Al-Hadbaa Uinversity

Nursing College

First semester

Adult Nursing 1

الدكتور

حارث فتحي العبيدي

- **Definition of Adult Nursing.**

- Adult nursing: expecting to learn students' practical skills and procedures. Adult nurses work with old and young adults with diverse health conditions, both chronic and acute. Depending on experience and training, As a nurse in the adult branch you will be working at the center of a multi professional team that includes doctors, physiotherapists, occupational therapists, pharmacists, radiographers, healthcare assistants and others.

- **Nursing Process.**
- The **nursing process** is a modified method. Nursing practice was first described as a four stage nursing process by Ida Jean Orlando in 1958. It should not be confused with nursing theories or Health informatics. The diagnosis phase was added later.
- The nursing process is goal-oriented method of caring that provides a framework to nursing care. It involves six major steps:

- **A** - Assess (what data is collected?).
- **D** - Diagnose (what is the problem?).
- **O** - Outcome Identification - (Was originally a part of the Planning phase, but has recently been added as a new step in the complete process).
- **P** - Plan (how to manage the problem).
- **I** - Implement (putting plan into action).
- **E** - Evaluate (did the plan work?).

- **Characteristics of the Nursing Process.**
- The nursing process is a **cyclical** and **ongoing** process that can end at any stage if the problem is solved.
- Cyclic and dynamic.
- Goal directed and client centered.
- Interpersonal and collaborative.
- Universally applicable.
- Systematic.
- Entire process is recorded or documented in order to inform all members of the health care team.

The **PIE method** is a system for documenting actions, especially in the field of nursing. The name comes from the acronym PIE meaning Problem, Intervention, Evaluation.

- **Steps of the Nursing Process.**
- **Assessment.**
- Conduct the health history.
- Perform the physical assessment.
- Interview the patient's family or significant others.
- Study the health record.
- Organize, analyze, synthesize, and summarize the collected data.

- **Nursing Diagnosis.**
- Identify the patient's nursing problems.
- Identify the defining characteristics of the nursing problems.
- Identify the etiology of the nursing problems.
- State nursing diagnoses concisely and precisely.

- **Collaborative Problems.**
- Identify potential problems or complications that require collaborative interventions.
- Identify health team members with whom collaboration is essential.

- **Planning.**
- Assign priority to the nursing diagnoses.
- Specify the goals.(immediate, intermediate, and long-term goals).
- Identify nursing interventions appropriate for goal attainment.
- Establish expected outcomes.
- Develop the written plan of nursing care

- **Implementation.**
- Put the plan of nursing care into action.
- Coordinate the activities of the patient, family or significant others, nursing team members, and other health team members.
- Record the patient's responses to the nursing actions.

- **Evaluation:**
- Collect data.
- Compare the patient's actual outcomes with the expected outcomes. Determine the extent to which the expected outcomes were achieved.
- Identify alterations that need to be made in the nursing procedure.

- **Rehabilitation in Nursing.**
- Rehabilitation is a dynamic, health-oriented process that helps ill people or people with physical, mental, or emotional disabilities (restrictions in performance or function in everyday activities) to achieve the greatest possible level of physical, mental, spiritual, social, and economic functioning. The rehabilitation process also helps patients achieve an acceptable quality of life with dignity, self-respect, and independence.

- **Basic principle in Rehabilitation Nursing.**
- The (4) principled stages of injury treatment and rehabilitation:
- Pain.
- Movement.
- Strength.
- Function.

Reduce Pain: It's impossible to get good results from any rehabilitation program before relief the pain first. Therefore it is a priority to reduce pain as much and as soon as possible. This can be achieved in a variety of ways whether it be drugs, ice, heat or rest amongst other means

Improve Movement: Once pain is under control it is vital, as soon as possible, to regain normal movement. This will prevent many complications occurring that can affect the circulation, joints and muscles.

Regain Strength: This refers to the process of exercising surrounding and associated muscles to maintain, regain or improve their strength. This is so they work effectively and do not waste or atrophy.

Improve Function: It is concerned with bringing the results of the previous stages into play to execute the desired result of functional activity. Jumping to this stage and moving through it too fast is the cause of many re-injury situations.

- **Types of Rehabilitation.**
- **Physical Rehabilitation**: This sort of rehabilitation is used for patients who have suffered from bone and muscle injuries. The rehabilitation program consists of exercises (strengthening and /or stretching), stair climbing, gait (walking) training with or without assistive devices such as canes, walkers, crutches, to improve balance and endurance activities and patient family education.

Occupational Rehabilitation: This particular type of Rehabilitation is for those patients with a paralytic stroke or any unfortunate major accident. , It consists of strengthening muscles, improving range of motion and coordination increasing work tolerance and physical activity endurance

Aquatic Rehabilitation: This is a new trend in rehabilitation yet it is a successful in treating problems in joints. The therapists treat the patients by giving various water exercises like swimming, water aerobics, etc. This helps in giving strength, flexibility and mobility to the muscles of legs.

Cognitive Rehabilitation: This type of rehabilitation is given to patients who have suffered from brain injury. To help them to get back to routine activities, they are treated with the help of neuropsychological approach.

Social rehabilitation: This type of rehabilitation focused on maximizing personal independence and returning patients home as quickly and safely as possible.

- **The Rehabilitation Team**.
  - **The patient**: is a key member of the rehabilitation team. The patient is the focus of the team's effort and the one who determines the final outcomes of the process.
- **Nurses:** provide the patient with 24-hour-a-day nursing care. Rehabilitation nurses encourage patients to do as much of their own care as functionally possible, since the goal is to teach independence and challenge each patient to achieve their maximum potential

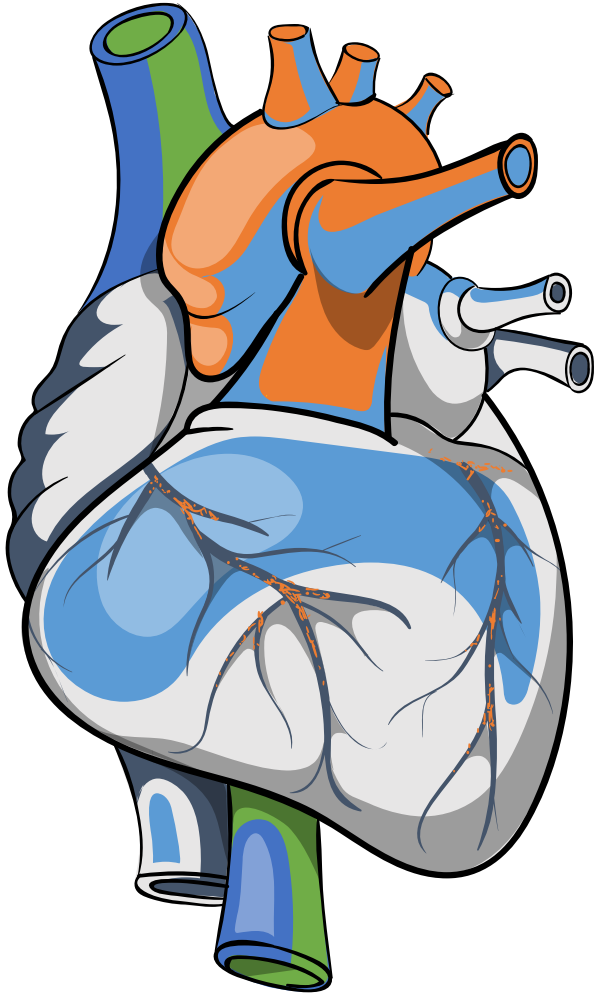
- **Physiatrists:** Is the main medical doctor on the rehabilitation team. The physiatrist assesses patients at admission to rehabilitation and directs the patient's medical care.
- **Neuropsychologists**: Their role on the rehabilitation treatment team is to address psychological needs and concerns, helping patients and families adjust to changes in their life.
- **Physical Therapists**: provide assessments, treatment and therapy programs to help patients gain greater mobility, muscle strength and performance, and joint motion and balance. They also work with patients to improve their ability to perform daily activities.

Occupational Therapists: work with patients to regain, develop, and build skills that are important for independent functioning, health, well-being and security

Speech Therapists: Evaluate speech and language, memory, problem-solving, hearing and swallowing skills in order to develop a treatment plan for improving problems related to a Patient's injury or illness.

Dietitians: supervise methods of feeding and caloric needs, and monitor feeding tolerance to assure patients receive adequate nutrition.

Thank you for your attention



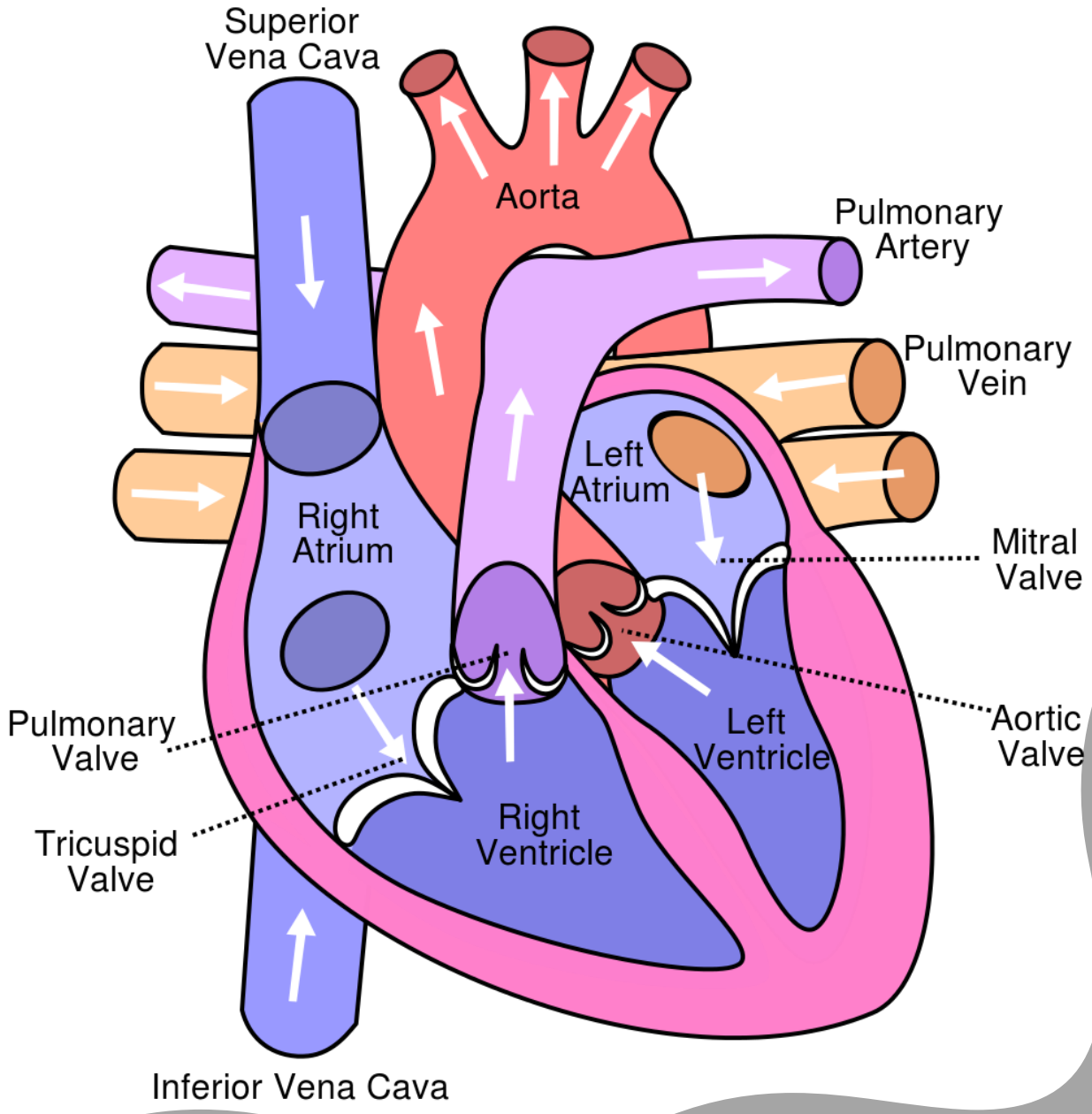
Valvular Heart Disease

Dr. Harith Al-Aubaidy

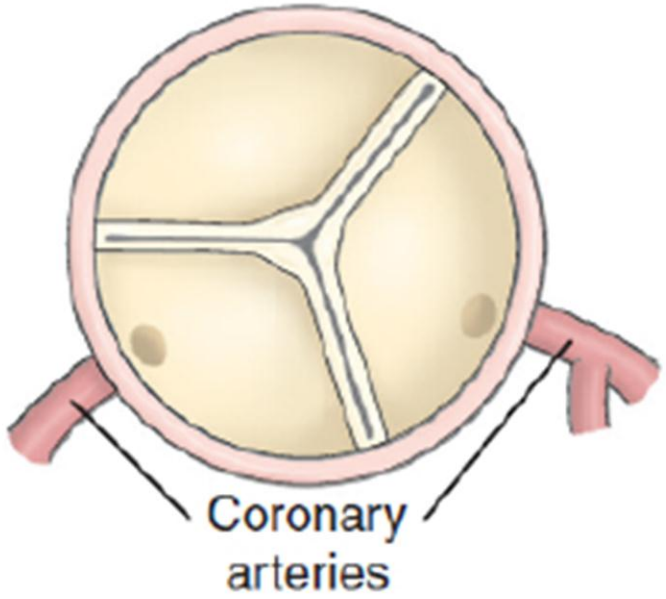
الدكتور
حارث العبيدي

Introduction

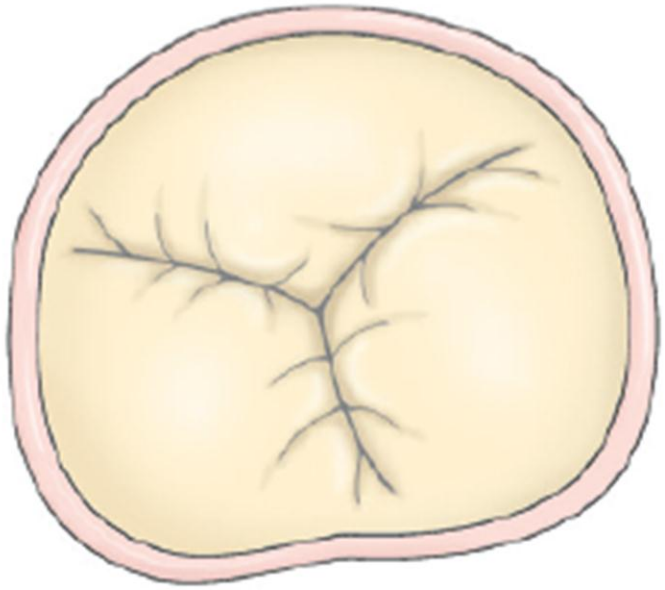
Valves of the heart control blood flow through the heart into the pulmonary artery and aorta by opening and closing in



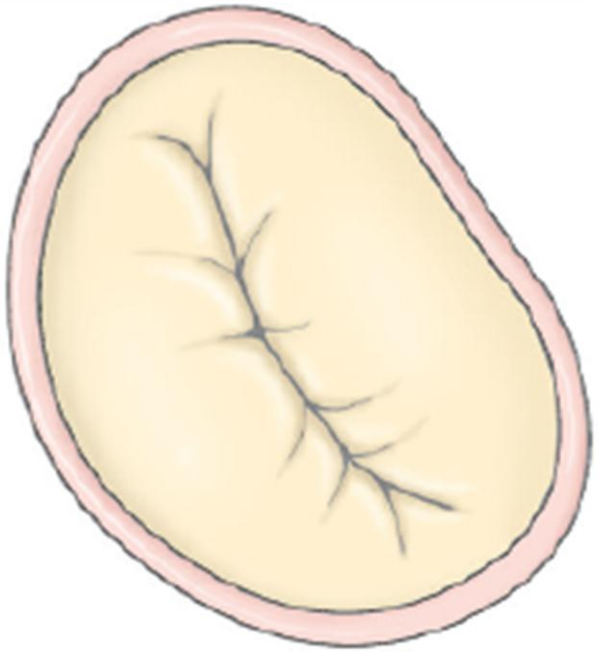
Introduction



Aortic (semilunar) valve



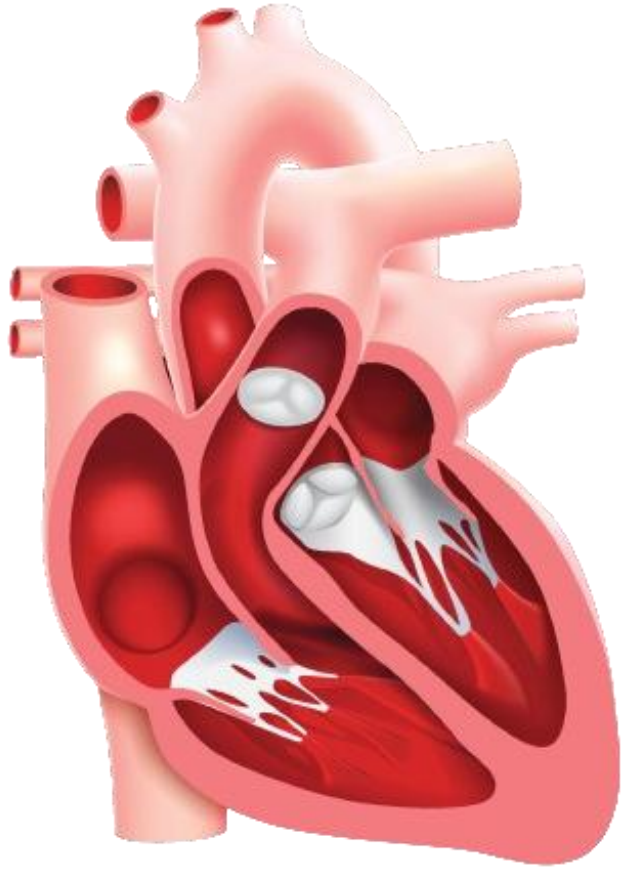
Tricuspid valve



Mitral valve

Introduction

1. Mitral Regurgitation
2. Mitral Stenosis
3. Aortic Regurgitation
4. Aortic Stenosis



Mitral Regurgitation

is a condition in which blood flows from the left ventricle back into the left atrium during systole. Often, the edges of mitral valve leaflets do not close completely during systole because leaflets and chordae tendineae have thickened and become fibrotic, resulting in abnormal contraction. Mitral regurgitation may be chronic or, less commonly, acute.

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Mitral Regurgitation

Causes

1. mitral valve prolapse
2. ischemia of the left ventricle
3. rheumatic heart disease
4. Infective endocarditis
5. enlarge and stretch the left atrium and ventricle
6. Cardiomyopathy
7. ischemic heart disease

Mitral Regurgitation

Pathophysiology

problems with one or more leaflets, chordae tendineae, the annulus, or the papillary muscles.

Leaflet may shorten or tear, and chordae tendineae may elongate, shorten, or tear.

deformed by calcification.

Mitral Regurgitation

Pathophysiology

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deformed by calcification.

Mitral Regurgitation

Pathophysiology

A papillary muscle may rupture, stretch, or be pulled out of position by changes in the ventricular wall

↓

Papillary muscles may be unable to contract because of ischemia,

↓

Regardless of the cause, the effect is backward blood flow into the atrium during systole.

↓

Mitral Regurgitation

Pathophysiology

each beat of the left ventricle pushes blood backward into the left atrium, adding to blood flowing in from the lungs.

This excess blood causes the left atrium to stretch and eventually thicken, or hypertrophy, then dilate.

Over time, blood coming in from the ventricle prevents blood flow from the lungs into the atrium.

As a result, the lungs become

Mitral Regurgitation

Clinical Manifestations

Often asymptomatic

usually manifests as severe and sudden congestive heart failure

1. Dyspnea.
2. Fatigue.
3. Weakness. are the most common symptoms.
4. Palpitations.
5. Shortness of breath on exertion.
6. Cough.

Mitral Regurgitation

Assessment Diagnostic Findings

The systolic murmur of mitral regurgitation is a blowing sound best heard at the apex.

The murmur may radiate to the left axilla.

The pulse may be regular.

Echocardiography

Mitral Regurgitation

Medical Management

Patients with mitral regurgitation who develop pulmonary congestion are managed with medications used for heart failure.

1. angiotensin-converting enzyme (ACE) inhibitors (e.g., captopril, lisinopril)
2. angiotensin receptor blockers (ARBs) (e.g., losartan, valsartan) 3. direct arterial dilators (e.g., hydralazine),
4. betablockers (e.g., carvedilol, metoprolol)

Mitral Regurgitation

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Mitral Stenosis

results in reduced blood flow from the left atrium into the left
ventricle. It is usually caused by rheumatic endocarditis, which progressively thickens mitral valve leaflets and chordae tendineae, causing the leaflets to fuse together.

Mitral Stenosis

Pathophysiology

Normally, the mitral valve orifice is as wide as the diameter of three fingers.

↓

the orifice narrows to the width of a pencil.

↓

increased resistance through the narrowed valve orifice, the left atrium is less able to push blood into the left ventricle.

↓

This results in increased residual blood volume in the left atrium, which over time causes left atrial hypertrophy and dilation

Mitral Stenosis

Pathophysiology

Decreased blood flow into the left ventricle leads to reduced ventricular filling and decreased cardiac output.

↓

stenotic valve fails to protect pulmonary veins from backward flow of blood from the atrium

↓

resulting in congestion of the pulmonary circulation

↓

The right ventricle must then contract against abnormally high pulmonary arterial pressure and is subjected to excessive strain

Mitral Stenosis

Pathophysiology

Over time, the right ventricle hypertrophies enlarges, and eventually fails.

If the heart rate increases, diastole is shortened

thus, the amount of time for forward flow of blood decreases

more blood backs into the pulmonary veins.

Therefore, as the heart rate increases, cardiac output further decreases, and pulmonary pressures increase

Mitral Stenosis

Clinical Manifestations

1. Dyspnea on exertion (DOE) caused by pulmonary venous hypertension.
2. Patients may experience progressive fatigue and decreased exercise tolerance because of low cardiac output.
3. a dry cough or wheezing resulting from An enlarged left atrium may create pressure on the left bronchial tree.

Mitral Stenosis

Clinical Manifestations

In cases of severe mitral stenosis with significant pulmonary congestion, patients may expectorate blood (i.e., hemoptysis) or experience palpitations, orthopnea, paroxysmal nocturnal dyspnea (PND), or repeated respiratory infections.

Mitral Stenosis

Assessment and Diagnostic Findings

low-pitched, rumbling diastolic murmur, best heard at the apex.

Patients may have a weak and irregular pulse if they develop atrial fibrillation and may have signs or symptoms of heart failure.

Echocardiography is used to diagnose and quantify the severity of mitral stenosis.

Electrocardiography (ECG), exercise testing, and

Mitral Stenosis

Prevention

prevention is aimed at decreasing the risk of contracting and providing early treatment for bacterial infections.

Prevention of acute rheumatic fever depends on effective antibiotic treatment of group A streptococcal infection.

Antibiotic prophylaxis for recurrent rheumatic fever with rheumatic carditis.

Mitral Stenosis

Medical Management

Anticoagulant medications to decrease the risk of developing atrial thrombi.

beta-blockers, digoxin, or calcium channel blockers.

anticoagulation for thromboembolism prevention.

Patients with severe mitral stenosis are advised to avoid strenuous activities, competitive sports, and pregnancy, all of which increase heart rate.

Aortic Regurgitation

Chronic or acute aortic regurgitation may also be caused by infections such as rheumatic endocarditis or syphilis, or by a dissecting aortic aneurysm resulting in dilation or tearing of the ascending aorta, blunt chest trauma, or deterioration of a surgically replaced aortic valve.

Aortic Regurgitation

Pathophysiology

During diastole, blood is normally delivered into the left atrium from the aorta.

In aortic regurgitation, blood flows back into the left ventricle, which will dilate to accommodate increased blood volume.

Over time, the left ventricle hypertrophies to expel more blood with above-normal force, thus increasing systolic blood pressure.

Aortic Regurgitation

Pathophysiology

Arteries attempt to compensate for higher pressures by

↓

reflex vasodilation

↓

peripheral arterioles relax

↓

reducing peripheral resistance and diastolic blood pressure.

Aortic Regurgitation

aortic insufficiency.

Clinical Manifestations

Some patients are aware of a pounding or forceful heartbeat, especially in the head or neck.

Patients who develop left ventricular hypertrophy may have visible or palpable arterial pulsations at the carotid or temporal arteries due to increased force and blood volume.

DOE and fatigue follow; progressive left ventricular failure including increased shortness

Aortic Regurgitation

Assessment and Diagnostic Findings

A high-pitched, blowing diastolic murmur is heard at the third or fourth intercostal space at the left sternal border.

pulse pressure may be widened in patients with aortic regurgitation.

One characteristic sign is the water hammer (Corrigan's)

pulse, in which the pulse strikes a palpating finger with a quick, sharp stroke and then

Aortic Regurgitation

Assessment and Diagnostic Findings

Echocardiography
cardiac magnetic resonance imaging (MRI)
cardiac catheterization.
Patients with symptoms usually have echocardiograms every 6 months.
those without symptoms have echocardiograms every 2 to 5 years.

Aortic Regurgitation

Medical Management

A patient who is symptomatic or has developed a significant decrease in left ventricular function is advised to avoid physical exertion, competitive sports, and isometric exercise until the valve has been replaced.

Controlling high blood pressure in patients with aortic regurgitation can improve forward blood flow through the heart.

ACE inhibitors and dihydropyridine calcium

Aortic Regurgitation

Medical Management

Patients who are symptomatic should be instructed to restrict sodium intake to prevent volume overload and will require valve replacement.

The treatment of choice is aortic valve replacement or valvuloplasty.

Aortic Stenosis

is narrowing of the orifice between the left ventricle and aorta.

stenosis is usually caused by degenerative calcification.

Congenital leaflet malformations or an abnormal number of leaflets.

Rheumatic endocarditis may cause adhesions or fusion of the commissures and valve ring

Aortic Stenosis

Pathophysiology

As the valve orifice narrows, the left ventricle overcomes obstruction by contracting more slowly and more forcibly.

Obstruction to left ventricular outflow increases pressure on the left ventricle, so the ventricular wall hypertrophies.

When these compensatory mechanisms are insufficient to allow for normal heart function, clinical signs and

Aortic Stenosis

Clinical Manifestations

the first symptom to appear is DOE, caused by increased pulmonary venous pressure due to a dilating left ventricle.

Over time, left ventricular failure may occur, causing orthopnea, PND, and pulmonary edema.

Reduced blood flow to the brain may cause dizziness, and in more severe aortic stenosis, syncope.

Aortic Stenosis

Clinical Manifestations

Patients may also report angina pectoris, which is caused by limited blood flow into the coronary arteries, decreased time in diastole to allow for myocardial perfusion, and simultaneously increased oxygen demand of the hypertrophied left ventricle.

Blood pressure is usually normal but may be low.

Aortic Stenosis

Assessment and Diagnostic Findings

a loud, harsh systolic murmur is heard over the aortic area and may radiate to the carotid arteries and apex of the left ventricle.

The murmur may be described as low pitched, crescendo–decrescendo, rough, rasping, and vibrating.

An S4 sound may be heard.

By having the patient lean forward during auscultation and

Aortic Stenosis

Assessment and Diagnostic Findings

There may also be a palpable vibration extending from the base of the heart (second intercostal space next to the sternum and above the suprasternal notch) and up along the carotid arteries. The vibration is caused by turbulent blood flow across the narrowed valve orifice.

Aortic Stenosis

Assessment and Diagnostic Findings

Cardiac imaging is used to diagnose and monitor the progression of aortic stenosis.
This may consist of echocardiography, cardiac MRI, or computed
tomography (CT) scanning
Patients with symptoms usually have echocardiograms every 6 to 12 months.
and those without symptoms have echocardiograms every 2 to 5 years.

Aortic Stenosis

Prevention

Prevention of aortic stenosis is primarily focused on controlling risk factors for proliferative and inflammatory responses—namely, through treating diabetes, hypertension, hypercholesterolemia, and elevated triglycerides, and avoiding
tobacco products and ENDS.

Aortic Stenosis

Medical Management

Definitive treatment for aortic stenosis is replacement of
the aortic valve, which may be done surgically or nonsurgically. Nonsurgical valve replacement, known as transcatheter aortic valve replacement (TAVR).

Nursing Management: Valvular Heart Disorders

The nurse educates the patient with valvular heart disease about the diagnosis, progressive nature of the disease, and treatment plan. The patient is instructed to report new symptoms or changes in symptoms to the primary provider. The nurse also educates the patient that an infectious pathogen, usually a bacterium, can adhere to a diseased heart valve more readily than to a normal valve.

Nursing Management: Valvular Heart Disorders

The nurse measures the patient's heart rate, blood pressure, and respiratory rate, compares these results with previous data, and notes any changes. Heart and lung sounds are auscultated, and peripheral pulses palpated.

Nursing Management: Valvular Heart Disorders

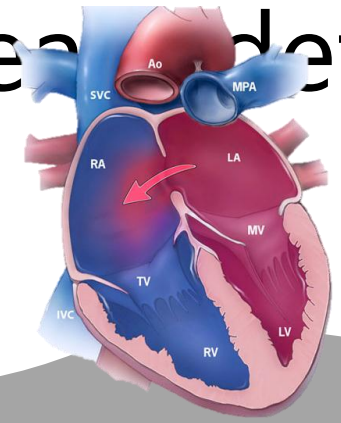
The nurse assesses the patient with valvular heart disease for the following:

1. Signs and symptoms of heart failure, such as fatigue, DOE, decreased activity tolerance, an increase in coughing, hemoptysis, multiple respiratory infections, orthopnea, and PND.
2. Arrhythmias, by palpating the patient's pulse for strength and rhythm (i.e., regular or irregular) and asking whether the patient has experienced palpitations or felt forceful heartbeats.

Atrial Septal Defect

An atrial septal defect is a birth defect of the heart in which there is a hole in the wall (septum) that divides the upper chambers (atria) of the heart.

A hole can vary in size and may close on its own or may require surgery. An atrial septal defect is one type of congenital heart defect. Congenital means present at birth.



Causes and Risk Factors

The causes of heart defects such as atrial septal defect among most babies are unknown. Some babies have heart defects because of changes in their genes or chromosomes. These types of heart defects also are thought to be caused by a combination of genes and other risk factors, such as things the mother comes in contact with in the environment or what the mother eats or drinks or the medicines the mother uses.

Diagnosis

An atrial septal defect may be diagnosed during pregnancy or after the baby is born. In many cases, it may not be diagnosed until adulthood.

During Pregnancy

During pregnancy, there are screening tests (prenatal tests) to check for birth defects and other conditions. An atrial septal defect might be seen during an ultrasound (which creates pictures of the body), but it depends on the size of the hole and its location.

After the Baby is Born

1. Frequent respiratory or lung infections
2. Difficulty breathing
3. Tiring when feeding (infants)
4. Shortness of breath when being active or exercising
5. Skipped heartbeats or a sense of feeling the heartbeat
6. A heart murmur, or a whooshing sound that can be heard with a stethoscope

Treatments

Treatment for an atrial septal defect depends on the age of diagnosis, the number of or seriousness of symptoms, size of the hole, and presence of other conditions. Sometimes surgery is needed to repair the hole. Sometimes medications are prescribed to help treat symptoms. There are no known medications that can repair the hole.

Treatments

If a child is diagnosed with an atrial septal defect, the health care provider may want to monitor it for a while to see if the hole closes on its own. During this period of time, the health care provider might treat symptoms with medicine. A health care provider may recommend the atrial septal defect be closed for a child with a large atrial septal defect, even if there are few symptoms, to prevent problems

Ventricular Septal Defect

A ventricular septal defect happens during pregnancy if the wall that forms between the two ventricles does not fully develop, leaving a hole. A ventricular septal defect is one type of congenital heart defect. Congenital means present at birth.

In a baby without a congenital heart defect, the right side of the heart pumps oxygen-poor blood from the heart to the lungs, and the left

Ventricular Septal Defect

In babies with a ventricular septal defect, blood often flows from the left ventricle through the ventricular septal defect to the right ventricle and into the lungs. This extra blood being pumped into the lungs forces the heart and lungs to work harder. Over time, if not repaired, this defect can increase the risk for other complications, including heart failure, high blood pressure in the lungs (called pulmonary

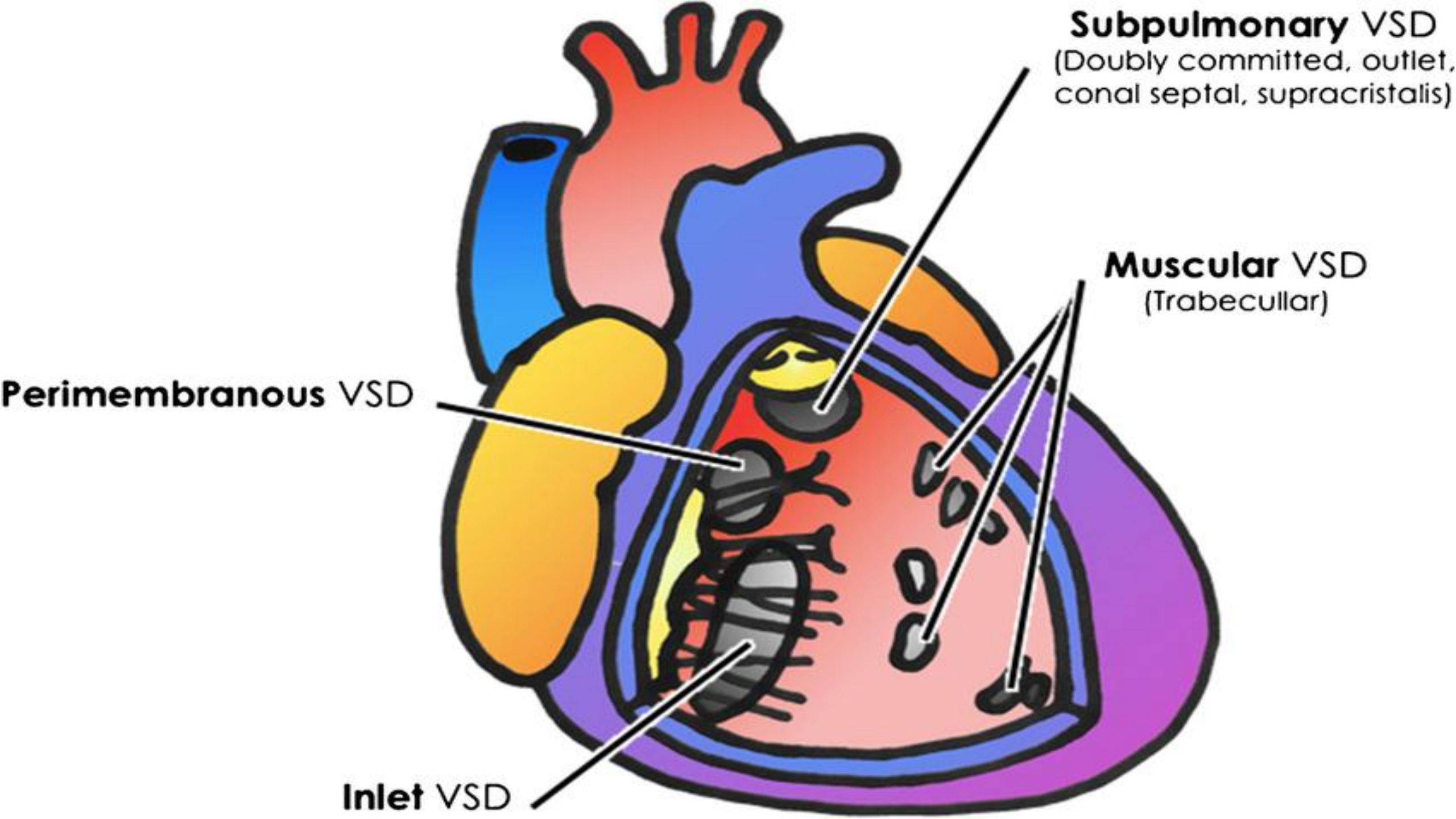
Types of VSD

1. Conoventricular VSD: this is a hole where portions of the ventricular septum should meet just below the pulmonary and aortic valves.
2. Perimembranous VSD: This is a hole in the upper section of the ventricular septum.

Types of VSD

3. Inlet VSD: This is a hole in the septum near to where the blood enters the ventricles through the tricuspid and mitral valves. This type of ventricular septal defect also might be part of another heart defect called an atrioventricular septal defect (AVSD).

4. Muscular VSD: This is a hole in the lower, muscular part of the ventricular septum and is the most common type of ventricular septal defect.


Subpulmonary VSD
(Doubly committed, outlet, conal septal, supracristalis)
Muscular VSD
(Trabecullar)
Perimembranous VSD
Inlet VSD

Causes and Risk Factors

The causes of heart defects (such as a ventricular septal defect) among most babies are unknown. Some babies have heart defects because of changes in their genes or chromosomes. Heart defects also are thought to be caused by a combination of genes and other risk factors, such as the things the mother comes in contact with in the environment or what the mother eats or drinks or the medicines the mother uses.

Diagnosis

A ventricular septal defect usually is diagnosed after a baby is born. The size of the ventricular septal defect will influence what symptoms, if any, are present, and whether a doctor hears a heart murmur during a physical examination.

1. Shortness of breath,
2. Fast or heavy breathing,
3. Sweating,
4. Tiredness while feeding, or
5. Poor weight gain

Diagnosis

During a physical examination the doctor might hear a distinct whooshing sound, called a heart murmur. The most common test is an echocardiogram, which is an ultrasound of the heart that can show problems with the structure of the heart, show how large the hole is, and show how much blood is flowing through the hole.

Treatments

Treatments for a ventricular septal defect depend on the size of the hole and the problems it might cause. Many ventricular septal defects are small and close on their own; if the hole is small and not causing any symptoms, the doctor will check the infant regularly to ensure there are no signs of heart failure and that the hole closes on its own. If the hole does not close on its own or if it is large, further actions might need to be taken.

Treatments

Depending on the size of the hole, symptoms, and general health of the child, the doctor might recommend either cardiac catheterization or open-heart surgery to close the hole and restore normal blood flow. After surgery, the doctor will set up regular follow-up visits to make sure that the ventricular septal defect remains closed. Most children who have a ventricular septal defect that closes (either on its own or with surgery) live healthy lives

Treatments

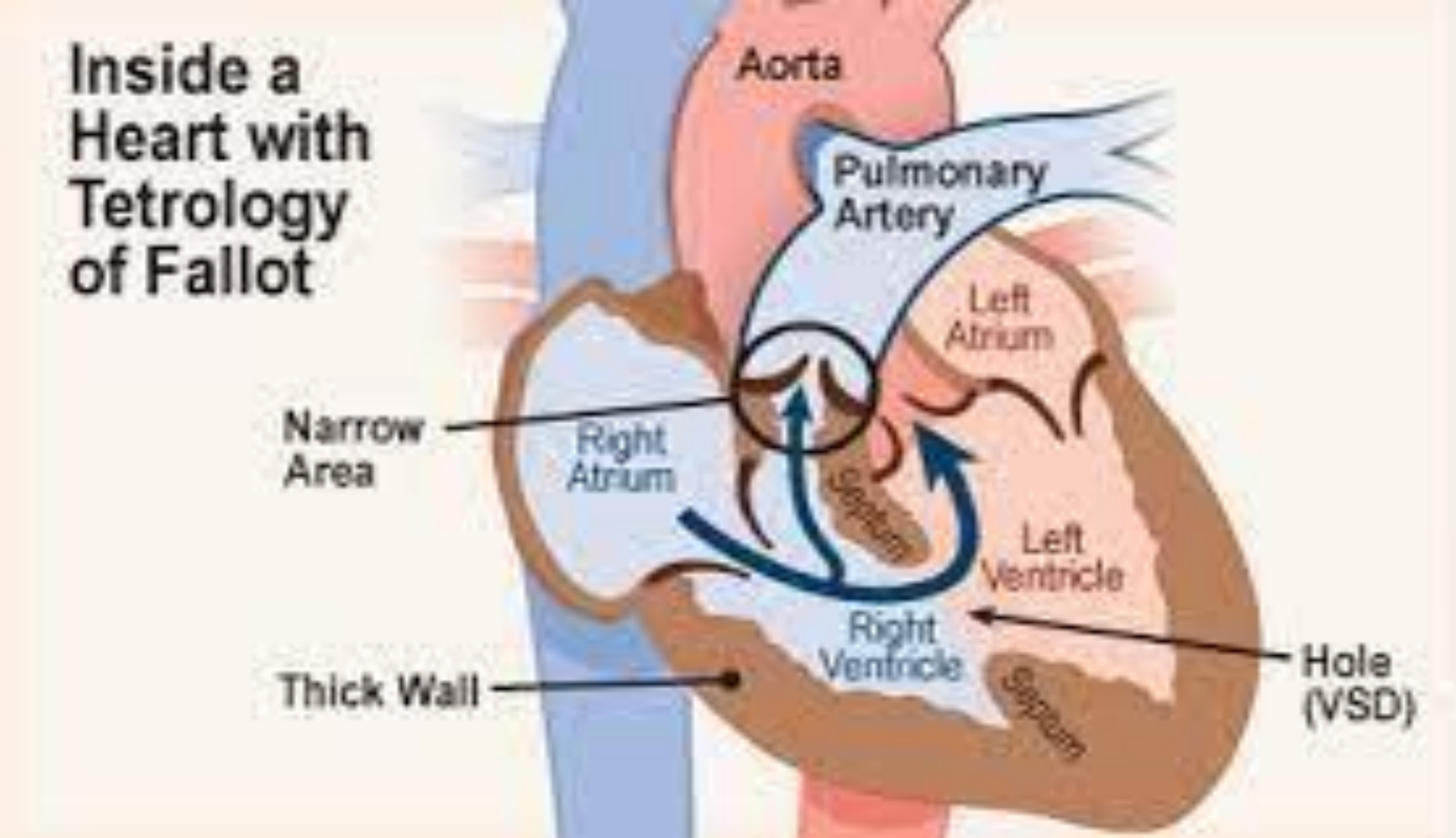
Medicines: Some children will need medicines to help strengthen the heart muscle, lower their blood pressure, and help the body get rid of extra fluid.

Nutrition: Some babies with a ventricular septal defect become tired while feeding and do not eat enough to gain weight. To make sure babies have a healthy weight gain, a special high-calorie formula might be prescribed.

Tetralogy of Fallot

Tetralogy of Fallot is made up of the following four defects of the heart and its blood vessels:

1. A hole in the wall between the two lower chambers—or ventricles—of the heart. This condition also is called a ventricular septal defect.
2. A narrowing of the pulmonary valve and main pulmonary artery. This condition also is called pulmonary stenosis.


Inside a Heart with Tetrology of Fallot
Aorta
Pulmonary Artery
Left Atrium
Narrow Area
Right Atrium
Septum
Left Ventricle
Right Ventricle
Septum
Hole (VSD)
Thick Wall

Tetralogy of Fallot

3. The aortic valve, which opens to the aorta, is enlarged and seems to open from both ventricles, rather than from the left ventricle only, as in a normal heart. In this defect, the aortic valve sits directly on top of the ventricular septal defect.

4. The muscular wall of the lower right chamber of the heart (right ventricle) is thicker than normal. This also is called ventricular hypertrophy.

Tetralogy of Fallot

Because a baby with tetralogy of Fallot may need surgery or other procedures soon after birth, this birth defect is considered a critical congenital heart defect. Congenital means present at birth.

Tetralogy of Fallot

Infants with tetralogy of Fallot or other conditions causing cyanosis can have problems including:

1. A higher risk of getting an infection of the layers of the heart, called endocarditis.
2. A higher risk of having irregular heart rhythms, called arrhythmia.
3. Dizziness, fainting, or seizures, because of the low oxygen levels in their blood.
4. Delayed growth and development

Causes and Risk Factors

The causes are unknown. Some babies have heart defects because of changes in their genes or chromosomes.

Diagnosis

Tetralogy of Fallot may be diagnosed during pregnancy or soon after a baby is born.

During Pregnancy

The ultrasound may make the health care provider suspect a baby may have tetralogy of Fallot. If so, the health care provider can request a fetal echocardiogram to confirm the diagnosis. A fetal echocardiogram is an ultrasound of the heart of the fetus. This test can show problems with the structure of the heart and how the heart is working with this defect.

After a Baby Is Born

Tetralogy of Fallot usually is diagnosed after a baby is born, often after the infant has an episode of turning blue during crying or feeding. Some findings on a physical exam may make the health care provider think a baby may have tetralogy of Fallot, including bluish-looking skin or a heart murmur (a “whooshing” sound caused by blood not flowing properly through the heart).

Treatments

Tetralogy of Fallot can be treated by surgery soon after the baby is born. During surgery, doctors widen or replace the pulmonary valve and enlarge the passage to the pulmonary artery. They also will place a patch over the ventricular septal defect to close the hole between the two lower chambers of the heart. These actions will improve blood flow to the lungs and the rest of the body.

THANKS

Do you have any questions?

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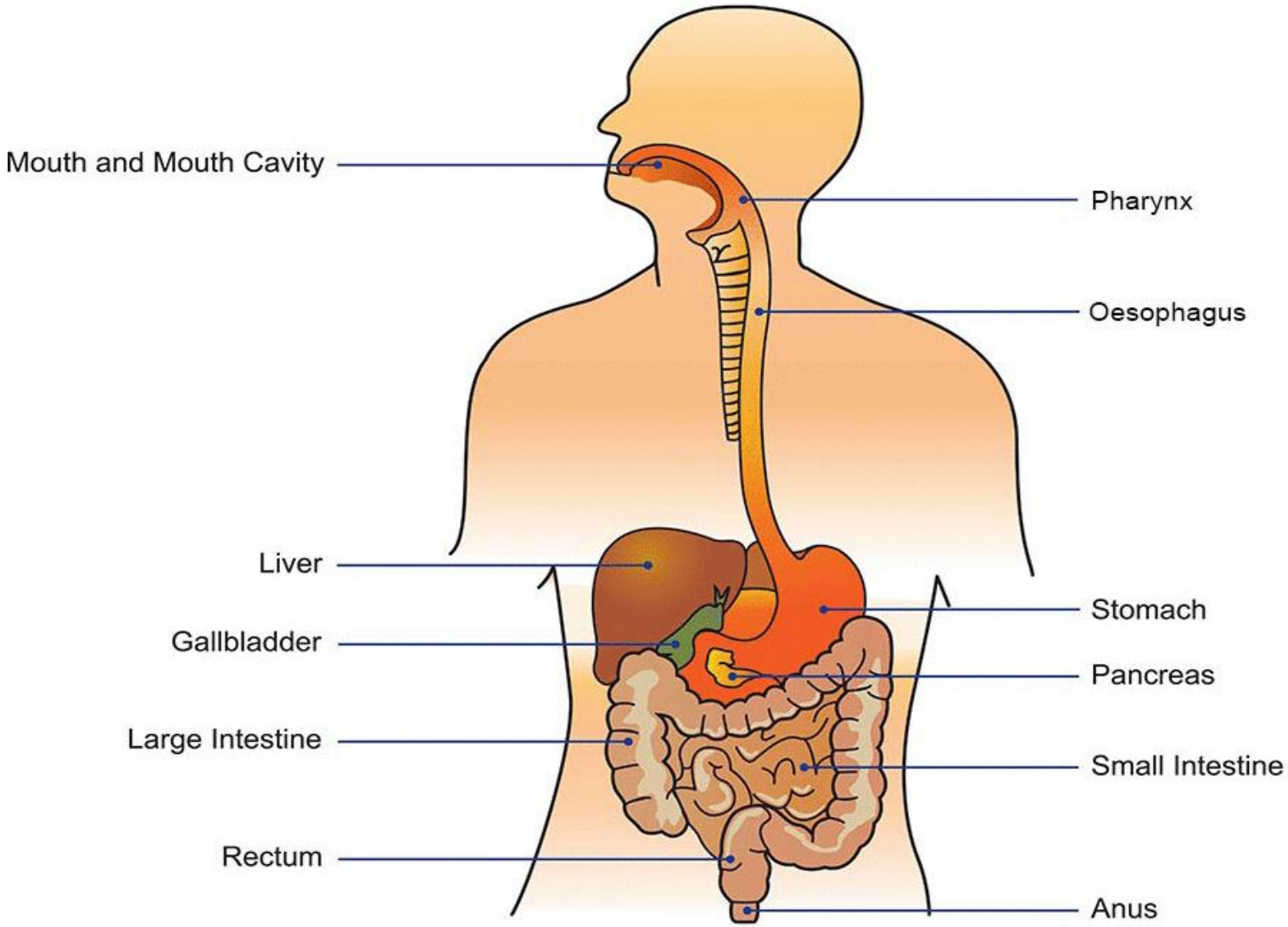

Mouth and Mouth Cavity
Pharynx
Oesophagus
Liver
Gallbladder
Stomach
Pancreas
Large Intestine
Small Intestine
Rectum
Anus

NURSING ASSESSMENT OF THE GASTROINTESTINAL, HEPATOBILIARY, AND PANCREATIC SYSTEMS

Health History

Physical Examination (Auscultation, Percussion, Palpation) (Height, Weight, and Body Mass Index)

Laboratory Tests

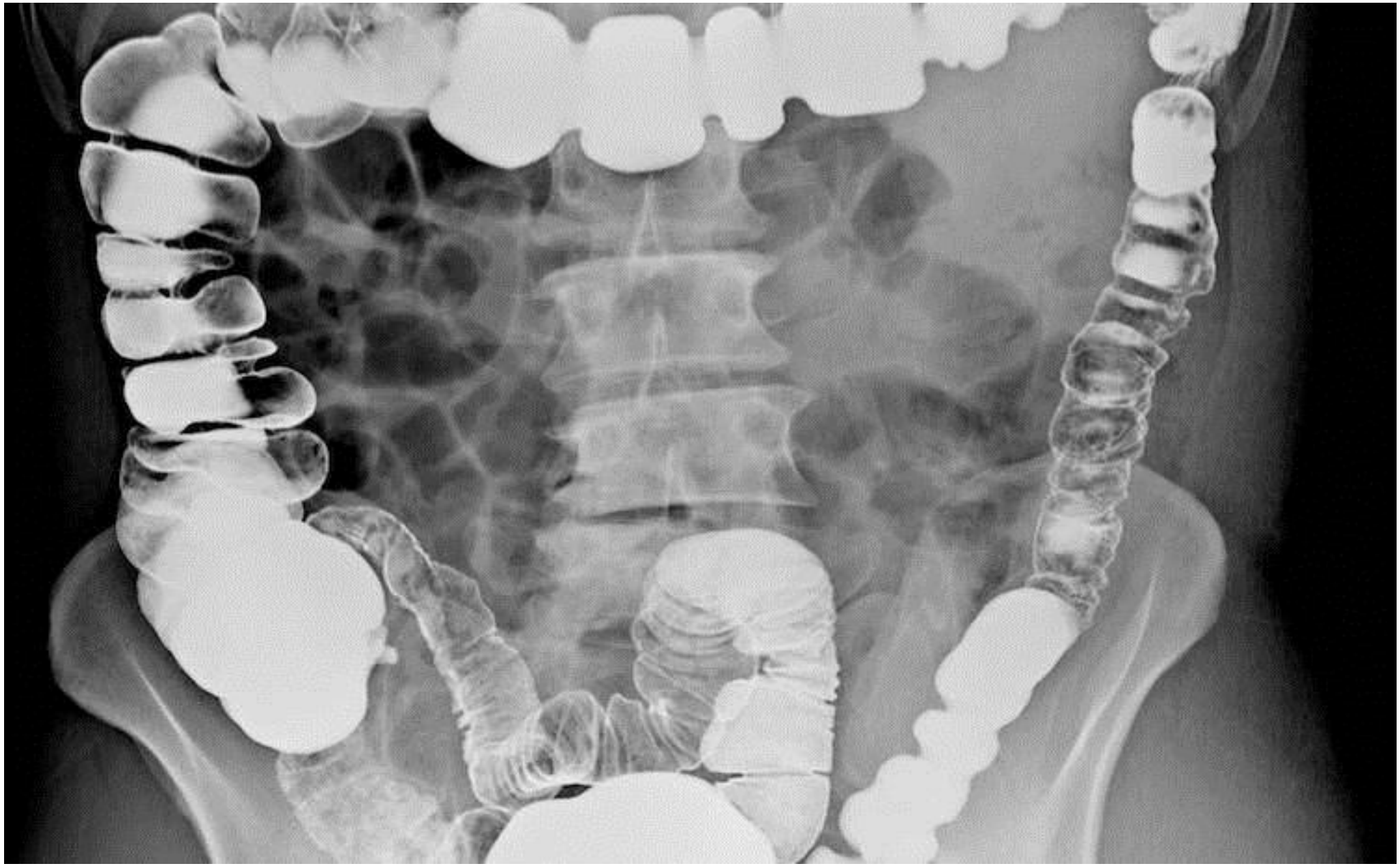
The complete blood cell count (CBC) reveals if anemia or infection is present. Anemia may occur with GI bleeding or cancer. Electrolyte imbalances often occur with GI illness as a result of vomiting, diarrhea, (ALT) Determines serum ALT levels. ALT is found mainly in the liver. With liver injury or disease, ALT is released into bloodstream.

Stool Tests

Stool samples can be tested for occult blood (blood not seen by the naked eye)

Radiographic Tests

Upper Gastrointestinal Series (Barium Swallow) An upper gastrointestinal (GI) series is an x-ray examination of the esophagus, stomach, duodenum, and jejunum using an oral liquid radiopaque contrast medium (barium) and a fluoroscope (an x-ray source and fluorescent screen between which the patient is placed) to outline the contours of the organs. An upper GI series is used to detect such things as strictures, ulcers, tumors, polyps, hiatal hernias, and motility problems.



Lower Gastrointestinal Series

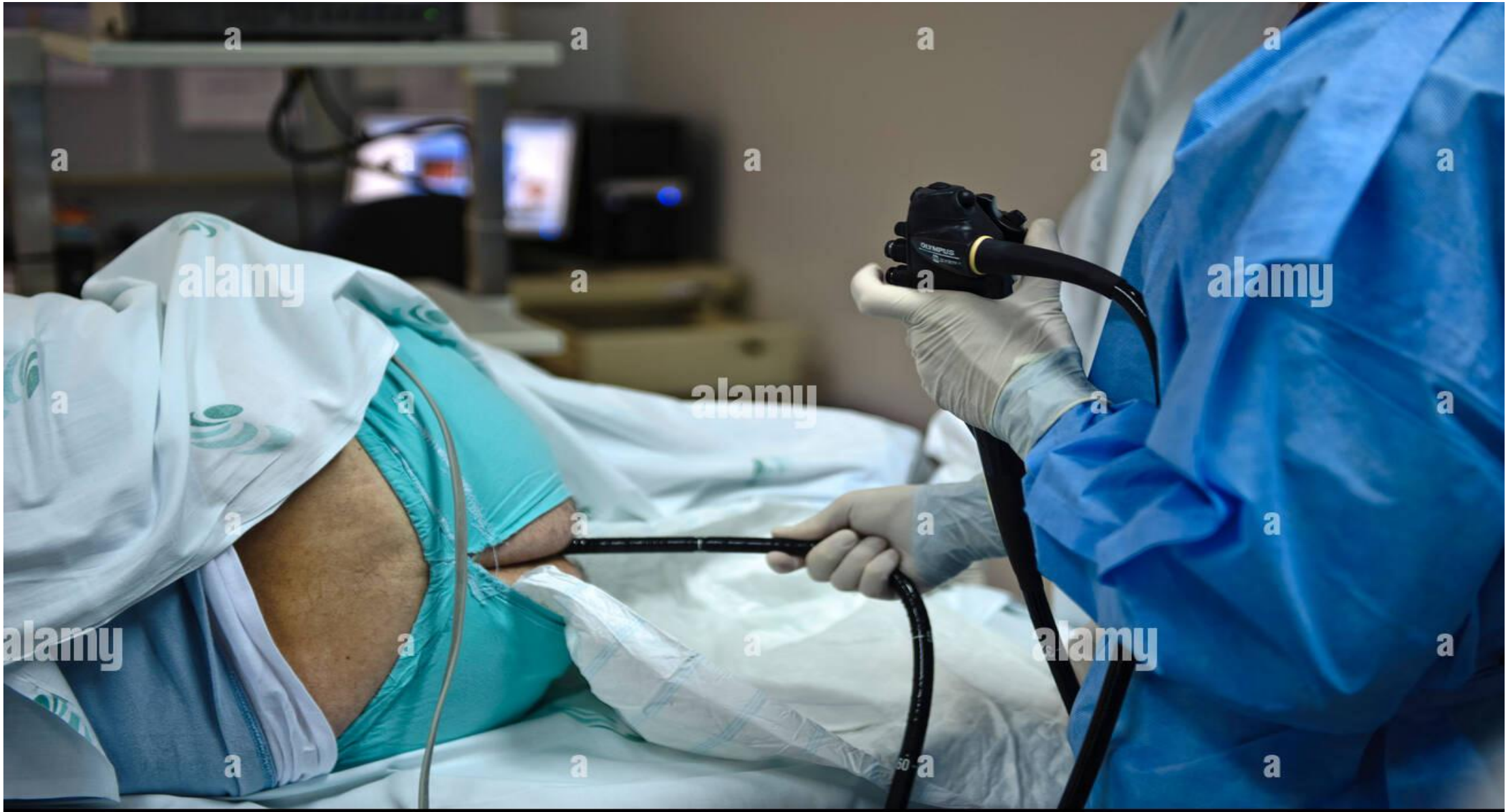
The lower GI series (barium enema) is performed to visualize the position, movements, and filling of the colon. Tumors, diverticula, stenosis, obstructions, inflammation, ulcerative colitis, and polyps can be detected. The patient is placed on a low-residue or clear liquid diet for 2 to 5 days before the test to empty the bowel

Esophagogastroduodenoscopy (EGD)

(EGD) visualizes the esophagus (esophagoscopy), the stomach (gastroscopy), and the duodenum (Fig. 32.7). Conscious sedation, for example, midazolam (Versed), is used to relax and ease pain during the procedure. Sometimes a local anesthetic in spray or gargle form is given to inhibit the gag reflex. Abnormalities such as inflammation, cancer, bleeding, injury, and infection can be seen. Biopsy or cytology specimens can be obtained.

Endoscopic Retrograde Cholangiopancreatography (ERCP)

(ERCP) permits the HCP to visualize the liver, gallbladder, and pancreas (Fig. 32.8). The procedure allows both direct viewing and use of contrast medium and intervention if needed such as biopsy, stone or tumor removal, stricture balloon dilation, or bile duct stent placement. An endoscope is passed through the esophagus to the duodenum, where dye is injected that outlines the pancreatic and bile ducts.



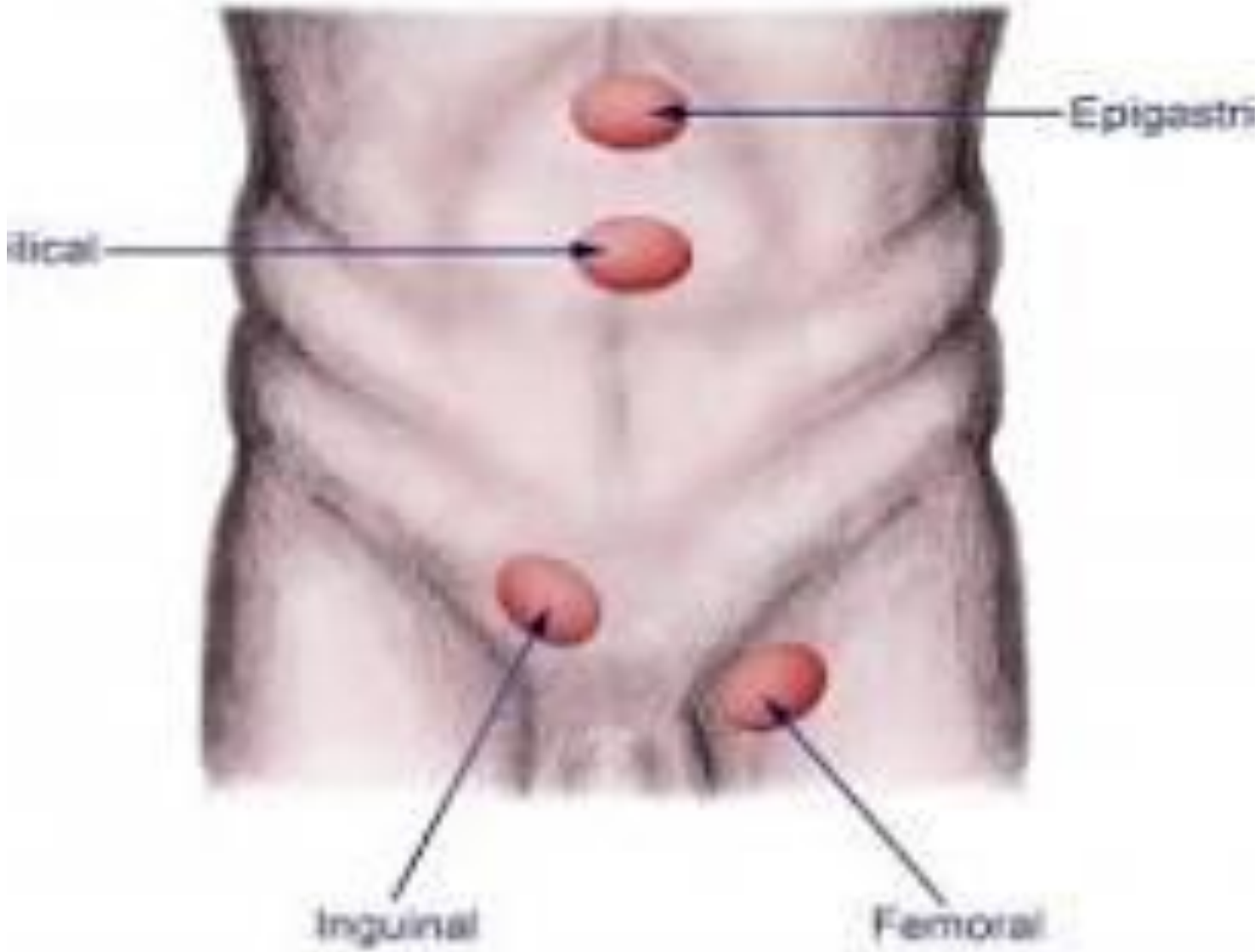
Colonoscopy : Visualization of lining of the large intestine to identify abnormalities through a flexible endoscope, inserted rectally. Biopsy specimen may be obtained or polyps removed

PROCTOSIGMOIDOSCOPY. is the examination of the distal sigmoid colon, the rectum, and the anal canal using a flexible endoscope (sigmoidoscope). Ulcerations, punctures, lacerations, tumors, hemorrhoids, polyps can be detedted.

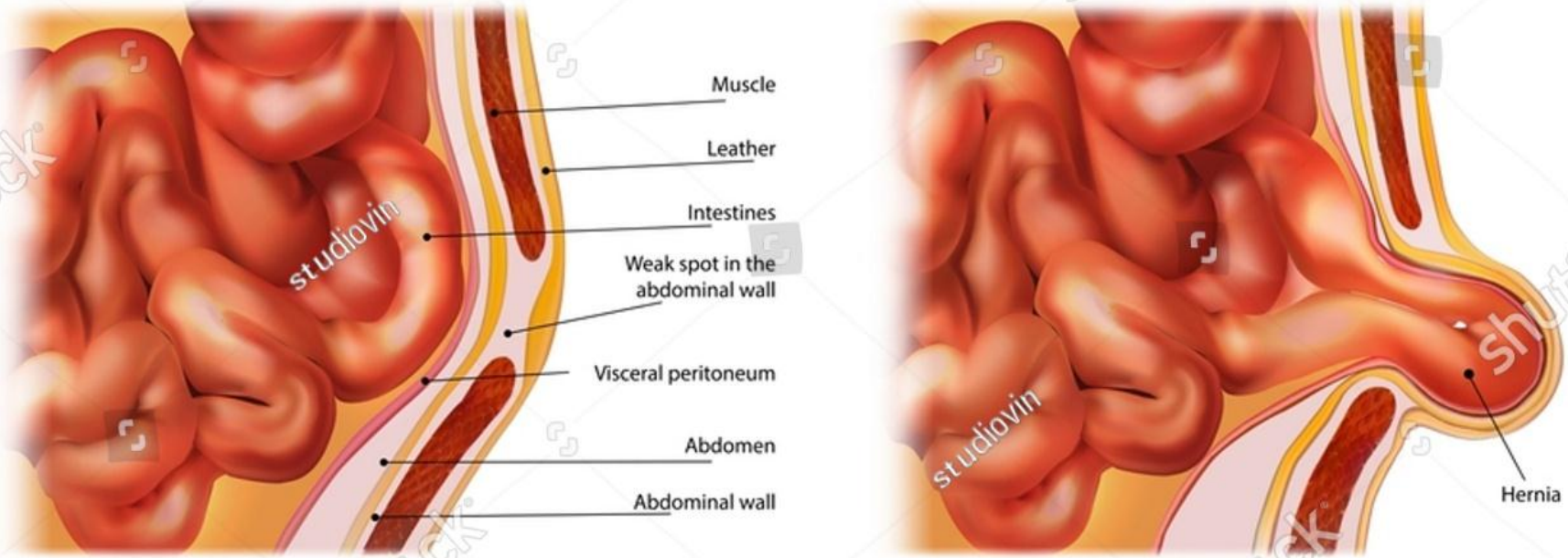
Hernia

Pathophysiology and Etiology

A hernia is an abnormal protrusion of an organ or structure through a weakness or tear in the wall of the cavity normally containing it, which in this case is the abdominal wall. Hernias are caused by a weakness in the abdominal wall along with increased intra-abdominal pressure, such as the pressure from coughing, straining, and heavy lifting. Obesity, pregnancy, and poor wound healing are also risk factors.


Epigastri
ilical
Inguinal
Femoral

ABDOMINAL HERNIA



Prevention

Congenital defects cannot be prevented. However, reducing strain on abdominal muscles is helpful. Those who do heavy lifting, tugging, or pushing should wear a support binder or avoid the lifting. A healthy lifestyle of maintaining normal weight, not smoking, and eating high-fiber foods is recommended.

Signs and Symptoms

Unless complications occur, few symptoms are associated with hernias. An abnormal bulging can be seen in the affected area of the abdomen, especially when straining or coughing. The patient may have some discomfort due to tension on tissues around the hernia. The herniation may disappear when the patient lies down. If the intestinal mass easily returns to the abdominal cavity or can be manually placed back in the abdominal cavity, it is called a reducible hernia. When adhesions or edema occur between the sac and its contents, the hernia becomes irreducible or incarcerated

Therapeutic Measures

Hernias are diagnosed by physical examination. Treatment options include no treatment, observing the hernia, using short-term support devices, or surgery to cure the hernia. A supportive truss or brief applies pressure to keep the reduced hernia in place. Emergency surgery is needed for strangulation or the threat of bowel obstruction. Surgical repair is recommended for inguinal hernias.

Surgical procedures are most often done laparoscopically and include hernioplasty (open or laparoscopically) or herniorrhaphy (open hernia repair). Herniorrhaphy involves making an incision in the abdominal w all, replacing the contents of the hernial sac, sewing the weakened tissue, and closing the opening. Hernioplasty involves replacing the hernia into the abdomen and reinforcing the weakened muscle wall with wire, fascia, or mesh. Bowel resection or a temporary colostomy may be necessary if the hernia is strangulated.

Nursing Care

The patient is instructed to avoid activities that increase intraabdominal pressure, such as lifting heavy objects. The patient is taught to recognize signs of incarceration or strangulation and the importance of notifying the HCP immediately . If a support truss or brief has been ordered, the patient is taught to apply it before arising from bed each morning while the hernia is not protruding. Special attention should be paid to maintenance of skin integrity beneath the truss

Postoperative care following inguinal hernia repair is generally similar to any abdominal postoperative care. Patients can perform deep breathing to keep lungs clear postoperatively but should avoid coughing. Coughing increases abdominal pressure and could affect the hernia repair. The male patient may experience swelling of the scrotum. Ice packs and elevation of the scrotum may be ordered to reduce the swelling.

Because most patients are discharged the same day of surgery, they are taught to change the dressing and report difficulty urinating, bleeding, and signs and symptoms of infection, such as redness, incisional drainage, fever, or severe pain. The patient is also instructed to avoid lifting, driving, or sexual activities for 2 to 6 weeks as specified by the HCP. Most patients can return to nonstrenuous work within 2 weeks.

Complications

An incarcerated hernia may become strangulated if the blood and intestinal flow are completely cut off in the trapped loop of bowel. Strangulated hernias do not develop in adults very often. Incarceration leads to an intestinal obstruction and possibly gangrene and bowel perforation. Symptoms are pain at the site of the strangulation, nausea and vomiting, and colicky abdominal pain.

PEPTIC ULCER DISEASE

Pathophysiology

Peptic ulcer disease (PUD) is a condition in which the lining of the stomach, pylorus, duodenum, or the esophagus is eroded, usually from infection with H. pylori. The erosion may extend into the muscular layers or the peritoneum

the cause of peptic ulcers was poorly understood and thought to be related to stress, diet, and alcohol or caffeine ingestion. However, research results have found that PUD is primarily caused by infection with the Gram-negative bacterium H. pylori. This bacterium is responsible for 80% of gastric ulcers and more than 90% of duodenal ulcers. Two thirds of all people are infected with H. pylori,

including pain, may not be experienced with gastric or duodenal ulcers until complications such as hemorrhage, obstruction, or perforation de velop. If pain does occur, patients with gastric ulcers commonly experience a burning and gnawing pain in the high left epigastric region, and may increase with food ingestion or 1 to 2 hours after a meal

Duodenal ulcers produce cramping or burning pain in the midepigastric or upper abdominal area, which occurs 2 to 4 hours after meals or in the middle of the night. This intermittent pain may be relieved by the ingestion of food or antacids. Anorexia and nausea and vomiting may also occur with either ulcer location. Bleeding may occur with massive hemorrhaging or slow oozing

Diagnostic Test

Upper GI series (barium swallow) ,Esophagogastroduodenoscopy

Complications

Major complications can result from PUD. These include bleeding, perforation, and obstruction. Bleeding can occur in varying degrees from occult blood in stool and emesis to massive bright red bleeding. Hemorrhage tends to occur more often with gastric ulcers in older adults. The patient may experience signs and symptoms of shock. Treatment includes stopping the bleeding, replacing fluid and electrolytes, and possibly administering vasopressin to stop the bleeding.

Treatment of H.pylori

Triple therapy: Two antibiotics + proton pump inhibitor

Amoxicillin (Amoxil) + clarithromycin (Biaxin) + omeprazole (Prilosec)

Dual therapy : Antibiotic + proton pump inhibitor

Clarithromycin (Biaxin) + omeprazole (Prilosec)

Amoxicillin (Amoxil) + lansoprazole (Prevacid)

Nursing Diagnosis: Acute Pain related to gastric mucosal erosion

Ask patient to rate pain level on scale of 0 to 10 every 3 hours and as needed. Note location, onset, intensity, characteristics of pain, and nonverbal pain cues

Ask about factors precipitating and relieving pain

Ask patient to help identify techniques for pain relief

Administer antiulcer medications as ordered

Provide small, frequent meals four to six times a day

Encourage nonacidic fluids between meals

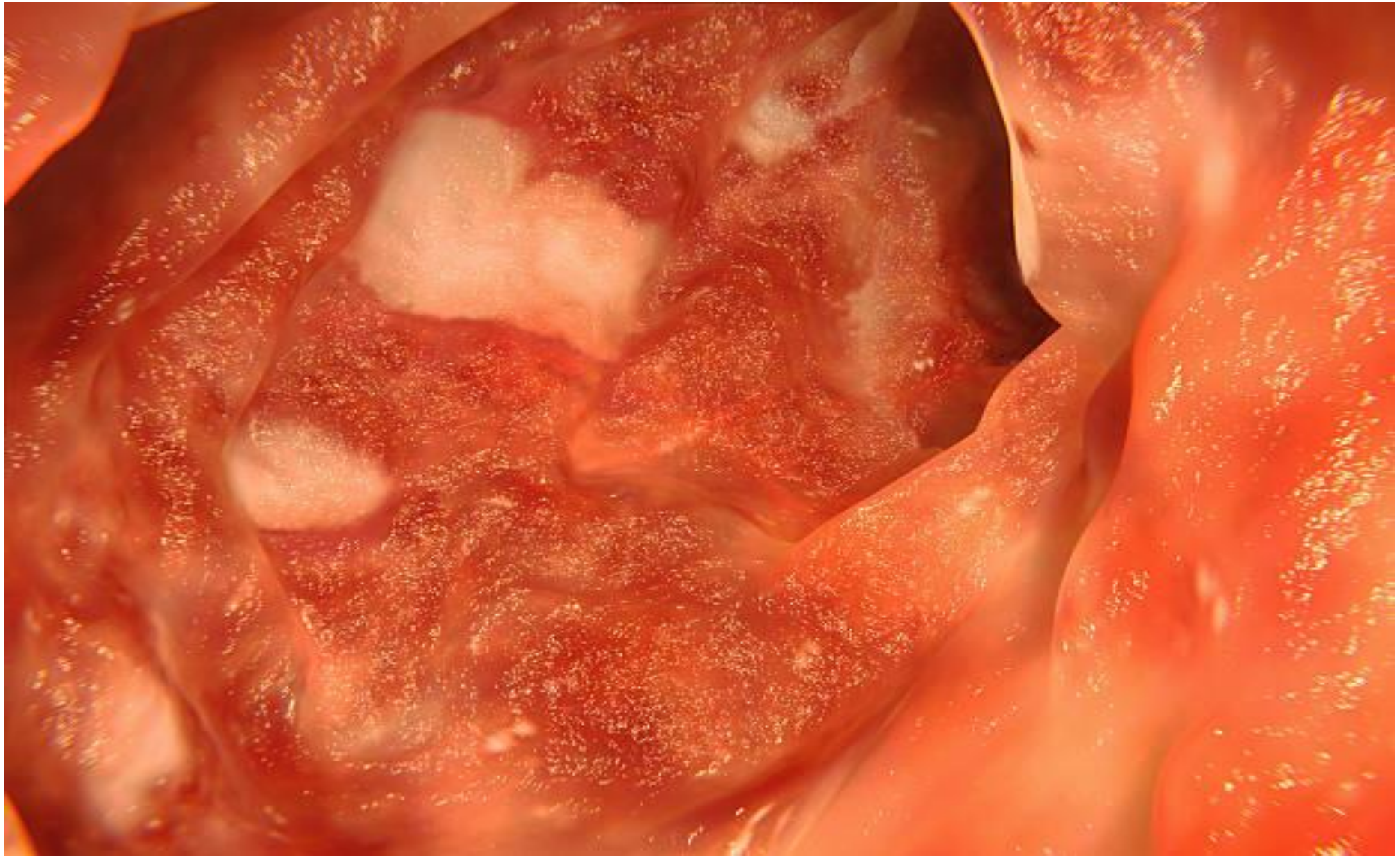
Nursing Diagnosis: Risk for Injury related to complications of peptic ulcer activity such as hemorrhage and perforation

Monitor for signs and symptoms of hemorrhage such as hematemesis (vomiting blood) and melena (blood in the stool)

Monitor vital signs: blood pressure, pulse, respirations, and temperature

Maintain IV infusion as ordered

Monitor hematocrit and hemoglobin levels as ordered.



Ulcerative Colitis

Pathophysiology

Ulcerative colitis is similar to Crohn's disease. Crohn's disease, however, can occur anywhere in the GI system, whereas ulcerative colitis occurs in the large colon and rectum. Multiple ulcerations and diffuse inflammation occur in the superficial mucosa and submucosa of the colon. The lesions spread in a continuous pattern throughout the large intestine and usually involve the rectum.

Etiology

Infection, allergy, and autoimmune response are possible causes of ulcerative colitis. Environmental agents such as pesticides, tobacco, radiation, and food additives may precipitate an exacerbation. Diet or psychological stress may trigger or worsen an attack of symptoms. Ulcerative colitis usually begins between ages 15 and 40.

Signs and Symptoms

Abdominal pain, diarrhea, rectal bleeding, and fecal urgency are common symptoms of ulcerative colitis. Anorexia, weight loss, cramping, vomiting, fever, and dehydration associated with passing 5 to 20 liquid stools a day may also occur. Along with the potential for fluid and electrolyte imbalance, calcium is lost. Anemia often develops as a result of rectal bleeding. Serum albumin level may be low because of malabsorption.

Like Crohn’s disease, arthritis, skin lesions, inflammatory disorders of the eyes, and abnormalities of liver function may also occur. Symptoms are usually intermittent, with remissions lasting from weeks to years.

Complications

Malnutrition occurs less often with ulcerative colitis than with Crohn's disease. Other complications include the potential for hemorrhage during an acute phase, bowel obstruction, perforation, and peritonitis. The risk for colorectal cancer is also increased in patients with ulcerative colitis.

Diagnostic Tests

Anemia and infection are checked with blood tests. Anemia is often present because of blood loss. Examination of stool specimens is done to rule out the presence of any bacterial or amebic organisms. The stool is positive for blood in the presence of ulcerative colitis. Electrolytes may be depleted from chronic diarrhea. There is protein loss because of liver dysfunction and malabsorption.

Barium enema is an x-ray with contrast that looks at the lower GI tract. A flexible sigmoidoscopy to view the lower colon or a colonoscopy to see the whole colon is done. Biopsy specimens show inflamed cells.

Therapeutic Measures

Diet and lifestyle changes and then medications are used for treatment. Foods that cause gas or diarrhea should be avoided. Because the offending foods may be different for each patient, foods are tried in small amounts if they are thought to cause symptoms. In general, high-fiber foods, caffeine, spicy foods, and milk products are avoided

Nursing Process for the Patient With ulceratice colitis

Impaired Skin Integrity related to frequent loose stools

• Keep perianal skin clean, dry, and protected with a moisture barrier, such as petrolatum or medicated ointment, after each bowel movement to protect perianal skin from contact with liquid stools and their enzymes. • Provide sitz baths, which may be comforting and helpful in keeping skin clean to prevent excoriation

Imbalanced Nutrition: Less Than Body Requirements related to malabsorption

• Weigh weekly to detect weight loss. • Give special liquid (elemental) formula that is absorbed in the upper bowel as ordered to allow the colon to rest. • Maintain PN as ordered to provide nourishment if the patient is unable to tolerate oral intake.

Acute Pain related to increased peristalsis and cramping

• Have patient rate pain on objective scale such as 0 to 10 to determine pain level. • Document the character of the pain (dull, cramping, burning) and ask whether the pain is associated with meals or other activities to plan care. • Give analgesics and medications to relieve cramping, as prescribed.

Risk for Deficient Fluid Volume related to diarrhea and insufficient fluid intake

Weigh patient daily to determine fluid loss. • Record intake and output (including diarrhea stools) to determine fluid balance. • Document and report signs of deficient fluid volume to the HCP to allow treatment. • Maintain IV fluids as ordered to maintain fluid balance. • Encourage fluids when acute diarrhea subsides to maintain fluid balance. • Teach patient signs and symptoms of dehydration to report to allow prompt treatment.

Irritable bowel syndrome

Pathophysiology

Irritable bowel syndrome (IBS) is not a disease but rather a functional problem. The colon mucosa is not damaged by the condition, and there is no increased risk of colorectal cancer. IBS is a disorder of altered intestinal motility in which the colon muscle contracts more easily. It contracts in a disorderly way that can be violent and last for long times or , at times, it may not contract at all. The abnormal contractions lead to changes in bowel patterns. Thus, the disorder may be classified as IBS with diarrhea, IBS with constipation, or IBS with mixed diarrhea and constipation.

Etiology

There is a hereditary tendency for IBS. IBS is more common in women than men and in those who are young to middle-aged. Flare-ups can be caused by other illnesses, infections, or the menstrual cycle

Signs and Symptoms

IBS is characterized by reports of gas, bloating, constipation, diarrhea, or alternating constipation and diarrhea. The patient also has feelings of abdominal bloating, with or without visible abdominal distention. Other symptoms include the rectal passage of mucus, a feeling of incomplete evacuation, abdominal pain, depression, anxiety, and palpitations.

Diagnostic Tests

Diagnosis of IBS is made based on history and physical examination along with stool examination, colonoscopy, and sigmoidoscopy to rule out other disorders. Avoiding milk products for a time may be advised to rule out lactose intolerance

Therapeutic Measures

IBS is a chronic condition, but symptoms can generally be controlled through lifestyle, diet, stress management, and medication. A high-fiber and high-bran diet (psyllium [Metamucil] or methylcellulose [Citrucel]) may help to form softer , larger stools but may increase other symptoms in some people. Eating smaller, frequent meals can be helpful in reducing bowel contractions.

Nursing Process for the Patient With IBS

Constipation related to irregular motility of GI tract

• Assess normal pattern of defecation, diet and fluid intake, and medications to help identify factors contributing to constipation for planning care. • Increase fluid intake, if not contraindicated, to 2 to 3 L per day to prevent hard stools. • Teach patient about the benefits of increasing fiber and bran in the diet to promote soft, larger stools that are easier to pass. • Give medication as ordered to control symptoms.

Diarrhea related to irregular motility of GI tract

• Obtain history including medications regarding diarrhea episodes to help identify cause. • Monitor and record stool characteristics, amount, and frequency to plan care. • Give antidiarrheal medications as ordered. Controlling diarrhea controls comfort and fluid balance. • Limit caffeine intake because it stimulates intestinal motility. • Keep skin clean, dry, and protected with a moisture barrier, such as petrolatum or medicated ointment, after each bowel movement to protect perianal skin from contact with liquid stools and their enzymes


Thank You!

Adult 1

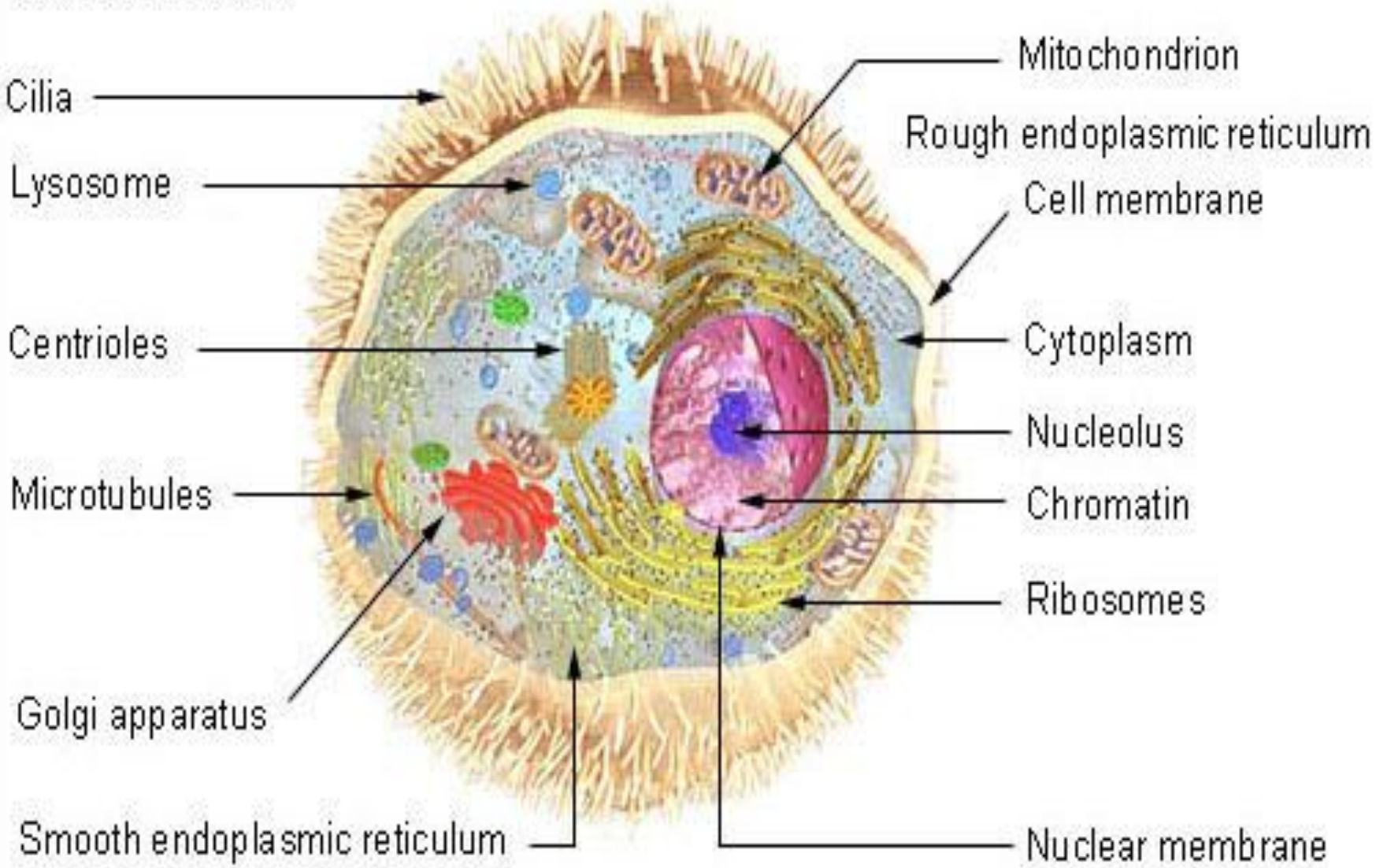
Dr. Harith Al-Aubaidy

الدكتور

حارث فتحي العبيدي

Cancer

Cell Structure



Cell Structure

Cells are the smallest living structural and functional subunits of the body. Although human cells vary in size, shape, and certain metabolic activities, they have many characteristics in common.

- Human cells have a plasma membrane, cytoplasm (cytosol, organelles), and a nucleus. Organelles are specific in structure and function. Variations in the relative amounts of organelles and cell features allow great diversity in cells, and therefore in tissues.

- **Nucleus**
- The nucleus of a cell is its control center, containing the individual's unique deoxyribonucleic acid (DNA) sequence. Most cells have one central nucleus, although variations exist. DNA coding regions are called genes; a gene is the code for one protein. Not all of the genes in a particular cell are active, only those needed for the proteins required to carry out their specific functions.

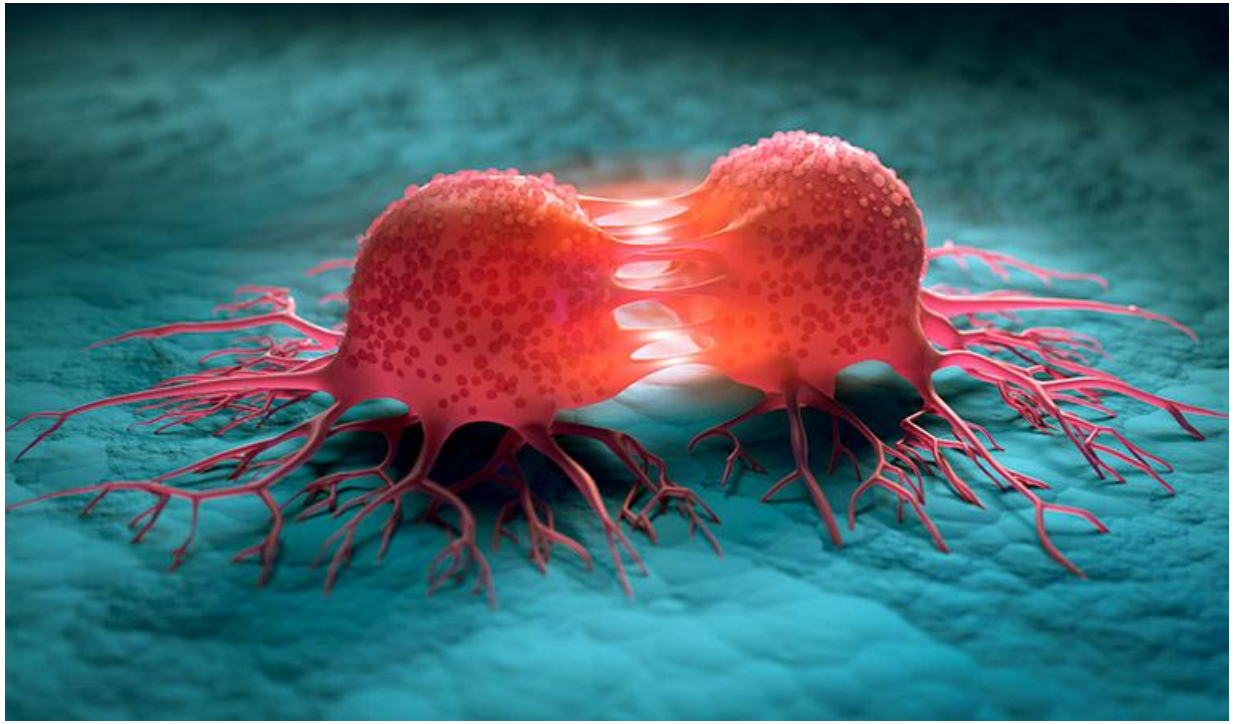
- **Genetic Code and Protein Synthesis**
- The genetic code of DNA is the code for the amino acid sequences needed to synthesize a cell's proteins. The assembly of amino acids into the primary structure of a protein is a twostep process: transcription and translation. Transcription makes a copy of the code needed for a protein so DNA can remain guarded in the nucleus. Translation occurs at the ribosome where the nucleotide code of nucleic acids is translated into the amino acid code of protein

As with any complex process, mistakes are possible. If there is a mistake in the DNA code, the process of protein synthesis may continue, but the resulting protein will not function normally; this is the basis for genetic diseases. DNA mistakes acquired during life are called mutations. A mutation is any change in the DNA code. Ultraviolet rays or exposure to certain chemicals may cause structural changes in the DNA code

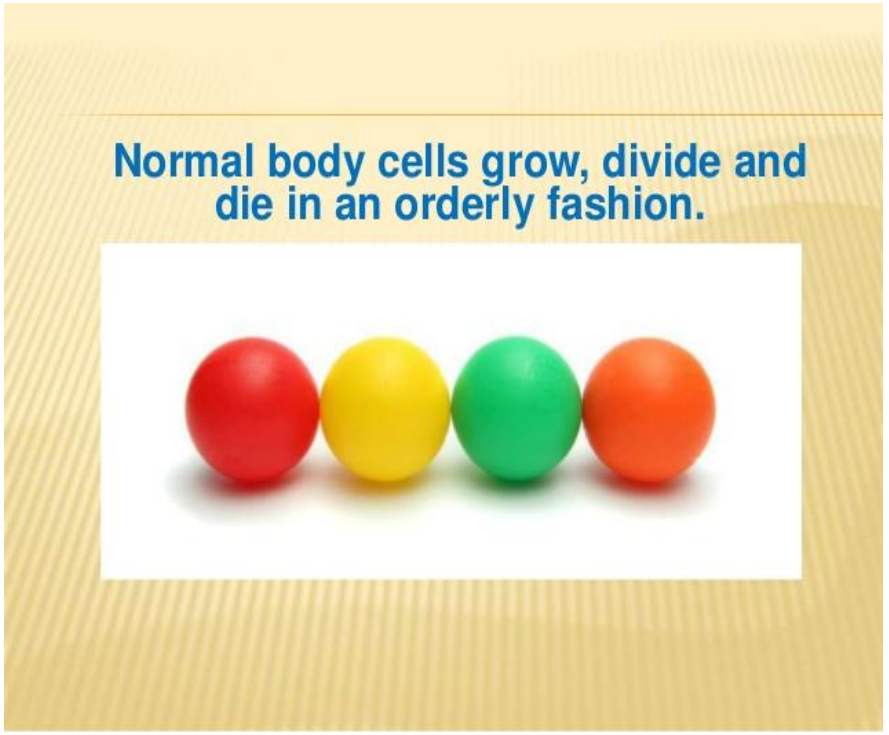
These changes can kill the affected cells or may irreversibly alter their function. Such altered cells can become malignant, being unable to function normally. These cells actively replicate the mutated DNA during division, creating a mass of faulty cells. This is the basis of some forms of cancer

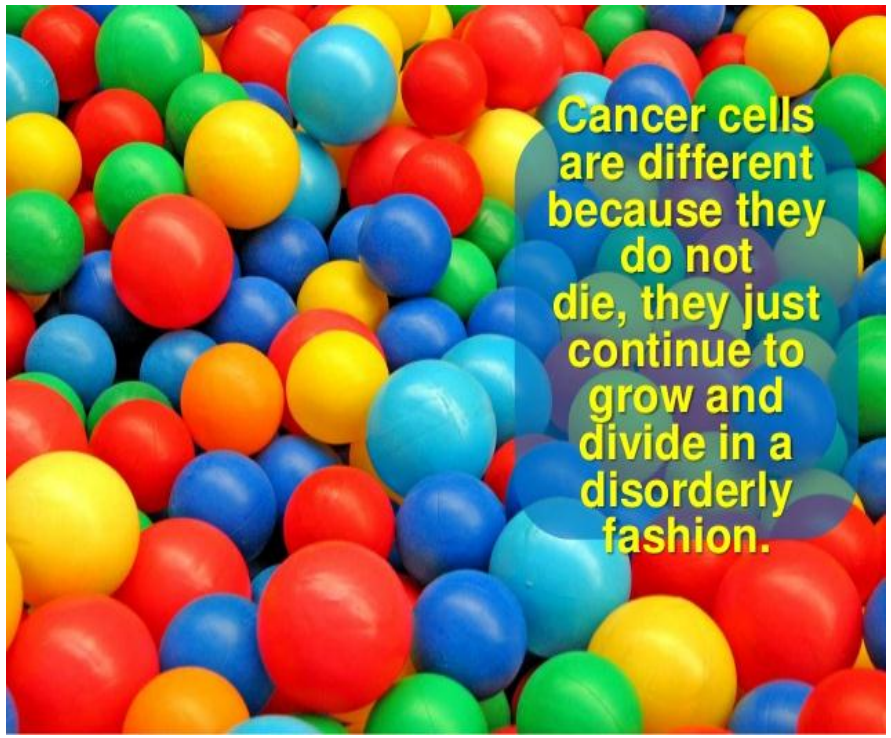
Cancer

Cancer: Cancer is a group of cells that grows out of control, taking over the function of the affected organ. Cancer cells are poorly constructed, loosely formed, and disorganized. A simplistic definition is “confused cell.” An organ with a cancerous tumor eventually ceases to function.



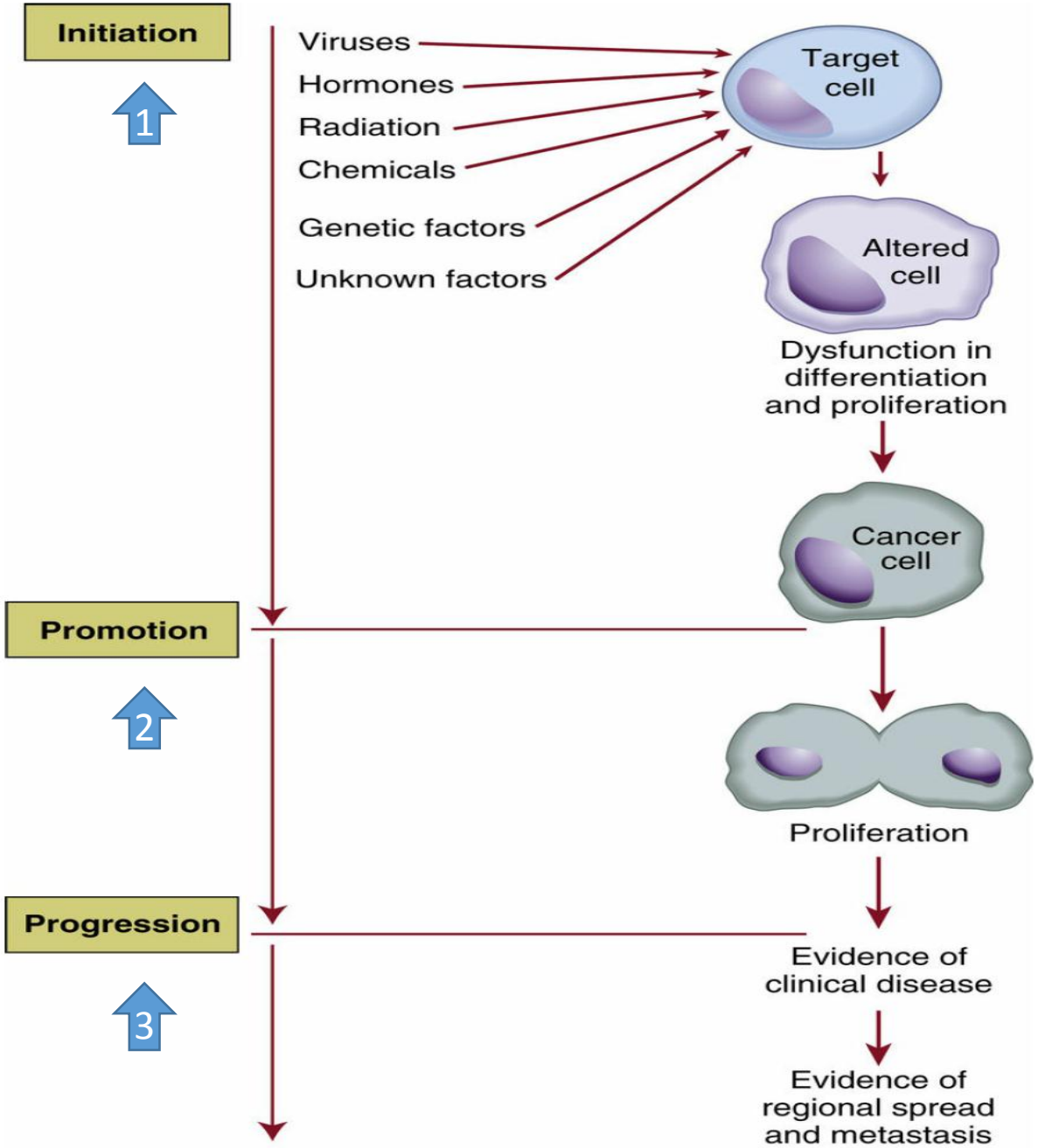
Difference between Normal and Cancer Cell





Cancer can occur at any age, but 67% of cancer deaths occur in people older than 65 years

Development of Cancer Genetic Link



Classification of Cancer

Tumors can be classified according to:

1. Anatomic site: Cancers are usually named according to the site of the primary tumor or to the type of tissue involved.

Benign Tumor

- **Lipoma** → **Fat tissue**
- **Fibroma** → **Fibrous connective tissue**
- **Leiomyomas** → **Smooth muscle tissue**

Benign tumor: Cells are confined to one area and are not able to spread to other parts of the body. This is not cancer.

Malignant Tumor

- **Leukemia and lymphoma** → **Blood-forming tissues: lymphoid tissue, plasma cells, and bone marrow.**
- **Melanoma** → **Pigment cells in the skin**
- **Carcinoma** → **Skin; glands; linings of digestive, urinary, and respiratory tracts**
- **Sarcoma** → **Bone, muscle, other connective tissue**

Malignant tumor: This is made up of cancerous cells, which have the ability to spread by travelling through the bloodstream or lymphatic system (lymph fluid).

COMPARING BENIGN AND MALIGNANT TUMORS

	Benign	Malignant
Growth rate	Typically slow expansion	Often rapid growth; malignant cells infiltrate surrounding tissue
Cell features	Typical of the tissue of origin	Atypical in varying degrees compared with the tissue of origin; altered cell membrane; contain tumor-specific antigens
Tissue damage	Minor	Often causes necrosis and ulceration of tissue
Metastasis	Not seen; remains localized at site of origin	Often spreads to form tumors in other parts of the body
Recurrence after treatment	Seldom recurs after surgical removal	Recurrence can be seen after surgical removal and following radiation and chemotherapy
Prognosis	Not injurious unless location causes pressure or obstruction to vital organ	Death if uncontrolled

Incidence of Cancer

Cancer affects all age groups, although the incidence is higher in people aged 60 to 69 years. The second highest age group is ages 70 to 79. Men have a higher incidence of cancer than women. Cancer in people over age 60 is thought to occur from a combination of exposure to carcinogens and weakening of the body's immune system.

Grading and staging of cancer

3. Extent of Disease Classification

- Stage 0: Cancer in situ
- Stage I: Tumor limited to the tissue of origin; localized tumor growth
- Stage II: Limited local spread
- Stage III: Extensive local and regional spread
- Stage IV: Metastasis

TNM Classification System

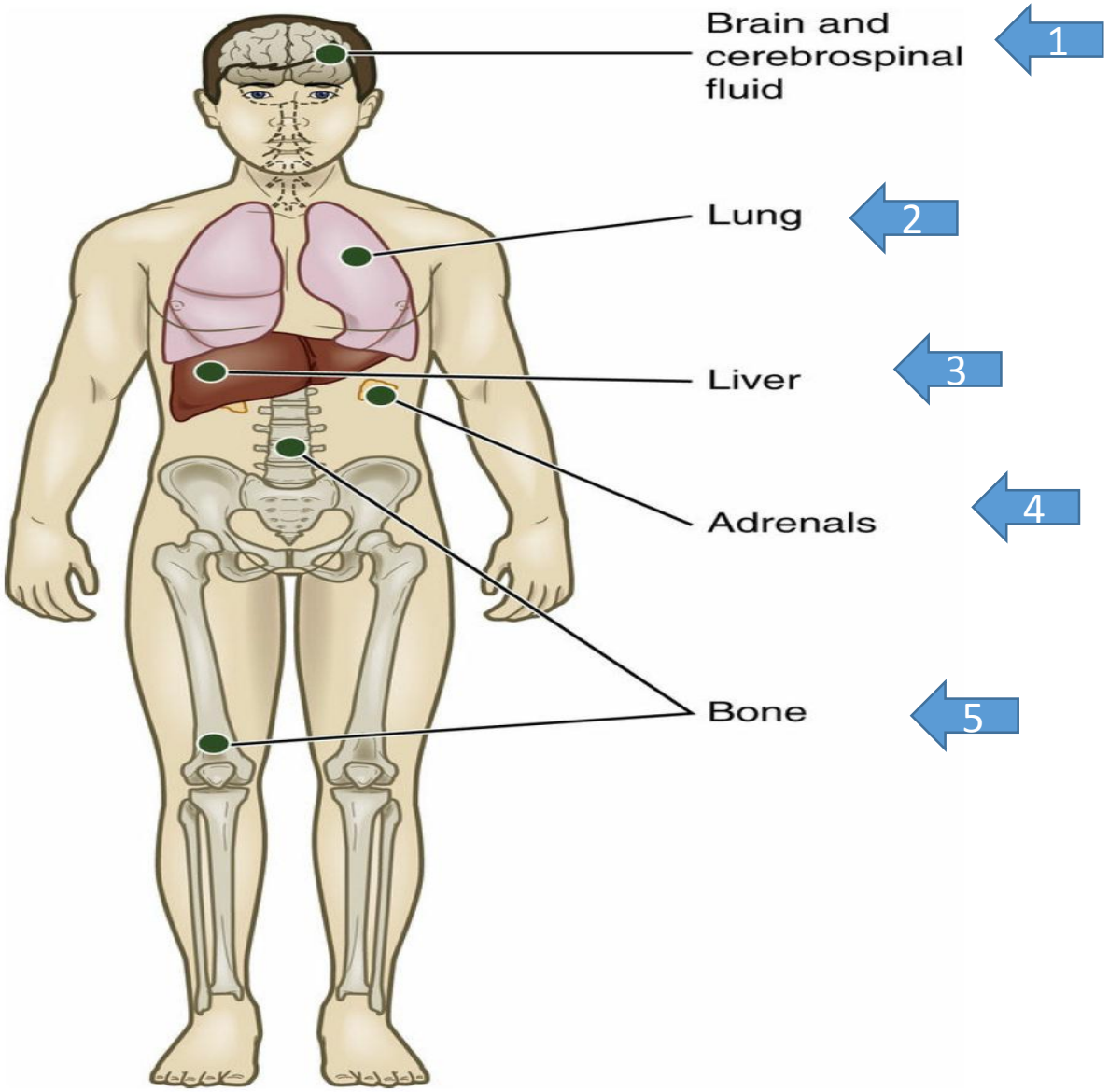
Primary Tumor (T)	
T_0	No evidence of primary tumor
T_{is}	Carcinoma in situ
T_{1-4}	Ascending degrees of increase in tumor size and involvement
T_x	Primary Tumor cannot be evaluated
Reginal Lymph Node (N)	
N_0	No evidence of disease in lymph nodes
N_{1-3}	Ascending degrees node involvement
N_x	Reginal lymph nodes unable to be assessed clinically
Distance Metastases (M)	
M_0	No evidence of distant metastases
M_{1-4}	Ascending degrees of metastatic involvement including distant nodes
M_x	Cannot determined

Cancer Metastasis

Cancer cells may spread from their origin site in a process called metastasis. Cancer cells metastasize in three ways:

1. By circulation through the bloodstream and lymphatic system
2. By accidental transplantation during surgery or other invasive procedures
3. By spreading to adjacent organs and tissues.

Main sites of metastasis



Diagnosis of cancer

BIOPSY. Accurate identification of a cancer can be made only by biopsy. Microscopic examination of a sample of suspected tissue or aspirated body fluid can confirm the presence of mutant cells. A

RADIOLOGICAL PROCEDURES. X-ray examination is a valuable diagnostic tool in detecting cancer of the bones and hollow organs

NUCLEAR IMAGING PROCEDURES. Nuclear medicine imaging involves camera imaging of organs or tissues containing radioactive media

ULTRASOUND PROCEDURES. Ultrasonography helps detect tumors of the pelvis and breast

MAGNETIC RESONANCE IMAGING. Magnetic resonance imaging (MRI) is valuable in the detection, localization, and staging of malignant tumors in the central nerv ous system, spine, head, and musculoskeletal system.

ENDOSCOPIC PROCEDURES. An endoscopic examination allows the direct visualization of a body ca vity or opening. Endoscopy enables the surgeon to biopsy tissue and is used to detect lesions of the throat, esophagus, stomach, colon, and lungs

LABORATORY TESTS. For normal values for the following laboratory tests, see Appendix B. Blood, serum, and urine tests are important in establishing baseline v alues and general health status. An elevated white blood cell (WBC) count is expected if the patient has e vidence of infection

CYTOLOGICAL STUDY. Cytology is the study of the formation, structure, and function of cells. Cytological diagnosis of cancer is obtained mainly through Pap smears of cells shed from a mucous membrane (e.g., cervical, anal, or oral).

Injectable chemotherapy medications

Antitumor Antibiotics Damage cells' DNA and the ability to make DNA and RNA.

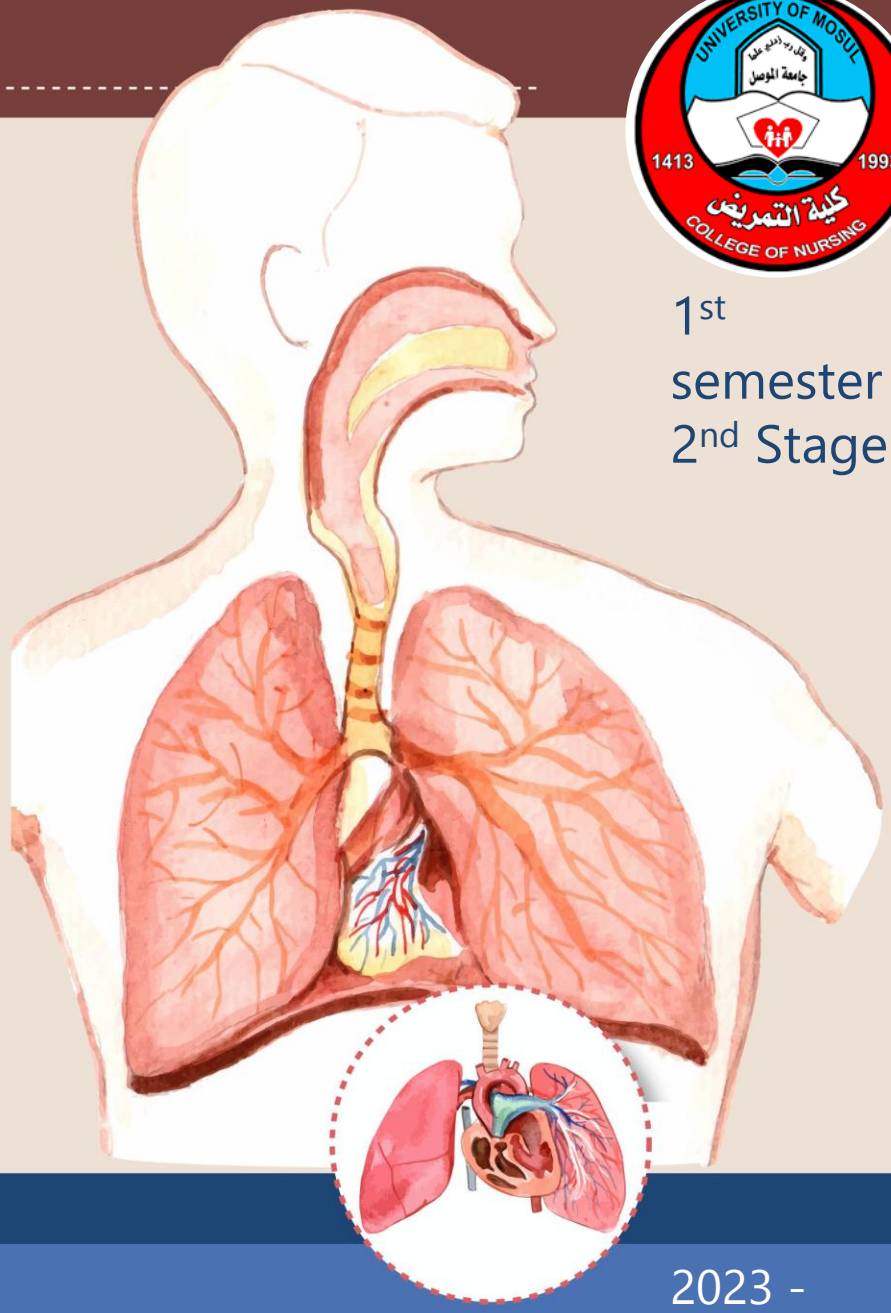
Antimetabolites; gemcitabine (Gemzar)

Alkylating Agents Cause the DNA strands to bind together and prevent the cell from dividing. cyclophosphamide (Cytoxan)

Monoclonal Antibodies Bind to receptor sites on cancer cells to inhibit proliferation; gemtuzumab (Mylotarg),

Thank You

Nursing management for patients with respiratory disorders



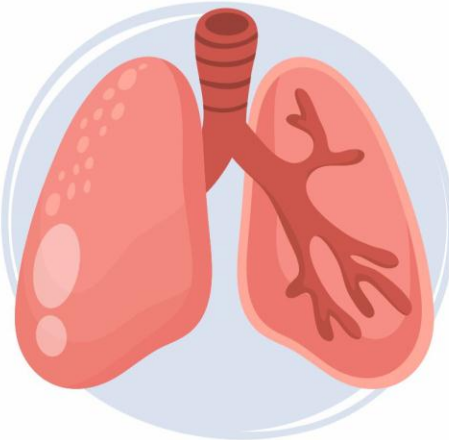
1st semester
2nd Stage

Presented by:
Tameem Thamir

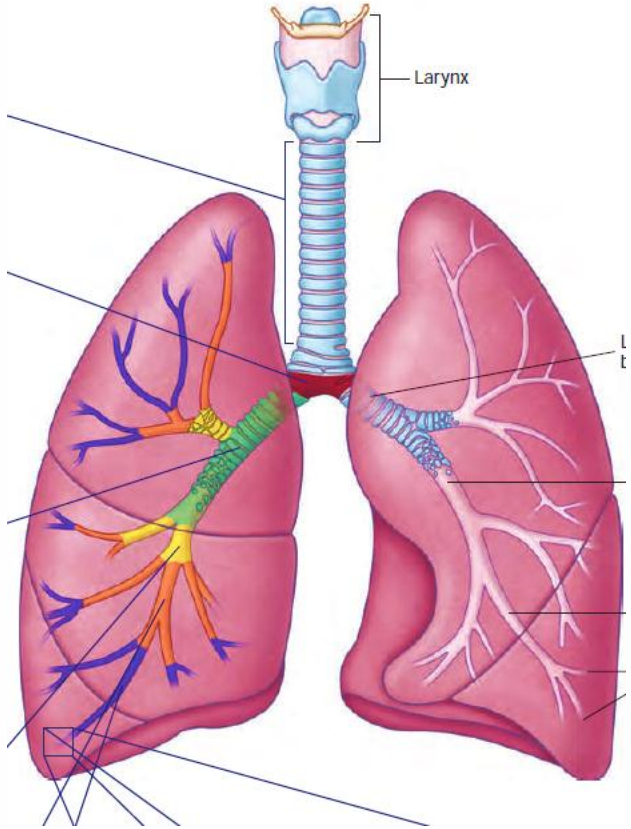
2023 - 2024

Anatomy and Physiology

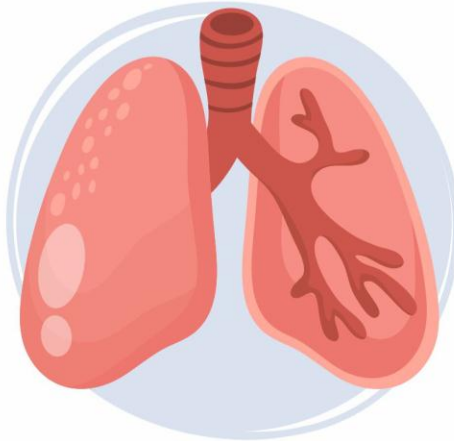
The respiratory system divided into upper and lower respiratory portions.



- Nose and Nasal Cavities
- Pharynx
- Larynx
- Trachea and Bronchial Tree
- Lungs and Pleural Membranes



Mechanism of Breathing

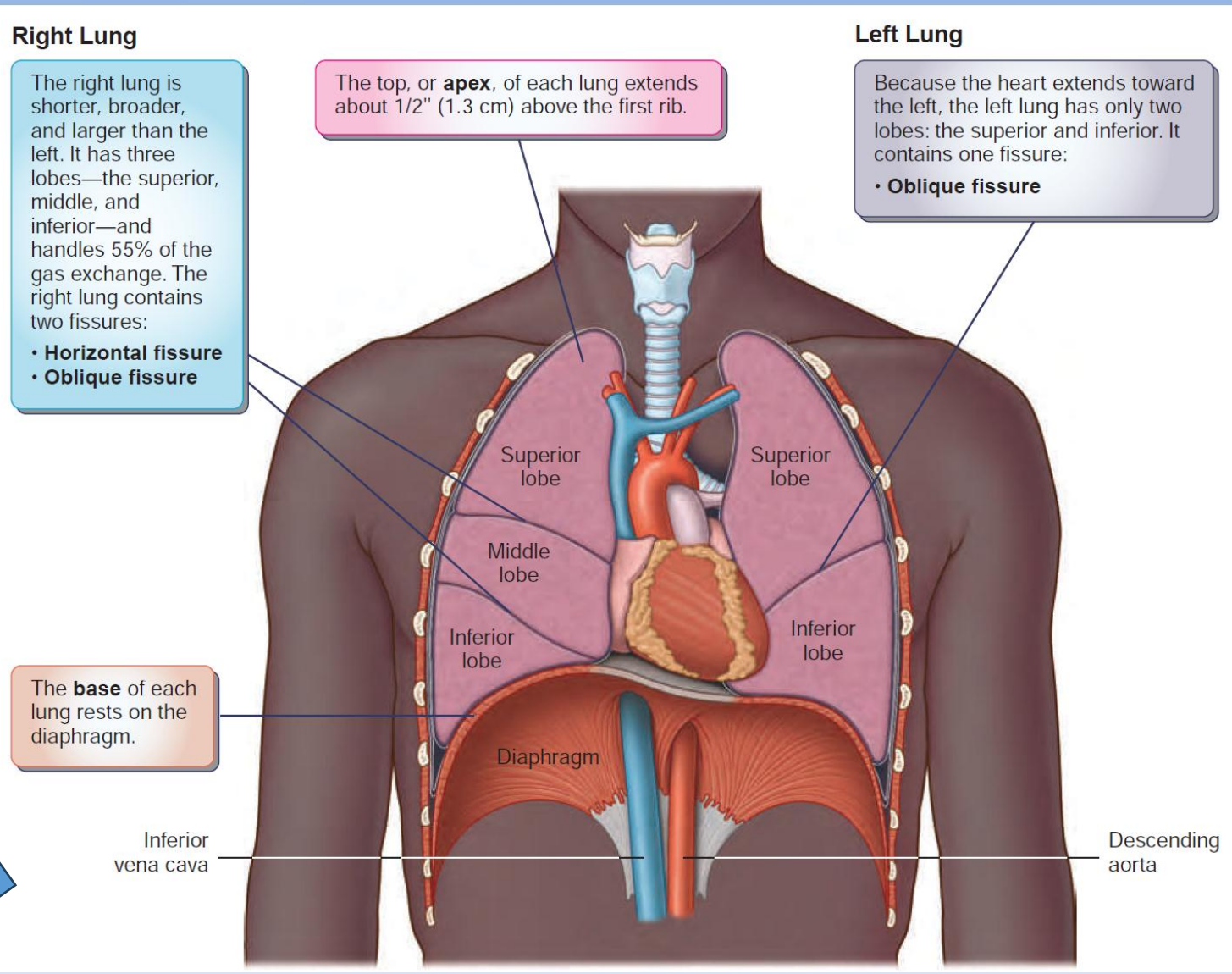


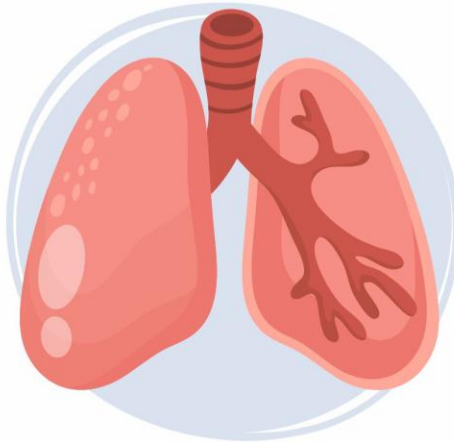
Ventilation: is the term for the movement of air into and out of the alveoli.

Inhalation also called inspiration: occurs when motor impulses from the medulla cause contraction of the respiratory muscles.

Exhalation: Normal exhalation is a passive process. The lungs are compressed as the thoracic cavity reduces volume and the recoil of the elastic lung tissue compresses the alveoli.

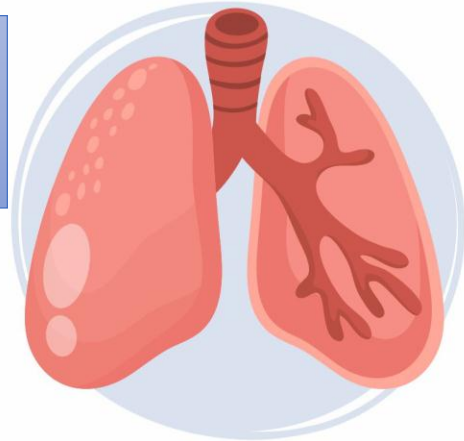
Mechanism of Breathing





Transport of Gases in the Blood

98.5% of oxygen is carried in the blood, bound to iron of hemoglobin (Hgb) in red blood cells (RBCs).



↓

Oxyhemoglobin is formed in the lungs

↓

where the partial pressure of oxygen (PO2) is high

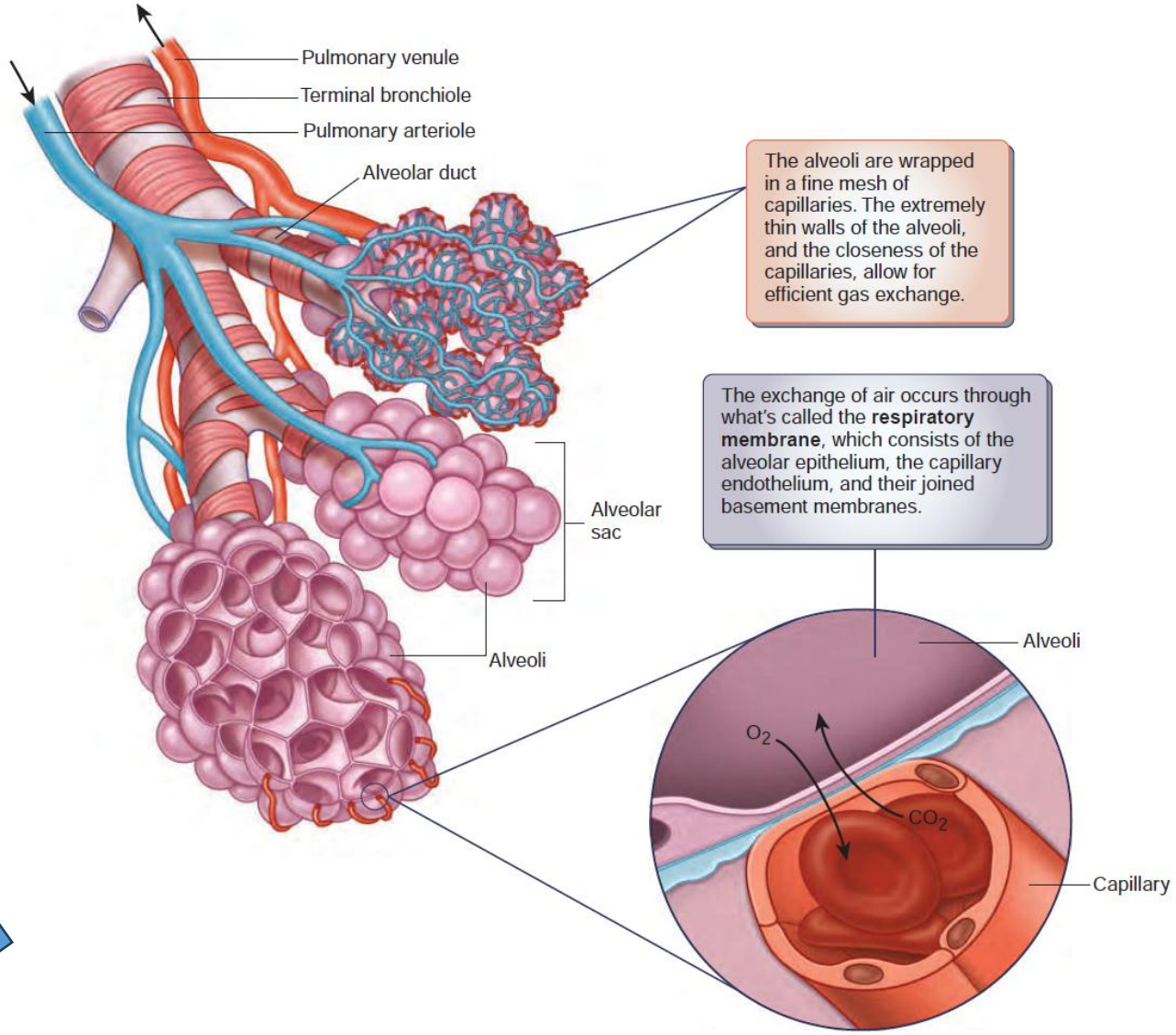
↓

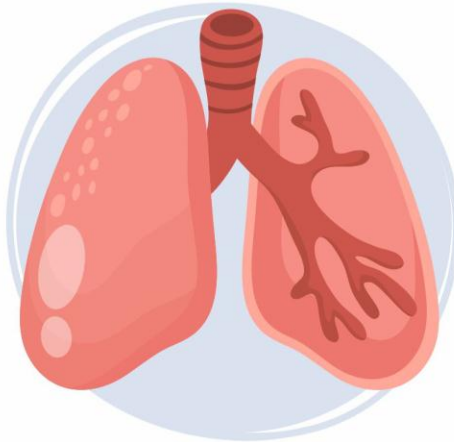
In tissues where the PO2 is low, hemoglobin releases much of its O2.

↓

The remaining oxygen is dissolved in the plasma.

Transport of Gases in the Blood

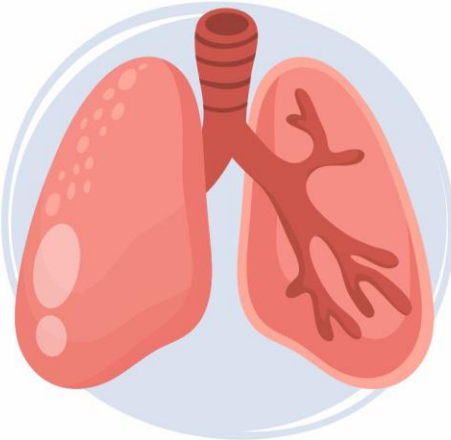




05

Respiration and Acid–Base Balance

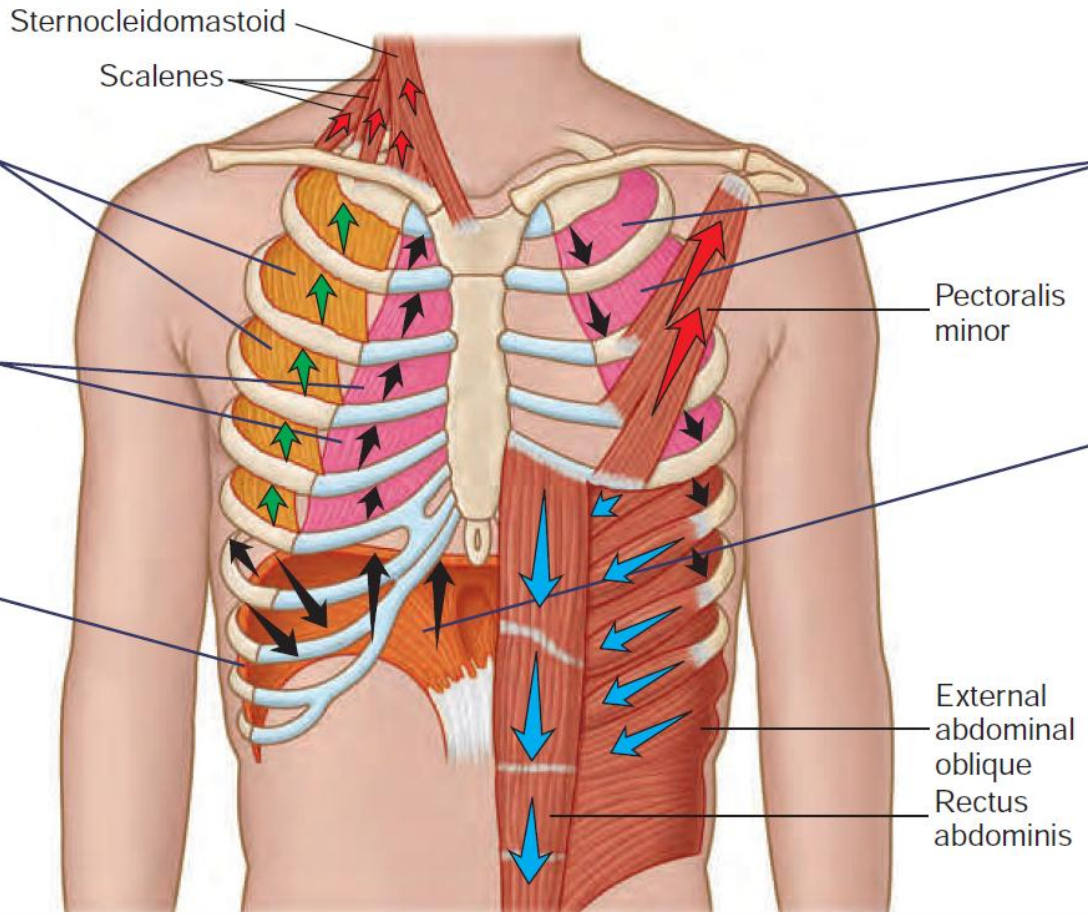
The respiratory system is important in the maintenance of acid–base balance, measured by blood pH. Any decrease in the rate or efficiency of respiration permits excess carbon dioxide to accumulate in the blood



Respiration and Acid–Base Balance

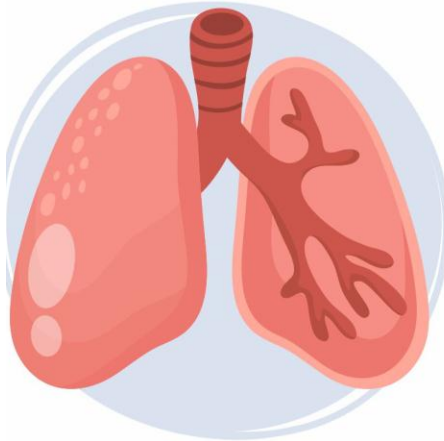
Inspiration

- The **external intercostal** muscles pull the ribs upward and outward, widening the thoracic cavity.
- The **internal intercostals** help elevate the ribs.
- The **diaphragm** contracts, flattens, and drops, pressing the abdominal organs downward and enlarging the thoracic cavity.
- Air rushes in to equalize pressure.

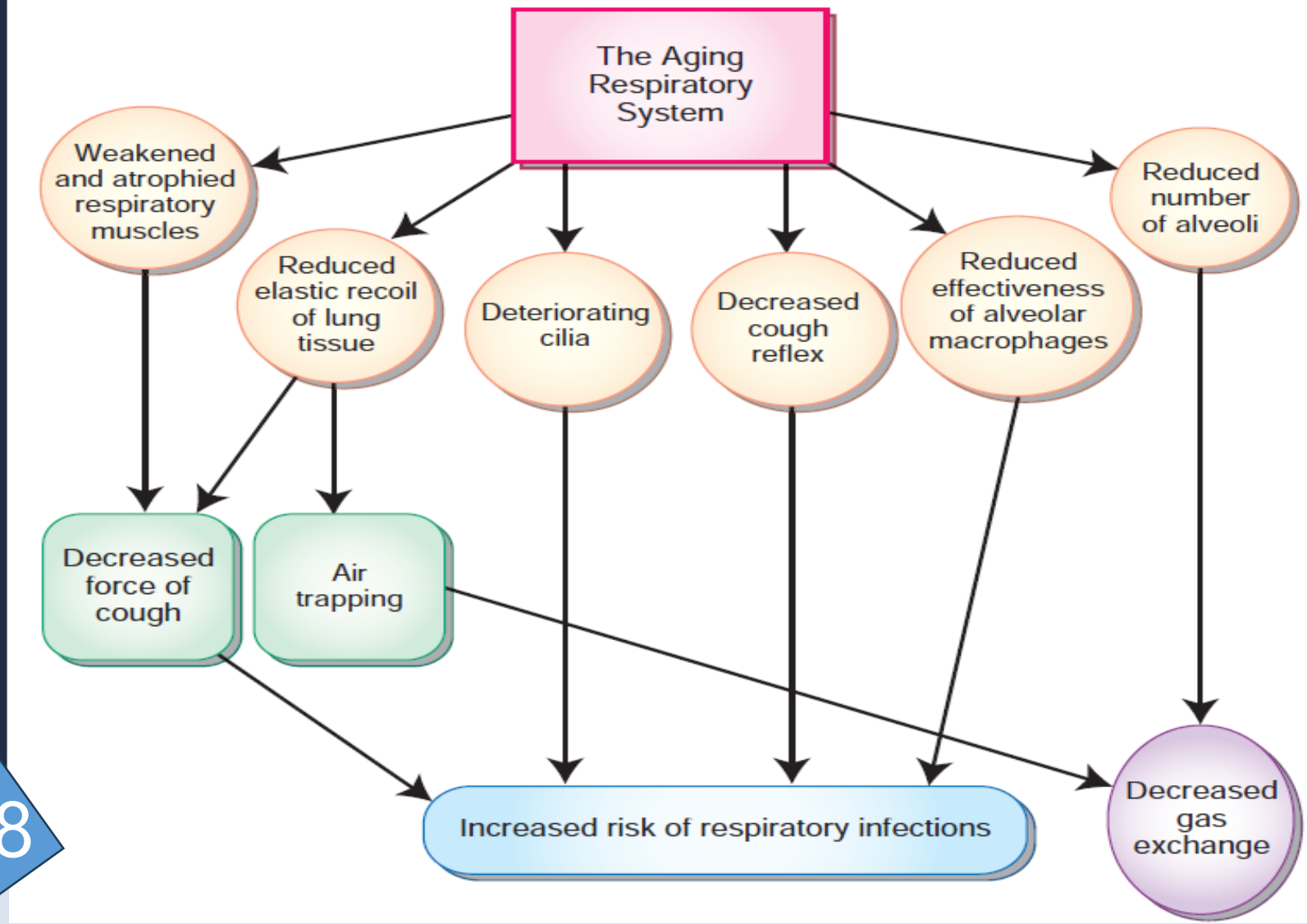


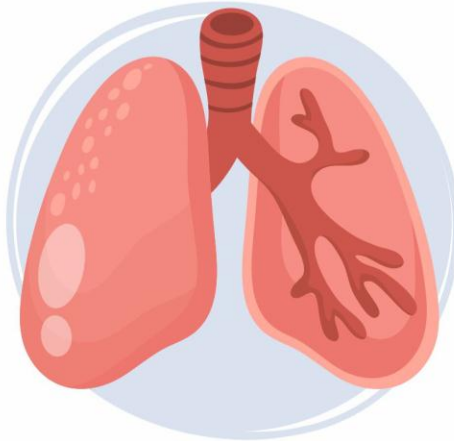
Expiration

- The **internal intercostal** muscles pull the ribs downward as the external intercostals relax.
- The **diaphragm** relaxes, bulging upward and pressing against the base of the lungs, reducing the size of the thoracic cavity.
- Air is pushed out of the lungs.



Effects of Aging on the Respiratory System

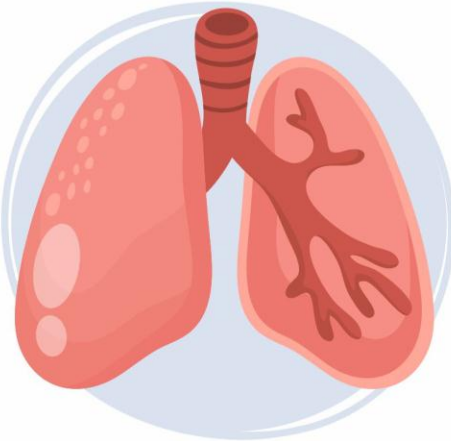




Nursing Assessment of the Respiratory System

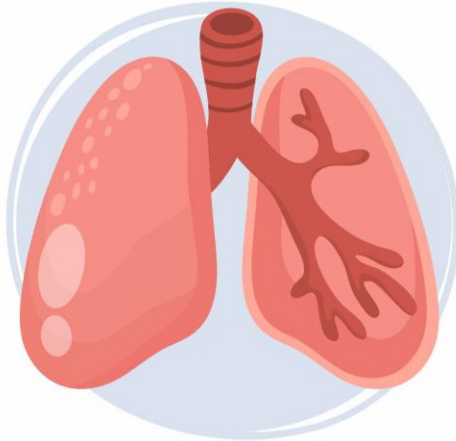
TABLE 29.2 SUBJECTIVE DATA COLLECTION FOR THE RESPIRATORY SYSTEM

Category	Questions to Ask During the Health History	Rationale/Significance
Upper Respiratory Tract	Do you often have headaches or sinus tenderness? Do you often experience nosebleeds? Has your voice changed?	These may indicate sinusitis. A history of nosebleeds may indicate an abnormality that can predispose to future nosebleeds. A voice change may indicate a variety of disorders of the nose or throat, including cancer.
Lower Respiratory Tract	Do you ever feel short of breath, like you can't get enough air? Do you have a cough? Is it productive? What does the sputum look like? Have you recently experienced night sweats, chills, or fever? Do you ever feel confused, lightheaded, or restless? Have you had any chest surgeries?	Many respiratory and cardiac problems result in shortness of breath. A cough indicates respiratory irritation or excessive secretions. Yellow, tan, or green sputum may accompany an infection. Blood in the sputum is usually serious; it can occur with pneumonia, tuberculosis, pulmonary embolism, or cancer. These are symptoms of tuberculosis. These symptoms might indicate a low PO_2, reducing oxygen to the brain. This may reveal problem areas the patient has not yet mentioned.



Nursing Assessment of the Respiratory System

Physical Examination



Inspection

Retraction

cyanosis

apnea

Palpation

Respiratory excursion

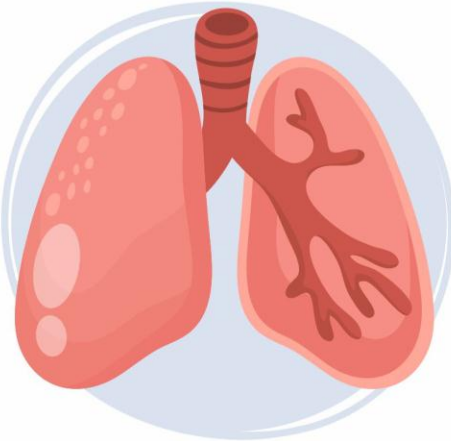
Percussion

Auscultation

Nursing Assessment of the Respiratory System

TABLE 29.4 ABNORMAL LUNG SOUNDS

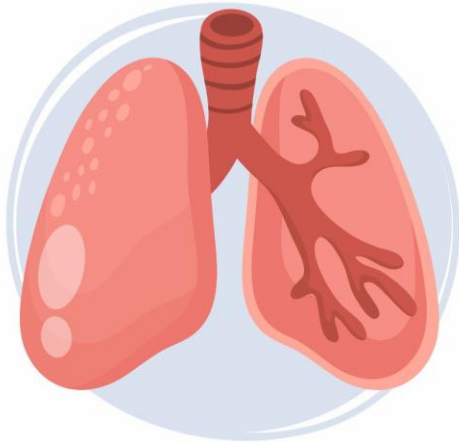
Abnormal (Adventitious) Sound	Cause of Sound	Description	Associated Disorders
Coarse crackles (sometimes called rales)	Fluid in airways	Moist bubbling sound, heard on inspiration or expiration	Pulmonary edema, bronchitis, pneumonia
Fine crackles (rales)	Alveoli popping open on inspiration	Velcro being torn apart, heard at end of inspiration	Heart failure, atelectasis
Wheezes	Narrowed airways	Fine high-pitched violins mostly on expiration	Asthma
Stridor	Airway obstruction	Loud crowing noise heard without stethoscope	Obstruction from tumor or foreign body
Pleural friction rub	Inflamed pleura rubbing together	Sound of leather rubbing together; grating sound	Pleurisy, lung cancer, pneumonia, pleural irritation
Diminished	Decreased air movement	Faint lung sounds	Emphysema, hypoventilation, obesity, muscular chest wall
Absent	No air movement	No sounds heard	Pneumothorax, pneumectomy



Nursing Assessment of the Respiratory System

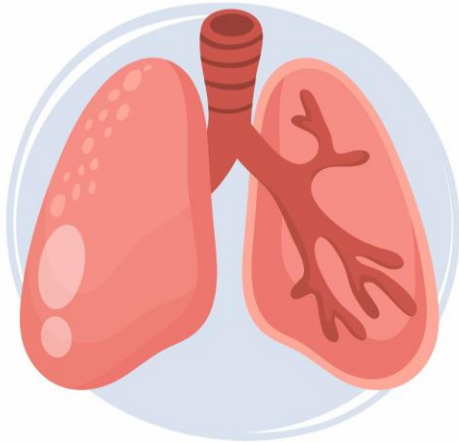
TABLE 29.6 ARTERIAL BLOOD GAS ANALYSIS

	Normal Values	Interpretation
PaO_2	75–100 mm Hg	↑ in hyperventilation ↓ in impaired respiratory function
$PaCO_2$	35–45 mm Hg	↑ in impaired gas exchange ↓ in hyperventilation
pH	7.35–7.45	↑ in respiratory alkalosis with low $PaCO_2$ ↓ in respiratory acidosis with high $PaCO_2$
HCO_3^-	22–26 mEq/L	↑ to buffer $PaCO_2$ in acidosis ↓ to buffer $PaCO_2$ in alkalosis
Oxygen saturation	95%–100%	↓ in impaired respiratory function



Nursing Assessment of the Respiratory System

Diagnostic Tests



- *Arterial Blood Gas Analysis.*
- *D-DIMER.*
- *Sputum Culture and Sensitivity*
- *Throat Culture*
- *Nasal Samples*
- *Oxygen Saturation*
- *Chest X-Ray Examination*
- *Computed Tomography*
- *Pulmonary Function Studies*
- *Pulmonary Angiography*
- *Bronchoscopy*

Acute Bronchitis

Bronchitis is an inflammation of the bronchial tree, which includes the right and left bronchi, secondary bronchi, and bronchioles.
Bronchiectasis is a dilation of the bronchial airways.

Pathophysiology

The dilated areas become flabby and scarred.

↓

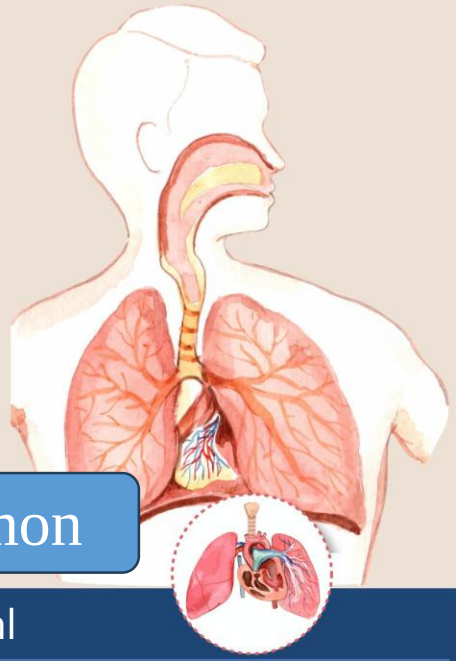
Bronchiectasis can remain localized or spread throughout the lungs.

↓

Secretions pool in these areas and are difficult to cough up.

↓

This creates an environment where bacteria can flourish, and infection is common



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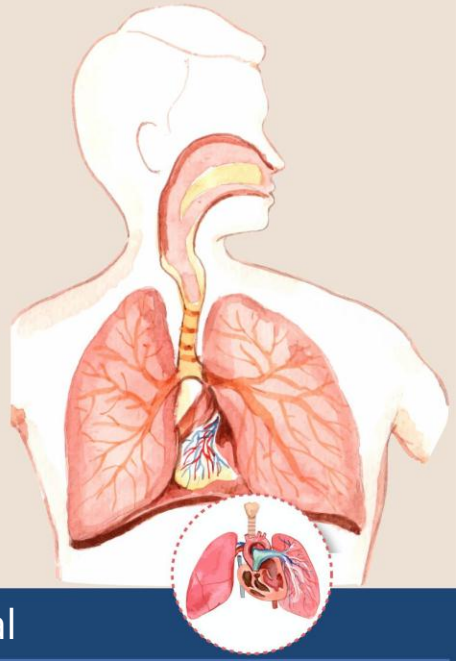
Acute Bronchitis Bronchiectasis

Etiology

chronic respiratory disorder, such as cystic fibrosis, asthma, tuberculosis, bronchitis, or exposure to a toxin.
Airway obstruction from a tumor or foreign body can also be a predisposing factor.

Signs and Symptoms

cough with Sputum (copious and purulent).
Dyspnea
Wheezes and crackles may be auscultated
Fever is present during active infection.



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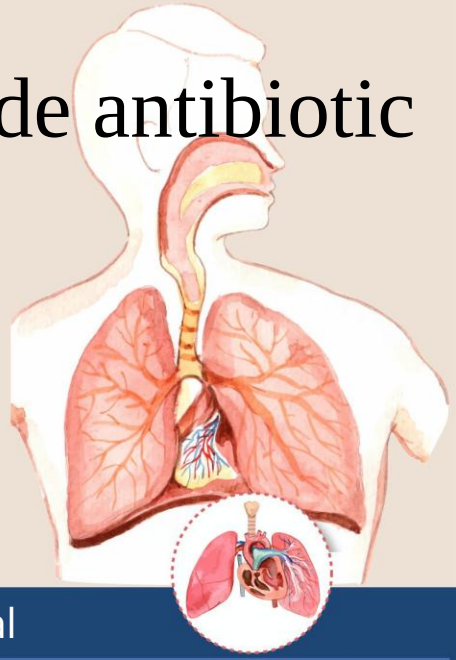
Acute Bronchitis Bronchiectasis

Diagnostic Tests

- A chest x-ray examination
- A computed tomography (CT) scan provides a better view of the dilated airways.
- Bronchoscopy may be done if needed.
- Sputum cultures determine infecting organisms and guide antibiotic therapy.



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Acute Bronchitis Bronchiectasis

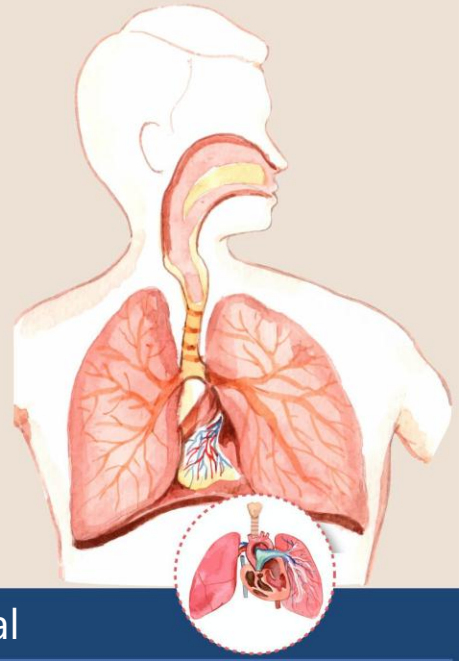
Therapeutic Measures

The aim is to keeping the airways clear of secretions, controlling infection, and correcting the underlying problem.

Antibiotics may be used intermittently or for prolonged periods.

Azithromycin may reduce exacerbations

Bronchodilators improve airway obstruction.



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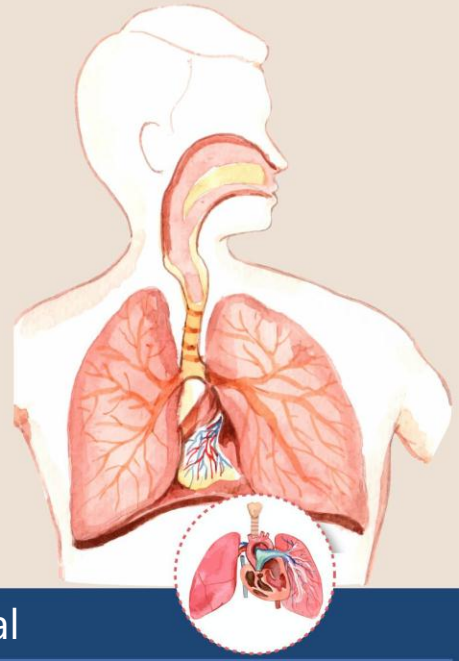
Pneumonia

Pneumonia is the cause of many hospital admissions each year and is a common cause of death from infection.

Pneumonia is categorized according to where it is acquired.

For example,

Hospital-acquired pneumonia (HAP) is defined as pneumonia that develops at least 48 hours after a hospital admission. One type of HAP is ventilatorassociated pneumonia, or VAP



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Pneumonia

Pathophysiology

an infectious agent enters and multiplies in the lungs of a susceptible person.

↓

Infectious particles can be transmitted by the cough of an infected individual

↓

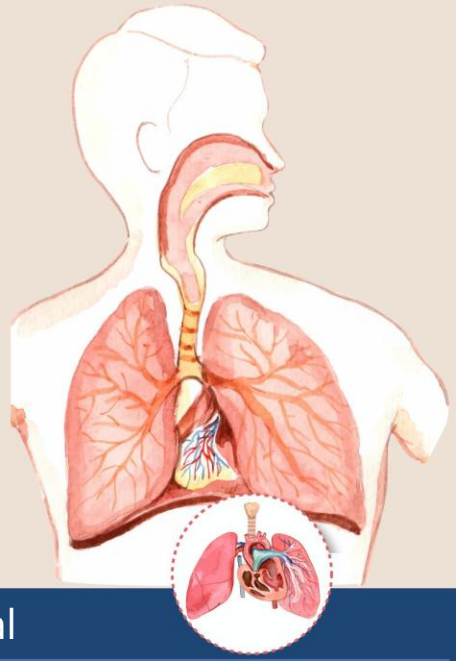
aspiration of bacteria from the mouth, pharynx, or stomach

↓

normal respiratory defense mechanisms and the immune system prevent the development of infection.

↓

In a person who is immunocompromised can cause an infection.



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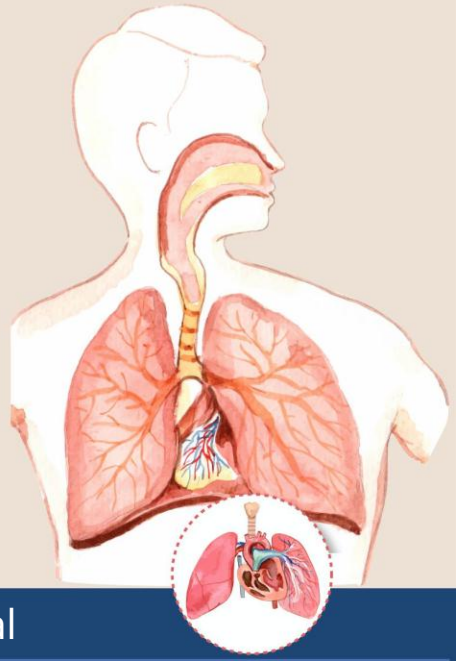
Pneumonia

Etiology

- Bacterial Pneumonia.
- Viral Pneumonia.
- Fungal Pneumonia.
- Aspiration Pneumonia.
- Ventilator-associated Pneumonia.
- Hypostatic Pneumonia.



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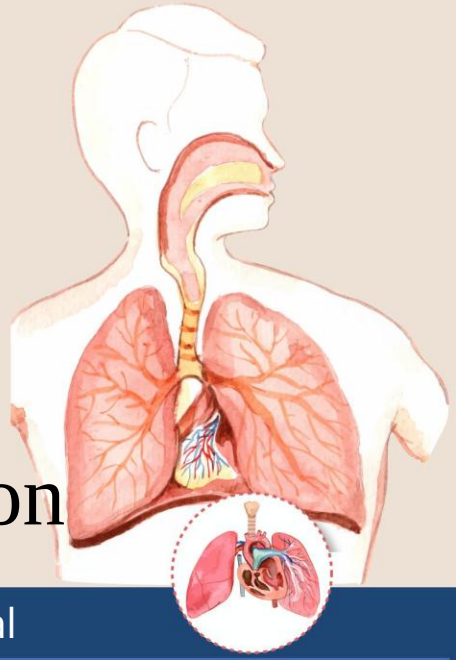
Pneumonia

Signs and Symptoms

- Fever
- Shaking
- Chills
- Chest Pain
- Dyspnea
- Fatigue
- A Productive Cough.
- Crackles and wheezes may be heard on lung auscultation



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Pneumonia

Complications

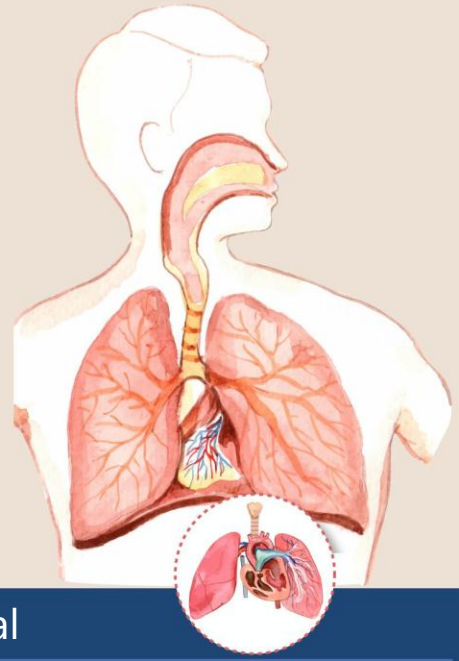
- Pleurisy and
- pleural effusion
- Atelectasis (collapsed alveoli)

Diagnostic Tests

A chest x-ray examination

sputum and blood

cultures are obtained to identify the organism causing the pneumonia and determine appropriate treatment.



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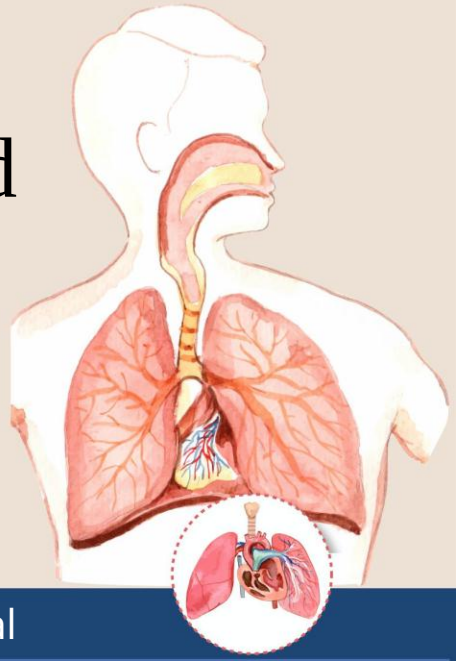
Pneumonia

Therapeutic Measures

- Broad-spectrum antibiotics
- Hospitalization and intravenous (IV) therapy
- Expectorants, bronchodilators, and analgesics
- Nebulized mist treatments
- Supplemental oxygen via nasal cannula or mask is used as needed.



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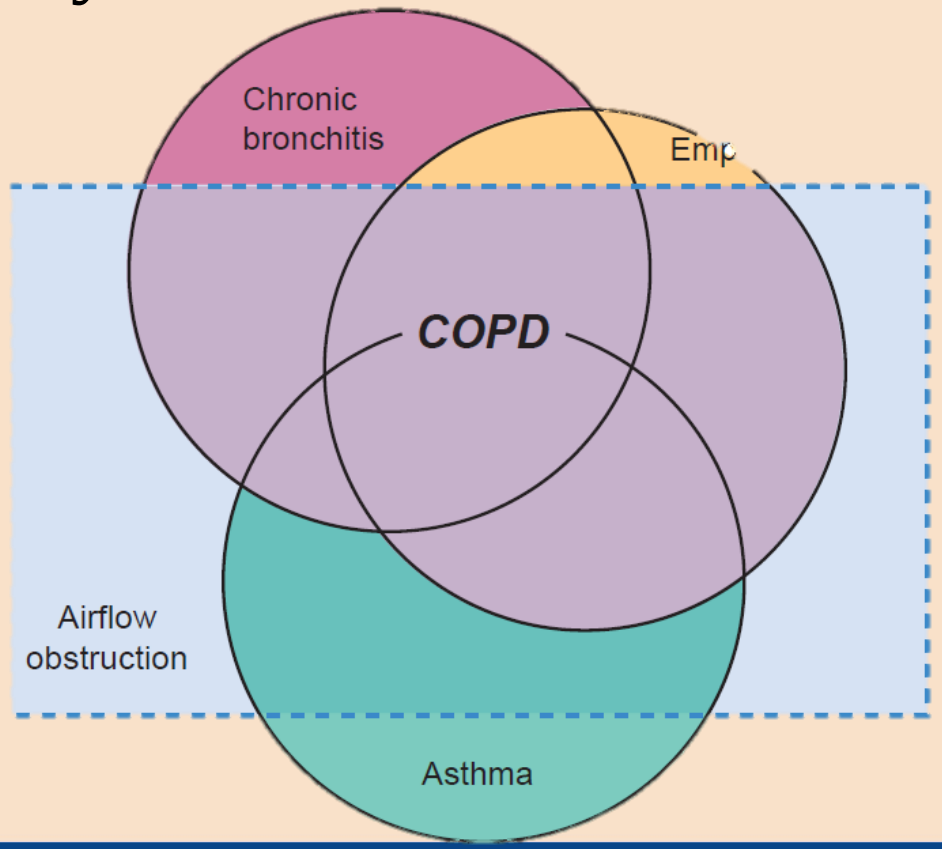
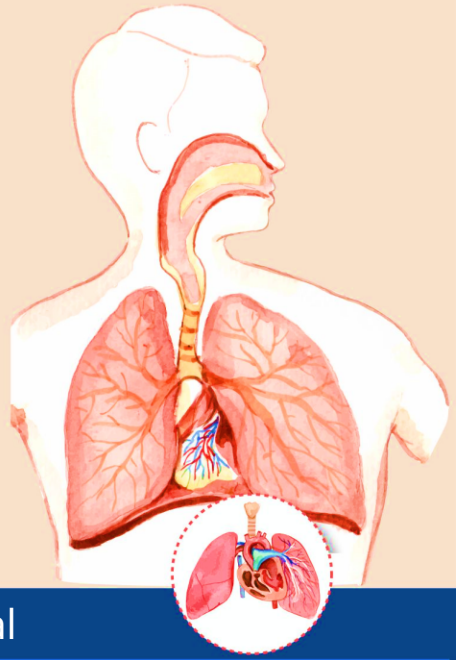
Chronic Obstructive Pulmonary Disease/Chronic Airflow Limitation

Group of pulmonary disorders characterized by difficulty exhaling because of airways that are narrowed or blocked by inflammation and mucus.





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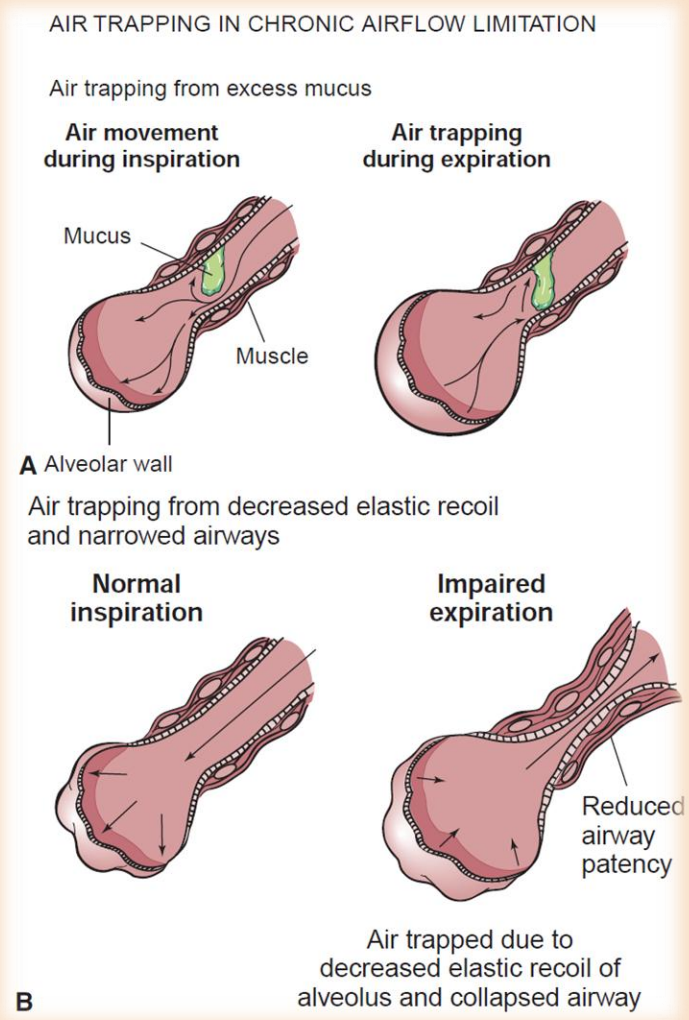
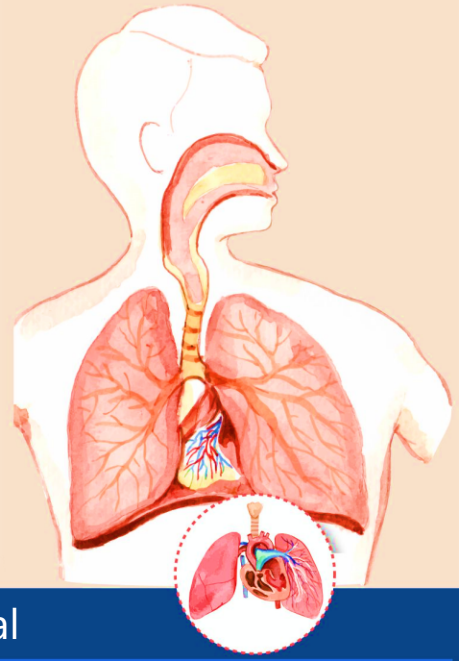
Pathophysiology

the loss of elastic fibers causes an increase in compliance.

↓

More effort is required for the weakened alveoli to push air out through obstructed airways





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CHRONIC BRONCHITIS PATHOPHYSIOLOGY

with symptoms occurring for at least 3 months of the year for 2 consecutive years.

↓

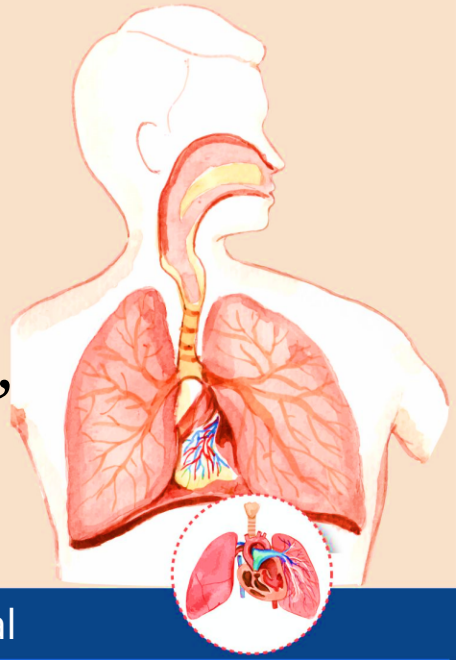
Patients may have multiple exacerbations, each lasting 2 weeks or more.

↓

The bronchial tree becomes inflamed from inhaled irritants, and impaired ciliary function reduces the ability to remove the irritants.

↓

The mucus-producing glands in the airways become hypertrophied, producing excessive thick, tenacious mucus, which obstructs airways



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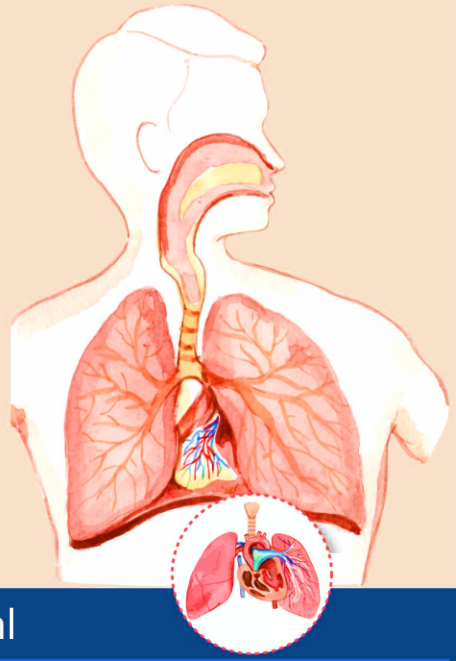
EMPHYSEMA PATHOPHYSIOLOGY

Emphysema affects the respiratory bronchioles and alveoli distal to the terminal bronchioles, causing destruction of the alveolar walls and loss of elastic recoil

Etiology

Smoking is the single most important risk factor for COPD. Other factors include passive (secondhand and possibly thirdhand) smoking, indoor and outdoor air pollution, and exposure to industrial chemicals



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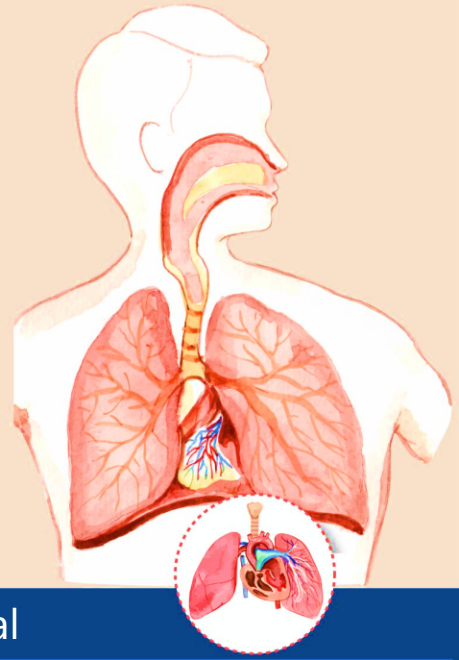
Chronic Obstructive Pulmonary Disease/Chronic Airflow Limitation

TABLE 31.3 COPD SUMMARY

Signs and Symptoms	Cough Chronic sputum production Dyspnea that occurs every day, worsens with exercise Activity intolerance Crackles, wheezes, diminished breath sounds Barrel chest Use of accessory muscles
Diagnostic Tests	Chest x-ray examination, CT scan ABG analysis CBC Sputum analysis Spirometry α_1AT level if hereditary deficiency suspected
Therapeutic Measures	Smoking cessation Bronchodilators (PO, NMT, MDI) Corticosteroids, expectorants Flu and pneumonia vaccinations Supplemental oxygen Breathing exercises Chest physiotherapy Pulmonary rehabilitation
Priority Nursing Diagnoses	*Impaired Gas Exchange* *Ineffective Airway Clearance* *Activity Intolerance*



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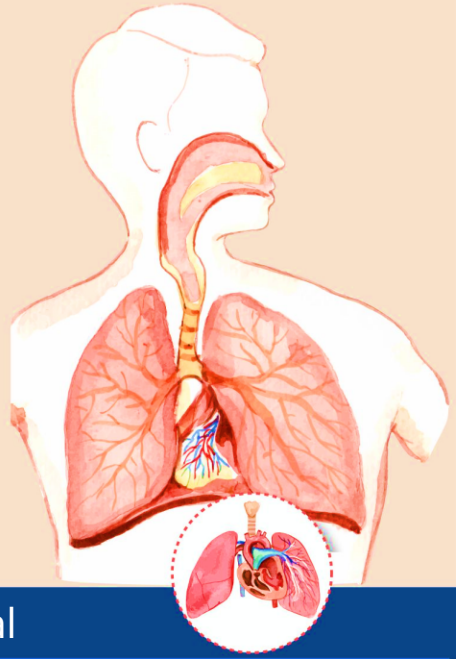
Complications

Some patients with emphysema develop large air spaces within the lung tissue **(bullae)** or adjacent to the pleurae **(blebs)**.

Diagnostic Tests

- Chest x-ray examination
- Blood gas analysis is correlated with the history and physical examination to diagnose COPD.
- Spirometry is essential for diagnosis. Normally, the forced expiratory volume in 1 second (FEV1) is about 70% to 80% of the forced vital capacity (FVC).



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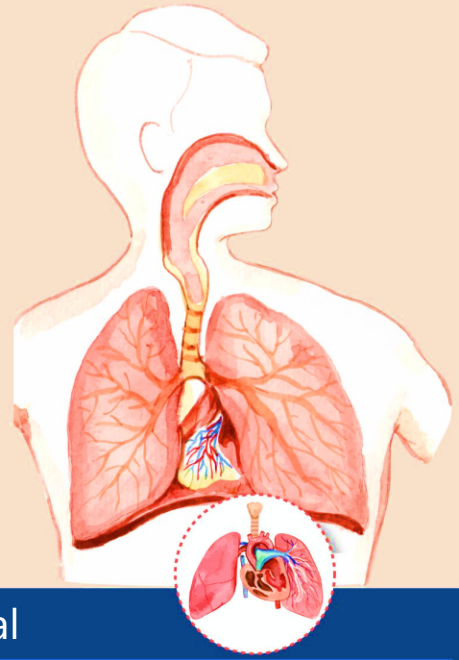
Therapeutic Measures

The goals of COPD treatment, according to the GOLD guidelines, are as follows:

- Relieve symptoms.
- Improve exercise tolerance.
- Improve health status.
- Prevent disease progression.
- Prevent and treat exacerbations.
- Reduce mortality



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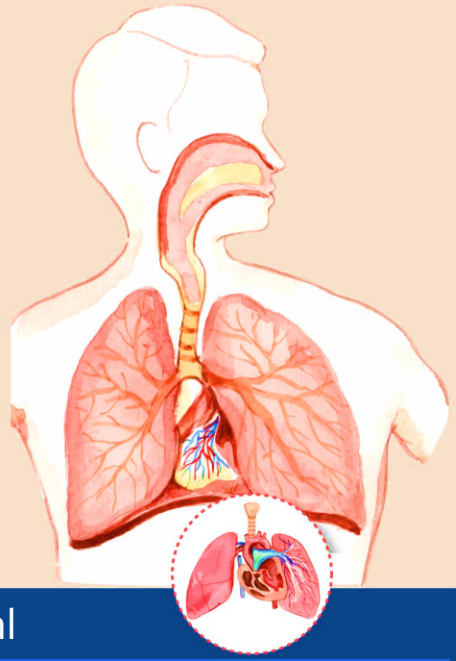
Therapeutic Measures

Smoking Cessation. Even Late In The Disease Process, Stopping Smoking Can Slow Disease Progression And Prolong Life.

Oxygen. Oxygen Therapy Is Usually Delayed Until Grade 4 Disease, And Then Is Used To Keep Spo2 At Or Above 90%.



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Therapeutic Measures

MEDICATIONS

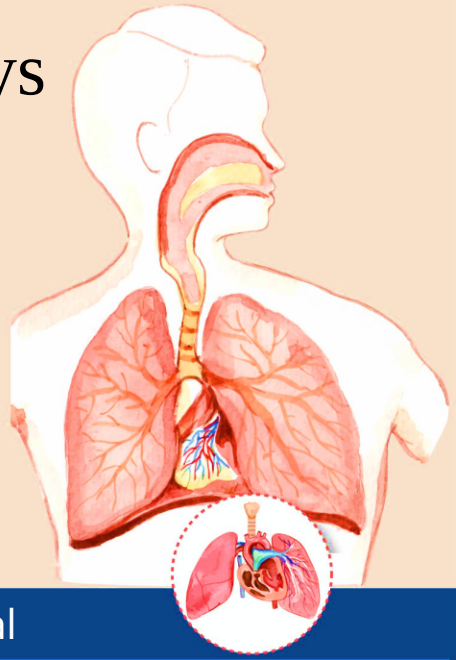
Adrenergic Bronchodilators: Stimulate beta receptors to dilate bronchioles

Anticholinergic Agents: Block parasympathetic response, causing bronchodilation

Methylxanthines: Relax bronchial smooth muscle to dilate airways

Corticosteroids: Reduce inflammation in Airways

Expectorants: Liquefy secretions and stimulate cough



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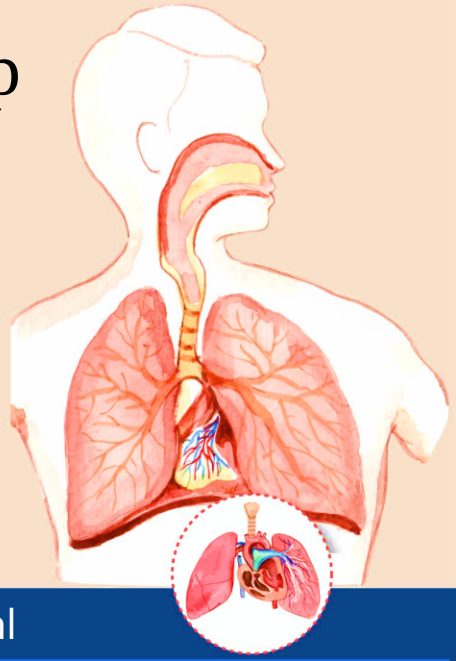
Therapeutic Measures

SUPPORTIVE CARE. A pneumococcal vaccination and yearly influenza vaccinations are recommended to reduce the risk of respiratory infection. Avoidance of crowds and exposure to people with respiratory infections is advised.

REHABILITATION. Pulmonary rehabilitation programs can help patients increase exercise tolerance and maintain a sense of well-being



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NURSING CARE PLAN for the Lower Respiratory Tract Disorder

Nursing Diagnosis: Impaired Gas Exchange related to decreased ventilation or perfusion as evidenced by PaO2 less than 80 mm Hg

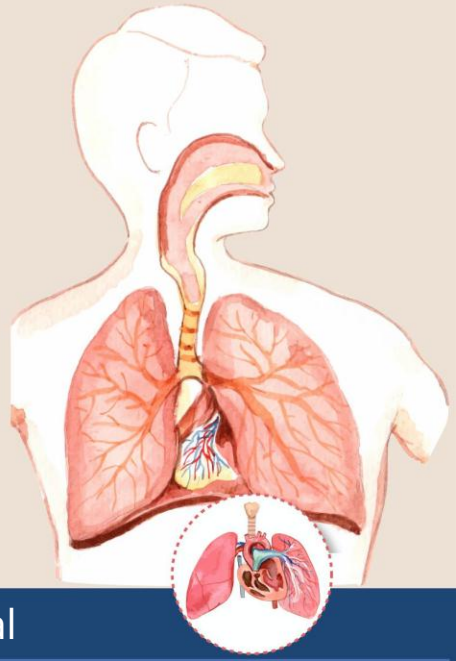
Expected Outcomes: The patient will experience improved gas exchange.

Intervention Monitor arterial blood gas values and pulse oximetry as ordered.

Intervention Assess degree of dyspnea on a scale of 0 to 10, with 0 = no dyspnea and 10 = worst dyspnea.

Intervention Assess lung sounds, respiratory rate and effort, use of accessory

Intervention Observe skin and mucous membranes for cyanosis.



UNDERSTANDING Medical Surgical Nursing, 2018.

NURSING CARE PLAN for the Lower Respiratory Tract Disorder

Nursing Diagnosis: Impaired Gas Exchange related to decreased ventilation or perfusion as evidenced by PaO2 less than 80 mm Hg

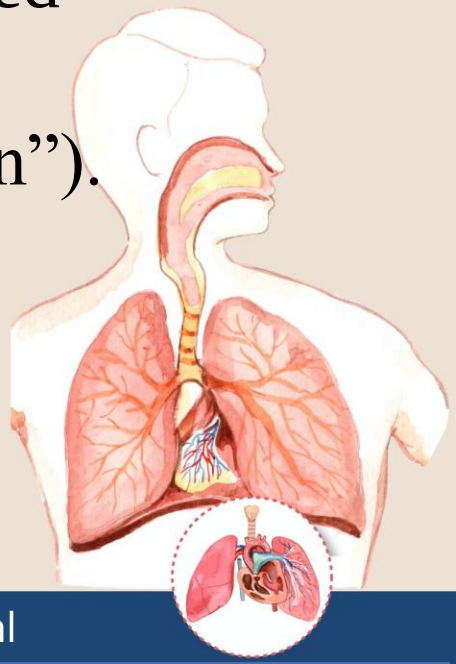
Intervention Monitor for confusion or changes in mental status.

Intervention Elevate head of bed or help patient to lean on over-bed table.

Intervention Position with good lung dependent (“good lung down”).

Intervention Administer supplemental oxygen at ≤2 L/min unless ordered otherwise.

Intervention Place a fan in the patient’s room, or provide a hand-held fan.



UNDERSTANDING Medical Surgical Nursing, 2018.

NURSING CARE PLAN for the Lower Respiratory Tract Disorder

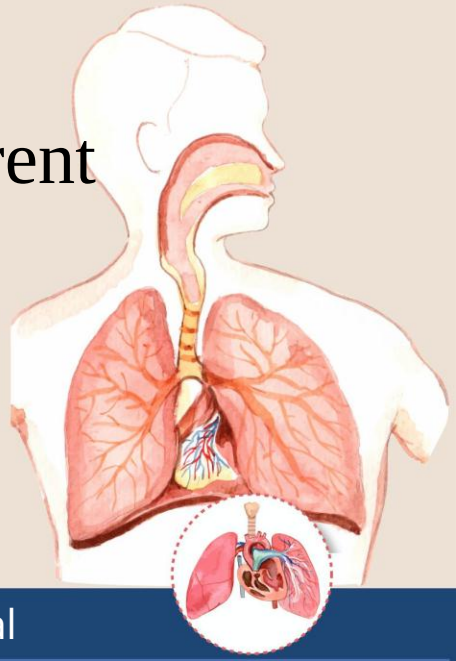
Nursing Diagnosis: Impaired Gas Exchange related to decreased ventilation or perfusion as evidenced by PaO2 less than 80 mm Hg

Intervention Teach patient relaxation exercises.

Intervention For chronic disease, teach patient diaphragmatic and pursed-lip breathing.

Intervention Encourage patient to stop smoking if patient is a current smoker.

Intervention For severe dyspnea, ask HCP about an order for IV morphine sulfate.



UNDERSTANDING Medical Surgical Nursing, 2018.

NURSING CARE PLAN for the Lower Respiratory Tract Disorder

Nursing Diagnosis: Ineffective Airway Clearance related to excessive secretions as evidenced by crackles or wheezes, ineffective cough

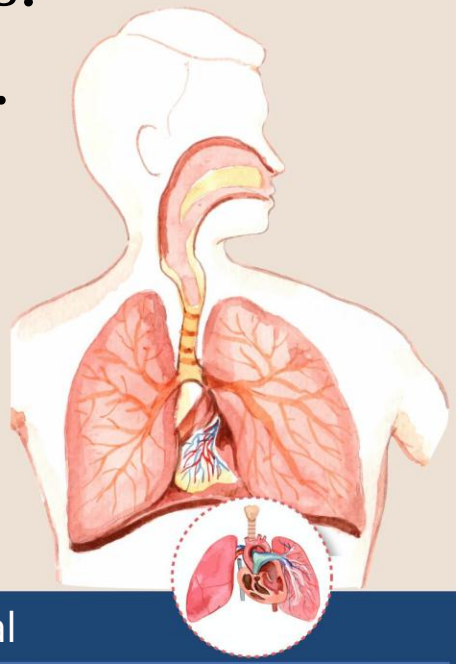
Expected Outcome: The patient will have improved airway clearance as evidenced by clear breath sounds and ability to cough up secretions.

Intervention Assess lung sounds every (q) 4h and as needed (prn).

Intervention Monitor amount, color, and consistency of sputum.

Intervention Turn patient q2h or encourage ambulating if able.

Intervention Encourage oral fluids; use cool steam room humidifier.



UNDERSTANDING Medical Surgical Nursing, 2018.

NURSING CARE PLAN for the Lower Respiratory Tract Disorder

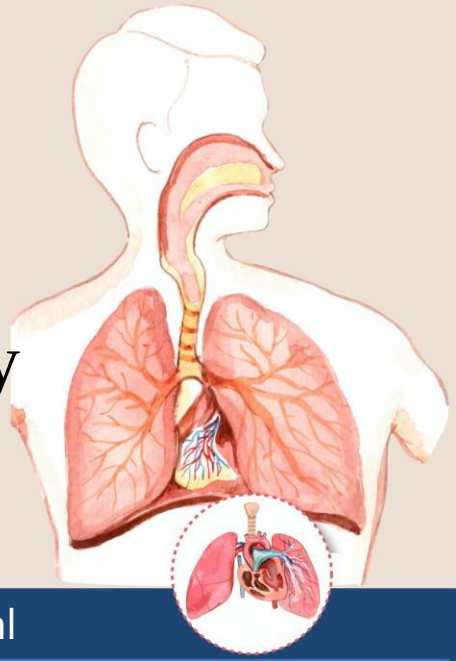
Nursing Diagnosis: Ineffective Airway Clearance related to excessive secretions as evidenced by crackles or wheezes, ineffective cough

Intervention Encourage patient to cough and deep breathe every hour and prn.

Intervention Administer expectorants or mucolytics as ordered.

Intervention If patient is unable to cough up secretions, suction per institution

Intervention Obtain order for CPT or vibratory positive expiratory pressure (PEP) device if indicated.



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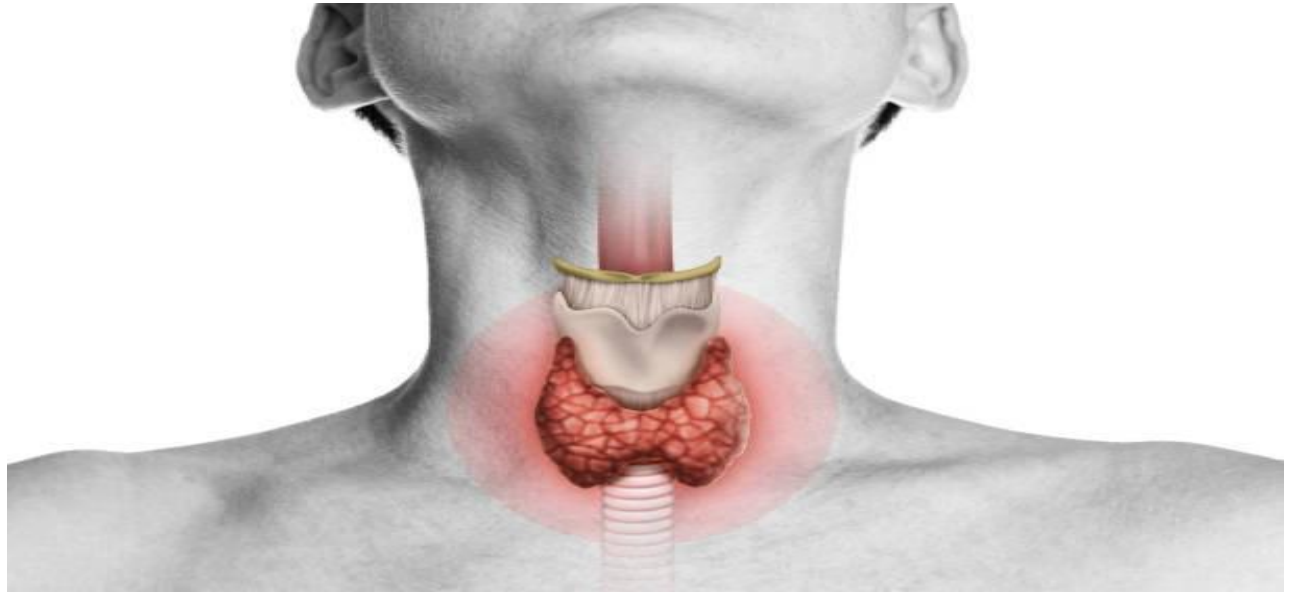

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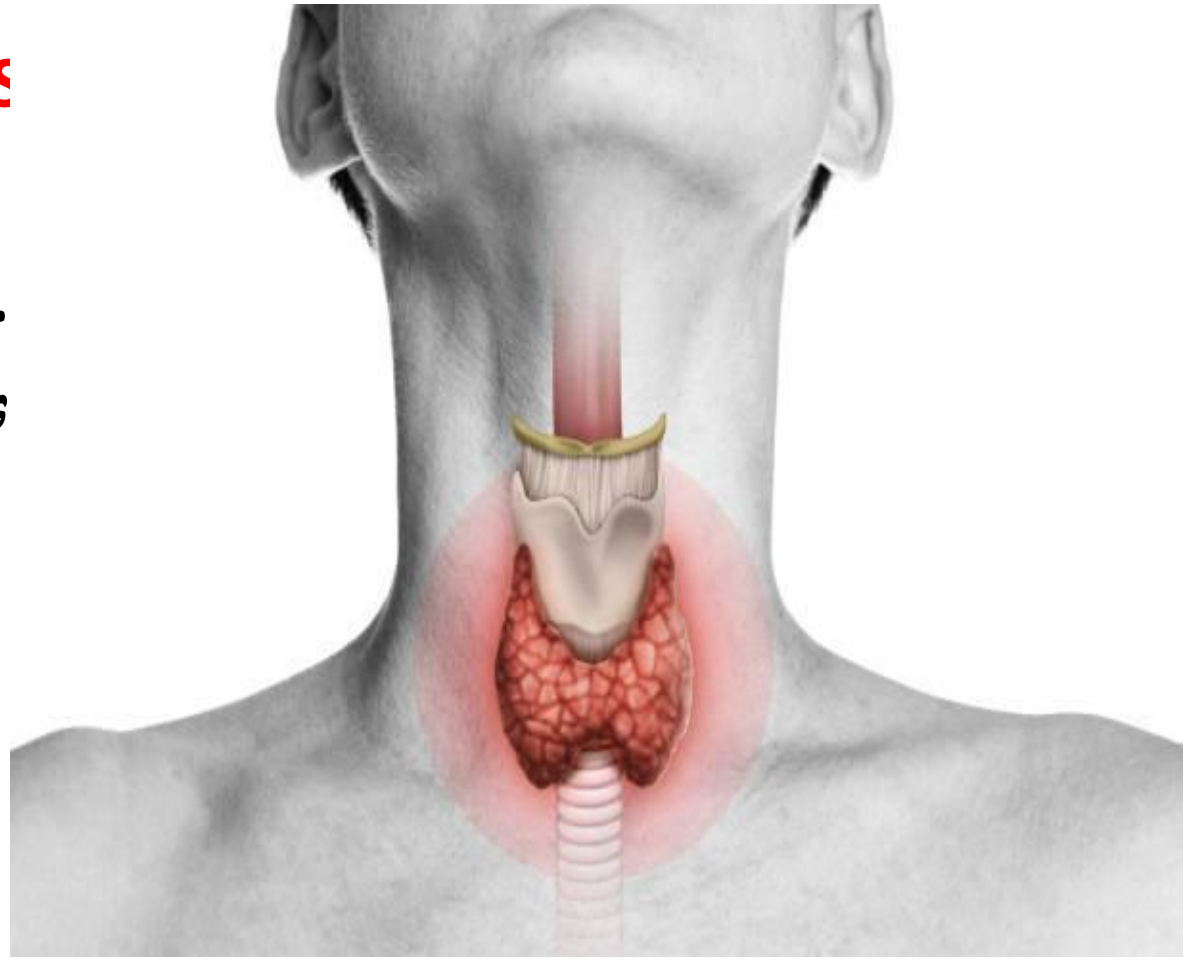

Thyroid hormones

Triiodothyronine (T3) and thyroxine (T 4) are thyroid hormones secreted by the thyroid gland. These hormones may be collectively referred to as thyroid hormone (TH). Deficient secretion of TH results in hypothyroidism; excess TH results in hyperthyroidism.

Hypothyroidism

Hypothyroidism occurs primarily in women over 50 years old. If hypothyroidism occurs in an infant, severe problems with growth and development occur. This is why all babies born in the United States are tested for hypothyroidism at birth.

Pathophysiology

Primary hypothyroidism occurs when the thyroid gland fails to produce enough TH even though enough thyroid-stimulating hormone (TSH) is being secreted by the pituitary gland. The pituitary responds to the low level of TH by producing more TSH. Secondary hypothyroidism is caused by low levels of TSH, which fail to stimulate release of TH. Tertiary hypothyroidism results from inadequate release of thyrotropin-releasing hormone (TRH), secreted by the hypothalamus. Most cases of hypothyroidism are primary.

Because thyroid hormones are responsible for metabolism, low levels of these hormones result in a slowed metabolic rate, which causes many of the characteristic symptoms of hypothyroidism.

Etiology

Primary hypothyroidism may be a result of a congenital defect, inflammation of the thyroid gland, or iodine deficiency. Hashimoto's thyroiditis is an autoimmune disorder that eventually destroys thyroid tissue, leading to hypothyroidism. Secondary or tertiary hypothyroidism can be caused by a pituitary or hypothalamic lesion or by postpartum pituitary necrosis, a rare disorder in which the pituitary is destroyed after pregnancy and delivery. Treatment of hyperthyroidism, whether with medication or thyroidectomy, can lead to secondary hypothyroidism.

THYROID HORMONE ABNORMALITIES

Primary	Hyperthyroidism ↑TH ↓TSH	Hypothyroidism ↓TH ↑TSH
Secondary (pituitary cause)	↑TH ↑TSH	↓ TH ↓TSH

Signs and Symptoms

Manifestations are related to the reduced metabolic rate and include fatigue, weight gain, bradycardia, constipation, mental dullness, feeling cold, shortness of breath, decreased sweating, and dry skin and hair. Heart failure may occur because of decreased pumping strength of the heart. Altered fat metabolism causes hyperlipidemia, which can lead to cardiovascular disease. In advanced disease, myxedema develops, which is a non pitting edema of the face, hands, and feet.

Complications

If the metabolic rate drops so low that it becomes life threatening, the result is myxedema coma. This usually occurs in patients with long-standing, untreated hypothyroidism and can be triggered by stress such as infection, trauma, or exposure to cold. The patient becomes hypothermic, with a temperature less than 95°F (35°C), and has a decreased respiratory rate, depressed mental function, and lethargy. Blood glucose drops. Cardiac output drops, which in turn can reduce perfusion of kidneys.

Death can occur as a result of heart or respiratory failure. If you note changes in mental status or vital signs, contact the registered nurse (RN) or health care pro vider (HCP) immediately. Treatment of myxedema coma involves intubation and mechanical ventilation. The patient is slowly rewarmed with blankets. IV levothyroxine (Synthroid) is given, and the underlying cause is treated.

Diagnostic Tests

The levels of T3 and T4 are low, and the level of TSH may be high or low, depending on the cause If the pituitary is functioning normally, TSH is elevated in an attempt to stimulate an increase in TH.

Therapeutic Measures

Primary hypothyroidism is easily treated with oral thyroid replacement hormone. Most patients now take synthetic thyroid hormone (levothyroxine). Doses are started low and are slowly increased to prevent symptoms of hyperthyroidism or cardiac complications

Nursing Diagnosis: Activity Intolerance related to fatigue

1. Assess level of fatigue
2. Allow for rest between activities.
3. Slowly increase patient's activities as medication begins to be effective.

Nursing Diagnosis: Constipation related to slowed gastrointestinal (GI) motility

1. Monitor and record bowel movements
2. Help patient follow usual pre-illness pattern
3. Increase fluids to eight 8-ounce glasses of water daily if cardiovascular status is stable.
4. Add fiber to diet: fresh fruit, vegetables, bran.
5. Encourage regular ambulation
6. Obtain physician order for stool softener if needed

Nursing Diagnosis: Imbalanced Nutrition: More Than Body Requirements related to decreased metabolic rate

1. Weigh weekly and record
2. Consult dietitian for therapeutic diet until hypothyroidism is controlled
3. Encourage regular exercise within limits of fatigue
4. Counsel patient that weight should normalize once hypothyroidism is controlled

Hyperthyroidism

Hyperthyroidism is most often diagnosed in women. Graves' disease, which is one cause of hyperthyroidism, is more common in young women. Multinodular goiter is more common in older women

Pathophysiology

Hyperthyroidism results in excessive amounts of circulating TH (thyrotoxicosis). Primary hyperthyroidism occurs when a problem within the thyroid gland causes excess hormone release. Secondary hyperthyroidism occurs because of excess TSH release from the pituitary, causing overstimulation of the thyroid gland; tertiary hyperthyroidism is caused by excess TRH from the hypothalamus.

A high level of TH increases the metabolic rate. It also increases the number of beta-adrenergic receptor sites in the body , which enhances the activity of epinephrine and norepinephrine. The resulting fight-or-flight response is the cause of many of the symptoms of hyperthyroidism.

Etiology

A variety of disorders can cause hyperthyroidism. Graves' disease is the most common cause; it is an autoimmune disorder in which thyroid-stimulating antibodies cause the thyroid gland to make too much TH. Other causes include thyroid nodules that secrete e xcess thyroid hormone (multinodular goiter and toxic adenoma), inflammation of the thyroid (thyroiditis), or a thyroid tumor. A pituitary tumor can secrete excess TSH, which overstimulates the thyroid gland. Patients taking TH for hypothyroidism may take too much.

Each of these problems can cause excess circulating TH and symptoms of hyperthyroidism. Radiation exposure can predispose a patient to develop hyperthyroidism. Heredity may also play a role in autoimmune hyperthyroidism. Women who smoke nearly double their risk of Graves' disease

Signs and Symptoms

Many signs and symptoms are related to the hypermetabolic state, such as heat intolerance, increased appetite with weight loss, and increased frequency of bowel movements. Nervousness, tremor, tachycardia, and palpitations are caused by the increase in sympathetic nervous system activity and may be more common in younger patients. Heart failure can occur because of tachycardia and the resulting inefficient pumping of the heart. See additional signs and symptoms in Table 39.4. If treatment is not be gun, the patient can become manic or psychotic.

Additional signs that occur only with Graves' disease include thickening of the skin on the anterior legs and exophthalmos (bulging of the e yes; Fig. 39.4) caused by swelling of the tissues behind the eyes. Other eye changes include photophobia and blurred or double vision

Therapeutic Measures

Several medications can be used to treat hyperthyroidism. Propylthiouracil and methimazole (Tapazole) inhibit the synthesis of TH, but they may take several months to be effective and must be continued for 12 to 18 months. Propranolol (Inderal) is a beta-blocking medication that relieves the sympathetic nervous system symptoms. High doses of oral iodine suppress the release of thyroid hormone. Calcium and vitamin D are given to protect bones.

Radioactive iodine may be used to destroy a portion of the thyroid gland. The patient takes one oral dose of RAI. Dietary iodine normally goes to the thyroid gland, where it is used to make TH. When RAI is given, the radioactivity destroys some of the cells that make TH.

Complications

THYROTOXIC CRISIS.

Thyrotoxic crisis (sometimes called thyroid storm) is a severe hyperthyroid state that can occur in hyperthyroid people who are untreated or who develop another illness or stressor. It also may occur after thyroid surgery in patients who have been inadequately prepared with anti thyroid medication. Thyrotoxic crisis can result in death in as little as 2 hours if untreated. Symptoms include tachycardia, high fever, hypertension (with eventual heart failure and hypotension), dehydration, restlessness, and delirium or coma.

If thyrotoxic crisis occurs :

treatment is first directed toward relieving the life-threatening symptoms. Acetaminophen is given for the fever. Aspirin is avoided because it binds with the same serum protein as T4, freeing additional T4 into the circulation. IV fluids and a cooling blank et may be ordered to cool the patient. A beta-adrenergic blocker such as propranolol is given for tachycardia and symptom control. Oxygen is administered and the head of the bed is elevated because the high metabolic rate requires more oxygen

HYPOTHYROIDISM.

Another complication of hyperthyroidism can be hypothyroidism. This can occur as a result of long-term disease or as a result of treatment

Diagnostic Tests

Serum levels of T3 and T4 are elevated. TSH is low in primary hyperthyroidism or high if the cause is pituitary. A radioactive iodine uptake test or a thyroid scan can be done to determine hyperactivity of the gland or to locate a nodule or tumor.

Nursing process of hyperthyroidism

Hyperthermia related to hypermetabolic state

1. Monitor temperature ,temperature may be elevated due to hypermetabolic state. Administer acetaminophen as ordered (avoid aspirin) to reduce temperature. Aspirin can cause an increase in circulating thyroid hormone.

2. Apply cooling blanket as ordered. External cooling may be needed if acetaminophen is not effective. • If a cooling blanket is needed, set it to 1 to 2 degrees below the current temperature, and wrap the extremities with towels to prevent shivering, which can further increase temperature.

3. Offer fluids to replace fluids lost through diaphoresis.

Nursing process of hyperthyroidism

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Diarrhea related to increase in peristalsis

• Provide a low-fiber diet. Fiber can increase peristalsis and stools. Provide small, frequent meals of bland foods (bananas, rice, applesauce) that are less likely to worsen diarrhea.

• Monitor electrolytes, especially sodium and potassium. Diarrhea can cause electrolyte loss. • Monitor for dehydration. Diarrhea causes fluid loss.

• Keep skin clean and dry; apply barrier cream to protect skin from injury from stool.

Imbalanced Nutrition: Less Than Body Requirements related to increased metabolism

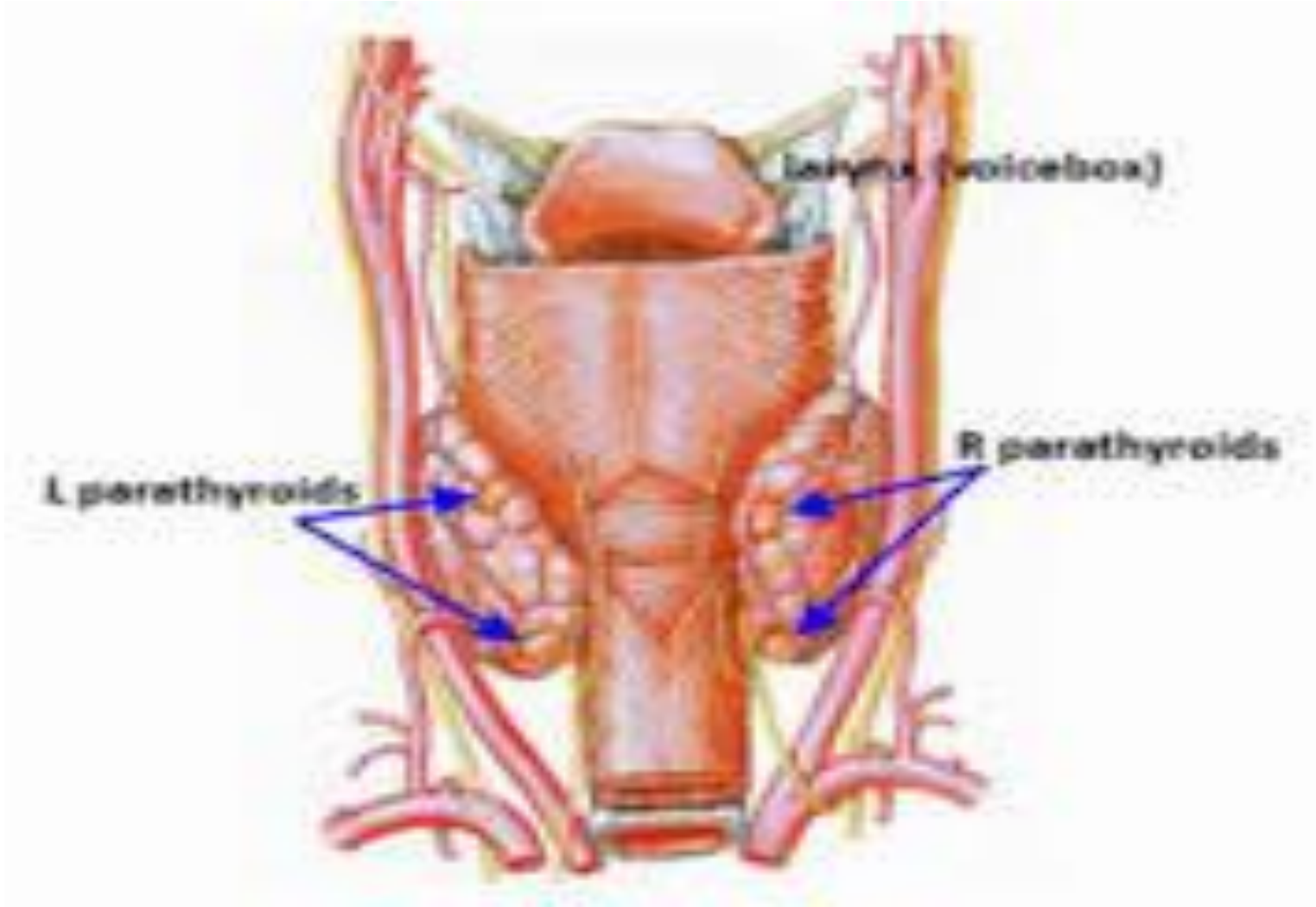
- Determine healthy weight for height, so that the expected outcome is realistic for the patient.
- Monitor weight weekly to make sure interventions are working.
- Consult dietician for high-calorie diet and supplements to meet caloric requirements.

Anxiety related to sympathetic stimulation

Provide the patient with accurate information about the disorder and treatment, and explain that proper treatment will correct symptoms. Fear of the unknown can produce anxiety.

- Administer propranolol or antianxiety agent as ordered to reduce sympathetic stimulation and calm patient.

- Offer massage, music, or other relaxation techniques preferred by the patient. These may promote relaxation.


larynx (voicebox)
R parathyroids
L parathyroids

DISORDERS OF THE PARATHYROID GLANDS

Recall that the parathyroid glands secrete PTH in response to low serum calcium levels. PTH raises serum calcium levels by promoting calcium movement from bones to blood, increasing absorption of dietary calcium, and increasing resorption of calcium by the kidne ys. Decreased PTH activity is called hypoparathyroidism. Increased PTH activity is called hyperparathyroidism.

Hypoparathyroidism

Pathophysiology

A decrease in PTH causes a decrease in bone resorption of calcium, a decrease in calcium absorption by the GI tract, and decreased resorption in the kidneys. This means that calcium stays in the bones instead of being moved into the blood, and more calcium is excreted from the body. The result is a decreased serum calcium level, called hypocalcemia. As calcium levels fall, phosphate levels rise.

Etiology

The most common causes of hypoparathyroidism are heredity and the accidental removal of the parathyroid glands during thyroidectomy or other neck surgeries hypoparathyroidism also occurs following purposeful removal of the parathyroid glands for hyperparathyroidism or cancer . Another cause is hypomagnesemia, which impairs secretion of PTH. Hypomagnesemia can occur with chronic alcoholism or certain nutritional problems.

Signs and Symptoms

Hypocalcemia causes neuromuscular irritability . In acute cases, tetany can occur, with numbness and tingling of the fingers and perioral area, muscle spasms, and twitching (Table 39.5). Positive Chvostek's and Trousseau's signs are early indications of tetany.


B

Chronic hypocalcemia can lead to lethargy; calcifications in the brain, leading to psychosis; cataracts; and convulsions. Bone changes may be evident on x-ray examination. Electrocardiogram (ECG) changes, and heart failure can develop because of the importance of calcium to cardiac function. Death can result from laryngospasm if treatment is not effective.

Diagnostic Tests

Laboratory studies show decreased serum calcium and PTH levels and increased serum phosphorus. An ECG is done to evaluate cardiac function. Radiographs show bone changes.

Therapeutic Measures Acute cases of hypoparathyroidism are treated with IV calcium gluconate. Long-term treatment includes a high-calcium diet (Box 39-2), with oral calcium and vitamin D supplements. Magnesium is given if hypomagnesemia is present.

If you suspect tetany, check for Chvostek's and Trousseau's signs. Monitor respirations closely for stridor , a sign of laryngospasm.

Nursing process for hypoparathyroidism

Risk for Injury related to hypocalcemia and tetany

Monitor patient for signs of tetany, and report immediately to RN or physician so that treatment can begin quickly.

- Make sure a tracheostomy set, endotracheal tube, and IV calcium are available for emergency use if laryngospasm occurs.
- Consult a dietitian for high-calcium diet teaching. The patient may need a lifelong high-calcium diet.
- Teach the patient about the importance of long-term diet and medication therapy and follow-up laboratory testing. The patient needs to understand self-care for follow-up at home.

Hyperparathyroidism

Pathophysiology

Overactivity of one or more of the parathyroid glands causes an increase in PTH, with a subsequent increase in the serum calcium level (hypercalcemia). This is achieved through movement of calcium out of the bones and into the blood, absorption in the small intestine, and reabsorption by the kidneys. PTH also promotes phosphorus excretion by the kidneys.

Hyperparathyroidism is usually the result of hyperplasia or a benign tumor of the parathyroid glands, or it may be hereditary. Parathyroid cancer is rare.

Secondary hyperparathyroidism occurs when the parathyroids secrete excessive PTH in response to low serum calcium levels. Serum calcium may be reduced in kidney disease because of the kidneys' failure to activate vitamin D, which is necessary for absorption of calcium in the small intestine.

Signs and Symptoms

Signs and symptoms of hyperparathyroidism are caused primarily by the increase in serum calcium level, although many patients are asymptomatic. Symptoms include fatigue, depression, confusion, increased urination, anorexia, nausea, vomiting, kidney stones, and cardiac dysrhythmias. The increased serum calcium level also causes gastrin secretion, resulting in abdominal pain and peptic ulcers. Because calcium is being removed from bones, bone and joint pain and pathological fractures can occur. Severe hypercalcemia can result in coma and cardiac arrest.

Diagnostic Tests

Laboratory studies include serum calcium, phosphorus, and PTH levels. Radiographs or bone density testing may sho w decreased bone density.

Diagnostic Tests

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Therapeutic Measures

In acute situations, IV normal saline is gi ven to hydrate the patient and lower the calcium level by dilution; furosemide (Lasix) is given to increase renal excretion of calcium. Alendronate (Fosamax) or calcitonin may be given to prevent calcium release from bones. For longer-term care, the patient is monitored for bone changes and decline in renal function. Oral calcium and vitamin D supplements are prescribed. Estrogen therapy might be used in women, although side effects must be considered.

Therapeutic Measures

In acute situations, IV normal saline is gi ven to hydrate the patient and lower the calcium level by dilution; furosemide (Lasix) is given to increase renal excretion of calcium. Alendronate (Fosamax) or calcitonin may be given to prevent calcium release from bones. For longer-term care, the patient is monitored for bone changes and decline in renal function. Oral calcium and vitamin D supplements are prescribed. Estrogen therapy might be used in women, although side effects must be considered.

If hypercalcemia is severe or if the patient is at risk for bone or kidney complications, surgery to remove the diseased parathyroid glands (parathyroidectomy) is performed. If possible, some parathyroid tissue is left intact to continue to secrete PTH. Minimally in vasive radio-guided parathyroidectomy can be done under local anesthesia through a small incision.

Risk for Injury (fracture, complications of hypercalcemia) related to calcium imbalance

Monitor patient for signs or symptoms of calcium imbalance and report promptly. Prompt treatment can prevent serious complications.

- Encourage oral fluids to prevent dehydration and kidney stones and help excrete calcium.
- Encourage strengthening and weight-bearing exercises to help keep calcium in the bones.
- Provide a safe environment for ambulation; assist the patient with ambulation if needed. A fall could result in fracture if bones are demineralized

- Encourage smoking cessation. Smoking causes bone loss.
- Teach patient symptoms to report and use of long-term medications so that patient can manage self-care at home


ThankYou!