teacher should present to the students the library textbooks on medical-surgical nursing especially ear related diseases and indicates the pages. All students must have their student's books. There is a need of black board and chalks or flipcharts and markers. Algorithms about assessment and management of dental caries must also be displayed.

d) Learning activities

Teacher's activities and methodology

- Ask learners to do individually activity 2.1 in their student book and answer the questions related.
- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide their answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student's ideas.
- Tick the correct responses and correct those ones, which are incorrect and try again to complete those, which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student

in making that conclusion.

- Use brainstorming while collecting the answers from different learners.
- Judge the answers from learners by confirming the right responses.

Student's activities

- The students answer the questions individually in learning activity 2.1 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully
- Summarize the content with the teacher and coming up with conclusion.
- Attempt to answer the self-assessment questions 2 .1

The expected answers from Questions of learning activity 2.1

1. Full Blood Count (FBC).
2. Treatment plan involved the use of Antibiotic like Amoxicillin 500mg TDS 7/7, Paracemol 500mg tds3/7 and Ibuprofen 400mg TDS 4/7 for pain relief.
3. Swollen gums indicating gingivitis to dental caries

The expected answers from Questions of self-assessment 2.1

1. The signs and symptoms of acute and chronic otitis includes a fever, tinnitus, malaise, severe earache, and hearing loss. Tenderness behind the ear indicates mastoiditis. Redness of the eardrum and bulging. Pressure in the middle ear or dysfunction of inner ear structures can cause nausea, vomiting, and dizziness. If the tympanic membrane perforates, fluid drains into the external acoustic canal and pain is relieved. Infants and children may have one or more of the following symptoms: Crying, irritability, sleeplessness, pulling on the ears, ear pain, a headache, neck pain, a feeling of fullness in the ear, fluid drainage from the ear, a fever, vomiting, diarrhea, irritability, a lack of balance and hearing loss.
2. The causes and risk factors of otitis media includes being between 6 and 36 months old, using a pacifier, attending daycare, being bottle fed instead of breastfed (in infants), drinking while laying down (in infants). Other risk factors are exposure to cigarette smoke, high levels of air pollution, experiencing changes in altitude, experiencing changes in climate, being in a cold climate, having had a recent cold, flu, sinus, or ear infection.

3. The most complications of acute otitis media include meningitis, brain abscesses, epidural abscesses, mastoiditis, permanent sensorineural hearing loss, and death.
4. The 5 elements to be monitored during otoscope examination includes redness, swelling, blood, pus, air bubbles, fluid in the middle ear, perforation of the eardrum.

Lesson 3: Description of CERUMEN PLUG (Ear Wax) (definition, causes, signs and symptoms, pathophysiology, investigation, treatment plan, evolution and complication)

a) Prerequisites

This is the Third lesson of the Second unit of medical pathologies of ear in sensory organs. In this lesson, you will be dealing with the description of different causes and risk factors of acute and chronic otitis, pathophysiology, signs and symptoms, investigation, management, evolution and complications. The first thing to do before starting teaching is to remind learners what they have learnt about the anatomy and physiology of the sensory organs (Ear), health assessment of ear from fundamentals of nursing. The students will discuss the questions from the case study from learning activity 2.2 so that they can prepare themselves for this lesson.

b) Learning objectives:

After completion of this lesson, the student will be able to:

- Define the term “Cerumen Plug (Ear wax)”
- Describe causes, risk factors and pathophysiology of Cerumen Plug (Earwax).
- Describe the signs and symptoms of Cerumen Plug (Earwax).
- Enumerate the investigations requested for patient different types of Cerumen Plug (Earwax).
- Identify the adequate medical diagnosis of Cerumen Plug (Earwax).
- Develop a treatment plan of Cerumen Plug (Earwax).
- Explain the evolution and complications of Cerumen Plug (Earwax).

c) Teaching resources

The teacher could avail the ear anatomical model and otoscope ensure the students are able to use them. In addition, the teacher should present to the students the library textbooks on medical-surgical nursing especially ear diseases and indicates the pages. All students must have their student’s books. There is need of black board and chalks or flipcharts and markers. Algorithms about assessment and management of conjunctivitis must also be displayed.

d) Learning activities

Teacher's activities and methodology

- Ask learners to do individually activity 2.2 in their student book and answer the questions related.
- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide they answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student's ideas.
- Tick the correct responses and correct those ones, which are incorrect and try again to complete those, which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.
- Use brainstorming while collecting the answers from different learners.
- Judge the answers from learners by confirming the right responses.

Student's activities

- The students answer the questions individually in learning activity 2.2 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully
- Summarize the content with the teacher and coming up with conclusion.
- Attend the library for reading related book of oral candidiasis conditions
- Attempt to answer the self-assessment questions 2.2

The expected answers from Questions of learning activity 2.2

1. Signs and symptoms that the patient was presenting are a fever, tinnitus, malaise, severe earache hearing loss, tenderness behind the ear, redness of the eardrum and bulging, nausea, vomiting, and dizziness. In infant and children: Crying, irritability, sleeplessness, pulling on the ears, ear pain, a headache, neck pain, a feeling of fullness in the ear, fluid drainage from the ear, a fever, vomiting, diarrhoea, irritability, a lack of balance and hearing loss.

2. The medical problem from those signs and symptoms are Otitis media
3. The otoscope examination was performed
4. The clinical management includes sodium bicarbonate eardrops and ear irrigation.

The expected answers from Questions of self-assessment 2.2

1. The client with impacted earwax may experience a sense of fullness or pain in the ears, referred to as otalgia, and diminished hearing. The client asks that words be repeated, misinterprets questions, or raises the volume on the television or radio. Visual inspection with an otoscope shows an orange-brown accumulation of cerumen in the distal end of the external acoustic meatus. Audiometric, Rinne, and Weber tests reveal conductive hearing loss. Some symptoms of impacted earwax include Hearing loss, earache, sense of ear fullness, itching in the ear, dizziness, ringing in the ears, cough, tinnitus, which is a ringing in the ear, an ear infection, vertigo, or a sense of being unbalanced that can lead to dizziness and nausea
2. The causes of cerumen plug are swimming for some people, individuals whose ear canals are narrow or not fully formed people with very hairy ear canals, and people with osteomata or benign bony growths in the outer part of the ear canal. In addition, those with certain skin conditions, such as eczema, older people, because earwax tends to become drier and harder with age, which increases the risk of impaction, people with recurring ear infections and impacted earwax, individuals with lupus or Sjogren's syndrome.
3. The diagnosis of cerumen impaction is made by direct visualization with an otoscope. Common symptoms include hearing loss, feeling of fullness in the ear, itching, otalgia, tinnitus, cough, and, rarely, a sensation of imbalance. Hearing loss from cerumen impaction can cause reversible cognitive impairment in older persons. Some patients are unable to accurately convey symptoms, such as those with dementia or developmental delay; nonverbal patients with behavioral changes; and young children with fever, speech delay, or parental concerns. In these patients, cerumen should be removed when it limits examination
4. Ear syringing techniques consists of pulling the external ear up and back, and aiming the nozzle of the syringe slightly upwards and backwards so that the water flows as a cascade along the roof of the canal. The irrigation solution flows out of the canal along its floor, taking wax and debris with it. The solution used to irrigate the ear canal is usually warm water, normal saline, sodium bicarbonate solution, or a solution of water and Vinegar to help prevent secondary infection.
5. The common cerumen softeners include urea hydrogen peroxide (6.5%) and glycerine, a solution of sodium bicarbonate in water, or sodium bicarbonate

(sodium bicarbonate and glycerine), Cerumol (peanut oil, turpentine and dichlorobenzene), cerumenex (triethanolamine), polypeptides and oleate-condensate), docusate, an emulsifying agent, an active ingredient found in laxatives, mineral oil.

6. Some of the complications of earwax includes ear infections if a person does not get treatment. Very rarely, the infection may spread to the base of the skull and cause meningitis or cranial paralysis.

Lesson 4: Description of deafness, hearing loss, and hearing impairment

(Definition, causes and risk factors, Pathophysiology, signs and symptoms, investigation, diagnosis, treatment plan, evolution and complication)

a) Prerequisites

This is the fourth lesson of the Second unit about medical pathologies of the ear. In this lesson, you will be dealing with the definition, causes and risk factors, Pathophysiology, signs and symptoms, investigation, diagnosis, treatment plan, evolution and complication of deafness. The first thing to do before starting teaching is to remind learners what they have learnt about the anatomy and physiology of the sensory organs (ear), health assessment of oral cavity from fundamentals of nursing. The students will discuss the questions from the case study from learning activity 2.3 so that they can prepare themselves for this lesson.

b) Learning objectives:

After completion of this lesson, the student will be able to:

- Define the term “Deafness, hearing loss and Hearing impairment”
- Describe causes, risk factors and pathophysiology of deafness.
- Describe the signs and symptoms of deafness.
- Enumerate the investigations requested for patient with deafness.
- Identify the adequate medical diagnosis of deafness.
- Enumerate the investigations requested for patient of deafness
- Describe the way used for adequate medical diagnosis of deafness.
- Develop a treatment plan of patient with deafness.
- Explain the evolution and complications of deafness.

c) Teaching resources

The teacher could avail the oral cavity anatomical model and otoscope and ensure the students are able to use them. In addition, the teacher should present to the

students the library textbooks on medical-surgical nursing especially deafness and indicates the pages. All students must have their student's books. There is need of black board and chalks or flipcharts and markers. Algorithms about assessment and management of conjunctivitis must also be displayed.

d) Learning activities

Teacher's activities and methodology

- Ask learners to do individually activity 2.3 in their student book and answer the questions related.
- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide they answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student's ideas.
- Tick the correct responses and correct those ones that are incorrect and try again to complete those which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.
- Use brainstorming while collecting the answers from different learners.
- Judge the answers from learners by confirming the right responses.

Student's activities

- The students answer the questions individually in learning activity 2.3 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully
- Summarize the content with the teacher and coming up with conclusion.
- Attend the library for reading related book of oral cavity condition
- Attempt to answer the self-assessment questions 2.3

The expected answers from Questions of learning activity 2.3

1. The signs and symptoms presented by the patient were difficulty understanding words, especially against background noise or in a crowd, trouble hearing consonants, He frequently asking others to speak more slowly, clearly and loudly, He needs to turn up the volume of the television or radio while listening to the radio and television'
2. The medical problem could be deafness, hearing loss, and hearing impairment
3. Laboratory, Full blood accounts (FBC); Imageries: Chest x- ray, otoscopic examination and audiometric tests complement each other for the diagnosis of hearing loss. Objective tests measure the hearing loss at some specific frequencies
4. Hearing aids, Behind-the-ear (BTE) hearing aids, In-the-canal (ITC) hearing aids, completely in the canal (CIC) hearing aids, Bone conduction hearing aids, Cochlear implants.

♦ Answers for Self-Assessment 2.3

1. The causes of loss of hearing in adult are the diseases of outer and middle ear, the presence of wax in the ear canal, the congenital defects in the outer or middle ear. In addition, defect and damage to the outer or middle ear, upper respiratory tract infections, neglect of care of ears and oral cavity (mouth) contribute to the conductive hearing loss. Moreover, the damage or disease of the inner ear or auditory nerve, the infectious diseases like measles, mumps, meningitis and Tuberculosis can cause the sensorineural hearing loss.

Some conditions that may cause congenital sensorineural hearing loss includes hereditary childhood deafness, Rh incompatibility, premature birth (birth before due time), and birth Asphyxia (lack of oxygen supply to the newborn due to inability to breathe. Other causes of sensorineural hearing loss are Viral infections in pregnancy, exposure to X–rays in the first trimester of pregnancy (taking X–ray within the first three months), harmful drugs of variety e.g. streptomycin, and acoustic neuroma (Tumor of the auditory nerve).

1. The physician will talk to the patient and ask several questions regarding the symptoms, including when they started, whether or not they have gotten worse, and whether the individual is feeling pain alongside the hearing loss. On physical examination, the doctor will look into the ear using an otoscope
2. Treatment plan of Hearing Loss includes hearing aids, Behind-the-ear (BTE) hearing aids, In-the-canal (ITC) hearing aids, completely in the canal (CIC) hearing aids, Bone conduction hearing aids, Cochlear implants
3. The complications for hearing include conversation difficult, some people experience feelings of isolation. Hearing loss is also associated with cognitive

impairment and decline, cognitive decline and Alzheimer's disease, clinical depression, diabetes, falls among the elderly, heart diseases.

Lesson 5: Description of ear injury or Trauma (definition causes, pathophysiology, signs and symptoms, investigation, treatment plan, evolution and complication)

a) Prerequisite

This is the fifth lesson of the Second unit about medical pathologies of the ear. In this lesson, you will be dealing with the definition, causes and risk factors, Pathophysiology, signs and symptoms, investigation, diagnosis, treatment plan, evolution and complication of ear injury or trauma. The first thing to do before starting teaching is to remind learners what they have learnt about the anatomy and physiology of the sensory organs (ear), health assessment of oral cavity from fundamentals of nursing. The students will discuss the questions from the case study from learning activity 2.4 so that they can prepare themselves for this lesson.

b) Learning objectives

After completion of this lesson, the student will be able to:

- Define the term "EAR INJURY"
- Describe causes, risk factors and pathophysiology of Ear injury
- Describe the signs and symptoms of Ear injury.
- Enumerate the investigations requested for patient with Ear injury.
- Describe the way used for the adequate medical diagnosis of Ear injury
- Develop a treatment plan for patient with Ear injury
- Explain the evolution and complications of Ear injury.

c) Teaching resources

The teacher could avail the oral cavity anatomical model and otoscope and ensure the students are able to use them. In addition, the teacher should present to the students the library textbooks on medical-surgical nursing especially deafness and indicates the pages. All students must have their student's books. There is need of black board and chalks or flipcharts and markers. Algorithms about assessment and management of conjunctivitis must also be displayed.

d) Learning activities

Learning activities should be directly related to the learning objectives of the course and provide experiences that will enable students to engage in practice and gain feedback on specific progress towards those objectives. The various learning activities will be carried out such as: taking notes, course work and reading textbook related to the lesson, group assignment and summarize the content, engagement in debate and other clinical learning activities such as case study.

Teacher's activity:

- Ask learners to do individually activity 2.4 in their student book and answer the questions related.
- Provide the necessary materials to the students.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide their answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student's ideas.
- Tick the correct responses and correct those ones, which are incorrect and try again to complete those which are incomplete.
- Use brainstorming while collecting the answers from different learners.
- Judge the answers from learners by conforming the right responses.
- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.

Student's activities

- The students answer the questions individually in learning activity 2.4 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully
- Summarize the content with the teacher and coming up with conclusion.
- Attend the library for reading related book of esophagus condition
- Attempt to answer the self-assessment questions 2.4

The expected answers from Questions of learning activity 2.4

1. Ear pain, dizziness, headache, hearing loss, bleeding from the same ear, tinnitus sensation after falling down from motorcycle after road traffic accident
2. The medical problem for this case suggests ear injury or trauma
3. Complete Blood Count (CBC) ,Hemoglobin ,An otoscope exam and tympanometry were performed
4. A sterile dry wound dressing was applied and Paracetamol 500mg TDS 3/7 as well as cloxacillin 500mg TDS

The expected answers from Questions of self-assessment 2.4

1. Accidents, loud noises, changes in air pressure, trauma from contact sports and foreign objects in the ear can cause injuries, causes of ear ruptures also include getting hit in the ear, sustaining an injury during sports, falling on your ear, car accidents
2. The signs and symptoms of ear injury includes Ear pain (earache), which can be severe, dizziness and balance problems, headache, hearing loss, pus or bleeding from the ear, tinnitus (buzzing or ringing in the ear).
3. The investigations that can help the doctor to confirm the diagnosis of ear injury are the fluid sample test, and an otoscope exam to look the ear canal. In addition, an audiology exam allows the doctor to test the hearing range and eardrum capacity. Other investigations include tympanometry to test the eardrum's response to pressure changes.
4. Eardrum repair such as myringoplasty, Tympanoplasty

2.6 Summary of the unit

Medical pathology is a branch of medical science primarily concerning with the diseases affecting different human organs such as respiratory tract organs, cardio-vascular organs, digestive organs, urino-genetal organs, sensory organs etc. This unit of medical pathologies of the ear described the most common ear conditions that are frequently observable in Rwanda such as acute and chronic otitis media, Cerumen plug (ear wax), deafness (Hearing loss, hearing impairment), Ear injury or Trauma. This unit describes the ear medical conditions by providing their definition, clinical features, causes and risk factors, pathophysiology, investigation, treatment plan, evolution and complications. The student who will be complete this content will be able to take appropriate decision on different common medical pathologies affecting the ear in terms of diagnosing, treatment and prevent the complication of otitis, Cerumen, deafness and ear trauma.

END OF UNIT 2 ASSESSMENT ANSWERS

Section A: Multiple Choice Questions

1=a	7=d	13=c	19=c	25=b
2=d	8=b	14=c	20=a	26=d
3=a,b,d	9=b	15=b	21=a	27=c
4=d	10=a	16=b	22=b	
5=c	11=c	17=b	23=c	
6=d	12=b	18=c	24=c	

Section B: Essay Questions

1. Answer: The first priority is to kill the insect. This can be accomplished in many ways. Asphyxiation is probably best. The use of lidocaine gel or solution not only will suffocate the bug, but also may help to provide some anesthetic to the ear canal, aiding with later removal. Contact medical control to discuss your options...Once the bug has stopped buzzing/moving your patient will be much more cooperative.
2. Answer: Hematomas of the outer ear will cause breakdown of the cartilage if they are not treated with an incision and expression of clot, then a pressure dressing. Cartilage breakdown will lead to the 'cauliflower ear' often seen in boxers (and would-be boxers).
3. Answer: As before, lacerations to the cartilage of the ear can lead to severe cosmetic defects unless the cartilage laceration is repaired.
4. Answer: The purpose of the Eustachian tube is to ventilate the middle ear, to maintain air pressure within the ear and to drain infections. The primary function of the Eustachian tube is to ventilate the middle ear space, ensuring that its pressure remains at near normal ambient air pressure. The secondary function of the Eustachian tube is to drain any accumulated secretions, infection, or debris from the middle ear space. Several small muscles located in the back of the throat and the palate control the opening and closing of the tube. Swallowing and yawning cause contractions of these muscles and help to regulate Eustachian tube function. If it were not for the Eustachian tube, the middle ear cavity would be an isolated air pocket inside the head that would be vulnerable to every change in air pressure, and lead to an unhealthy ear.
5. Answer: Bottle-feeding. Bottle feeding is a risk factor for otitis media in infants. Breastfeeding passes immunity to the child that helps prevent acute otitis media. The position of the breastfeeding child is better than the bottle feeding position for Eustachian tube function. If a child needs to be bottle-fed, hold the infant instead of allowing the child to lie down with the bottle is best. A child should not take the bottle to bed. In addition to increasing the chance for acute otitis media, falling asleep with milk in the mouth increases the incidence of tooth decay.

6. Answer: Ear infection symptoms generally include trouble hearing and fever; fluid drainage and dizziness and congestion in the ear. The hallmark of an acute ear infection is sudden, piercing pain in the ear. The pain may be worse when lying down, making it difficult to sleep. Other symptoms include difficulty hearing, fever, fluid drainage from the ears, dizziness, and congestion. Young children with otitis media may be irritable, fussy, or have problems feeding or sleeping. Older children may complain about pain and fullness in the ear (earache). Fever may be present in a child of any age. These symptoms are often associated with signs of upper respiratory infection such as a runny or stuffy nose, or a cough.
7. Answer: Hearing loss may occur as a result of an ear infection because pus buildup dampens ear drum vibrations. Temporary hearing loss may occur during an ear infection because the buildup of pus within the middle ear causes pain, and dampens the vibrations of the eardrum.

SECTION C: Questions to answer by True or False

1. Answer: True. Acute otitis media (ear infection) describes inflammation of the middle ear, or tympanum. During an ear infection, there is fluid in the middle ear accompanied by signs or symptoms of ear infection including a bulging eardrum usually accompanied by pain; or a perforated eardrum, often with drainage of pus (purulent material).
2. Answer: A: False. An ear infection itself is not contagious. Ear infections are often the result of a previous infection of the throat, mouth, or nose that has relocated and settled in the ears.
3. Answer: True. Untreated ear infections can lead to more serious complications, including mastoiditis (a rare inflammation of a bone adjacent to the ear), hearing loss, scarring and/or perforation of the eardrum, meningitis, speech and language development problems, facial nerve paralysis, and possibly -- in adults - Meniere's disease.

Note: Meniere's disease is likely a disorder of the flow of fluids of the inner with symptoms that include vertigo, tinnitus, and hearing loss

4. Answer: False. Remember that the common cold is a key cause of ear infections. Because of the highly contagious nature of the common cold, one strategy for prevention of the cold itself and subsequent ear infections is to keep cold viruses at bay. The most effective way to do this is frequent and meticulous hand washing. Other strategies to prevent acute ear infections are to ensure a child is vaccinated. Ensuring that a child receives an annual flu vaccine and is up to date with his/her pneumococcal vaccine are excellent strategies used to prevent the most common causes of ear infections. Other lines of defense against ear infections include avoiding second hand smoke and breastfeeding your baby for

the first year of life.

2.7 Additional Information

Common additional information

Otitis Externa

Otitis externa is an inflammation of the tissue in the outer ear. Otitis externa means that the inflammation is confined to the external part of the ear canal and does not go further than the eardrum.

Pathophysiology and etiology

Inflammation usually is caused by an overgrowth of pathogens. The microorganisms tend to follow trauma to the lining of the ear, or their growth is supported by retained moisture from swimming. Another possibility is that a hair follicle becomes infected, causing a furuncle or an abscess to develop.

Several factors may predispose patients to the development of acute otitis externa. One of the most common predisposing factors is swimming, especially in fresh water. Other factors include skin conditions such as eczema and seborrhea, trauma from cerumen removal, use of external devices such as hearing aids, and cerumen buildup. These factors appear to work primarily through loss of the protective cerumen barrier, disruption of the epithelium, inoculation with bacteria, and increase in the pH of the ear canal.

Signs and symptoms

The tissue in the external ear looks red. Sometimes it is difficult to see the tympanic membrane because of swelling. Clients describe discomfort that increases with manipulation during the examination. Hearing is reduced because of swelling. In severe infections, a fever develops and the lymph nodes behind the ear enlarge. Otoscopic examination reveals diffuse or confined inflammation, swelling, and pus. A culture of drainage identifies the specific pathogen.

Acute otitis externa presents with the rapid onset of ear canal inflammation, resulting in otalgia, itching, canal edema, canal erythema, and otorrhea, and often occurs following swimming or minor trauma from inappropriate cleaning.

Treatment Plan

Treatment includes warm soaks, analgesics, and antibiotic ear medication, often with corticosteroid medication, such as neomycin/polymyxin/hydrocortisone otic

solution.

The nurse instructs the client to carry out the medical treatment and provides health teaching to prevent recurrence. For example, he or she advises swimmers to wear soft plastic ear plugs to prevent trapping water in the ear. If chewing produces or potentiates discomfort, the nurse encourages the client to temporarily eat soft foods or consume nourishing liquids. Above all, the nurse advises the client to avoid the use of non-prescription remedies unless they have been approved by the physician and to contact the physician if symptoms are not relieved in a few days.

A young woman comes in the clinic complaining of severe pain of her left ear; it hurts to touch it. She says that she swims at least 3 days a week. She is diagnosed with otitis externa. The nurse practitioner prescribes analgesics and application of heat to the affected ear and also tells the client to avoid swimming for 2 weeks. Because this client swims regularly for exercise, what further instructions can the nurse provide to prevent future problems?

What actions would the nurse perform while administering ear drops to remove excessive cerumen? Select all that apply.

a. Avoid inserting the irrigating syringe too deeply.

b. Boil the solution once.

c. Direct the flow of the ear drops toward the eardrum.

d. Direct the flow of the ear drops toward the roof of the canal.

e. Shake the ear drops container vigorously.

f. Warm the ear drops by holding the container in the hand for a few minutes.

A client arrives at the emergency department after an insect has entered the ear. Which of the following solutions would the nurse instill into the client's ear to smother the insect?

a. Carbamide peroxide

b. Hot water

c. Mineral oil

d. Triethanolamine

Which is the best evidence that the antibiotic the nurse is administering for the treatment of acute otitis media is having a therapeutic effect?

a. Ear discomfort is relieved.

b. Ear drainage is thin and watery.

c. Ringing sounds within the ear stop.

d. The ear feels less warm to the touch.

Cerumen-Softening Agents for Cerumen Removal

Agent	Use	Dosing
Water-based		
Acetic acid, 2.5%	Home treatment of impacted cerumen	Fill affected ear with 2 to 3 mL twice daily f to 14 days
Docusate sodium	Soften cerumen before irrigation	Fill affected ear canal with 1 mL 15 to 30 m before irrigation
Hydrogen peroxide, 3%	Soften cerumen before irrigation	Fill affected ear canal 15 to 30 minutes bef irrigation
Sodium bicarbonate, 10%	Soften cerumen before irrigation or as an alternative to irrigation	Fill affected ear with 2 to 3 mL 15 to 30 mir before irrigation, or alternatively for three to days at home with or without irrigation
Triethanolamine polypeptide oleate condensate, 10%	Soften cerumen before irrigation	Fill affected ear canal 15 to 30 minutes bef irrigation
Water or saline	Soften cerumen before irrigation	If irrigation is attempted without softening a ineffective after the first attempt, instill wate wait 15 minutes before repeating irrigation
Non–water- or oil-based		
Carbamide peroxide (Debrox)	Soften cerumen before irrigation or as an alternative to irrigation	Put five to 10 drops into the affected ear tw daily for up to seven days

Agent	Use	Dosing	Comment
Choline salicylate plus glycerol (e.g., Earex Advance); ethylene oxide polyoxypropylene glycol (Addax); propylene glycol; chlorbutol, 0.5%	Soften cerumen before irrigation or as an alternative to irrigation	Put three drops into the affected ear twice daily for four days	Not all brands and formulations are available in the United States
Oil-based			
Almond, arachis, or rectified camphor oil (e.g., Otocerol, Earex)	Soften cerumen before irrigation or as an alternative to irrigation	Put four drops into the affected ear twice daily for up to four days	Not all brands and formulations are available in the United States
Almond or mineral oil	Soften cerumen before irrigation	Put three drops into the affected ear at bedtime for three or four days	
Arachis oil, 57%; chlorbutol, 5%; paradichlorobenzene, 2%, and turpentine oil, 10% (e.g., Cerumol)	Soften cerumen before irrigation or as an alternative to irrigation	Fill affected ear with 5 mL twice daily for two or three days	Not all brands and formulations are available in the United States

Table 2.1 Cerumen-Softening Agents for Cerumen Removal

Remedial activities

1. Define the following medical pathology terminology of ear medical condition

a. Acute otitis

b. Chronic suppurative otitis media

c. Impacted cerumen

ANSWERS:

a) Acute otitis is an acute, suppurative infectious process marked by the presence of infected middle ear fluid and inflammation of the mucosa lining the middle ear space.

b) Chronic suppurative otitis media (CSOM) is the result of an initial episode of acute otitis media and is characterized by a persistent discharge from the middle ear through a tympanic perforation. It is an important cause of preventable hearing loss, particularly in the developing world.

c) Impacted cerumen is accumulated ear wax that obstructs the external acoustic meatus

4. During the physical examination of ear disorders, the clinician may look into the ear using an otoscope. List five elements that she/he may report.

Answer:

a. A blockage caused by a foreign object

b. A collapsed eardrum

c. An accumulation of earwax

d. An infection in the ear canal

e. An infection in the middle ear if a bulge is present in the eardrum.

f. Cholesteatoma, a skin growth behind the eardrum in the middle ear.

g. Fluid in the ear canal

5. A hole in the eardrum

3. Complete the following table

Ear conditions	Causes and risk factors	Clinical features	Treatment
Otitis media			
Impacted cerumen			
Hearing Loss			

Answer:

Ear conditions	Causes and risk factors	Clinical features	Treatment
Otitis media	being between 6 and 36 months old, using a pacifier, attending daycare, being bottle fed instead of breastfed (in infants), drinking while laying down (in infants), being exposed to cigarette smoke, being exposed to high levels of air pollution, experiencing changes in altitude, experiencing changes in climate, being in a cold climate, having had a recent cold, flu, sinus, or ear infection	A fever, tinnitus, malaise, severe earache, and hearing loss. Tenderness behind the ear indicates mastoiditis. Redness of the eardrum and bulging. Pressure in the middle ear or dysfunction of inner ear structures can cause nausea, vomiting, and dizziness. Infants and children: Crying, irritability, sleeplessness, pulling on the ears, ear pain, a headache, neck pain, a feeling of fullness in the ear, fluid drainage from the ear, a fever, vomiting, diarrhea, irritability, a lack of balance and hearing loss	High-dose a day)
Impacted cerumen	Swimming can cause some people to produce excess earwax. Individuals whose ear canals are narrow or not fully formed, people with very hairy ear canals, people with osteomata or benign bony growths, in the outer part of the ear canal. Other risk factors are those patients with certain skin conditions, such as eczema older people, because earwax tends to become drier and harder with age, which increases the risk of impaction, people with recurring ear infections and impacted earwax, individuals with lupus or Sjogren's syndrome.	The client with impacted earwax may experience a sense of fullness or pain in the ears, referred to as otalgia, and diminished hearing. The client asks that words be repeated, misinterprets questions, or raises the volume on the television or radio. Visual inspection with an otoscope shows an orange-brown accumulation of cerumen in the distal end of the external acoustic meatus. Audiometric, Rinne, and Weber tests reveal conductive hearing loss. Some symptoms of impacted earwax include Hearing loss, earache, sense of ear fullness, itching in the ear, dizziness, ringing in the ears, cough, tinnitus, which is a ringing in the ear, an ear infection, vertigo, or a sense of being unbalanced that can lead to dizziness and nausea	Ear syringin the external the nozzle c and backwa a cascade a irrigation so along its flo The solution usually warn bicarbonate and Vinegar infection. The commo hydrogen pe solution of s sodium bica and glycerin turpentine a (triethanolar condensate agent, an ac mineral oil.

		amoxicillin (80 to 90 mg per
		g techniques consists of pulling ear up and back, and aiming of the syringe slightly upwards rds so that the water flows as along the roof of the canal. The lution flows out of the canal or, taking wax and debris with it. n used to irrigate the ear canal is m water, normal saline, sodium solution, or a solution of water r to help prevent secondary
		n cerumen softeners include urea eroxide (6.5%) and glycerine, a sodium bicarbonate in water, or arbonate (sodium bicarbonate ne), Cerumol (peanut oil, nd dichlorobenzene), cerumenex mine), polypeptides and oleate-), docusate, an emulsifying ctive ingredient found in laxatives,
Hearing Loss		Treatment plan of Hearing Loss includes hearing aids, Behind-the-ear (BTE) hearing aids, In-the-canal (ITC) hearing aids, completely in the canal (CIC) hearing aids, Bone conduction hearing aids, Cochlear implants

2.9.2 Consolidation activities

1. List at least 5 cerumen softening agents for cerumen removal

Answer: Acetic acid, 2.5%, Hydrogen peroxide, 3%, Sodium bicarbonate, 10%, Triethanolamine polypeptide oleate condensate, 10%, Water or saline

2. What is the difference between the different levels of hearing loss?

Answer:

Hearing loss: This is a reduced ability to hear sounds in the same way as other people.

Deafness: This occurs when a person cannot understand speech through hearing, even when sound is amplified.

Profound deafness: This refers to a total lack of hearing.An individual with profound deafness is unable to detect sound at all.

3. Outline at least 10 communication strategies with persons with hearing loss

Answer:

- Eliminate background noise as much as possible.
- Stand or sit on the side of the client's better ear.
- Ensure that there is adequate natural or artificial light.
- Get the client's attention.
- Face the client.
- Speak clearly and at a normal pace without exaggerating pronunciations.
- Do not shout, but avoid dropping conversational volume at the end of a sentence.

Promote a clear image of your mouth; do not chew gum or cover your mouth.

- Use gestures and facial expressions to enhance what is being said orally.
- Rephrase whatever the client does not understand.
- Remain patient, positive, and relaxed.
- Provide paper and pencil if the client communicates by sign language or has speech that is difficult to understand
- Use a support person who can communicate by signing.

Extended activities

1. What actions would the nurse perform while administering ear drops to remove excessive cerumen? Select all that apply.

a. Avoid inserting the irrigating syringe too deeply.

b. Boil the solution once.

c. Direct the flow of the ear drops toward the eardrum.

d. Direct the flow of the ear drops toward the roof of the canal.

e. Shake the ear drops container vigorously.

f. Warm the ear drops by holding the container in the hand for a few minutes.

Answer: all the above

2. A client arrives at the emergency department after an insect has entered the ear. Which of the following solutions would the nurse instill into the client's ear to smother the insect?

a. Carbamide peroxide

b. Hot water

c. Mineral oil

d. Triethanolamine

Answer:

3. Which is the best evidence that the antibiotic the nurse is administering for the treatment of acute otitis media is having a therapeutic effect?

a. Ear discomfort is relieved.

b. Ear drainage is thin and watery.

c. Ringing sounds within the ear stop.

d. The ear feels less warm to the touch.

Answer:

4. Outline at least 3 differential medical diagnoses of otitis media

Answer: Otosclerosis, ototoxicity, Accoustic neuroma

5. A young woman comes in the clinic complaining of severe pain of her left ear; it hurts to touch it. She says that she swims at least 3 days a week. She is diagnosed with otitis externa. The nurse practitioner prescribes analgesics and application of heat to the affected ear and tells the client to avoid swimming for 2 weeks. Because this client swims regularly for exercise, what further instructions can the nurse provide to prevent future problems?

Answer:

Preventive measures including use of earplugs while swimming, use of hair dryers

on the lowest settings and head tilting to remove water from the ear canal, and avoidance of self-cleaning or scratching the ear canal. Acetic acid 2% (Vosol) otic solutions are also used, either two drops twice daily or two to five drops after water exposure.

6. What is ototoxicity and enumerate the factors that are related to it?

Answer:

Ototoxicity describes the detrimental effect of certain medications on the eighth cranial nerve or hearing structures. Signs and symptoms of ototoxicity include tinnitus and sensorineural hearing loss. Vestibular toxicity includes signs and symptoms of light-headedness, vertigo, nausea, and vomiting. Drugs associated with ototoxicity include salicylates, loop diuretics, quinidine, quinine, and aminoglycosides.

7. Which is the most ototoxicity among the following antimalarial drugs?

a. Coartem

b. Artesunate

c. Quinine

d. Chroloquine

Answer: c

8. Changes in the ear that occur with aging may include:

a. atrophy of the tympanic membrane.

b. increased hardness of the cerumen.

c. degeneration of cells at the base of the cochlea.

d. all of the above

Answer: d

9. The most common fungus associated with ear infections is:

a. Staphylococcus albus.

b. Staphylococcus aureus.

c. Aspergillus.

d. Pseudomonas

Answer:c

10. Nursing instructions for a patient suffering from external otitis should include the:

a. application of heat to the auricle.

b. avoidance of swimming.

c. ingestion of over-the-counter analgesics, such as aspirin.

d. all of the above.

Answer: d

11. A tympanoplasty, the most common procedure for chronic otitis media, is surgically performed to:

a. close a perforation.

b. prevent recurrent infection.

c. reestablish middle ear function.

d. accomplish all of the above

Answer: d

12. A symptom that is not usually found with acute otitis media is:

a. aural tenderness.

b. rhinitis.

c. otalgia.

d. otorrhea

Answer:a

13. An incident of otitis media is usually associated with:

a. ear canal swelling.

b. discharge.

c. intense ear pain.

d. prominent localized tenderness.

Answer:c

14. A myringotomy is performed primarily to:

a. drain purulent fluid.

b. identify the infecting organism.

c. relieve tympanic membrane pressure.

d. accomplish all of the above

Answer:d

15. Postoperative nursing assessment for a patient who has had a mastoidectomy should include observing

for facial paralysis, which might indicate damage to which cranial nerve?

a. First

b. Fourth

c. Seventh

d. Tenth

Answer:c

16. A facial nerve neuroma is a tumor on which cranial nerve?

a. Third

b. Fifth

c. Seventh

d. Eighth

Answer:c

3.1 Key unit competence

Demonstrate understanding of the appropriate management of different common Medical Pathologies of the Nose

3.2 Prerequisite (Knowledge, skills, attitude and values)

To achieve the above competence the associate nurse student needs to have learnt the following subjects:

- **Human body anatomy and physiology:** Sensory organs mainly Nose and Throat
- **Fundamental of Nursing:** Vital signs and parameters measurements and interpretation, Drugs administration (PO, inhalations, spray and injectable), History taking, Complete health assessment from head to toes through interview and Physical assessment regarding nose and throat.
- **Ethics and professional code of conduct:** Respect of principles of ethics during management of a patient with all medical diseases. The Associate Nurse student should demonstrate good behaviors while interacting with the patient.
- **Pharmacology:** drugs acting on sensory system (NSAIDs, cortico-steroids, anti-histamines drugs, antibiotics, etc.) with their posology and their mode of administration.

3.3. Cross-cutting issues to be addressed

Standardization culture

All health care facilities must use same standard and accurate equipment and techniques in the management of the medical conditions. During the field trips, the teacher should ensure the availability of standard medical equipment and technics before selecting the health care facility to use. The learners have to learn the use of those standards equipment and technics in the management of patients with sensory diseases.

3.3.1. Inclusive education

All students should participate in all activities without discrimination of a student with any disability. This may be challenging to students with special educational needs especially those with disabilities, slow learners, those with low self-esteem, etc. However, the teacher can make some arrangements like:

- Grouping students: Students with special educational needs are grouped with others and assigned the roles basing on individual student's abilities. Providing procedure/checklists or protocols earlier before the practical work so that students get familiar with them. They can be written on the chalkboard

or printed depending on available resources. If you have, students with low vision remember to print in appropriate fonts. In addition, you are supposed to pay attention to all categories of learners.

- Every important point is written and spoken. The written points help students with hearing impairment and speaking aloud helps students with visual impairment.
- Remember to repeat the main points of the lessons.

3.3.2. Gender education

Emphasize to learners that anybody irrespective of their gender can be a health care professional. The teacher must present some role models of people who have been successful in medical and nursing professions in the area where the learners come from. Make sure that during practical work both boys and girls shares and participate equally in practices, arranging and proper hygiene after procedures.

3.4 Guidance on the introductory activity

During the introductory activity 3.0, learners will observe all images illustrated and the abnormal features from those images, and will remember the anatomy and physiology of sensory system mainly nose and throat learnt in the unit of biology and parts of sensory assessment learnt in unit of fundamentals of nursing. From all these prerequisites, learners will be requested to observe the picture illustrated and be able to list all abnormal features they see and list all medical conditions that can lead to those abnormal features mentioned.

Teacher's activity

- Using brainstorming: Every learner is given opportunity to observe the image and answer the questions related to the image illustrated.
- Teacher writes on whiteboard the correct answers from the learners.

The expected answers to introductory activity 3.0

1) The observations about what the persons illustrated are

complaining:

Images 1, 2 and 4: the persons might be sneezing, blowing the nose, pressing due to pain, etc.

Image 3: the person is having nose bleeding

Images 5 and 6: the persons might be having wounds at the noses

2) **The medical conditions that might be having above mentioned as clinical presentations: flu like syndrome, rhinitis, sinusitis, tonsillitis, epistaxis, nose-bleeding, nasal injury, pharyngitis, laryngitis, etc.**

3.5 List of lessons/sub-heading (including assessment)

#	Lessons	Learning objectives	Number of periods
1	Description of Nose diseases (Introductory activity 3.0) in general and Description of Rhinitis (learning activity 3.1)	• Through brain storming, learners will be able to know all common medical pathologies of the nose reviewing all general signs and symptoms. • By brainstorming, learners will be able to answer all questions related to introductory activity 3.0 • Within the groups and using the learning activity 3.1, learners will be to demonstrate the knowledge and take appropriate decisions in management of patients with rhinitis.	1
2	Description of nose related diseases (Sinusitis)	• Within the groups and using the learning activities 3.2, learners will be to demonstrate the knowledge and take appropriate decisions in management of patients with sinusitis.	1

3	Description of nose related diseases (Epistaxis/ Nose-bleeding, and Nasal Injury)	• Within the groups and using the learning activities 3.3 and 3.4, learners will be to demonstrate the knowledge and take appropriate decisions in management of patients with epistaxis, nose-bleeding and nasal injury.	1
4	Description of Nose and Throat related diseases (Pharyngitis, and Tonsillitis)	• Within the groups and using the learning activities 3.5, and 3.6, learners will be to demonstrate the knowledge and take appropriate decisions in management of patients with pharyngitis, and tonsillitis.	1
5	Description of Nose and Throat related diseases (Laryngitis)	• Within the groups and using the learning activities 3.7, learners will be to demonstrate the knowledge and take appropriate decisions in management of patients with laryngitis.	1
6	Self-assessment 3.1, 3.2, 3.3, 3.4, 3.5, 3.6 and 3.7.	Demonstrate understanding of the appropriate management of different common Medical Pathologies of the Nose and Throat	1

	End unit 3 assessment	• Demonstrate the understanding of the appropriate decisions regarding the management of different common Medical Pathologies of Nose and Throat. • Identify the strengths and gaps of learners on appropriate decisions in the management of common pathologies of the Nose and Throat. • Prepare the feedback to students Organize different additional learning activities.	

Lesson 1: Description of Nose diseases (Introductory activity 3.0) in general and Description of Rhinitis (learning activity 3.1)

a) Prerequisites

This is the first lesson of the third unit on medical pathologies of sensory system mainly the Nose and Throat. In this lesson, you will be dealing with the common medical pathologies of the Nose and Throat. The learner will be able to revise the anatomy and physiology of sensory system mainly the nose and throat.

The first thing to do before starting teaching is to remind learners what they have learnt about structure and function of nose in biology, health assessment of sensory system focusing on ear, nose and throat from fundamentals of nursing and let them discuss the questions as indicated in introductory activity 3.0. after brainstorming in answering the questions relate to introductory activity 3.0, learners will be given time to be into groups and read he case from the case study from learning activity 3.1 and provide answers. All these will be preparing the learners themselves for this lesson.

b) Learning objectives

On completion of this lesson, the learner will be able to:

- List all signs and symptoms that the patients on the images were presenting that are common in the common nose diseases
- List all Medical conditions that lead to all signs and symptoms listed
- Demonstrate the knowledge about rhinitis and demonstrate competencies in taking appropriate decisions in management of patients with rhinitis.

c) Teaching resources

This lesson will be taught with different aids and methods in order to achieve learning objectives. The teaching materials are white board, flip chart, marker, computer, screen, handout, textbook, videos. In addition, the teacher will avail the didactic materials (all materials for physical examination focusing on sensory system assessment mainly Nose and Throat, etc.). The teaching methods are lecture, brainstorming, course work, and small group discussion. In addition, the teacher guides the learners where they can find the supporting resources such computer lab, Nursing skills lab, and Library.

d) Learning activities

Learning activities should be directly related to the learning objectives of the course, and provide experiences that will enable students to engage in practice, and gain feedback on specific progress towards those objectives. The various learning activities will be carried out such as taking notes, course work, and read textbook related to the lesson, group assignment, listening to the video and summarize the content, engagement in debate and other clinical learning activities such as case study.

Teacher's activity

- Ask learners to brainstorm while answering the questions related to the image in the introductory activity 3.0.
- Supervise the work where the learners are grouped in small group and teacher facilitates them to answer the questions by using the case study in learning activity 3.1.
- Ask learners to present what they have done in group
- Identify the correct answers and complete those ones that are incomplete.
- Correct the answers that are false.
- Note on the blackboard the main student's ideas.
- Help learners to summarize what they have learnt and make conclusion.

Student activity:

- Brainstorm in answering the questions regarding the introductory activity 3.0.
- Form group and participate in the group work
- To read carefully the case study from learning activity 3.1 and answer the questions
- Group representatives will present their work
- Other students will follow when group representatives will be presenting
- Take notes from the correct answers
- Make conclusion from what they have learnt.

♦ **Answers of learning activity 3.1**

1. The abnormal signs and symptoms that patient was presenting are nasal block (obstruction), rhinorrhea, sneezing and pruritus of nasal mucosa for 2 days.
2. The medical problem of this patient is Rhinitis/allergic rhinitis or Flu like syndrome
3. The management plan included to be encouraged to have bed rest, to drink plenty warm water, normal saline nasal drops instillation, NSAIDs (paracetamol tablets) and anti-histamines (chlorphenilamine tablets).
4. The teaching plan should include patient can try using an air conditioner instead of opening the windows and if possible, add a filter designed for allergies, use of a dehumidifier can help the patient control the allergies while indoors. If patient is allergic to dust mites, wash the sheets and blankets in hot water that is above 130°F (54.4°C). Patient will be advised to avoid driving while taking the anti-histamines and to adhere to medications. The teaching plan should mainly include the identification of the allergen, use of nasal sprays, encourage thorough cleaning of the house, and encourage medication compliance .
5. If not well treated, the consequences might be inability to sleep, keeping sleepless during night; development or worsening of asthma symptoms, frequent ear and nasal infection, absences from school or work because of reduced productivity, frequent headaches. Other complications can also arise from antihistamine side effects like drowsiness (feeling of being sleepy and lethargic), headache, anxiety, and insomnia.

Lesson 2: Description of nose related diseases (Sinusitis)

a) Prerequisites

This is the second lesson of the third unit on medical pathologies of sensory system. In this lesson, you will be dealing with two medical conditions (Sinusitis) specifically their definitions, causes and risk factors and pathophysiology, signs and symptoms of sinusitis, investigations to be requested, plan of management and the possible complications. The learner will be able to revise the anatomy and physiology of the nose and throat. The first thing to do before starting teaching is to remind learners what they have learnt about structure and function of nose and throat in biology, health assessment of sensory system with focus on nose and throat. In addition, the teacher will let students discuss the questions from the case studies from learning activity 3.2 so that they can prepare themselves for this lesson.

b) Learning objectives

On completion of this lesson, the learner will be able to:

- Demonstrate the knowledge about sinusitis and demonstrate competencies in taking appropriate decisions in management of patients with sinusitis.
- Demonstrate the knowledge about tonsillitis and demonstrate competencies in taking appropriate decisions in management of patients with tonsillitis.

c) Teaching resources

This lesson will be taught with different aids and methods in order to achieve learning objectives. The teaching materials are white board, flip chart, marker, computer, screen, hand out, textbook, and videos. In addition, the teacher will avail the didactic materials such as materials for physical examination focusing on sensory system assessment mainly Nose and Throat, etc. The teaching methods are lecture, brainstorming, course work, and small group discussion. In addition, the teacher guides the learners where they can find the supporting resources such computer lab, Nursing skills lab, and Library.

d) Learning activities

Learning activities should be directly related to the learning objectives of the course, and provide experiences that will enable students to engage in practice, and gain feedback on specific progress towards those objectives. The various learning activities will be carried out such as taking notes, course work, and read textbook related to the lesson, group assignment, listening to the video and summarize the content, engagement in debate and other clinical learning activities such as case study.

Teacher's activity

- Ask learners to be into different small groups and ask them to read the case studies and answer the questions from learning activities 3.2
- Supervise the work where the learners are grouped in small group and teacher facilitates them to answer the questions by using the case studies in learning activities 3.2
- Ask learners to present what they have done in groups
- Identify the correct answers and complete those ones that are incomplete.
- Correct the answers that are false.
- Note on the blackboard the main student's ideas.
- Help learners to summarize what they have learnt and make conclusion.

Student activity:

- Form small groups and participate in the group work

- To read carefully the case study from learning activity 3.2 and answer the questions related to the case.
- Group representatives will present their work
- Other students will follow when group representatives will be presenting
- Take notes from the correct answers
- Make conclusion and summary from what they have learnt.

♦ Answers of learning activity 3.2

1. The abnormal signs and symptoms that patient was presenting are facial pain, pressure sensation, congestion or fullness, nasal obstruction or blockage, discolored nasal discharge, loss of smell, headache and fatigue.
2. The medical problem of this patient might be Sinusitis.
3. The management plan included amoxicillin 500mg TDS for 5 days, and cetirizine 10mg OD for 5 days preferably during the night. He was also advised to use normal saline nose drops followed by suction or nose blowing to wash dried mucus or pus out of the nose.
4. The teaching topics for a patient with sinusitis include:
    - Avoid upper respiratory infections (try to stay away from people who have colds or who are sick with other infections). Wash the hands frequently with soap and water, especially before the meals.
    - Manage the allergies.
    - Avoid cigarette smoke and polluted air (tobacco smoke and other pollutants can irritate and inflame your lungs and nasal passages).
    - Use a humidifier (if the air in the home is dry, be sure the humidifier stays clean and free of mold with regular, thorough cleaning).
    - Drink plenty of fluids to keep your mucus thin
    - Sleep with your head propped up, or with the pain-free side of your face on the pillow
    - Inhale steam three or four times a day (for example, sit in the bathroom with a hot shower running)
    - Use a salt-water nasal spray or a nasal cup to loosen mucus

- Adhere properly to the prescribed medications to help with pain and headaches and avoid the infections. Adhere also to the prescribed decongestant to help the sinuses drain, but antihistamines should be the last options as they make mucus thick.
- Put a warm, wet towel against your face to help with pain.

5. If the sinusitis is not well treated, the consequences might be chronic sinusitis, vision problems, orbital cellulitis, sub-periosteal abscess, orbital abscess, mastoiditis, frontal or maxillary osteomyelitis, subdural abscess, and cavernous sinus thrombosis. Other consequences include brain abscess, permanent loss of your ability to smell because of damage to your olfactory nerve, which helps you smell, loss of vision if an infection spreads to your eyes, inflammation of the brain and spinal cord membranes (known as meningitis).

Lesson 3: Description of nose related diseases (Epistaxis, Nose-bleeding and Nasal Injury)

a) Prerequisites

This is the third lesson of the third unit on medical pathologies of sensory system. In this lesson, you will be dealing with the medical conditions of the nose (Epistaxis, Nose-bleeding and Nasal Injury) specifically their definitions, causes and risk factors and pathophysiology, signs and symptoms of each one among those diseases, investigations to be requested, plan of management and the possible complications.

The learner will be able to revise the anatomy and physiology of the nose. The first thing to do before starting teaching is to remind learners what they have learnt about structure and function of nose in biology, and health assessment of sensory system with focus on nose from fundamentals of nursing. In addition, the teacher will let students discuss the questions from the case studies from learning activity 3.3 and 3.4 so that they can prepare themselves for this lesson.

b) Learning objectives

On completion of this lesson, the learner will be able to:

- Demonstrate the knowledge about epistaxis and nose bleeding, and demonstrate competencies in taking appropriate decisions in management of patients with epistaxis and nose bleeding.
- Demonstrate the knowledge about nasal injury and demonstrate competencies in taking appropriate decisions in management of patients with nasal injury.

c) Teaching resources

This lesson will be taught with different aids and methods in order to achieve learning objectives. The teaching materials are white board, flip chart, marker, computer, screen, hand out, textbook, and videos .In addition, the teacher will avail the didactic materials such as materials for physical examination focusing on sensory system assessment mainly Nose, etc. The teaching methods are lecture, brainstorming, course work, and small group discussion. Moreover, the teacher guides the learners where they can find the supporting resources such computer lab, Nursing skills lab, and Library.

d) Learning activities

Learning activities should be directly related to the learning objectives of the course, and provide experiences that will enable students to engage in practice, and gain feedback on specific progress towards those objectives. The various learning activities will be carried out such as taking notes, course work, and read textbook related to the lesson, group assignment, listening to the video and summarize the content, engagement in debate and other clinical learning activities such as case study.

Teacher's activity

- Ask learners to be into different small groups and ask them to read the case studies and answer the questions from learning activities 3.3 and 3.4
- Supervise the work where the learners are grouped in small group and teacher facilitates them to answer the questions by using the case studies in learning activities 3.3 and 3.4
- Ask learners to present what they have done in groups
- Identify the correct answers and complete those ones that are incomplete.
- Correct the answers that are false.
- Note on the blackboard the main student's ideas.
- Help learners to summarize what they have learnt and make conclusion.

Student activity:

- Form small groups and participate in the group work
- To read carefully the case studies from learning activities 3.3 and 3.4 and answer the questions related to those cases
- Group representatives will present their work
- Other students will follow when group representatives will be presenting
- Take notes from the correct answers
- Make conclusion and summary from what they have learnt.

♦ Answers of learning activity 3.3

1. The abnormal signs and symptoms that patient was presenting:

Patient had history of sinus infection that he has been using antihistamine nasal spray and developed the continuous ooze of blood from the right nostril.

2. The medical problem of this patient: Epistaxis or nose bleeding.
3. The investigations that have been ordered are: A full blood count that revealed the hemoglobin level of 9 g/dl and the blood group type was done and revealed type B, Rh+.
4. The management plan included to put the patient in a quiet area, advised to apply the pressure by pinching the anterior aspect of the nose.
5. If the epistaxis is not treated, it leads **to many consequences:**

If epistaxis has severe form, the complications might be hemorrhagic shock, septic shock, pneumocephalus, sinusitis, septal pressure necrosis, neurogenic syncope during packing, epiphora (from blockage of the lacrimal duct), hypoxia (from impaired nasal air movement), aspiration, hypovolemia in heavy bleeding, cerebral abscess.

♦ Answers of learning activity 3.4

1. The body organ that is most affected than others is the probably the nose bone and surrounding tissues.
2. The abnormal signs and symptoms that the patient was presenting are nasal injury, nasal bleeds, and nasal pain. During the physical examination, the patient had inflammation of mucosa and other surrounding membrane with the tears inside the nose. There was also pain in and around the nose, blood coming from the nose, clear fluid coming from the nose, bruising around the eyes, swelling of the face, particularly around the nasal area, trouble breathing through the nose, distortion of the shape of the nose, loss of sense of smell.
3. The causes of nasal fracture include:

External nasal trauma can occur when force is exerted on the nose. Common causes of external nasal trauma include falls, sports injuries, road traffic accidents, physical assault or abuse, etc.

Internal nasal trauma can occur when the cartilage or the blood vessels inside the nose are damaged. Common causes of internal nasal trauma include infections from nasal piercings, irritation caused by inhaling certain substances, sniffing cocaine or other illegal drugs, picking or scratching the inside of your nose, getting a foreign object lodged in the nose.

4. Treatment of nasal injury and trauma include to have rest, pain management, antibiotics to prevent infections, tetanus toxoid, manual realignment (if the break has displaced the bones and cartilage in the nose, the manual realignment needs to be done within 14 days from when the fracture occurred. During this procedure, administer medication by injection or nasal spray to ease discomfort, open the nostrils with a nasal speculum and uses special instruments to help realign the broken bones and cartilage of the nose). Surgeries can be done if the nasal fracture is severe and the manual re-alignment is not successful.
5. The possible complications of nasal fracture include hypovolemia, infection, deformity, septal hematoma, nasal obstruction, epistaxis, CSF leakage, loss of sense of smell (anosmia).

Lesson 4: Description of nose and throat related diseases (Pharyngitis, and Tonsillitis)

a) Prerequisites

This is the fourth lesson of the third unit on medical pathologies of sensory system. In this lesson, you will be dealing with the medical conditions of the nose and throat (Pharyngitis/Tonsillitis and Laryngitis) specifically their definitions, causes and risk factors and pathophysiology, signs and symptoms of each one among those diseases, investigations to be requested, plan of management and the possible complications. The learner will be able to revise the anatomy and physiology of the nose and throat. The first thing to do before starting teaching is to remind learners what they have learnt about structure and function of nose and throat in biology, and health assessment of sensory system with focus on nose and throat from fundamentals of nursing. The teacher will let students discuss the questions from the case studies from learning activity 3.5 and 3.6 so that they can prepare themselves for this lesson.

b) Learning objectives

On completion of this lesson, the learner will be able to:

- Demonstrate the knowledge about pharyngitis, and demonstrate competencies in taking appropriate decisions in management of patients with pharyngitis
- Demonstrate the knowledge about laryngitis and demonstrate competencies in taking appropriate decisions in management of patients with Tonsillitis.

c) Teaching resources

This lesson will be taught with different aids and methods in order to achieve learning objectives. These teaching aids are white board, flip chart, marker, computer, screen,

hand out, textbook, and videos. The teacher will avail the didactic materials such as materials for physical examination focusing on sensory system assessment mainly nose and throat, etc. The teaching methods are lecture, brainstorming, course work, and small group discussion. In addition the teacher guides the learners where they can find the supporting resources such computer lab, Nursing skills lab, and Library.

d) Learning activities

Learning activities should be directly related to the learning objectives of the course, and provide experiences that will enable students to engage in practice, and gain feedback on specific progress towards those objectives. The various learning activities will be carried out such as taking notes, course work, and read textbook related to the lesson, group assignment, listening to the video and summarize the content, engagement in debate and other clinical learning activities such as case study.

Teacher's activity

- Ask learners to be into different small groups and ask them to read the case studies and answer the questions from learning activities 3.5 and 3.6
- Supervise the work where the learners are grouped in small group and teacher facilitates them to answer the questions by using the case studies in learning activities 3.5 and 3.6
- Ask learners to present what they have done in groups
- Identify the correct answers and complete those ones that are incomplete.
- Correct the answers that are false.
- Note on the blackboard the main student's ideas.
- Help learners to summarize what they have learnt and make conclusion.

Student activity:

- Form small groups and participate in the group work
- To read carefully the case studies from learning activities 3.5 and 3.6 and answer the questions related to those cases
- Group representatives will present their work
- Other students will follow when group representatives will be presenting
- Take notes from the correct answers
- Make conclusion and summary from what they have learnt.

♦ Answers of learning activity 3.5

1. The abnormal signs and symptoms that the patient was presenting are sore throat and cough. She has had some hoarseness in her voice over the past few days and subjective sweats but no documented fever. She has a history of seasonal allergies. She complains of isolated throat pain, without any rhinorrhea, sinus pressure, or headache. She had severe unilateral sore throat, bulging of pharyngeal wall, neck pain, swelling, and dysphagia with pharyngeal wall that had whitish plaques.
2. The medical diagnosis the child was presenting is Pharyngitis.
3. The investigations requested to diagnose the medical condition are Full blood count (FBC), erythrocytes sedimentation rate (VS), throat swab for culture.
4. The treatment plan of that patient include health education about home remedies (drink plenty of fluids and rest), ibuprofen for fever management, and was given appointment to come back when the results of culture might be available.
5. The complications that might result from untreated and poorly managed pharyngitis:

Severe infections of the pharynx and surrounding soft tissue can be life-threatening. Upper airway obstruction can result from severe pharyngeal inflammation. Bacterial invasion of the deep tissue of the neck can lead to infection and/or abscess formation in the peritonsillar, submandibular, parapharyngeal, or retropharyngeal space suppurative thrombophlebitis (Lemierre syndrome) can arise from bacterial invasion and clot formation of the jugular vein.

GAS (group A streptococcus) infection can lead to suppurative and nonsuppurative complications. Suppurative complications of GAS pharyngitis are due to invasion of the organism beyond the pharynx and include otitis media, peritonsillar cellulitis or abscess, sinusitis, meningitis, bacteremia, and necrotizing fasciitis. Non-suppurative complications of GAS pharyngitis are immune mediated and include acute rheumatic fever, post-streptococcal glomerulonephritis, and reactive arthritis.

♦ Answers of learning activity 3.6

1. The abnormal signs and symptoms that patient was presenting are throat is so sore that she has difficulty swallowing even liquids. Patient also has acutely swollen and reddened area of the soft palate is noted in her mouth, half occluding the orifice from the mouth into the pharynx. Yellow exudate is present.
2. The medical problem of this patient is Tonsillitis.
3. The investigations that have been ordered include full blood count that revealed elevated white blood cells.
4. The management plan included Amoxicillin 500mg TDS for 7 days, paracetamol 500mg TDS for 3 days, and ibuprofen 400mg TDS. The patient was also advised to drink warm or very cold fluids to help with throat pain and gargle with warm

salt water.

5. If not well treated, the consequences might be:

Complications usually happen only if bacteria caused the infection. These complications include:

- A collection of pus around the tonsil (peritonsillar abcess)
- Middle ear infection
- Breathing problems or breathing that stops and starts while sleeping (obstructive sleep apnea)
- Tonsillar cellulitis, or infection that spreads and deeply penetrates nearby tissues

If the patient has streptococcus bacteria and does not get treatment, the illness could lead to a more serious problem, including rheumatic fever, scarlet fever, sinusitis, kidney infection called glomerulonephritis.

Lesson 5: Description of nose and throat related diseases (Laryngitis)

a) Prerequisites

This is the fifth lesson of the third unit on medical pathologies of sensory system. In this lesson, you will be dealing with the medical condition of the throat (Laryngitis) specifically its definition, causes and risk factors and pathophysiology, signs and symptoms, investigations to be requested, plan of management and the possible complications. The learner will be able to revise the anatomy and physiology of the throat. The first thing to do before starting teaching is to remind learners what they have learnt about structure and function of nose and throat in biology, and health assessment of sensory system with focus on nose and throat from fundamentals of nursing. The teacher will let students discuss the questions from the case studies from learning activity 3.7 so that they can prepare themselves for this lesson.

b) Learning objectives

On completion of this lesson, the learner will be able to:

- Demonstrate the knowledge about Laryngitis, and demonstrate competencies in taking appropriate decisions in management of patients with laryngitis.

c) Teaching resources

This lesson will be taught with different aids and methods in order to achieve learning objectives. These teaching aids are white board, flip chart, marker, computer, screen, hand out, textbook, and videos. The teacher will avail the didactic materials such as materials for physical examination focusing on sensory system assessment

mainly throat, etc. The teaching methods are lecture, brainstorming, course work, and small group discussion. In addition the teacher guides the learners where they can find the supporting resources such computer lab, Nursing skills lab, and Library.

d) Learning activities

Learning activities should be directly related to the learning objectives of the course, and provide experiences that will enable students to engage in practice, and gain feedback on specific progress towards those objectives. The various learning activities will be carried out such as taking notes, course work, and read textbook related to the lesson, group assignment, listening to the video and summarize the content, engagement in debate and other clinical learning activities such as case study.

Teacher's activity

- Ask learners to be into different small groups and ask them to read the case studies and answer the questions from learning activities 3.7
- Supervise the work where the learners are grouped in small group and teacher facilitates them to answer the questions by using the case study in learning activity 3.7
- Ask learners to present what they have done in groups
- Identify the correct answers and complete those ones that are incomplete.
- Correct the answers that are false.
- Note on the blackboard the main student's ideas.
- Help learners to summarize what they have learnt and make conclusion.

Student activity:

- Form small groups and participate in the group work
- To read carefully the case studies from learning activities 3.5 and 3.6 and answer the questions related to those cases
- Group representatives will present their work
- Other students will follow when group representatives will be presenting
- Take notes from the correct answers
- Make conclusion and summary from what they have learnt.

♦ Answers of learning activity 3.7

1. The abnormal signs and symptoms that the patient was presenting are acute episode of hoarseness progressing to aphonia, which she had experienced 3 days before her appointment. She also reported a sore throat, odynophagia, and

cough for 5 days.

2. The medical diagnosis of this patient is acute laryngitis.
3. The possible causes and risk factors of laryngitis:

Most cases of laryngitis are temporary and improve after the underlying cause gets better. Causes of acute laryngitis include viral infections similar to those that cause a cold, vocal strain caused by yelling or overusing the voice, bacterial infections, although these are less common.

Laryngitis that lasts longer than three weeks is known as chronic laryngitis. This type of laryngitis is generally caused by exposure to irritants over time. Chronic laryngitis can cause vocal cord strain and injuries or growths on the vocal cords (polyps or nodules). The other causes include inhaled irritants such as chemical fumes, allergens or smoke; acid reflux also called gastroesophageal reflux disease (GERD); chronic sinusitis; excessive alcohol use; habitual overuse of the voice (such as in singers or cheerleaders); smoking

Less common causes of chronic laryngitis include bacterial or fungal infections, Infections with certain parasites.

Other causes of chronic hoarseness include cancer, vocal cord paralysis, which can result from nerve injury due to surgery, injury to the chest or neck, cancer, nerve disorders, or other health conditions, bowing of the vocal cords.

Other risk factors for laryngitis include having a respiratory infection, such as a cold, bronchitis or sinusitis, exposure to irritating substances, such as cigarette smoke, excessive alcohol intake, stomach acid or workplace chemicals, overusing your voice, by speaking too much, speaking too loudly, shouting or singing.

1) The treatment plan of this patient included:

She had been taking a cough suppressant (Dextromethorphan15mg 2x/day/5days), antihistamine (azatadinex3/day/3days), decongestant (Sudafed take 1 tablet every 4 hours), and acetaminophen (Paracetamol 500mg tds/4days) to relieve her symptoms, and she was advised the oral hydration. She was also treated with amoxicillin-clavulanate 500mg tds/day for 10 days and a methylprednisolone 1 tablet per day in 7days.

2) The possible complications of laryngitis:

Acute laryngitis: complications are rare, as the disease is usually self-limiting. Damage to the vocal cords is possible in patients who try to overcompensate for the dysphonia.

Chronic laryngitis: the main complications are voice loss, obstruction of the airways

and chronic cough. Laryngeal stenosis may develop occasionally. Rarely, in severe infections such as those with herpes viruses, laryngeal erosion and necrosis may occur.

In some cases of laryngitis caused by infection, the infection may spread to other parts of the respiratory tract.

Answers of Self-assessment 3. 1

1. The common signs and symptoms of patient with allergic rhinitis are:

The signs and symptoms for rhinitis includes sneezing, runny nose, stuffy nose, itchy nose, coughing, sore throat, itchy, frequent headaches, eczema-type symptoms, such as having extremely dry, itchy skin that can blister and weep, hives, excessive fatigue.

Allergic rhinitis may cause additional symptoms, such as sneezing, nasal itching, nasal congestion, coughing, headache, fatigue, malaise, and cognitive impairment. The allergens may also affect the eyes, causing watery, reddened, or itchy eyes and puffiness around the eyes.

2. The risk factors or causes of allergic rhinitis:

Rhinitis is commonly caused by a viral or bacterial infection, including the common cold, which is caused by rhinoviruses, coronaviruses, and influenza viruses, others caused by adenoviruses, human parainfluenza viruses\, human respiratory syncytial virus, enteroviruses other than rhinoviruses, metapneumovirus, and measles virus, or bacterial sinusitis, which is commonly caused by Streptococcus pneumoniae, Haemophilus influenzae, and Moraxella catarrhalis. Other factors include having history of allergies in your family, tree pollen, and from other common allergens like grass pollen, dust mites, animal dander, which is old skin, cat saliva, mold.

3. The remedies that should be advised to the patient with allergic rhinitis are:

patient can try using an air conditioner instead of opening the windows and if possible, add a filter designed for allergies, use of a dehumidifier can help the patient control the allergies while indoors. If patient is allergic to dust mites, wash the sheets and blankets in hot water that is above 130°F (54.4°C). Patient will be advised to avoid driving while taking the anti-histamines and to adhere to medications. The teaching plan should mainly include identification of the allergen, use of nasal sprays; encourage thorough cleaning of the house, and encourage medication compliance (administer pharmacologic treatment prescribed and adhere to medications).

4. The treatment plan of allergic rhinitis focuses on trigger avoidance (exposure to

tobacco smoke can be reduced if household members stop smoking or smoke only outside of the home. It is also important to avoid smoke exposure in the workplace. Exposure to pollutants and irritants can be reduced by avoiding wood-burning stoves and fireplaces; properly venting other stoves and heaters; and avoiding cleaning agents and household sprays that trigger symptoms. Exposure to strong perfumes and scented products may be more difficult), medications (daily use of a nasal glucocorticoid (steroid) and/or an antihistamine nasal spray can be helpful for people with allergic rhinitis.

These medications may be used alone or in combination), and/or nasal rinsing or irrigation (simply rinsing the nose with a salt water (saline) solution one or more times per day is helpful for many patients with rhinitis, as well as for other rhinitis conditions. Nasal rinsing is particularly useful for symptoms of postnasal drainage. Nasal rinsing can be done before use of nasal medication so that the lining is freshly cleansed when the medication is applied). All these include respect of remedies, use of antihistamines (loratidine, cetirizine, etc), use of decongenstants (cetirizine, oxymetazoline, etc), use of corticosteroids, eye drops and/or nasal sprays, and Immunotherapy if the patient has severe allergies.

If the rhinitis is not treated well, the possible medical complications are inability to sleep from symptoms keeping sleepless during night; development or worsening of asthma symptoms frequent ear and nasal infection, absences from school or work because of reduced productivity, frequent headaches. Other complications can also arise from antihistamine side effects like drowsiness (feeling of being sleepy and lethargic), headache, anxiety, and insomnia. In rare cases, antihistamines can cause gastrointestinal, urinary, and circulatory effects.

♦ Answers for Self-assessment 3.2

1. The possible causes or risk factors to develop Sinusitis are:

Sinusitis can be caused by a virus, bacteria, or fungus that swells and blocks the sinuses. A few specific causes include common cold, nasal and seasonal allergies, including allergies to mold, polyps (growths), and a deviated septum. A deviated septum means that it is not straight, so that it is closer to the nasal passage on one side of your nose, causing a blockage.
Older persons have more compromised immune systems and a greater prevalence of serious upper respiratory tract infections, both of which increase their risk for the complication of acute sinusitis. Air travel as well as other situations that involve changes in atmospheric pressure, such as deep sea diving or climbing to high altitude increase the risk for sinus blockage and sinusitis. Medical conditions that cause inflammation in the airways or create persistent thickened stagnant mucus can increase the risk for recurrent acute or chronic

If symptoms of sinusitis do not improve after 10 days, there is need to administer the following drugs:

- Antibiotics (for seven days in adults and 10 days in children).
- Oral or topical decongestants.
- Prescription intranasal steroid sprays. (Do not use non-prescription sprays or drops for longer than three to five days — they may actually increase congestion).

Long-term (chronic) sinusitis may be treated by focusing on the underlying condition (typically allergies). This is usually treated with:

- Intranasal steroid sprays.
- Topical antihistamine sprays or oral pills.
- Leukotriene antagonists to reduce swelling and allergy symptoms.
- Rinsing the nose with saline solutions that might also contain other types of medication.

2. The complications for sinusitis include chronic sinusitis, vision problems, orbital cellulitis, sub-periosteal abscess, orbital abscess, mastoiditis, frontal or maxillary osteomyelitis, subdural abscess, cavernous sinus thrombosis, and brain abscess. In addition, the patient may have a permanent loss of the ability to smell because of damage to the olfactory nerve, loss of vision if an infection spreads to the eyes, inflammation of the brain and spinal cord membranes (known as meningitis).

♦ Answers for self-assessment 3.3

1. The possible causes and risk factors to develop epistaxis are:

The most common cause of nosebleeds is dry air. Dry air can be caused by hot, low-humidity climates or heated indoor air. Both environments cause the nasal membrane (the delicate tissue inside your nose) to dry out and become crusty or cracked and more likely to bleed when rubbed or picked or when blowing your nose.

Some of the most common causes include trauma from nose picking, blunt trauma (such as a motor vehicle accident), or insertion of a foreign object (more likely in children). Relative humidity (including centrally heated buildings), respiratory tract infections, chronic sinusitis, rhinitis or environmental irritants can cause inflammation and thinning of the tissue in the nose, leading to a greater likelihood of bleeding from the nose.

Risk factors include trauma, including putting the finger in the nose, blood thinners, high blood pressure, alcoholism, seasonal allergies, dry weather, and inhaled corticosteroids. There are two types: anterior, which is more common; and posterior, which is less common but more serious. Anterior nosebleeds generally occur from Kiesselbach's plexus while posterior bleeds generally occur from the sphenopalatine artery.

Other rare cases are coagulopathy disorders (hemophilia, thrombocytopenia, leukemia, etc.), dietary (salicylates, sulphites, etc.), inflammatory diseases (granulomatosis, SLE, etc), and drugs (anti coagulants, nasal spray, etc.).In addition, neoplastic conditions (squamous cell carcinoma, adenoid cystic carcinoma, nasopharyngeal carcinoma, cancer in sinus area, tumors at the base of brain/meningioma, etc.), and traumatic (anatomic deformity, blunt trauma, foreign bodies, nasal bone fracture, surgery, septal fracture, facial bones/maxilla and zygomatic, etc.)could be the risk factors for epistaxis. Other risks are vascular (hereditary hemorrhagic telangiectasia, angioma, aneurysm of carotid artery, etc.).

2. General signs and symptoms of epistaxis include bleeding from either or both nostrils, a sensation of flowing liquid at the back of the throat, the urge to swallow frequently.
3. The investigations that should be requested to a patient with epistaxis:

For a patient with nasal bleeding, the diagnosis must focus on:

- Clinical diagnosis/ complete history taking and full physical exam
- Complete blood count(CBC)
- Coagulation studies (international normalization rate/INR, prothrombin time/PT, activated partial thromboplastin time, platelet function tests)
- Blood urea nitrogen (BUN), serum creatinine
- Liver function tests(LFTs)

Direct visualization with a good directed light source, a nasal speculum, and nasal suction should be sufficient in most patients. However, computed tomography (CT) scanning, magnetic resonance imaging (MRI), or both may be indicated to evaluate the surgical anatomy and to determine the presence and extent of rhinosinusitis, foreign bodies, and neoplasms. Nasopharyngoscopy may also be performed if a tumor is the suspected cause of bleeding. Sinus films are rarely indicated for a nosebleed.

The diagnosis of posterior epistaxis is diagnosed by focusing on:

- Complete Blood Count (CBC), which is a blood test to check for blood disorders.

- Partial Thromboplastin Time (PTT) or INR, which is a blood test that checks how long it takes for the blood to clot.
- Nasal endoscopy.
- CT scan of the nose.
- X-ray of the face and nose.

4. The management plan of epistaxis include the following elements:

The first treatment is direct pressure. Grasp the nose firmly between the thumb and forefinger and squeeze it for 10 to 30 minutes without stopping. Putting an ice pack on the neck or bridge of the nose may help slow blood flow. Leaning forward to spit out blood instead of letting it run down the throat and be swallowed may help prevent vomiting. Using salt water nasal sprays and humidifying the air may help dryness.

Most anterior nosebleeds can be stopped by applying direct pressure, which helps by promoting blood clots. Those who suffer a nosebleed should first attempt to blow out any blood clots and then apply pressure for at least five minutes and up to 20 minutes. Pressure should be firm and tilting the head forward helps decrease the chance of nausea and airway obstruction as seen in the picture on the right. When attempting to stop a nosebleed at home, the head should not be tilted back.

Patient will be advised to breathe through the mouth, use a tissue or damp washcloth to catch the blood, use the thumb and index finger to pinch together the soft part of the nose. Make sure to pinch the soft part of the nose against the hard bony ridge that forms the bridge of the nose. Squeezing at or above the bony part of the nose will not put pressure where it can help stop the bleeding.

B. Nasal packing: if pressure and chemical cauterization cannot stop bleeding, nasal packing is the mainstay of treatment. There are several forms of nasal packing that can be contrasted by anterior nasal packing and posterior nasal packing. Traditionally, nasal packing was accomplished by packing gauze into the nose, thereby placing pressure on the vessels in the nose and stopping the bleeding. Traditional gauze packing has been replaced with products such as Merocel and the Rapid Rhino. The Merocel nasal tampon is similar to gauze packing except it is a synthetic foam polymer (made of polyvinyl alcohol and expands in the nose after application of water) that provides a less hospitable medium for bacteria. The Rapid Rhino stops nosebleeds using a balloon catheter, made of carboxymethylcellulose, which has a cuff that is inflated by air to stop bleeding through extra pressure in the nasal cavity.

C. Medications: use of tranexamic acid: helps promote blood clotting. For nosebleeds it can be applied to the site of bleeding, taken by mouth, or injected into a vein.

Vasoconstrictive medications such as oxymetazoline (Afrin) or phenylephrine are widely available for treatment of allergic rhinitis and may also be used to control benign cases of epistaxis. Those with nosebleeds that last longer than 20 minutes (in the setting of direct pressure as seen in the image to the right) should seek medical attention. Oral and topical antibiotics to prevent rhinosinusitis and possibly toxic shock syndrome. Avoidance of aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDs). Medications to control underlying medical problems (e.g., hypertension, vitamin K deficiency) in consultation with other specialists.

D. Cauterization: this method involves applying a chemical such as silver nitrate to the nasal mucosa, which burns and seals off the bleeding.

E. Surgery: ongoing bleeding despite good nasal packing is a surgical emergency and can be treated by endoscopic evaluation of the nasal cavity under general anesthesia to identify an elusive bleeding point or to directly ligate (tie off) the blood vessels supplying the nose. The bleeding can also be stopped by intra-arterial embolization using a catheter placed in the groin and threaded up the aorta to the bleeding vessel by an interventional radiologist.

There is no difference in outcomes between embolization and ligation as treatment options, but embolization is considerably more expensive. All these other alternatives are also considered: foreign body removal should be considered if the foreign body is the cause of the nose bleed, surgical repair of a broken nose or correction of a deviated septum if this is the cause of the nosebleed, and ligation (in this procedure, the culprit blood vessel is tied off to stop the bleeding).

5. If epistaxis is not well managed treated, it will lead to some severe forms of the complications like hemorrhagic shock, septic shock, pneumocephalus, sinusitis, septal pressure necrosis, neurogenic syncope during packing, epiphora (from blockage of the lacrimal duct), hypoxia (from impaired nasal air movement), aspiration, hypovolemia from heavy bleeds, cerebral abscess.

♦ **Answers for self-assessment 3.4**

1) The causes of nasal fractures:

External nasal trauma can occur when force is exerted on your nose. Common causes of external nasal trauma include: falls, sports injuries, road traffic accidents, physical assault or abuse.

Internal nasal trauma can occur when the cartilage or the blood vessels inside the nose are damaged. Common causes of internal nasal trauma include infections from nasal piercings, irritation caused by inhaling certain substances, sniffing cocaine or other illegal drugs, picking or scratching the inside of your nose, getting a foreign object lodged in the nose.

2) Different signs and symptoms of nasal fracture:

Signs and symptoms of nasal trauma can range from mild to severe, depending on the type and extent of the injury. Symptoms of nasal trauma can include pain in and around the nose, pain or tenderness, especially when touching the nose, and blood coming from the nose. Other symptoms are clear fluid coming from the nose, bruising around the nose or eyes, swelling of the face, particularly around the nasal area, and trouble breathing through the nose. In addition, the signs and symptoms of nasal fracture include the distortion of the shape of the nose, loss of sense of smell, discharge of mucus from the nose, feeling that one or both nasal passages are blocked and misshapen nose.

3) The complications of nasal injury/fractures: Some complications related to nasal injury are hypovolemia, infections, deformity of the nose and face, and all these others might occur from some serious and severe nose fractures:

Septal haematoma: Blood collecting (haematoma) under the lining (mucosa) of the central partition wall of the nose (septum) is stripped off either side causing a purple swelling inside the nose. If this occurs, it will lead to nasal obstruction, pain, and need treating by draining the blood away soon after it happened. If the blood is left and not drained it can become infected or cause damage to the underlying support destroying cartilage and then leave a 'saddle nose' deformity. Treatment is by surgical drainage and a course of antibiotics.

Nasal obstruction: Nasal blockage usually occurs after the injury due to swelling inside the nose and this may take a few days to settle. If the nose is still blocked after three weeks, it may be due to the septum being deviated and buckled which

blocks the nasal passage. Septal deviation may require surgical correction if the blockage is significant.

Nosebleeds (epistaxis): Nosebleeds are common and usually settle on their own with simple first aid by gently pinching the lower half of the nose for 15 minutes. Nasal packing or cautery in hospital is reserved for nosebleeds that do not stop of their own accord.

Cerebrospinal fluid leak: severe nasal trauma can push the nasal bones into the face, giving the face a pug-like appearance. The thin cribriform plate at the roof of the nose may fracture causing the cerebrospinal fluid that bathes the brain to leak out. Small fractures seal spontaneously with conservative management (95% within two weeks). Antibiotics are not given unless infection is proven to be present. If fluid leak continues, more treatment may be required.

Loss of sense of smell (anosmia): the smell organ in the roof of the nose can also be damaged.

♦ **Answers to Self-assessment 3.5**

1) Different causes and risk factors of pharyngitis:

In most cases, Pharyngitis is caused by an infection, either bacterial or viral. Other less common causes of pharyngitis are non-infectious that include allergies, trauma, cancer, reflux, and certain toxins.

There are numerous viral and bacterial agents that can cause pharyngitis like measles, adenovirus (which is one of the causes of the common cold), chickenpox, croup (which is a childhood illness distinguished by a barking cough), group A streptococcus.

Viruses are the most common cause of sore throats. Pharyngitis is most commonly caused by viral infections such as the common cold, influenza, or mononucleosis. Respiratory viruses, including SARS-CoV-2 are the most common causes of acute pharyngitis. Adenovirus, rhinovirus, and coronaviruses (including severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Other respiratory viruses that cause pharyngitis include enteroviruses, influenza A and B, parainfluenza viruses, and respiratory syncytial virus.

Less commonly, pharyngitis is caused by a bacterial infection. The most common bacterial infection of the throat is streptococcus throat, which is caused by group A streptococcus. Group A Streptococcus (GAS) is the most common bacterial cause of acute pharyngitis. Other bacteria that can cause pharyngitis include: Group C and G Streptococcus (are generally considered to be less common causes of pharyngitis than GAS), Arcanobacterium haemolyticum (formerly Corynebacterium haemolyticum, a facultative anaerobic gram-positive bacillus is an uncommon cause of acute pharyngitis.

Pharyngitis caused by A. haemolyticum is similar to streptococcal pharyngitis and is most common in adolescents and young adults), Fusobacterium necrophorum (an anaerobe that often colonizes the oropharynx, is a putative cause of pharyngitis), Mycoplasma and Chlamydia species (both Mycoplasma pneumoniae and Chlamydia pneumoniae have been reported to cause pharyngitis, most commonly in children and young adults), Corynebacterium diphtheria (is the causative agent of diphtheria.

The clinical syndrome of diphtheria is characterized by pharyngitis, low-grade fever, malaise, and cervical lymphadenopathy. Symptom onset is usually gradual. The hallmark of diphtheria, the formation of a tightly adherent gray membrane that bleeds when dislodged, occurs in at least one-third of patients. Although diphtheria is rare, suspicion should be raised in patients who have recently lived in or traveled to areas where diphtheria remains endemic and in unvaccinated patients), Francisella

tularensis (can cause pharyngeal tularemia, particularly when infection is acquired by ingestion of contaminated food or water. Pharyngeal tularemia is characterized by fever and severe exudative pharyngitis, which is often accompanied by oral ulcers and painful cervical lymphadenopathy. As with diphtheria, a pharyngeal membrane may be present). Rare causes of bacterial pharyngitis include also gonorrhea.

The most common noninfectious causes of pharyngitis include allergic rhinitis or sinusitis, gastroesophageal reflux disease, smoking or exposure to second-hand smoke, and exposure to dry air (particularly in the winter). Trauma (e.g., caused by tracheal intubation) or vocal strain have also been reported to cause sore throat. Other risks include the use of angiotensin-converting enzyme (ACE) inhibitors and some chemotherapeutics, autoimmune disorders like Kawasaki disease, periodic fever. Frequent exposure to colds and flus can increase your risk for pharyngitis. Allergy, frequent sinus infections and exposure to second hand smoke may also raise your risk.

2) Investigations to diagnose the pharyngitis focus on:

- The complete history taking and physical exam that will mainly focus on ear, nose, throat and neck.
- **Throat swab culture:** this involves using a cotton swab to take a sample of the secretions from the throat for the rapid strep test in the consultation room for Group A beta-hemolytic streptococcal rapid antigen detection test (preferred diagnostic method in emergency settings), or the swab is sent to a lab for further testing and results. This is criterion standard for diagnosis of GAS infection (90-99% sensitive).
- Testing for coronavirus 2 (SARS-CoV-2) by rapid test after taking nasal swabs or polymerase chain reaction (PCR) with oro-pharyngeal swab.
- **Blood tests:** mainly to determine whether the patient has mononucleosis. A complete blood count (CBC) may be done to look for any other type of infection. Other laboratory studies that may be helpful include peripheral blood smear, erythrocytes sedimentation rate, blood culture or gonococcal culture if indicated by the history.
- Imaging studies generally are not indicated for uncomplicated viral or streptococcal pharyngitis. However, the following may be considered: lateral neck x-ray in patients with suspected epiglottitis or airway compromise, soft-tissue neck CT if concern for abscess or deep-space infection exists

3) The treatment plan of pharyngitis include:

The main goals in evaluation of adults with pharyngitis are the exclusion of serious or potentially life-threatening conditions and the identification of treatable causes.

Viral infections do not need to be treated with antibiotics, and treatment is

symptomatic as it is only necessary to help relieve symptoms. For the viral pharyngitis, home care that can help in relieving symptoms includes drinking plenty of fluids to prevent dehydration, eating warm broth, gargling with warm salt water (1 teaspoon of salt per 8 ounces of water), using a humidifier, resting until the person feels better.

Bacterial infections (Group A beta-hemolytic streptococcal pharyngitis) require antibiotics. Antibiotics may shorten the duration of symptoms by 16 to 24 hours and prevent rheumatic fever. A 7 to 10 days course of oral penicillin is recommended to ensure the eradication of bacterial carriage and the prevention of rheumatic fever. Treatment options for Group A beta-hemolytic streptococcal pharyngitis include oral treatment with penicillin V or oral amoxicillin.

Cephalosporins and clindamycin may also be used. Intramuscular penicillin is also a treatment option. Macrolides (azithromycin and clarithromycin) have been shown to create the resistance and are not considered a first-line antibiotic for pharyngitis. In patients with a mild penicillin allergy, cephalosporins can be used. In patients with a history of anaphylaxis to penicillin, azithromycin or clindamycin can be used. The disease is no longer infectious after 24 hours of antibiotics.

Single dose corticosteroids like dexamethasone may be given to reduce the severity of symptoms. Symptomatic treatment with gargles (wash one's mouth and throat with a liquid that is kept in motion by breathing through it with a gurgling sound) and acetaminophen/paracetamol or ibuprofen as nonsteroidal anti-inflammatory drugs should be recommended. Use caution in the setting of severe dehydration. For patients with infectious mononucleosis, contact sports should be avoided for 6 to 8 weeks due to the risk of splenic rupture.

Maintaining proper hygiene can prevent many cases of pharyngitis. Some preventive measures include avoid sharing food, drinks and eating utensils, avoid individuals who are sick (isolation or quarantine if possible), wash your hands often especially before eating and after coughing or sneezing, use alcohol-based hand sanitizers when soap and water aren't available, avoid smoking and inhaling secondhand smoke.

4) The complications of pharyngitis:

Severe infections of the pharynx and surrounding soft tissue can be life-threatening. Upper airway obstruction can result from severe pharyngeal inflammation. Bacterial invasion of the deep tissue of the neck can lead to infection and/or abscess formation in the peritonsillar, submandibular, parapharyngeal, or retropharyngeal space suppurative thrombophlebitis (Lemierre syndrome) can arise from bacterial invasion and clot formation of the jugular vein.

GAS (group A streptococcus) infection can lead to suppurative and nonsuppurative

complications. Suppurative complications of GAS pharyngitis are due to invasion of the organism beyond the pharynx and include otitis media, peritonsillar cellulitis or abscess, sinusitis, meningitis, bacteremia, and necrotizing fasciitis. Non-suppurative complications of GAS pharyngitis are immune mediated and include acute rheumatic fever, post-streptococcal glomerulonephritis, and reactive arthritis.

♦ Answers of Self-assessment 3.6

1) Possible causes or risk factors to develop tonsillitis are:

Tonsillitis is most often caused by common viruses, but bacterial infections also can be the cause. The most common bacterium causing tonsillitis is streptococcus pyogenes (group A streptococcus), the bacteria that causes strep throat. Other strains of strep and other common causes of tonsillitis includes adenoviruses, influenza virus, Epstein-Barr virus, Parainfluenza viruses, Enteroviruses, Herpes simplex virus. Other factors include age (children are at higher risk).

2) The general signs and symptoms of tonsillitis:

The main signs and symptoms of tonsillitis are inflamed and swollen tonsils sometimes severe forms make it hard to breathe via the mouth. Patient experiences sore throat, throat pain or tenderness difficulty or pain on swallowing, fever, chills red tonsils, a white or yellow coating on the tonsils, painful blisters or ulcers on the throat, headache, loss of appetite, ear pain, swollen glands in the neck or jaw, bad breath and malaise are the most common symptoms. Enlarged adenoids may produce nasal obstruction, noisy breathing, snoring, and a nasal quality to the voice (a scratchy or muffled voice), stiff neck. Visual examination reveals enlarged and reddened tonsils. White patches may appear on, the tonsils if group A streptococci are the cause.

3) The investigations that should be requested to make the diagnosis of tonsillitis are:

A throat culture by gently swabbing the back of the throat is usually done. The culture will be sent to a laboratory to identify the cause of the throat infection. Ssensitivity test determines the causative microorganism and appropriate antibiotic therapy. A blood test (This test can show whether your infection is viral or bacterial, which may affect your treatment options). It looks for high and low numbers of blood cells to show whether a virus or bacteria are among the causes of tonsillitis.

4) The management plan of tonsillitis:

The treatment of tonsillitis depends on the causes:

A. Medications: if the tests find bacteria, client will get antibiotics. These drugs might be given in a one-time injection or in pills that patient will swallow for several days. The antibiotics usually used are Penicillins for tonsillitis due to group A streptococcus. Other antibiotics might also be used if patient is allergic to penicillin.

Antibiotic therapy, analgesics such as acetaminophen, and saline gargles may be used to treat the infection and associated discomfort. Chronic tonsillitis and adenoiditis may require tonsillectomy.

B. Home remedies: if client has a virus, antibiotics won't help, and the body will fight the infection on its own. In the meantime, client can try some home remedies:

- Get lots of rest
- Drink warm or very cold fluids to help with throat pain
- Eat smooth foods, such as flavored gelatins, ice cream, and applesauce
- Use a cool-mist vaporizer or humidifier in your room
- Gargle with warm salt water
- Suck on lozenges with bensoine or other medications to numb the throat
- Take over-the-counter pain relievers such as acetaminophen or ibuprofen
- If the causative organism is group A streptococcus, the nurse ensures that the client and family members can manage self-care at home by communicating the following points:

– Report any signs of bleeding to the physician, this is particularly important in the first 12 to 24 hours, and then 7 to 10 days after surgery as the throat heals.

– Gently gargle with warm saline or an alkaline mouthwash to assist in removing thick mucus.

– Maintain a liquid and very soft diet for several days after surgery, avoid spicy foods and rough-textured foods.

– Also, avoid milk and milk products if the client does not tolerate them well. Streptococcus, prompt treatment is needed to prevent potential cardiac and renal complications.

C. Surgery

Tonsils are an important part of the immune system, so the best option is to do all best to ensure they kept. But if the tonsillitis keeps coming back or won't go away, or if swollen tonsils make it hard to breathe or eat, client might need to have the tonsils taken out. This surgery is called tonsillectomy (usually, a sharp tool called a scalpel is used to take out the tonsils. But other options are available including lasers, radio

waves, ultrasonic energy, or electrocautery to remove enlarged tonsils). The criteria for performing tonsillectomy are repeated episodes of tonsillitis, hypertrophy of the tonsils, enlarged obstructive adenoids, repeated purulent otitis media, hearing loss related to serous otitis media associated with enlarged tonsils and adenoids, and other conditions (e.g., asthma, rheumatic fever) exacerbated by tonsillitis. Tonsillectomy and adenoidectomy are generally done as outpatient procedures. Post tonsillectomy recovery, patient will be advised to get plenty of rest and drink lots of fluids while recovering, but don't eat or drink any dairy products for the first 24 hours.

5) The complications for tonsillitis:

Complications usually happen only if bacteria caused the infection. These complications include:

- A collection of pus around the tonsil (peritonsillar abcess)
- Middle ear infection
- Breathing problems or breathing that stops and starts while sleeping (obstructive sleep apnea)
- Tonsillar cellulitis, or infection that spreads and deeply penetrates nearby tissues

If the patient has streptococcus bacteria and does not get treatment, the illness could lead to a more serious problem, including rheumatic fever, scarlet fever, sinusitis, kidney infection called glomerulonephritis.

♦ Answers of self-assessment 3.7

1. The signs and symptoms of patient with acute laryngitis include hoarseness, weak voice or voice loss, tickling sensation and rawness in your throat, sore throat, dry throat, and dry cough. Other symptoms might include difficulty breathing, shortness of breath, wheezing, drooling, or difficulty swallowing. But these often indicate a more serious condition, such as epiglottitis, a swelling of the epiglottis, the flap of tissue that covers the larynx to prevent food from going down the trachea (windpipe).
2. The causes and risk factors of acute laryngitis and chronic laryngitis: Most cases of laryngitis are temporary and improve after the underlying cause gets better. Causes of acute laryngitis include viral infections similar to those that cause a cold, vocal strain caused by yelling or overusing the voice, bacterial infections, although these are less common.

Laryngitis that lasts longer than three weeks is known as chronic laryngitis. This type of laryngitis is generally caused by exposure to irritants over time. Chronic laryngitis can cause vocal cord strain and injuries or growths on the vocal cords (polyps or nodules). The other causes include inhaled irritants such as chemical fumes, allergens or smoke; acid reflux also called gastroesophageal reflux disease (GERD); chronic sinusitis; excessive alcohol use; habitual overuse of the voice (such as in singers or cheerleaders); smoking

Less common causes of chronic laryngitis include bacterial or fungal infections, Infections with certain parasites.

Other causes of chronic hoarseness include cancer, vocal cord paralysis, which can result from nerve injury due to surgery, injury to the chest or neck, cancer, nerve disorders, or other health conditions, bowing of the vocal cords.

Other risk factors for laryngitis include having a respiratory infection, such as a cold, bronchitis or sinusitis, exposure to irritating substances, such as cigarette smoke, excessive alcohol intake, stomach acid or workplace chemicals, overusing your voice, by speaking too much, speaking too loudly, shouting or singing.

3. The treatment plan for someone who has signs and symptoms of laryngitis involve:

Supportive care: no matter what the cause, laryngitis is best treated by giving the voice a rest by reducing vocal activity as much as possible. Steam inhalation and drinking fluids also help to soothe irritated tissue, moderate symptoms, and speed healing. Topical medications or remedies such as saltwater, over-the-counter throat lozenges, sore throat syrups, hard candy, herbal teas, herbal sprays, or herbal lozenges only work by coming in contact with inflamed or irritated tissues and so will help only with irritation in the throat itself. The larynx, however, is the doorway to the lungs. If topical medications like saltwater, lozenges, or cough syrup could enter the larynx, the result would be choking or drowning.

Medications: pain, sore throat, and dry cough are most effectively relieved with over-the-counter pain relievers. In severe cases, or for voice professionals, a doctor may use oral or inhaled corticosteroids to rapidly reduce swelling. Other medications will be used only to treat the underlying cause, not the laryngitis itself. Because laryngitis is not usually caused by a bacterial infection, doctors rarely use antibiotics unless if the cause is bacterial. Pain relievers such as acetaminophen, ibuprofen, naproxen, or aspirin are also used. Corticosteroids as prednisone might be used for severe laryngitis cases or voice professionals, an oral or inhaled corticosteroid helps to rapidly reduce swelling. Because of the side effects, which include laryngitis, corticosteroids are only rarely used

Treating the underlying cause: when identified, the underlying condition must be

managed. If laryngitis is caused by acid reflux, dietary changes and medications that reduce stomach acid may be prescribed. Laryngitis caused by medications or irritants will be treated by discontinuing the medication or avoiding the irritant. In particular, tobacco users will be advised to quit smoking to relieve chronic laryngitis due to smoking. Allergies will be treated with allergy medications and lifestyle changes. Laryngitis due to an upper respiratory infection caused by a bacteria or fungus will be treated with the appropriate antimicrobial medications, either antibiotics or antifungals.

Voice therapy: in cases of chronic laryngitis, voice therapy trains patients in vocal behaviors and lifestyle changes that help preserve the voice. Sessions are directed by speech-language therapists and usually last for four to eight weeks.

There is no “best” medication for laryngitis. In most cases, the best treatment for laryngitis is vocal rest, steam inhalation, and proper hydration. Medications are used to treat a possible underlying cause or to provide symptom relief.

To prevent dryness or irritation to your vocal cords avoid smoking and stay away from secondhand smoke, limit alcohol and caffeine, drink plenty of water, keep spicy foods out of your diet, include a variety of healthy foods in your diet, avoid clearing your throat, avoid upper respiratory infections.

4. Diagnosis of laryngitis focus on:

Complete physical exam and review of medical history and symptoms.

Listen to the voice and examine the vocal cords (Laryngoscopy: using the laryngoscope, the health care provider can visually examine the vocal cords by using a light and a tiny mirror to look into the back of the throat. The doctor may use fiber-optic laryngoscopy, and he or she may refer you to an ear, nose and throat specialist).

Taking the oro-pharyngeal swab for culture and/or Biopsy: If the doctor sees a suspicious area, he or she may do a biopsy, taking a sample of tissue for examination under a microscope.

5. The complications if the laryngitis is not treated:

Acute laryngitis: complications are rare, as the disease is usually self-limiting. Damage to the vocal cords is possible in patients who try to overcompensate for the dysphonia.

Chronic laryngitis: the main complications are voice loss, obstruction of the airways and chronic cough. Laryngeal stenosis may develop occasionally. Rarely, in severe infections such as those with herpes viruses, laryngeal erosion and necrosis may occur.

In some cases of laryngitis caused by infection, the infection may spread to other

parts of the respiratory tract.

End Unit 3 Assessment

♦ Answers to multiple choice questions

1. E	7. A	13. D	19. A
2. E	8. C	14. D	20. C
3. D	9. A	15. A	21. A
4. C	10. A	16. D	22. C
5. D	11. A	17. D	23. A
6. D	12. B	18. C	24. D

♦ Answers to essay questions

1. Nose-picking especially in kids but also adults. Dry air, nasal sprays, cocaine, nose blowing, altitude changes, and other traumas and irritants can cause nosebleeds as well, and anticoagulation and hypertension can cause them to recur or persist. Spontaneous nose bleeds (often associated with spontaneous bruises, gum bleeding, etc.) may be a sign of a new malignancy or a problem with platelet function (as seen in renal patients and alcoholic).
2. Direct pinching pressure just below the nasal bone either manually or with clips is effective at stopping virtually all anterior nosebleeds. Pressure should be held at least five minutes. The patient should be kept leaning forward to avoid swallowing blood (often causes vomiting, which will usually restart the bleed).
3. Afrin and other nasal sprays which cause vasoconstriction can be very helpful at stopping bleeding. These sprays are only useful in the acute setting. Chronic use of these nasal sprays actually leads to severe congestion.
4. Hypertension is not generally a cause of nosebleeds, but will help to prolong bleeding or promote re-bleeding from a traumatized or irritated area. Aspirin or coumadin use will have the same effect.
5. Anterior bleeds are most common, and arise from the septum (middle wall) of the nose. This area is called Kiesselbach's (or nosepicker's) plexus. These bleeds are usually responsive to direct pressure or simple packs. Posterior bleeds most commonly involve elderly hypertensive and severe trauma patients. These bleeds occur far back in the nose and drain blood down the oropharynx.

6. They often present with hematemesis. They often require large packs or balloon devices to stop the bleeding and these patients generally require admission to the hospital. Field treatment should concentrate on stopping an anterior bleed and preventing aspiration of blood.
7. Sinusitis is an inflammation of the membrane lining of any sinus, especially one of the paranasal sinuses. Acute sinusitis is a short-term condition that responds well to antibiotics and decongestants; chronic sinusitis is characterized by at least four recurrences of acute sinusitis. Either medication or surgery is a possible treatment.
8. For acute sinusitis, symptoms include facial pain/pressure, nasal obstruction, nasal discharge, diminished sense of smell, and cough not due to asthma (in children). Additionally, sufferers of his disorder could incur fever, bad breath, fatigue, dental pain, and cough .Acute sinusitis can last four weeks or more. This condition may be present when the patient has two or more symptoms and/or the presence of thick, green or yellow nasal discharge. Acute bacterial infection might be present when symptoms worsen after five days, persist after ten days, or the severity of symptoms is out of proportion to those normally associated with a viral infection.
9. Acute sinusitis is generally treated with ten to 14 days of antibiotic care. With treatment, the symptoms disappear, and antibiotics are no longer required for that episode. Oral and topical decongestants also may be prescribed to alleviate the symptoms.
10. Victims of chronic sinusitis may have the following symptoms for 12 weeks or more: facial pain/pressure, facial congestion/fullness, nasal obstruction/ blockage, thick nasal discharge/discolored post-nasal drainage, pus in the nasal cavity, and at times, fever. They may also have headache, bad breath, and fatigue.
11. An endoscope is a special fiber optic instrument for the examination of the interior of a canal or hollow viscus. It allows a visual examination of the nose and sinus drainage areas.

3.6 Additional information

The Heimlich maneuver for dislodging an airway obstruction:

- Ask the person if he or she is choking. (Note: Hands crossed at the neck is the universal sign of choking.)
- Assess ability to speak and cough. If the person cannot talk or cough, say that you can help and place your arms around his or her waist.

- Make a fist with one hand and place the thumb toward the victim above the umbilicus.
- Hold your fist with the other hand and thrust upward into the abdomen
- Repeat thrusts.
- If the object is dislodged and the victim can cough effectively, encourage him or her to do so to eject the object.
- If the object is not ejected or coughed out and the victim loses consciousness, lower the victim to the ground.
- Straddle the victim's body and place the heel of one hand on top of the other. Position the hands midway between the umbilicus and the xiphoid process.
- Deliver thrusts and repeat.
- Open the mouth to assess if the object can be swept out with a hooked finger (do not sweep the mouth in children).
- If the airway remains obstructed, repeat the procedure.
- Clients with serious airway conditions require aggressive treatment to maintain an airway or relieve airway obstruction.

TRACHEOTOMY AND TRACHEOSTOMY

A tracheotomy is the surgical procedure that makes an opening into the trachea. A tracheostomy is a surgical opening into the trachea into which a tracheostomy or laryngectomy tube is inserted. A tracheostomy may be temporary or permanent. A permanent opening in the trachea is required for certain disorders, such as a laryngectomy for laryngeal cancer.

Tracheostomy tubes come in several sizes and differ from laryngectomy tubes in their length and diameter. A cuffed tracheostomy tube has a cuff on the lower end that is inflated with air to provide a snug fit.

The cuff prevents aspiration of liquids or escape of air when a mechanical ventilator is used. The physician specifies the amount of air to be injected into the cuff, usually to achieve a pressure between 20 and 25 mm H2O. The amount of air determines the seating of the cuff in the trachea. The pressure in the cuff requires monitoring with a pressure gauge every 8 hours. During the immediate postoperative period, the physician

may change the tracheostomy tube every 3 to 5 days. To pass a tracheostomy tube into the tracheal opening, an obturator is placed in the tube to facilitate placement. Once the tracheostomy tube is in place, the obturator is removed. The outer tube is held snugly in place by tapes inserted in openings on either side of it and tied at the side of the client's neck. The respiratory passages react to the creation of the new opening with inflammation and excessive mucus secretion. Copious respiratory

secretions are life-threatening. The client cannot be left unattended during the immediate postoperative period because the secretions make frequent suctioning necessary. Additionally, inspired air passes directly into the trachea, bronchi, and lungs without becoming warmed and moistened by passing through the nose. Dry secretions can subsequently develop, which easily form crusts and can break off, obstruct the lower airway, and cause serious respiratory problems. Humidification by a mist collar is usually necessary to prevent drying and incrustation of the mucous membrane in the trachea and the main bronchus.

The longterm and short-term complications of tracheostomy include infection, bleeding, airway obstruction resulting from hardened secretions, aspiration, injury to the laryngeal nerve, erosion of the trachea, fistula formation between the esophagus and trachea, and penetration of the posterior tracheal wall.

Nursing Management

After surgery, the nurse monitors vital signs and auscultates breath sounds. He or she assesses skin color, level of consciousness, and mental status. The nurse monitors for potential complications and checks airway patency frequently. Secretions can rapidly clog the inner lumen of the tracheostomy tube, resulting in severe respiratory difficulty or death by asphyxiation. If the airway is obstructed, the client becomes cyanotic, restless, and frightened. To facilitate breathing during the immediate postoperative period, the nurse positions the client as ordered. When the client is fully awake and blood pressure is stable, the nurse elevates the head of the bed to about 45 degrees. This position decreases edema and makes breathing easier.

The nurse inspects the tracheostomy carefully, ensuring that tapes are secure. If the tube is not tied securely, the client can cough it out, a serious occurrence if the edges of the trachea have not been sutured to the skin. This may be the case in a temporary tracheostomy. The nurse keeps a tracheal dilator at the bedside at all times. If the outer tube accidentally comes out, the nurse inserts the dilator to hold the edges of the stoma apart until the physician arrives to insert another tube. A tracheal tube must never be forced back in place.

Use of force may compress the client's trachea (by pushing the tube alongside and compressing the trachea, rather than inserting the tube into the stoma). Such action could cause respiratory arrest.

Suctioning the Client with a Tracheostomy:

- Use sterile equipment (e.g., gloves, suction catheter, normal saline) and aseptic technique for tracheal suctioning.
- Place client in Fowler's position.

- Pre-oxygenate client for at least 1 to 2 minutes.
- Check that suction pressure is at a low setting.
- Open the suction kit, don gloves, lubricate a sterile, 10 to 14 sized French disposable catheter with sterile saline, and insert it into the lumen of the tube.
- Do not apply suction while the catheter is inserted down the trachea because this irritates the lining of the trachea.
- Begin intermittent suctioning while slowly withdrawing and rotating the catheter. Do not suction for more than 10 seconds at a time.
- Allow client to rest and deep breathe before repeating if more suctioning is necessary.
- Discard the suction catheter after use.

Providing Tracheostomy Care:

- Maintain aseptic technique, washing hands before, during, and after the procedure.
- Position client in a supine or low Fowler's position.
- Using a clean glove, remove the soiled stomal dressing and discard it, glove and all, in an appropriate receptacle.
- Open the tracheostomy kit without contaminating the contents.
- Don sterile gloves—keep the dominant hand sterile.
- Pour hydrogen peroxide and normal saline into respective containers.
- Unlock the inner cannula by turning it counterclockwise.
- Remove it and place in hydrogen peroxide. Clean the inside and outside of the cannula with pipe cleaners.
- Rinse the cleaned cannula with normal saline.
- Tap the cannula and wipe the excess solution with sterile gauze.
- Replace the inner cannula and turn it clockwise within the outer cannula.
- Clean around the stoma with an applicator moistened with normal saline.
- Place a sterile dressing around the tracheostomy tube.
- Change the tracheostomy ties by placing the new ones on first, and removing the soiled ones last.
- Tie the new ends securely, but not tightly, at the side of the neck.

3.7. End unit 3 summary

Disorders of the nose and throat are considered as disorders of the upper airway and range from common colds to cancer. The severity depends on the nature of the

disorder and the client's physiologic response. Most people experience common colds and sore throats and find them more inconvenient than serious. For others, even the most common disorders of the upper respiratory airway are of great concern because other physical problems compound their effects.

Laryngitis is inflammation and swelling of the mucous membrane that lines the larynx. Edema of the vocal cords frequently accompanies laryngeal inflammation. Laryngitis may follow a URI and results from spread of the infection to the larynx. Other causes include excessive or improper use of the voice, allergies, and smoking. Hoarseness, inability to speak above a whisper, or aphonia (complete loss of voice) are the usual symptoms.

In addition, clients complain of throat irritation and a dry, nonproductive cough. The diagnosis is based on the symptoms. If hoarseness persists more than 2 weeks, the larynx is examined (laryngoscopy). Persistent hoarseness is a sign of laryngeal cancer and thus merits prompt investigation. Treatment involves voice rest and treatment or removal of the cause. Antibiotic therapy may be used if a bacterial infection is the cause. If smoking is the cause, the nurse encourages smoking cessation and refers the client to a smoking-cessation program.

Tonsillitis is inflammation of the tonsils, and adenoiditis is inflammation of the adenoids. These conditions generally occur together—the common diagnosis is tonsillitis. Although both disorders are more common in children, they also may be seen in adults. The tonsils and adenoids are lymphatic tissues and common sites of infection. Primary infection may occur in the tonsils and adenoids, or the infection can be secondary to other URIs. Chronic tonsillar infection leads to enlargement and partial upper airway obstruction. Chronic adenoidal infection can result in acute or chronic infection in the middle ear (otitis media). If the causative organism is group A streptococcus, prompt treatment is needed to prevent potential cardiac and renal complications.

Pharyngitis, inflammation of the throat, is often associatedwith rhinitis and other URIs. Viruses and bacteria cause pharyngitis. The most serious bacteria are the group A streptococci, which cause a condition commonly referred to as strep throat. Strep throat can lead to dangerous cardiac complications (endocarditis and rheumatic fever) and harmful renal complications (glomerulonephritis). Pharyngitis is highly contagious and spreads via inhalation of or direct contamination with droplets. The incubation period for pharyngitis is 2 to 4 days.

The first symptom is a sore throat, sometimes severe, with accompanying dysphagia (difficulty swallowing), fever, chills, headache, and malaise. Some clients exhibit a white or exudate patch over the tonsillar area and swollen glands. A throat culture reveals the specific causative bacteria. Rapid identification methods, such as the Biostar or the Strep A optical immunoassay (OIA), are available to diagnose group

A streptococcal infections. These tests are done in clinics and physician offices. Standard 24-hour throat culture and sensitivity tests identify other organisms. Early antibiotic treatment is the best choice for pharyngitis to treat the infection and help prevent potential complications. Penicillin or its derivatives are generally the antibiotics of choice. Clients sensitive to penicillin receive erythromycin. The antibiotic regimen is 7 to 14 days.

Sinusitis is inflammation of the sinuses. The maxillary sinus is affected most often. Sinusitis can lead to serious complications, such as infection of the middle ear or brain. The principal causes are the spread of an infection from the nasal passages to the sinuses and the blockage of normal sinus drainage. Interference with sinus drainage predisposes a client to sinusitis because trapped secretions readily become infected. Impaired sinus drainage may result from allergies (which cause edema of the nasal mucous membranes), nasal polyps, or a deviated septum.

Rhinitis is inflammation of the nasal mucous membranes. It also is referred to as the common cold, or coryza. Rhinitis may be acute, chronic, or allergic, depending on the cause. The most common cause is the rhinovirus, of which more than 100 strains exist. Colds are rapidly spread by inhalation of droplets and direct contact with contaminated articles (e.g., telephone receivers, doorknobs). Allergic rhinitis is a hypersensitive reaction to allergens, such as pollen, dust, animal dander, or food. Rhinitis is usually not a serious condition; however, it may lead to pneumonia and other more serious illnesses for debilitated, immunosuppressed, or older clients. Symptoms associated with rhinitis include sneezing,

nasal congestion, rhinorrhea (clear nasal discharge), sore throat, watery eyes, cough, low-grade fever, headache, aching muscles, and malaise. With the common cold, these symptoms continue for 5 to 14 days. A sustained elevated temperature suggests a bacterial infection or infection in the sinuses or ears. Symptoms of allergic rhinitis will persist as long as the client is exposed to the specific allergen. For most clients, treatment for rhinitis is minimal. Unless specific bacteria are identified as the cause of the infection, antibiotics are not used. Clients may be advised to use antipyretics, such as acetaminophen or nonsteroidal analgesics, for fever. Decongestants such as pseudoephedrine may be recommended for severe nasal congestion.

For clients experiencing a prolonged cough, antitussives may be ordered. Saline gargles are useful for a sore throat, as is saline spray for nasal congestion and prevention of crusting. For allergic rhinitis, antihistamines are often used. An example of a first-generation antihistamine is diphenhydramine (Benadryl). Newer antihistamines include loratadine (Claritin), fexofenadine (Allegra), and cetirizine (Zyrtec). Combination decongestants and antihistamines may also be helpful. An example of this is brompheniramine/pseudoephedrine (Dimetapp). Medications that desensitize or suppress immune responses, such as cromolyn (Nasalcrom)

or intranasal glucocorticosteroids, such as fluticasone (Flonase) may also be prescribed for allergic rhinitis.

Epistaxis, or nosebleed, is a common occurrence. It is not usually serious but can be frightening. Nosebleeds are the rupture of tiny capillaries in the nasal mucous membrane.

They occur most commonly in the anterior septum, referred to as Kiesselbach's plexus. Causes of nosebleed include trauma, rheumatic fever, infection, hypertension, nasal tumors, and blood dyscrasias. Epistaxis that results from hypertension or blood dyscrasias is likely to be severe and difficult to control. Those who abuse cocaine may have frequent nosebleeds. Foreign bodies in the nose and deviated septum contribute to epistaxis, along with forceful nose blowing and frequent or aggressive nose picking.

Obstruction of the nasal passage interferes with air passage. Three primary conditions lead to nasal obstruction: a deviated septum, nasal polyps, and hypertrophied turbinates.

A peritonsillar abscess is an abscess that develops in the connective tissue between the capsule of the tonsil and the constrictor muscle of the pharynx. It may follow a severe streptococcal or staphylococcal tonsillar infection. Clients with a peritonsillar abscess experience difficulty and pain with swallowing, fever, malaise, ear pain, and difficulty talking. On visual examination, the affected side is red and swollen, as is the posterior pharynx. Drainage from the abscess is cultured to identify the microorganism. Sensitivity studies determine the appropriate antibiotic therapy. Immediate treatment of a peritonsillar abscess is recommended to prevent the spread of the causative microorganism to the bloodstream or adjacent structures. Penicillin or another antibiotic is given immediately after a culture is obtained and before results of the culture and sensitivity tests are known. Surgical incision and drainage of the abscess are done if the abscess partially blocks the oropharynx. A local anesthetic is sprayed or painted on the surface of the abscess, and the contents are evacuated. Repeated episodes may necessitate

a tonsillectomy. Nursing management of the client undergoing drainage of an abscess includes placing the client in a semi-Fowler's position to prevent aspiration. An ice collar may be ordered to reduce swelling and pain. The nurse encourages the client to drink fluids. He or she observes the client for signs of respiratory obstruction (e.g., dyspnea, restlessness, cyanosis) or excessive bleeding.

A nasal fracture usually results from direct trauma. It causes swelling and edema of the soft tissues, external and internal bleeding, nasal deformity, and nasal obstruction. In severe nasal fractures, cerebrospinal fluid, which is colorless and clear, may drain from the nares. Drainage of cerebrospinal fluid suggests a fracture in the cribriform plate. The diagnosis of a nasal fracture may be delayed because of

significant swelling and bleeding. As soon as the swelling decreases, the examiner inspects the nose internally to rule out a fracture of the nasal septum or septal hematoma. Both conditions require treatment to prevent destruction of the septal cartilage. If drainage of clear fluid is observed, a Dextrostix is used to determine the presence of glucose, which is diagnostic for cerebrospinal fluid. Radiography studies are done to ascertain any other facial fractures.

Laryngeal trauma occurs during motor vehicle accidents when the neck strikes the steering wheel or other blunt trauma occurs in the neck region. Endoscopic and endotracheal intubations are other possible causes. Although uncommon, a fracture of the thyroid cartilage is also traumatic to the larynx. Laryngeal obstruction is an extremely serious and often life-threatening condition. Some causes of upper airway obstruction include edema from an allergic reaction, severe head and neck injury, severe inflammation and edema of the throat, and aspiration of foreign bodies.

3.8 Additional activities

A. Remedial activities

A1. Multiple choices Questions

1. Nursing measures associated with the uncomplicated common cold include all of the following except:

a) Administering prescribed antibiotics to decrease the severity of the viral infection.

b) Informing the patient about the symptoms of secondary infection, the major complication of a cold.

c) Suggesting adequate fluid intake and rest.

d) Teaching people that the virus is contagious for 2 days before symptoms appear and during the first part of the symptomatic phase.

2. Health teaching for viral rhinitis (common cold) includes advising the patient to:

a) Blow his or her nose gently to prevent spread of the infection.

b) Blow through both nostrils to equalize the pressure.

c) Rest, to promote overall comfort.

d) Do all of the above.

3. About 60% of cases of acute rhinosinusitis are caused by bacterial organisms. The antibiotic of choice is:

a) Augmentin.

b) Amoxil.

c) Erythromycin.

d) Septra.

4. Acute pharyngitis of a bacterial nature is most commonly caused by:

a) Group A, beta-hemolytic streptococci.

b) Gram-negative Klebsiella.

c) Pseudomonas.

d) Staphylococcus aureus.

5. A complication of acute pharyngitis can be:

a) Mastoiditis.

b) Otitis media.

c) Peritonsillar abscess.

d) All of the above.

6. Nursing management for a patient with acute pharyngitis includes:

a) Applying an ice collar for symptomatic relief of a severe sore throat.

b) Encouraging bed rest during the febrile stage of the illness.

c) Suggesting a liquid or soft diet during the acute stage of the disease.

d) All of the above measures.

7. The most common bacterial pathogen associated with tonsillitis and adenoiditis is:

a) Group a, beta-hemolytic streptococcus.

b) Gram-negative klebsiella.

c) Pseudomonas.

d) Staphylococcus aureus.

8. Nursing intervention for a patient with a fractured nose includes all of the following except:

a) Applying cold compresses to decrease swelling and control bleeding.

b) Assessing respirations to detect any interference with breathing.

c) Observing for any clear fluid drainage from either nostril.

d) Packing each nostril with a cotton pledget to minimize bleeding and help maintain the shape of the nose during fracture setting.

9. Surgical reduction of nasal fractures is usually performed how long after the fracture?

a) Within 24 hours

b) 3 to 7 days

c) 2 to 3 weeks

d) 2 months

A2. Short answers Questions

1. Explain how rhinitis can lead to rhinosinusitis. _____ _____
2. Name four bacterial organisms that account for more than 60% of all cases of acute rhinosinusitis: _____, _____, _____, and _____.
3. If untreated, chronic rhinosinusitis can lead to severe complications. List four: _____, _____, _____, and _____.
4. The most serious complication of a tonsillectomy is: _____.
5. The most common cause of laryngitis is _____, with symptoms including _____, _____, and _____.

Answers:

A1: MCQs

1. A

2. D

3 B

4. A

5. D

6. D

7. A

8. D

9. B

A2: Answers for short questions

1. Rhinitis causes the nasal passages to become inflamed, congested, and edematous. The swollen conchae block the sinus openings and cause sinusitis.
2. Streptococcus pneumoniae, Haemophilus influenzae, Staphylococcus aureus, and Moraxella catarrhalis.
3. Answers should include four of the following: severe orbital cellulitis, subperiosteal abscess, cavernous sinus thrombosis, meningitis, encephalitis, and ischemic infarction.
4. Hemorrhage
5. Viral; symptoms include hoarseness, aphonia, and severe cough.

B. Consolidation activities

1.The nurse receives an evening report on a patient who underwent posterior nasal packing for epistaxis earlier in the day. What is the first patient assessment the nurse should make?

a) Patient's temperature
b) Level of the patient's pain
c) Drainage on the nasal dressing
d) Oxygen saturation by pulse oximetry

2. What does the nurse teach the patient with intermittent allergic rhinitis is the most effective way to decrease allergic symptoms?

a) Undergo weekly immunotherapy.
b) Identify and avoid triggers of the allergic reaction.
c) Use cromolyn nasal spray prophylactically year-round.
d) Use over-the-counter antihistamines and decongestants during an acute attack.

3. A patient with an acute pharyngitis is seen at the clinic with fever and severe throat pain that affects swallowing. On inspection, the throat is reddened and edematous with patchy yellow exudates. The nurse anticipates that collaborative management will include

a) Treatment with antibiotics.

b) Treatment with antifungal agents.

c) A throat culture or rapid strep antigen test.

d) Treatment with medication only if the pharyngitis does not resolve in 3 to 4 days.

Answers:

1. D. All of the assessments are appropriate but the most important is the patient's oxygen status. After the posterior nasopharynx is packed, some patients, especially older adults, experience a decrease in PaO2 and an increase in PaCO2 because of impaired respiration and the nurse should monitor the patient's respiratory rate and rhythm and SpO2.

2. B. The most important factor in managing allergic rhinitis is identification and avoidance of triggers of the allergic reactions. Immunotherapy may be indicated if specific allergens are identified and cannot be avoided. Drug therapy is an alternative to avoidance of the allergens but long-term use of decongestants can cause rebound nasal congestion.

3. C. Although inadequately treated hemolytic streptococcal infections may lead to rheumatic heart disease or glomerulonephritis, antibiotic treatment is not recommended until strep infections are definitely diagnosed with culture or antigen tests. The manifestations of viral and bacterial infections are similar and appearance is not diagnostic except when the white irregular patches on the oropharynx suggest that candidiasis is present.

C. Extended activities

C1: Multiple choice Questions:

1. A patient was seen in the clinic for an episode of epistaxis, which was controlled by placement of anterior nasal packing. During discharge teaching, the nurse instructs the patient to:

a) Use aspirin for pain relief.

b) Remove the packing later that day.

c) Skip the next dose of antihypertensive medication.

d) Avoid vigorous nose blowing and strenuous activity.

2. A patient with allergic rhinitis reports severe nasal congestion; sneezing; and watery, itchy eyes and nose at various times of the year. To teach the patient to control these symptoms, the nurse advises the patient to:

a) Avoid all intranasal sprays and oral antihistamines.

b) Limit the usage of nasal decongestant spray to 10 days.

c) Use oral decongestants at bedtime to prevent symptoms during the night.

d) Keep a diary of when the allergic reaction occurs and what precipitates it.

3. A patient is seen at the clinic with fever, muscle aches, sore throat with yellowish exudate, and headache. The nurse anticipates that the collaborative management will include (select all that apply)

a) Antiviral agents to treat influenza.

b) Treatment with antibiotics starting asap.

c) A throat culture or rapid strep antigen test.

d) Supportive care, including cool, bland liquids.

e) Comprehensive history to determine possible etiology.

4. The best method for determining the risk of aspiration in a patient with a tracheostomy is to:

a) Consult a speech therapist for swallowing assessment.

b) Have the patient drink plain water and assess for coughing.

c) Assess for change of sputum color 48 hours after patient drinks small amount of blue dye.

d) Suction above the cuff after the patient eats or drinks to determine presence of food in trachea.

5. Which nursing action would be of highest priority when suctioning a patient with a tracheostomy?

a) Auscultating lung sounds after suctioning is complete

b) Providing a means of communication for the patient during the procedure

c) Assessing the patient's oxygenation saturation before, during, and after suctioning

d) Administering pain and/or antianxiety medication 30 minutes before suctioning

Case studies

A. Isabel, a 14-year-old girl, has just undergone a tonsillectomy and adenoidectomy. The staff nurse assists her with transport from the recovery area to her room.

1. On the basis of knowledge about tonsillar disease, the nurse knows that Isabel must have experienced symptoms that required surgical intervention. Clinical manifestations may have included:

a) Hypertrophy of the tonsils.

b) Repeated attacks of otitis media.

c) Suspected hearing loss secondary to otitis media.

d) All of the above.

2. The nurse assesses Isabel's postoperative vital signs and checks for the most significant postoperative complication of:

a) Epiglottis.

b) Eustachian tube perforation.

c) Hemorrhage.

d) Oropharyngeal edema.

3. The nurse maintains Isabel in the recommended postoperative position of:

a) Prone with her head on a pillow and turned to the side.

b) Reverse trendelenburg with the neck extended.

c) Semi-fowler's position with the neck flexed.

d) Supine with her neck hyperextended and supported with a pillow.

4. Isabel is to be discharged the same day of her tonsillectomy. The nurse makes sure that her family knows to:

a) Encourage her to eat a house diet to build up her resistance to infection.

b) Offer her only clear liquids for 3 days, to prevent pharyngeal irritation.

c) Offer her soft foods for several days to minimize local discomfort and supply her with necessary nutrients.

d) Supplement her diet with orange and lemon juices because of the need for vitamin c to health tissues.

B. Gilberta, a 14-year-old high school student, is sent with her mother to the emergency department of a local hospital for uncontrolled epistaxis.

1. Describe what the school nurse should tell Gilberta to manage the bleeding site

while being transported to the hospital.

2. Initial nursing measures in the emergency department that can be used to stop the nasal bleeding include:

a) Compressing the soft outer portion of the nose against the midline septum continuously for 5 to 10 minutes.

b) Keeping Gilberta in the upright position with her head tilted forward to prevent swallowing and aspiration of blood.

c) Telling Gilberta to breathe through her mouth and to refrain from talking.

d) All of the above.

3. The nurse expects that emergency medical treatment may include insertion of a cotton pledget moistened with:

a) An adrenergic blocking agent.

b) A topical anesthetic.

c) Protamine sulfate.

d) Vitamin K.

4. The nurse can advise the mother that nasal packing used to control bleeding can be left in place:

a) No longer than 2 hours.

b) An average of 12 hours.

c) An average of 24 hours.

d) Anywhere from 2 to 6 days.

Answers:

C1: MCQs

1. D

2. D

3. C, D, E.

4. A

5. C.

C2: CASE STUDIES

A:

1. D

2. C

3. A

4. C

B:1. Gilberta should sit upright with her head tilted forward to prevent swallowing and aspiration of blood. She should also pinch the soft outer portion of the nose against the midline spectrum for 5 to 10 continuous minutes.

2. D

3. B

4. D

UNIT 4: MEDICAL PATHOLOGIES OF ORAL AND OESOPHAGUS

4.1. Key unit competence:

Take appropriate decision on different common medical pathologies of Oral and oesophagus.

4.2. Prerequisite (knowledge, skills, attitudes, and values)

To achieve the above competence, the associate nurse student needs the following prerequisites: human body anatomy and physiology, fundamentals of Nursing, pharmacology.

4.3. Cross-cutting Issues to be addressed

4.3.1. Standardization culture

In health care system, the most case of patients is presented with medical pathology of oral cavity and esophagus such dental caries/teeth, oral pharyngeal candida, injuries, esophagitis. The learners have to learn oral diseases and esophagus in order to handle and to manage the patients with oral cavity and esophagus related diseases.

4.3.2. Inclusive education

The teacher involves the students in all learning activities concerning the kind of learner or disabilities for example the slow learner should be reinforced in order to catch up others, and the teacher takes into consideration respective disability of learner.

Grouping students, Students with special educational needs are grouped with others and assigned roles basing on individual student's abilities. Providing earning resources earlier before teaching session so that students get familiar with them. After end lesson assessment, the identified slow learners are exposed to the remedial learning activities.

Every important point is written and spoken. The written points help students with hearing impairment and speaking aloud helps students with visual impairment. Remember to repeat the main points of the lessons.

4.3.3. Gender education

Emphasize to learners that anybody irrespective of their gender can have medical career mainly medical sciences. Give role models who are successful medical pathology of oral and esophagus in the area where the learners come from. Make sure that during classroom teaching and skills lab demonstration both boys and girls shares and participate equally in practices, arranging and proper hygiene after classroom and skills lab teaching session.

4.4. Guidance on the introductory activity

This introductory activity helps you to engage learners in the introduction of medical pathology of oral and esophagus and invite the learners to follow the next lessons.

Teacher's activity:

- Ask students to read the text and discuss the given questions.
- Engage students in working collectively the activity
- Help students with different problems
- Ask any four students to present their findings while others are following.
- Prepare trip field to nearest health facility in order to be familiar with dental department equipment, and health assessment for oral cavity disorders.
- Invite guest person who has specialty in oral health dental department domain to teach the learners.

4.5. List of Lessons/sub-headings (including assessment)

#	Lesson Title	Learning Objectives	Number of Periods
1	Introduction of medical pathologies of dental caries (definition, causes, pathophysiology, signs and symptoms of dental caries)	• List the common medical pathologies of oral and oesophagus dental caries, oral candidiasis, injuries, esophagitis • Define the term “dental caries” • Describe causes, risk factors and pathophysiology of dental caries. • Describe the signs and symptoms of dental caries.	1
2	Description of dental caries (investigation diagnosis, treatment plan, evolution and complication)	• Enumerate the investigations requested for patient with dental caries • Identify the adequate medical diagnosis of dental caries • Develop a treatment plan of patient with dental caries • Explain the evolution and complications of dental caries.	1
3	Description of oral pharyngeal candidiasis (definition, causes, signs and symptoms, pathophysiology ,investigation, treatment plan, evolution and complication)	• Define the term “oral pharyngeal candidiasis” • Describe causes, risk factors and pathophysiology of oral pharyngeal candidiasis. • Describe the signs and symptoms of oral pharyngeal candidiasis. • Enumerate the investigations requested for patient different types of oral pharyngeal candidiasis. • Identify the adequate medical diagnosis of oral pharyngeal candidiasis. • Develop a treatment plan of oral pharyngeal candidiasis. • Explain the evolution and complications of oral pharyngeal candidiasis.	1

4	Description of oral injuries (definition, causes, pathophysiology, signs and symptoms, investigation diagnosis, treatment plan, evolution and complication)	• Define the term “oral cavity injuries” • Describe causes, risk factors and pathophysiology of injuries. • Describe the signs and symptoms of injuries. • Enumerate the investigations requested for patient with oral cavity injuries. • Identify the adequate medical diagnosis of oral cavity injuries • Enumerate the investigations requested for patient of injuries • Describe the way used for adequate medical diagnosis of injuries. • Develop a treatment plan of patient with injuries. • Explain the evolution and complications of injuries.	1
5	Description of esophagitis (definition, causes, pathophysiology, signs and symptoms, investigation diagnosis, treatment plan, evolution and complication)	• Define the term “esophagitis” • Describe causes, risk factors and pathophysiology of esophagitis • Describe the signs and symptoms of esophagitis. • Enumerate the investigations requested for patient with esophagitis • Describe the way used for the adequate medical diagnosis of esophagitis • Develop a treatment plan for patient with esophagitis • Explain the evolution and complications of esophagitis.	1

6	End unit assessment	• Take appropriate decision on different common medical pathologies of oral dental caries and esophagitis • Identify the strengths and gaps of learners on appropriate decision of different common medical pathologies of eyes • Prepare the feedback to individual and class • Organize different additional learning activities	1

Lesson 1: Introduction of Medical Pathologies of dental caries (Definition, causes, pathophysiology, signs and symptoms of dental caries)

a) Prerequisites

This is the first lesson of the four unit on medical pathologies of oral and esophagus. In this lesson, you will be dealing with the common medical pathologies of dental caries and esophagus, which are dental caries, oropharyngeal candidiasis, injuries and esophagitis. Definition, causes, pathophysiology, signs and symptoms of dental caries for each disease will described. The first thing to do before starting teaching is to remind learners that they have learnt about structure and function of teeth in biology, health assessment of oral cavity from fundamentals of nursing. The teacher will let students discuss the questions as indicated in introductory activity and from the case study from learning activity 4.1 so that they can prepare themselves for this lesson.

b) Learning objectives

- List the common medical pathologies of oral and oesophagus: dental caries, oropharyngeal candidiasis, injuries and esophagitis.
- Define the term “dental caries”
- Describe causes, risk factors and pathophysiology of dental caries
- Describe the signs and symptoms of dental caries.

c) Teaching resources

The teacher could avail the anatomical model of the normal teeth and abnormal teeth and ensure that the students are able to interpret. In addition, the teacher should present to the students the library textbooks on medical-surgical nursing, especially dental caries and indicates the pages. All students must have their

student's books. The algorithm or protocols about oral diseases management must be available. There is a need of black board and chalks or flipcharts and markers.

d) Learning activities 4.1

Teacher 'activities and methodology:

- Ask learners to do individually activity 4.1 in their student book and answer the question number 1, 2, 3 and 4.
- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide their answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard, flipchart and whiteboard to take note of the main students' ideas.
- Tick the correct responses and correct those ones, which are incorrect and try again to complete those, which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.

Student's activity

- The students answer the questions individually in learning activity 4.1 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully.
- Summarize the content with the teacher and coming up with the conclusion.

Expected answers to introductory activity 4.0

1. The possible types of oral health problems illustrated by the picture B, C, D and E might be dental diseases, dental caries, dental accident, teeth eruption, teeth fracture, candidiasis, oral epithelial carcinoma, stenosis of the esophagus, narrowing of the esophagus, esophagitis
2. The picture A looks normal, the picture B may be presenting necrotic dental tissue, dental tissue damage, darkness of oral cavity etc. The picture C indicates oral whitish, swollen tonsils. The picture D may indicate bleeding in the teeth, cut off the teeth. The Picture E indicates the redness of esophagus, narrowed

esophageal lumen.

3. Poor hygiene especially retained food is suggestive risk factor in the development of dental caries as microorganisms invade the teeth surfaces and attract the microorganisms that later damage the dental tissue resulting from dental caries
4. The possible risk factors in diseases process on picture B is poor hygiene, lack of brushing with adequate tooth paste, elderly, childhood, poor diet

The picture C is having risk factors such as chronic immune depressive disease, chronic severe infection, and malnutrition.

Lesson 2: Description of dental caries (investigation diagnosis, treatment plan, evolution and complication)

a) Prerequisite

This is the second lesson of the fourth unit on medical pathologies of oral and esophagus in sensory organs. In this lesson you will be dealing with the description of dental caries such its investigation, diagnosis treatment plan evolution and complication. The first thing to do before starting teaching is to remind learners that they have learnt about lesson one of dental caries.

b) Learning objectives

After completion of this lesson, the student will be able to:

- Enumerate the investigations requested for patient with dental caries
- Identify the adequate medical diagnosis of dental caries
- Develop a treatment plan of patient with dental caries
- Explain the evolution and complications of dental caries.

c) Teaching resources

The teacher could avail the Snellen chart, slip lamp, and ensure the students are able to interpret them. In addition, the teacher should present to the students the library textbooks on medical-surgical nursing, especially oral Diseases and indicates the pages. All students must have their student's books. There is a need of black board and chalks or flipcharts and markers. Algorithms about assessment and management of dental caries must also be displayed.

d) Learning activities

Teacher's activities and methodology

- Ask learners to do individually activity 4.1 in their student book and answer the questions related.
- Provide the necessary materials.

- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide their answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student's ideas.
- Tick the correct responses and correct those ones, which are incorrect and try again to complete those, which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.
- Use brainstorming while collecting the answers from different learners.
- Judge the answers from learners by conforming the right responses.

Student's activities

- The students answer the questions individually in learning activity 4.1 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully
- Summarize the content with the teacher and coming up with conclusion.
- Attempt to answer the self-assessment questions 4 .1

The expected answers from Questions of learning activity 4.1

1. The signs and symptoms that the patient was presenting were tooth sensitivity to hot meal, constant tooth pain, dark spots on the teeth, and bad breath. In addition, the physical exam reveals cavities in teeth and tenderness on palpation (pain), facial swelling. The x-ray reveals the presence of holes in the 34, swelling of gingiva, and fever with body temperature of 38.8°C. An acutely swollen and reddened area of the soft gingiva is noted in her mouth, and an elevated WBC of 16,000/mm3,
2. The x-ray and Full Blood Count (FBC) were performed
3. The medical problem is Dental caries
4. Treatment plan involved the use of Antibiotic like Amoxicillin 500mg TDS 7/7, and Ibuprofen 400mg TDS 4/7 for pain relief.

Lesson 3: Description of oral pharyngeal candidiasis (definition, causes, pathophysiology, signs and symptoms, investigation, treatment plan, evolution and complication)

a) Prerequisites

This is the third lesson of the fourth unit about medical pathologies of the oral and esophagus. In this lesson, you will be dealing with the description of different causes and risk factors of oral pharyngeal candidiasis, pathophysiology, signs and symptoms, investigation, management, evolution and complications. The first thing to do before starting teaching is to remind learners what they have learnt about the anatomy and physiology of the sensory organs (oral cavity), health assessment of oral cavity from fundamentals of nursing. The students will discuss the questions from the case study from learning activity 4.2 so that they can prepare themselves for this lesson.

b) Learning objectives:

After completion of this lesson, the student will be able to:

- Define the term “oral pharyngeal candidiasis”
- Describe causes, risk factors and pathophysiology of oral pharyngeal candidiasis.
- Describe the signs and symptoms of oral pharyngeal candidiasis.
- Enumerate the investigations requested for patient different types of oral pharyngeal candidiasis.
- Identify the adequate medical diagnosis of oral pharyngeal candidiasis.
- Develop a treatment plan of oral pharyngeal candidiasis.
- Explain the evolution and complications of oral pharyngeal candidiasis.

c) Teaching resources

The teacher could avail the oral cavity anatomical model, Penlight and tongue depressor and ensure the students are able to use them. In addition, the teacher should present to the students the library textbooks on medical-surgical nursing, especially oral pharyngeal candidiasis Diseases and indicates the pages. All students must have their student’s books. There is need of black board and chalks or flipcharts and markers. Algorithms about assessment and management of conjunctivitis must also be displayed.

d) Learning activities

Teacher's activities and methodology

- Ask learners to do individually activity 4.2 in their student book and answer the questions related.
- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide they answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student's ideas.
- Tick the correct responses and correct those ones, which are incorrect and try again to complete those, which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.
- Use brainstorming while collecting the answers from different learners.
- Judge the answers from learners by confirming the right responses.

Student's activities

- The students answer the questions individually in learning activity 4.2 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully
- Summarize the content with the teacher and coming up with conclusion.
- Attend the library for reading related book of oral candidiasis conditions
- Attempt to answer the self-assessment questions 4.2

The expected answers from Questions of learning activity 4.2

1. Signs and symptoms that the patient was presenting are soreness, cotton-like feeling in the mouth, loss of taste, dysphagia, cracking and redness at the corners of the mouth.
2. The problem that the patient may be presenting would be oral lesions, oral thrush, oral cavity tissues trauma etc.

3. Full Blood Count of 112,000/mm3
4. The treatment plan includes Antifungal drugs were prescribed such as Fluconazole 800mg OD 14/7, or oral Nystatin 500000UI QID7/7 and Oral paracetamol 500mg TDS 3/7 for pain relief

Lesson 4: Description of injuries (Definition, causes and risk factors, Pathophysiology, signs and symptoms, investigation, diagnosis, treatment plan, evolution and complication)

a) Prerequisites

This is the third lesson of the fourth unit about medical pathologies of the oral and esophagus. In this lesson, you will be dealing with the definition, causes and risk factors, Pathophysiology, signs and symptoms, investigation, diagnosis, treatment plan, evolution and complication of oral injuries. The first thing to do before starting teaching is to remind learners what they have learnt about the anatomy and physiology of the sensory organs (oral cavity), health assessment of oral cavity from fundamentals of nursing. The students will discuss the questions from the case study from learning activity 4.3 so that they can prepare themselves for this lesson.

b) Learning objectives:

After completion of this lesson, the student will be able to:

a. Define the term “oral cavity injuries”

b. Describe causes, risk factors and pathophysiology of injuries.

c. Describe the signs and symptoms of injuries.

d. Enumerate the investigations requested for patient with oral cavity injuries.

e. Identify the adequate medical diagnosis of oral cavity injuries

f. Enumerate the investigations requested for patient of injuries

g. Describe the way used for adequate medical diagnosis of injuries.

h. Develop a treatment plan of patient with injuries.

i. Explain the evolution and complications of injuries.

j) Teaching resources

The teacher could avail the oral cavity anatomical model and Penlight and tongue depressor and ensure the students are able to use them. In addition, the teacher should present to the students the library textbooks on medical-surgical nursing, especially oral pharyngeal candidiasis Diseases and indicates the pages. All

students must have their student's books. There is need of black board and chalks or flipcharts and markers. Algorithms about assessment and management of conjunctivitis must also be displayed.

k) Learning activities

Teacher's activities and methodology

- Ask learners to do individually activity 4.3 in their student book and answer the questions related.
- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide they answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student's ideas.
- Tick the correct responses and correct those ones, which are incorrect and try again to complete those, which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.
- Use brainstorming while collecting the answers from different learners.
- Judge the answers from learners by conforming the right responses.

Student's activities

- The students answer the questions individually in learning activity 4.3 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully
- Summarize the content with the teacher and coming up with conclusion.
- Attend the library for reading related book of oral cavity condition
- Attempt to answer the self-assessment questions 4.3

The expected answers from Questions of learning activity 4.3

1. oral mucous lesions involving multiple oral cavity structure with high sensitivity on palpation following accidental tooth bite after patient fall during sport with the presence of whitish, linear, filament like plicae formation observed via

inspection body temperature was 36.8°C, Blood pressure 100/60 mmHg, pulse rate: 64beats per minute, respiratory rate was 16 breaths per minutes the x-ray was performed and revealed the presence of slight tooth fracture

2. Medical problem could be like tooth fracture, oral mucous lesions
3. The only x-ray was performed to rule out any tooth fracture
4. The medical treatment included Antibiotic drugs were prescribed such as amoxicillin 500mg TDS 7/7 for bacterial infection prevention and saline water to be used to wash out, Diclofenac tablet 100mg TDS 3/7 for pain relief

♦ **Answers for Self-Assessment**

1. The causes and risk factors of injuries might be mechanical irritation from C. albicans dentures, tissue response to microorganisms living beneath the dentures, Accidental mucosal biting, Sharp edges of prosthesis, Lip biting after injection of local anaesthetic solutions, Neonatal teeth, faulty tooth, brushing, Caustic chemical, Chemotherapy, radiotherapy or their combinations, Oral mucositis, Long-term exposure to sunlight.
2. Signs and symptoms of injuries affecting oral cavity includes whitish, linear, filament-like plicae formations, pain, bleeding, light color in respect to neighboring normal tissue, wrinkled appearance
3. chest x-ray if suspicious tooth has been aspirated, orthopantogram (OPG) if considering fractured mandible
4. The treatment plan include pain relief, infection control, and antibiotic ointments to the burn, in radiation injuries, Supportive care, cessation of radiation treatment, and B-complex vitamins.

Lesson 5: Description of esophagitis (definition causes, pathophysiology, signs and symptoms, investigation, treatment plan, evolution and complication)

a) Prerequisite

This is the fifth lesson of the fourth unit about medical pathologies of the oral and esophagus. In this lesson, you will be dealing with the definition, causes and risk factors, pathophysiology, signs and symptoms, investigation, management, evolution and complications of esophagus. The first thing to do before starting teaching is to remind learners what they have learnt about the anatomy and physiology of the sensory organs (oral cavity), esophagus, health assessment of oral cavity from fundamentals of nursing. The students will discuss the questions

from the case study from learning activity 4.4 so that they can prepare themselves for this lesson.

b) Learning objectives

After completion of this lesson, the student will be able to:

- Define the term “esophagitis”
- Describe causes, risk factors and pathophysiology of esophagitis
- Describe the signs and symptoms of esophagitis.
- Enumerate the investigations requested for patient with esophagitis
- Describe the way used for the adequate medical diagnosis of esophagitis
- Develop a treatment plan for patient with esophagitis
- Explain the evolution and complications of esophagitis.

c) Teaching resources

The teacher could avail the oral cavity anatomical model, Penlight, and tongue depressor and ensure the students are able to use them. In addition, the teacher should present to the students the library textbooks on medical-surgical nursing especially esophagitis disease and indicates the pages. All students must have their student’s books. This lesson will be taught with different aids like (white board or black board, computer, chalks or flipcharts and markers. Algorithms about assessment and management of esophagitis must also be displayed.

d) Learning activities

Learning activities should be directly related to the learning objectives of the course and provide experiences that will enable students to engage in practice and gain feedback on specific progress towards those objectives. The various learning activities will be carried out such as: taking notes, course work and reading textbook related to the lesson, group assignment and summarize the content, engagement in debate and other clinical learning activities such as case study.

Teacher’s activity:

- Ask learners to do individually activity 4.4 in their student book and answer the questions related.
- Provide the necessary materials to the students.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide their answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student’s ideas.

- Tick the correct responses and correct those ones, which are incorrect and try again to complete those, which are incomplete.
- Use brainstorming while collecting the answers from different learners.
- Judge the answers from learners by confirming the right responses.
- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.

Student's activities

- The students answer the questions individually in learning activity 1.5 in their student book
- The students ask the problems that may be raised from the provided activity if any in order to get clarification
- Some students present the findings from the learning activity while others are following carefully
- Summarize the content with the teacher and coming up with conclusion.
- Attend the library for reading related book of esophagus condition
- Attempt to answer the self-assessment questions 4.4

Answer to learning activity 4.4

1. Difficult swallowing, painful swallowing, chest pain, particularly behind the breastbone, that occurs with eating, swallowed food becoming stuck in the oesophagus, heartburn, acid regurgitation, fever to:39.8oc
2. The medical diagnosis was esophagitis
3. The endoscopy, Full Blood Count and Barium x-ray were performed
4. Oral paracetamol 500mg TDS 3/7 for pain relief orally and oral Penicillin 500mg TDS 7/7.

♦ Answers for self-assessment 4.4

1. The five forms of esophagitis include reflux esophagitis, infectious esophagitis, pill esophagitis, eosinophilic esophagitis, drug-induced esophagitis, lymphocytic esophagitis, radiation, and chemo radiation esophagitis.
2. The 5 signs and symptoms of esophagitis development include difficult swallowing, painful swallowing, chest pain, particularly behind the breastbone, that occurs with eating, swallowed food becoming stuck in the oesophagus (food impaction), heartburn, acid regurgitation

3. The three types of medical investigations to rule out the esophagitis diagnosis include Barium X-ray, Endoscopy and biopsy.
4. Reflux esophagitis may include over-the-counter treatments. These include antacids (Maalox, Mylanta, others); medications that reduce acid production, called H-2-receptor blockers, such as cimetidine (Tagamet HB); and medications that block acid production and heal the oesophagus, called proton pump inhibitors, these include H-2-receptor blockers as well as proton pump inhibitors, such as esomeprazole (Nexium), omeprazole (Prilosec). The metoclopramide may be prescribed.
5. The three major complications of esophagitis include scarring or narrowing (stricture) of the esophagus, tearing of the esophagus lining tissue from retching (if food is stuck) or during endoscopy (due to inflammation), Barrett's oesophagus.

1.6 Summary of the unit

Medical pathology is a branch of medical science primarily concerning the diseases affects different human organs such as respiratory tract organs, cardio-vascular organs, digestive organs, uro-genital organs, sensory organs etc. This unit of medical pathology of the oral and esophagus described the most common oral cavity and esophagus conditions that are frequently observable in Rwanda such dental caries/teeth, oral-pharyngeal candidiasis, injuries and esophagitis. The medical conditions of oral and oesophagus are described by the definition, clinical features, causes and risk factors, pathophysiology, investigation, treatment plan, evolution and complications. The student who will be complete this content will be able to take appropriate decision on different common medical pathologies in terms of diagnosing, treatment and prevent the complication of dental caries, oral pharyngeal, injuries and esophagitis.

1.7 Additional Information

Common additional oral cavity disorders.

- Gingivitis
- Cancer of the esophagus

1. GINGIVITIS

Gingivitis is an often-painful inflammation of the gums, or gingiva. It typically occurs due to plaque buildup on the teeth. People may generally refer to this as gum disease. Gingivitis is an early form of gum disease and typically produces mild symptoms

Causes

The most common cause of gingivitis is the accumulation of bacterial plaque between and around the teeth. Dental plaque is a biofilm that accumulates naturally on the teeth. It occurs when bacteria attach to the smooth surface of a tooth.

Several underlying conditions and outside factors trusted source can increase plaque formation or a person's risk of gum inflammation. Changes in hormones: this may occur during puberty, menopause, the menstrual cycle and pregnancy. The gums might become more sensitive, raising the risk of inflammation. Some diseases: cancer, diabetes and HIV are linked to a higher risk of gingivitis; medications that reduce saliva production can affect a person's oral health. Dilantin, an epilepsy medication, and angina drugs can also cause abnormal growth of gum tissue, increasing the risk of inflammation, smoking, age, family history of gingivitis are also a risk factor of gingivitis.

Signs and Symptoms

The signs and symptoms of gingivitis might include gum inflammation and discoloration, tender gums that may be painful to the touch, bleeding from the gums when brushing or flossing, halitosis or bad breath, receding gums, soft gums

However, in mild cases of gingivitis, there may be no discomfort or noticeable symptoms

Adequate diagnosis

A dentist or oral hygienist will check for symptoms, such as plaque and tartar in the oral cavity. They may also order tests to check for signs of periodontitis. This can be done by x-ray or periodontal probing, using an instrument that measures pocket depths around a tooth

Treatment Plan

If diagnosis happens early and treatment is prompt and proper, a person may be able to treat gingivitis at home with good oral hygiene. However, if symptoms do not resolve, or the condition affects a person's quality of life, they may wish to seek professional help.

Treatment often involves care by a dental professional and follow-up procedures carried out by the patient at home. A person may be able to prevent gingivitis at home by practicing regular good oral hygiene. This includes brushing teeth at least twice a day, using an electric toothbrush, flossing teeth at least once a day, regularly rinsing the mouth with an antiseptic mouthwash

Top of Form

Complications

Some complications include abscess or infection in the gingiva or jawbone, periodontitis a more serious condition that can lead to loss of bone and teeth, recurrent gingivitis, trench mouth, where bacterial infection leads to ulceration of the gums

2. Cancer of Esophagus

Oesophageal cancer is a serious condition. Clients usually do not experience symptoms until the disease has progressed to interfere with swallowing and passage of food, leading to weight loss.

Causes and risk factors

The major cause of oesophageal cancer is chronic irritation of the oesophagus from any source. Alcohol abuse and cigarette smoking, clients with GERD are at higher risk for adenocarcinoma of the oesophagus, other risk factors include habitual ingestion of hot liquids or foods, poor or inadequate, oral hygiene, and nutritional deficiencies

Signs and symptoms

Mild, with vague discomfort and difficulty swallowing some foods, Weight loss, progressive dysphagia. As the disease continues the client resorts to consuming liquids only.

He or she may experience regurgitation of food, haemorrhage, haemoptysis (Vomiting of blood), back pain and respiratory distress due to expansion of the tumour, loss and weakness.

Investigation

A barium swallow demonstrates a filling defect caused by a space-occupying mass. A biopsy of tissue removed during esophagoscopy or an esophagogastroduodenoscopy reveals malignant cells.

A bronchoscopy may determine whether the cancer cells have affected the trachea. Computed tomography (CT) of the chest and abdomen to determine whether metastasis has occurred. If oesophageal cancer is diagnosed in early stages, treatment

Treatment Plan

If oesophageal cancer is diagnosed in early stages, treatment is directed at a cure and includes surgery, chemotherapy, and/or radiation. The surgery is a complete resection of the oesophagus (esophagectomy), which involves removing the tumor and a wide margin of tumor-free tissue as well as surrounding lymph node

Additional activities

Remedial activities

1. Using different literature, define the following medical pathology of oral and oesophagus medical condition

    a. Dental caries

    b. Oral candidiasis

    c. esophagitis

ANSWERS:

a. Dental caries also known as a dental decay is defined as a disease that is caused by the breakdown of tooth enamel or it is a chemical dissolution of a tooth surface that brought about by metabolic activity in a microbial deposit covering a tooth surface at any given time.

b. Oral candidiasis is an infection caused by a yeast (a type of fungus) called candida which normally lives on the skin and inside the body in area such as the mouth, throat, gut and vagina, without causing any problem problems.

c. Esophagitis is defined as an inflammation that may damage tissues of the esophagus, the muscular tube that delivers food from the patient's mouth to the stomach.

2. Oesophageal candidiasis is one of the MOST common infections in the following group of people:

    a. People with Non communicable diseases

    b. People living with HIV/AIDS

    c. People with low salt intake diet

    d. People with hearing bulimia

ANSWER: b

a) Complete the following table

Eye conditions	Causes and risk factors	Clinical features	Treatment
Dental caries			
Oral pharyngeal candidiasis			
Oral cavity injuries			
esophagitis			
Gingivitis			

ANSWERS:

Oral and oesophagus conditions	Causes and risk factors	Clinical features	Treatment
Dental caries	**Poor oral hygiene, tooth placement** **Inadequate fluoride,** Heartburn and eating disorders, gastroesophageal reflux	tooth sensitivity to sugary, hot, or cold food, constant tooth pain, white or dark spots on the teeth, bad breath, loose filling, cavities in teeth, food frequently trapped teeth, difficulty biting certain foods, abscesses on teeth that cause pain, facial swelling or fever	Fillings, Crowns, root canals, Tooth extraction, **medication** **Anti-inflammatory drugs include** corticosteroids are anti-inflammatory drugs.

Oral pharyngeal candidiasis	lower pH, increased carbohydrate concentration, increased temperature, nitrogen or carbon starvation, products of inflammation and tissue breakdown, suppressed commensal bacterial population, micro trauma, poor oral plaque control and generalized neglected oral self-care, poorly fitting dentures, reduced salivary flow, radiotherapy to the head and neck, oral cancer, oral immunopathogenic diseases, old age, infancy, pregnancy. Nutritional: malnutrition, avitaminosis, iron deficiency, glucocorticosteroids, other immunosuppressive drugs, cytotoxic chemotherapy, broad spectrum antibiotics, cell-mediated immunodeficiencies, malignancies, diabetes mellitus, hypothyroidism, hypoparathyroidism, prolonged hospitalisation, having an HIV infection, undergoing high-dose chemotherapy or radiotherapy treatment for cancer, having a central venous catheter (CVC) for medication, being on dialysis	White patches on the inner cheeks, tongue, roof of the mouth, and throat (photo showing candidiasis in the mouth), redness or soreness, cotton-like feeling in the mouth, loss of taste, pain while eating or swallowing, cracking and redness at the corners of the mouth	medications include clotrimazole, miconazole, or nystatin. For severe infections, the most common treatment is fluconazole (an antifungal medication) taken by mouth or through a vein. If patient does not get better after taking fluconazole, healthcare providers may prescribe a different antifungal. The treatment for candidiasis in the oesophagus is usually fluconazole
Oral cavity injuries	chronic biting of the oral mucosa Parafunctional bite of the buccal mucosa, lips, and tongue	Mechanical irritation from C. albicans dentures or a tissue response to microorganisms living beneath the dentures, accidental mucosal biting, sharp edges of prosthesis, sharp or pointed food stuff, during orthodontic treatment, lip biting after injection of local anaesthetic solutions, neonatal teeth, or faulty tooth brushing, Caustic chemical and drug materials	Saline would be prescribed to accelerate wound healing and avoid bacterial ingrowth. In severe damages, prophylactic antibiotic coverage is recommended. In hard tissue damages related to thermal burn, surgical removal of necrotic tissue should be performed to surrounding vital tissues and obtain blood supply for repair and subsequent regeneration. In radiation injuries, Supportive care, cessation of radiation treatment, B-complex vitamins, and sometimes low doses of corticosteroids are suggested

Esophagitis	difficult swallowing, painful swallowing, chest pain, particularly behind the breastbone, that occurs with eating, swallowed food becoming stuck in the oesophagus (food impaction), heartburn, acid regurgitation	High concentration of these white blood cells in the esophagus, most likely in response to an allergy-causing agent (allergen) or acid reflux or both. In many cases, this type of esophagitis may be triggered by foods such as milk, eggs, wheat, soy, peanuts, beans, rye and beef	Antacids (Maalox, Mylanta, others); medications that reduce acid production, called H-2-receptor blockers, such as cimetidine (Tagamet HB); and medications that block acid production and heal the esophagus, called proton pump inhibitors, such as lansoprazole (Prevacid) and omeprazole (Prilosec). Prescription-strength **medications.** These include H-2-receptor blockers as well as proton pump inhibitors, such as esomeprazole (Nexium), lansoprazole (Prevacid), omeprazole (Prilosec) and pantoprazole (Protonix)

1.9.2 Consolidation activities

A common disease of oral tissue characterized by painful, inflamed, and swollen gums is:

a. Candidiasis.

b. Gingivitis.

c. Herpes simplex.

d. Periodontitis.

ANSWER: b

The incidence of most dental caries is directly related to an increase in the dietary intake of:

a. Fat.

b. Protein.

c. Salt.

d. Suga**r.**

ANSWER: d

Usually, the first symptom associated with oesophageal disease is:

a. Dysphagia.

b. Malnutrition.

c. Pain.

d. Regurgitation of food.

ANSWER: a

Extended activities

1. The nurse suspects that a patient who presents with the symptom of food "sticking" in the lower portion of the oesophagus may have the motility disorder known as:

    a. Achalasia

    b. Diffuse spasm

    c. Gastroesophageal reflex

    d. Hiatal hernia

ANSWER: c

1. Match the abnormality of the lips, mouth, or gums listed in column II with its associated symptomatology of the lip, mouth, or gums listed in column I.

Colum I	ColumII
1. _____ Ulcerated and painful, white papules	a. Actinic cheilitis
2. _____ Reddened area or rash associated with itching	b.Leukoplakia
3. _____ Painful, inflamed, swollen gums	c.Chancre
4. _____ White overgrowth of horny layer of epidermis	d.Canker sore
5. _____ Shallow ulcer with a red border and white or yellow center	e.Gingivitis
6. _____ Hyperkeratotic white patches usually in buccal mucosa	f.Lichen planus
7. _____ Reddened circumscribed lesion that ulcerates and becomes encrusted	g.Contact dermatitis
8. _____ White patches with rough, hairlike projections usually found on the tongue	h. Hairy leucoplakia

ANSWERS:

1=f

2=g

3=e

4=a

5=d

6=b

7=c

8=h

1. Discuss the following topics with your classmates.

1. Discuss at least eight healthy oral hygiene habits that have been found to promote good dental health.

Answer:

1. Discuss the nursing interventions for a patient with cancer of the oesophagus.

Answer:

2. CASE STUDY: Cancer of the Mouth

Edith, a 64-year-old mother of two, has been a chain smoker for 20 years. During the past month she noticed a dryness in her mouth and a roughened area that is irritating. She mentioned her symptoms to her dentist, who referred her to a medical internist.

Q1. On the basis of the patient's health history, the nurse suspects oral cancer. Describe what the nurse would expect the lesion to look like.

.....

.....

Answer:

Q2. During the health history, the nurse noted that Edith did not mention a late occurring symptom of mouth cancer, which is:

b. Drainage.

c. Fever.

d. Odor.

e. Pain.

Answer: d

Q3. On physical examination, Edith evidenced changes associated with cancer of the mouth, such as:

a. A sore, roughened area that has not healed in 3 weeks.

b. Minor swelling in an area adjacent to the lesion.

c. Numbness in the affected area of the mouth.

d. All of the above.

Answer: d

Q4. To confirm a diagnosis of carcinoma of the mouth, a physician would order:

e. A biopsy.

f. A staining procedure.

g. Exfoliative cytology.

h. Roentgenography.

Answer: a

Q5. What is the differential medical diagnosis of esophagitis?

Answer:

The differential medical diagnosis of esophagitis includes acute coronary syndrome with atypical chest pain, malignancy, peptic ulcer disease, rings and webs, pneumonia, pulmonary embolism, achalasia, and esophageal motility disorder

Q6. Differentiate periodontal disease from pulpitis?

Answer:

Periodontal (gum) disease is the infection of the gum tissue, and is a more severe version of gingivitis while Pulpitis is the infection of the tooth's pulp, which is made up of blood vessels, nerves and connective tissue

UNIT 4: MEDICAL PATHOLOGIES OF THE SKIN

5.1. Key unit Competence

Take appropriate decision on different common medical pathologies of the skin

5.2. Prerequisite (knowledge, skills, attitudes, and values)

To achieve the above competence the associate nurse student needs to have learnt the following subjects:

- Human body anatomy and physiology: Anatomy of integumentary system is human body's outer layer, it consists skin, hair, nails and gland. The skin protects human body from infection and injuries that could get from the external environment.
- Fundamental of Nursing: Vital signs taking and parameters measurements, drugs administration, History taking, Complete health assessment from head to toes trough interview and Physical assessment regarding cardiovascular system.
- Pharmacology: Some topical and oral drugs for skin condition include: antibacterials,antiinflamatory,corticosteroids,antibiotics,antifungal,antiviral drugs

5.3. Cross-cutting issues to be addressed

5.3.1. Gender education

Emphasize to learners that anybody irrespective of their gender can present and report during group activities.

During interactive lecturing, make sure that the response of both boys and girls are equally considered.

Ensure that boys and girls participate equally in all activities such as group work presentations.

5.3.2. Environment and sustainability

They also get skills and attitudes that will enable them in their everyday life to address the environment and climate change issues and to have a sustainable livelihood. Help the learners to know maximum skills and attitudes on the environmental sustainability and to be responsible in caring for the skills laboratory where they perform their practice even at health facilities.

5.4. Guidance on the introductory activity

This introductory activity helps you to engage learners in introduction of medical pathologies of integumentary system and invite the learners to follow the next lessons.

Teacher`s activity:

- Ask learners to observe the schematic representation of skin diseases and answer the given questions.
- Engage learners in working individually on the activity.
- Ask any three learners to give their answers

The expected answers:

1) The organs and layers of the integumentary include the epidermis(Nails, hair, gland), dermis (It contains sweat and oil glands and hair follicles.),Hypodermis (It's the fatty layer of skin that helps insulate the body)
2) The integumentary system is responsible of protective barrier against mechanical, thermal and physical injury and hazardous substances. Prevents loss of moisture. Reduces harmful effects of UV radiation. Acts as a sensory organ (touch, detects temperature)
3) The different skin conditions due various microorganism such as bacteria, fungi, virus and some allergy agent.
4) The most common genetic skin diseases(albinism) and atopic dermatitis (eczema)
5) Treatment of Skin conditions such as antihistamines; medicated creams and ointments; antibiotics; vitamin or steroid injections; laser *therapy*; targeted prescription medications.

5.5. List of Lessons/sub-headings (Including Assessment)

	Lesson Title	Learning Objectives	Number of Periods
1	Introduction to integumentary system and Description of erythema	• Describe causes, risk factors and pathophysiology of skin conditions. • Describe the signs and symptoms of skin conditions • Enumerate the investigations requested for skin diseases • Identify the adequate medical diagnosis of skin diseases • Develop a medical and nursing management plan for patient with skin diseases. • Define the term of erythema • Identify the causes of erythema • Explain the different signs and symptoms • Explain pathophysiology of erythema • Describe the different types of erythema. • Describe different medical diagnosis of erythema. • Describe different treatment of erythema.	1

2	Description of Albinism and Vitiligo	• Define the term of albinism and Vitiligo • Identify the causes of albinism and Vitiligo • Explain the different signs and symptoms of albinism and Vitiligo • Explain pathophysiology of albinism and Vitiligo • Describe the different types of albinism and Vitiligo. • Describe different medical diagnosis of albinism and Vitiligo • Describe different treatment of albinism and Vitiligo	1
3	Self-assessment	• Identify the performance of child • Identify the learners 'gaps during teaching • Give the relevant feedback to the learner • Elaborate the remedial teaching session	1
4	Description of and Psoriasis and Eczema	• Define the term of Psoriasis and Eczema • Identify the causes of Psoriasis and Eczema • Explain the different signs and symptoms of Psoriasis and Eczema • Explain pathophysiology Psoriasis and Eczema • Describe the different types of Psoriasis and Eczema • Describe different medical diagnosis of Psoriasis and Eczema • Describe different treatment of Psoriasis and Eczema	1

5	Description of Furuncle and acne	• Define the term of furuncle and acne • Identify the causes of furuncle and acne • Explain the different signs and symptoms of furuncle and acne • Explain pathophysiology of eczema and acne • Describe the different types of furuncle and acne • Describe different medical diagnosis of furuncle and acne • Describe different treatment of furuncle and acne	1
6	• END UNIT ASSESSMENT	• Take appropriate decision on different common medical pathologies of skin • Identify the strengths and gaps of learners on appropriate decision of different common medical pathologies of skin • Prepare the feedback to individual and class • Organize different additional learning activities	1

Lesson 1: Introduction to integumentary system and Description of erythema

a) Prerequisites

This is the first lesson of the fifth unit of medical pathologies of integumentary system. In this lesson, you will be dealing with the common medical skin conditions, which are dermatitis, skin infection, and genetic diseases. The first thing to do before starting teaching is to remind learners that they have learnt about structure of skin and skin function, health assessment of integumentary system from fundamentals of nursing. The teacher will let students discuss the questions as indicated in introductory activity and from the case study from learning activity 5.1 so that they can prepare themselves for this lesson.

b) Learning objectives:

- List the common medical skin conditions of integumentary system: erythema, eczema, albinism, vitiligo, psoriasis, furuncle and acne.
- Describe causes, risk factors and pathophysiology of skin diseases

c) Teaching resources

The teacher could avail the model of skin structure. In addition, the teacher should present to the students the library textbooks on diseases, which affect the human skin, and indicates the pages. All students must have their student's books. There is need of black board and chalks or flipcharts and markers.

d) Learning activities

Teacher 'activities and methodology

- Ask learners to do individually activity 5.0 in their student book and answer the questions number 1, 2 and learning activity 5.1
- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide their answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student`s ideas.
- Tick the correct responses and correct those ones, which are incorrect and try again to complete those, which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.

The expected answers from Questions of introductory activity5.0

1. Probably the patients are complaining of rashes, itchiness, skin changes and damage of body image.
2. The different medical conditions could be Vitiligo, eczema, psoriasis, acne etc.

The expected answers from Questions of learning activity 5.1

1. The abnormal signs and symptoms that patient was presenting are:

Physical examination revealed multiple rounded purplish nodules located bilaterally on the extensor surface of the lower extremities, and red bumps on the soles, palms, arms, face and legs that grow into circles that may look like targets, itchiness.

2. The medical problem of this patient could be:

Skin conditions like eczema, scabies, and pityriasis versicolor.

3. The following investigations have been ordered to guide the confirmation of the medical problem:

Laboratory investigations revealed an elevated C-reactive protein – CRP (119.82 mg/l, normal 5.0 mg/l) and erythrocyte sedimentation rate – ESR (74 mm/h; normal 0–10 mm/h). Urine and blood culture results were negative. Throat swab revealed growth of normal flora. The diagnostic test for Yersinia was negative. His chest X-ray revealed bihilar lymphadenopathy.

4. The management of this case include:

Further evaluation with high-resolution chest computed tomography confirmed the lymphadenopathy and demonstrated thickened bronchial walls of both lungs and nodular lesions, which suggested an alveolar sarcoidosis. The foot ultrasound showed a small amount of fluid in the right ankle joint and effusion in all sheaths of the flexor, extensor digitorum and the big toe tibial and peroneal tendons. Sonography also showed massive bilateral swelling of the subcutaneous tissue up to 1/2 shank.

5. If not treated, the consequences will be:

Altered body image, generalized infection, anxiety and depression.

The expected answers from Questions of self-assessment 5.1

1) Definition of Erythema

Erythema is redness of the skin or mucous membranes, caused by hyperemia (increased blood flow) in superficial capillaries.It occurs with any skin injury, infection, or inflammation. Examples of erythema not associated with pathology include nervous blushes.

2) The Types of Erythema are:

There are various types of erythema, of which erythema multiforme is the most common. Each type of erythema has a different cause, and therefore needs different treatments. Some forms of erythema include:

- Erythema multiforme (EM), which occurs due to an allergic reaction to medications or infection
- Erythema nodosum (EN), which is characterized by nodular eruptions on the lower legs
- Erythema Ab Igne, which is caused by continued exposure to heat
- Erythema chronicum migrans, which is noted in in the early stages of Lyme disease
- Erythema induratum, which is associated with tuberculosis
- Erythema infectiosum (also called the Fifth disease), which is commonly caused during childhood
- Erythema marginatum, which is characterized by pink rings on the limbs
- Erythema toxicum (ET), which affects neonates
- Erythema gyratum repens, which is a component of a paraneoplastic process
- Palmar erythema, which is characterized by reddening on the palms of hands
- Erythema annulare centrifugum, presents with erythema (redness) in a ring (annulare) form that spreads from a center (centrifugam). This condition was first described by Darier in 1916.
- Erythema nodosum (EN), which is characterized by nodular eruptions on the lower legs. Specific symptoms include weight loss, uneasiness, low-grade fever, cough and pain in joint (arthralgia) with or without arthritis.

There are two serious forms of erythema multiforme – Stevens Johnson syndrome (SJS) and Toxic epidermal necrolysis (TENS)

3) The Causes of Erythema are:

The causes of erythema vary in different conditions. Common causes include an allergic reaction to:

- Medications such as penicillin, antibiotics, sulfonamides, barbiturates and phenytoin
- Infections such as herpes simplex virus (HSV), or mycoplasma.

Other causes of erythema include exposure to:

- Heat
- Radiation

- Insect bites
- Hormonal problems

4) The Symptoms of Erythema are the following:

The symptoms associated with erythema vary from one type to another. The most common symptoms of erythema multiforme include: Itchy skin, Joint pain, Vision problems with dry and itchy eyes, Mouth sores, Fatigue, Photosensitivity (sensitivity to light or sun), Flu-like symptoms in severe cases, Fever.

The skin sores or lesions may be raised, discolored and have a central sore surrounded by pale red rings that look like a bulls-eye, earning them the name Target lesions. Some lesions are liquid-filled blisters while others look like hives. They can appear on face, lips, legs, feet, hands, arms or palms.

5) The diagnosis of Erythema

Different types of erythema manifest differently, and the diagnosis may depend on the physical appearance of the skin. Doctors normally recognize erythema multiforme just by examining the skin. The doctor may also ask a series of questions such as a history of recent infections and medications to pinpoint out the cause. In some cases, a skin biopsy may be done.

6) Treatment plan of Erythema

Supportive care for erythema includes:

- Cool compresses on the affected areas
- Pain killers(Paracetamol) or antihistamines(Polaramine), for itching
- Steroid(hydrocortisone, dexamethasone)) or IV medications in severe cases
- Soothing creams for itchy or sore skin

These medications and supportive care do not shorten the duration of the condition, but provide comfort to the patient.

Erythema is treated depending on the severity and type of erythema.

- For mild rashes: These may be treated with only moisturizers and topical corticosteroid creams to reduce itching and burning of the skin.

A Burrow's compress, which has antibacterial and antifungal properties, is an effective way to treated erythema.

For severe rashes: These can be life threatening and must be treated as soon as possible. Patients with severe rashes may need to stay in a burns unit. Severe pain due to blisters and nodules may require pain medications such as acetaminophen, hydrocodone or others as recommended by your doctor. The blisters can be

infected and leak large amounts of pus, which needs to be monitored and treated. Intravenous immunoglobulins such as immunoglobulin G (IgG) may be needed. Antivirals may be administered if the cause of the erythema is suspected to be herpex simplex virus (HSV). Other specialists may be consulted if different organs such as the eyes are affected. Photomodulation therapy, which is a red light therapy for the skin is another effective way to treat severe cases.

For recurrent rashes: Recurrent rashes due to HSV infection may require a daily dose of the anti-viral medication acyclovir orally to suppress the virus for several months.

Lesson 2: Description of albinism and vitiligo

a) Prerequisites

This is the second lesson of the fifth unit of medical pathologies of integumentary system. In this lesson, you will be dealing with the common medical skin conditions, which are albinism and vitiligo. The first thing to do before starting teaching is to remind learners that they have learnt about structure of skin and skin function, health assessment of integumentary system from fundamentals of nursing. In addition, the teacher will remind the learners what they have learnt on erythema. The teacher will let students discuss the questions from the case studies from learning activity 5.2 and 5.3 so that they can prepare themselves for this lesson.

b) Learning objectives:

- Define the term of albinism and Vitiligo
- Identify the causes of albinism and Vitiligo
- Explain the different signs and symptoms of albinism and Vitiligo
- Explain pathophysiology of albinism and Vitiligo
- Describe the different types of albinism and Vitiligo.
- Describe different medical diagnosis of albinism and Vitiligo
- Describe different treatment of albinism and Vitiligo

c) Teaching resources

The teacher could avail the model of skin structure. In addition, the teacher should present to the students the library textbooks on diseases, which affect the human skin, and indicates the pages. All students must have their student's books. There is need of black board and chalks or flipcharts and markers.

d) Learning activities

Teacher 'activities and methodology

- Ask learners to do individually activity 5.2 and 5.3 in their student book and answer the questions number from the learning activities 5.2 and 5.3

- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide their answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student`s ideas.
- Tick the correct responses and correct those ones, which are incorrect and try again to complete those, which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.

♦ **Expected answers to Learning Activity 5.2**

1) The abnormal signs and symptoms that patient was presenting are:

- Freckles
- Moles, with or without pigment — moles without pigment are generally pink-colored
- Large freckle-like spots (lentigines)
- Sunburn and the inability to tan

2) The medical problem of this patient could be:

Skin diseases like vitiligo, hypopigmentation, albinism

3) The investigations that have been ordered to guide the confirmation of the medical problem: None

Physical examination is helpful to diagnose the eczema

4) The management of this case:

Albinism is a lifelong genetic condition with no cure. Therefore, treatment focuses on minimizing the symptoms and watching for skin changes.

People with albinism must receive appropriate eye care, including:

- prescription glasses
- dark glasses to protect the eyes from the sun
- regular eye exams

Surgery on the optical muscles can sometimes minimize the “shaking” that occurs

in nystagmus. Procedures to minimize strabismus can make it less noticeable, but surgery does not improve the vision. The level of success in reducing symptoms varies among individuals.

People should watch their skin carefully for any changes and use sunscreen for protection.

5) If not treated, the consequences are:

If the albinism is not treated, the patient will present eye problems, poor eyesight – either short-sightedness or long-sightedness, and low vision (sight loss that cannot be corrected)

astigmatism – where the cornea (clear layer at the front of the eye) is not perfectly curved or the lens is an abnormal shape, causing blurred vision, photophobia – where the eyes are sensitive to light, nystagmus – where the eyes move involuntarily from side to side, causing reduced vision.

♦ Answers to Self-assessment 5.2

1) Definition of Albinism

The term albinism typically refers to oculocutaneous (ok-u-low-ku-TAY-nee-us) albinism (OCA) — a group of inherited disorders where there is little or no production of the pigment melanin. The type and amount of melanin your body produces determines the color of your skin, hair and eyes. Albinism is a rare genetic condition caused by mutations of certain genes that affect the amount of melanin your body produces.

2) The types of albinism

There are several different types of albinism. Levels of pigmentation vary depending on which type of albinism you have. The different types of albinism include:

- **Ocul**ocutaneous albinism: Oculocutaneous (pronounced “ock-you-low-kew-TAIN-ee-us”) albinism, or OCA, is the most common type of albinism. People with OCA have extremely pale hair, skin and eyes. There are seven different subtypes of OCA, caused by mutations in one of seven genes (OCA1 to OCA7).
- **Ocular albinism:** Ocular albinism, or OA, is much less common than OCA. Ocular albinism affects only your eyes. People with OA usually have blue eyes. Sometimes your irises (colored part of your eyes) are very pale, so your eyes may appear red or pink. This is because the blood vessels inside your eyes show through the irises. Your skin and hair color are usually normal.

- **Hermansky-Pudlak syndrome:** Hermansky-Pudlak syndrome, or HPS, is a type of albinism that includes a form of OCA along with blood disorders, bruising issues and lung, kidney or bowel diseases.
- **Chediak-Higashi syndrome:** Chediak-Higashi syndrome is a type of alb**inism that includes a form of OCA along with immune and neurological issues.**

3) The Causes of albinism

Albinism is caused by mutations in specific genes that are responsible for melanin production

Yes, albinism is passed down (inherited) through families. People are born with albinism when they inherit an albinism gene from their parents.

In oculocutaneous albinism, both parents must carry an albinism gene for their child to be born with albinism. The child has a 1 in 4 chance of being born with albinism. If just one parent has an albinism gene, the child will not have oculocutaneous albinism. However, the patients will have a 50% chance of being a carrier of the gene themselves

4) The Symptoms of albinism

People with albinism may experience the following symptoms:

- Very pale skin, hair and eyes.
- Patches of missing skin pigment.
- Crossed eyes (strabismus).
- Rapid eye movements (nystagmus).
- Vision problems.
- Light sensitivity (photophobia).

5) The diagnosis of albinism

The healthcare provider may do a physical exam and examine the skin, hair and eyes. However, a genetic test will provide the most accurate results and help determine which gene is mutated. This DNA test will help determine which type of albinism you have.

6) Treatment plan of albinism

There is no cure for albinism. You must manage the condition by being vigilant about sun protection. You can protect your skin, hair and eyes by:

- Staying out of the sun.

- Wearing sunglasses.
- Covering up with sun-protective clothing.
- Wearing hats.
- Applying sunscreen regularly.

If you have crossed eyes (strabismus), a surgeon may be able to correct the issue with surgery.

♦ Expected answers to Learning Activity 5.3

1. The abnormal signs and symptoms that pictures present are:
2. Discoloration of skin, hypopigmentation, white patches
3. The medical problem of this patient could be Vitiligo or albinism.
4. The investigations that have been ordered to guide the confirmation of the medical problem

Skin disease as vitiligo is diagnosed by physical examination according to health experience of working with patient suffering the vitiligo.

A skin biopsy involves removing a small portion of the affected skin tissue to check whether there are pigment cells (melanocytes) in the skin. The skin sample will be evaluated under a microscope in the lab. If it shows that there are no pigment cells present, a diagnosis of vitiligo will likely be confirmed.

1) The management of this case

There is no cure for vitiligo. The goal of medical treatment is to create a uniform skin tone by either restoring color (repigmentation) or eliminating the remaining color (depigmentation). Common treatments include camouflage therapy, repigmentation therapy, light therapy and surgery. Counseling may also be recommended.

2) If not treated, the consequences will be the following:

Vitiligo does not pose a serious threat to one's health, but it can result in physical complications, such as eye issues, hearing problems, and sunburn. People with vitiligo also tend to be more likely to have another autoimmune disease (like thyroid disorders and some types of anemia)

♦ Answers to self-assessment 5.3

1) Definition of vitiligo

Vitiligo is a skin disorder in which smooth white areas (called macules or patches) appear on a person's skin. It generally starts on the hands, forearms, feet and face. Globally, about 1% or so of the population has vitiligo

2) The types of vitiligo are the following:

- Generalized, which is the most common type, when macules appear in various places on the body.
- Segmental, which is restricted to one side of the body or one area, such as the hands or face.
- Mucosal, which affects mucous membranes of the mouth and/or the genitals.
- Focal, which is a rare type in which the macules are in a small area and do not spread in a certain pattern within one to two years.
- Trichome, which means that there is a white or colorless center, then an area of lighter pigmentation, and then an area of normally colored skin.
- Universal, another rare type of vitiligo, and one in which more than 80% of the skin of the body lacks pigment.

3) The Causes of vitiligo

Although the causes of vitiligo are not completely understood, there are a number of different theories:

- Autoimmune disorder: The affected person's immune system may develop antibodies that destroy melanocytes.
- Genetic factors: Certain factors that may increase the chance of getting vitiligo can be inherited. About 30% of vitiligo cases run in families.
- Neurogenic factors: A substance that is toxic to melanocytes may be released at nerve endings in the skin.
- Self-destruction: A defect in the melanocytes causes them to destroy themselves.

4) Signs and Symptoms of vitiligo include the following:

- Patches of skin lose color. This can include the eyes and/or the mucous membranes in the mouth or nose.
- Patches of hair on the head or face turn prematurely gray or white

5) The diagnosis of vitiligo

Usually the white patches are easily visible on the skin, but healthcare providers can use a Wood's lamp, which shines ultraviolet (UV) light onto the skin to help differentiate from other skin conditions.

6) Treatment plan of vitiligo

There is no cure for vitiligo. The goal of medical treatment is to create a uniform skin tone by either restoring color (repigmentation) or eliminating the remaining color (depigmentation). Common treatments include camouflage therapy, repigmentation therapy, light therapy and surgery. Counseling may also be recommended.

Camouflage therapy:

- Using sunscreen with an SPF of 30 or higher. Also, the sunscreen should shield ultraviolet B light and ultraviolet A light (UVB and UVA). Use of sunscreens minimizes tanning, thereby limiting the contrast between affected and normal skin.
- Makeups help camouflage depigmented areas. One well-known brand is Dermablend®.
- Hair dyes if vitiligo affects the hair.
- Depigmentation therapy with the drug monobenzone can be used if the disease is extensive. This medication is applied to pigmented patches of skin and will turn them white to match the areas of vitiligo.

Repigmentation therapy:

- Corticosteroids can be taken orally (as a pill) or topically (as a cream put on the skin). Results may take up to 3 months. The doctor will monitor the patient for any side effects, which can include skin thinning or striae (stretch marks) if used for a prolonged period.
- Topical vitamin D analogs.
- Topical immunomodulators such as calcineurin inhibitors.

Light therapy:

- Narrow band ultraviolet B (NB-UVB) requires two to three treatment sessions per week for several months.
- Excimer lasers emits a wavelength of ultraviolet light close to that of narrow band UVB. This is better for patients who do not have widespread or large lesions since it is delivered to small, targeted areas.
- Combining oral psoralen and UVA (PUVA) is used to treat large areas of skin with vitiligo. This treatment is said to be very effective for people with vitiligo in the areas of the head, neck, trunk, upper arms and legs.

Surgery:

- Autologous (from the patient) skin grafts: Skin is taken from one part of

the patient and used to cover another part. Possible complications include scarring, infection or a failure to repigment. This might also be called mini grafting.

- Micropigmentation: A type of tattooing that is usually applied to the lips of people affected by vitiligo.

Counseling:

- Vitiligo can cause psychological distress and has the ability to affect a person's outlook and social interactions. If this happens, your caregiver may suggest that you find a counselor or attend a support group.

Lesson 3: Description of Eczema and Psoriasis

a) Prerequisites

This is the third lesson of the fifth unit of medical pathologies of integumentary system. In this lesson, you will be dealing with the common medical skin conditions, which are Eczema and Psoriasis . The first thing to do before starting teaching is to remind learners that they have learnt about structure of skin and skin function, health assessment of integumentary system from fundamentals of nursing. In addition, the teacher will remind the learners what they have learnt on erythema, albinism and vitiligo. The teacher will let students discuss the questions from the case studies from learning activity 5.4 and 5.5 so that they can prepare themselves for this lesson.

b) Learning objectives:

- Define the term of psoriasis and eczema
- Identify the causes of psoriasis and eczema
- Explain the different signs and symptoms of psoriasis and eczema
- Explain pathophysiology of psoriasis and eczema
- Describe the different types of psoriasis and eczema
- Describe different medical diagnosis of psoriasis and eczema
- Describe different treatment of psoriasis and eczema

c) Teaching resources

The teacher could avail the model of skin structure. In addition, the teacher should present to the students the library textbooks on diseases, which affect the human skin, and indicates the pages. All students must have their student's books. There is need of black board and chalks or flipcharts and markers.

d) Learning activities

Teacher 'activities and methodology

- Ask learners to do individually activity 5.4 and 5.5 in their student book and answer the questions number from the learning activities 5.4 and 5.5
- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide their answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student`s ideas.
- Tick the correct responses and correct those ones, which are incorrect and try again to complete those, which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.

♦ Expected Answers from questions of Learning Activity 5.4

1. The abnormal signs and symptoms that patient was presenting

Plaques of red skin often covered with silver-colored scales. These plaques may be itchy and painful, and they sometimes crack and bleed. In severe cases, the plaques will grow and merge, covering large areas.

Disorders of the fingernails and toenails, including discoloration and pitting of the nails. The nails may also crumble or detach from the nail bed.

2. Basing on those signs and symptoms, The medical problem could be Psoriasis, eczema or Pityriasis vesicolor
3. The investigations that have been ordered to guide the confirmation of the medical problem: None

Investigation is based by physical examination done by experienced health care providers

4. The management of this case include:

- Steroid creams
- Moisturizers for dry skin
- Coal tar (a common treatment for scalp psoriasis available in lotions, creams, foams, shampoos, and bath solutions)
- Vitamin D-based cream or ointment (a strong kind ordered by your doctor.

Vitamin D in foods and pills has no effect.)

- Retinoid creams

5. If not treated, the consequences will be the following:

The short-term symptoms of psoriasis may include: thick, discolored skin patches with a covering of silvery scales, dry and cracked skin that may bleed or itch, thick, ridged, and pitted nails, psoriatic arthritis (PsA),

Expected Answers from questions of Self-assessment 5.4

1) Definition of psoriasis

Psoriasis is a skin disorder that causes skin cells to multiply up to 10 times faster than normal. This makes the skin build up into bumpy red patches covered with white scales.

2) Types of psoriasis

- Psoriatic arthritis
- Pustular psoriasis
- Guttate psoriasis
- Inverse psoriasis
- Erythrodermic psoriasis

3) The Causes of psoriasis are not known

Things that can trigger an outbreak of psoriasis include:

- Cuts, scrapes, or surgery
- Emotional stress
- Strep infections
- Medications, including blood pressure medications, anti-malarial drugs, lithium and other mood stabilizers, antibiotics, and NSAIDs.

4) Signs and Symptoms of psoriasis are the following:

Plaques of red skin often covered with silver-colored scales. These plaques may be itchy and painful, and they sometimes crack and bleed. In severe cases, the plaques will grow and merge, covering large areas.

Disorders of the fingernails and toenails, including discoloration and pitting of the nails. The nails may also crumble or detach from the nail bed.

Plaques of scales or crust on the scalp Arthritis

5) Diagnosis of psoriasis

Physical exam. It is usually easy for the doctor to diagnose psoriasis, especially if the patient has some plaques on areas such as on the Scalp, Ears, Elbows, Knees, Belly button, and Nails. The health care provider performs full physical exam and ask if people in the family have psoriasis.

Lab tests. The doctor might do a biopsy -- remove a small piece of skin and test it to make sure you do not have a skin infection. There is no other test to confirm or rule out psoriasis.

6) Treatment of psoriasis

- Steroid creams
- Moisturizers for dry skin
- Coal tar (a common treatment for scalp psoriasis available in lotions, creams, foams, shampoos, and bath solutions)
- Vitamin D-based cream or ointment (a strong kind ordered by your doctor. Vitamin D in foods and pills has no effect.)
- Retinoid creams

Treatments for moderate to severe psoriasis include:

- Light therapy
- Biologic treatments .These work by blocking the part of the body's immune system that is overactive in psoriasis. Biologic medications such as adalimumab.
- An enzyme i**nhibitor**

♦ Expected Answers from questions of Learning Activity 5.5

1) The abnormal signs that above picture present

Red to brownish-gray patches, especially on the hands, feet, ankles, wrists, neck, upper chest, eyelids, inside the bend of the elbows and knees, and in infants, the face and scalp. Small, raised bumps, which may leak fluid and crust over when scratched.

2) Based the signs that picture have, it should be eczema, psoriasis, pityriasis

3) The investigations that have been ordered to guide the confirmation of the medical problem

Investigation is based by physical examination done by experienced health care providers

4) The management of this case include:

Use a humidifier if dry air makes your skin dry

Moisturize your skin using a cream or ointment. Lotions do not work as well.

Use skin products that contain ceramide. These moisturizers replace some of the "glue" (the barrier) missing from your skin.

Apply cortisone creams and ointments. Cortisone is an over-the-counter steroid found in hydrocortisone (Cortisone 10®) and hydrocortisone acetate (Cort-Aid®). They may help control the itching and redness

♦ Expected Answers to Self-assessment 5.5

1) Definition of eczema

Eczema (eg-zuh-MUH) is an inflammatory skin condition that causes itchiness, dry skin, rashes, scaly patches, blisters and skin infections. Itchy skin is the most common symptom of eczema. There are seven different types of eczema: atopic dermatitis, contact dermatitis, dyshidrotic eczema, nummular eczema, seborrheic dermatitis and stasis dermatitis.

2) Types of eczema

There are several types of eczema:

- Besides atopic dermatitis
- Allergic contact dermatitis: This is a skin reaction that occurs following contact with a substance or allergen that the immune system recognizes as foreign.
- Dyshidrotic eczema: This refers to irritation of the skin on the palms of the hands and soles of the feet. It is characterized by blisters.
- Neurodermatitis: This leads to scaly patches of skin on the head, forearms, wrists, and lower legs. It occurs due to a localized itch, such as from an insect bite.
- Discoid eczema: Also known as nummular eczema, this type presents as circular patches of irritated skin that can be crusted, scaly, and itchy.
- Stasis dermati**tis:** This refers to skin irritation of the lower leg. It is usually related to circulatory problems.

3) The Causes of eczema

Researchers do not know the definitive cause of eczema, but many health professionals believe that it develops from a combination of genetic and environmental factors.

Children are more likely to develop eczema if a parent has it or another atopic condition. If both parents have an atopic condition, the risk is even higher.

The following environmental factors may also bring out the symptoms of eczema:

- Irritants: These include soaps, detergents, shampoos, disinfectants, juices from fresh fruits, meats, and vegetables.
- Allergens: Dust mites, pets, pollens, and mold can all lead to eczema. This is known as allergic eczema.
- Microbes: These include bacteria such as Staphylococcus aureus, viruses, and certain fungi.
- Hot and cold temperatures: Very hot and very cold weather, high and low humidity, and perspiration from exercise can bring out eczema.
- Foods: Dairy products, eggs, nuts and seeds, soy products, and wheat can cause eczema flares.
- Stress: This is not a direct cause of eczema, but it can make the symptoms worse.
- Hormones: Females may experience increased eczema symptoms when their hormone levels are changing, such as during pregnancy and at certain points in the menstrual cycle.

4) The Symptoms of eczema

The following atopic dermatitis symptoms are common in adults:

- rashes that are more scaly than those occurring in children
- rashes that commonly appear in the creases of the elbows or knees or the nape of the neck
- rashes that cover much of the body
- very dry skin on the affected areas
- rashes that are permanently itchy
- skin infections

5) The diagnosis of eczema

The healthcare provider may recommend patch testing on the skin. In this test, small amounts of different substances are applied to the skin and then covered. The healthcare provider looks at the skin during visits over the next few days to look for signs of a reaction. Patch testing can help diagnose specific types of allergies causing your dermatitis

6) Treatment plan of eczema

The goal is to reduce itching and discomfort and prevent infection and additional flare-ups.

Consider these treatment tips:

- Use a humidifier if dry air makes your skin dry.
- See a psychiatrist for medication and a therapist for counseling if you are experiencing symptoms of poor mental/emotional health.
- Moisturize your skin using a cream or ointment. Lotions do not work as well. Apply several times a day, including after you bathe or shower. Use lukewarm water in the tub or shower instead of hot.
- Use mild soaps and other products that are free of perfumes, dyes and alcohol. Look for products labeled “fragrance free,” “hypoallergenic” and “for sensitive skin.”
- Use skin products that contain ceramide. These moisturizers replace some of the “glue” (the barrier) missing from your skin.
- Apply cortisone creams and ointments. Cortisone is an over-the-counter steroid found in hydrocortisone (Cortisone 10®) and hydrocortisone acetate (Cort-Aid®). They may help control the itching and redness.
- Take over-the-counter antihistamines for severe itching.
- Take prescription medications. Your healthcare provider may prescribe steroid creams, pills and/or shots. Long-term risks include side effects like high blood pressure, weight gain and thinning of the skin. There are newer medications, called topical immunomodulators (TIMs) that show progress in treating patients who do not respond to other treatments. They change the body’s immune response to allergens and have fewer side effects.
- Phototherapy: The ultraviolet light waves found in sunlight have been shown to help certain skin disorders, including eczema. Phototherapy uses ultraviolet light, usually ultraviolet B (UVB), from special lamps.

Lesson 5: Description of furuncle and acne

a) Prerequisites

This is the fifth lesson of the unit 5 of medical pathologies of integumentary system. In this lesson, you will be dealing with the common medical skin conditions, which are furuncle and acne. The first thing to do before starting teaching is to remind learners that they have learnt about structure of skin and skin function, health assessment of integumentary system from fundamentals of nursing. In addition, the teacher will remind the learners what they have learnt on erythema, albinism, vitiligo, psoriasis, and eczema. The teacher will let students discuss the questions from the case studies from learning activity 5.6 and 5.7 so that they can prepare themselves for this lesson.

b) Learning objectives:

- Define the term of furuncle and acne
- Identify the causes of furuncle and acne

- Explain the different signs and symptoms of furuncle and acne
- Explain pathophysiology of furuncle and acne
- Describe the different types of furuncle and acne
- Describe different medical diagnosis of furuncle and acne
- Describe different treatment of furuncle and acne

c) Teaching resources

The teacher could avail the model of skin structure. In addition, the teacher should present to the students the library textbooks on diseases, which affect the human skin, and indicates the pages. All students must have their student's books. There is need of black board and chalks or flipcharts and markers.

d) Learning activities

Teacher 'activities and methodology

- Ask learners to do individually activity 5.6 and 5.7 in their student book and answer the questions number from the learning activities 5.6 and 5.7
- Provide the necessary materials.
- Move around in silence to monitor if they are having some problems
- Remember to assist those who are weak but without giving them the knowledge.
- Invite any five students to provide their answers
- Ask other students to follow carefully the answers provided by students
- Note on the blackboard the main student`s ideas.
- Tick the correct responses and correct those ones, which are incorrect and try again to complete those, which are incomplete.
- Harmonize and conclude on the learned knowledge and still engage student in making that conclusion.

♦ Answers to Learning Activity 5.6

1. The medical skin conditions that above pictures present are acne,furuncle,abcess
2. The causes of the above skin conditions are Microorganisms such as bacetria ,virus,fungi,and poor hygiene,hormanal changes
3. The treatment of the above skin condition include:

Local care ,body hygien ,antibiotic drugs such as pommade tetracycline,fucidin,analgesi drugs.

4. If they are not treated ,the complications are the following:

Skin infection,abcess,pain and fever, Bacteremia is an infection of the bloodstream that may occur after having a bacterial infection, such as a furuncle. If untreated, it can lead to severe organ dysfunction such as sepsis.

Self-assessment 5.6

1) Definition of furuncle

A boil (or furuncle) is a pus-filled bump that develops in your skin. Carbuncles are clusters of several boils. Boils usually begin as red bumps, which quickly increase in size and fill with pus. Boils are usually caused by the bacteria Staphylococcus aureus (staph infection)

Furuncles (boils) are skin abscesses caused by staphylococcal infection, which involve a hair follicle and surrounding tissue. Carbuncles are clusters of furuncles connected subcutaneously, causing deeper suppuration and scarring. They are smaller and more superficial than subcutaneous abscesses.

2) Types of furuncle are :

- Carbuncle.
- Hidradenitis suppurativa (seen in the armpit or groin)
- Pilonidal cyst (area on the back where the buttocks merge)
- Cystic acne.
- Sty (stye)

3) The Causes of furuncle are:

Bacteria typically cause a furuncle, the most common being Staphylococcus aureus — which is why furuncles can also be called staph infections. S. aureus normally resides on some areas of the skin.

S. aureus can cause an infection in situations where there are breaks in the skin, such as a cut or a scratch. Once the bacteria invade, the immune system tries to fight the microorganisms. The boil is actually the result of your white blood cells working to eliminate the bacteria

4) The Symptoms of furuncle are the following:

Furuncles develop rapidly as pink or red bumps. They are often painful. The surrounding skin is typically red, inflamed and tender.

The lesions often appear on the neck, breast, face, buttocks, or thighs. They occur in places prone to hair, sweat, and friction, and they tend to start in a hair follicle

The bump fills with pus within a few days, and it grows. The bigger it gets, the more painful it becomes.

5) The diagnosis of furuncle

The health care provider will likely be able to diagnose a boil or carbuncle simply by looking at it. A sample of the pus may be sent to the lab for testing. This may be useful if you have recurring infections or an infection that has not responded to standard treatment

6) Treatment plan of furuncle include:

Antibiotics should only be used if recommended by a medical professional. The best medicine for furuncle are clindamycin (Cleocin, Benzaclin, Veltin), doxycycline (Doryx, Oracea, Vibramycin), erythromycin (Erygel, Eryped), gentamicin (Gentak), levofloxacin (Levaquin), mupirocin (Centany), sulfamethoxazole/trimethoprim (Bactrim, Septra), tetracycline. The health care provider prescribe the painkiller such paracetamol, etc.

♦ Expected answers to Learning Activity 5.7

1. The medical skin conditions that above pictures present are acne,abcess ,and furuncle
2. The causes of the above skin conditions are Some microorganism such as bacteria,virus,fungiuman body and hormonal change in
3. The treatment of the above skin condition

Prescribe the antibiotics,antiinflammatory,and pain killer

4. If they are not treated , it can be complicated into the abscess, damage body image of adolescent

♦ **Answers to self-assessment 5.7**

1) Definition of acne

Acne is a skin condition that occurs when your hair follicles become plugged with oil and dead skin cells. It causes whiteheads, blackheads or pimples. Acne is most common among teenagers, though it affects people of all ages.

2) Types of acne

Grade one (mild): mostly whiteheads and blackheads, with a few papules and pustules. Grade two (moderate, or pustular acne): multiple papules and pustules, mostly on your face. Grade three (moderately severe, or nodulocystic acne): numerous papules and pustules, along with occasionally inflamed nodules.

3) The Causes of acne

Acne is largely a hormonal condition that is driven by androgen hormones, which typically become active during the teenage and young adult years. Sensitivity to these hormones — combined with surface bacteria on the skin and fatty acids within oil glands — can result in acne

4) The signs and Symptoms of acne

Acne signs vary depending on the severity of your condition:

- Whiteheads (closed plugged pores)
- Blackheads (open plugged pores)
- Small red, tender bumps (papules)
- Pimples (pustules), which are papules with pus at their tips
- Large, solid, painful lumps under the skin (nodules)
- Painful, pus-filled lumps under the skin (cystic lesions)

Acne usually appears on the face, forehead, chest, upper back and shoulders

5) The diagnosis of acne

Acne is diagnosed by a simple visual inspection by your healthcare provider. There is no test for acne. Rarely, a practitioner may take a swab or scraping of a lesion or pustule for microbiological examination or culture to rule out other sources of infection

6) Treatment plan of acne

The most common topical prescription medications for acne are:

- Retinoids and retinoid-like drugs. Drugs that contain retinoic acids or tretinoin are often useful for moderate acne. ...
- Antibiotics. These work by killing excess skin bacteria and reducing redness and inflammation. ...
- Azelaic acid and salicylic acid. ...
- Dapsone.

1.5. SUMMARY OF THE UNIT

Skin diseases are conditions that affect your skin. These diseases may cause rashes, inflammation, itchiness or other skin changes. Some skin conditions may be genetic, while lifestyle factors may cause others. Skin disease treatment may include medications, creams or ointments, or lifestyle changes. Common skin conditions include acne, contact dermatitis, benign tumors, cancers, atopic dermatitis (also called eczema), and psoriasis.

END UNIT 5 ASSESSMENT OF MEDICAL PATHOLOGIES OF THE SKIN (TO BE HIGHLIHTTED)

QUESTIONS	ANSWERS
	B
	D
	D
	A
	B
	C
	D
	D
	A
	D
	B
	B
	B
	B
	A

	A
	B
	A
	T
	T

ADDITIONAL INFORMATION

1. Scabies

Source: World Health Organisation (2022),scabies retreived from https://www.who.int/news-room/fact-sheets/detail/scabies

Scabies is a skin infestation caused by a mite known as the Sarcoptes scabiei. Untreated, these microscopic mites can live on your skin for months. They reproduce on the surface of your skin and then burrow into it to lay eggs. This causes an itchy, red rash to form on your skin.

Signs and Symptoms

After the initial exposure to scabies, it can take 2 to 5 weeks Trusted Source for symptoms to appear.

The hallmark symptoms of scabies include a rash and intense itching that gets worse at night.

Common sites for scabies in older children and adults include the:

- wrist
- elbow
- armpit
- nipple
- penis
- waist
- buttocks
- area between the fingers

Scabies in babies and toddlers, and sometimes the very elderly or immunocompromised, can show up on the:

- head
- face
- neck
- hands
- soles of the feet

The rash itself can consist of:

- tiny bites
- hives
- bumps under the skin
- pimple-like bumps

The burrow tracks of the mite can sometimes be seen on the skin. They may appear as tiny raised or discolored lines.

Types of scabies

There is only one type of mite that causes a scabies infestation in humans. This mite is called Sarcoptes scabiei. However, these mites can cause several types of infestations.

Typical scabies

This infestation is the most common. It causes an itchy rash on the hands, wrists, and other common spots. However, it does not infest your scalp or face.

Nodular scabies

This type of scabies may develop as itchy, raised bumps or lumps, especially around your genitals, armpits, or groin.

Scabies diagnosis

The health care provider is able to diagnose scabies simply by performing a physical exam and inspecting your affected area of skin. In some cases, your doctor may want to confirm the diagnosis by removing a mite from your skin with a needle.

If a mite cannot easily be found, your doctor will scrape off a small section of skin to obtain a tissue sample. This sample will then be examined under a microscope to confirm the presence of scabies mites or their eggs.

A scabies ink test (or Burrow Ink Test) can help spot burrowed paths in your skin created by the mites. To do this test, your doctor can drop ink from a fountain pen onto an area of the skin that appears to be infested. They then wipe away the ink.

Any ink that fell into the burrowed tunnels will remain and be obvious to the naked eye. That is a good indication you have an infestation.

Scabies treatment

Products used to treat scabies are called scabicides because they kill scabies mites; some also kill mite eggs. Scabicides used to treat human scabies are available only with a doctor's prescription.

Scabicide lotion or cream should be applied to all areas of the body from the neck down to the feet and toes.

Scabies treatment includes administration of a scabicidal agent (eg, permethrin, lindane, or ivermectin), as well as an appropriate antimicrobial agent if a secondary infection has developed.

The two most widely used treatments for scabies are permethrin cream and malathion lotion (brand name Derbac M). Both medications contain insecticides that kill the scabies mite. Permethrin 5% cream is usually recommended as the first treatment. Malathion 0.5% lotion is used if permethrin is ineffective.

Medications for scabies itch

There are additional medications to help relieve some of the bothersome symptoms

associated with scabies. These medications include:

- antihistamines, such as diphenhydramine (Benadryl or pramoxine lotion to help control the itching
- antibiotics to kill any infections that develop as a result of constantly scratching your skin
- steroid creams to relieve swelling and itching

Pityriasis versicolor

Carefully observe the picture below and answer the following questions:


Source: Wikipedia (2022),tinea verscolor,retrieved from https://en.wikipedia.org/wiki/Tinea_versicolor

Pityriasis versicolor is a rash caused by a yeast-like germ. It is not harmful or passed on through touching (contagious). Treatment can clear the rash. Some people who are prone to this condition need regular treatment to prevent the rash from coming back (recurring).

Signs and Symptoms

Discolored patches of skin are the most noticeable symptom of tinea versicolor, and these patches usually show up on the arms, chest, neck, or back. These patches may be:

- lighter (more common) or darker than the surrounding skin
- pink, red, tan, or brown
- dry, itchy, and scaly
- more prominent with tanning
- prone to disappear in cooler, less humid weather

Tinea versicolor that develops in people with dark skin may result in the loss of skin color, known as hypopigmentation. For some people, the skin may darken instead of lighten. This condition is known as hyperpigmentation.

Pathophysiology of Tinea versicolor (Ptyriasis versicolor)

Pityriasis versicolor (Tinea versicolor) is a superficial chronic fungal infection caused by Pityrisporum species which are normal “inhabitants” of the cutaneous flora. The morphologic changes from yeast to mycelial hypha form are important in the development of clinical lesions.

Pityriasis versicolor is a superficial fungal infection of the stratum corneum, due to dimorphic yeasts of the genus Malassezia, leading to hypo- or hyperpigmented macular lesions on seborrheic areas of the trunk.

Eruption is most common in the summer months in adolescents. Often has a relapsing nature requiring frequent treatment or prophylaxis.

Primarily a clinical diagnosis that is confirmed by a KOH preparation demonstrating fungal elements with a characteristic spaghetti-and-meatballs appearance indicating the presence of both yeast and short hyphae.

Easily treated with either topical medications, including zinc pyrithione shampoo, selenium sulfide shampoo, or azole-class topical antifungal creams. More extensive disease may require systemic therapy with antifungal drugs.

After successful treatment, remind patients that it may take up to 6 weeks before their normal skin pigmentation returns.

Causes of Ptyriasis Versicolor (Tenea Versicolor)

The fungus that causes tinea versicolor can be found on healthy skin. It only starts causing problems when the fungus overgrows. A number of factors may trigger this growth, including:

- Hot, humid weather
- Oily skin
- Hormonal changes
- Weakened immune system

Medical Diagnosis

The health care provider can diagnose tinea versicolor by physical exam (inspection). If there's any doubt, he or she may take skin scrapings from the infected area and view them under a microscope.

Treatment

If tinea versicolor is severe or doesn't respond to over-the-counter antifungal medicine, you may need a prescription-strength medication. Some of these medications are topical preparations that you rub on your skin. Others are drugs that you swallow. Examples include:

- Ketoconazole (Ketoconazole, Nizoral, others) cream, gel or shampoo
- Ciclopirox (Loprox, Penlac) cream, gel or shampoo
- Fluconazole (Diflucan) tablets or oral solution
- Itraconazole (Onmel, Sporanox) tablets, capsules or oral solution
- Selenium sulfide (Selsun) 2.5 percent lotion or shampoo

5.8. REMEDIAL ACTIVITIES

Question one: Fulfill the following table

Skin diseases	Definition	Signs and symptoms	causes	Treatment	Prevention
Erythema					
Albinism					
Vitiligo					
Eczema					
Psoriasis					
Furuncle					
Acne					

QUESTION TWO: MULTIPLE CHOICE QUESTIONS: Circle the most one correct answer

Bottom of Form

1) Which of the following pathogens can cause skin infections?

a. Fungi

b. Bacteria

c. Virus

d. All of above

Answer: d

2) Topical skin infection can spread to internal organs.

a. True

b. False

Answer: a

3) Which of the following can make you susceptible for a skin infection?

a. Burn injury

b. Poor injury

c. Skin disease

d. All of above

Answer: d

5) Which of the following drugs is commonly recommended as topical cream for skin infections?

a. Fusidic acid

b. Cefaclor

c. Ampicillin

Answer: a

4) Which of the following is the most common micro-organism responsible for causing skin infections?

a. Mycobacterium tuberculae

b. Staphylococcus aureus

c. Plasmodium

Answer: b

4) Bacterial skin infection may occur due to alternation of normal skin flora.

a. True

b. False

Answer: a

3) Which of the following symptoms indicate a possible skin infection?

a. Erythema /warmth

b. Pain /tenderness

c. Swelling

d. All of above

Answer: d

5.9 CONSOLIDATION ACTIVITIES

Question 1

What is the most common causative agent of erythema multiforme (EM)?

a. Penicillin and sulphonamides

b. Systemic lupus erythema

c. HSV infection

d. Malignancy

Answer: c

HSV is the most common etiologic agent of EM, which presents as a targetoid rash and bullae. All the other options are also associated with the disorder, but less commonly.

Question 2 How does impetigo present?

a. Golden honey coloured crust over an erythematous base

b. Salmon coloured plaque with silvery scale

c. Comedones , pustules and nodules

d. Flesh coloured papule with a rough surface

Answer: a

Impetigo is a superficial skin infection caused by Staph aureus or Strep pyogenes. It frequently affects children. It is treated with penicillin and topical preparations e.g. mupirocin.

Question 3

What is the infective agent implicated in acne?

a. Staphylococcus aureus

b. Streptococcus pyogenes

c. Staphylococcus epidermidis

d. Propionibacterium acnes

Answer: d

Propionibacterium acnes infection produces lipases resulting in inflammation and breakdown of sebum, leading to pustule formation.

5.10 EXTENDED ACTIVITIES

Question one: Fulfill the following table

Skin diseases	Definition	Signs and symptoms	causes	Treatment	Prevention
Scabies					
Pityriasis versicolor					

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