SURGICAL PATHOLOGY

TEACHER'S BOOK SENIOR 6

ASSOCIATE NURSING PROGRAM

First Edition

FOREWORD

Dear Teacher,

The Rwanda Basic Education Board is pleased to present this Teacher's Guide for the Associate Nursing Program. This guide is designed to support competence-based teaching and ensure consistency in delivering the Surgical Pathology subject.The Rwandan educational philosophy aims to help student-associate nurses achieve their full potential, preparing them to address community health needs and pursue career opportunities.

To enhance education quality, the government of Rwanda emphasizes the alignment of teaching materials with the syllabus. Effective teaching relies on the relevance of content, pedagogical approaches, assessment strategies, and instructional materials. The guide focuses on activities that promote learning, allowing students to develop ideas and make discoveries.

In a competence-based curriculum, learning involves actively building knowledge and skills through activities, scenarios, and real-life applications. Your role as a teacher includes:

- Planning lessons and preparing teaching materials.
- Organizing group discussions and collaborative learning.
- Engaging students through active learning methods such as inquiry, research, and group work.
- Supporting and facilitating the learning process by valuing student contributions and guiding them towards integrating their findings.

This guide is divided into three parts:

1. Explains the book's structure and provides methodological guidance.
2. Offers sample lesson plans for reference.
3. Provides detailed teaching guidance for each concept in the student book.

Although the guide includes answers to student book activities, please review each question and activity before assessing student responses.

I extend my gratitude to everyone involved in developing this guide, including the Ministry of Health, University of Rwanda, and other institutions. Special thanks go to faculty members, nurses, midwives, teachers, illustrators, designers, Health Workforce development staff/MoH, and REB staff for their dedicated work.

Dr. MBARUSHIMANA Nelson

Director General of Rwanda Education Board

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Ms. MURUNGI Joan

Head of Curriculum, Teaching, and Learning Resources Department / REB

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PART 1 GENERAL INTRODUCTION

This book is a teacher's guide for Surgical Pathology 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 Surgical Pathology 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 techniques of Surgical Pathology 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 student'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 sub heading

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 answers to 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 Teachers Training Centers (TTCs), 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 student 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 student can do rather than what students 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 student-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 Surgical Pathology:

Generic competence	Examples of activities that develop generic competences
Critical thinking	Describe the relationship and interdependence of sciences Observe, record, interpret data recorded during case studies and clinical settings. Identify and use the applications of Surgical Pathology concepts to take decision on patient conditions
Research and Problem solving	Research using internet or books from the library Design a questionnaire for data collection during field visit
Innovation and creativity	Develop a graph to illustrate information Design a data collection survey/questionnaire Identify local problems and ways to resolve them
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 case study. Observe, record, interpret the results of patient's examination. 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 particular 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 so as to progressively develop related attitudes and values.

Below are examples on how crosscutting issues can be addressed in Surgical Pathology:

Cross-cutting issues	**Examples on how to integrate the cross-cutting issues**
Inclusive education	Involve all students in all activities without any bias. Eg: Allow a student with physical disability to take notes or lead the team during an experiment.
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 experiments as well as during cleaning and tidying up related activities after experiments.
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	– Medical science keeps changing with new medications and treatments being developed. Instruction should be clear for students to always check if they are not using outdated medications and treatments. – When students are assessing patients they have to record data accurately.

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 in order 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.

In order 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, simulations, case studies, 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 in order 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 over protective 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 students have 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 students 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 sub unit 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 student textbook, formative assessment principle is applied through learning, self-assessment and 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:

d) Active and reflective students

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

e) Sensing and intuitive students

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

f) Visual and verbal students

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

g) Sequential and global students

Sequential students tend to gain understanding in linear steps, with each step following logically from the previous one. Global students 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

Students 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 student engaged in active learning: Communicates and shares relevant information with other students through presentations, discussions, group work and

other student-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 Surgical Pathology

The teaching methods strongly emphasised in the competence Based Curriculum (CBC) are active:

Case studies

The case study methodology is rich in detail which allows the apprentices learn not only theoretical concepts but practical concepts in different disease conditions. The advantage of the case study method is that students must actively and openly discuss the principals of the study. This helps develop their skills in problem solving, analysis, decision making and in dealing with ambiguities.

Teaching the case study

In a classroom setting, a case study is presented and can be either written, oral or in an audio-visual form. Teachers generally start by having students read the case or watch a video that summarizes the case. Students then work in small groups or individually to solve the case study. Teachers set milestones defining what students should accomplish to help them manage their time.

Research work

Students are requested to gather information related to the surgical conditions from online published works and available books/journals in the library then the results are presented in verbal or written form and discussed in class.

Skills lab and clinical settings

One of the main aims of teaching surgical pathology is to allow students to be able to take decisions on surgical conditions depending on their scope of practice. Skills lab can be used for simulation (using simulated patients or advanced mannequins) and clinical settings can be used to allow students to be in contact with real patients presenting the surgical conditions.

Group work and discussions

Small group work will help students to be active and engage in their learning. Groups have more information than a single individual. They stimulate creativity, foster learning and comprehension as students tend to remember what have been discussed in group.

The teacher must help the group to succeed by defining and assigning roles, such as the note take or the group leader. The teacher also monitors the progress of the work and facilitates the presentations for synthesis and harmonization.

The teacher can review each group's written plan of action or meet with each group individually and discuss their plan.

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 2: SAMPLE LESSON PLAN

Subject: Surgical pathology

School Name: ----------

Teacher's name: -------

Term	Date	Subject	Class	Unit No	Lesson No	Duration	Class size
1	15th Oct 2021	Surgical pathology	S6	1	1 of 3	80 mins	30 students

Type of Special Educational Needs to be catered for in this lesson and number of students in each category	Assist students with decreased hearing capacity or communication difficulties: – Encourage them to take the front sits – Always get the student 's 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.
Unit title	Gastro-duodenal Ulcers
Key Unit Competence	Take appropriate decision on gastro-duodenal ulcer
Title of the lesson	Description of gastro-duodenal ulcers
Instructional Objective	**Students should be able to:** • Correctly explain the causes and pathophysiology of gastro-duodenal ulcers in his own words. • Accurately list the diagnosis measures for gastro-duodenal ulcers. • Adequately describe signs and symptoms of gastro duodenal ulcers, its evolution and complications in his own words
Plan for this Class (location: in / outside)	Inside the classroom.
Learning Materials **(for all students)**	Laptop and projectors, Books, other supporting visual (charts, videos) and teaching aids such as Chalks and Chalkboard, Flash Cards, papers, Pens, markers, flip charts

References	1) Lewis, S. L., Dirksen, S. R., Heitkemer, M. M., & Linda Bucher. (2014). MEDICAL-SURGICAL NURSING Assessment and Management of clinical problems (NINTH). Canada: ELSEVIER MOSBY. 2) Williams, L. S., & Hopper, P. D. (2015). Understanding Medical Surgical Nursing (Fifth edit). Philadelphia: F.A. Davis Company. 3) Hinkle, J. L., & Cheever, K. H. (2018). Brunner and Suddarth's textbook of medical-surgical nursing. Wolters kluwer india Pvt Ltd. 4) Winkelman, C. (2016). Medical-surgical nursing: Patient-centered collaborative care. Elsevier

Timing for each step	**Description of teaching and learning activity**		**Generic competences and Cross cutting issues to be addressed + a short explanation**
	The teacher starts with the introductory activity. After that, the students are organized into groups to read and discuss the leaning activity 1.1. Then students respond to the questions. The reporter from each group, presents the findings from the discussion. The teacher facilitates student's interactions to capture the key contents of the lesson through harmonization.		
	Teacher activities	**Student activities**	
1. Introduction 15 Minutes	– As this is the first lesson of the unit, Introduce the unit by displaying the images in introductory activity1.1 and ask indicated questions. Check the answers from the students and tell them that the right answers shall be provided throughout the unit. • Split students into small working groups and distribute the handouts of the learning activity 1.1 (case study).	• The students observe the images, reflect on them and answers to the attached questions. • The students sit in groups and receive the handouts of the learning activity 1.1 (case study).	**Generic competences** – Critical thinking is improved trough observation and reflection • Communication is improved through class interactions

1. Development of the lesson: 45 minutes			
1.1.Discovering activity	– Invite students to read, discuss the learning activity 1.1 (case study) and respond to questions – Move around to help those who are having difficulties to understand the case study and guides them in finding gastro-duodenal ulcer's definitions, signs and symptoms, causes, eevolution and complications as well as its diagnostic measures	– The students brainstorm on • definitions, • signs and symptoms, • causes, • evolution and complications as well as its diagnostic measures	**Generic competences:** – Cooperation is improved through group work: team working spirit is developed through working together in small group discussions.- Communication skills are developed through small group discussions. – Collaboration is developed by accommodating individual idea
2.1 Presentation	– Ask the group to choose the reporter – Invite student to present their findings	– Group representatives present findings from groups and other students participate actively in the presentation by comments or by asking questions – The students respond to the questions asked by the teacher – The students compare the summary from the groups presentation to the content within the student's book	Generic competences – Communication skills are developed through presentation **Crosscutting issues:** – Gender is respected in choosing the group representatives

2.3 Exploitation	From the presentation of each group, – Choose the definitions, signs and symptoms, causes, evolution and complications as well as diagnostic measures of Gastro-duodenal ulcer. – Present the findings in a six column table. – Ask the students their inputs or additions from the presentations	– The students compare the summary from the groups presentation to the content within the student's book	Generic competences: Critical thinking is developed through comparison of group presentation to the content.
2.4 Synthesis	– Ask the students to compare the summary from the groups presentation to the content within the student's book – Highlights the definitions, signs and symptoms, causes, evolution and complications as well as diagnostic measures of Gastro-duodenal ulcer	– The students take note of key elements highlighted	**Generic competences** – The critical thinking through choosing the correct elements to be compared.

2.5 Conclusion **10 mins**	– Highlight/ask the usefulness of the acquired knowledge in the care of patients with Gastro-duodenal ulcers.	– Students highlight the key message taken from the lesson	– Listening skills – Writing skills
3. Assessment **10mins**	– Ask the students the questions in self-assessment – Ask students to define gastro-duodenal ulcer using illustration of Gastro-duodenal ulcer diagrams.	– Students respond to the questions in self-assessment – Students define Gastro-duodenal ulcer using illustration of Gastro-duodenal ulcer diagrams.	– Students develop critical thinking and reasoning skills while answering questions
Teacher self-evaluation	To be completed after feed-back from the students or after the lesson delivery.		

PART 3: UNIT DEVELOPMENT

UNIT 1 GASTRO DUODENAL ULCER

1.1. Key Unit competence

Take appropriate decision on Gastro-duodenal ulcer conditions

1.2. Prerequisites

Before you teach this lesson ensure that the student have mastered the normal structure of the stomach, and duodenum, the inflammatory and healing process, basic of hematological tests (Full Blood Count), physical assessment of the patient, communication and collaboration skills, as well as ethical principles (patient autonomy, beneficence, non-maleficence and justice).

1.3. Cross-cutting issues to be addressed

1.3.1. Gender education

During teaching and learning activities, ensure that both boys and girls take responsibility of group leadership and participate equally.

1.3.2. Peace and values

During group activities, the teacher emphasizes the importance of respecting each student's ideas and encourages everyone to feel free to provide their inputs in a respectful manner.

1.4.Guidance on the introductory activity

Teacher's activity

- Avail any visual aid that display the figures in the introductory activity 1.0 student's book.
- Computer and a projector to display the figures
- A print out of the same colored figures.
- Avail other material depending on the context and teaching environment (white board, flip chat and markers, blackboard and chalks)
- Allow students to observe and reflect on the figures
- Allocate time to questions. Use an interactive brainstorm and let the students answer to the questions
- Students may not be able to find the correct answers, but they are invited to predict
- Summarize the answers for the purpose of orientation to the new unit topic

♦ **Answers for the introductory activity**

1) Yes. There is a difference between the figure A and the figure B.
2) The figure A displays the normal structure of stomach and duodenum in the human body
3) On the diagram, the figure A displays the normal/intact stomach and duodenal mucosal lining, whereas the figure B, displays hollows/ ulcerations on the stomach and duodenal mucosal lining.
4) The abnormal structure of stomach and duodenum displayed in figure B, if not treated, it can result in perforation, severe pain, hemorrhage, gastric outlet obstruction, and peritonitis
5) Health personnel identify abnormal structure of stomach and duodenum by doing complementary exam/ investigations such as endoscopy
6) The abnormal structures can be collected by giving adequate medication: antibiotics, anti-acids, pain killers/Analgesics, and or surgery if advanced stage of the disease.

1.5. List of lessons/ subheading

	Lesson title	Learning objectives	Numbers of periods
1	Description of Gastro-duodenal Ulcer • Definition • Signs and Symptoms • Causes and pathophysiology • Diagnostic measures	• Define gastro-duodenal ulcer • Explain the causes and pathophysiology of Gastro-duodenal ulcer • Describe the signs and symptoms of Gastro-duodenal ulcer • List the diagnostic measures for Gastro-duodenal ulcer	2
2	Management of Gastro-duodenal Ulcer • Treatment plan • Complications • Evolution of Gastro-duodenal ulcer	• Develop a treatment plan Gastro-duodenal ulcer • Explain the evolution and complications of Gastro-duodenal ulcer • Describe the evolution and complications of Gastro-duodenal ulcer	1
3	Assessment	To take appropriate decision on gastro-duodenal ulcers	1

Lesson 1: Description of gastro-duodenal ulcer

a) Learning objectives

At the end of this lesson, the student will be able to:

- Define gastro-duodenal ulcer
- Explain the causes and pathophysiology of Gastro-duodenal ulcer
- Describe the signs and symptoms of Gastro-duodenal ulcer
- List the diagnostic measures for Gastro-duodenal ulcer

b) Prerequisites

Students have covered the normal structure of the stomach and duodenum and the inflammatory and healing process in the anatomy and physiology. Basic of hematological tests (Full Blood Count), physical assessment of the patient, communication and collaboration skills, the ethical principles (patient autonomy, beneficence, non-maleficence and justice).

c) Teaching resources

You can use visual (charts) to display figures of in student's book. Depending on the available resources you can also use the laptop and projectors to visualise the same figures. Other resources include boards (white or black), markers, flash cards, papers, pens, books.

d) Learning activities

Discuss the cases study related to Gastro-duodenal ulcer to understand their definition, their causes, signs and symptoms as well as the pathophysiology of their occurrence. In addition to that diagnostic measures will also be discussed.

e) Teacher's activity

- Print the handout of the learning activity 1.1 in the student's book
- Split students into small working groups and distribute the handouts of the learning activity 1.1 (case study).
- Invite students to read, discuss the learning activity 1.1 (case study).
- Give the students' opportunity to work in their respective groups and at the same time supervise how the work is being conducted.
- Ask the group to choose the reporter and ask them to present their respective findings.
- Help students to summarize what they have learnt and highlight definition, causes and pathophysiology signs and symptoms (of each disease) and diagnostic measures of gastro-duodenal ulcer

♦ **Answers for learning activity 1.1**

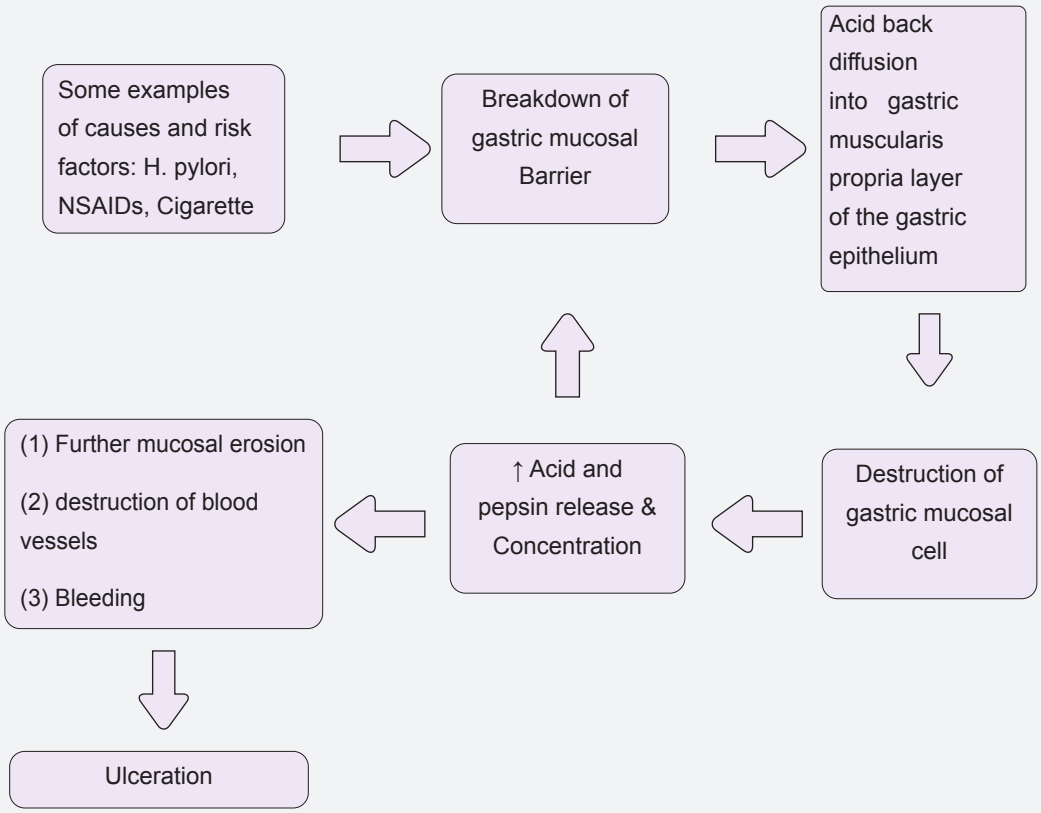
1. Bibliography described in the case study include:
    - Age of 47 years
    - Employment type: policeman (police officer)
    - Residence and working area: rural area
2. The medical history of patient described in the case study:
    - heartburn' and abdominal discomfort for years
    - weakness, being light-headed and short of breath, (antecedent of anemia).
    - Medication taken in the past included: omeprazole and ferrous sulfate for 3 months
3. The signs and symptoms that the patient present and which are described in the case study:
    - Paleness of the skin, coldness; BP of 136/78mmhg, Pulse of 98;
    - Distended abdomen and tenderness
    - Presence of hyperactive bowel sounds;
    - Active upper GI bleeding (200 mL of bright red blood obtained via an inserted nasogastric tube
4. The aggravating and relieving factors include are displayed in the table below:

Type of ulcers	Aggravating Factors	Relieving Factors
Gastroduodenal Ulcer	• Frequent use of nonsteroidal anti-inflammatory drugs (NSAIDs), • Advanced age • Illness such as liver, kidney or lung disease. • High and regular alcohol intake • Cigarette smoking • Unclean food or water • Coffee (caffeinated and decaffeinated: a strong stimulant of gastric acid secretion) • Psychologic distress,(stress and depression, negatively influence the healing of a developed ulcers once they have developed)	• Eating certain foods (to buffer stomach acid • Taking an acid-reducing medication

5. The Probable diagnostic method: endoscopy and a biopsy taken from the stomach and duodenum.

♦ **Answers for self-assessment 1.1**

1. Summarized pathophysiology of gastro-duodenal ulcer



2. Diseases that would mimic the symptoms of gastroduodenal ulcers include: gastritis, gastroesophageal reflux disease, biliary tract disease, chronic pancreatitis, and irritable bowel syndrome, gastric cancer.
3. To reduce the anxiety of the patient caused by the fear of endoscopy, the patient should be psychological prepared. this include provision of information about the diagnostic procedure, management of pain, existence of wrong beliefs that endoscopy can cause suffocation, or infection

Lesson 2: Management of Gastro-duodenal ulcer

a) Learning objectives

At the end of this lesson the student will be to:

- Develop a treatment plan Gastro-duodenal ulcer
- Explain the evolution and complications of Gastro-duodenal ulcer
- Describe the evolution and complications of Gastro-duodenal ulcer

b) Prerequisites

Students have covered the normal structure of the stomach and duodenum layers and the inflammatory and healing process in the anatomy and physiology. Basic of hematological tests (Full Blood Count), physical assessment of the patient, communication and collaboration skills, the ethical principles (patient autonomy, beneficence, non-maleficence and justice).

c) Teaching resources

Resources include computer and projector, chalks boards (white or black), markers, flash cards, papers, pens, books.

d) Learning activities

Discuss the cases study related to Gastro-duodenal ulcer to understand the management, evolution and complications of Gastro-duodenal ulcer.

e) Teacher's activity

- Print the handout of the learning activity 1.2 (the continuation of the case study) in the student's book
- Split students into small working groups and distribute the handouts of the learning activity 1.2 (The continuation of the case study).
- Invite students to read, discuss the learning activity 1.2 (case study).
- Give the students' opportunity to work in their respective groups and at the same time supervise how work is being conducted.
- Remember to assist those who are weak without giving them the answers
- Ask the group to choose the reporter and ask them to present their respective findings.
- Help students to summarize what they have learnt and highlight definition, causes and pathophysiology signs and symptoms (of each disease) and diagnostic measures.

♦ **Answers for learning activity 1.2**

1) The surgical treatment plan adopted by the medical doctor for this patient:

- Provide two units of packed RBCs
- Provide intravenous fluids.
- Stopping bleeding via endoscopic intervention.

2) Different medication prescribed to this patient:

- **Proton pump inhibitors (PPI):** 40 mg BID, was ordered to reduce acid, which allows the ulcer to heal
- **Histamine receptor blockers (H2 blockers):** to reduce acid production (ex: Tagamet).
- **Antibiotics:** to kill bacteria.
- **Protective medications:** Like a liquid bandage, to cover the ulcer in a protective layer to prevent further damage from digestive acids and enzymes (ex. Carafate).
- Several treatment options are combined to cure H. pylori without recurrence, and include are summarized in table below.

Medication regimen options for H. pylori infection	
Type of therapy	**Examples of therapy options**
Triple therapy: Two antibiotics + proton pump inhibitor	• Amoxicillin + clarithromycin + omeprazole • Amoxicillin + clarithromycin + lansoprazole
Dual therapy: Antibiotic + proton pump inhibitor	• Clarithromycin + omeprazole • Amoxicillin + lansoprazole) • Clarithromycin + H2 antagonist

3) The complications which may happen to this police officer are: Gastro-duodenal ulcer perforation accompanied by peritonitis and acute abdomen.

♦ **Answers for application activity**

1) Ask more additional data on the status of gastroduodenal ulcer of Mrs. SM such as: provocation, quality, radiation, severity and timing of onset Gastro-duodenal ulcer such as: what triggered the crisis of the pain? What is the quality of pain, is it charp? Is it like cramp, is it continuous or intermittent? Where does the pain radiate? When did the pain started? Did it occur suddenly or gradually? When did you start to have similar signs and symptoms? What do you do to calm your pain, what aggravate your pain? Do you have any chronic disease?

2) Emotional support to be given to Mr. SM includes

   - Reassuring him: letting him know that his severe pain is going to be manage appropriately and timely
   - Appropriate diagnosis is going to be done
   - Appropriate medication is going to be given

3) After orders are obtained the actions to anticipate to be implanted under supervision include performing tasks that are delegated by registered nurses, with the primary of educating the patient on

   - Diet
   - Emphasize the need to take all medications as prescribed
   - Explain the importance of reporting any of the following:
     - Bloody emesis or tarry stools
     - Increase in epigastric pain
     - Increased nausea or vomiting
   - Describe the relationship between symptoms and stress.
   - Stress reducing activities and relaxation strategies are encouraged.
   - Encourage patient and caregiver to share concerns about lifestyle changes and living with a chronic illness.

1.6. Summary of the unit

Gastro-duodenal Ulcer also known as Peptic ulcer (PU) disease is a condition caused by Helicobacter pylori (H. pylori) bacteria, and other factors leading to hypersecretion of gastric acid or pepsin which later lead to irritation of gastric and duodenal mucosal, their disruption, and finally the formation of either gastric ulcer or duodenal ulcer or both. Those factors include but are not limited to: frequent use of nonsteroidal anti-inflammatory drugs (NSAIDs), high and regular alcohol intake, Coffee, cigarette smoking, unclean food or water, advanced age. Etc.

- In mild to moderate case, common signs and symptoms of Gastroduodenal Ulcer include: burning pain in the middle or upper stomach, bloating, heartburn, nausea or vomiting.
- In severe cases, symptoms can include dark or black stool (due to bleeding), vomiting, weight loss, as well as severe pain in the mid to upper abdomen.
- In addition to complete history taking and physical exam, the diagnostic measures include gastric and duodenal endoscopic exam and biopsy, Helicobacter pylori testing, Full blood count
- The treatment plan of Gastro-duodenal Ulcer consists of combining several treatment options to: dual or tritherapy

Note that if gastroduodenal ulcer is not appropriately treated, the major complications may occur. These may include perforation, abscess of the appendix, and peritonitis. In case of gastro-duodenal perforation, the treatment plan may now involve an urgent surgical intervention.

1.7. Additional information

Differential diagnosis for Gastroduodenal Ulcer Disease

Gastroduodenal Ulcer has got various differential diagnosis. The following table displays some of the differential diagnosis of gastroduodenal ulcer, their causes as well as their symptoms to help students differentiate them with gastroduodenal ulcer

Differential diagnosis, causes, and symptoms of Gastroduodenal Ulcer

Diseases	Causes	Symptoms	Observation
Chronic gastritis	H. pylori Alcohol Medications Autoimmune diseases Chronic stress	Epigastric pain	Both conditions cause inflammation in the stomach lining, but gastritis is general inflammation while an ulcer is a patch of inflamed stomach lining. Ulcers cause more severe, localized pain with the risk of cancer, bleeding, and perforation.
Atrophic gastritis	chronic H pylori infection and autoimmune gastritis	Epigastric pain	is a histopathologic entity characterized by chronic inflammation of the gastric mucosa with loss of gastric glandular cells and replacement by intestinal-type epithelium pyloric-type glands, and fibrous tissue
Crohn's disease	Autoimmune disease	Abdominal pain	Crohn ulceration can involve any part of the gastrointestinal tract from the buccal mucosa to the rectum. Isolated Crohn ulceration of the stomach is rare, although it may cause duodenal or ileal ulcerations.

Zollinger-Ellison syndrome (ZES)	H. pylori and Autoimmune disease	excessive acid secretion. severe peptic ulceration, kidney stones, watery diarrhea, or malabsorption	(ZES) is a rare disorder that can cause gastric or duodenal ulcers (usually multiple) from excessive acid secretion. ZES can also be associated with multiple endocrine neoplasia type I, which occurs earlier than isolated ZES.

Nursing Management of the patient with Peptic Ulcer Disease or Gastroduodenal ulcer disease

The following table summarize the nursing management of a patient with Peptic Ulcer Disease or Peptic Ulcer Disease. patient's various health problems, the goal of treatment plan and some of the nursing intervention to be done are provided

Nursing management of a patient with Peptic ulcer disease/ Gastroduodenal ulcer disease

Health Problem	Objective /Goals of Treatment Plan	Intervention and Health Promotion
1. Ineffective self–health management related to lack of knowledge of long-term management of PUD	The overall goals are that the patient with PUD will: 1. adhere to the prescribed therapeutic regimen, 2. experience a reduction in or absence of discomfort, 3. exhibit no signs of GI complications,	Early detection and effective treat ment of ulcers are important aspects of reducing morbidity risks associated with PUD. Patients who are taking ulcerogenic drugs: – Encourage to take these drugs with food. – Teach patients to report symptoms related to gastric irritation, (epigastric pain, to their health care provider.) – If acute exacerbation of an ulcer, encourage the patient to be NPO for a few days, have an naso gastric tube inserted and connected to intermittent? suction, have IV fluid replacement. – Explain to the patient and the caregiver the reasons for these therapies so they understand that the advantages far outweigh any temporary discomfort. – Regular mouth care alleviates the dry mouth. – Cleansing and lubrication of the nares facilitate breathing and decrease soreness. – Take vital signs initially and at least hourly to detect and treat shock

4. Nausea related to acute exacerbation of disease process	5. have complete healing of the peptic ulcer, 6. make appropriate lifestyle changes to prevent recurrence.	– NB: The volume of fluid lost, the patient's signs and symptoms, – and laboratory test results (hemoglobin, hematocrit, and electrolytes) – determine the type and amount of IV fluids administered. – Be aware that other health problem (e.g., heart failure) may be adversely affected by the type or amount of fluid used.

1.8. End unit assessment

♦ **Answers for end unit assessment**

1. The most frequent symptoms of Gastroduodenal ulcers are:

In mild to moderate cases:

- Burning pain (in the middle or upper stomach between meals or at night).
- Pain (that temporarily disappears if you eat something or take an antacid)
- Bloating,
- Heartburn,
- Nausea or vomiting.

In severe case:

- Dark or black stool (due to bleeding),
- Vomiting,
- Weight loss, and Severe pain in the mid to upper abdomen.

2. The diagnostic measures of Gastroduodenal ulcers include:
   - a complete history taking, and physical examination,
   - Complete Blood cell Count (CBC)(to determine the level of Hemoglobin(Hb) and Hematocrit(Ht) to rule out any anemia due to chronic bleeding.)
   - upper gastrointestinal endoscopy with biopsy (the most accurate diagnostic procedure)
   - Helicobacter pylori testing. and allows for direct viewing of the gastric and duodenal mucosa
3. b
4. a, c

5. The dietary modifications recommended to a patient with gastroduodenal ulcers includes:

To be encouraged

- Diet high in fiber and rich in vegetables (oats, legumes, flax seeds, nuts, oranges, apples, and carrots. ...
- Vitamin A rich food (broccoli, sweet potatoes, kale, spinach, and collard greens contain vitamin A. ...
- Green tea., Flavonoid-rich foods, Cranberry juice.

NB: The major goal of diet is to avoid extreme elevations of gastric acid secretion and the direct irritation of gastric mucosa.

To be avoided

- Alcohol,
- Smoking
- Citric acid juices (induce reflux and cause discomfort in selective patients).
- Spice food (causes discomfort, especially during exacerbation of peptic disease).
- Coffee

1.9. Additional activities

1.9.1. Remedial activities

Using the provided list of words, fill in the gaps the appropriate word.

- Pain-relieving NSAID medications
- Peptic ulcer,
- Peptic ulcer diseases
- Stomach
- The duodenum
- Helicobacter pylori (H. pylori) bacteria

1) Gastroduodenal ulcers also known as _____disease is a condition in which painful sores or ulcers develop in the lining of _____or the first part of the _____

2) Two main causes of peptic ulcers are_____and_____

Respond by true or False

1) Hypersecretion of acid, creates a large amount of acid which easily moving into the duodenum causing duodenal ulceration_____

2) Burning or gaseous pressure in high left epigastrium and back and upper abdomen are clinical features more characteristic of duodenal ulcer _____

♦ **Answers for remedial activities**

1) Peptic ulcers ------ Duodenum ---------Stomach
2) Helicobacter pylori (H. pylori) bacteria, pain-relieving NSAID medications
3) True
4) False

1.9.2. Consolidations activities

1) Which patient is at highest risk for having a gastric ulcer?

a. 45-year-old female admitted for illicit drug detoxification

b. 55-year-old female, smoker, with nausea and vomiting

c. 37-year-old male, smoker, who fell while looking for a job

d. 27-year old male who is being divorced and has back pain

2) What type of pain does the nurse expect a patient with an ulcer of the posterior portion of the duodenum to experience?

a. Pain that occurs after not eating all day

b. Back pain that occurs 2 to 4 hours following meals

c. Midepigastric pain that is unrelieved with antacids

d. High epigastric burning that is relieved with food intake

3) Of the following medications which one is not used to decrease gastric or hydrochloric acid secretion?

a. Tagamet (cimetidine)

b. Sucralfate (Carafate)

c. Omeprazole (Prilosec)

d. Misoprostol (Cytotec

e. Amoxicillin+clarithromycin+omeprazole

4) Which of the followings characteristics are unique to duodenal ulcers?

I. Pain is relieved with eating food.

II. They have a high recurrence rate.

III. Associated with Helicobacter pylori infection.

IV. Increased gastric secretion occurs.

V. Hemorrhage, perforation, and obstruction may result.

VI. There is burning and cramping in the midepigastric area.

a. I and III

b. II and V

c. I and IV

d. IV and VI

♦ **Answers for consolidation activities**

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

1.9.3. Extended activities

Circle the letter corresponding to the rightest answer. Explain your response

1) Corticosteroid medications are associated with the development of peptic ulcers because of which probable pathophysiologic mechanism?

a. The enzyme urease is produced.

b. Secretion of hydrochloric acid is increased.

c. The rate of mucous cell renewal is decreased.

d. The synthesis of mucus and prostaglandins is inhibited.

2) Regardless of the precipitating factor, what causes the injury to mucosal cells in gastroduodenal ulcers?

a. Acid back diffusion into the mucosa

b. The release of histamine from GI cells

c. Ammonia formation in the mucosal wall

d. Breakdown of the gastric mucosal barrier

3) What does the nurse include when teaching a patient with newly diagnosed peptic ulcer disease?

a. Maintain a bland, soft, low-residue diet.

b. Use alcohol and caffeine in moderation and always with food.

c. Eat as normally as possible, eliminating foods that cause pain or discomfort.

d. Avoid milk and milk products because they stimulate gastric acid production.

4) What type of pain does the nurse expect a patient with an ulcer of the posterior portion of the duodenum to experience?

a. Pain that occurs after not eating all day

b. Back pain that occurs 2 to 4 hours following meals

c. Midepigastric pain that is unrelieved with antacids

d. High epigastric burning that is relieved with food intake

♦ **Answers for extended activities**

1) C	2) C
3) A	4) b

UNIT 2 APPENDICITIS

2.1. Key Unit competence

Take appropriate decision on appendicitis condition.

2.2. Prerequisites

The disease usually changes the normal anatomy and physiology of the body. For the purpose of this unit, ensure that the students mastered the normal parts of intestines and the physiology of digestion. Appendicitis is an inflammatory disease and students should understand the normal mechanisms of inflammation process. For better diagnosis of appendicitis, ensure that the students understand the physical assessment of the patient and the basics of hematological tests (Full Blood Count).

Before teaching the management of appendicitis, confirm that the student understands the wound dressing technique and medications such as antibiotics, anti-inflammatories and analgesiques. Communication and collaboration skills are also important throughout the learning process, mainly before group activities. The ethical principles (patient autonomy, beneficence, non-maleficence and justice) are also the prerequisite to this unit and help students to manage the appendicitis with justice and by respecting the autonomy of the patient.

2.3. Cross-cutting issues to be addressed

2.3.1. Gender education

During class interactions, you should aim to treat all students equally regardless their gender. While students are in group activities, ensure that both boys and girls take responsibility of group leadership and participate equally. As a teacher you also have to ensure the equitable access and use of resources in your classroom.

2.3.2. Peace and values

As a teacher, learn to appreciate the unique strengths and needs of each student. Create a democratic space in your class where students are encouraged to share their ideas and ask questions. During group activities, emphasize on the importance of respecting each student ideas and encourage everyone to feel free to provide his/her inputs in a respectful manner. Deemphasize self-interests and prejudices during group activities.

2.4. Guidance on the introductory activity

Teacher's activity

- Avail any visual aid that display the figures in the introductory activity 2.0 student's book.
- Computer and a projector to display the figures
- A print out of the same colored figures.
- Avail other material depending on the context and teaching environment (white board, flip chat and markers, blackboard and chalks)
- Allow students to observe and reflect on the figures
- Allocate time to questions. Use an interactive brainstorm and let the students answer to the questions
- Students may not be able to find the correct answers, but they are invited to predict
- Summarise the answers for the purpose of orientation to the new unit topic

♦ **Answers for the introductory activity 2.0**

1) Yes, there is a difference between two appendixes.
2) The figure A reflects the normal structure of appendix in the human body.
3) On figure B, the appendix is swollen and red, there is an inflammation of the appendix (appendicitis).
4) Obstruction of the appendix that can lead to inflammation.
5) Someone with such inflammation would have pain, that appendix is very swollen and it may rupture.
6) The health personnel will ask questions to know the characteristics of pain. S/he will perform a physical examination such as light palpation to localize the pain. The health personnel will run some tests to complete the physical examination such as Full blood count, ultrasound and CT scan
7) The appendicitis is usually treated by medications and surgery.

2.5. List of lessons

No	Lesson title	Learning objectives	Numbers of periods
1	Description of appendicitis • Definition • Causes and pathophysiology • Signs and Symptoms • Diagnostic measures	• Define appendicitis • Explain the causes and pathophysiology of appendicitis • Describe the signs and symptoms of appendicitis • List the diagnostic measures for appendicitis	2
2	Management of appendicitis • Treatment plan • Complications • Evolution of appendicitis	• Develop a treatment plan appendicitis • Explain the evolution and complications of appendicitis • Describe the evolution and complications of appendicitis	2
3	Assessment	To take decision about appendicitis	1

Lesson 1: Description of appendicitis

a) Learning objectives

At the end of this lesson the student will be able to:

- Define appendicitis
- Explain the causes and pathophysiology of appendicitis
- Describe the signs and symptoms of appendicitis
- List the diagnostic measures for appendicitis

b) Prerequisites

Appendicitis is an inflammatory disease of low GI system, for the students to be able to give the definition, causes, pathophysiology, signs and symptoms, teacher ensures that they mastered the normal parts of intestines and their roles, physiology of digestion and the inflammatory process. The student also should understand the basic diagnostic measures such physical assessment, FBC, ultrasound and CT Scan. For better assessment (history taking) of a patient with appendicitis, ensure students have adequate communication skills.

c) Teaching resources

You can use visual (charts) to display figures of in student's book. Depending on the available resources you can also use the Laptop and projectors to visualise the same figures. Other resources include chalks boards (white or black), markers, flash cards, papers, pens, books.

d) Learning activities

Discuss the case study related to appendicitis to understand its definition, causes, signs and symptoms as well as pathophysiology of its occurrence. In addition to that diagnostic measures are discussed.

e) Teacher's activity

- Print the handout of the learning activity 2.1 in the student's book
- Split students into small working groups and distribute the handouts of the learning activity 2.1 (case study).
- Invite students to read, discuss the learning activity 1.1 (case study).
- Give the students' opportunity to work in their respective groups and at the same time supervise how work is being conducted.
- Ask the group to choose the reporter and ask them to present their respective findings.
- Help students to summarize what they have learnt and highlight definition, causes, pathophysiology, signs and symptoms and diagnostic measures of appendicitis.

♦ **Answers for learning activity 2.1**

1) The biography of M.H
   - Sex: Male,
   - Age: 13 years
2) The medical history of M.H is constipation.
3) The signs and symptoms of M.H started with the mild pain around his umbilicus last night and this morning he the pain has migrated to his right lower quadrant.

The pain is getting worse. There are other signs that were observed with physical examination like fever and tenderness. The blood sample taken also showed an elevated WBC and a CT scan revealed an enlargement in the area of the cecum.

4) The pain aggravating factor in the case study was the physical examination. The relieving factor was the lying position with the right leg flexed.
5) The differential diagnosis would be the intestinal obstruction.

♦ **Answers for Self-assessment 2.1**

1) People most likely to develop appendicitis are children and male gender.
2) Among the cells of WBC, Neutrophils are the one that increase in case of appendicitis

Lesson 2: Management of appendicitis

a) Learning objectives

At the end of this unit the student shall be able to:

- Develop a treatment plan appendicitis
- Explain the evolution and complications of appendicitis
- Describe the evolution and complications of appendicitis

b) Prerequisites

Before you teach this lesson ensure that the student mastered wound dressing technique, communication and collaboration skills and ethical principles (patient autonomy, beneficence, non-maleficence and justice). Ensure the student understand the medications such as antibiotics, anti-inflammatories and analgesics. Ensure they learned the general care of pre and post-operative management.

c) Teaching resources

Resources include computer and projector, chalks boards (white or black), markers, flash cards, papers, pens, books.

d) Learning activities

Discuss the cases study related to appendicitis in student's book to understand the management, evolution and complications of appendicitis.

e) Teacher's activity

- Print the handout of the learning activity 2.1 in the student's book
- Split students into small working groups and distribute the handouts of the learning activity 2.1 (case study).
- Invite students to read, discuss the learning activity 2.1 (case study).
- Give the students' opportunity to work in their respective groups and at the same time supervise how work is being conducted.
- Ask the group to choose the reporter and ask them to present their respective findings.
- Help students to summarize what they have learnt and highlight definition, causes and pathophysiology signs and symptoms (of each disease) and diagnostic measures.

♦ Answers for learning activity 2.2

1. The surgery (appendectomy)
2. The patient was kept NPO and was decided on him but prior to surgery he prescribed intravenous fluids, antibiotics and analgesics. After the surgery, the surgeon noted in the post-surgery report that there was no perforation or abscess of the appendix, and no signs of peritonitis. The boy stayed in hospital for 3 days and was discharged home without pain and normal vital signs. He was requested to report himself to the nearest health facility after 3 days for wound care.
3.

Antibiotics	**Fluids**	**Post-operative analgesics**
A third-generation cephalosporin effective against many gram-negative bacteria, such as cefotaxime (Cefotaxime Sandoz), ceftazidime (Fortum) or ceftriaxone (Rocephin) is initiated prior to surgery	Intravenous fluids are given to maintain vascular volume and to provide a route for antibiotic administration. Normal saline 0.9%, Ringer lactate, Dextrose in water 5% can be used.	A person with appendicitis experiences pain before and after surgery. Analgesia is limited until the diagnosis is established. Postoperative pain is controlled by narcotic or non-narcotic analgesics.

♦ Answers for self-assessment 2.2

1) The use of a warm pad/heating pads on the abdomen is avoided because the warmth may increase inflammation and risk of rupture.
2) Explain the treatment options for a patient with appendicitis.

Intravenous fluids	**Antibiotics**	**Analgesics**	Surgery
Given to restore or maintain vascular volume and prevent electrolyte imbalance Example: Normal saline	In the treatment of uncomplicated case of appendicitis mainly in children or when the operation is not possible (e g: pregnancy) Prevent infection: can start in preoperative and continue few days after surgery Use third-generation cephalosporin effective against many gram-negative bacteria, such as cefotaxime (Cefotaxime Sandoz), ceftazidime (Fortum) or ceftriaxone (Rocephin) antibiotic alone can treat the	Alleviating pain Narcotics and non-narcotics	Appendectomy Check the appendectomy collaborative care in student's book.

2.6. Summary of the unit

Appendicitis is an inflammation of the appendix, causing the pain in the lower right abdomen. Although anyone can develop appendicitis, most often it occurs in people between the ages of 10 and 30 and male are at risk compared to female. The inflammation is a result of an obstruction of appendix. The pain of appendicitis usually becomes localized, starts on the periumbilical area to the right lower quadrant at McBurney's point. Other signs and symptoms include fever, anorexia vomiting and local tenderness.

The appendicitis can be diagnosed through a complete history, physical examination, and a differential WBC count. The WBC count is mildly to moderately elevated in most cases. CT scan is the preferred diagnostic procedure, but ultrasound is also used. A urinalysis is done to rule out genitourinary conditions that mimic the manifestations of appendicitis. Other differential diagnostic includes intestinal obstruction. The treatment of appendicitis is appendectomy unless there is an evidence of perforation or peritonitis. The evolution/prognosis of appendicitis is often good but some complications may arise manly where it is perforated. Those complications include abscess, peritonitis and sepsis.

2.7. Additional information

Appendicitis is common cause of acute abdominal pain and remains a clinical emergency. When appendicitis perforates, further complications such as sepsis can follow. The sepsis is dangerous and fatal thus, an early diagnostic and treatment is of paramount. The appendectomy is still the most common treatment for appendicitis. The surgeon can choose an open or laparoscopic appendectomy. The difference between two procedures turns around the way the abdomen is accessed. Laparoscopic surgery is a minimally invasive surgery. The Surgeons use surgical instruments for keyhole surgery and watching the monitor which displays images from inside the patient's abdomen. The open surgery requires a large incision that cuts through the abdominal muscle and wall.

The laparoscopic surgery is more recommended as it decreases postoperative pain and shortens the length of hospitalization. The chances of post-operative infection are also minimized. However, the laparoscopic surgery is not a solution to everyone, therefore the open surgery is still done, for example for pregnant women, patients who had prior surgery who may have a buildup scar that may inhibit to enter the abdomen with minimally invasive tools. In some context the shortage of material for laparoscopic surgery is also observed. When there is perforation, the open surgery is the best option recommended.

In pregnant women, the pain of appendicitis may be localized in upper abdomen because their appendix is a bit higher during the pregnancy.

2.8. End unit assessment

♦ **Answers for end unit self-assessment**

1) Within hours of onset, the pain of appendicitis usually becomes localized starts on the periumbilical area to the lower right quadrant.
2) History and physical examination, WBCs, ultrasound, CT scan

   Response to MCS
3) b
4) c
5) b
6) a. The characteristics of abdominal pain that are missing: Pain starting periumbilical area and migrating to be localized pain over the right lower quadrant.

   b. Eat and drink adequately , Eliminate body waste.

   Move and maintain desirable postures , Sleep and rest,

   Work in such a way that there is a sense of accomplishment,

   Play or participate in various form of recreation,

   Keep the body clean and well-groomed and protect the integument

   c. Yes. As there are no signs and symptoms of rupture.
7) Potential complications which may happen to this young boy are perforation, abscess of the appendix and peritonitis.

2.9. Additional activities

2.9.1. Remedial activities

Fill in the brackets using the words given below

Faecalith, hard mass of faeces, calculus or stone, a foreign body, inflammation, tumor. blood supply, oedema, ulceration, infection, peritonitis.

Intestinal obstruction, stones of gall bladder, stones in urinary organs, tubal pregnancy, perforation of stomach.

1. Because of the small size of the appendix, obstruction may occur, causing inflammation and making it susceptible to infection. The obstruction is often caused by _____ or _____. Other obstructive causes include _____, _____ _____, and _____.

2. Following obstruction, the appendix distends with fluid secreted by its mucosa. As pressure within the lumen of the appendix increases, _____is impaired, leading to_____, _____, _____ and _____.
3. Otherconditionslike_____,_____,_____, _____ and _____ can produce pain similar to appendicitis.
4. The inflamed appendix can bust resulting in the inflammation of the ling of the abdomen (peritoneum) a condition being called_____ True or false
5. Worms don't cause appendicitis. True or False
6. Diet does not influence the development of appendicitis. True or False

♦ **Answers for remedial activities**

1. Because of the small size of the appendix, obstruction may occur, causing inflammation and making it susceptible to infection. The obstruction is often caused by a **faecalith** or hard mass of faeces. Other obstructive causes may include **a calculus or stone, a foreign body, inflammation, and tumor.**
2. Following obstruction, the appendix distends with fluid secreted by its mucosa. As pressure within the lumen of the appendix increases, **blood supply** is impaired, leading to **inflammation, oedema, ulceration** and **infection.**
3. Other conditions like **Intestinal obstruction, stones of gall bladder, stones in urinary organs, tubal pregnancy** and **perforation of stomach** or duodenal ulcer can produce pain similar to appendicitis.
4. The inflamed appendix can bust resulting in the inflammation of the ling of the abdomen (peritoneum) a condition being called **peritonitis**
5. False
6. False

2.9.2. Consolidations activities

1) Select all the following options that are NOT causes of appendicitis:

a. Fecalith

b. Routine usage of NSAIDs

c. Infection due to Helicobacter pylori

d. Lymph node enlargement due to viral or bacterial infection

e. Diet low in fiber

2) **What are the signs and symptoms associated with appendicitis. Select all that apply:**

a. Increased red blood Cells

b. Patient has the desire to be positioned in the prone position to relieve pain

c. Umbilical pain that extends in the right lower quadrant

d. Abdominal rebound tenderness

e. Abdominal Flaccidity

3) **An 16-year-old patient is admitted with appendicitis. Which statement by the patient requires immediate health care provider intervention? Choose the best answer**

a. The pain hurts so much it is making me nauseous.

b. I have no appetite.

c. The pain seems to be gone now.

d. If I position myself on my right side, it makes the pain less intense.

♦ **Answers for consolidation activities**

1) b, c, e 2) c, d 3) c

2.9.3. Extended activities

1. You're providing education to a group of students about the care of a patient with appendicitis. Which statement by a student requires re-education about your teaching? Choose the best answer

   a. After an appendectomy the patient may have a nasogastric tube to remove stomach fluids and swallowed air.

   b. Non-pharmacological techniques for a patient with appendicitis include application of heat to the abdomen and the side-lying position.

   c. The health provider should monitor the patient for signs and symptoms of peritonitis.

   d. It is normal for some patients to have shoulder pain after a laparoscopic appendectomy.

2. Your patient is 4 days post-opt from an appendectomy. Which assessment finding requires further evaluation?

   a. The patient reports their last bowel movement was the day before surgery.

   b. The patient reports incisional pain.

c. The patient coughs and deep breathes while splinting the abdominal incision.

d. Options A and C

3. A patient is recovering after having an appendectomy. The patient is 48 hours post-opt from surgery and is tolerating full liquids. The physician orders for the patient to try solid foods. What types of foods should the patient incorporate in their diet?

a. Foods high in fiber
b. Foods low in fiber
c. Foods high in carbohydrates
d. Foods low in protein

4. A patient is scheduled for appendectomy at noon. While performing your morning assessment, you note that the patient has a fever of 38.5 C and rates severe abdominal pain. In addition, the abdomen is distended and the patient states, "I was feeling better last night but it seems the pain has become worst." The patient is having tachycardia and tachypnea. Based on the scenario, what do you suspect the patient is experiencing?

a. Pulmonary embolism
b. Peritonitis
c. Colon Fistulae
d. Hemorrhage

♦ **Answers for extended activities**

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

UNIT 3 INTESTINAL OBSTRUCTION

3.1. Key Unit competence

Take appropriate decision on intestinal obstruction condition.

3.2. Prerequisites

Ensure that the students mastered the normal parts of intestines and the physiology of digestion. Intestinal obstruction is an inflammatory disease and students should understand first the normal mechanisms of inflammation process. For better diagnosis of intestinal obstruction, ensure that the students understand the physical assessment (both terminology and technique) of the patient and the basics of hematological tests (Full Blood Count). Before teaching the management of intestinal obstruction, confirm that the student understands pre and post-operative care. Students should master wound dressing technique and medications such as antibiotics, anti-inflammatories and analgesics. Communication and collaboration skills are also important throughout the learning process, mainly before group activities. The ethical principles (patient autonomy, beneficence, non-maleficence and justice) are also the prerequisite to this unit and help students to manage the intestinal obstruction with justice and by respecting the autonomy of the patient.

3.3. Cross-cutting issues to be addressed

3.3.1. Gender education

During class interactions, the teacher should aim to treat all students equally regardless their gender. While students are in group activities, ensure that both boys and girls take responsibility of group leadership and participate equally. As a teacher you also have to ensure the equitable access and use of resources in your classroom.

3.3.2. Peace and values

As a teacher learn to appreciate the unique strengths and needs of each student. Create a democratic space in your class where students are encouraged to share their ideas and ask questions. During group activities, the teacher emphasizes the importance of respecting each student ideas and encourages everyone to feel free to provide his/her inputs in a respectful manner. Deemphasize self-interests and prejudices during group activities

3.4. Guidance on the introductory activity

Teacher's activity

- Avail any visual aid that display the figures in the introductory activity 3.0 student's book.
- Computer and a projector to display the figures
- A print out of the same colored figures.
- Avail other material depending on the context and teaching environment (white board, flip chat and markers, blackboard and chalks)
- Allow students to observe and reflect on the figures
- Allocate time to questions. Use an interactive brainstorm and let the students answer to the questions
- Students may not be able to find the correct answers, but they are invited to predict
- Summarise the answers for the purpose of orientation to the new unit topic

♦ **Answers for the introductory activity 3.0**

1. These segments are abnormal and the lumen of the intestines is impaired/obstructed
2. The figure A shows a segment of intestines that bulges/protrudes through a muscle.

   On figure B the segment of intestines is twisted, on figure C two segments are adhered together and on figure D the segment of intestines slides over another and blocks it off.
3. When the lumen of intestines is blocked, the proximal bowel becomes increasingly distended, and intraluminal bowel pressure rises, leading to an increase in capillary permeability and extravasation of fluids and electrolytes into the peritoneal cavity. Therefore, the absorption is impaired and the body will respond by hypotension, dehydration
4. The abdomen can be distended, nausea, vomiting can result from the back flow of the content of intestines blocked, the absorption is impaired and dehydration can be observed. The twisted segments can impair the normal blood circulation and neural transmission, hence the ischemia.
5. History and physical examination. X-ray and CT scan
6. The surgery is the best option to collect the abnormalities

3.5. List of lessons

	Lesson title	Learning objectives	Numbers of periods
1	Description of intestinal obstruction • Definition • Causes and pathophysiology • Signs and Symptoms • Diagnostic measures	• Define intestinal obstruction • Explain the causes and pathophysiology of intestinal obstruction • Describe the signs and symptoms of intestinal obstruction • List the diagnostic measures for intestinal obstruction	2
2	Management of intestinal obstruction • Treatment plan • Complications • Evolution of intestinal obstruction	• Develop a treatment plan intestinal obstruction • Explain the evolution and complications of intestinal obstruction • Describe the evolution and complications of intestinal obstruction	2
3	Assessment	To take appropriate decisions about intestinal obstructions	1

Lesson 1: Description of intestinal obstruction

a) Learning objectives

At the end of this unit, the leaner shall be able to:

- Define intestinal obstruction
- Explain the causes and pathophysiology of intestinal obstruction
- Describe the signs and symptoms of intestinal obstruction
- List the diagnostic measures for intestinal obstruction

b) Prerequisites

Intestinal obstruction is a disease of lower GI system that impairs the normal digestion. For the students to be able to give the definition, causes, pathophysiology, signs and symptoms, teacher ensures that they mastered the normal parts of intestines, their roles and the normal physiology of digestion. The student also should understand the basic diagnostic measures such physical assessment, basic blood tests (FBC, urea, creatinine, electrolytes), ultrasound and CT Scan.

For better assessment (history taking) of a patient with intestinal obstruction, ensure students have adequate communication skills.

c) Teaching resources

You can use visual (charts) to display figures of intestinal obstructions in student's book. Depending on the available resources you can also use the Laptop and projectors to visualise the same figures. Other resources include chalks, boards (white or black), markers, flash cards, papers, pens, books.

d) Learning activities

Discuss the case study related to intestinal obstruction (learning activity 3.1) to understand its definition, causes, signs and symptoms as well as pathophysiology of its occurrence. In addition to that diagnostic measures are discussed.

e) Teacher's activity

- Print the handout of the learning activity 3.1 in the student's book
- Split students into small working groups and distribute the handouts of the learning activity 3.1 (case study).
- Invite students to read, discuss the learning activity 3.1 (case study).
- Give the students' opportunity to work in their respective groups and at the same time supervise how work is being conducted.
- Ask the group to choose the reporter and ask them to present their respective findings.
- Help students to summarize what they have learnt and highlight definition, causes, pathophysiology, signs and symptoms and diagnostic measures of intestinal obstruction.

♦ **Answers for learning activity 3.1**

1. Intestinal obstruction occurs when the contents of intestines fail to pass through the bowel lumen.
2. When an obstruction occurs, fluid, gas, and intestinal contents accumulate proximal to the obstruction, and the distal bowel collapses. The proximal bowel becomes increasingly distended, and intraluminal bowel pressure rises, leading to an increase in capillary permeability and extravasation of fluids and electrolytes into the peritoneal cavity. This accumulation of fluids in intestines and in peritoneal cavity causes a severe reduction in circulating blood volume, hence hypotension, hypovolemic shock and bowel ischemia. When the distension is severe the segment of the bowel becomes gangrenous a condition known as intestinal strangulation or intestinal infarction.

If it is not corrected quickly, the bowel will rupture, leading to infection, septic shock, and death. If the obstruction is below the proximal colon or in the large bowel which is less common and not usually as dramatic as small-bowel obstruction, dehydration occurs more slowly because of the colon's ability to absorb fluid and distend well beyond its normal full capacity. If the blood supply to the colon is cut off, the patient's life is in jeopardy because of bowel strangulation and necrosis

3. From history and physical examination: Complete constipation, faeculent vomiting, abdomen distended and mildly tender in the right iliac fossa, tachycardia. From diagnostic measures: increased WBC, increases urea and creatinine, a relatively gasless abdomen with a few dilated loops of small bowel in X-ray. Small bowel obstruction within the mid small bowel loop with the possibility of ischemia of the small bowel loop from CT scan.

   When the distension is severe the segment of the bowel becomes gangrenous a condition known as intestinal strangulation or intestinal infarction. If it is not corrected quickly, the bowel will rupture, leading to infection, septic shock, and death. If the obstruction is below the proximal colon or in the large bowel which is less common and not usually as dramatic as small-bowel obstruction, dehydration occurs more slowly because of the colon's ability to absorb fluid and distend well beyond its normal full capacity. If the blood supply to the colon is cut off, the patient's life is in jeopardy because of bowel strangulation and necrosis

♦ **Answers for self-assessment 3.1**

1. The difference exams are:
   - Hematologic tests: FBC
   - Biochemistry tests: Urea, creatinine, electrolytes
   - X-ray, CT scan, sigmoidoscopy
2. Serum electrolytes, BUN, and creatinine are monitored frequently to assess the degree of dehydration.

Lesson 2: Management of intestinal obstruction

a) Learning objectives

At the end of this unit, the student shall be able to:

- Develop a treatment plan intestinal obstruction
- Explain the evolution and complications of intestinal obstruction
- Describe the evolution and complications of intestinal obstruction

b) Prerequisites

Before you teach this lesson ensure that the student mastered wound dressing technique, communication and collaboration skills and ethical principles (patient autonomy, beneficence, non-maleficence and justice). Ensure the student understand the medications such as antibiotics, anti-inflammatories and analgesics. Ensure they learned the pre and post-operative care.

c) Teaching resources

Resources include computer and projector, chalks boards (white or black), markers, flash cards, papers, pens, books.

d) Learning activities

Discuss the cases study related to intestinal obstruction to understand the management, evolution and complications of intestinal obstruction.

e) Teacher's activity

- Print the handout of the learning activity 3.1 in the student's book
- Split students into small working groups and distribute the handouts of the learning activity 3.1 (case study).
- Invite students to read, discuss the learning activity 3.1 (case study).
- Give the students' opportunity to work in their respective groups and at the same time supervise how work is being conducted.
- Ask the group to choose the reporter and ask them to present their respective findings.
- Help students to summarize what they have learnt and highlight definition, causes and pathophysiology signs and symptoms (of each disease) and diagnostic measures.

♦ **Answers for learning activity 3.2**

The pre-operative management of a bowel obstruction focuses on relieving the pressure. The intestine is decompressed by NG tube insertion and keeping the patient Nothing by mouth (NPO), the dehydration and electrolytes imbalances are corrected by administering fluid and electrolytes. Supportive care is also important

In post-surgery mouth care is performed, medications such as antibiotics, antiemetics, and analgesics are administered. A teaching plan is also elaborated

- Self-assessment answers 3.1
- Hematologic tests: FBC
- Biochemistry tests: Urea, creatinine, electrolytes
- X-ray, CT scan, sigmoidoscopy

♦ **Answers for self-assessment 3.2**

1. Yes, Mrs. L.S is at risk of developing intestinal obstruction
2. Mrs. L.S had antecedents of surgery and adhesions are likely to occur. Adhesions may then lead to intestinal obstructions

3.6. Summary of the unit

Intestinal obstruction is a common surgical emergency caused by a mechanical blockage (Mechanical obstruction) or failure of peristalsis leading to paralytic ileus (dynamic obstruction). Obstruction leads to sequestration of fluid in the bowel lumen with consequent dehydration and electrolyte imbalances. Mechanical obstruction leads to the classical symptoms of colicky abdominal pain, abdominal distension, constipation (especially with distal obstruction), and vomiting (especially with proximal obstruction). In contrast, paralytic contrast is usually painless. Obstruction can be complicated by bowel ischemia and perforation, resulting in a life-threatening situation. Management requires aggressive resuscitation, followed by appropriate investigation, and treatment tailored to the underlying cause. The surgery is the common treatment.

3.7. Additional information

Problems of intestinal obstruction and how to manage them

Problems	Cause	Possible complications	Interventions
Fluid volume deficit	– Large collection of fluid in the bowel proximal to an obstruction, – Vomiting and – Nasogastric suction	– Hypovolemic shock, – Acute kidney injury – Multiple organ system dysfunction from poor tissue perfusion may	Monitor vital signs, peripheral perfusion (skin temperature, peripheral pulses and capillary refill); measure urinary output hourly and nasogastric A urinary output of 0.5 mL per kg per hour or drainage every 2 to 4 hours. more usually indicates an adequate glomerular filtration rate.
Tissue perfusion	– Obstructive process itself	– Strangulation or volvulus	– Monitor vital signs hourly – Monitor urine output – Monitor temperature – Monitor Pain
Breathing	– Significant abdominal distension from a bowel obstruction can cause the diaphragm to flatten	– Impairing pulmonary ventilation	– Assess respiration rate – Assess the blood gases – Elevate the head of the bed – Provide a pillow or folded towel to use in splinting the abdomen while coughing postoperatively. – Contact physiotherapist as indicated – Provide good oral care 2 to 4 hourly.

3.8. End unit assessment

♦ **Answers for end unit self-assessment**

1. The two types of intestinal obstruction which are mechanical and non-mechanical. Mechanical obstruction occurs when a blockage occurs within the intestine from conditions causing pressure on the intestinal walls. Paralytic ileus (lack of intestinal peristalsis and bowel sounds) is the most common form of non-mechanical obstruction
2. Volvulus, Adhesion, intussusception and strangulated

3. Complications of intestinal obstructions

Small intestines obstructions:

- Hypovolaemia and hypovolaemic shock
- Renal insufficiency.
- Pulmonary ventilation may be impaired
- Strangulation Gangrene
- Perforation,
- Septic shock.
- Strangulation greatly increases the risk of mortality.

Large intestines

- Gangrene
- Perforation

3.9. Additional activities

3.9.1. Remedial activities

Fill in the brackets

1. The patient often notes _____, audible abdominal sounds produced by hyperactive intestinal motility.
2. When the distension is severe the segment of the bowel becomes gangrenous a condition known as _____or _____

♦ **Answers for remedial activities**

1. The patient often notes borborygmi, audible abdominal sounds produced by hyperactive intestinal motility.
2. When the distension is severe the segment of the bowel becomes gangrenous a condition known as strangulation or infarction

3.9.2. Consolidation activities

1. What would be the mechanisms of difficulty in breathing to a patient with intestinal obstruction?
2. What are the cause of fluid deficit to a patient with intestinal obstruction?

♦ **Answers for the consolidations activities**

1. Significant abdominal distension from a bowel, obstruction can cause the diaphragm to flatten
2. Large collection of fluid in the bowel proximal to an obstruction, Vomiting and Nasogastric suction

3.9.3. Extended activities

Read the case study and respond to the attached questions

A 67-year-old male presents to the emergency with a 2-day history of nausea and vomiting, abdominal distention and a decreased frequency of bowel movements. He has no prior history of operations. He relates a history of two prior similar episodes which have resolved spontaneously at home over the last 3 months. Physical exam: T 37.8 degrees C, HR 98, RR 20, BP 148/78.

The abdomen is distended and not tender. There are no scars or hernias on exam.

1. What is the clinical impression in this patient?
2. What are the diagnostic measures will you do?
3. What is the initial management plan?
4. What is the differential diagnosis of small bowel obstruction without prior surgery?

♦ **Answers for extended activities**

1. The clinical impression in this patient is recurrent small bowel obstruction
2. The initial diagnostic workup includes laboratory tests and X-rays as usual in small bowel obstruction.
3. The initial management plan includes IV fluids with correction of volume and electrolytes, nasogastric tube for decompression, and Foley catheter to monitor output. If the obstruction is partial, he can be managed conservatively and be frequently reevaluated.
4. Differential diagnosis of small bowel obstruction without prior surgery: hernia, small bowel mass, intussusception, appendicitis, small bowel diverticulitis, viral enteritis, colon cancer at ileocecal valve, Meckel's diverticulum, adult malrotation, foreign body, mesenteric ischemia, Crohn's disease.

UNIT 4 HERNIA

4.1. Key Unit competence

Take appropriate decision on Hernia

4.2. Prerequisites

Before teaching this lesson ensure that the learners have mastered the human body anatomy and physiology, fundamental of nursing, pharmacology, communication and collaboration skills and ethical principles in nursing.

4.3. Cross-cutting issues to be addressed

4.3.1. Gender education

During teaching and learning activities, ensure that both boys and girls take equal chance of group leadership and participation.

4.3.2. Peace and values

During group activities, the teacher focuses on the importance of respecting each learner ideas and encourages everyone to feel free to provide their inputs in a respectful manner. Make sure the learning environment is conducive.

4.2.3. Inclusive education

All students have equal opportunities to 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 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. Also 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.

4.4. Guidance on the introductory activity

Teacher's activity

- Avail any visual aid that display the figures in the introductory activity 4.0 student's book.
- Computer and a projector to display the figures.
- Avail other material depending on the context and teaching environment (white board, whiteboard markers, blackboard and chalks, chart and videos on hernia, speakers; text books).
- Allow students to observe and reflect on the figures.
- Allocate time to questions. Use open discussion and let the students answer to the questions.
- Learners may not be able to find the correct answers, but they are invited to predict.
- Summarize the answers for the purpose of orientation to the new unit topic.

Student's activity

- Form group and participate in the group work.
- To read carefully the case study and answer the indicated questions.
- Group representatives will present the group 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 for the introductory activity 4.0**

1. Normal structure: A; abnormal structures are: B, C, D and E.
2. Common characteristic of abnormal structure is organ protrusion.
3. Possible causes: Muscle weakness, strain and weight bearing on the organ.
4. The manifestations of this abnormalities may abdominal pain, tenderness and vomiting
5. Health personnel can identify these abnormalities through history taking and physical exam, and lab /imaging results
6. Can be corrected through manual corrections to surgery performance

4.5. List of lessons

	Lesson title	Learning objectives	Numbers of periods
1	Description of hernia (Definition of hernia, Causes and pathophysiology of hernia, Description of signs and symptoms of hernia	• Define hernia • Explain the causes and pathophysiology of hernia • Describe the signs and symptoms of hernia	1
2	Adequate surgical diagnosis of hernia, Treatment plan of hernia, Evolution and complications of hernia.	• List adequate surgical diagnosis of hernia • Develop treatment plan of hernia • Explain the evolution and complications of hernia	1
3	End unit assessment	• Learner takes appropriate decision on hernia	1

Lesson 1: Description of hernia

This is the first lesson of unit four senior six of surgical pathology which deals with Definition of hernia, Causes and pathophysiology, Description of signs and symptoms of hernia.

a) Learning objectives

At the end of this lesson the learner will be able to:

- Define hernia
- Explain the causes and pathophysiology of hernia
- Describe the signs and symptoms of hernia

b) Prerequisites

Before teaching this lesson ensure that the learners have mastered the human body anatomy and physiology, health assessment, fundamental of nursing, pharmacology, communication and collaboration skills and ethical principles in nursing.

c) Teaching resources

To teach this lesson, teacher will use different aids and methods in order to achieve learning objectives, these aids and teaching methods include: teaching materials (written case studies on Hernia; text books, Simulated patient) teaching methods (lecture, brainstorming, course work, small group discussion). Other resources may include computer lab, Nursing skills lab and Library.

d) Learning activities

Learning activities will be directly related to the learning objectives of the course, and provide knowledge and skills that will empower students to be involved in practice and receive 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, watch the video and summarize the content, engagement in debate and other clinical learning activities such as case study discussion.

e) Teacher's activity

- Print the handouts of the learning activity 4.1 in the student's book
- Split learners into small working groups and distribute the handouts of the learning activity 4.1 (case study).
- Invite learners to read carefully and discuss the learning activity 4.1 (case study).
- Give the learners' opportunity to work in their respective groups and at the same time supervise how work is being conducted.
- Ask the group to choose the reporter and ask them to present their respective findings.
- Help learners to summarize what they have learnt and highlight definition, causes and pathophysiology, description of signs and symptoms of hernia.

♦ **Answers for learning activity 4.1**

1. Contributing factors of inguinal hernia: standing, coughing and lifting heavy weights.
2. Signs and symptoms of inguinal hernia are: swelling and pain in the right groin.
3. Inguinal hernia is diagnosed based on history, physical examination and ultrasound.
4. The treatment adopted by the health personnel is surgical treatment.

♦ **Answer for self-assessment 4.1**

1. The common abdominal hernias include inguinal, femoral, umbilical and ventral or incisional
2. Contributing factors to abdominal hernia are: a weakness in the abdominal wall along with increased intra-abdominal pressure, such as the pressure from coughing, straining, and heavy lifting.
3. Signs and symptoms of complicated hernia are: pain, nausea and vomiting, colicky abdominal pain.

Lesson 2: Adequate surgical diagnosis, treatment plan, complications and evolution of hernia

This is the second lesson of eight of surgical pathology which deals with adequate surgical diagnosis, treatment plan, evolution and complications of hernia.

a) Learning objectives

At the end of this lesson the learner will be able to:

- List adequate surgical diagnosis of hernia
- Develop treatment plan of hernia
- Explain the evolution and complications of hernia

b) Prerequisites

Before teaching this lesson ensure that the learners have mastered the human body anatomy and physiology, health assessment, fundamental of nursing, pharmacology, first aid, communication and collaboration skills and ethical principles in nursing. In addition to this, the learners should have covered the lesson one of unit eight regarding hernia.

c) Teaching resources

To teach this lesson, teacher will use different aids and methods in order to achieve learning objectives, these aids and teaching methods include: teaching materials (white board, whiteboard markers, pens, blackboard and chalks, chart and videos on hernia, speakers, text books, mannequin) teaching methods (lecture, brainstorming, course work, small group discussion). Other resources may include computer lab, Nursing skills lab and Library.

d) Learning activities

Discuss the cases study of learning activity 4.2 related to hernia to better understand the adequate surgical diagnosis, treatment plan, evolution and complications of hernia.

Discuss the answer of all questions in self-assessment related to surgical diagnosis, treatment plan, evolution and complications of hernia.

e) Teacher's activity

- Print the handout of the learning activity 4.2 in the student's book
- Split learners into small working groups and distribute the handouts of the learning activity 4.2 (case study).
- Invite learners to read, discuss the learning activity 4.2 (case study).
- Give the learners' opportunity to work in their respective groups and at the same time supervise how work is being conducted.

- Ask the group to choose the reporter and ask them to present their respective findings.
- Help learners to summarize what they have learnt and highlight the surgical treatment, treatment plan, evolution and complications of hernia.

♦ **Answers for learning activity 4.2**

1. The biography of the patient in this case study: Age: 56year, sex: male, obese patient
2. The medical history of the patient is that he consulted the health facility experiencing pain about 2-3cm beneath his sternum and sharp pains in radiating towards his left shoulder. The pain varies in intensity and is increased immediately after eating spicy foods. After most meals, he suffers from mild heartburn. He said that the health personnel initially prescribed a two week course of Omeprazole, which alleviated the symptoms, but they returned after a few days.
3. 3. The signs and symptoms that the patient present and are described in the case study are: pain about 2-3cm beneath his sternum and sharp pains in radiating towards his left shoulder, mild heartburn.
4. The diagnostic studies included an esophagram (barium swallow) and an endoscopy to visualization the lower esophagus.
5. The proposed management plan is surgical treatment

♦ **Answers for self-assessment 4.2**

The types of hiatal hernia are:

1. Sliding: The junction of the stomach and the esophagus is above the diaphragm, and a part of the stomach slides through the hiatal opening in the diaphragm.
2. Paraesophageal, or rolling: The esophagogastric junction remains in the normal position, but the fundus and the greater curvature of the stomach roll up through the diaphragm, forming a pocket alongside the esophagus.
3. Differential diagnosis of hiatal hernia may be peptic ulcer disease, gastritis, acute coronary syndrome and coronary artery disease

4.6. Summary of the unit

Hernia is a protrusion of an organ through weakness in a wall in a cavity containing it. It is classified into two classes: Hiatal hernia and abdominal hernias. Abdominal hernia is further subdivide into inguinal, femoral, ventral or incisional and umbilical hernia. Strangulated hernia causes severe pain, abdominal cramping, nausea and vomiting. Abdominal hernia are diagnosed by history taking and physical examination. Herniorrhaphy is done as emergency surgery to correct strangulated hernia. Abdominal hernias are complicated into intestinal obstruction, bowel perforation and gangrene. Hiatal hernia or diaphragmatic hernia is a condition in which the stomach slides up in hiatus of the diaphragm into the thorax.

Factors that increase intra-abdominal pressure, including obesity, pregnancy, ascites, tumors, intense physical exertion, and heavy lifting on a continual basis may also predispose patients to development of a hiatal hernia. Two types of hiatal hernia are sliding and paraesophageal or rolling hernia. A large hiatal hernia can cause pain, heartburn, a feeling of fullness, or reflux (regurgitation), which can injure the esophagus with possible ulceration and bleeding. Hiatal hernia is diagnosed by esophagram and endoscopy. It is managed surgically (fundodiplication).

4.7. Additional information

Other types of hernias include

Epigastric hernia: Fatty tissue protrudes through the abdominal area between the navel and lower part of the sternum (breastbone).

Spigelian hernia: The intestine pushes through the abdomen at the side of the abdominal muscle, below the navel.

Diaphragmatic hernia: Organs in the abdomen move into the chest through an opening in the diaphragm.

How common are hernias?

- 75 to 80% are inguinal or femoral.
- 2% are incisional or ventral.
- 3 to 10% are umbilical, affecting 10 to 20% of new-borns; most close by themselves by 5 years of age.
- 1 to 3% are other types.

Three types of hernia surgery that can be performed:

- **Open surgery,** in which a cut is made into the body at the location of the hernia. The protruding tissue is set back in place and the weakened muscle wall is stitched back together. Sometimes a type of mesh is implanted in the area to provide extra support.

- **Laparoscopic surgery** involves the same type of repairs. However, instead of a cut to the outside of the abdomen or groin, tiny incisions are made to allow for the insertion of surgical tools to complete the procedure.
- **Robotic hernia repair**, like laparoscopic surgery, uses a laparoscope, and is performed with small incisions. With robotic surgery, the surgeon is seated at a console in the operating room, and handles the surgical instruments from the console. While robotic surgery can be used for some smaller hernias, or weak areas, it can now also be used to reconstruct the abdominal wall.

4.8. End Unit assessment

♦ **Answers for end unit assessment**

1. c
2. a
3. a
4. Signs and symptoms of abdominal hernia are: vomiting, cramping abdominal pain, and distention.
5. Diagnostic test of hiatal hernia: x-ray (esophagram), Endoscopy
6.

Do's	Don'ts
Taking antacids, eating small meals that pass easily, through the esophagus, not reclining for 3 to 4 hours after eating, elevating the head of the bed 6 to 12 inches to prevent reflux.	Eating at bedtime: snacks, spicy foods. Drinking alcohol, caffeine, and smoking.

4.9 Additional activities

4.9.1. Remedial activities

1. Which is not a type of abdominal hernia among the following:

a. Inguinal hernia

b. Femoral hernia

c. Paraesophageal hernia

d. Ventral hernia

2. The following are the complications of strangulated hernia Except:
    a. Gangrene
    b. Intestinal obstruction
    c. Bowel perforation
    d. Severe headache
3. The following factors contribute to the development of hiatal hernia Except:
    a. Obesity
    b. Pregnancy
    c. Ascites
    d. Lighter exercise
4. Fundodiplication is a surgical procedure performed for:
    a. Ventral hernia
    b. Femoral hernia
    c. Hiatal hernia
    d. Incisional hernia

♦ **Answers for remedial activities**

1=c	3=d
2=d	4=c

4.9.2. Consolidations activities

1. The nurse suspects that a patient who presents with the symptom of food "sticking" in the lower portion of the esophagus may have the motility disorder known as:
    a. Achalasia.
    b. Diffuse spasm.
    c. Gastroesophageal reflex.
    d. Hiatal hernia.
2. A hiatal hernia involves:
    a. An extension of the esophagus through an opening in the diaphragm.
    b. An involution of the esophagus, which causes a severe stricture.
    c. A protrusion of the upper stomach into the lower portion of the thorax.
    d. A twisting of the duodenum through an opening in the diaphragm.

3. The patient asks the nurse why she needs to have surgery for a femoral, strangulated hernia. What is the best explanation the nurse can give the patient?

    a. The surgery will relieve her constipation.

    b. The abnormal hernia must be replaced into the abdomen.

    c. The surgery is needed to allow intestinal flow and prevent necrosis.

    d. The hernia is because the umbilical opening did not close after birth as it should have.

♦ **Answers for consolidation activities**

1=d 2=c 3=a

4.9.3. Extended activities

1. The incidence of inguinal hernia in men has a bimodal distribution, which peaks: Before the second year of life and after age 50

    a. Before the first year of life and after age 40

    b. Before the eighth year of life and after age 40

    c. Before the fifth year of life and after age 50

2. What are the home remedies for hernia?

    a. Ice pack

    b. Weight loss

    c. Practice stress reduction exercise

    d. All of the above

3. Hernia sac that extends into the sacrum may:

    a. Require extensive dissection and reduction

    b. Require division within the inguinal canal

    c. Require amputation of the sac

    d. Require the sac to be inverted into the preperitoneum

4. The two types of collagen found to exist in decreased ratio of the skin of inguinal hernia patients are:

    a. Types I and II

    b. Types II and III

    c. Types I and III

    d. Types III and V

♦ **Answers for extended activities**

1=b 2=d 3=d 4=c

UNIT 5 HEMORRHOIDS

5.1. Key Unit competence

Take appropriate decision on hemorrhoid conditions.

5.2 Prerequisites

Before you teach this lesson ensure that the learner have mastered the normal structure of the Human anatomy and physiology(Gastro intestinal system), Fundamental of Nursing, Pharmacology, the inflammatory and healing process, physical assessment of the patient, wound dressing technique, communication and collaboration skills, the ethical principles (patient autonomy, beneficence, non-maleficence and justice).

5. 3 Cross-cutting issues to be addressed

5.3.1 Gender education

During teaching and learning activities, ensure that both boys and girls take responsibility of group leadership and participate equally.

5.3.2 Peace and values

During group activities, the teacher emphasizes the importance of respecting each learner ideas and encourages everyone to feel free to provide their inputs in a respectful manner.

5.4 Guidance on the introductory activity

Teacher's activity

- Avail any visual aid that display the figures in the introductory activity 5.1 student's book.
- Computer and a projector to display the figures
- A print out of the same colored figures.
- Avail other material depending on the context and teaching environment (white board, flip chat and markers, blackboard and chalks)
- Allow students to observe and reflect on the figures
- Allocate time to questions. Use an interactive brainstorm and let the students answer to the questions

- Learners may not be able to find the correct answers, but they are invited to predict
- Summarize the answers for the purpose of orientation to the new unit topic

♦ **Answers for the introductory activity**

1. Physiological changes in the intestines reflected by the figure A ,B ,C and D are many like abnormal venous dilatation, vascular thrombosis, degenerative process in the collagen fibers and fibro-elastic tissues, distortion and rupture of the anal sub-epithelial muscle. This patient in image A probably is having hemorrhoids condition.
2. These abnormalities in the human body are usually not painful unless they prolapse. They may bleed during bowel movements.
3. Health personnel can identify or notice these abnormalities by history taking and correct physical examination of the anus.
4. These abnormalities can be corrected by life style change and modification and medication.

5.5. List of lessons

	Lesson title	Learning objectives	Numbers of periods
1	Description of Hemorrhoids • Definition • Causes and risks factors • Pathophysiology • Signs and Symptoms.	• Define hemorrhoid • Explain the causes and risks factors of hemorrhoids. • Describe brief pathophysiology of hemorrhoids. • Describe the different signs and symptoms of hemorrhoids.	1
2	• Adequate surgical diagnosis • Treatment plan of hemorrhoids. • Evolution and complications	• Identify the diagnosing modalities for hemorrhoids • Describe the management of hemorrhoids • Explain the prognosis and complications of hemorrhoids..	1
3	Assessment	• Take appropriate decision on hemorrhoid conditions	1

♦ **Lesson 1: Description of hemorrhoids**

a) Learning objectives

At the end of this lesson the learner will be able to:

- Define hemorrhoid
- Explain the causes and risks factors of hemorrhoids.
- Describe brief pathophysiology of hemorrhoids.
- Describe the different signs and symptoms of hemorrhoids.

b) Prerequisites

Learners have covered the normal structure of the Human anatomy and physiology (gastro intestinal system) inflammatory and healing process .Basic of hematological tests (Full Blood Count), physical assessment of the patient, wound dressing technique, communication and collaboration skills, the ethical principles (patient autonomy, beneficence, non-maleficence and justice).

c) Teaching resources

You can use visual (charts) to display figures of in student's book page (…). Depending on the available resources you can also use the Laptop and projectors to visualise the same figures. Other resources include chalks boards (white or black), markers, flash cards, papers, pens, books.

d) Learning activities

Discuss the cases study related to hemorrhoid to understand its causes and risk factors and pathophysiological process of its occurrence.

Teacher's activity

- Print the handout of the learning activity 5.1 in the student's book
- Split learners into small working groups and distribute the handouts of the learning activity 5.1 (case study).
- Invite learners to read, discuss the learning activity 5.1 (case study).
- Give the learners' opportunity to work in their respective groups and at the same time supervise how work is being conducted.
- Ask the group to choose the reporter and ask them to present their respective findings.
- Help learners to summarize what they have learnt and highlight definition, causes/risk factors and pathophysiology process, signs and symptoms of hemorrhoids.

♦ **Answers for learning activity 5.1**

1. The medical history of N.A described in the case study: complaining pain in the rectum during and after passing stools, rectal bleeding after defecation, hard stool since some weeks and itching(constipation) and a bulging mucosa was observed during inspection and palpated confirming external hemorrhoids.
2. Yes, because some information like having hard stool, anal itching and bleeding are considered as signs and risks factors of hemorrhoids.
3. The signs and symptoms presented in the case study are rectal anal pain during and after passing stool associated to anal bleeding, she has been having hard stool since some weeks and itching, bulging mucosa was observed during inspection and palpated confirming external hemorrhoids.

♦ **Answers for self-assessment 5.1**

1. The pathophysiology of Haemorrhoids: The veins become distended as they lose their elasticity. The descended loose lining becomes more sensitive to pressure from straining and to trauma from the stool. There can be a stasis in the veins, with clot formations and swelling, or erosions of the lining, with bleeding. The hemorrhoids become symptomatic.
2. Other diseases/differential diagnosis that would mimic the symptoms of Haemorrhoids include anal cancer, anal fissures, and anal fistulae; pedunculated polyps; perianal abscesses; prostatitis; proctitis, rectal prolapse, condyloma acuminate; inflammatory bowel disease.

♦ **Lesson 2: Treatment plan and complications of hemorrhoids.**

a) Learning objectives

At the end of this lesson the learner will be able to:

- Identify the diagnosing modalities for hemorrhoids
- Describe the management of hemorrhoids
- Explain the prognosis and complications of hemorrhoids.

b) Prerequisites

Learners have covered the normal structure of the gastrointestinal system in the anatomy and physiology, inflammation process and pharmacology .Basic of hematological tests (Full Blood Count), physical assessment of the patient, wound dressing technique, communication and collaboration skills, the ethical principles (patient autonomy, beneficence, non-maleficence and justice).

c) Teaching resources

Resources include computer and projector, chalks boards (white or black), markers, flash cards, papers, pens, books.

d) Learning activities

Discuss the cases study learning activity 5.2 related to hemorrhoid to understand the treatment and its complications.

e) Teacher's activity

- Print the handout of the learning activity 5.2 in the student's book
- Split learners into small working groups and distribute the handouts of the learning activity 5.1 (case study).
- Invite learners to read, discuss the learning activity 5.2 (case study).
- Give the learners' opportunity to work in their respective groups and at the same time supervise how work is being conducted.
- Ask the group to choose the reporter and ask them to present their respective findings.
- Help learners to summarize what they have learnt and highlight different ways to diagnose hemorrhoids, treatment /management to patient with hemorrhoids, and complications.

♦ **Answers for learning activity 5.2**

1. The patient received anti-inflammatory drugs and advice on how to change her lifestyle.
2. Anti-inflammatory drugs: A drug or substance that reduces inflammation in the body. Anti-inflammatory is the property of a substance or treatment that reduces inflammation or swelling. Anti-inflammatory drugs, also called anti-inflammatories, make up about half of analgesic.
3. The potential complications which may happen to Madam N.A are: Anemia, blood clots in external hemorrhoids, infection, strangulated hemorrhoids and perianal thrombosis.

♦ **Answers for self-assessment 5.2**

1. The additional data is pain assessment: location, intensity, quality, duration, aggravating/relieving factors, and associated symptoms.
2. The emotional support is to provide comfort and reassurance.

5.6. Summary of the unit

Hemorrhoids defined as symptomatic enlargement and distal displacement of the anal cushions. Some risk factors such as prolonged sitting or standing position, obesity and chronic constipation, hypertension related to liver disease are associated with hemorrhoids. Signs and symptoms of internal hemorrhoids are usually not painful unless they prolapse. They may bleed during bowel movements. External hemorrhoids cause itching and pain when inflamed and filled with blood (thrombosed). Inflammation and edema occur with thrombosis, causing severe pain and possibly infarction of the skin and mucosa over the hemorrhoid.

The Hemorrhoids diagnosed through a complete history, physical examination (anal digital examination), Anoscopy, Sigmoidoscopy, colonoscopy and full blood count. Treatment of hemorrhoids aimed at preventing constipation, avoiding straining during defecation, maintaining good personal hygiene, and making lifestyle changes to relieve hemorrhoid symptoms and discomfort. Lifestyle modification use of anti-inflammatory and surgery are the treatment of hemorrhoids. The most common and serious complications of haemorrhoids include perianal thrombosis and incarcerated prolapsed internal haemorrhoids with subsequent thrombosis.

5.7. Additional information

Description of the types of hemorrhoids

Hemorrhoids can happen inside or outside the rectum. The type depends on where the swollen vein develops. Types include:

- **External:** Swollen veins form underneath the skin around the anus. Your anus is the canal where poop comes out. External hemorrhoids can be itchy and painful. Occasionally, they bleed. Sometimes they fill with blood that can clot. This is not dangerous, but can result in pain and swelling.
- **Internal:** Swollen veins form inside the rectum. Your rectum is the part of the digestive system that connects the colon (large intestine) to the anus. Internal hemorrhoids may bleed, but they usually aren't painful.
- **Prolapsed:** Both internal and external hemorrhoids can prolapse, meaning they stretch and bulge outside of the anus. These hemorrhoids may bleed or cause pain.

What's the difference between hemorrhoids and anal fissures?

Hemorrhoids and anal fissures cause similar symptoms, such as itching, pain and bleeding. While swollen veins cause hemorrhoids, a tear in the lining of the anus causes an anal fissure. Your healthcare provide will do a physical exam and may order tests to find what's causing your symptoms.

5.8. End Unit assessment

♦ **Answers for end unit assessment**

1. d
2. a
3. Other diagnostic tests indicated in the case of hemorrhoids are:
   - Anoscopy
   - Colonoscopy
   - Sigmoidoscopy
   - Complete history
   - Full blood count
4. Lifestyle modifications that would be recommended to a patient with haemorrhoids is:

   Lifestyle modification include the use of anti-inflammatory and surgery are the treatment of hemorrhoids.
5. The goals of pharmacotherapy are to reduce pain and constipation in patients with haemorrhoids.
6. The role of pregnancy in the etiology of hemorrhoids is:

   Pregnancy clearly predisposes women to symptoms from haemorrhoids, although the aetiology is unknown. Notably, most patients revert to their previously asymptomatic state after delivery. The relationship between pregnancy and haemorrhoids lends credence to hormonal changes or direct pressure as the culprit.
7. The role of blood studies in the workup of hemorrhoids:

   A complete blood cell (CBC) count may be useful as a marker for infection. Anemia due to haemorrhoidal bleeding is possible
8. The role of colonoscopy in the workup of hemorrhoids is:

   Colonoscopy, virtual colonoscopy, and barium enema are reserved for cases of bleeding without an identified anal source

5.9. Additional activities

5.9.1. Remedial activities

1. Symptoms of hemorrhoids can include:

    a. Flatulence (intestinal gas)

    b. Bright red blood in stool, toilet tissue, or in the toilet bowl

    c. Acid reflux

    d. Dry mouth

2. What causes hemorrhoids?

    a. Pregnancy

    b. Being overweight

    c. Diarrhea

    d. All of the above

3. The following are the types of hemorrhoids except:

    a. Internal

    b. External

    c. Prolapsed

    d. Herniated

♦ **Answers for remedial activities**

1=b

2=d

3=d

5.9.2. Consolidation activities

1. A 32-year-old woman who is at 30 weeks' gestation comes to the office because she has had pain on defecation during the past week. She says she also has had pain when attempting to cleanse the anal region as well as pain when sitting. Based on these findings, which of the following types of hemorrhoid is most likely to be noted on further evaluation of this patient?

    a. External

    b. Internal

    c. Strangulated

    d. Thrombosed

2. What are treatments for hemorrhoids?

    a. Scarring

    b. Rubber banding

    c. Heat and cold therapies

    d. All of the above

3. Which of the following is true about hemorrhoids?

    a. More common with portal hypertension

    b. External hemorrhoids are proximal to the dentate line

    c. internal hemorrhoids bleed profusely and painless

    d. Internal hemorrhoids are covered by anoderm

4. All of the following are true in the management of hemorrhoids except:

    a. Excisional surgery is the cornerstone

    b. Fiber supplementation is effective

    c. Improvement in bowel function is helpful

    d. Ligation with rubber bands effective

♦ **Answers for consolidation activities**

1=a

2=d

3=c

4=a

5.9.3. Extended activities

1. A patient is referred to the gastroenterologist for evaluation of internal hemorrhoids. During examination, the internal hemorrhoid prolapses after Valsalva maneuver and the prolapse requires manual reduction. Based on these findings, the internal hemorrhoid in this patient is classified at which of the following stages?

    a. I

    b. II

    c. III

    d. IV

2. What is the newest surgical technique for treating hemorrhoids?

    a. Stapled hemorrhoidectomy

    b. Stitching

    c. Flattening

    d. Hemorrhoid taping

3. The following are true of hemorrhoids except:

    a. They are anterior dilatations

    b. They are common causes of painless bleeding

    c. They cannot be per rectally palpated

    d. They can be banded

4. The most important disadvantage of cryosurgery for hemorrhoid is:

    a. Pain

    b. infection

    c. profuse watery discharge

    d. Hemorrhage

♦ **Answers for extended activities**

1=c

2=a

3=a

4=a

UNIT 6 BALANITIS AND BALANOPOSTHITIS

6.1. Key Unit competence

Take appropriate decision on Balanitis and Balanoposthitis.

6.2. Prerequisites

Before teaching this lesson ensure that the learners have mastered the human body anatomy and physiology, fundamental of nursing, pharmacology, communication and collaboration skills and ethical principles in nursing.

6.3. Cross-cutting issues to be addressed

6.3.1. Gender education

During teaching and learning activities, ensure that both boys and girls take equal chance of group leadership and participation.

6.3.2.Peace and values

During group activities, the teacher focuses on the importance of respecting each learner ideas and encourages everyone to feel free to provide their inputs in a respectful manner. Make sure the learning environment is conducive.

6.3.3. Inclusive education

All students have equal opportunities to 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 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. Also 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.

6.4. Guidance on the introductory activity

Teacher's activity

- Avail any visual aid that display the figures in the introductory activity 6.0 student's book.
- Computer and a projector to display the figures.
- Avail other material depending on the context and teaching environment (white board, whiteboard markers, blackboard and chalks, chart and videos on Balanitis and Balanoposthitis, speakers and text books).
- Allow students to observe and reflect on the figures.
- Allocate time to questions. Use open discussion and let the students answer to the questions.
- Learners may not be able to find the correct answers, but they are invited to predict.
- Summarize the answers for the purpose of orientation to the new unit topic.

Student's activity

- Form group and participate in the group work.
- To read carefully the case study and answer the indicated questions.
- Group representatives will present the group 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 for the introductory activity 6.0**

1. Normal structure: A; abnormal structure is B
2. B is abnormal because there is redness on the head of penis (glans)
3. Possible cause of the abnormality is infection.
4. Manifestations of the abnormality are: redness, pain, painful urination, and swelling.
5. Health personnel identify these abnormality through history taking and physical examination.

6.5. List of lessons

	Lesson title	Learning objectives	Numbers of periods
1	Description of Balanitis and Balanoposthitis (Definition of Balanitis and Balanoposthitis, causes, pathophysiology, signs and symptoms of Balanitis and Balanoposthitis	• Define Balanitis and Balanoposthitis • Explain the causes and pathophysiology of Balanitis and Balanoposthitis • Describe the signs and symptoms of Balanitis and Balanoposthitis	1
2	Adequate surgical diagnosis of Balanitis and Balanoposthitis, Treatment plan, Evolution and complications of Balanitis and Balanoposthitis.	• List adequate surgical diagnosis of Balanitis and Balanoposthitis • Develop treatment plan of Balanitis and Balanoposthitis • Explain the evolution and complications of Balanitis and Balanoposthitis	1
3	End unit assessment	• Learner takes appropriate decision of case management on Balanitis and Balanoposthitis	1

Lesson 1: Description of Balanitis and Balanoposthitis

This is the first lesson of unit six senior six of surgical pathology which deals with definition of Balanitis and Balanoposthitis, causes and pathophysiology, description of signs and symptoms of Balanitis and Balanoposthitis.

a) Learning objectives

At the end of this lesson the learner will be able to:

- Define Balanitis and Balanoposthitis
- Explain the causes and pathophysiology of Balanitis and Balanoposthitis
- Describe the signs and symptoms of Balanitis and Balanoposthitis

b) Prerequisites

Before teaching this lesson ensure that the learners have mastered the human body anatomy and physiology, health assessment, fundamental of nursing, pharmacology, communication and collaboration skills and ethical principles in nursing.

c) Teaching resources

To teach this lesson, teacher will use different aids and methods in order to achieve learning objectives, these aids and teaching methods include: teaching materials

(written case studies on Balanitis and Balanoposthitis; text books, Simulated patient) teaching methods (lecture, brainstorming, course work, small group discussion). Other resources may include computer lab, Nursing skills lab and Library.

d) Learning activities

Learning activities will be directly related to the learning objectives of the course, and provide knowledge and skills that will empower students to be involved in practice and receive 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, watch the video and summarize the content, engagement in debate and other clinical learning activities such as case study discussion.

e) Teacher's activity

- Print the handouts of the learning activity 6.1 in the student's book
- Split learners into small working groups and distribute the handouts of the learning activity 6.1 (case study).
- Invite learners to read carefully and discuss the learning activity 6.1 (case study).
- Give the learners' opportunity to work in their respective groups and at the same time supervise how work is being conducted.
- Ask the group to choose the reporter and ask them to present their respective findings.
- Help learners to summarize what they have learnt and highlight definition, causes and pathophysiology, description of signs and symptoms of Balanitis and Balanoposthitis.

♦ **Answers for learning activity 6.1**

1. Risk factor that exposed K.C to the problem is: unprotected sex
2. Signs and symptoms described in the case study are: painful urination, inflamed glans and prepuce, redness and urethra discharge.
3. Statement by the patient which indicates the most likely cause of the recurrence of his infection ''I've only had sexual intercourse once since my medication''
4. Blood tests were included in the diagnostic tests in order to determine the type of infection

♦ **Answer for self-assessment 6.1**

1. Signs and symptoms of Balanitis and Balanoposthitis are: Swelling, Pain and irritation on the glans, Redness or red patches on the penis, Itching under the foreskin, Areas of shiny or white skin on the penis, White discharge under the foreskin, Foul smell, Painful urination, Sores or lesions on the glans
2. Pathophysiology of Balanoposthitis: It is inflammation of the foreskin and glans in uncircumcised males, Balanoposthitis occurs over a wide age range and may have any of multiple bacterial or fungal origins or be caused by contact dermatitides. Complex infections have been well documented, often from a poorly retractile foreskin and poor hygiene that leads to colonization and overgrowth
3. Specific sign for Circinate Balanitis is small lesions on the head of penis.
4. Treatment goals of Balanitis and Balanoposthitis are:
   - Minimize sexual dysfunction
   - Minimize urinary dysfunction
   - Exclude penile cancer
   - Treat premalignant disease
   - Diagnose and treat sexually transmitted disease.

Lesson 2: Adequate surgical diagnosis, treatment plan, complications and evolution of Balanitis and Balanoposthitis

This is the second lesson of unit six of surgical pathology which deals with adequate surgical diagnosis, treatment plan, evolution and complications of Balanitis and Balanoposthitis.

a) Learning objectives

At the end of this lesson the learner will be able to:

- List adequate surgical diagnosis of Balanitis and Balanoposthitis
- Develop treatment plan of Balanitis and Balanoposthitis
- Explain the evolution and complications of Balanitis and Balanoposthitis

b) Prerequisites

Before teaching this lesson ensure that the learners have mastered the human body anatomy and physiology, health assessment, fundamental of nursing, pharmacology, communication and collaboration skills and ethical principles in

nursing. In addition to this, the learners should have covered the lesson one of unit six regarding Balanitis and Balanoposthitis.

c) Teaching resources

To teach this lesson, teacher will use different aids and methods in order to achieve learning objectives, these aids and teaching methods include: teaching materials (white board, whiteboard markers, pens, blackboard and chalks, chart and videos on Balanitis and Balanoposthitis, speakers, text books, mannequin) teaching methods (lecture, brainstorming, course work, small group discussion). Other resources may include computer lab, Nursing skills lab and Library.

d) Learning activities

Discuss the cases study of learning activity 6.1 related to hydrocele to better understand the adequate surgical diagnosis, treatment plan, evolution and complications of Balanitis and Balanoposthitis.

Discuss the answer of all questions in self-assessment related to surgical diagnosis, treatment plan, evolution and complications of Balanitis and Balanoposthitis.

e) Teacher's activity

- Print the handout of the learning activity 6.1 in the student's book
- Split learners into small working groups and distribute the handouts of the learning activity 6.1 (case study).
- Invite learners to read, discuss the learning activity 6.1 (case study).
- Give the learners' opportunity to work in their respective groups and at the same time supervise how work is being conducted.
- Ask the group to choose the reporter and ask them to present their respective findings.
- Help learners to summarize what they have learnt and highlight the surgical treatment, treatment plan, evolution and complications of Balanitis and Balanoposthitis.

6.6. Summary of the unit

Balanitis and Balanoposthitis are the conditions which affect the penis. Balanitis is defined as inflammation of the head of the penis. Balanoposthitis is inflammation of both head of the penis and foreskin. These conditions are mostly caused by poor hygiene in uncircumcised men. STIs, scabies, genital candidiasis, reactive arthritis and OTC, are also associated with above mentioned conditions.

Balanitis is classified as Circinate Balanitis and Pseudoepitheliomatous keratotic and micaceous Balanitis. Clinical features of Balanitis and Balanoposthitis are: swelling, pain, redness, white discharge, painful urination and lesions or sores on

the glans. Balanitis and Balanoposthitis are diagnosed through complete history taking and physical examination.

Urinalysis, blood tests and urethral opening swab are done to determine underlying cause. Treatment modalities of these conditions depend on the underlying cause. Antibiotics, antifungal, circumcision and improved hygiene are used to treat Balanitis and Balanoposthitis. Untreated Balanoposthitis does not usually cause serious complication except when its underlying cause are cancerous origin. Depending on the degree of inflammation of penis, phimosis, paraphimosis and urethral constricture may happen.

6.7. Additional information

Patient education about Balanoposthitis

The following points should be discussed with patient:

- The nature of the condition.
- The need for hygiene balanced with avoidance of over washing.
- Avoidance of soap is advised.
- Abstinence from sex during episodes as this may flare the condition.
- Routine hygiene after sex will help to decrease the chance of developing Balanitis.
- The foreskin should always be retracted during urination.

6.8. End unit assessment

♦ **Answers for end unit assessment**

1. C
2. Complications of Balanitis and Balanoposthitis are: phimosis, paraphimosis, and stricture of urethral meatus.
3. Preventive measures of Balanitis and Balanoposthitis: Improved hygiene by washing and drying under the penis's foreskin (glands) often to reduce the risk of reoccurrence of Balanitis, safe sexual intercourse.
4. Clotrimazole is applied on the glans (head of the penis) and foreskin.
5. The treatment modalities of Balanitis/ Balanoposthitis are: Antibiotics, circumcision, antifungals and improved hygiene.

6.9 Additional activities

6.9.1. Remedial activities

1. Balanoposthitis is defined as:
    a. Inflammation of foreskin
    b. Inflammation of glans
    c. Inflammation of both glans and foreskin
    d. All of the above
2. Balanitis is defined as:
    a. Inflammation of foreskin
    b. Inflammation of glans
    c. Inflammation of both glans and foreskin
    d. Inflammation of the testis
3. The treatment gaols of Balanitis and Balanoposthitis are:
    a. Minimize sexual dysfunction
    b. Minimize urinary dysfunction
    c. Treat premalignant disease
    d. All of the above
4. The following are the complications of Balanitis and Balanoposthitis Except:

a. Paraphimosis
b. Phimosis
c. Penis cancer
d. Urethral stricture

♦ **Answers for remedial activities**

1=c
2=b
3=d
4=c

6.9.2. Consolidations activities

1. The nurse suspects that a patient who presents with the erythema on the glans and foreskin may have the following disorder known as:

a. Balanitis
b. Gonorrhoea
c. Balanoposthitis
d. Human papilloma virus

2. Balanitis and Balanoposthitis are associated with the following risk factors except:

   a. Poor hygiene in uncircumcised men.

   b. Reactive arthritis.

   c. Retraction of foreskin.

   d. Over the counter (OTC) medications.

3. The following statements characterize micaceous balanitis except

a. Very rare form of balanitis
b. It mostly affects men over 60
c. Scaly warts on the glans is present
d. Small lesions on the head of penis

♦ **Answers for consolidation activities**

1=c

2=c

3=d

6.9.3. Extended activities

1. State five differential diagnosis of Balanoposthitis.
2. What the key point to be focused on while conducting health education regarding Balanoposthitis prevention.
3. Describe different types of Balanitis.

♦ **Answers for extended activities**

1. Five differential diagnosis of Balanoposthitis are:
   - Psoriasis
   - Circinate balanitis
   - balanitis xerotica obliterans
   - Human papillomavirus
   - Reactive arthritis
2. Key points for health education regarding Balanoposthitis are:
   - The nature of the condition.
   - The need for hygiene balanced with avoidance of over washing.
   - Avoidance of soap is advised.
   - Abstinence from sex during episodes as this may flare the condition.

- Routine hygiene after sex will help to decrease the chance of developing Balanitis.
- The foreskin should always be retracted during urination.

3. Description of different types of balanitis:

♦ **Zoon's balanitis**

  - This is the main type of balanitis,
  - usually affects uncircumcised, middle-aged men
  - the head of penis is inflamed, painful, and reddened

♦ **Circinate balanitis**

  - This is the type of Balanitis which occurs as a result of reactive arthritis that develops in response to an infection in the body).
  - Inflammation, redness, pain, and small lesions (sores) on the head of the penis are present

♦ **Pseudoepitheliomatous keratotic and micaceous balanitis**

  - very rare form of balanitis
  - It mostly affects men over 60
  - Scaly warts on the glans is present

UNIT 7 PHIMOSIS AND PARAPHIMOSIS

7.1. Key Unit competence

Take appropriate decision on phimosis and paraphimosis conditions.

7.2. Prerequisites

Before you teach this lesson ensure that the learner have mastered the normal structure of the Human anatomy and physiology(Urogenital and reproductive system), Fundamental of Nursing, Pharmacology, the inflammatory and healing process, physical assessment of the patient, wound dressing technique, communication and collaboration skills, the ethical principles (patient autonomy, beneficence, non-maleficence and justice).

7. 3 Cross-cutting issues to be addressed

7.3.1 Gender education

During teaching and learning activities, ensure that both boys and girls take responsibility of group leadership and participate equally.

7.3.2 Peace and values

During group activities, the teacher emphasizes the importance of respecting each learner ideas and encourages everyone to feel free to provide their inputs in a respectful manner.

7.4 Guidance on the introductory activity

Teacher's activity

- Avail any visual aid that display the figures in the introductory activity 7.1 student's book.
- Computer and a projector to display the figures
- A print out of the same colored figures.
- Avail other material depending on the context and teaching environment (white board, flip chat and markers, blackboard and chalks)
- Allow students to observe and reflect on the figures
- Allocate time to questions. Use an interactive brainstorm and let the students answer to the questions
- Learners may not be able to find the correct answers, but they are invited to predict
- Summarize the answers for the purpose of orientation to the new unit topic

♦ **Answers for the introductory activity**

1. The figure A,B,C and D can give impression process conditions such as inflammation
2. On figure A, is showing the normal structure of the penis while figure B, is showing phimosis condition which is abnormality, figure C, is showing paraphimosis condition which is complication of phimosis and figure D, is showing the manual management of phimosis/ Paraphimosis.
3. The image B is describing Phimosis and C is describing paraphimosis.
4. The difference between A and C is that A is normal while C is showing skin forming band behind the glans of the penis as it failed comeback its normal position.
5. Image D is showing someone trying to pull the foreskin in its normal place by using fingers.

7.5. List of lessons

	Lesson title	Learning objectives	Numbers of periods
1	Description of phimosis and paraphimosis • Definition • Causes and risks factors • Pathophysiology • Signs and Symptoms • Adequate diagnosis of phimosis and paraphimosis.	• Define phimosis and paraphimosis • Explain the causes and risks factors of phimosis and paraphimosis. • Describe brief pathophysiology of paraphimosis. • Describe the different signs and symptoms of phimosis and paraphimosis. • Describe the adequate diagnosis measures of phimosis and paraphimosis.	2
2	• Treatment plan of phimosis and paraphimosis. • Evolution and complications	• Describe the management of phimosis and paraphimosis. • Explain the prognosis and complications of phimosis and paraphimosis.	1
3	Assessment	• Take appropriate decision on phimosis and paraphimosis	1

Lesson 1: Description of phimosis and paraphimosis

a) Learning objectives

At the end of this lesson the learner will be able to:

- Define phimosis and paraphimosis
- Explain the causes and risks factors of phimosis and paraphimosis.
- Describe brief pathophysiology of paraphimosis.
- Describe the different signs and symptoms of phimosis and paraphimosis.
- Describe the adequate diagnosis measures of phimosis and paraphimosis.

b) Prerequisites

Learners have covered the normal structure of the Human anatomy and physiology (male urogenital and reproductive system) inflammatory and healing process .Basic of hematological tests (Full Blood Count), physical assessment of the patient, wound dressing technique, communication and collaboration skills, the ethical principles (patient autonomy, beneficence, non-maleficence and justice).

c) Teaching resources

You can use visual (charts) to display figures of in student's book page (…). Depending on the available resources you can also use the Laptop and projectors to visualise the same figures. Other resources include chalks boards (white or black), markers, flash cards, papers, pens, books.

d) Learning activities

Discuss the cases study related to phimosis and paraphimosis to understand its causes and risk factors,pathophysiological process, signs and symptoms.

Teacher's activity

- Print the handout of the learning activity 7.1 in the student's book
- Split learners into small working groups and distribute the handouts of the learning activity 7.1 (case study).
- Invite learners to read, discuss the learning activity 7.1 (case study).
- Give the learners' opportunity to work in their respective groups and at the same time supervise how work is being conducted.
- Ask the group to choose the reporter and ask them to present their respective findings.
- Help learners to summarize what they have learnt and highlight definition, causes/risk factors and pathophysiology process of phimosis and paraphimosis.

♦ **Answer for learning activity 7.1**

1. The causes and possible risks: An uncircumcised male patient, he tried to retract his prepuce.
2. Identify the signs and symptoms: the glans and the prepuce are inflamed, and reddened, foreskin scratching, painful urination, and painful erections.
3. Because the physical exam of external genitalia is enough.
4. The nurse is performing a physical exam of external genitalia.
5. The treatment for Mr.MG is surgical treatment by performing sterile circumcision under local anesthesia (emergency dorsal slit) and a prescription of painkillers was done.

♦ **Answers for self-assessment 7.1**

1. The signs and symptoms of paraphimosis are: clients with phimosis report pain with erection and intercourse and difficulty cleaning under the foreskin. While clients with paraphimosis often presents with penile pain, the glans appears enlarged and congested, with a collar of swollen foreskin around the coronal sulcus. Severe edema and urinary retention may occur with a tight, constricting band of tissue behind the head of the penis.
2. The pathophysiology of the paraphimosis: When the foreskin becomes trapped behind the corona for a prolonged time, it may form a tight, constricting band of tissue. This circumferential ring of tissue can impair the blood and lymphatic flow to and from the glans and prepuce. As a result of penile ischemia and vascular engorgement, the glans and prepuce may become swollen and edematous. If left untreated, penile gangrene and auto amputation may follow in days or weeks.
3. In physiologic phimosis children are born with tight foreskin at birth and separation occurs naturally over time. Phimosis is normal for the uncircumcised infant/child and usually resolves around 5-7 years of age while pathologic phimosis occurs due to scarring, infection or inflammation. Forceful foreskin retraction can lead to bleeding, scarring, and psychological trauma for the child and parent. If there is ballooning of the foreskin during urination, difficulty with urination, or infection, then treatment may be warranted.
4. The risks factors associated to paraphimosis are: congenital small foreskin, poor hygiene in young children, Inflammatory conditions of the skin like eczema, adhesions of the foreskin or scar tissue, that keep the foreskin attached to the tip of your penis, injury to the penis, sexually transmitted infections.

Lesson 2: Treatment plan of phimosis and paraphimosis

a) Learning objectives

At the end of this lesson the learner will be able to:

- Describe the management of phimosis and paraphimosis.
- Explain the prognosis and complications of paraphimosis.

b) Prerequisites

Learners have covered the normal structure of the urogenital and male reproductive system in the anatomy and physiology, inflammation process and pharmacology .Basic of hematological tests (Full Blood Count), physical assessment of the patient, wound dressing technique, communication and collaboration skills, the ethical principles (patient autonomy, beneficence, non-maleficence and justice).

c) Teaching resources

Resources include computer and projector, chalks boards (white or black), markers, flash cards, papers, pens, books.

d) Learning activities

Discuss the cases study learning activity 7.1 related to phimosis and paraphimosis to understand the signs and symptoms.

e) Teacher's activity

- Print the handout of the learning activity 7.1 in the student's book
- Split learners into small working groups and distribute the handouts of the learning activity 7.1 (case study).
- Invite learners to read, discuss the learning activity 7.1 (case study).
- Give the learners' opportunity to work in their respective groups and at the same time supervise how work is being conducted.
- Ask the group to choose the reporter and ask them to present their respective findings.
- Help learners to summarize what they have learnt and highlight different ways to provide care/management to patients with phimosis and paraphimosis.

7.6. Summary of the unit

Phimosis and paraphimosis are conditions that occur among uncircumcised male clients when the opening of the foreskin is constricted. Phimosis appear as a tight ring or "rubber band" of foreskin around the tip of the penis, preventing full retraction while paraphimosis is a strangulation of the glans penis from an inability to replace the retracted foreskin. Phimosis may be pathologic or physiologic and the last one

often is caused by a congenitally small foreskin. The cause of paraphimosis is most often iatrogenic and is frequently occurring after penile examination, urethral catheterization or cystoscopy.

Pathophysiologically it occurs when foreskin becomes trapped behind the corona for a prolonged time forming a tight and constricting band of tissue. The circumferential ring of tissue can impair the blood and lymphatic flow to and from the glans and prepuce. This can resulting in penile ischemia and vascular engorgement, the glans and prepuce will become swollen and edematous. In absence of treatment, penile gangrene and auto amputation may follow in days or weeks. Clinically, glans appears enlarged and congested with a collar of swollen foreskin around the coronal sulcus with potential severe edema and urinary retention.

Treatments for phimosis and paraphimosis vary depending on the child and severity of phimosis. Paraphimosis is a urologic emergency and require emergency surgical intervention. The treatment is aiming at reducing the penile edema and restoring the prepuce to its original position and may include: gentle daily manual retraction, topical corticosteroid ointment and application or circumcision.

The prognosis for phimosis is usually very good while prognosis for paraphimosis depends on the speed of diagnosis and reduction constricting band of tissue. With prompt treatment, the outlook is excellent. But without effective or delayed treatment, complications that can occur with paraphimosis will range from mild to severe and life threatening condition. Complication include ischemia or necrosis of the distal part of penis which can resulting in severe infection, damage to the tip of the penis, gangrene, or tis and loss of the tip of the penis.

7.7 Additional information

The differential diagnosis includes hair tourniquet, allergic reaction, traumatic changes, and infection. Often the patient will have a history of phimosis. The diagnosis of paraphimosis may be misread by others pathology with the similar clinical futures including acute Angioedema , Balanitis, Foreign body tourniquet, penile fracture and Penile hematoma.

Penile fracture: is a tear in the tunica albuginea. The tunica albuginea is the rubbery sheath of tissue below the skin that allows the penis to increase in width and length to produce a firm erection. Sometimes the erectile tissue beneath the tunica albuginea also ruptures. That's known as the corpus cavernosum. Common causes are: Sexual activity with a partner. Penile fracture can happen when penis slips out of the partner and thrusts against the area between the anus and the perineum or the pelvic bone.

The diagnosis of "penile fracture" specifically refers to a rupture of the corpus cavernosum induced by blunt trauma to the erect penis. Signs and symptoms of a

penis fracture include immediate penile pain, cracking sound, rapid loss of erection, swelling in the penile shaft, discoloration of the penis Penile fracture is most often treated with surgery consisting of repairing the tunica albuginea with stitches. Potential complications of penile fracture include erectile dysfunction, abnormal penile curvature, painful erections, and formation of fibrotic plaques, penile abscess, urethrocutaneous fistula, corporourethral fistula, and painful nodules along the site of injury.

7.8 End unit assessment

♦ **Answers for end unit assessment**

1. Which patient is at the greatest risk for developing Paraphimosis condition?
   c. A 17-year-old man with pre-existence congenital phimosis
2. What is the most important cause of the paraphimosis among the following?

   b. Iatrogenic cause like urethral catheterization or cystoscopy.
3. The 4 components of treatment plan for phimosis and paraphimosis are:
   - Manual reduction of phimosis and Paraphimosis,
   - Pharmacologic therapy,
   - Minimally invasive therapy and
   - Surgical therapy
4. The pain killer administration before manual reduction of paraphimosis is necessary because this procedure may cause extreme pain. In this case, a penile nerve block or topical analgesic or oral narcotics before penile manipulation should administered.
5. The goal of manual reduction of phimosis and paraphimosis is to return the foreskin to its natural position over the glans penis through manual technic.
6. For reducing edema for patient with paraphimosis the following activities will be done:
   - Performing manual pressure: a gloved hand is circled around the distal penis to apply circumferential pressure and disperse the edema.
   - Application of Ice on the foreskin, glans, and penis may be done to reduce edema
   - Topical corticosteroid cream applied two or three times daily to the exterior and interior of the tip of the foreskin may also be effective
7. Surgical therapy will be decided when severe constricting band of tissue precludes all forms of conservative or minimally invasive therapy.

8. Prevention of complications to paraphimosisis done by prompt treatment in right away. Once the swelling is reduced and the foreskin is returned to its normal position, most people recover without complications.
9. The 4 complications of phimosis and paraphimosis are:
    - Severe infection, and inflammation of the glans penis.
    - The distal penis can become ischemic or necrotic.
    - Gangrene resulting in the loss of the tip of the penis.
    - Amputation of the glans of the penis
10. Prevention of complications to paraphimosisis done by prompt treatment in right away. Once the swelling is reduced and the foreskin is returned to its normal position, most people recover without complications.
11. The 4 complications of phimosis and paraphimosis are:
    - Severe infection, and inflammation of the glans penis.
    - The distal penis can become ischemic or necrotic.
    - Gangrene resulting in the loss of the tip of the penis.
    - Amputation of the glans of the penis

7.9 Additional activities

7.9.1 Remedial activities

1. List the 2 types of phimosis.
2. List the 3 factors associated to paraphimosis?

♦ **Answers for remedial activities**

1. The 2 types of phimosis are physiology phimosis and pathologic phimosis.
2. The 3 factors associated to paraphimosis are
    - Congenital small foreskin,
    - Poor hygiene in young children,
    - Inflammatory conditions of the skin like eczema, adhesions of the foreskin or scar tissue, that keep the foreskin attached to the tip of your penis,
    - Injury to the penis, sexually transmitted infections

7.9.2 Consolidations activities

1. Does paraphimosis dangerous condition?

♦ **Answer for consolidations activities**

1. Yes, because it is associated with interruption of blood supply the distal part of the glans and if not properly restore on time, ischemia and necrosis will happen with potential to amputation of the penis.

7.9.3 Extended activities

1. Describe the clinical symptoms and complications of penile fracture.

♦ **Answers for extended activities**

- The Signs and symptoms of a penis fracture include immediate penile pain, cracking sound, rapid loss of erection, swelling in the penile shaft, discoloration of the penis.
- Potential complications of penile fracture include erectile dysfunction, abnormal penile curvature, painful erections, and formation of fibrotic plaques, penile abscess, urethrocutaneous fistula, corporourethral fistula, and painful nodules along the site of injury.

UNIT 8 HYDROCELE AND TESTICULAR TORSION

8.1. Key Unit competence

Take appropriate decision on hydrocele and testicular torsion

8.2. Prerequisites

Before teaching this lesson ensure that the learners have mastered the human body anatomy and physiology, health assessment, fundamental of nursing, pharmacology, first aid, communication and collaboration skills and ethical principles in nursing.

8.3. Cross-cutting issues to be addressed

8.3.1. Gender education

During teaching and learning activities, ensure that both boys and girls take equal chance of group leadership and participation.

8.3.2.Peace and values

During group activities, the teacher focuses on the importance of respecting each learner ideas and encourages everyone to feel free to provide their inputs in a respectful manner. Make sure the learning environment is conducive.

8.2.3. Inclusive education

All students have equal opportunities to 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 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. Also 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.

8.4. Guidance on the introductory activity

Teacher's activity

- Avail any visual aid that display the figures in the introductory activity 8.0 student's book.
- Computer and a projector to display the figures.
- Avail other material depending on the context and teaching environment (white board, whiteboard markers, blackboard and chalks, chart on hydrocele and testicular torsion, videos on hydrocele and testicular torsion, speakers; text books).
- Allow students to observe and reflect on the figures.
- Allocate time to questions. Use open discussion and let the students answer to the questions.
- Learners may not be able to find the correct answers, but they are invited to predict.
- Summarize the answers for the purpose of orientation to the new unit topic.

Student's activity

- Form group and participate in the group work.
- To read carefully the case study and answer the indicated questions.
- Group representatives will present the group 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 for the introductory activity 8.0**

1. Normal structure of testicle: image B and D
2. B: is normal structure of testicle, A: fluid accumulated in scrotal cavity.
3. B: is normal structure of testicle; C: accumulated fluid from scrotal cavity communicates with abdominal cavity.
4. D: normal structure of testicle with intact spermatic cord; E: twisted spermatic cord.
5. These abnormality may be corrected by surgery

8.5. List of lessons

	Lesson title	Learning objectives	Numbers of periods
1	Description of hydrocele (Definition, causes, types, signs and symptoms, Surgical diagnosis,	• Define hydrocele • Explain the causes of hydrocele • Explain the types of hydrocele • Describe the signs and symptoms of hydrocele • List the adequate surgical diagnosis of hydrocele	1
2	Treatment plan, complications and evolution of hydrocele	• Develop treatment plan of hydrocele • Explain the evolution and complications of hydrocele	1
3	Description of testicular torsion (Definition, causes and pathophysiology, signs and symptoms, surgical diagnosis, Treatment plan, complications and evolution of testicular torsion)	• Define testicular torsion • Explain the causes and pathophysiology of testicular torsion • Describe the signs and symptoms of testicular torsion • List the adequate surgical diagnosis of testicular torsion • Develop treatment plan of testicular torsion • Explain the evolution and complications of testicular torsion	2
4	End unit assessment	• Evaluate the level of understanding of learners about hydrocele and testicular torsion	1

Lesson 1: Description of hydrocele

This is the first lesson of unit eight of surgical pathology which deals with definition, causes, types, signs and symptoms, and adequate surgical diagnosis of hydrocele.

a) Learning objectives

At the end of this lesson the learner will be able to:

- Define hydrocele
- Explain the causes of hydrocele
- Explain the types of hydrocele
- Describe the signs and symptoms of hydrocele
- List the adequate surgical diagnosis of hydrocele

b) Prerequisites

Before teaching this lesson ensure that the learners have mastered the human body anatomy and physiology, health assessment, fundamental of nursing, pharmacology, first aid, communication and collaboration skills and ethical principles in nursing.

c) Teaching resources

To teach this lesson, teacher will use different aids and methods in order to achieve learning objectives, these aids and teaching methods include: teaching materials (white board, whiteboard markers, pens, blackboard and chalks, chart on hydrocele, videos on hydrocele, speakers, text books, mannequin) teaching methods (lecture, brainstorming, course work, small group discussion). Other resources may include computer lab, Nursing skills lab and Library.

d) Learning activities

Learning activities will be directly related to the learning objectives of the course, and provide knowledge and skills that will empower students to be involved in practice and receive 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, watch the video and summarize the content, engagement in debate and other clinical learning activities such as case study discussion.

e) Teacher's activity

- Print the handouts of the learning activity 8.1 in the student's book
- Split learners into small working groups and distribute the handouts of the learning activity 8.1 (case study).
- Invite learners to read carefully and discuss the learning activity 8.1 (case study).

- Give the learners' opportunity to work in their respective groups and at the same time supervise how work is being conducted.
- Ask the group to choose the reporter and ask them to present their respective findings.
- Help learners to summarize what they have learnt and highlight definition, causes, types, signs and symptoms as well as diagnostic measures of hydrocele.

♦ **Answers for learning activity 8.1**

1. Biographical data described in the case study: Name: HK; age: 5years, Sex: male.
2. Signs and symptoms describe in the case study are: right scrotal swelling and mild pain.
3. Probable surgical diagnosis for H.K was Hydrocele.
4. Test performed to confirm surgical diagnosis: Trans-illumination.

♦ **Answers for self-assessment 8.1**

1. Hydrocele is a collection of fluid in the scrotum.
2. Signs and symptoms of hydrocele are: scrotal swelling, pain and discomfort, feeling of heaviness.
3. Difference between communicating and non-communicating hydrocele:
   - In communicating hydrocele the opening does not close and fluid is able to go back between abdominal cavity and scrotal cavity.
   - In non-communicating hydrocele, the open remains closed after the testicle is in the scrotum but there is fluid trapped in the scrotum.
4. Trans-illumination is done by shining a light through the scrotum (trans-illumination). If you or your child has a hydrocele, trans-illumination will show clear fluid surrounding the testicle.

Lesson 2: Treatment plan, complications and evolution of hydrocele

This is the second lesson of eight of surgical pathology which deals with treatment plan, evolution and complications of hydrocele.

a) Learning objectives

At the end of this lesson the learner will be able to:

- Develop treatment plan of hydrocele
- Explain the evolution and complications of hydrocele

b) Prerequisites

Before teaching this lesson ensure that the learners have mastered the human body anatomy and physiology, health assessment, fundamental of nursing, pharmacology, first aid, communication and collaboration skills and ethical principles in nursing. In addition to this, the learners should have covered the lesson one of unit eight regarding hydrocele.

c) Teaching resources

To teach this lesson, teacher will use different aids and methods in order to achieve learning objectives, these aids and teaching methods include: teaching materials (white board, whiteboard markers, pens, blackboard and chalks, chart and videos on hydrocele, speakers, text books, mannequin) teaching methods (lecture, brainstorming, course work, small group discussion). Other resources may include computer lab, Nursing skills lab and Library.

d) Learning activities

Discuss the cases study of learning activity 8.1 related to hydrocele to better understand the treatment plan, evolution and complications of hydrocele.

Discuss the answer of all questions in self-assessment related to treatment plan, evolution and complications of hydrocele.

e) Teacher's activity

- Print the handout of the learning activity 8.1 in the student's book
- Split learners into small working groups and distribute the handouts of the learning activity 8.1 (case study).
- Invite learners to read, discuss the learning activity 8.1 (case study).
- Give the learners' opportunity to work in their respective groups and at the same time supervise how work is being conducted.
- Ask the group to choose the reporter and ask them to present their respective findings.
- Help learners to summarize what they have learnt and highlight the treatment plan, evolution and complications of hydrocele.

♦ **Answers for learning activity 8.2**

1. Patient's biographical data: Age: 15years old; sex: Male.
2. Signs and symptoms on arrival are: left testicle swelling, nausea and vomiting.
3. Physical examination findings on admission: left testicular swelling, pain on palpation, negative Prehn sign, and absence of cremasteric reflex.
4. Surgical diagnosis of the patient: Testicular torsion.
5. The problem corrected with emergency surgery (orchiectomy).

Lesson 3: Descriptions of testicular torsion

This is the third lesson of eight of surgical pathology which deals with definition, causes and pathophysiology, signs and symptoms, surgical diagnosis, treatment plan, complications and evolution of testicular torsion.

a) Learning objectives

At the end of this lesson the learner will be able to:

- Define testicular torsion
- Explain the causes and pathophysiology of testicular torsion
- Describe the signs and symptoms of testicular torsion
- List the adequate surgical diagnosis of testicular torsion
- Develop treatment plan of testicular torsion
- Explain the evolution and complications of testicular torsion

b) Prerequisites

Before teaching this lesson ensure that the learners have mastered the human body anatomy and physiology, health assessment, fundamental of nursing, pharmacology, first aid, communication and collaboration skills and ethical principles in nursing.

c) Teaching resources

To teach this lesson, teacher will use different aids and methods in order to achieve learning objectives, these aids and teaching methods include: teaching materials (white board, whiteboard markers, pens, blackboard and chalks, chart and videos on testicular torsion, speakers, text books, mannequin) teaching methods (lecture, brainstorming, course work, small group discussion). Other resources may include computer lab, Nursing skills lab and Library.

d) Learning activities

Learning activities will be directly related to the learning objectives of the course, and provide knowledge and skills that will empower students to be involved in practice and receive 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, watch the video and summarize the content, engagement in debate and other clinical learning activities such as case study discussion.

e) Teacher's activity

- Print the handouts of the learning activity 8.2 in the student's book
- Split learners into small working groups and distribute the handouts of the learning activity 8.2 (case study).
- Invite learners to read carefully and discuss the learning activity 8.2 (case study).
- Give the learners' opportunity to work in their respective groups and at the same time supervise how work is being conducted.
- Ask the group to choose the reporter and ask them to present their respective findings.

Help learners to summarize what they have learnt and highlight definition, causes and pathophysiology, signs and symptoms, surgical diagnosis, treatment plan, complications and evolution of testicular torsion.

8.6. Summary of the unit

Hydrocele and testicular torsion both affect genital organs. Hydrocele is defined as fluid accumulation in the scrotum. Its causes are unknown but some factors such as infection, inflammation, injury or tumors are associated with hydrocele. It is classified into communicating and non-communicating hydrocele. The most common clinical feature of hydrocele is scrotal swelling and sometimes pain or discomfort if hydrocele becomes larger. Hydrocele is diagnosed through physical examination by performing trans-illumination test and scrotal ultrasound may also be performed.

Treatment modalities of hydrocele include aspiration using syringe with needle and hydrocelectomy. Infection, testicular atrophy and inguinal hernia are the complication of untreated hydrocele. The prognosis of congenital hydrocele is excellent because it resolves itself and persistence hydrocele is corrected surgically. For testicular torsion, the spermatic cord is twisted and prevents flow of blood to the testes. It is caused by trauma or anatomic abnormality. Signs and symptoms of testicular torsion are: testicular pain, nausea and vomiting, scrotal swelling and abdominal pain.

Doppler ultrasound is used to diagnose testicular torsion but MRI and CT scan may be used to confirm the diagnosis. Two treatment modalities for testicular torsion are manual detorsion and surgical exploration. Loss of testes, infection, and infertility, decreased exocrine and endocrine function are the complication of testicular torsion. Better outcome is obtained if surgery is done before 8hours.

8.7. Additional information

Differential Diagnoses testicular torsion

Problems to be considered in the differential diagnosis of testicular torsion include the following:

- Appendicitis
- Fournier gangrene
- Scrotal trauma
- Spermatocele
- Testicular choriocarcinoma
- Testicular seminoma
- Varicocele

How congenital hydrocele develop?

Congenital hydrocele results from failure of processus vaginalis to obliterate. During development, the testes are formed retroperitoneally in the abdomen and proceed to descend into the scrotum via the inguinal canal in the third gestational week. This descent of the testes into the scrotum is accompanied by a fold of peritoneum of the processus vaginalis. Normally, the proximal portion of processus vaginalis gets obliterated while the distal portion persists as the tunica vaginalis covering the anterior, lateral, and medial aspects of the testes. The tunica vaginalis is a potential space for fluid to accumulate, provided the proximal portion of processus vaginalis remains patent and results in free communication with the peritoneal cavity, leading to congenital hydrocele.

Hydroceles are divided into two types: primary and secondary

- Primary Hydrocele: The processus vaginalis of the spermatic cord fuses at term or within 1-2 years of birth, thus obliterating the communication between the abdomen and scrotum. Depending upon the site of the obliteration of processus vaginalis, there are four types of primary hydrocele.1. Congenital Hydrocele: This occurs when processus vaginalis is patent and communicates with the peritoneal cavity. This communication allows the movement of peritoneal fluid but is too small to allow the intra-abdominal contents to herniate through.2. Infantile Hydrocele: In this case, processus vaginalis gets obliterated at the level of the deep inguinal ring. However, the portion distal to it remains patent and allows fluid accumulation.3.

Encysted Hydrocele of the Cord: Both the proximal and distal portions of processus vaginalis get obliterated while the central portion remains patent and fluid accumulates within it.4. Vaginal Hydrocele: Processus vaginalis remains patent only around the testes, and, as fluid accumulates, it renders the testes impalpable.

- Secondary Hydrocele: This usually occurs as a result of an underlying condition, such as infection (filariasis, tuberculosis of the epididymis, syphilis), injury (trauma, post-herniorrhaphy hydrocele), or malignancy. This type of hydrocele tends to be small, with the exception of secondary hydrocele due to filariasis, which can be very large.

8.8. End unit assessment

♦ **Answers for end unit assessment**

1. Testicular torsion is defined as twisting of spermatic cord that supplies blood to the testes and epididymis.
2. Two main causes of testicular torsion are: Trauma and anatomical abnormality.
3. d
4. d
5. A) Non-communicating hydrocele

   B) Communicating hydrocele
6. The common imaging study performed to diagnose testicular torsion is Doppler ultrasound.
7. Two treatment modalities for:

   A) Hydrocele: Aspiration and surgical (hydrocelectomy)

   B) Testicular torsion: Manual detorsion and surgical exploration

8.9 Additional activities

8.9.1. Remedial activities

1. Hydrocele is defined as:

    a. Scrotal mass

    b. Fluid accumulation in the scrotum

    c. Cystic accumulation of sperm in the epididymis

    d. Pus accumulation in the scrotum

2. The following are the factors associated with hydrocele:

    a. Infection

    b. Injury

    c. Tumors

    d. All the above

3. Which of the following is a treatment modality of testicular torsion?

    a. Hydrocelectomy

    b. Manual detorsion

    c. a and b

    d. None of the above

4. The common complications of testicular torsion include:

    a. Infection

    b. Loss of testis

    c. Infertility

    d. All of the above

♦ **Answers for remedial activities**

1=b
2=d
3=b
4=d

8.9.2. Consolidations activities

1. When a patient presents with testicular torsion, which of the following is the most immediate symptom?

    a. Fever

    b. Scrotal edema

    c. Pain

    d. Urinary frequency

2. Which statement is true regarding the prognosis of testicular torsion?

    a. About 20-40% of cases of testicular torsion result in an orchiectomy.

    b. The survival rate drops to less than 50% if the delay in seeking help is more than 12-24 hours.

    c. Better outcome is obtained if the surgery is done within 8 hours.

    d. All of the above

3. In both testicular torsion and epididymitis, generalized swelling and tenderness develop, making it difficult to distinguish between the two conditions. When presented with an equivocal diagnosis, which of the following is the most appropriate next step?

    a. Angioscintigraphy

    b. Color Doppler ultrasound

    c. More detailed physical examination

    d. Radioisotope scanning

4. If testicular torsion is strongly suspected during clinical examination, manual detorsion without imaging can be attempted, but its success is variable. Timing is of the essence during management of this condition, as testicular salvage can drop from 80% to near 0% by just how many hours?

    a. 6

    b. 8

    c. 10

    d. 12

5. Which of the following is likely to be a hydrocele?

    a. A painless mobile mass on the left side of the scrotum that you can get above on palpation

    b. A mass in the scrotum and groin that transilluminates and is tender to palpation, with the testes clearly palpable within it

c. A scrotal swelling that transilluminates but in which you cannot feel the testes

d. A red, tender mass in the scrotum that does not transilluminate

♦ **Answers for consolidation activities**

1=c

2=d

3=b

4=d

5=c

8.9.3. Extended activities

1. A 9-year-old boy is at home with his parents when he suddenly complains of a pain in his right groin. He has been playing football all afternoon. As a baby he had a hydrocele on the right side of his scrotum but this disappeared when he was about 12 months old. His father has a look at his groin area and noticed the right side of his scrotum is swollen and extremely tender. He telephones the family doctor for advice as to what he should do next.

   a. List four conditions that should be in the GP's differential diagnosis for this presentation?

   b. What features on examination will differentiate between them?

2. Differentiate primary hydrocele and secondary hydrocele.

3. Explain four types of primary hydrocele.

4. List five differential diagnoses of testicular torsion.

♦ **Answers for Extended activities**

1. (a) Four differential diagnoses for this presentation are:

   - Hydrocele
   - Testicular torsion
   - Inguinal hernia
   - Trauma to the testes

(b) Features on examination that will differentiate between them are:

- **A hydrocele** will transilluminate light from a pen-torch or otoscope, due to the presence of fluid around the testes. It is unusual for a hydrocele to recur having resolved in early childhood.
- **An inguinal hernia** will become more prominent on coughing and it is difficult to delineate the upper margin of the swelling. It is not normally painful unless incarcerated.
- **Testicular torsion** tends to occur in teenage boys and is acutely painful with a red tender mass present in the scrotum.
- **Trauma** may be caused by a direct blow to the scrotum, although there would normally be a clear history of this.

2. Difference between primary hydrocele and secondary hydrocele

Primary Hydrocele: The processus vaginalis of the spermatic cord fuses at term or within 1-2 years of birth, thus obliterating the communication between the abdomen and scrotum whereas secondary Hydrocele: This usually occurs as a result of an underlying condition, such as infection (filariasis, tuberculosis of the epididymis, syphilis), injury (trauma, post-herniorrhaphy hydrocele), or malignancy.

3. Four types of primary hydrocele

i. **Congenital Hydrocele:** This occurs when processus vaginalis is patent and communicates with the peritoneal cavity.

ii. **Infantile Hydrocele:** In this case, processus vaginalis gets obliterated at the level of the deep inguinal ring. However, the portion distal to it remains patent and allows fluid accumulation.

iii. **Encysted Hydrocele of the Cord:** Both the proximal and distal portions of processus vaginalis get obliterated while the central portion remains patent and fluid accumulates within it.

iv. **Vaginal Hydrocele:** Processus vaginalis remains patent only around the testes, and, as fluid accumulates, it renders the testes impalpable.

5. Five differential diagnoses of testicular torsion are:

- Appendicitis
- Fournier gangrene
- Scrotal trauma
- Spermatocele
- Varicocele

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