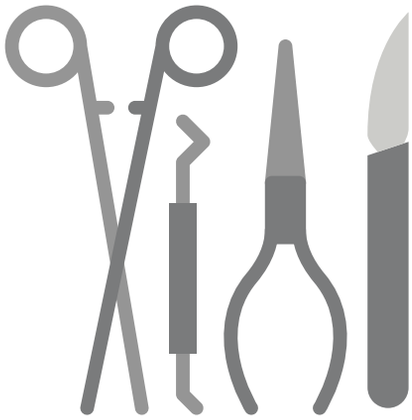


A COMPLETE GUIDE FOR
NURSING MEDSURG CLASS

Medical Surgical Nursing Bundle

NURSINGSTORERN

TABLE OF CONTENTS

1- Neuro (Pag 2)
Stroke
Multiple Sclerosis
Traumatic Head Injury
Meningitis
Seizures
Parkinson Disease
Skull Fracture
GLASGOW COMA SCALE
Spinal Cord Injury
Seizures
Intracranial Seizure
Stroke
Cranial Nerves

2- Respiratory - Lungs (Pag 17)
Adventitious Sounds
Pneumonia
COPD
Asthma
Pleural Effusion
Acute Respiratory Distress Syndrome
Oxygen Therapy
Chest Tube
Flail Chest
Tension Pneumothorax

3- Endocrine (Pag 27)
Adrenal Hormones
Antidiuretic Hormones
Growth Hormone
Thyroid Hormone
DIABETES MELLITUS
Type I, II, Patho, Complications
Insulin Cheat Sheet

4- Gastrointestinal (Pag 31)
Gastroesophageal Reflux Disease
GERD
Peptic Ulcer Disease
Cholecystitis
IBS – Crohn's / Ulcerative Colitis
Appendicitis
Pancreatitis

5- Heart (Pag 36)
Heart Sounds, Concepts
Cardiac Disorders
Coronary Artery Disease
Aortic Aneurism

5- Heart Cont.
Cardiogenic Shock
Dysrhythmias
Cardiac Valve Stenosis
Aortic Valve Regurgitation
Mitral Valve Regurgitation
Angina
Test Notes

EKG (Pag 44)

6- Integumentary (Pag 55)
Herpes
Steven-Johnson
Psoriasis
Frostbite
Pressure Injuries (Pressure Ulcers)
LESSIONs
Burns
Rule of 9's

7- Renal – Kidneys (Pag 59)
Pyelonephritis
Hydronephrosis
Benign Prostatic Hypertrophy
Renal Calculi
Polycystic Kidney Disease
Chronic Kidney Disease
Acute Kidney Injury

8- Musculoskeletal (Pag 62)
Rheumatoid Arthritis
Osteoporosis
Osteoarthritis
Herniated Disk
Gout
Amputation
Join Injuries (Sprain-Strain)
Sport Related Injuries
Dislocation / Subluxation
Fractures
Traction
Cast

9- Hematologic (Pag 68)
Iron Deficiency
B12 Deficiency
Sickle Cell Disease
Folic Acid Deficiency Anemia
Aplastic Anemia
Thrombocytopenia
Blood Products – Transfusion

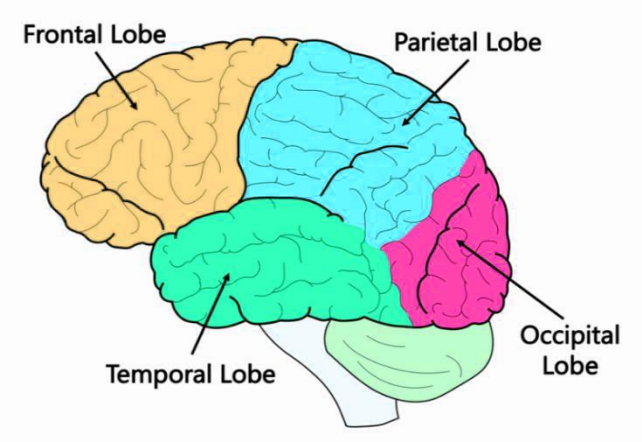
10- Reproductive (Pag 72)
Polycystic Ovarian Syndrome
Endometriosis
Pelvic Inflammatory Disease
Varicocele
Sterility
Erectile Disfunction

11- Cancer (Pag 73)
Carcinoma
Sarcoma
Melanoma
Leukemia
Nursing Interventions
Lung Cancer

12- Lab Values (Pag 76)

13- Bed Positions (Pag 77)

14- Acid-Base Balance (Pag 78)



P: Pathophysiology	Dx: Diagnosis
R: Risk Factors	N: NursingManagement
S/Sx: Signs+Symptoms	C: Complications

NursingStoreRN

STROKE

P: Neurological Deficit caused by a lack of blood flow to the brain
S/Sx: One side weakness, Facial Drooping, Confusion, Slurred Speech
Dx: CT scan or MRI confirms and identifies type of stroke which determines treatment
R: Atherosclerosis, hypertension, diabetes, stress obesity, oral contraceptives, anticoagulation therapy
N: - Airway is priority - Monitor VS, LOC, pupils + reflexes - Position client on side to prevent aspiration

Types of Strokes
Ischemic: An obstruction of a blood vessel - 87% of stroke cases
Hemorrhagic: A weakened blood vessel ruptures (Risk Factor = Hypertension)
TIA (transient ischemic attack): Temporary clot that resolves on its own (A warning sign for stroke)

MULTIPLE SCLEROSIS

P: A central nervous system disease characterized by demyelination of axons
S/Sx: Fatigue, weakness, ataxia, vertigo, tremors, Blurred vision, emotional changes, ↓sensation, Bladder + bowel disturbances, +Babinski reflex
Dx: Requires extensive neurological testing over many years of a slow onset of disease
N: Provide energy preservation measures, encourage independence while providing safety, Monitor for urinary + bowel dysfunction
C: Falls, psychological problems, decreased mobility

TRAUMATIC HEAD INJURY

P: A trauma or blunt force hits the skull causing damage to the brain
S/Sx: Confusion, agitation, visible head injury, sleepiness blown pupils
N: - Assess for neurological changes or change in the level of consciousness, monitor V/S, assess pt. for headache, nausea/vomiting, check for CSF drainage, Assess pupil size
C: Cerebral bleed, hematoma, ↑intracranial pressure, infection, seizure, ↑CO_2 levels, permanent damage

MENINGITIS

P: Inflammation of the arachnoid + pia mater of the CNS. Usually caused by bacteria or a virus. CSF is tested for the pathogen and used to determine the treatment
S/Sx: ↓LOC, Red macular rash, pain with neck flexion
N: Monitor for seizures. Assess cranial nerves

SEIZURES

P: Abnormal, sudden electrical activity in the brain
S/Sx: Uncontrollable involuntary muscle movements (convulsions) or Gaze off into the distance with no response to stimuli. May lose consciousness for seconds or minutes. Usually, the person will not recall the events leading up to it but they may remember experiencing an aura beforehand.
N: Assess seizure history. Note Time + duration. Prevent injury, but do not restrain. Monitor behavior before + after episode. Turn Pt. on side at end of seizure to drain secretions
C: Status epilepticus - epileptic spasms without any rest periods which can result in brain damage
R: Genetic Inheritance, Brain trauma, tumors, toxicity, metabolic disorders or infection

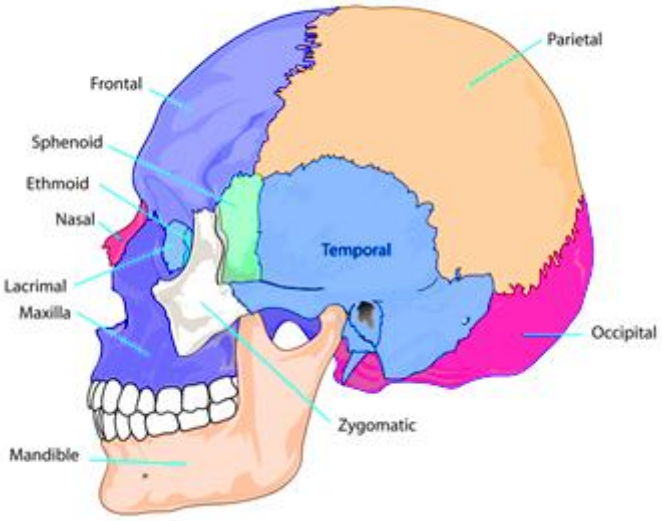
PARKINSON'S DISEASE

P: Decreased dopamine levels in the brain cause neurological + musculoskeletal Sx
S/Sx: Blank facial expression, Slow, monotonous, slurred speech, Rigidity and tremor of extremities and head, Forward tilt to posture, Reduced arm swinging, Short, shuffling gait
N: Monitor swallowing activity + neuro activity. Assist w/ ambulation. Promote PT + OT to preserve function, Increase fluid intake to 2L/day
C: Falls, Self-care deficits, depression, constipation and poor posture

Injured Brain Area	Nursing Intervention
Frontal lobe	Give simple instructions, re-orientate as needed
Temporal Lobe	Speak clearly due to impaired hearing
Occipital Lobe	Assist with ADL due to visual disturbances
Brain Stem	Monitor vital signs
Parietal Lobe	Provide simple, one-step instructions
Cerebellum	Assist with walking

CAUSES OF SKULL FRACTURES:

- Motor Vehicle Collision
- Falls
- Fire arms related injuries
- Assaults
- Sport related Injuries
- Recreational Accidents
- War related injuries



Death Can Occur at 3 points in time after injury:
1- Immediately After
2- within 2 hours after
3- Three weeks after injury

Scalp Lacerations: Highly Vascular/High Risk of Blood Loss

TYPES OF SKULL FRACTURES

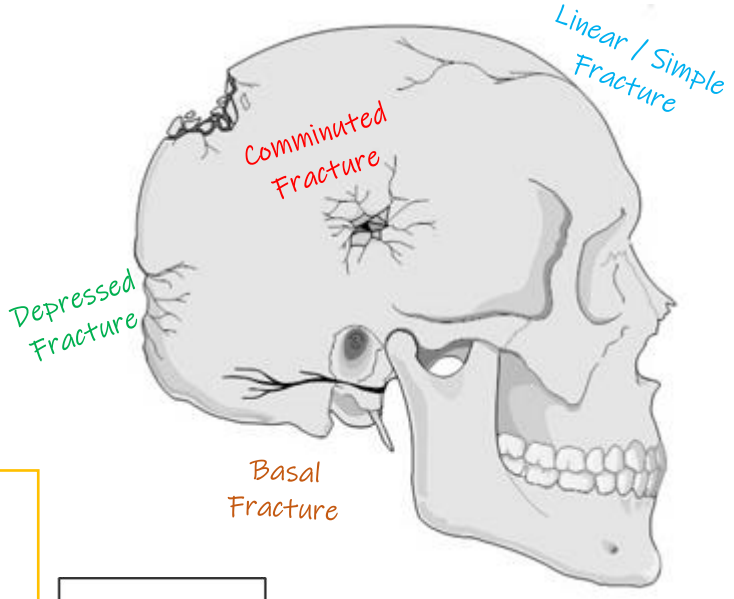
Simple (linear) fracture: is a break in the continuity of the bone.

Comminuted skull fracture: a splintered or multiple fracture line.

Depressed skull fractures: occur when the bones of the skull are forcefully displaced downward.

Basal skull fracture: A fracture of the base of the skull.

It allows CSF to leak from the nose and ears



Signs of Basilar Skull: Battle's Sign and Raccoon Eyes

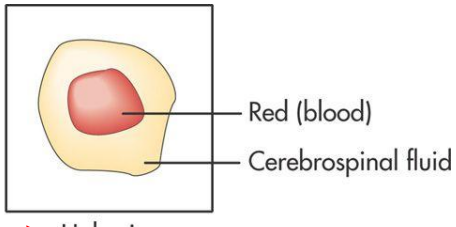
TESTING FOR CSF =CEREBROSPINAL FLUID=

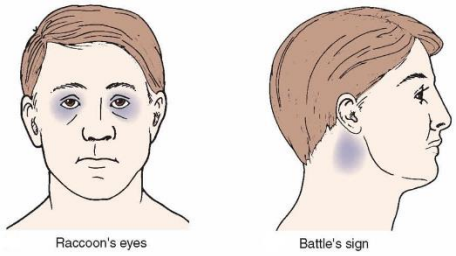
Dextrostix or Test-Tape Strips

Used to detect glucose found in CSF, however it is inaccurate if blood is in the sample as there is glucose in the blood

Halo's Sign

Allow drainage to leak onto a white gauze pad. Within a few minutes, blood should gather in the center and CSF will create a yellow ring around the blood





Glasgow Coma Scale

EYE	Spontaneous	4
	To Voice	3
	To Pain	2
	NONE	1
VERBAL	Oriented	5
	Confused	4
	Inappropiate Words	3
	Incomprehensible sounds	2
	NONE	1
MOTOR	Obey command	6
	Localized Pain	5
	Withdraws	4
	Flexion	3
	Extension	2
	NONE	1

NursingStoreRN

Deep Coma: 3
Comatose: ≤8
Normal: 15

Spinal Cord Injury

PRIMARY

Initial mechanical disruption of axons as a result of stretch or laceration

Types of Injuries:
- Cord Compression (r/t bone displacement)
- Interruption of blood flow
- Traction from pulling
- Penetrating trauma (gun shot, stabbing)

SECONDARY

Ongoing, progressive injury that occurs after primary injury

Complete cord damage r/t auto destruction which occurs during weeks after initial injury
- Usually starts within 24hrs of injury
- Cannot be diagnosed sooner than 72 hrs. after injury

CLASSIFICATION

MECHANISM OF INJURY

Flexion
Hyperflexion
Flexion-Rotation
Extension-rotation
Compression

Most unstable because the ligaments structures that stabilizes the spine are torn

Tetraplegia (aka - Quadriplegia): All 4 extremities are paralyzed
Paraplegia: Loss of function of lower extremities

LEVEL OF INJURY

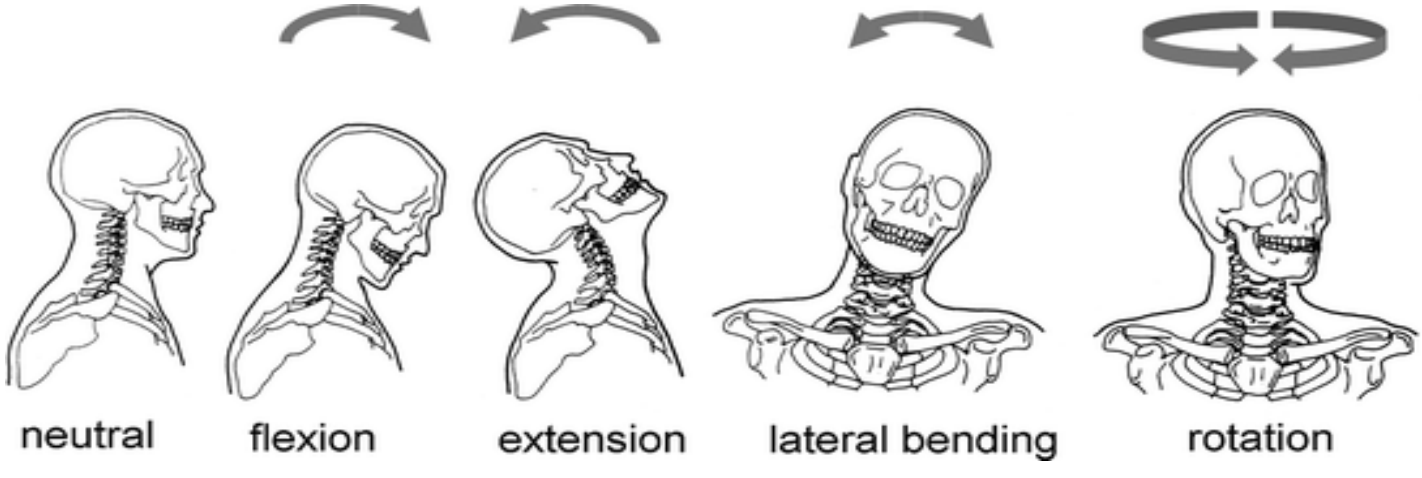
Skeletal Level
- Cervical
- Thoracic
- Lumbar

Neurological Level: The lowest segment of spinal cord with normal sensory and motor function on both sides of the body

DEGREE OF INJURY

Complete Cord Involvement:
-Total loss of function below the level of injury

Incomplete Cord Involvement:
-Mixed loss of voluntary and sensory functions, leaves some tracts intact



RESPIRATORY

C4 or ↑: Loss of system function mechanical ventilation needed
↓C4: diaphragmatic breathing if phrenic nerve if functioning (Hypoventilation)

CARDIOVASCULAR

T6 or ↑: Decrease CNS – Peripheral vasodilation – Bradycardia, Hypotension and Hypovolemia – Decreased Cardiac Output

INTEGUMENTARY

Skin breakdown/pressure ulcers
Poikilothermia r/t inability to shiver or sweat below the point of injury
VTE common in 1st 3 months. DVT (difficult to diagnose due to decrease pain sensation)

GI

T5 or ↑: Paralytic ileus, gastric distention (may need gastric suctioning), intraabdominal bleeding (may be hard to detect due to decreased pain sensation)

URINARY

Retention (If shock occurs)

AMERICAN SPINAL INJURY ASSOCIATION "ASIA" IMPAIRMENT SCALE

A- Complete: No motor or sensory function is preserved in the sacral segment S4-5

B- Incomplete: Sensory but not motor function is preserved below the neurologic level and includes the sacral segment

C- Incomplete: Motor function is preserved below the neurologic level, and more than half of key muscles below the neurologic level have muscle grade of less than 3

D- Incomplete: Motor function is preserved below the neurologic level, and at least half of the key muscles below the neurologic level have a muscle grade of >3.

E- NORMAL: Motor and sensory function are normal.

INCOMPLETE SPINAL CORD SYNDROME

Central Cord Syndrome
Damage to the middle of spinal cord
Typical occurs in cervical area
Motor weakness and sensory loss in both upper and lower extremities
More common in upper extremities

Anterior Cord Syndrome
Damage to anterior spinal artery.
Results in compromised blood flow to anterior spinal cord
Typically caused by hyperflexion injury.
Motor paralysis and loss of pain and temp sensation

Lateral Cord Syndrome
Brown-Sequard Syndrome
Damage to half the spinal cord
Typically results from penetrating trauma
Ipsilateral (same side) loss of motor function and position and vibratory sense, vasomotor paralysis.
Contralateral (opposite side) loss of pain and temp sensation below level of injury

Posterior Cord Syndrome
Damage to posterior spinal cord
RARE!
Loss of proprioception

Conus Medullaris Syndrome
Damage to conus (lowest part of the spinal cord)
Flaccid paralysis of lower limbs and areflexic bladder and bowel

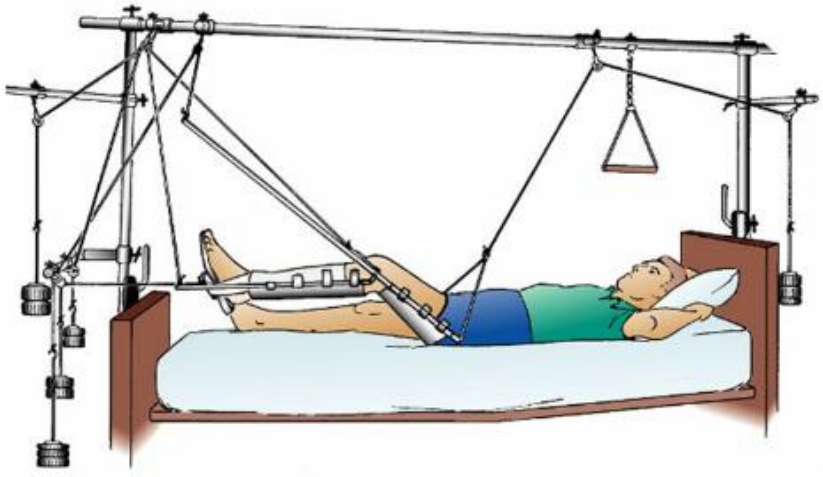
Cauda Equina Syndrome
Damage to cauda equina (lumbar and sacral nerve roots)
Flaccid paralysis of lower limbs and areflexic bladder and bowel

IMMOBILIZATION

GOAL IS TO MAINTAIN NEUTRAL POSITION AND TO PREVENT LATERAL ROTATION

SKELETAL TRACTION

Used to realign or reduce injury when skin traction is not possible Ropes pulls and weights are used. Traction needs to be maintained at all times.
Weights must hang freely and the knots in the rope are tied securely



Metabolic Causes
Electrolyte Imbalances
Acidosis
Hypoglycemia
ETOH/Barbiturate withdrawals
Dehydration / Water toxicity

Intracranial
Brain tumor
Head Injury
Aneurism
Brain Infection

Extracranial
Heart, lungs, kidneys disease. SLE
Diabetes Septicemia

Seizures resulting from metabolic disturbances are NOT considered epilepsy if seizure stops after underlying condition is resolved.

Seizure in Children
Birth trauma
Infection
Congenital Defects
Fever

Seizure in Adults
Head Injury
ETOH
Infection
Stimulants
Med Side Effect

Seizure in Elderly
Brain Tumor
Stroke

EPILEPSY

RISK FACTORS

- Increased risk in older adults
- Males> females
- African American
- Socially Disadvantages
- Parent with epilepsy
- Hx of Alzheimer or CVA

CAUSES

30% Idiopathic Generalized Epilepsy
Changes in the function of astrocytes my play a role in recurring seizures

Astrocytes release glutamate which triggers synchronized firing of neurons.

PHASES OF SEIZURE

Prodromal: Symptoms preceding seizure: nervousness, lightheaded, etc

Aural: Sensory Warning

Ictal: Actual seizure

Postictal: Altered state of consciousness - Can last 5-30 min after seizure

GENERALIZED SEIZURE

TONIC-CLONIC SEIZURE

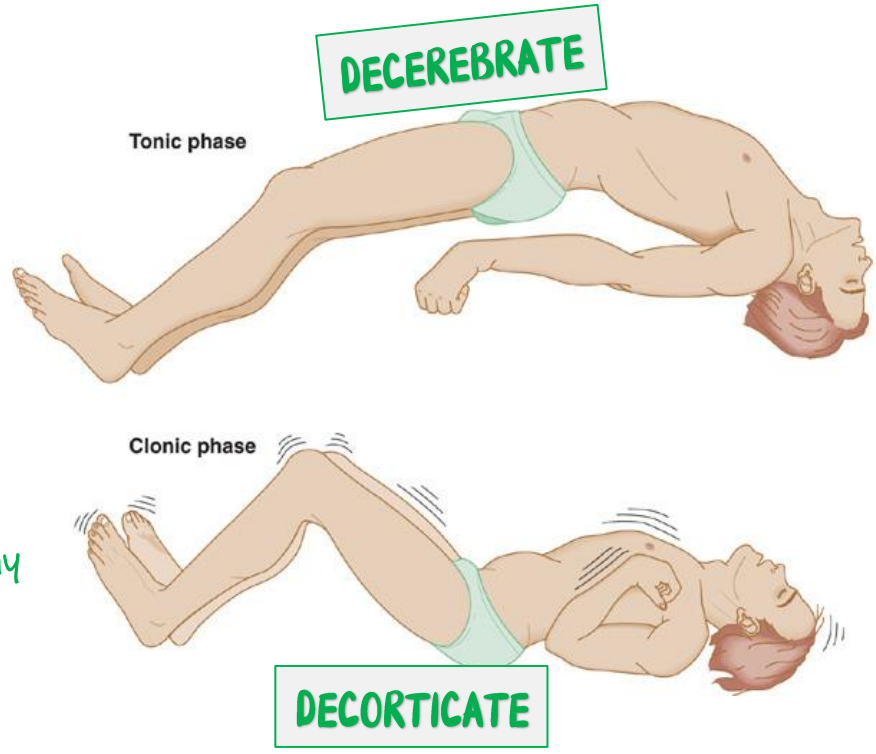
"Grand Mal" -Most Common-

- Synchronized epileptic discharge in both sides of the brain
- No Warning
- Cyanosis, excessive salivation, and tongue/cheek biting may occur

TONIC:
Body Stiffens

CLONIC:
Jerking of extremities

Postictal Phase:
Muscle soreness, fatigue, may sleep for hours



TYPICAL ABSENT SEIZURE

"Petit Mal"

- Common in Children, typically resolve by adulthood
- Precipitated by flashing lights or hyperventilation

CHARACTERISTICS

- Daydreaming" STARE
- Peculiar behavior during seizure i.e.: Blinking, twitching
- Sometimes loss of postural tone
- Confusion after seizure

TYPICAL ABSENT SEIZURE

- Tonic episode → loss of muscle tone
- Patient usually regains consciousness by the time they fall
- No postictal phase

HIGH RISK FOR HEAD INJURY

FOCAL SEIZURE

aka "partial" "partial focal"

- Caused by focal irritation
- Symptoms depend on location of irritation
- Unilateral

SIMPLE Experiences unusually feeling, sudden unexplained emotions, may sense things that are not there. No loss of consciousness

COMPLEX Strange Behavior. Lip smacking. Repetitive Movement.
Patient doesn't remember events that occurred during seizure

PSYCHOGENIC "Pseudoseizure". Resembles epileptic seizure
Psychiatric: patient typically suffer from emotional abuse, physical neglect or PTSD

STATUS EPILEPTICUS

EMERGENCY

- A continuous seizure or recurrent seizures without regaining consciousness
- Seizure activity can continue even with patients that are sedated and show no physical signs.

MEDICATION MANAGEMENT

ONSET of Seizure: Diazepam, Lorazepam

MAINTENANCE: Dilantin, Phenobarbital

NEVER abruptly discontinue antiseizure meds, as that can precipitate a seizure

FACTORS THAT AFFECT ICP

- Arterial Pressure
- Venous Pressure
- Intra-abdominal/Intra-thoracic pressure
- Posture
- Temperature
- Blood Gases

Normal ICP: 5-15 mmHg

Elevated ICP: >20 mmHg, sustained

Monro-Kellie doctrine
If one component increases, another decreases to maintain normal ICP

MAINTAINING A NORMAL ICP

1- Changes in CSF
  - Altering the CSF absorption/production
  - Displace the CSF into the spinal subarachnoid space
2- Changes in Intracranial Blood Volume
  - Collapse of cerebral veins and dural sinuses
  - Regional Cerebral vasoconstriction or dilation
  - Changes in venous flow
3- Changes in brain tissue volume
  - Distention of dura
  - Compression of brain tissue

CEREBRAL BLOOD FLOW

The amount of blood in mm passing through 100g of brain tissue in 1 min

AUTOREGULATION: The atumatic adjustment in the diameter of the cerebral blood vessels by the brain to maintain a constant blood flow during changes in arterial BP.

Only effective if the MAP is between 70-150

MAP – Mean Arterial Pressure

Average Pressure exerted against vessel walls by blood

$$MAP = \frac{Systolyc + 2xDiastolic}{3}$$

INCREASE ICP STAGES

Stage 1: Total compensation related to autoregulation

Stage 2: Decreased compensation, Risk of Increase ICP

Stage 3: Failing compensation, clinical manifestation of ICP appear (Cushing Triad)

Stage 4: Herniation and death likely to occur

TREATMENT

Treat underlying condition. Adequate Oxygenation Intubation, Mechanical Ventilation, Surgery – AS NEEDED

Drug Therapy:

MANNITOL (Osmitrol) ***
- Increase CBF. Plasma Expansion, Reduces blood viscosity, Vascular Osmotic diuretic effect

Hypertonic Saline
- Move water into blood

Corticosteroids:
- Vasogenic Edema

PRN Med: Antiseizure, Antipyretics, Sedatives, Analgesics, Barbiturates

Cushing Triad

- ↑ Systolic B/P
- ↓ Pulse
- ↓ Respirations

STROKE

Sudden interruption of blood flow to part of the brain, killing brain cells and destroying or impairing body functions controlled by that part of the brain.
During a stroke, brain tissue fails to receive adequate oxygen, leading to tissue damage and necrosis

Brain uses 20% of body's total oxygen, it has no oxygen reserve.
Anoxia: >2-4 min - Cell Damage
10 mins – Irreversible Damage
Glucose is the main source of energy

TRANSIENT ISCHEMIC ATTACH =TIA=

1/3 LEAD TO STROKE

Temporary Loss of neurologic function due to ischemia
S/Sx last less than 24hrs, longer than 1hr

Depend on vessel involved:
Carotid: Slurred speech, aphasia, 1-side weakness
Vertebral: vertigo, diplopia, ataxia

TREATMENT

Medical: Antiplatelets, Anticoagulants, Vasodilators

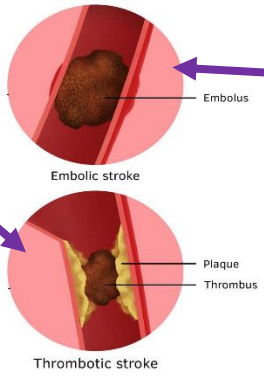
Surgical: Carotid Endarterectomy, Angioplasty, Stents, Extracranial/Intracranial Bypass

ISCHEMIC

80% OF ALL STROKES

Inadequate blood flow due to occlusion of an artery

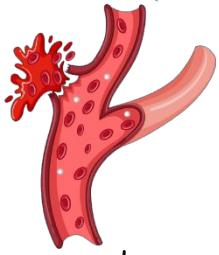
Thrombotic:
Occurs in large arteries. Occurs from injury to a blood vessel wall, formation of a blood cloth
Gradual Onset. Typically occurs at night. Commonly precedes by TIA



Embolic:
Clot can be made up of:
Blood, fat, bacteria or air.
Caused when embolus lodges/occludes cerebral arteries.
Sudden onset

HEMORRHAGIC

Sudden onset of symptoms. Progression over minutes to hours because of ongoing bleeding
- Most commonly caused by Hypertension
- Typically occurs during activity

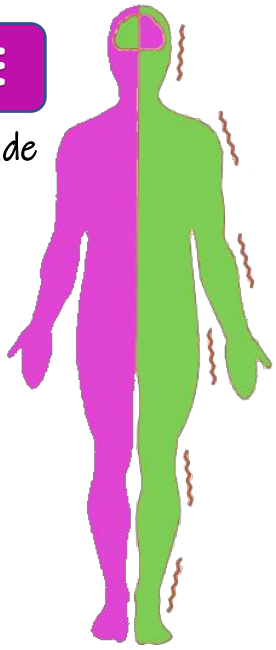


Symptoms: Severe, sudden headache. N/V, Nuchal rigidity, Rapid deterioration of function, HTN

Clinical Manifestations
by affected Side

LEFT HEMISPHERE DAMAGE

Paralysis, weakness on RIGHT side
Right visual field deficit
Aphasia
- Expressive
- Receptive
- Global
Altered intellectual ability
Slow, cautious behavior
Increased level of frustration
Depression



RIGHT HEMISPHERE DAMAGE

Paralysis, weakness on LEFT side
Left visual field deficit
Spatial-Perceptual deficit
Increased Distractibility
Impulsive behavior/poor judgment
Lack of awareness of deficits
Abilities overestimated

DIAGNOSTIC TEST

NON-contrast CT/MRI – to determine ischemic or hemorrhagic

Lumbar Puncture, Cerebral Angiography or Angioplasty, Digital Subtraction Angiography, Transcranial Doppler Ultrasound

PT/INR, PTT

TREATMENT

HEMORRHAGIC

Management of HTN
Surgery (based on cause)
- Evaluate hematoma
- Clip aneurism
- Resection
Prevent ICP
Seizure prophylaxis if needed

ISCHEMIC

Thrombolytic Therapy
(Tissue Plasminogen Activator)
- MUST be given within 3.5-4 hrs of onset
- MUST rule out hemorrhage via CT
- Criteria:
  - BP<185/110
  - PT <15, INR < 1.7
  - Not on coumadin
  - >18 years old

Cranial Nerves

I: OLFACTORY

SENSORY

Smell

Pt should be able to ID aromas.
-Assess Patency occluding one nostril at the time.
-Close eyes, occlude one nostril and smell.

II: OPTIC

SENSORY

Visual Acuity

Ask Pt to read Snellen's Chart about 20 ft away. Close one eye at the time.
If Pt with Glasses, leave them on. Remove only reading glasses

III: OCULOMOTOR

Pupillary Constriction (PERRLA)

Assess ocular movements and pupil reaction.
PERRLA: Pupils Equal, Round, React to Light, and Accommodation.

MOTO

IV: TROCHLEAR

MOTO

Vertical Eye Movement

Ask Pt to move eyeballs up and down (following object)

V: TRIGEMINAL

MIX

S: **Face Sensation**

Light touch, wipe forehead, cheeks and chin with cotton (eyes closed)

M: **Mastication Muscles**

Palpate Temporal and masseter muscles as Pt clenches the teeth

VI: ABDUCENS

Horizontal Eye Movement

Ask Pt to move eyeballs laterally (following object)

MOTO

VII: FACIAL

MIX

S: **Taste anterior 2/3**

Ask Pt to ID various tastes placed on the tip and side of the mouth

M: **Facial Expression**

Ask Pt to do facial expressions, smile, frown, raise eyebrows

VIII: ACOUSTIC

SENSORY

Hearing + Equilibrium

Hear loud and soft-spoken words. Whispered Voice Test.
Tuning Fork: Hearing by air and bone conduction. WEBER - RINNE

IX: GLOSSOPHARYNGEAL

S: **Taste posterior 1/3**

M: **Pharynx**

Gag Reflex

Depress tongue, Pt says "Ahhhh" uvula and soft palate should rise to midline

MIX

X: VAGUS

MIX

S: **Sensation pharynx, viscera, carotid body**

M: **Pharynx and Larynx**

Ask Pt to swallow, Assess Speech for hoarseness.

XI: SPINAL ACCESSORY

MOTO

Movement Trapezius and Sternomastoid Muscles

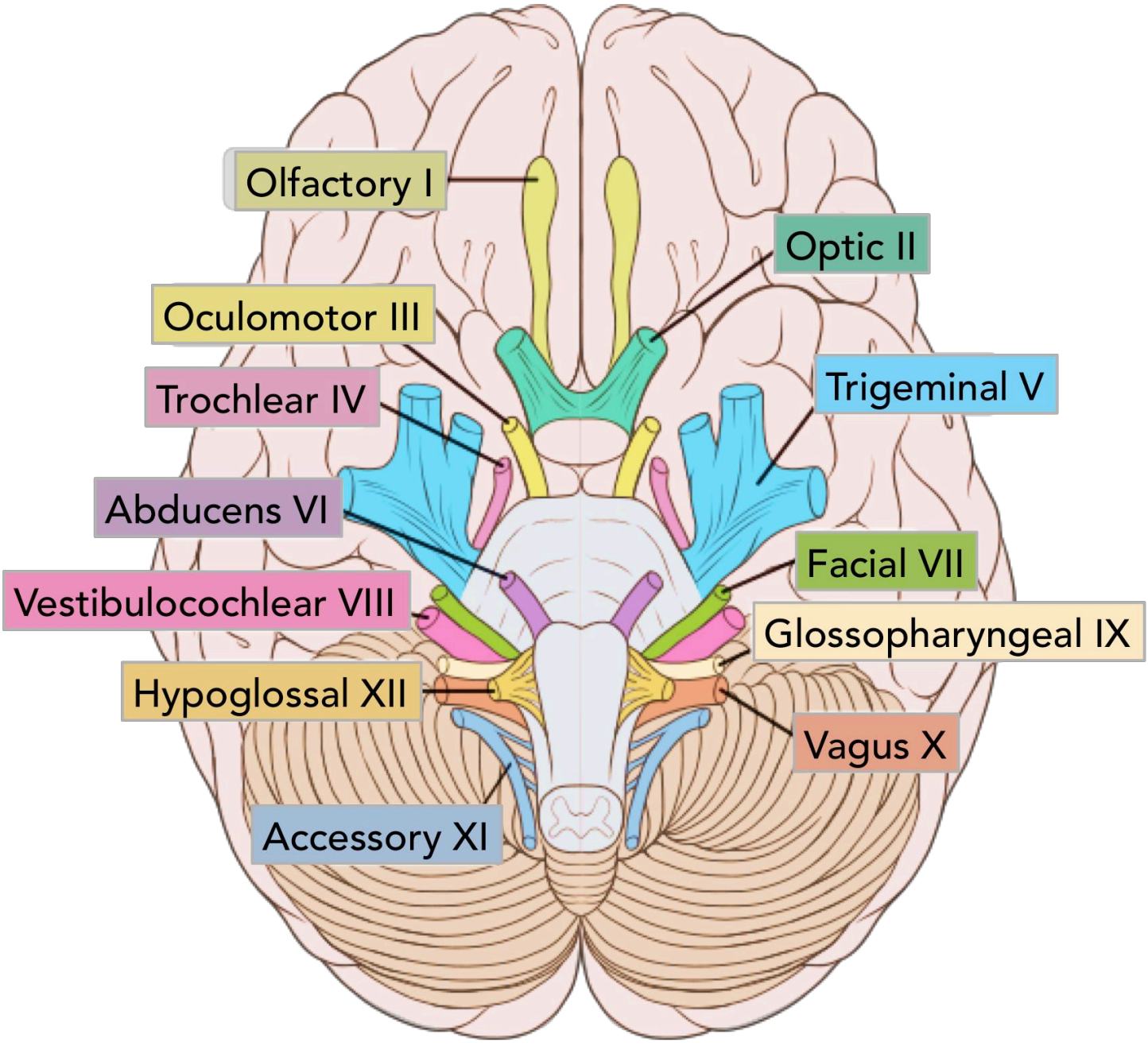
Ask Pt to rotate the head against resistance applied to side of chin.
Ask Pt to shrug the shoulders against resistance.

XII: HYPOGLOSSAL

Movement of Tongue

Inspect the tongue. Tongue in midline as Pt protrudes the tongue. Ask Pt to say: "light, tight, dynamite"

MOTO



SOME SAY MARRY MONEY BUT MY BROTHER SAYS BIG BRAINS MATTER MORE

I II III IV V VI VII VIII IX X XI XII

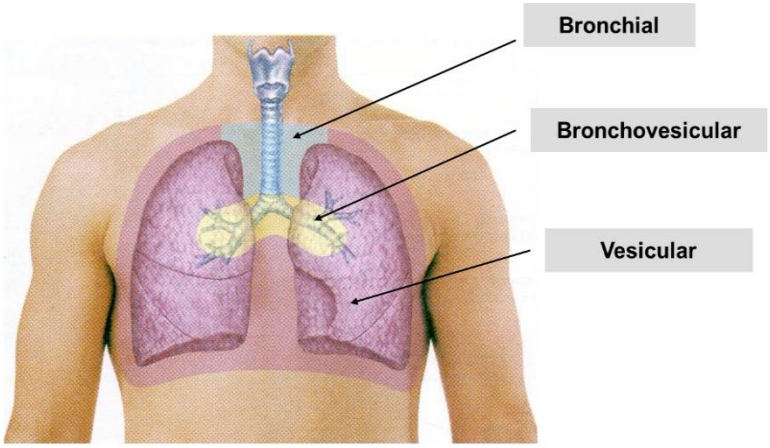
S: SENSORY M: MOTOR B: BOTH ≥MIX≤

Tracheal Sound: Harsh, hollow

Bronchial Sound: High pitched, loud, hollow

Bronchovesicular: Low Pitched, hollow, Anterior and Posterior

Vesicular: Low pitched, blowing Anterior and Posterior



ADVENTITIOUS BREATH SOUNDS

NAME	LOCATION	CAUSE	SOUND
CRACKLES	R+L lung bases	Sudden reinflation of alveoli or fluid in small airways	Crinkle of crackle Fine and short Coarse of Medium Can be cleared with cough
RONCHI	Trachea Bronchi	Fluid or Secretions in large airways	Loud and low pitched Heard on expiration Fluid through a straw
WHEEZING	Can be heard over all lung fields. Usually heard louder posteriorly	Narrowed or obstructed Bronchi	High pitched Prolonged Heard on expiration
PLEURAL RUB	Lateral Lung Fields	Inflamed Pleura	Rubbing or grating sound heard on inspiration
STRIDOR	Upper lungs	Disrupted air flow of larynx or Trachea Croup, foreign body in airways, infection	High pitched, wheezing Mostly heard on inspiration

ASK ABOUT

- ✓ Tabaco Use or Smoking
- ✓ Persistent cough or sputum production
- ✓ Chest Pain
- ✓ Environmental Exposures
- ✓ Chronic hoarseness
- ✓ Uncharacteristic Shortness of Breath
- ✓ Family history of TB

PNEUMONIA

P: Infection of pulmonary tissue
S/Sx: Chills, fever, tachypnea, rhonchi, wheezes, labored breathing
N: Encourage coughing and deep breathing. Provide O_2 therapy or CPT
R: Previous respiratory tract infection, smokers, patients who recently had surgery, elderly, those with a weakened immune system

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

P: A progressive disorder of the airway that restricts airflow and alveolar expansion. Exacerbated by infection. Caused by emphysema or bronchitis
S/Sx: Cough, excess mucus, wheezes, crackles, barrel chest, use of accessory muscles to breathe + prolonged expiration
N: Administer oxygen therapy as ordered. Monitor pulse oximetry. Monitor sputum color/ characteristics. Place in Fowlers position to aid in breathing. Suction Pt. air way PRN.
E: Avoid extremely hot, cold or spicy foods. Avoid exposure to those with infection. Eat a nutritional diet. Stop smoking. Use pursed-lip breathing when in distress.

ASTHMA

P: Chronic inflammatory disease of airway. Smooth muscles constrict in bronchi
S/Sx: Recurrent episodes of wheezing, breathlessness, chest tightness and cough that is usually brought on by exercise or triggers
N: Monitor vital signs + pulse oximetry frequently. Administer oxygen as prescribed. Stay with the patient to reduce anxiety. Administer bronchodilators + corticosteroids as ordered
R: Asthma Triggers: Animal dander, mold, exhaust, pollen, stress, hormonal changes, GERD, chemicals, plastics, shrimp, potatoes

PLEURAL EFFUSION

P: Collection of fluid in pleural space
S/Sx: Progressive dyspnea, dry cough, sharp pain on inspiration. Decreased breath sounds
N: Identify the underlying cause. Prepare for possible thoracentesis. Encourage Cough/deep breathing

ACUTE RESPIRATORY DISTRESS SYNDROME

P: Respiratory failure caused by an underlying cause like a lung trauma or inflammation. Interstitial edema causes airway compression
S/Sx: Abnormal ABG values, tachypnea, hypoxemia, pulmonary infiltrates
N: Prepare for intubation or mechanical ventilation

PATHOPHYSIOLOGY

An infection of the lung parenchyma. Usually your epiglottis, cough reflex, mucous membranes and bronchoconstriction can protect the lungs from becoming infected, but they can become overwhelmed and allow bacteria and viruses to grow.

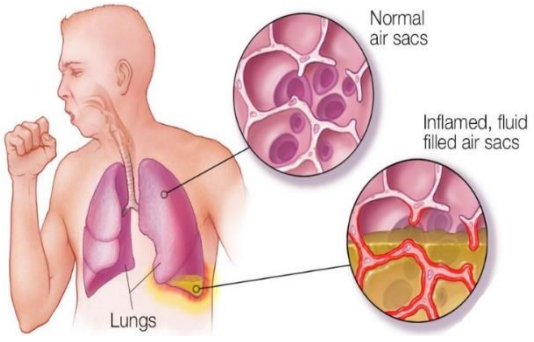
DISEASE PROCESS

EARLY SYMPTOMS
- Purulent sputum
- Diminished lung sounds
- Fatigue
- Cough
- Sore throat

LATE SYMPTOMS
- Chest pain
- Hemoptysis
- Tachycardia
- Respiratory distress
- Sepsis
- Dyspnea
- Activity

COMMON CAUSES

- Abdominal/thoracic surgery
- IV drug use
- Air pollution
- Immunosuppressive disease/meds
- Age of 65+
- Intestinal/gastric feeding via NG tube
- Altered consciousness
- Malnutrition
- Bed rest/immobility
- Tracheal intubation
- Smoking
- Chronic disease
- Upper respiratory infection
- Exposure to farm animal
- Diabetes
- Lung cancer
- CKD
- Recent antibiotics



MEDICAL INTERVENTIONS

Labs
ABG, CBC, WBC
Blood cultures
Sputum culture

Radiology
Chest X-Ray
Chest CT

Pharmacology
Antibiotics (macrolides)
Corticosteroids
Glucocorticoids

Other Treatment
- O2 therapy
- IV therapy
- chest physiotherapy
- suctioning
- early mobilization

Nursing Management

ASSESSMENT

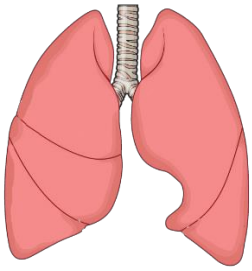
Lung sounds, VS, SaO_2 %, Health Hx, Medications, Recent Surgeries, Smoking, Mobility Level, Fatigue LABs ABGs, Sputum Culture, WBCs

NUTRITIONAL CONSIDERATIONS

- Fruits + Vegetables build Immune System
- Protein Rich Foods help Repair Tissue
- Drink Plenty of Water and fluid to Maintain Fluid - Electrolyte Balance
- Avoid Throat Irritating Foods Like Milk That Can Cause Excess Secretions

PREVENTIONS

- Wash Hands Frequently
- Eat A Balanced Diet
- Get Adequate Rest
- Exercise Regularly
- Cough + Sneeze into Elbow
- Stop Smoking
- Avoid Others Who Are ill



INTERVENTIONS

- Teach good handwashing
- Change position frequently
- Promote expectoration
- Limit visitors to prevent spread of infection
- Encourage adequate rest
- Educate pt. to report chest pain, fever, changes in sputum or altered sensorium
- Provide comfort for pain
- Administer antipyretics as ordered
- Continuously monitor pulse oximetry
- Suction secretion as needed
- Encourage early ambulation/mobilization to speed up recovery

Care Plan

Dx: Impaired gas exchange r/t fluid and mucous accumulation

Goal: Improve ventilation and oxygenation of tissues

Interventions:

1- Assess respiratory rate, depth and effort frequently

2- Administer oxygen therapy (Will help maintain PaO2 levels)

3- Assess skin color, mucous membranes + nails for cyanosis (Cyanosis can be a sign of hypoxemia)

4- Monitor Arterial blood gasses (ABGs) + pulse oximetry (helps alert healthcare team to changes in condition)

Dx: Activity intolerance r/t SOB + general fatigue + weakness

Goal: Regain baseline activity levels without complications

Interventions:

1- Evaluate response to activity (Allows you to anticipate the interventions needed)

2- Assist with ambulation + self-care (prevents exhaustion and decrease the likelihood of falls)

3- Turn + reposition every 2 hrs. (Prevents complication like pressure ulcers and fluid accumulation)

4- Group care together (Minimizes exhaustion + conserves oxygen)

5- Ensure pt. is receiving adequate rest (It is important to conserve rest to promote healing + save energy)

Dx: Risk for infection r/t inadequate immune defense

Goal: Recover from infection without complications

Interventions:

1- Educate patient about importance of clearing secretions (sputum accumulation can cause secondary infection)

2- Provide mouth care frequently (keeps bacteria from growing + spreading to lungs)

3- Ensure pt. is practicing good hand hygiene (helps prevent the spread of infection + save energy)

PATHOPHYSIOLOGY

- COPD is characterized by airflow obstruction that is caused by chronic bronchitis or emphysema
- The obstruction is caused by inflammation which changes the structural function of the lung that makes it harder to expire CO2
- The air becomes trapped causing the chest to hyper expand and become barrel shaped. This prevents more air from being expired.
- Because of decreased expiration the pt. will become hypercapnic ($\uparrow CO_2$) and hypoxic ($\downarrow O_2$)
- The excess pressure can damage alveoli further causing a snowball effect of decreased function

POSSIBLE COMPLICATIONS

Pulmonary Insufficiency - Impaired gas exchange r/t backflow from the Pulmonary Artery to Right Ventricle
Acute Exacerbation - Worsening or Symptoms. Tx: Assess ABGs, maintain fowler's position, suction airway if necessary
Pulmonary hypertension - Excess Pressure in Lungs. Tx: Diuretics, vasodilators, anticoagulants + Calcium Channel Blockers
Cor Pulmonale - Right Ventricle Hypertrophy. Tx: Treated with diuretics + management of underlying cause

RISK FACTORS

SMOKING - The major risk factor for developing COPD - hyperplasia, ↑mucus, ↓cilia
OCCUPATIONAL - Chemicals + Dusts (Dusts, vapors, irritants, fumes can increase the risk of COPD)
AIR POLLUTION - Urban air pollution coal + biomass fuels used for heating
INFECTION - Recurring infection in childhood are linked to reduced function
GENETICS OR AAT DEFICIENCY - Linked to poor lung function
AGING - Loss of recoil, stiffening of chest wall + impaired gas exchange
ASTHMA - Can be secondary to COPD or contribute to progression of it

SIGNS & SYMPTOMS

Early Stages
- Symptoms develop slowly
- Chronic intermittent cough
- Dyspnea that increase in severity
- Inability to take a deep breath
- Prolonged expiration and ↓lung sounds

Late Stages
- Dyspnea at rest
- Relies on accessory muscles to breathe
- Wheezing, chest tightness
- Fatigue, weight loss, anorexia

DIAGNOSIS

- History and physical Exam
- Spirometry - required
- Chest X-Ray
- A1 - antitrypsin levels (AAT)
- Blood gasses - in severe stage
- 6 min walk test

SPIROMETRY MEASURES FEV

$\downarrow FEV_1 = \uparrow$Obstruction

FEV_1 / FVC < 70% = COPD

FEV_1 = Forced Expiratory Volume / 1 Sec

Classification	Severity	FEV_1
Stage 1	Mild	>80%
Stage 2	Moderate	50-80%
Stage 3	Severe	30-50%
Stage 4	Very Severe	<30%

TREATMENT

Minimally invasive
- Smoking cessation
- Airway clearance techniques
- Hydration (if indicated)
- Long - term O2 (if indicated)
- Exercise Plan (walking + upper body)

Pharmacology
- Bronchodilators (↓Dyspnea, ↑FEV_1)
- Anticholinergics (↓Exacerbations)
- Corticosteroids

Surgical
- Lung volume reduction
- Bullectomy
- Lung transplant

Pulmonary rehab
- Exercise training (ambulation + upper limb exercises)
- Smoking cessation
- Nutrition counseling
- Education (Importance of sleep and good nutrition)

NURSING MANAGEMENT

Assessment

Subjective Data
- Hx of exposure to pollutants/irritants?
- Hx of recent infection or hospital stay?
- Do they use O_2 therapy?
- Medications they're on?

1) bronchodilators
2) corticosteroids
3) Anticholinergics
4) OTC

- Smoker? Pack years/ quit date
- Weight Loss or Anorexia?
- Exercise / Activity Level?
- Anxiety / Depression? Sleep Pattern?

Objective Data
General
-Restlessness, Fatigue, Sitting upright
Integument
Cyanosis, poor turgor, clubbing, bruising, edema, thin skin
Respiratory
- Rapid + shallow breathing, prolonged exp.,
- ↓Breath sounds, accessory muscle breathing
- ↓Diaphragm movement, resp. acidosis

Cardiovascular
- Tachycardia, Jugular vein distention, edema in feet, dysrhythmias

Planning

Goals
- Prevent disease progression
- Maintain ability to care for self
- Relieve symptoms – avoid complications

Diagnosis
- Ineffective breathing pattern
- Impaired gas exchange
- Ineffective airway clearance

Implementation

Interventions
- Counsel smoking cessation
- Breathing retraining: Pursed-lip (PLB) To prolong expiration. Easier to learn + should be 1st choice in acute situation
- Diaphragmatic breathing: use of abdomen instead of accessory muscles to prevent Fatigue and slow Respiratory rate
- Airway clearance (ACTs): loosen mucus/secretions then cleared by huff coughing
- Chest Physiotherapy (CPT): Percussion / vibration loosens mucus
- Postural drainage: Repositioning to drain secretions from specific areas
- Nutritional therapy: Increase Kcals and protein

Education
- Encourage Pt. to avoid or control exposure to pollutants
- Caution Pt. to avoid others who are sick and practice good hand hygiene
- Explain importance of reporting changes in conditions to HCP
- Remind Pt. to follow O_2 therapy as ordered to prevent oxygen toxicity
- Suggest nutritional meals options

Evaluation
- Assess need to change flow rate
- Evaluate compliance to meds.
- Monitor for signs of complications
- Determine O_2 therapy effectiveness

PATHOPHYSIOLOGY

- Chronic lung disease that causes narrowing and inflammation of bronchi and bronchioles
Asthma Attack:
1- Sooth muscle constricts = Chest Tightness dyspnea
2- Mucosa lining + goblet cells = more inflamed + excessive mucus production
goblet cells: collect bacteria to prevent going in the airways

S/SX

Early S/Sx	Active S/Sx	VERY BAD!
1- Shortness of breath	1- Chest Tight	1- Rescue inhaler doesn't work
2- Easy fatigue	2- Wheezing	2- Can't speak
3- Cough at night, trouble sleeping	3- Cough	3- Chest retractions
4- Sneezing, tired, scratchy throat	4- Dyspnea	4- Cyanosis lips/Skin
5- Wheezing	5- ↑HR	5- Sweaty
6- ↓Peak flow best	6- Tachy	
	6- O_2Sat <90%	

TRIGGERS

- Smoke, pollen, pollution, perfume, dander, dust, pest, mold, cool and dry air, GERD, respiratory infection, exercise, hormonal shift, beta blockers/NSAIDS, Aspirin, sulfites

INTERVENTIONS

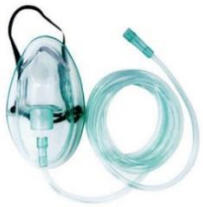
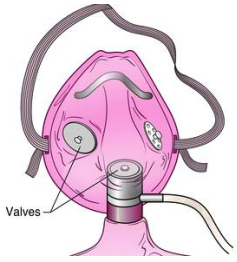
- V/S
- Keep Pt. calm
- High Fowlers
- Oxygen / Bronchodilators
Assess: lungs, cyanosis, ease of speak

BRONCHODILATORS

1- ALBUTEROL – Short Acting, fast relieve
-NOT for daily Tx-
2- SALMETEROL – Long Acting
-NOT for acute attack-
3- IPRATROPIUM – Short acting

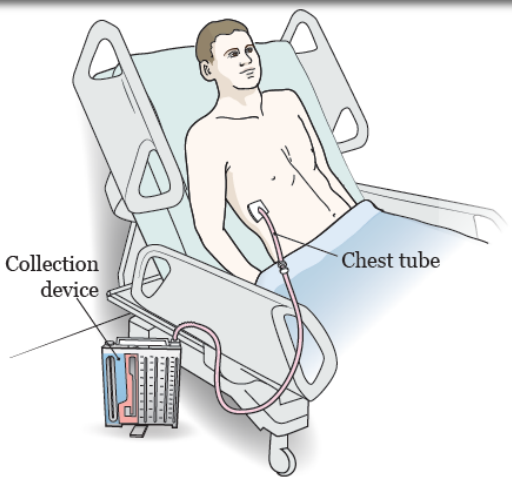
ANTI-INFLAMMATORIES

1- CORTICOSTEROIDS – "-sone" "solone"
-NOT for acute attack-
2- MONTELUKAST – Oral – Relaxes smooth muscle, ↓mucus.
<u>for CONTROL and MAINTENANCE</u>
-NOT for acute attack-

DEVICE	NAME	O_2 RATE	ADVANTAGE	DISADVANT
	Nasal Cannula	1-6 L/min FiO_2 24-44%	Lightweight Inexpensive Pt. can talk and eat	Easily dislodged, skin breakdown Mucosal drying
	Simple Face Mask	6-10 L/min FiO_2 40-60%	Simple to use, inexpensive. Can have humidification	Poor fitting, must remove to eat
	Partial-Rebreathing	6-12 L/min FiO_2 50-75%	Moderate O_2 Concentration	Warm, poorly fitting, remove to eat
	Non-Rebreathing	10-15 L/min FiO_2 80-95	HIGH FLOW O_2 Concentration	Poorly fitting, remove to eat
	Venturi	4-10 L/min FiO_2 24-60%	MOST PRECISE & ACCURATE	Remove to eat

Uses:

- Removing Air, Fluid or Blood
- Preventing drained air and fluid from returning to the pleural space
- Restoring Negative Pressure with the pleural space to re-expand the lung



Placement:

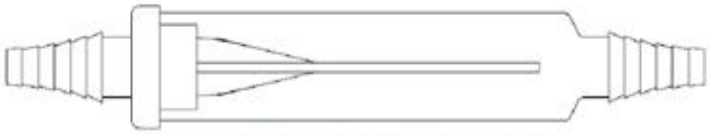
Mid-anterior axillary line at the 4th or 5th intercostal space on affected side

Complications:

- Bleeding
- Infection
- Air leak / Crepitus
- Clogged tubing – DO NOT MILK / STRIP TUBING
- Tube disconnects from drainage system – Place chest tube in sterile water until new system is set up

Heimlich Valve:

One-way used with a chest tube to prevent air from entering the pleural space



HEIMLICH CHEST DRAINAGE VALVE

Assessments (q2h):

- Pulmonary Status
- Dressing Status
- Assess for crepitus
- Check tubing
- Keep CDU (Chest Drainage Unit) below patient's Chest Level
- Monitor Water Levels
- Assess for bubbling in water chamber
- Assess Drainage

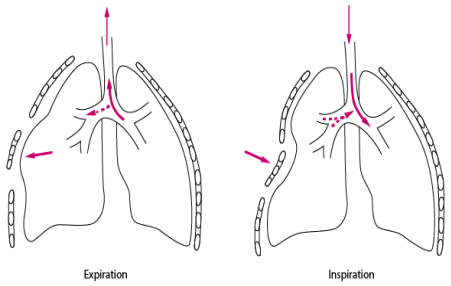
Flail Chest

Occurs when Rib Cage fractures creating a "**free**" segment.

Causes – Severe Blunt Trauma

Treatment:
- Oxygenation
- Mechanical Ventilation
- IV Hydration
- Possible Surgical Intervention

Symptoms:
- Tachycardia
- Dyspnea/Tachypnea
- Hypotension
- Cyanosis
- Chest Pain
- Anxiety
- Paradoxical Breathing
- Diminished Breath Sounds

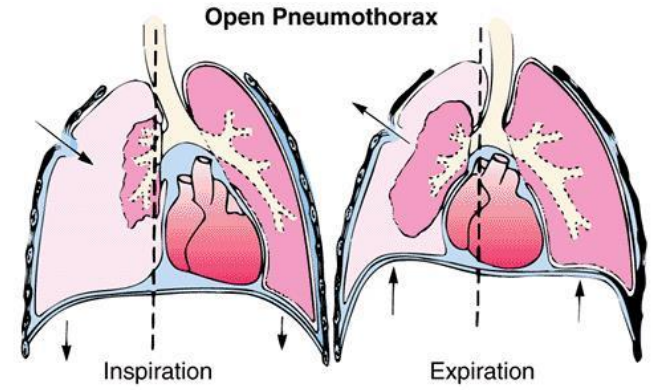


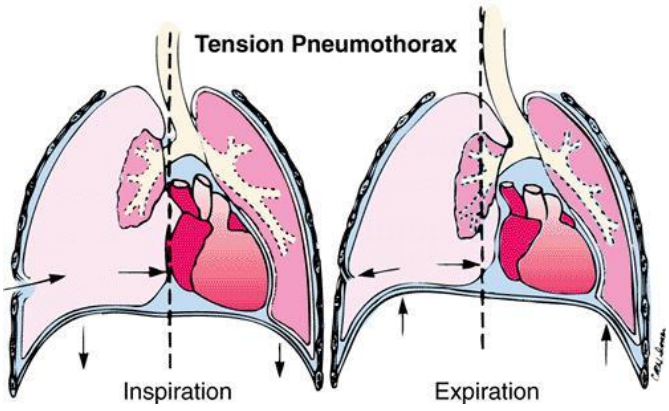
Tension Pneumothorax

Life-threatening condition that develops when air is trapped in the pleural cavity under positive pressure, displacing mediastinal structures. The air that enters the chest cavity with each inspiration is trapped

Symptoms:
- Acute Respiratory Distress
- Hypoxia
- Cyanosis
- Agitation
- Distended Neck Veins
- Drop in BP
- Tracheal Deviation away from the affected side

MEDICAL EMERGENCY

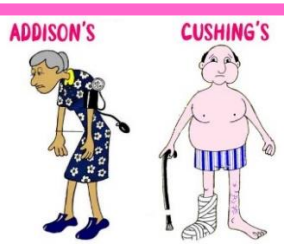




Treatment:
- Emergency Thoracotomy
- Chest Tube Insertion

Incision in the chest wall at:
4th Intercostal mid-axillary space
2nd and 3rd space at mid-clavicular line
Right-Side ONLY

ADRENAL HORMONES



Addison's ↓Cortisol ↓ACTH

S/Sx: Decreased vascular tone, hypotension, bronze skin tone, weight loss and weakness
Tx: lifelong replacement of glucocorticoids or mineral corticoids

Cushing's ↑Cortisol ↑ACTH

S/Sx: Moon face, weight gain, hypertension, fragile skin
Tx: Glucocorticoid treatment, adrenalectomy with synthetic glucocorticoid replacement therapy for life.

ANTIDIURETIC HORMONE

Diabetes Insipidus ↓ADH

S/Sx: Excretion of large amounts of dilute urine. Polydipsia, headache, low specific gravity, dehydration
Tx: Vasopressin therapy, avoiding foods/beverages that are diuretics

GROWTH HORMONE

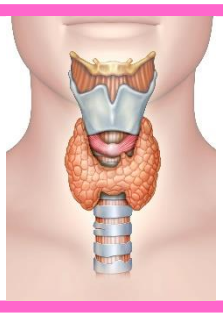
Acromegaly ↑GH

S/Sx: Gigantism, long arms and extremities, oily skin, deep voice.
Tx: suppress GH with a GH inhibition medication

Pituitary Dwarfism ↓GH

S/Sx: Short height, reduced cardiac output, moderate obesity
Tx: If caught early, can be cured with GH Supplementation

THYROID HORMONE



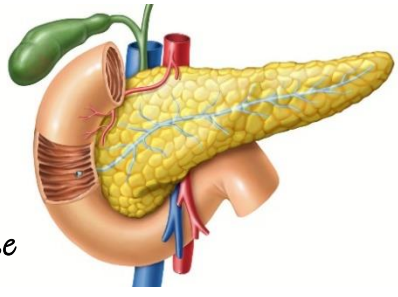
Hyperthyroidism ↑T_3+T_4

S/Sx: Tumors, nervousness, tachycardia, weight loss, cramps, diarrhea
Tx: Anti-thyroid medications that inhibit the creation of thyroid hormone

Hypothyroidism ↓T_3+T_4

S/Sx: Drowsiness, fatigue, excessive hunger, weight gain
Tx: Thyroid hormone replacement therapy based on T3-T4 levels

DIABETES MELLITUS



Type I - Inability to make Insulin

S/Sx: Polyuria, polydipsia, polyphagia, weight loss, blurred vision
Tx: Consistency in food intake, close monitoring + correction of blood glucose level.

Type II – Inability to absorb Insulin

S/Sx: Polyphagia, polydipsia, poor wound healing, weight gain
Tx: Exercise, diet changes + weight loss are preferred treatment, but if these are unsuccessful medications like metformin and Insulin are used

Diabetes Type I - II

Concepts:

Pancreas: Beta cells produce and secrete Insulin

Glucose [Sugar]: Fuels cells in the body. Will only enter the cells with the help of insulin

Insulin: Secreted by Beta cells to attach glucose so that It can be used to regulate blood sugar

Liver: Stores Excess glucose as glycogen for a later time when your body needs it

Glucagon: Helps increase blood glucose levels. When released, it causes the liver to release glycogen (glucose)

WHAT'S NORMAL:

A patient with HIGH Sugar: Pancreas releases Insulin to attach to glucose to enter the cell

A Patient with LOW Sugar: Pancreas releases glucagon to tell the liver to release glycogen-glucose

DIABETES TYPE 1

Diagnosed in Children and Young adult. Insulin-Dependent

1- Immune System attacks beta cells responsible for Insulin production.
2- NO Insulin in the bloodstream – Increase glucose
3- Muscle unable to use glucose
4- Glycogen and Protein breakdown cause ketoacidosis

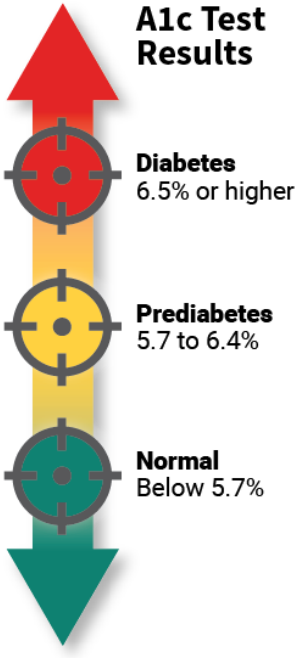
Treatment:
Exogenous Insulin

DIABETES TYPE 2

Three Causes:
1- Pancreas doesn't produce enough Insulin
2- Body doesn't use Insulin appropriately
3- Liver inappropriately produces glucose

Treatment:
1- Nutrition
2- Insulin

Most common type usually occurs over 35y/o.
80%-90% patients are obese



GESTATIONAL DIABETES

Develops during pregnancy. Detected at 24-28 weeks of gestation
Usually, glucose levels normalize at 6 weeks post-partum.

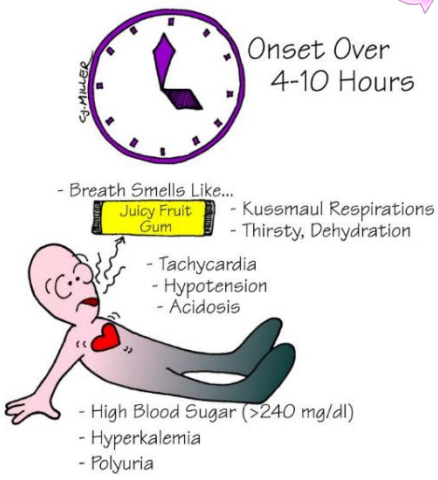
RISKs
Increased risk for C-Section, Perinatal death and neonatal complications.
Increased Risk for developing type 2 DM in 5-10 years

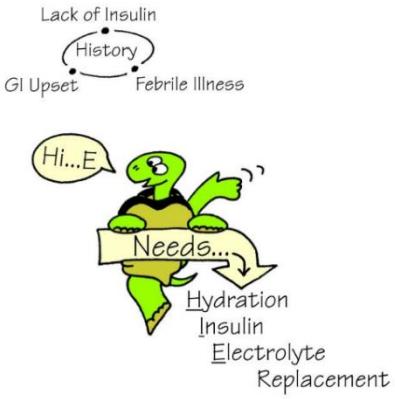
DIABETIC KETOACIDOSIS DKA

Associated with Type 1

DKA usually develops rapidly, over 24h period.

Signs/Symptoms
- Blood Glucose >250
- Ketones + Acidosis = pH<7.35
- Dehydration
- Kussmaul Respirations – rapid, deep breathing, fruity breath
- Abdominal Pain
- Polyuria, Polydipsia, weakness, fatigue and





TREATMENT

1- Treat Dehydration - 0.9% Normal Saline

2- Lower Blood Sugar → >250: IV Regular Insulin only
-Add K+ during IV Insulin
<200 or if Ketones resolve
SubQ Insulin + IV D5W

3- Hourly BG Checks + Heart Monitor

HYPERGLYCEMIC HYPEROSMOLAR SYNDROME HHS

Associated with Type 2

Slower onset, NO ketones.

Signs/Symptoms

Blood Glucose >600 (Severe 600-2400mg/dL)

Caused by Unmanaged Diabetes, Infection

Dehydration

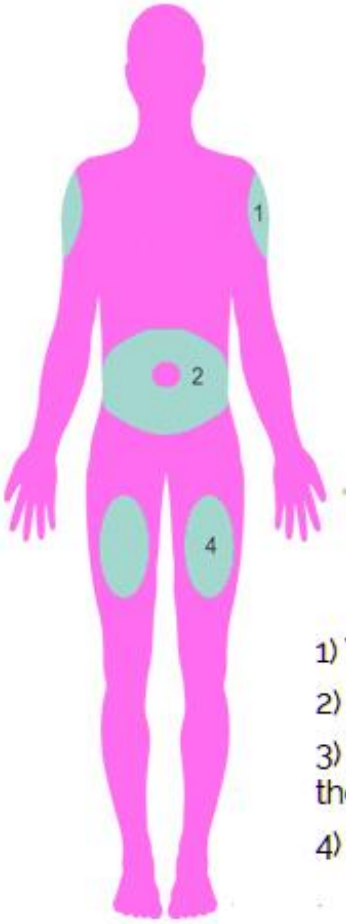
pH >7.30

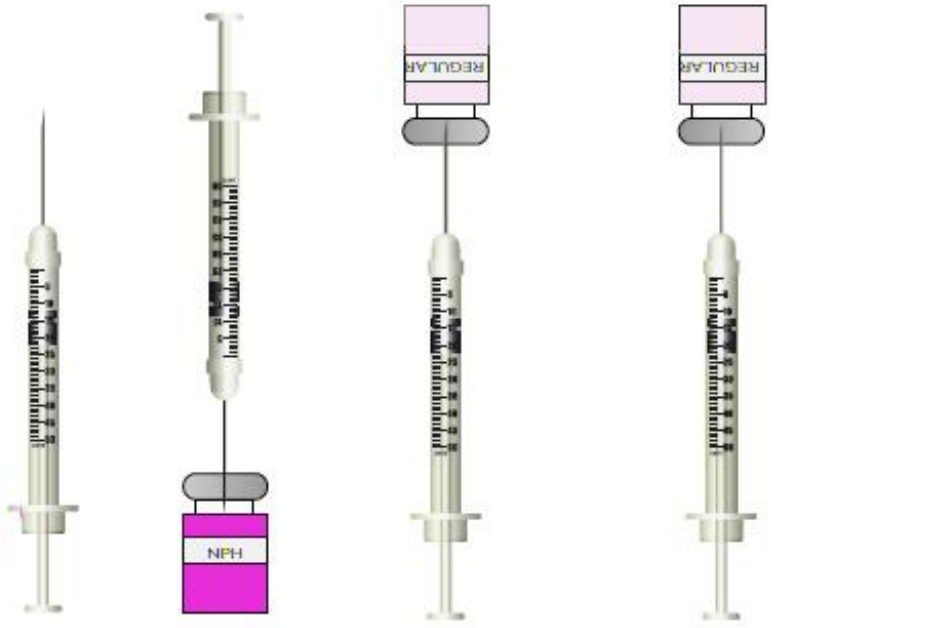
TREATMENT

1- Treat Dehydration – 0.9% NS
2- Lower Blood Sugar → IV Regular Insulin, then titrate with SubQ Insulin + IV D5W
3- Hourly BG Checks
4- Assess Rehydration: Stable BP, Pink skin, warm temp, Urine Output >30mL/hr

Insulin Mixing Cheat Sheet

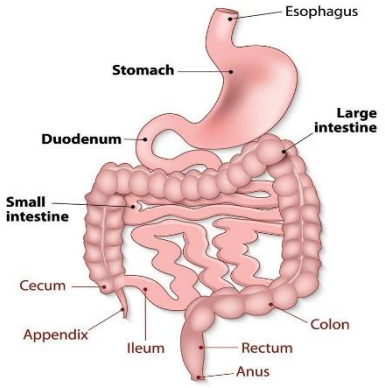
Insulin	Starts to Work In (hours)	Peak Action (hours)	Duration of Action (hours)	Maximum Duration (hours)	When to Take
Rapid Acting					
Lispro (Humalog)	15 to 30 minutes	1 to 2 hours	3 to 6 hours	4 to 6 hours	0 to 15 minutes before meal
Aspart (Novolog)	15 to 30 minutes	1 to 2 Hours	3 to 6 hours	4 to 6 hours	
Glulisine (Apidra)	15 to 30 minutes	1 to 2 hours	3 to 6 hours	4 to 6 hours	
Short Acting					
Regular	30 minutes to 1 hour	2 to 4 hours	3 to 6 hours	6 to 8 hours	30 minutes before meal
Intermediate Acting					
NPH	2 to 4 hours	8 to 10 hours	10 to 18 hours	14 to 20 hours	Does not need to be given with meal
Long Acting					
Glargine (Lantus)	1 to 2 hours	None	19 to 20 hours	24 hours	Does not need to be given with meal
Detemir (Levemir)	1 to 2 hours	None	19 to 20 hours	20 hours	





1) Withdraw enough air equal to the total amount of insulin.
2) Inject the air into the NPH without touching the insulin.
3) Inject remaining air into the regular insulin then withdraw the regular dosage.
4) Withdraw the NPH dosage.

GASTROINTESTINAL DISORDERS 31



Mouth – Amylase breaks down starch
Esophagus - Peristalsis brings foods to Stomach
Stomach - HCL breaks up food + activates enzymes. Pepsin converts proteins
Small Intestine - Duodenum contains bile, pancreatic ducts
Large Intestine - H2O absorption + waste elimination. Vit K synthesis
Pancreas - Maltase – Maltose > monosaccharides
Lactase – Lactose > galactose/glucose
Gallbladder – Stores, Concentrates Bile
Liver - Kupffer cells remove bacteria in the portal venous blood

GASTROESOPHAGEAL REFLUX DISEASE GERD

P: Backflow of gastric and duodenal contents up into the esophagus caused by a dysfunctional lower sphincter
S/Sx: Frequent heartburn and epigastric pain, nausea, dyspepsia, dysphagia, regurgitation
N: Teach pt. to avoid irritants like peppermint, chocolate, coffee, fatty foods, alcohol, smoking. Avoid eating 2 hrs before bedtime. Avoid anticholinergics, NSAIDs. Keep HOB elevated after eating

PEPTIC ULCER DISEASE

P: An ulceration that erodes the lining of the stomach or S.I. Caused by irritation, H. pylori, NSAIDs
S/Sx: Sharp pain in left/mid epigastric area after meals 30-60 mins=gastric 90-180mins= duodenal
Rx: Proton pump inhibitors + H2 blockers
Tx: Surgical: resection, vagotomy. Total gastrectomy, pyloroplasty

CHOLECYSTITIS

P: Inflammation of the gallbladder can be caused by slow bile emptying, contracted gallbladder or bacterial invasion
S/Sx: Murphy's sign > can't take deep breath when fingers are placed on the hepatic margin due to pain
Belching, flatulence, RUQ pain
N: Maintain NPO status during exacerbations. Educate pt. to eat small low-fat meals.

INFLAMMATORY BOWEL DISEASE ≥IBS - UC - CROHN'S≤

P: Inflammatory diseases of the bowel
S/Sx: Diarrhea, abdominal cramps for > 6 weeks
N: Educate about a low FODMAP diet, help decrease triggers and stress, avoid use of NSAIDS to ↓ GI bleeding

APPENDICITIS

P: Acute inflammation of the appendix + surrounding tissue
S/Sx: Sharp, constant, abdominal pain that moves to the RLQ
N: Administer pain meds, prep for imaging or surgery

PANCREATITIS

P: Acute inflammation of pancreas
S/Sx: Nausea, vomiting, diarrhea, diffuse abdominal pain and cramping
N: Pain control, nausea medication administration, limit oral intake

Peptic Ulcer Disease PUD

A peptic ulcer is an excavation (hollowed-out area) that forms in the mucosa of the stomach, in the duodenum or in the esophagus.

CAUSES:

Everything that reduces the protective mucosa layer:

1- H. Pylori – Bacteria that attacks the mucosa

2- NSAIDs – Inhibit prostaglandins - ↓Bicarbonate, = ↓Defense - ↑Acid

3- Smoking, ETOH, Genetics, STRESS

When damaged: histamine release - parietal cells stimulated to release more HCL acid

GASTRIC ULCER:

-Food makes it worst. Pain occurs IMMEDIATELY after eating.

-Pyrosis vomiting, constipation or diarrhea, and bleeding.

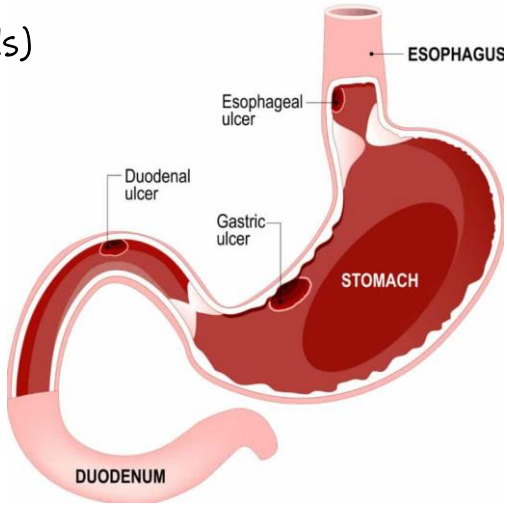
-If bleeding ulcer, hematemesis or melena (black, tarry stools)

DUODENAL ULCER:

-Food makes it better. Pain occurs 2-3 hours after meals.

- Pt. awake with pain during the night.

- Stool- Dark, Tarry



TREATMENT:

Medication:

- PPI – Proton Pump Inhibitors (-prazole)
- Antibiotics – If confirmed H. Pylori
- Bismuth (Pepto-Bismol)
- H_2 Blockers (-tidine)
- Antacids (Mag. Hydroxide, Calcium Carbonate, Sucralfate, Carafate)

FOODS TO AVOID

Gastroesophageal Reflux Disease GERD

Backflow of gastric or duodenal contents into the esophagus, due to a weak/damaged lower esophageal sphincter (LES)

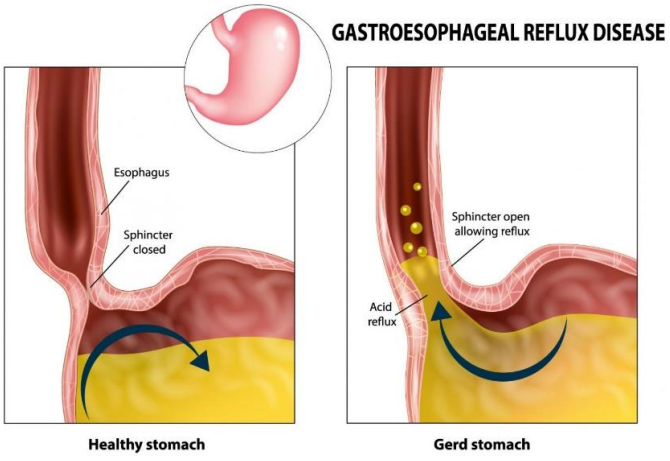
DIAGNOSTICS:

Endoscopy – Will assess narrowing or ulcers formed
pH Monitoring – Measures the amount of acid in the esophagus

SIGNS/SYMPTOMS:

Most Common – Pyrosis (heartburn)
- Epigastric Pain
- Regurgitation
- Dry cough worse at night/ hoarseness
- Nausea
- Difficulty swallowing
- symptoms may mimic those of a heart attack

[Brunner & Suddarth's Med Surg 14e page 1283]



TREATMENT:

Lifestyle changes: Small meals
- last meal 30min before bedtime
- Sit up 1hr after meals
- Weight loss, smoking cessation

Avoid: fatty, ETOH, coffee, peppermint, acid foods (citrus, tomatoes)

Medication
- Antacids – Interferes with many drugs. Give alone, wait 1-2 hrs before taking another meds
- Histamine Receptors Blockers – lowers Histamine – Lowers Inflammation
- PPIs – Protect lining of the stomach
- Bethanechol – Protect lining of stomach

Fundoplication Surgery – Reinforces the LES by wrapping a portion of the stomach around the esophagus

Crohn's Disease

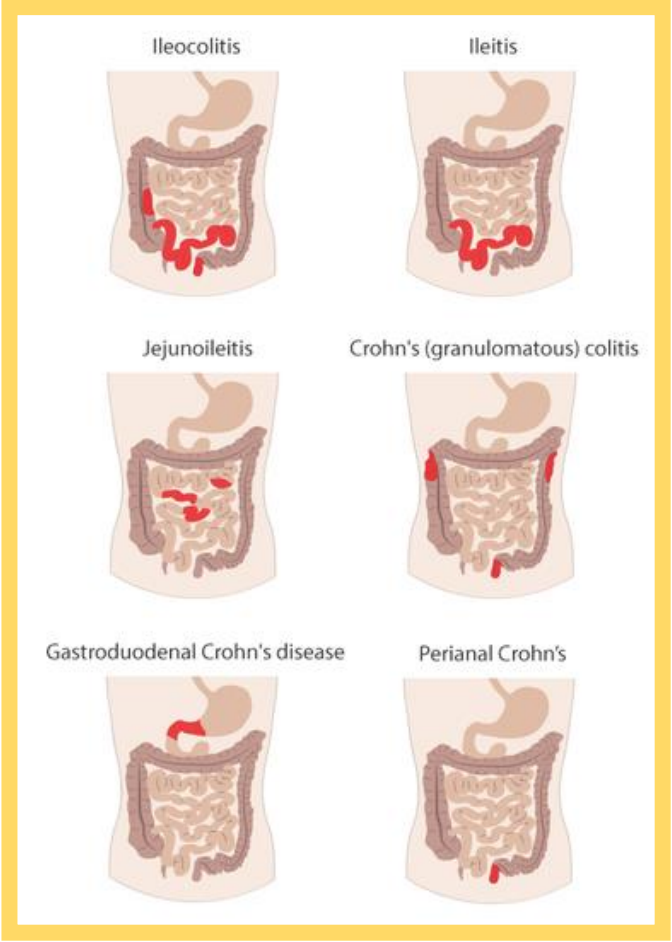
Inflammation or ulceration (or both) of the bowel.

Characterized by periods of remission and exacerbation.

May affect anywhere in the GI. Most common in ileum and the ascending colon.

Scattered patches – Not continuous with cobblestone appearance

TYPES



SIGNS/SYMPTOMS:

1- Right Lower abdominal pain
- Mouth or GI ulcers
- Diarrhea (sometimes with blood, pus, mucus)
- Loss of appetite / weight
- Fissures with anal bleeding
- Abdominal bloating

COMPLICATIONS:

1- Abscesses: Form in the intestinal wall
2- Fistula: Worsening of abscess may lead to a hollow hole
3-Malnourishment: If affecting the Small Intestine
4- Fissures: If affecting anal area – loss of integrity
5- Strictures: Narrowing, Intestinal Blockage

TREATMENT:

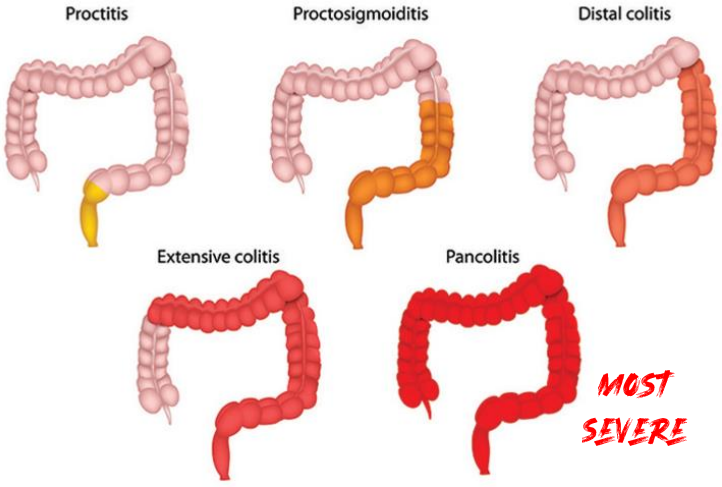
1- Diet Education – AVOID high fiver, nuts vegies, fruits, dairy, spicy, high fat, gas causing food
Encourage- LOW fiber, HIGH protein, HIGH fluids
2- Medication
1st Line- Mild case: sulfasalazine.
Steroids: ↓Inflammation, NOT long term, ↑ Infection risk
2nd line- Immunosuppressors: ↑risk of infection, cancer, ↓Inflammation
3- Teach Ostomy care if surgery occurs
4- Smoking Cessation
5- In severe cases, TPN for malnourishment – Monitor weight
6- Monitor bowel movement, frequency and characteristics/ Bowel sounds

Ulcerative Colitis

Chronic ulcerative and inflammatory disease in the INNERMOST lining of the Colon and Rectum ONLY. (There is NO abscesses, fistulas or fissures -usually)
Continuous - Not Scattered

SIGNS/SYMPTOMS

- Cells of intestinal lining die from ulcers that pus and bleed.
- Intestine can't absorb water as usual – Watery diarrhea that Includes Pus and Blood
- Urge to defecate frequently
- Periods of remission and exacerbation. Ulcer sites heal, but lining stays damaged, may form polyps

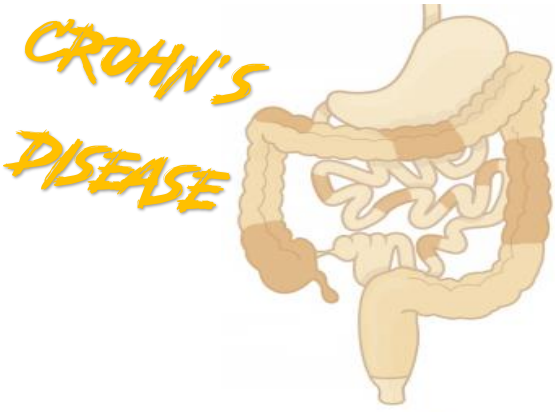


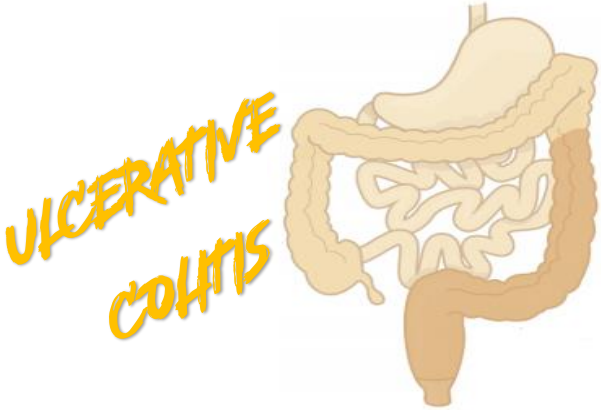
SEVERE

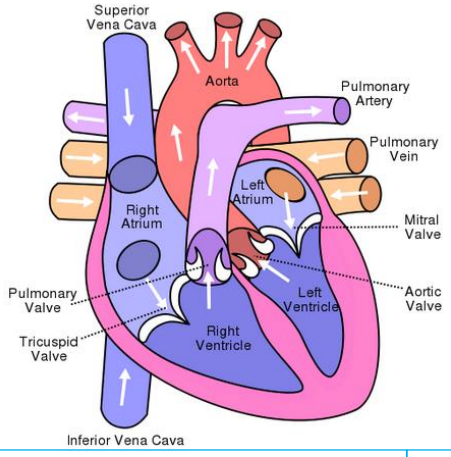
- Lead-pipe Sign – large intestine starts to lose its form. Will appear smooth (no Haustra)
- Repeated Ulceration – Rupture of bowels – peritonitis
- Toxic Megacolon – Large intestine dilates due to inflammation – Unable to function properly

TREATMENT

1- Surgery – Proctocolectomy ileoanal anastomosis
2- Diet Education – AVOID high fiver, nuts vegies, fruits, dairy, spicy, high fat, gas causing food
Encourage- LOW fiber, HIGH protein, HIGH fluids
3- Medication:
1st Line- Mild case: sulfasalazine.
Steroids: ↓Inflammation, NOT long term, ↑ Infection risk
2nd line- Immunosuppressors: ↑risk of infection, cancer, ↓Inflammation
Also, Abx during flares up Antidiarrheals







Conducting System

1- Sinoatrial (SA) Node
[Primary Pacemaker] 60-100bpm
2- Atrioventricular (AV) Node
[40-60 bpm]
3- Bundle of His
4- Bundle Branches
5- Purkinje Fibers

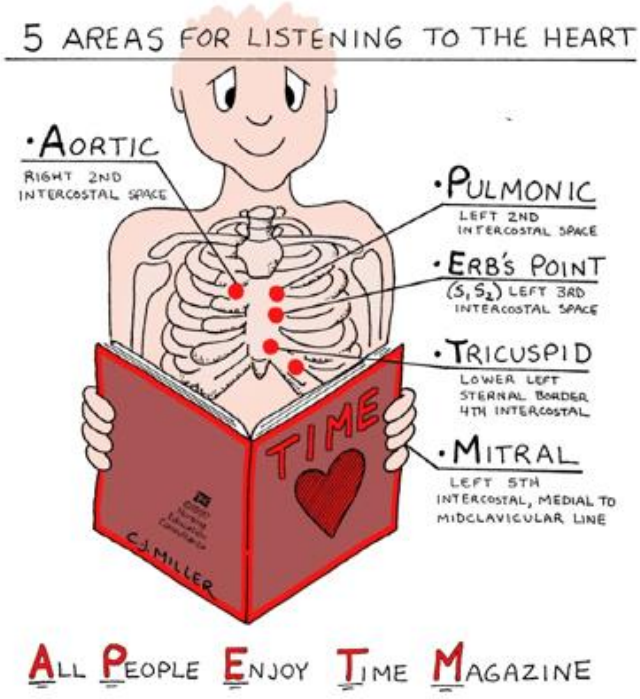
Properties of Cardiac Cells

Automaticity: The ability to initiate an impulse
Excitability: The ability to be electrically stimulated
Conductivity: The ability to transmit and impulse along a membrane
Contractility: The ability to respond mechanically to an impulse

Cardiac Output = HR x SV
CO = 5-7 L (normal)
Mean Arterial Pressure
MAP=(SBP+2DBP)/3
Normal >60mmHg

Depolarization: When the charges are reversed
– Heart Muscle Contract –

Repolarization: When the cells return to their original State



Heart Sounds

S1- AV Valves Close – Heard at Apex
-Beginning of Systole
S2- Semilunar Valves close – Heard at Base
-End of Systole, Beginning of Diastole

→ Normal

S3- Heart Failure and Regurgitation
S4- Resistance w/ ventricular filling

→ Abormal

S3- VENTRICULAR GALLOP (Lub-de-dub)

Rapid Rush of Blood from the Atrium to the Ventricle as it starts relaxing
-Low Pitch
-Early Diastole
-May be Normal in Athlete, Pregnancy, Children
-Normal Up To 30 yrs
-Causes: HF, MI, Cardiomyopathy, HT,

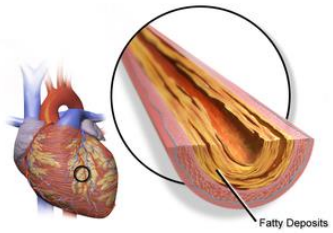
S4- ATRIAL GALLOP

Sudden slowing of blood flow by the ventricle as the atrium contracts
- Low Intensity sound
- May be a sign of Diastolic HF or Ischemia
- Heard at apex
Causes: HF, MI, Cardiomyopathy

P: Pathophysiology | Dx: Diagnosis
R: Risk Factors | N: NursingManagement
S/Sx: Signs+Symptoms | C: Complications

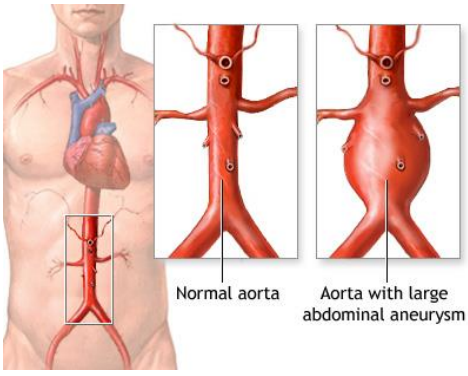
CORONARY ARTERY DISEASE

Patho: Narrowing or obstruction of a coronary artery due to plague buildup/ atherosclerosis
Dx: ECG, Catheterization, blood lipids
N: Educate about ↓ Kcal/fat, ↑ fiber diet & exercise
C: ↓ Perfusion, HTN, angina, MI



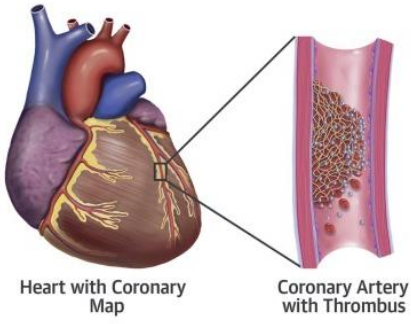
AORTIC ANEURISM

Patho: Stretching of the medial wall of an artery caused by vessel weakness
S/Sx: Thoracic - neck, shoulder, ↓back pain, ↑HR, dyspnea
Abdominal - pulsating mass in abdomen, Abd/back pain
Ruptured - severe Abd/back pain, shock, ↓BP
Dx: Ultrasound, CT Scan, arteriography
N: Monitor Vitals, check peripheral pulses, assess for abdominal tenderness, ask pt. if abdominal or back pain is present



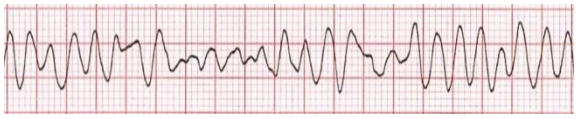
CARDIOGENIC SHOCK

Patho: Reduced cardiac output and tissue perfusion. Usually caused by a corona artery blockage
S/Sx: Hypotension, pallor, tachy, disorientation, chest pain, cool, clammy skin
N: Administer O2, morphine sulfate as ordered. Prep for intubation, Monitor blood gas levels



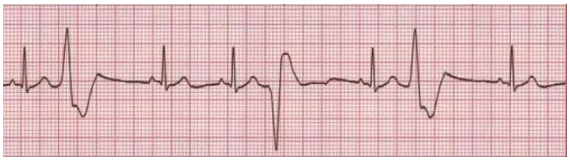
VENTRICULAR FIBRILLATION

Patho: Ventricles depolarize in a completely disorganized way
S/Sx: Cardiac output ceases no pulse, BP, Respirations and Pt. is unconscious
N: Activate Emergency response, Administer CPR, defibrillate and administer O2 as ordered



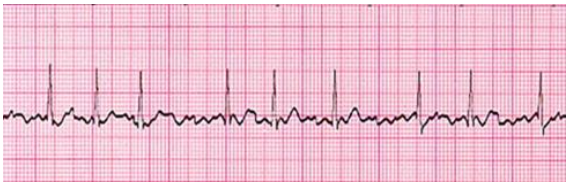
PREMATURE VENTRICULAR CONTRACTION

Patho: Ventricles contract prematurely due to impulse initiation by **purkinje fibers** instead of the **SA node**
N: Assess O2 saturation. Monitor anticoagulant and electrolytes as ordered
Bigeminy - PVC every other heartbeat
Trigeminy - PVC every 3rd heartbeat
Quadrigeminy - PVC every 4th heartbeat



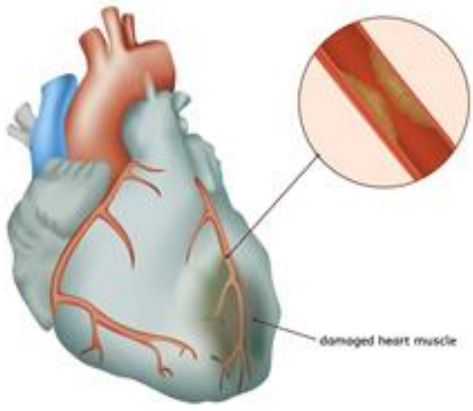
ATRIAL FIBRILLATION

Patho: Multiple depolarizations from the atrium occur in a disorganized way causing the atria to quiver
Dx: ECG - no P wave seen
N: Administer O2 and anticoagulants as ordered. Educate pt. about therapy.
C: Thrombus formation, stroke



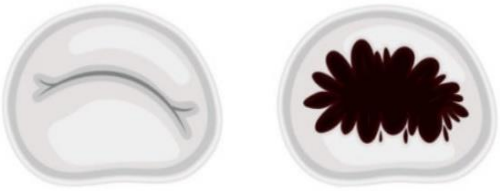
MYOCARDIAL INFARCTION

Patho: Cardiac tissue no longer has Oxygen Supply which can lead to necrosis. Blockage of 1 or more arteries of the heart.
S/Sx: Chest pain, SOB, nausea, low back pain, diaphoresis, pallor, fear + anxiety
Dx: Troponin levels, CK, CK-MB, Myoglobin, ECG
N: Administer O2, Establish IV access, Obtain 12-lead EKG, Administer thrombolytic therapy, assess pulses, Monitor for Blood Pressure Changes
Morphine – Pain and relaxes the heart
Oxygen – ↑O_2 in the heart
Nitroglycerin - vasodilates
Aspirin – blood thinner

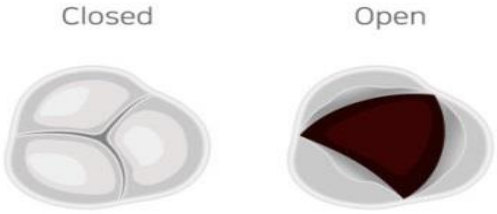


Cardiac Valve Stenosis

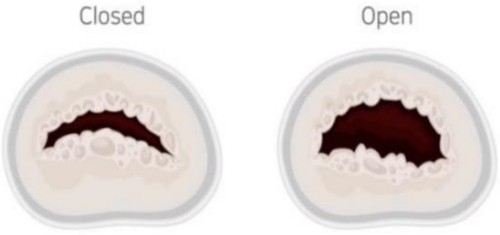
Normal Mitral Valve



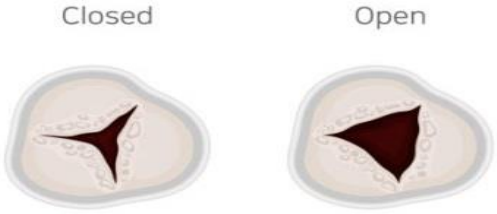
Normal Aortic Valve



Mitral Stenosis



Aortic Stenosis



Caused by
- Rheumatic disease
- Strep Infection

Can lead to
LV Enlargement
Right Side Heart Failure

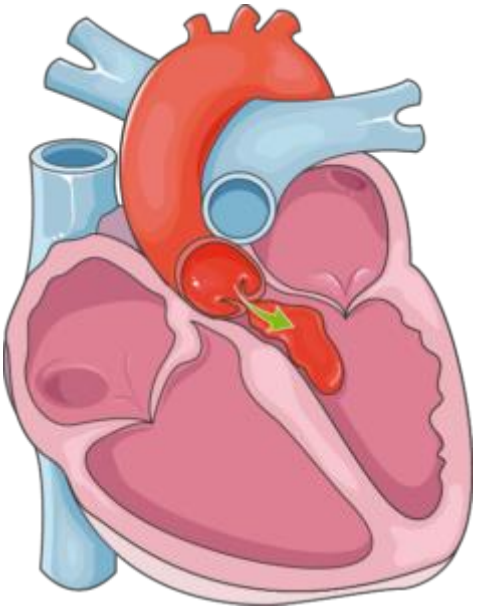
Treatment
- Valvuloplasty
- Commissurotomy (Removal of Scar Tissue)
- Valve Replacement

Symptoms:
- Dyspnea
- Fatigue
- Palpitations
- Hemoptysis
- Diastolic Murmur

Symptoms:
- Fatigue
- Chest Pain
- Shortness of Breath
- Syncope

Aortic Valve Regurgitation

Blood leaks backward from aorta unto Left Ventricle



Leads to Left Ventricle enlargement due to volume overload from inadequate / incomplete emptying during systole

Symptoms

Varies depending on cause/severity
Increased CO (early compensation)
Paradoxical Nocturnal Dyspnea
Pulmonary Edema
Right Side Heart Failure
Shock – Acute A.R.

Causes

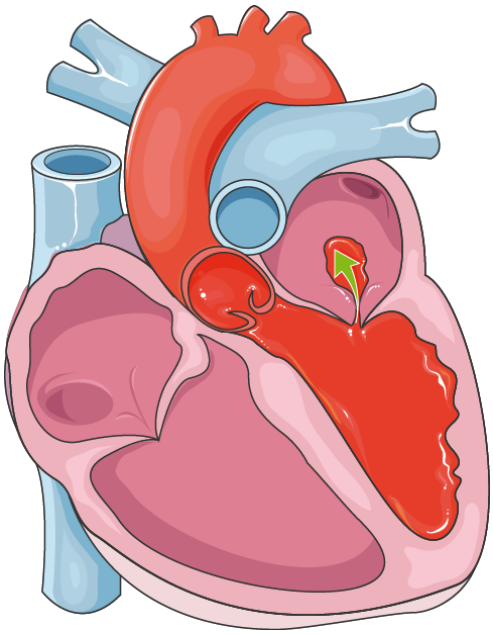
Congenital Heart Valve Disease
Age-Related heart changes
Endocarditis
Rheumatic Fever
Trauma

TREATMENT

- Balloon Valvuloplasty
- Commissurotomy
- Annuloplasty
- Valve Replacement

Mitral Valve Regurgitation

Backward of Blood from the Left Ventricle to Left Atrium due to an incompetent valve



NursingStoreRN

Symptoms

- Weakness
- Fatigue
- Paradoxical Nocturnal Dyspnea
- Murmur
- A-Fib

Causes

- Mitral Valve Prolapse
- Rheumatic Fever
- Endocarditis
- Heart Attack
- Cardiomegaly
- Trauma

TREATMENT

- Medication to Increase CO
- Valvuloplasty
- Annuloplasty
- MV Repair / Replacement

ANGINA

Angina / Chest Pain: A narrowing of the coronary artery that supply the heart with blood and oxygen. It occurs in times of HIGH demand for Oxygen (Exercise or Emotional Stress). If it goes untreated, ischemia or myocardial infarction can occur.

Risk Factors: Smoking, diabetes, High BP, **High Cholesterol**, sedentary lifestyle, obesity, family history, MEN>45 | WOMEN >55

Dx: Coronary Angiography – CT scan with dye to see occlusion EKG + Echocardiogram LFT's Lipid Profile – Cholesterol Stress test to the heart Blood test to see risk for Myocardial Infarction	**S/Sx:** Chest Pain constricting that radiates, pressure to the jaws, arms, back. Depending on the severity: Nausea, pallor, SOB, diaphoresis, upper GI discomfort

TREATMENT

1- Immediate relief – **Nitroglycerin** (dilates heart arteries to ↑ blood flow

PILL

For **stable angina**
1 pill q5m (up to 3 doses)
Call 911 if symptoms persist 5 min after 1st tablet
Heat + Light sensitive. Don't leave in the car, and keep it in dark bottle
Don't take with Sidenafil.
HA and flushing are normal

PATCH

For **Unstable Angina**
Rotate daily
Clean, dry, shaved area
Shower ok
Wear gloves

2- Surgical: PCI- Stent in Artery | CABG-reroute around artery

3- Beta Blockers; CCB; -statins, anticoagulants

STABLE

1- Occurs with **exertion or stress**
2- Short duration – less than 5 min
3- Sx of CP relieved by rest or Nitroglycerin
4- **Predictable**

UNSTABLE

1- Occurs with exertion, stress and **REST**
2- Longer duration - > 30min indicative of Heart attack
3- Unrelieved by medication or rest
4- **Unpredictable**

Test Notes

Nursing interventions for dysrhythmias
- Defibrillation for ventricular tachycardia or ventricular fibrillation
- Cardioversion for all other dysrhythmias
- CPR for a client who is pulseless or not breathing
- Lidocaine IV bolus for a client who has ventricular dysrhythmia

Patient teaching about prevention of atherosclerosis
- Smoking cessation
- Maintain an appropriate weight
- Eat a low-fat diet

Cardiovascular dysfunctions
- Murmur: sustained swishing or blowing sound caused by turbulent blood flow through a valve, vessel, or heart chamber
- S4 (atrial gallop): involves an extra heart sound that occurs before S1, resulting from decreased ventricular compliance
- Pericardial friction rub: scratchy, high-pitched sound associated with infection, inflammation, or infiltration and can be a manifestation of pericarditis
- S3 (ventricular gallop): extra heart sound immediately following S2, and is caused by decreased vascular compliance

Holter monitor
- Records and transmits electrical impulses of the heart and alerts the nurse to dysrhythmias, myocardial injury, or conduction defects
- Allows the client freedom of movement while cardiac activity is recorded

Cardiac catheterization
- Hematoma formation nursing interventions
- Greatest risk = bleeding
- Apply firm pressure to stop bleeding

Cardiac measurements
- **Cardiac output**: heart rate times stroke volume, measures the amount of blood ejected by the heart over 1 minute
- **Echocardiogram**: non-invasive ultrasound procedure, evaluates heart valve function and structure
- **Telemetry**: detects the ability of cardiac cells to generate a spontaneous and repetitive electrical impulse through the heart muscle
- **Cardiac catheterization**: measurement of coronary artery blood flow

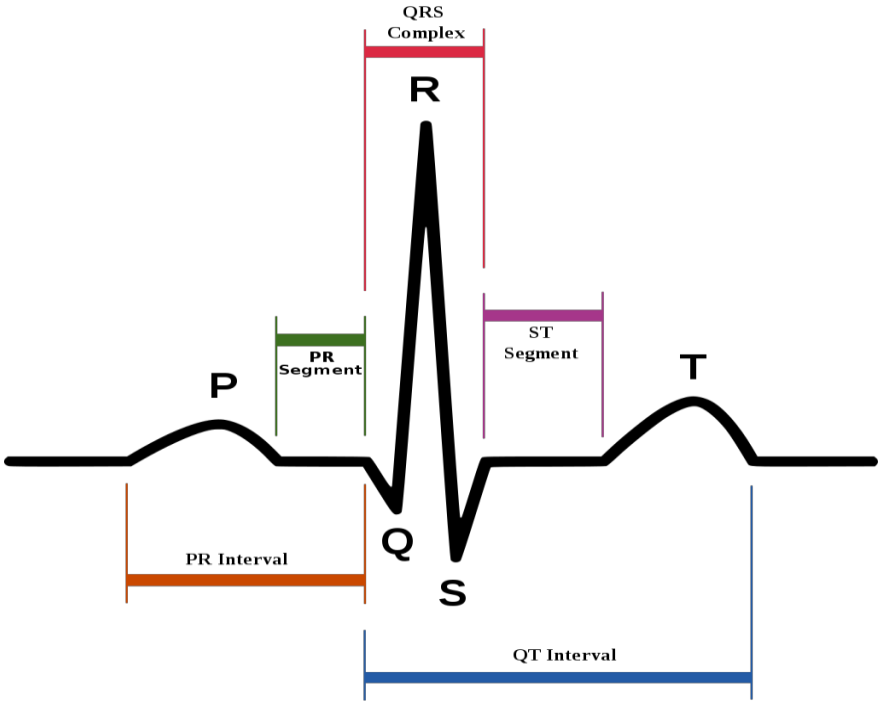
Cardiac medications
- **Dopamine**: give to client in cardiogenic shock because produces inotropic effect and improves cardiac output by strengthening force of contractions
  Increases blood pressure by causing vasoconstriction of blood vessels
- **Nitroglycerine**: vasodilator that decreases cardiac preload and afterload
  Decreases blood pressure
- **Nitroprusside**: vasodilator that decreases cardiac preload and afterload by causing the arterial and venous smooth muscles to relax
  Decreases cardiac output
  Decrease blood pressure
- **Morphine**: opioid analgesic and vasodilator that can decrease cardiac preload and afterload
  Decreases blood pressure

Sublingual Nitroglycerin
- Instruct client to allow the tablets to dissolve under the tongue or between cheek and gums
  Moisten mouth if dry
- Onset of relief should begin 1-3 minutes after administration
  If client's chest pain has not eased in 5 minutes, client should take another tablet and call 911
- Nitroglycerin is inactivated by heat, light, and moisture
  Nurse should instruct the client to keep the medication in its original dark glass container with the lid closed tightly
- Client should take the medication at the onset of angina, regardless of food intake
- Instruct client to lie down after taking the medication because hypotension can occur quickly, leading to dizziness and syncope

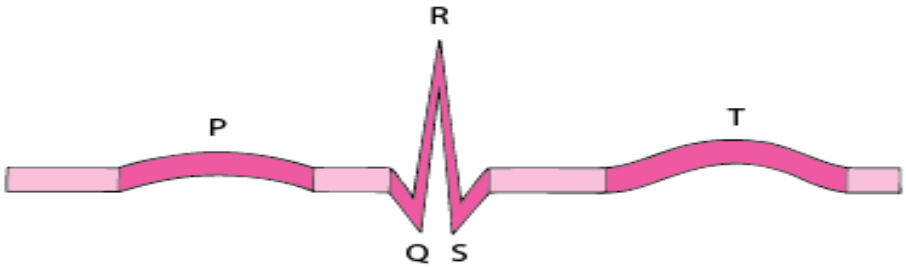
Angina Precipitating Factors: 4 E's
Exertion: physical activity and exercise
Eating
Emotional distress
Extreme temperatures: hot or cold weather

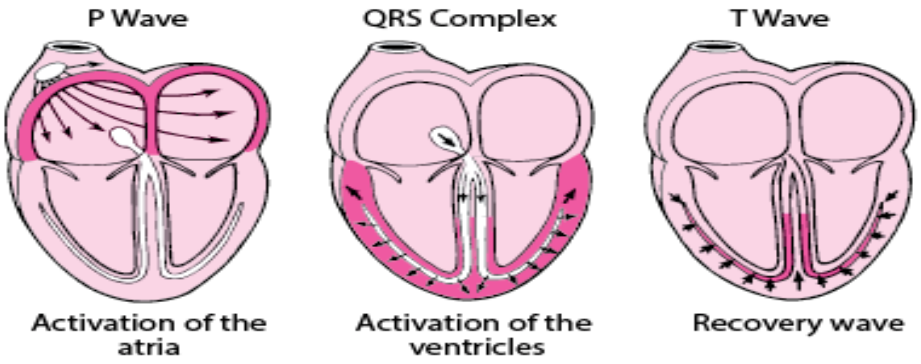
Heart Murmur Causes: SPASM
Stenosis of a valve
Partial obstruction
Aneurysms
Septal defect
Mitral regurgitation

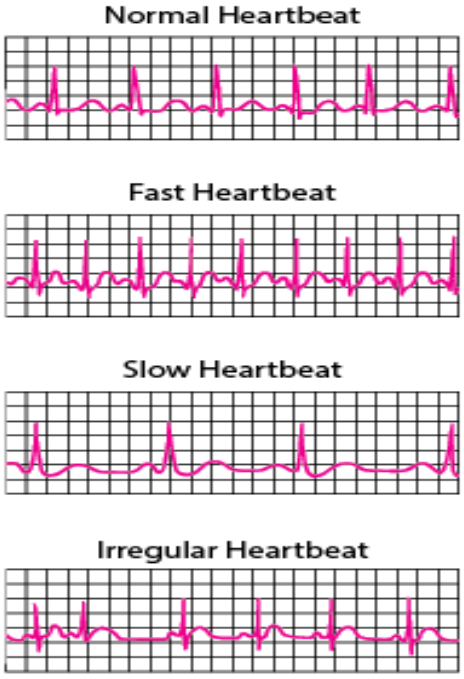
ECG Interpretation



NursingStoreRN







P-wave: Atrial Depolarization
QRS Complex: Ventricular depolarization
T-wave: Ventricular Repolarization

Normal Sinus Rhythm: 60-100 bpm
Sinus Bradycardia: <60 bpm
Sinus Tachycardia: >100
Supraventricular Tachycardia: >150 bpm
QRS Complex: 0.06-0.10 sec
PR Interval: 0.12-0.20

ASSESSMENT

Rate: Is it Normal? (60-100) Fast (>100) Slow (<60)

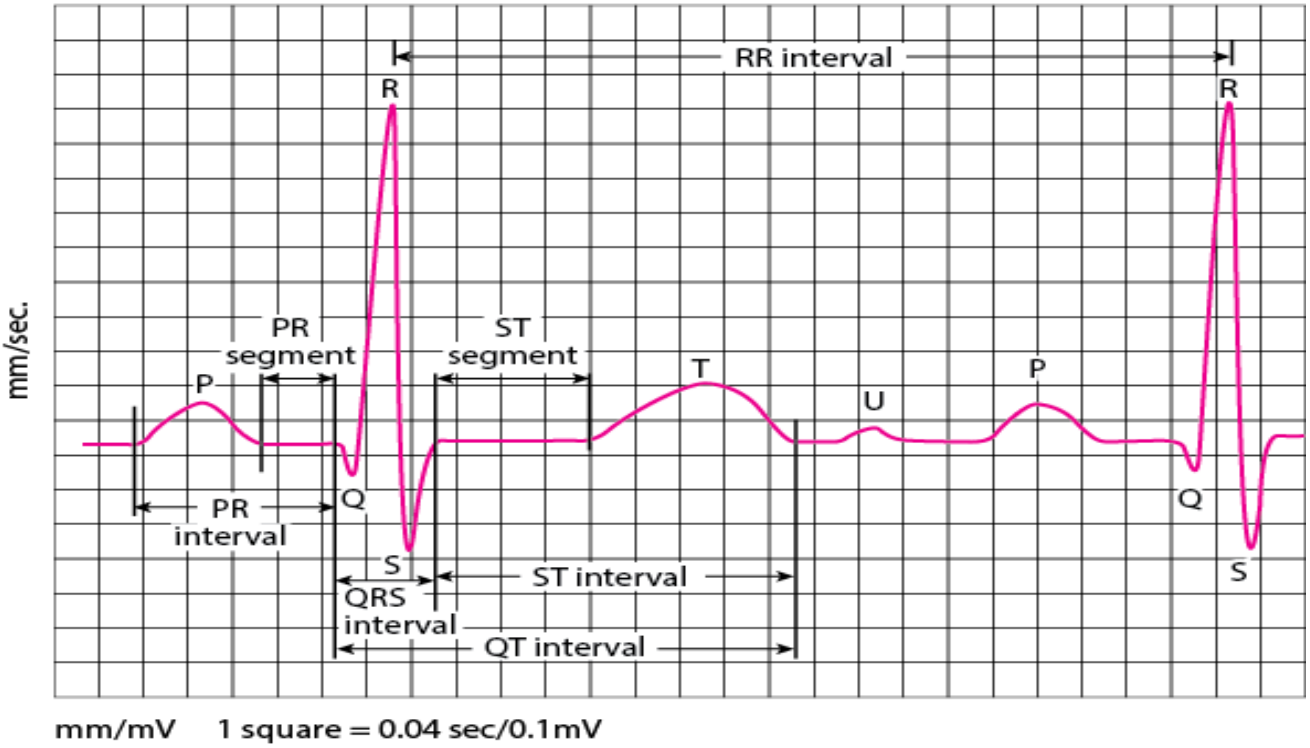
Rhythm: Is it Regular? Irregular?

P Waves: Are they present? Are they 1:1 with the QRS?

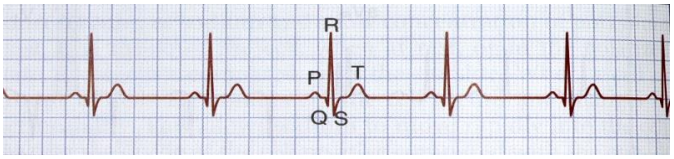
PR Interval: Is it normal? Does it remain consistent?

QRS Complex: Is it Normal? Or is it wide? (>10)

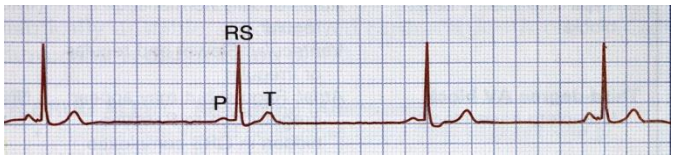
Extra: Are there any extra or abnormal complexes?



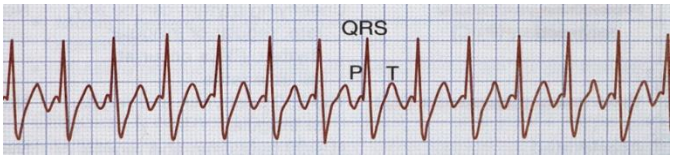
Normal Sinus Rhythm



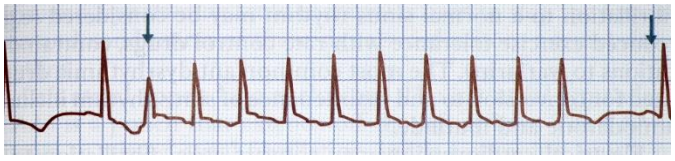
Sinus Bradycardia



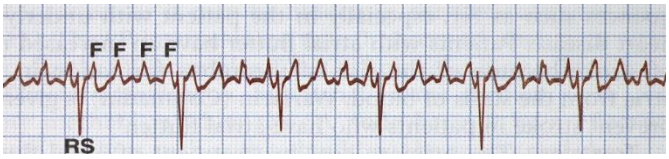
Sinus Tachycardia



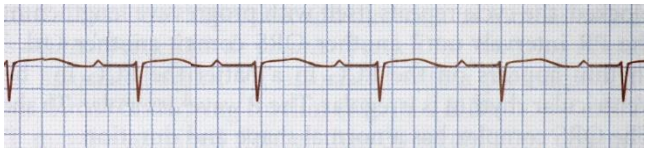
Paroxysmal Supraventricular Tachycardia



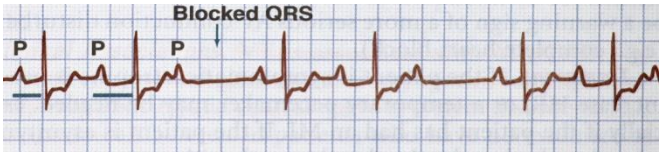
Atrial Flutter



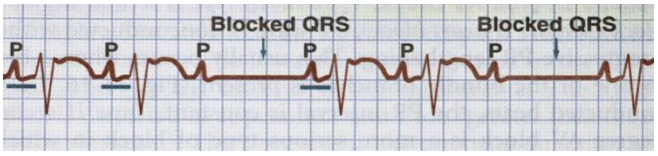
1st Degree AV Block



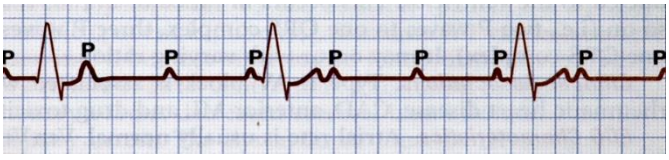
2nd Degree AV Block – Type I



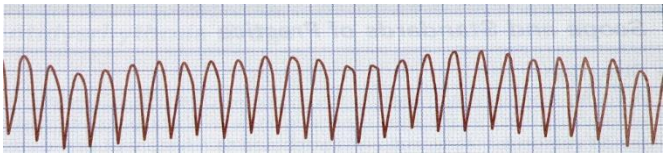
2nd Degree AV Block – Type II



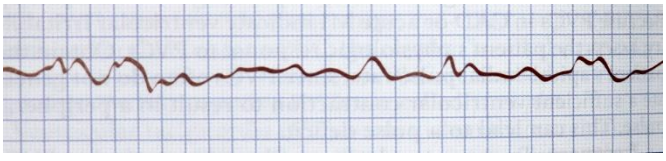
3rd Degree AV Block

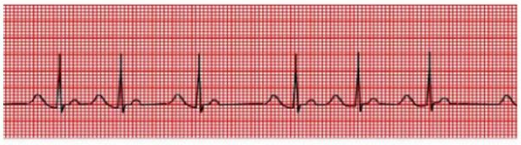
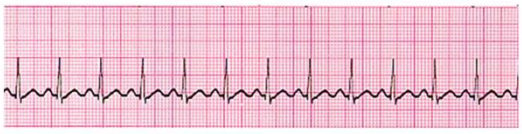
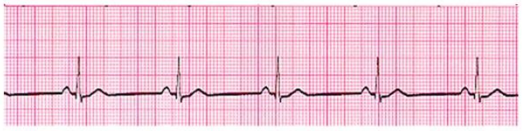
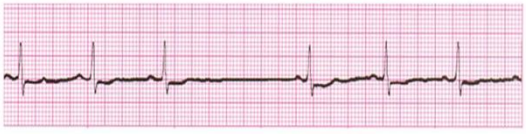
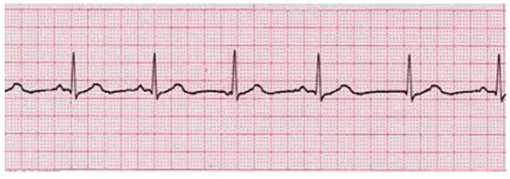
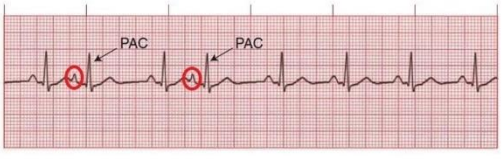


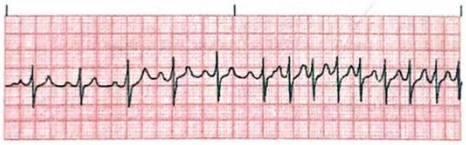
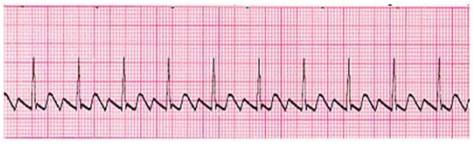
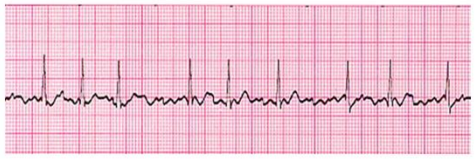
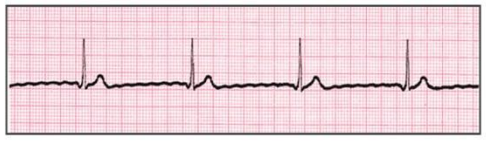
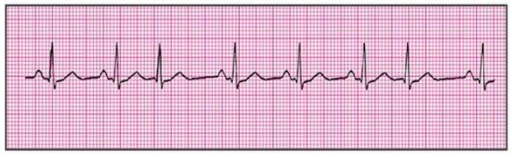
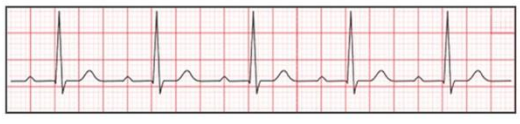
Ventricular Tachycardia

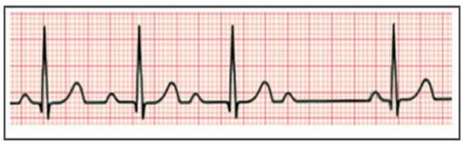
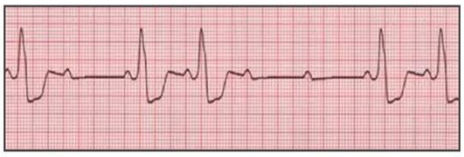
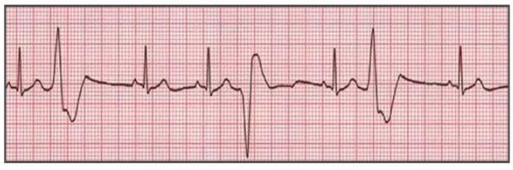
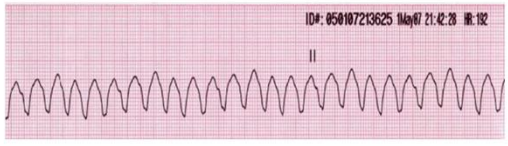
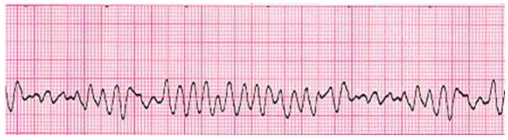
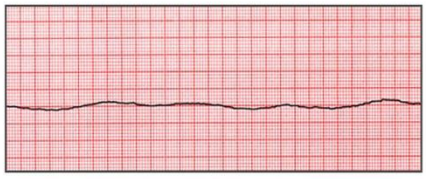


Ventricular Fibrillation



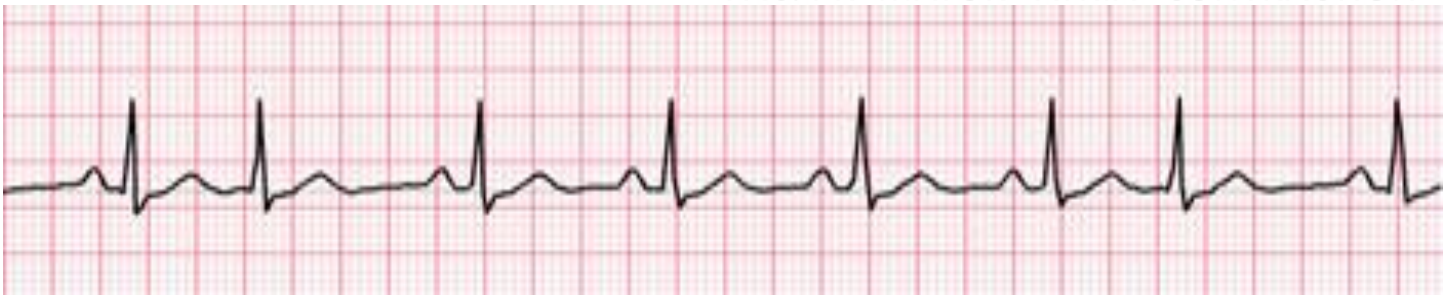
Arrhythmias	Description	Causes	Treatment
Sinus Arrhythmia 	• Irregular atrial and ventricular rhythms. • Normal P wave preceding each QRS complex.	• Normal variation of normal sinus rhythm in athletes, children, and the elderly. • Can be seen in digoxin toxicity and inferior wall MI.	• Atropine if rate decreases below 40bpm.
Sinus Tachycardia 	• Atrial and ventricular rhythms are regular. • Rate > 100 bpm. • Normal P wave preceding each QRS complex.	• Normal physiologic response to fever, exercise, anxiety, dehydration, or pain. • May accompany shock, left-sided heart failure, cardiac tamponade, hyperthyroidism, and anemia. • Atropine, epinephrine, quinidine, caffeine, nicotine, and alcohol use.	• Correction of underlying cause. • Beta-adrenergic blockers or calcium channel blockers for symptomatic patients.
Sinus Bradycardia 	• Regular atrial and ventricular rhythms. • Rate < 60 bpm. • Normal P wave preceding each QRS complex.	• Normal in a well-conditioned heart (e.g., athletes). • Increased intracranial pressure; increased vagal tone due to straining during defecation, vomiting, intubation, mechanical ventilation.	• Follow ACLS protocol for administration of atropine for symptoms of low cardiac output, dizziness, weakness, altered LOC, or low blood pressure. • Pacemaker
Sinoatrial Block 	• Atrial and ventricular rhythms are normal except for missing complexes. • Normal P wave preceding each QRS complex. • Pause not equal to multiple of the previous rhythm.	• Infection • Coronary artery disease, degenerative heart disease, acute inferior wall MI. • Vagal stimulation, Valsalva's maneuver, carotid sinus massage.	• Treat symptoms with atropine I.V. • Temporary pacemaker or permanent pacemaker if considered for repeated episodes.
Wandering Atrial Pacemaker 	• Atrial and ventricular rhythms vary slightly. • Irregular PR interval. • P waves irregular with changing configurations indicating that they aren't all from SA node or single atrial focus; may appear after the QRS complex. • QRS complexes are uniform in shape but irregular in rhythm.	• Rheumatic carditis due to inflammation involving the SA node. • Digoxin toxicity • Sick sinus syndrome	• No treatment if patient is asymptomatic • Treatment of underlying cause if patient is symptomatic.
Premature Atrial Contraction (PAC) 	• Premature, abnormal-looking P waves that differ in configuration from normal P waves. • QRS complexes after P waves except in very early or blocked PACs. • P wave often buried in the preceding T wave or identified in the preceding T wave.	• May prelude supraventricular tachycardia. • Stimulants, hyperthyroidism, COPD, infection and other heart diseases.	• Usually no treatment is needed. • Treatment of underlying causes if the patient is symptomatic. • Carotid sinus massage. •

Arrhythmias	Description	Causes	Treatment
Paroxysmal Supraventricular Tachycardia 	• Atrial and ventricular rhythms are regular. • Heart rate > 160 bpm; rarely exceeds 250 bpm. • P waves regular but aberrant; difficult to differentiate from preceding T waves. • P wave preceding each QRS complex. • Sudden onset and termination of arrhythmia • When a normal P wave is present, it's called paroxysmal atrial tachycardia; when a normal P wave isn't present, it's called paroxysmal junctional tachycardia.	• Physical exertion, emotion, stimulants, rheumatic heart diseases. • Intrinsic abnormality of AV conduction system. • Digoxin toxicity. • Use of caffeine, marijuana, or central nervous system stimulants.	• If the patient is unstable prepare for immediate cardioversion. • If the patient is stable, vagal stimulation, or Valsalva's maneuver, carotid sinus massage. • Adenosine by rapid I.V. bolus injection to rapidly convert arrhythmia. • If a patient has normal ejection fraction, consider calcium channel blockers, beta-adrenergic blocks or amiodarone. • If a patient has an ejection fraction less than 40%, consider amiodarone.
Atrial Flutter 	• Atrial rhythm regular, rate, 250 to 400 bpm • Ventricular rate variable, depending on degree of AV block • **Saw-tooth** shape P wave configuration. • QRS complexes are uniform in shape but often irregular in rate.	• Heart failure, tricuspid or mitral valve disease, pulmonary embolism, cor pulmonale, inferior wall MI, carditis. • Digoxin toxicity.	• If a patient is unstable with ventricular rate > 150bpm, prepare for immediate cardioversion. • If the patient is stable, drug therapy may include calcium channel blockers, beta-adrenergic blocks, or antiarrhythmics. • Anticoagulation therapy may be necessary.
Atrial Fibrillation 	• Atrial rhythm grossly irregular rate > 300 to 600 bpm. • Ventricular rhythm grossly irregular, rate 160 to 180 bpm. • PR interval indiscernible. • No P waves, or P waves that appear as erratic, irregular base-line fibrillatory waves	• Heart failure, COPD, thyrotoxicosis, constrictive pericarditis, ischemic heart disease, sepsis, pulmonary embolus, rheumatic heart disease, hypertension, mitral stenosis, atrial irritation, complication of coronary bypass or valve replacement surgery	• If a patient is unstable with ventricular rate > 150bpm, prepare for immediate cardioversion. • If stable, drug therapy may include calcium channel blockers, beta-adrenergic blockers, digoxin, procainamide, quinidine, ibutilide, or amiodarone. • Anticoagulation therapy to prevent emboli. • Dual chamber atrial pacing, implantable atrial pacemaker, or surgical maze procedure may also be used.
Junctional Rhythm 	• Atrial and ventricular rhythms are regular. • Atrial rate 40 to 60 bpm. • Ventricular rate is usually 40 to 60 bpm. • P waves preceding, hidden within (absent), or after QRS complex; usually inverted if visible. • PR interval (when present) < 0.12 second • QRS complex configuration and duration normal, except in aberrant conduction.	• Inferior wall MI, or ischemia, hypoxia, vagal stimulation, sick sinus syndrome. • Acute rheumatic fever. • Valve surgery • Digoxin toxicity	• Correction of underlying cause. • Atropine for symptomatic slow rate • Pacemaker insertion if patient is refractory to drugs • Discontinuation of digoxin if appropriate.
Premature Junctional Conjunctions 	• Atrial and ventricular rhythms are irregular. • P waves inverted; may precede be hidden within, or follow QRS complex. • QRS complex configuration and duration normal.	• MI or ischemia • Digoxin toxicity and excessive caffeine or amphetamine use	• Correction of underlying cause. • Discontinuation of digoxin if appropriate.
First-degree AV block 	• Atrial and ventricular rhythms regular • PR interval > 0.20 second. • P wave preceding each QRS complex. • QRS complex normal.	• Inferior wall MI or ischemia or infarction, hypothyroidism, hypokalemia, hyperkalemia. • Digoxin toxicity. • Use of quinidine, procainamide, beta-adrenergic blocks, calcium	• Correction of the underlying cause. • Possibly atropine if PR interval exceeds 0.26 second or symptomatic bradycardia develops. • Cautious use of digoxin, calcium channel blockers, and zbeta-adrenergic blockers.

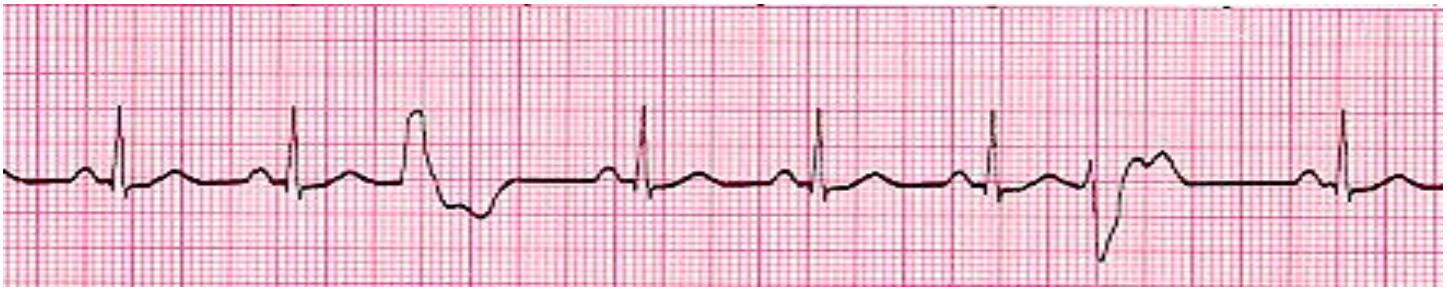
Arrhythmias	Description	Causes	Treatment
Second-degree AV block Mobitz I (Wenckebach) 	• Atrial rhythm regular. • Ventricular rhythm irregular. • Atrial rate exceeds ventricular rate. • PR interval progressively, but only slightly, longer with each cycle until QRS complex disappears. • PR interval shorter after dropped beat.	• Severe coronary artery disease, anterior wall MI, acute myocarditis. • Digoxin toxicity	• Atropine, epinephrine, and dopamine for symptomatic bradycardia. • Temporary or permanent pacemaker for symptomatic bradycardia. • Discontinuation of digoxin if appropriate.
Third-degree AV block (complete heart block) 	• Atrial rhythm regular. • Ventricular rhythm regular and rate slower than atrial rate. • No relation between P waves and QRS complexes. • No constant PR interval. • QRS interval normal (nodal pacemaker) or wide and bizarre (ventricular pacemaker).	• Inferior or anterior wall MI, congenital abnormality, rheumatic fever.	• Atropine, epinephrine, and dopamine for symptomatic bradycardia. • Temporary or permanent pacemaker for symptomatic bradycardia.
Premature ventricular contraction (PVC) 	• Atrial rhythm regular • Ventricular rhythm irregular • QRS complex premature, usually followed by a complete compensatory pause • QRS complexes are wide and distorted, usually >0.14 second. • Premature QRS complexes occurring singly, in pairs, or in threes; alternating with normal beats; focus from one or more sites. • Ominous when clustered, multifocal, with R wave on T pattern.	• Heart failure; old or acute myocardial ischemia, infarction, or contusion. • Myocardial irritation by ventricular catheters such as a pacemaker. • Hypercapnia, hypokalemia, hypocalcemia. • Drug toxicity by cardiac glycosides, aminophylline, tricyclic antidepressants, beta-adrenergic. • Caffeine, tobacco, or alcohol use. • Psychological stress, anxiety, pain	• If warranted, procainamide, lidocaine, or amiodarone I.V. • Treatment of underlying cause. • Discontinuation of drug causing toxicity. • Potassium chloride IV if PVC induced by hypokalemia. • Magnesium sulfate IV if PVC induced by hypomagnesaemia.
Ventricular Tachycardia 	• Ventricular rate 140 to 220 bpm, regular or irregular. • QRS complexes wide, bizarre, and independent of P waves • P waves no discernible • May start and stop suddenly	• Myocardial ischemia, infarction, or aneurysm • Coronary artery disease • Rheumatic heart disease • Mitral valve prolapse, heart failure, cardiomyopathy • Ventricular catheters. • Hypokalemia, Hypercalcemia. • Pulmonary embolism. • Digoxin, procainamide, epinephrine, quinidine toxicity, anxiety.	• **If pulseless**: initiate CPR; follow ACLS protocol for defibrillation. • **If with pulse**: If hemodynamically stable, follow ACLS protocol for administration of amiodarone; if ineffective initiate synchronized cardioversion.
Ventricular Fibrillation 	• Ventricular rhythm and rate are rapid and chaotic. • QRS complexes wide and irregular, no visible P waves	• Myocardial ischemia or infarction, R-on-T phenomenon, untreated ventricular tachycardia, • Hypokalemia, hyperkalemia, Hypercalcemia, alkalosis, electric shock, hypothermia. • Digoxin, epinephrine, or quinidine toxicity.	• **If pulseless**: start CPR, follow ACLS protocol for defibrillation, ET intubation, and administration of epinephrine or vasopressin, lidocaine, or amiodarone; ineffective consider magnesium sulfate.
Asystole 	• No atrial or ventricular rate or rhythm. • No discernible P waves, QRS complexes, or T waves	• Myocardial ischemia or infarction, aortic valve disease, heart failure, hypoxemia, hypokalemia, severe acidosis, electric shock, ventricular arrhythmias, AV block, pulmonary embolism, heart rupture, cardiac tamponade, hyperkalemia, electromechanical dissociation. • Cocaine overdose.	• Start CPR.

MORE

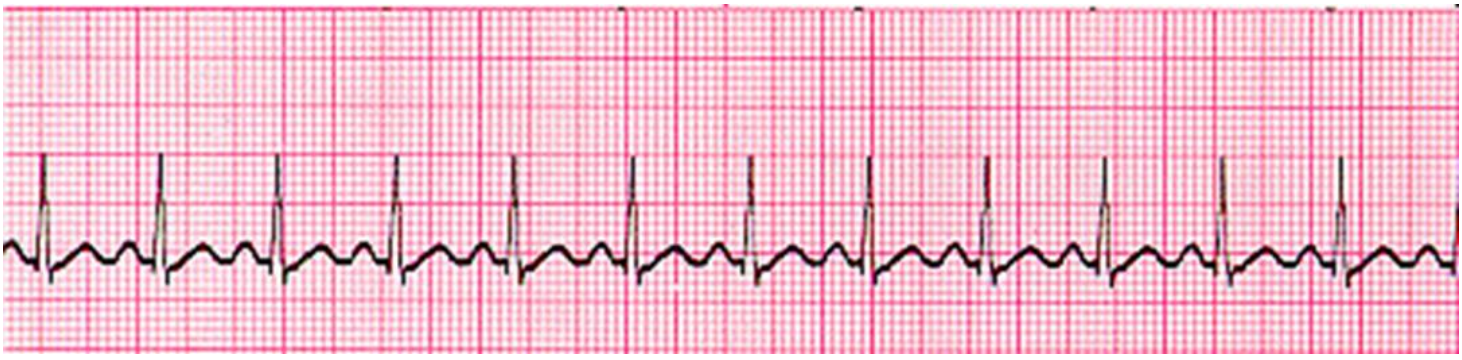
PAC: PREMATURE ATRIAL CONTRACTION



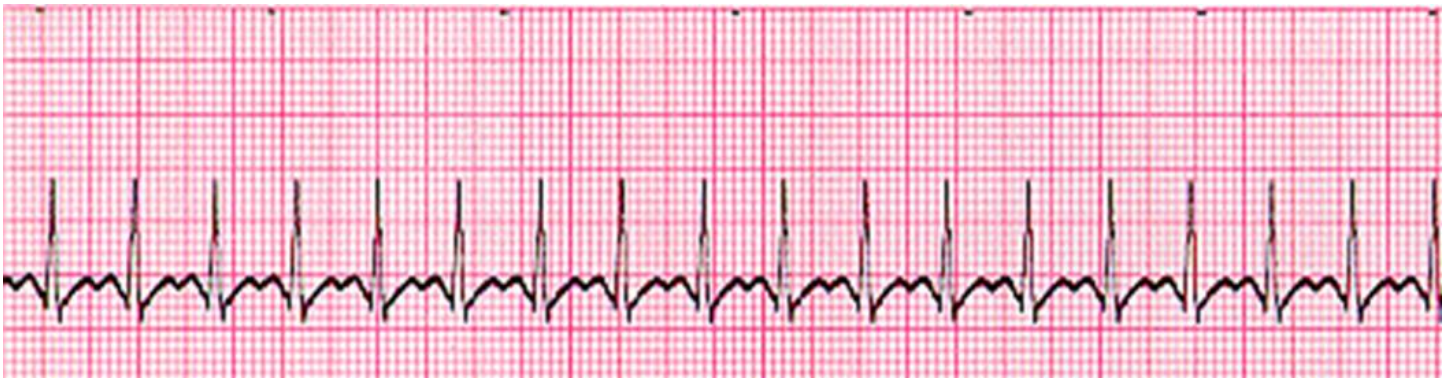
PVC: PREMATURE VENTRICULAR CONTRACTION



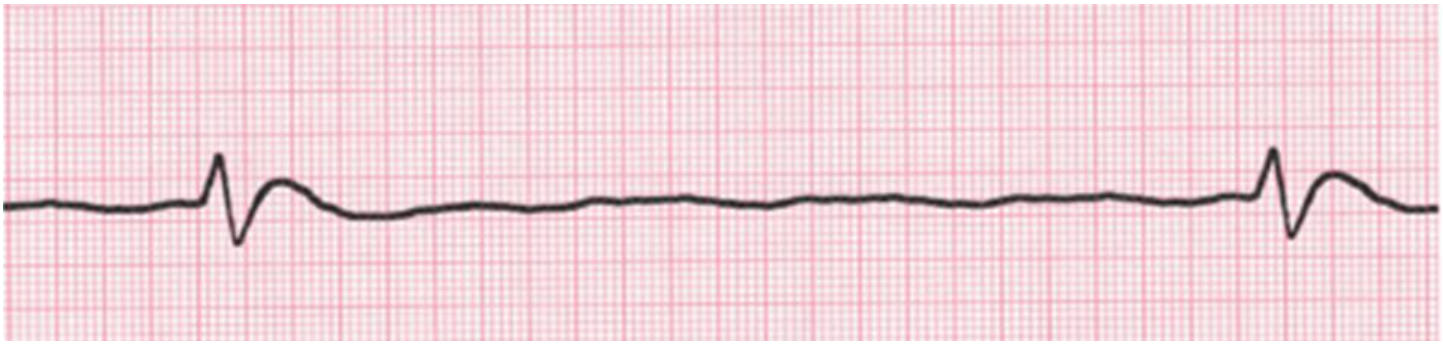
SINUS TACHYCARDIA



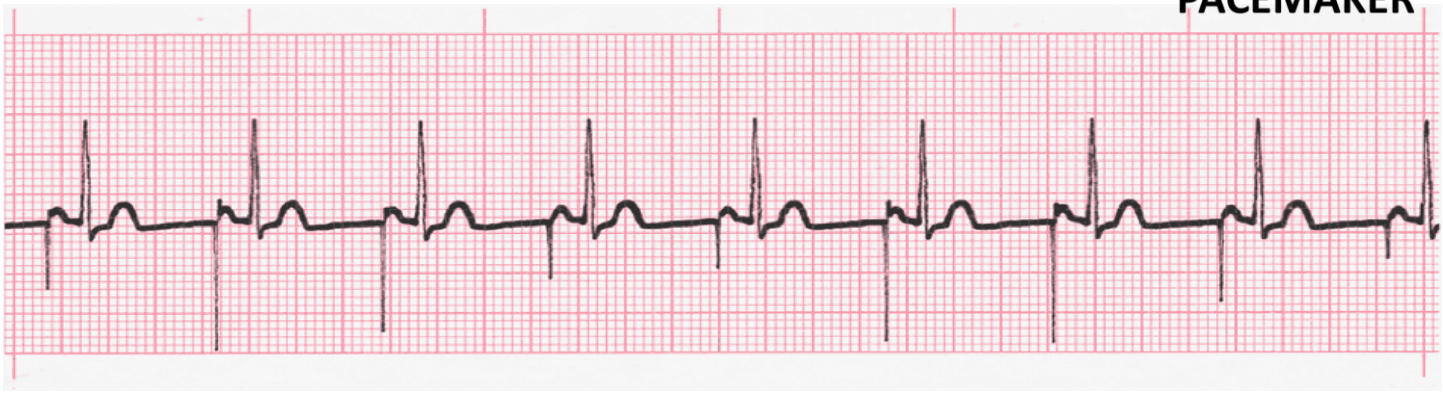
SUPRAVENTRICULAR TACHYCARDIA



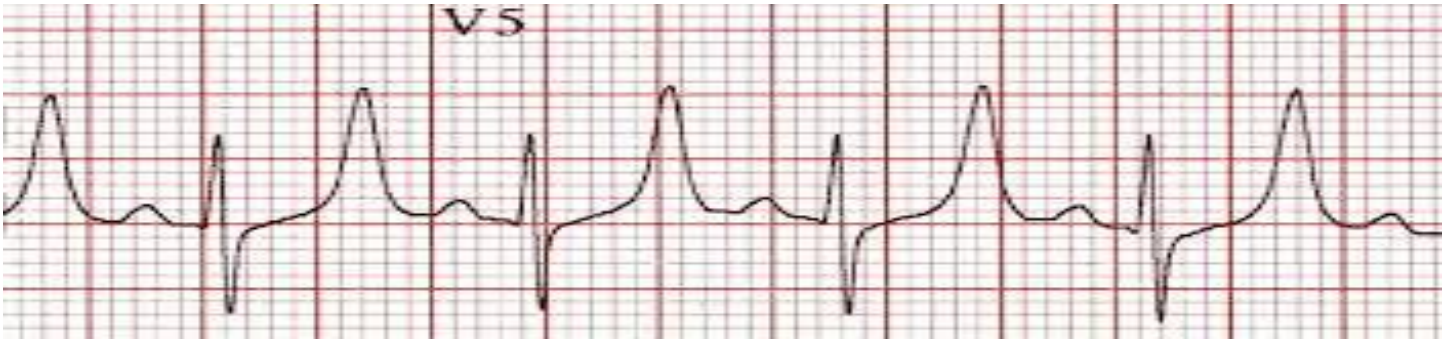
AGONAL RHYTHM



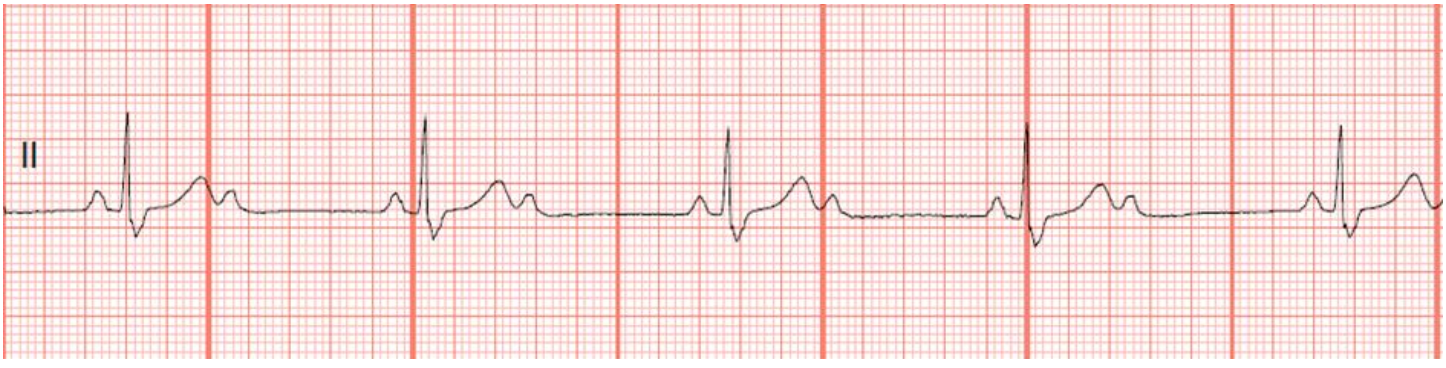
PACEMAKER



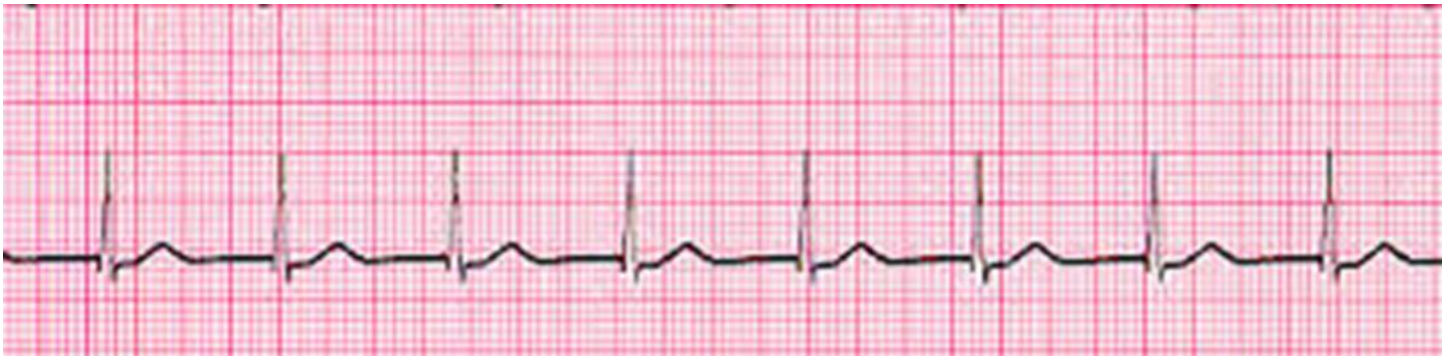
HYPERKALEMIA



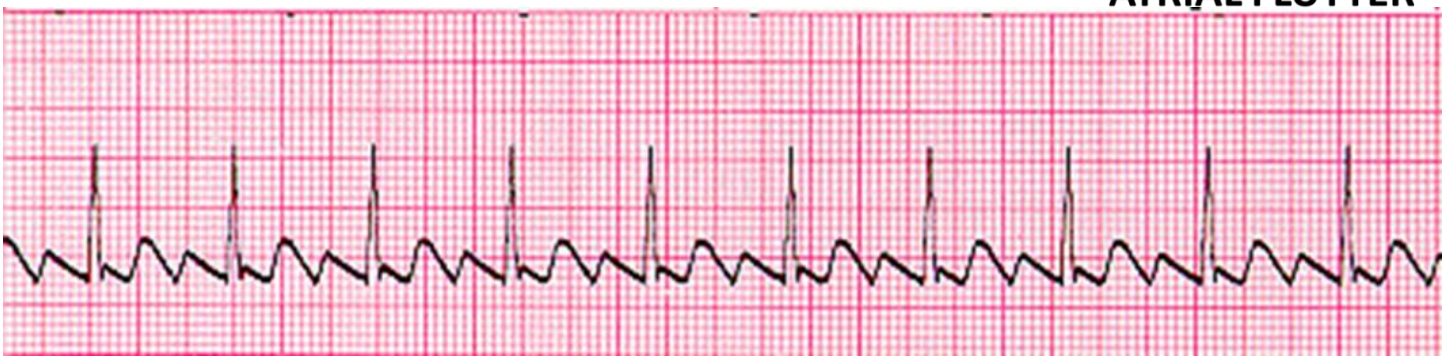
HYPOKALEMIA



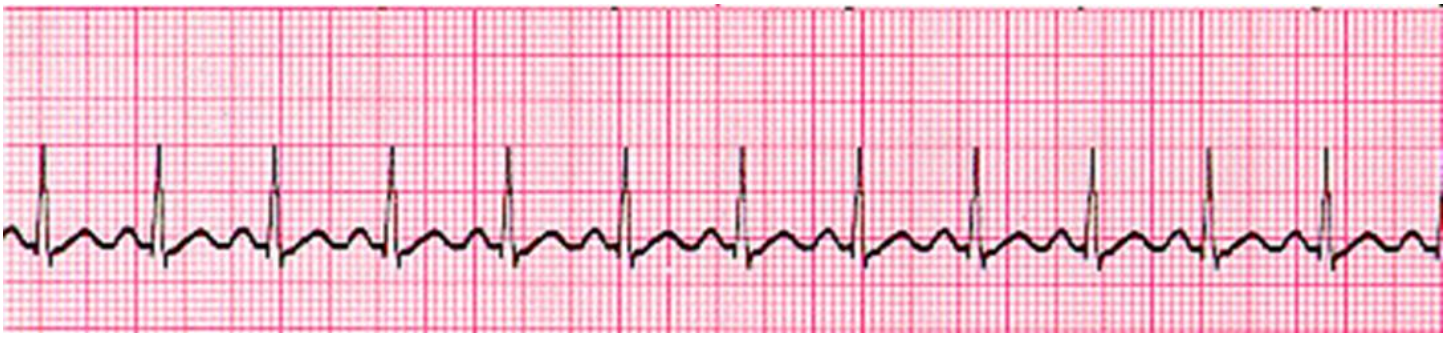
NORMAL NODAL or JUNCTIONAL RHYTHM



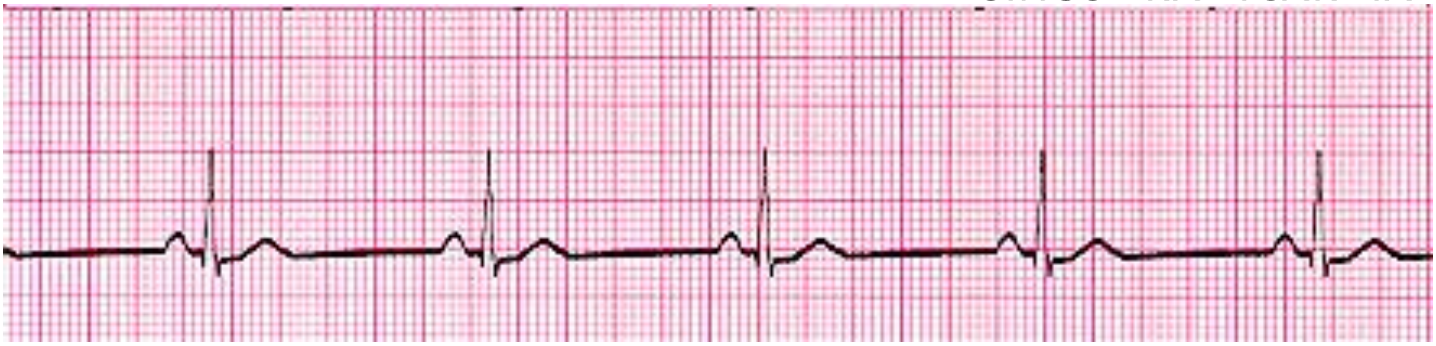
ATRIAL FLUTTER



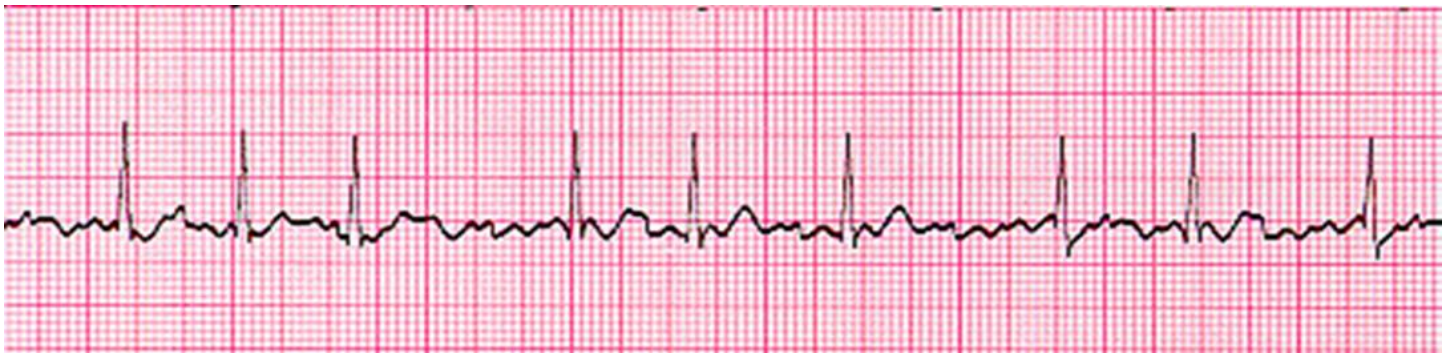
SINUS TACHYCARDIA

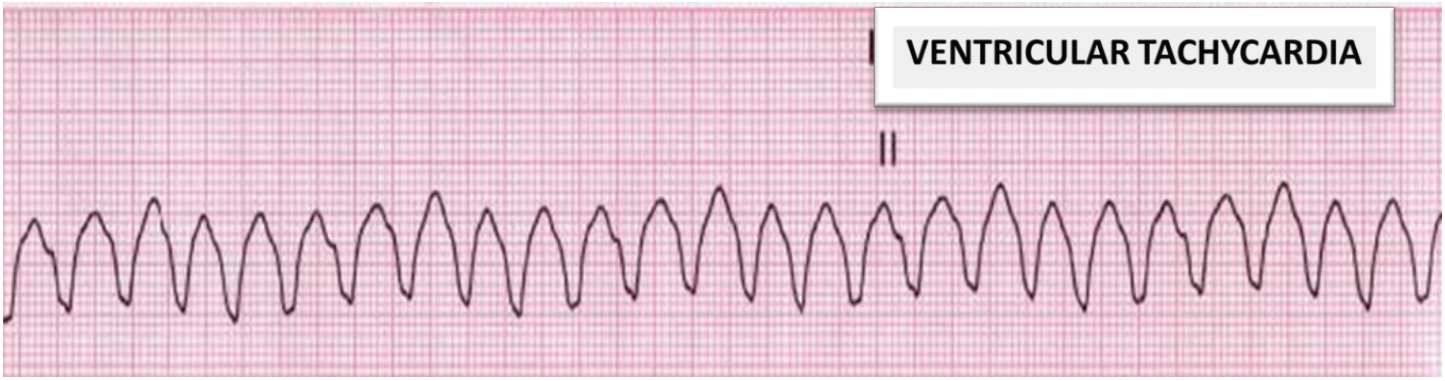


SINUS BRADYCARDIA

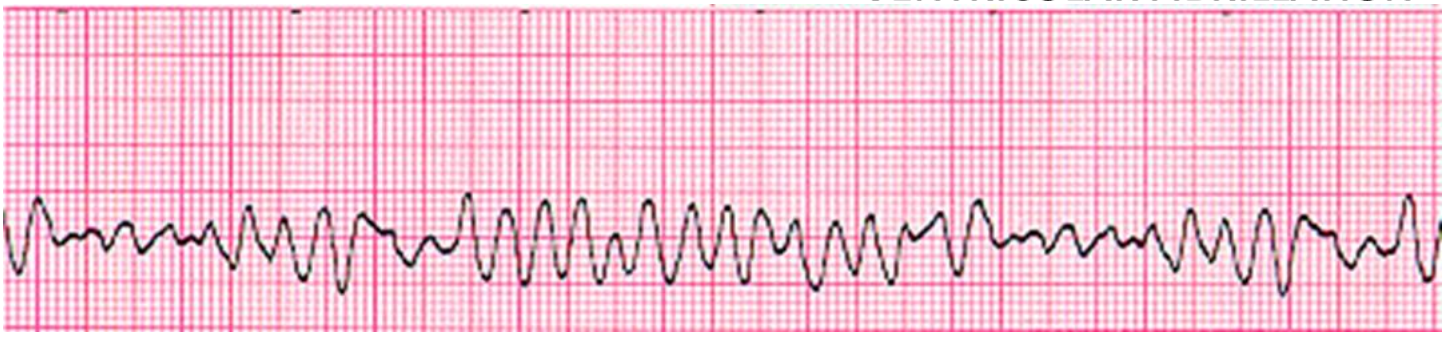


ATRIAL FIBRILLATION

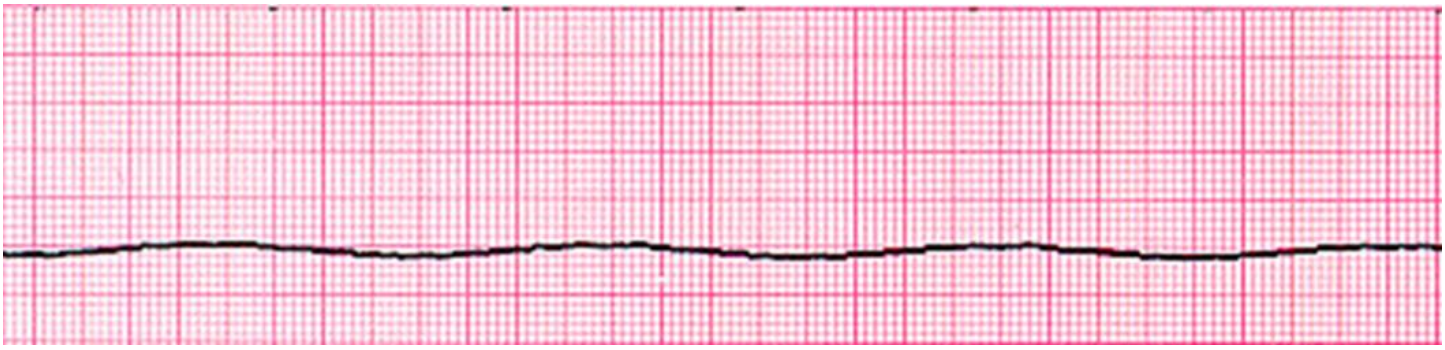




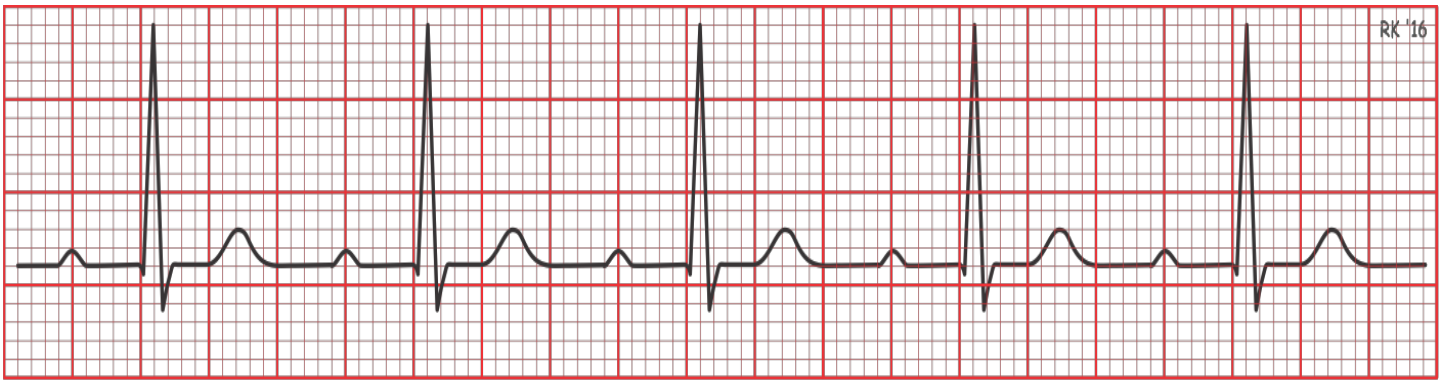
VENTRICULAR FIBRILLATION



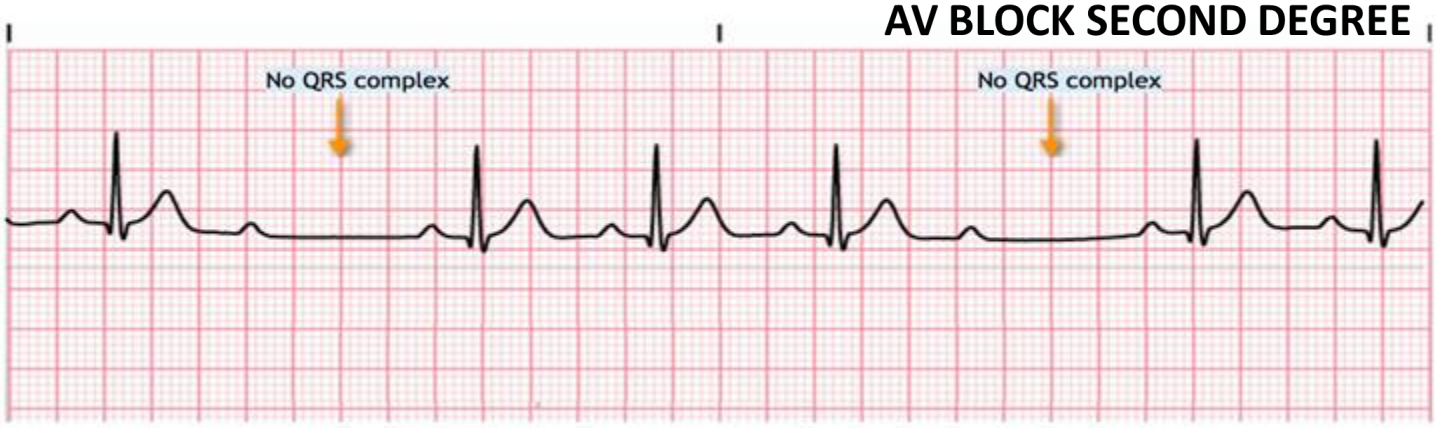
ASYSTOLE



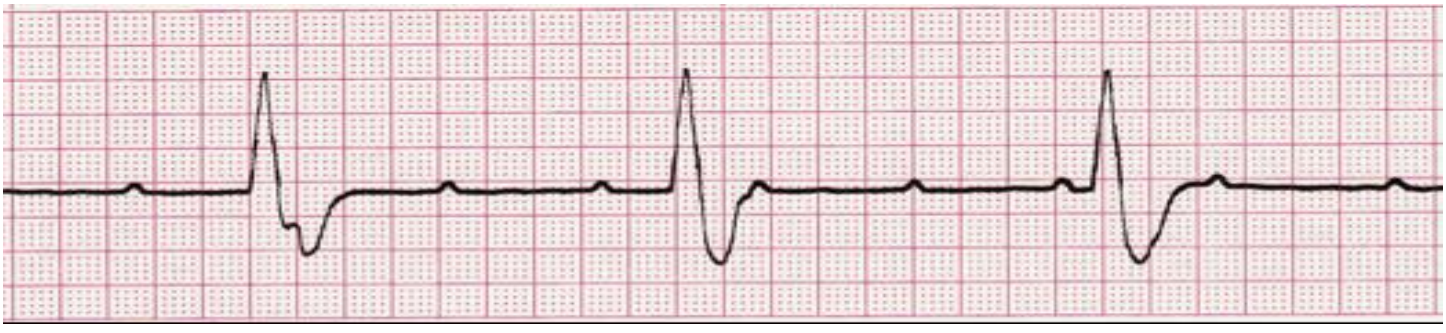
AV BLOCK FIRST DEGREE



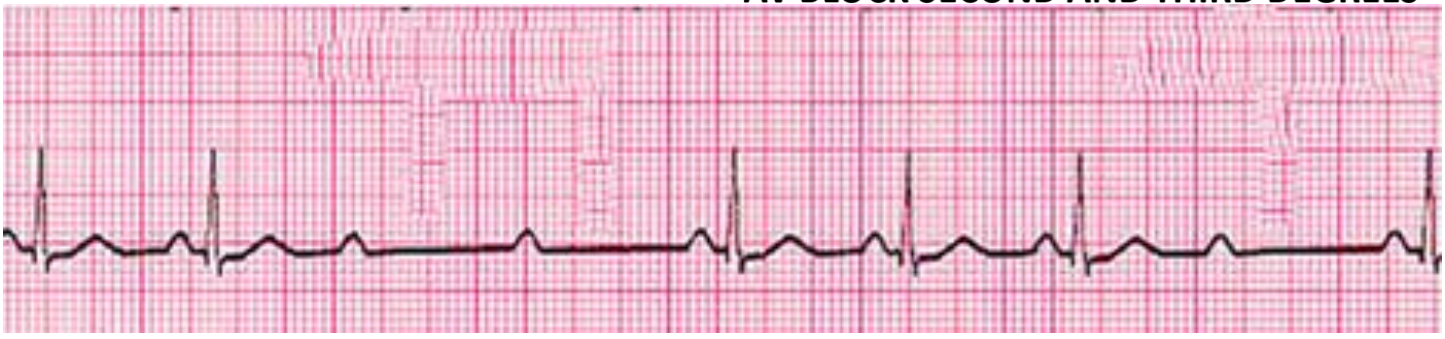
AV BLOCK SECOND DEGREE



AV BLOCK THIRD DEGREE



AV BLOCK SECOND AND THIRD DEGREES



HERPES ZOSTER

P: Reactivation of the varicella zoster virus from previous Chickenpox infection
S/Sx: Red skin vesicles along areas of sensory nerves.
N: Isolate patient in contact precautions, prevent scratching - irritation or vesicles. Admin antivirals as ordered

STEVENS - JOHNSON SYNDROME

P: A skin reaction caused by an immunological response to taking certain medications
S/Sx: Vesicles, erosions, flulike symptoms and redness
N: Discontinue the medication that is causing the reaction. Administer antibiotics and corticosteroids as ordered

PSORIASIS

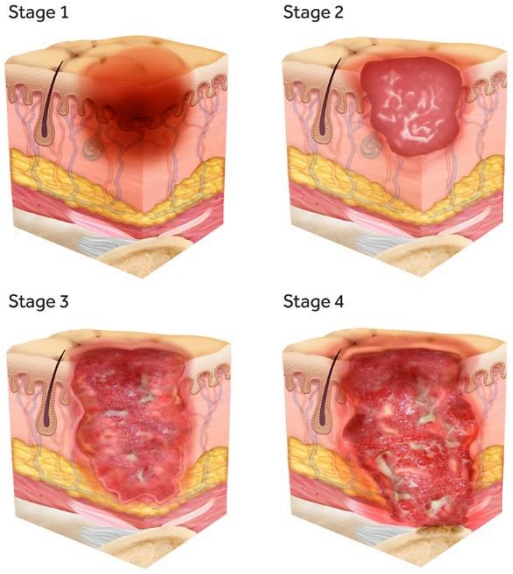
P: Chronic, non-contagious inflammation of the skin due to over-keratinization
Ed: Teach client to avoid scratching and wear nonirritating clothing like cotton. Ensure pt. doesn't use any OTC meds without approval.

FROSTBITE

P: Damage to tissue/vessels as a result of prolonged exposure to cold
S/Sx: White plaque around redness, blisters, bluish skin and numbness of extremities
Tx: Rewarm slowly with moist heat + monitor CMS and for signs of compartment syndrome

PRESSURE INJURIES

Pressure against a vessel near the skin prevents adequate blood flow and causes skin breakdown (especially near pony areas)
- Stage 1: Non-Blanchable but intact/unbroken skin
- Stage 2: partial-thickness injury, extends up to epidermis or dermis.
- Stage 3: full thickness injury extends past dermis FAT visible.
- Stage 4: full thickness injury extends past subcutaneous/ BONE visible.
- Unstageable: unable to see thickness layers due to excess exudate.
- Wound healing is promoted by a diet that is rich in protein and vitamin C.



PRIMARY LESIONS

MACULE
Flat area of color change (no elevation or depression)

Example: Freckles

PAPULE
Solid elevation less than 0.5 cm in diameter

Example: Allergic eczema

NODULE
Solid elevation 0.5 to 1 cm in diameter. Extends deeper into dermis than papule

Example: Mole

TUMOR
Solid mass—larger than 1 cm

Example: Squamous cell carcinoma

PLAQUE
Flat elevated surface found on skin or mucous membrane

Example: Thrush

WHEAL
Type of plaque. Result is transient edema in dermis

Example: Intradermal skin test

VESICLE
Small blister—fluid within or under epidermis

Example: Herpesvirus infection

BULLA
Large blister (greater than 0.5 cm)

Example: Burn

PUSTULE
Vesicle filled with pus

Example: Acne

SECONDARY LESIONS

SCALES
Flakes of cornified skin layer

Example: Psoriasis

CRUST
Dried exudate on skin

Example: Impetigo

FISSURE
Cracks in skin

Example: Athlete's foot

ULCER
Area of destruction of entire epidermis

Example: Decubitus (pressure sore)

SCAR
Excess collagen production after injury

Example: Surgical healing

ATROPHY
Loss of some portion of the skin

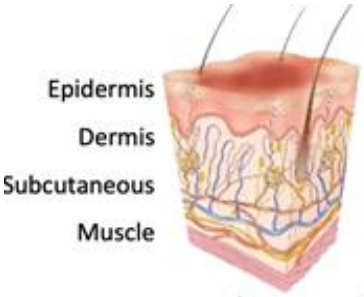
Example: Paralysis

Burns

Classification of Burns:

Thermal: liquid, steam, fire
Chemical: powder, gas (inhalation injury)
Electric: usually have an entry or exit wound. Injuries may be internal
Cold: Frostbite
Radiation: Dun, Radiation
Friction: Road rash

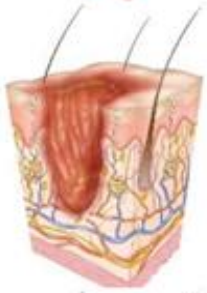
TYPES OF BURNS



Superficial
(First degree burn)

- Only affect Top Layer (Epidermis)
- No Blister or Scars
- Pink or Red
- May be Tender or Painful
- Some pain, minor Edema, and Erythema

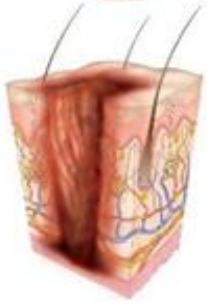
1ST



Partial Thickness
(Second degree burn)

- Epidermis and Dermis
- Raw, mottled, red appearance
- Skin is moist; May blister or need grafting
- Painful, blanching
- Shiny, Scars left behind; 2-6 weeks healing time

2ND



Full Thickness
(Third degree burn)

- Through all dermal layers; SQ tissue, muscle, bone, and/or organs involved.
- Nerves burnt away, so, little to no pain.
- May need grafting
- Eschar must be removed

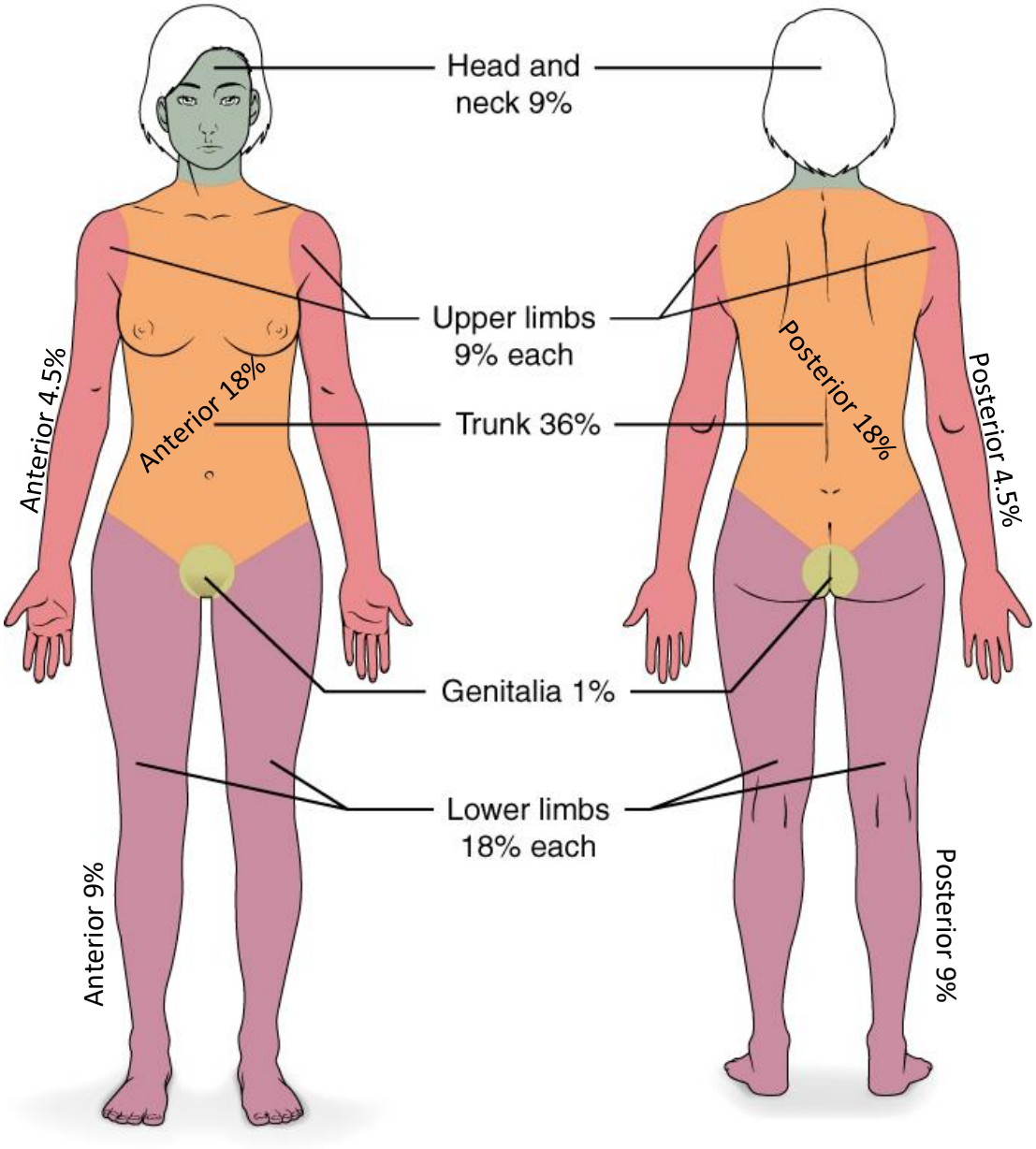
3RD

NURSING CARE

- Ensure patient Tetanus shot if >5-10 years
- Watch for temperature loss = shivering
- Pain control – IV rout (best)
- Wound Care – Premedicate
debridement – remove necrotic tissue
- No pillows for the ear or neck. Use rolled towel under shoulder
- Watch for Webbing

Rule of 9's - Burns

System used to estimate the percentage of body surface involved in a burn injury, and to estimate the severity of the burn



Once stablished the total body surface area% burned, we use the Parkland Burn Formula, for 2nd and 3rd Degree Burn

4mL x TBSA % x Weight (Kg)

1st HALF of the Solution, over the 1st 8 Hours

2nd HALF of the Solution, over the next 16 Hours

NursingStoreRN

*TBSA% - Total Body Surface Area Burned

PYELONEPHRITIS

Patho: Inflammation of the renal pelvis caused by bacterial infection

S/Sx: Fever, chills, tachypnea, nausea, flank pain, frequency, urgency, cloudy urine, hematuria

N: Monitor temperature, Encourage increased fluid intake and decreased protein. Administer analgesics, antipyretics. Monitor I/O + Weight

HYDRONEPHROSIS

Patho: Distension of the renal pelvis caused by an obstruction. Trapping urine proximally

S/Sx: Colicky or dull flank pain that radiates to the grain. Headache + hypertension

N: Monitor vitals, electrolytes, specific gravity, and dehydration

BENIGN PROSTATIC HYPERTROPHY

Patho: Slow enlargement of the prostate gland that can compress the urethra

S/Sx: Diminished urinary stream, Nocturia, urgency, hematuria, retention, dysuria, bladder pain

N: Increase fluid intake. (2-3L/day) Encourage patient to decrease caffeine + artificial sweetness intake. Educate about a timed voiding schedule

RENAL CALCULI

Patho: Stones that form in the urinary tract

S/Sx: Severe intermittent pain, nausea, vomiting, low- grade fewer, hematuria

N: Monitor temperature, encourage increased fluids, apply heat to flank area, diet modification

C: Scar tissue formation, infection and obstruction

POLYCYSTIC KIDNEY DISEASE

Patho: Cyst formation and hypertrophy of the kidneys causing scar tissue, infection, nephron damage

S/Sx: Flank or lumbar pain that worsens with activity + improves upon lying down, Hematuria, proteinuria, recurrent UTI

N: Monitor for hematuria which could indicate a rupture. Increase sodium + water intake. Educate about possible need for surgical interventions

Chronic Kidney Disease

Decrease of Kidney Function >3 months

Patho: Slow progressive loss of kidney function resulting in uremia and hypervolemia - the inability to conserve sodium and water

S/Sx: Polyuria, decreased skin turgor, edema, diluted urine, proteinuria

N: low protein, potassium, high phosphorus diet. Educate about fluid restriction and possible dialysis treatment

R: Diabetes, Hypertension, AKI, Recurrent Infections, Renal Occlusions

Stages

Stage 1: GFR ≥90 mL/min

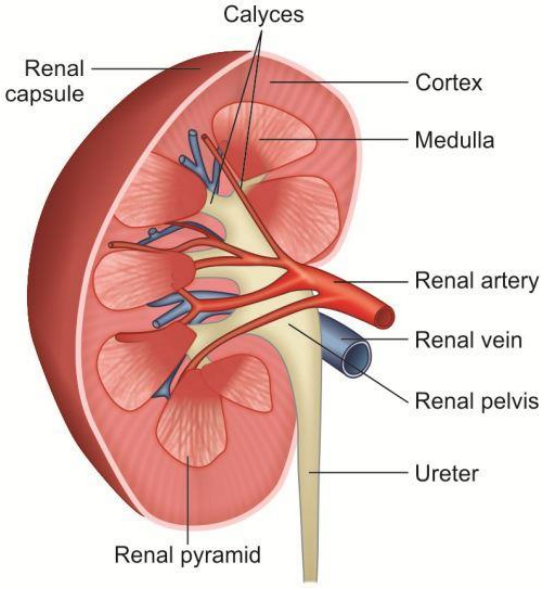
Stage 2: GFR = 60–89 mL/min

Stage 3: GFR = 30–59 mL/min

Stage 4: GFR = 15–29 mL/min

Stage 5: GFR <15 mL/min

GFR: Glomerular Filtration Rate



DIALYSIS

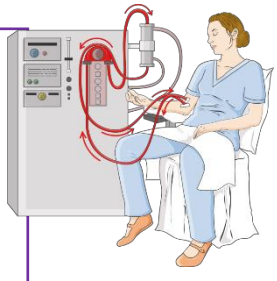
Hemodialysis

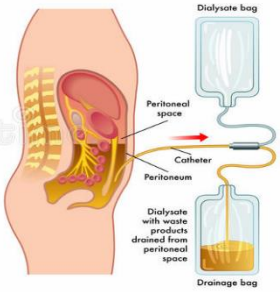
The Process of filtering the blood through a dialyzer (Artificial Kidney)

Frequency: 3 times a week / 5-6 hrs/day

Complications: Hypotension, Muscle Cramps, Blood Loss, Hepatitis, Sepsis, Disequilibrium Syndrome

Nocturnal Hemodialysis: It's done 5-6 days/week – 2-3 hrs/day





Peritoneal

Continuous Abdominal Peritoneal Dialysis (CAPD)

Uses Peritoneal Cavity as "Artificial Kidney"

Uses dextrose as osmotic agent

Complications: Peritonitis

Acute Kidney Injury

Sudden loss of kidney ability to regulate volume, remove waste products, release hormones or maintain body's acid-base balance.

CAUSES
- Prolonged Renal Ischemia
- Nephrotoxic Injury leading to tubular necrosis

PRERENAL

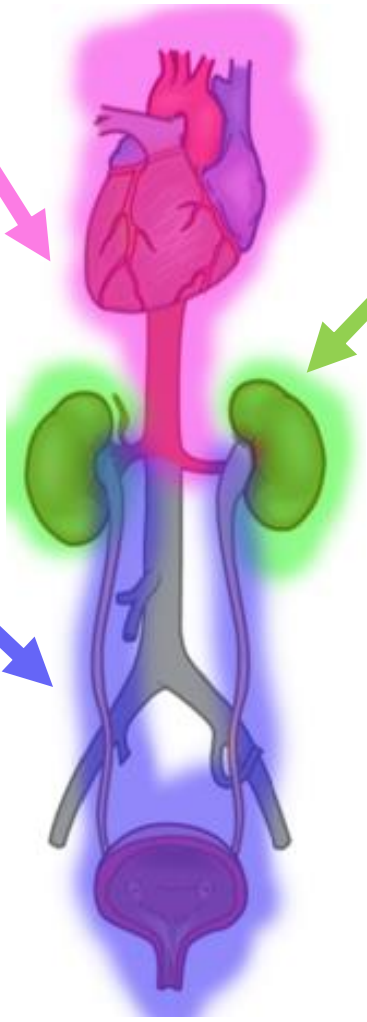
Caused by a reduced blood flow to the kidneys.

Causes:
- Vasoconstriction
- Hypotension
- Hypovolemia
- Decreased cardiac output

POSTRENAL

Occurs when there is an obstruction of urinary flow causing intraluminal pressure

Causes:
- BPH
- Bladder Cancer
- Calculi
- Prostate Cancer
- Trauma



INTRARENAL

Injury occurring from disease within the kidneys

Causes:
- Acute Tubular Nephritis
- Nephritis
- Nephrotoxic Injury
- Acute Glomerular Nephritis
- Thrombolytic Disorders
- Malignant Hypotension
- SLE
- Infection

PHASES

Initiation Phase: Onset of Injury / Onset of symptoms

Oliguria Phase: Decrease urine output to 400ml/day, usually 1-7 days after injury

Diuretic Phase: Increase urine output to 1-3L/day, caused by inability to concentrate

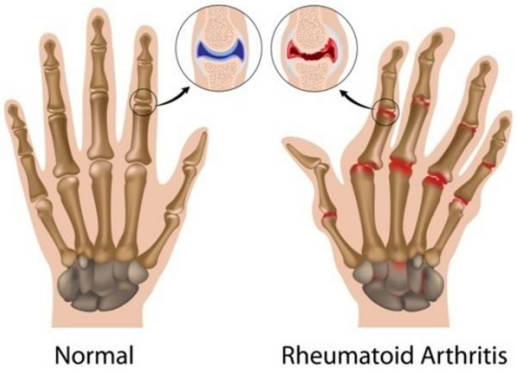
↑ Risk of hyponatremia, hypokalemia, dehydration

Recovery Phase: Increase in filtration rate, BUN/Creatinine

Musculoskeletal Disorders

RHEUMATOID ARTHRITIS

P: An autoimmune response that causes deformities
S/Sx: Fatigue, anorexia, stiffness, weight loss
Event may trigger: Childbirth, Infection, Stress
Permanent deformity, Symmetrical
D: Rheumatoid factor- Blood Test + - >60 u/mL
↑ Erythrocyte sedimentation rate (ESR) -non specific
CRP, ANA
Radiology showing joint space deterioration
C: Nodular myositis, contractures Sjogren's syndrome, cataracts
Tx: Surgery to restore function



OSTEOPOROSIS

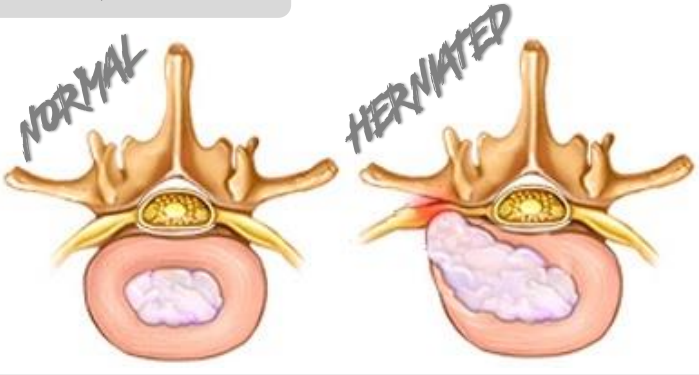
P: Bone demineralization caused by loss of calcium and phosphorus. Bone resorption occurs faster than bone formation
S/Sx: Loss of bone density and easily fractured bones
N: Encourage a well - balanced diet high in protein, calcium, iron, vit D + C

OSTEOARTHRITIS

P: On inflammatory degeneration, gradual loss of articular cartilage. Asymmetrical
R: trauma, aging, obesity, smoking, ↓estrogen, genetic changes
S/Sx: Exacerbated by temperature + climate changes. Joint space narrowing. One leg shorter than other. Pain is increased after rest
T: Regular exercise -> preventative. Avoid prolonged standing, kneeling and squatting. Apply cold for inflammation / Heat for stiffness

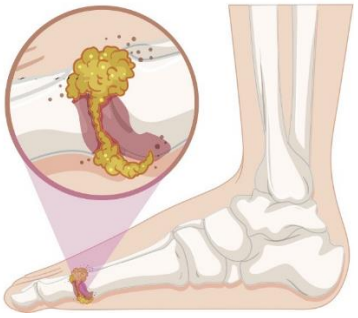
HERNIATED DISK

P: A vertebral disk slips out of place which can cause pain due to compression of spinal nerve
R: Numbness and tingling in back and extremities. Severe pain.
Tx: Surgery to realign vertebra, physical therapy and adjustment by a chiropractor can alleviate pain but doesn't fix the herniation



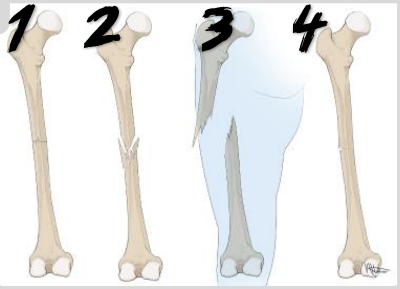
GOUT

P: Uric acid crystals build up in joints and body tissues. Can result from poor metabolism of purine
S/Sx: Swelling + inflammation of joints, low grade fever, malaise, itchiness + pain at joints
N: Low purine diet, increase fluid intake.
Ed: Instruct client to avoid alcohol and excessive use of the joint



FRACTURES

1- Transverse: A break that is perpendicular to the long axis
2- Comminuted: The bone fragments into pieces
3- Open / Compound: Part of the bone is through skin
4- Greenstick: The bone is splintered on one side



CASTS

N: Elevate for 24-48 hours to promote venous drainage. Allow plasters casts to dry for 24-72 Hours
Ed: Instruct client to report skin irritation and hot spot

TRACTION

N: Ensure weights are freely hanging + off the floor. Assess skin integrity frequently with skin traction

FRACTURE COMPLICATION

Fat Embolism: Altered mental status, impaired respiratory function, decreased perfusion distal to embolus site.
Compartment Syndrome: Pressure is an extremity that can't escape, i.e., under a cast.
Numbness + tingling, pain that increase with elevation, Pallor, pain W/ Movement

JOINT INJURIES

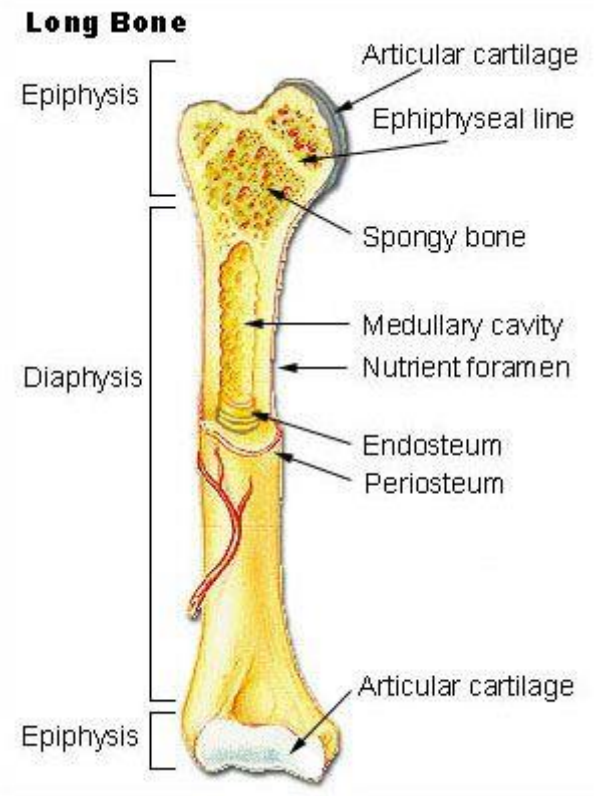
Sprains: The ligament connecting two bones becomes torn or stretched
sTrains: The muscle or Tendon attached to a bone becomes injured or over stretched

AMPUTATION

Ensure residual limb sock is worn at all times, position is prone position as prescribed. Educate patient about cleaning prosthesis socket daily.

Above Knee: Prevent internal and external rotation of the hip
Below Knee: Discourage long period of sitting to reduce Flexion.
Don't allow limb to dangle

Musculoskeletal Disorders



Active range of motion: Can move joint without assistance

Passive range of motion: Can only move w/ assistance

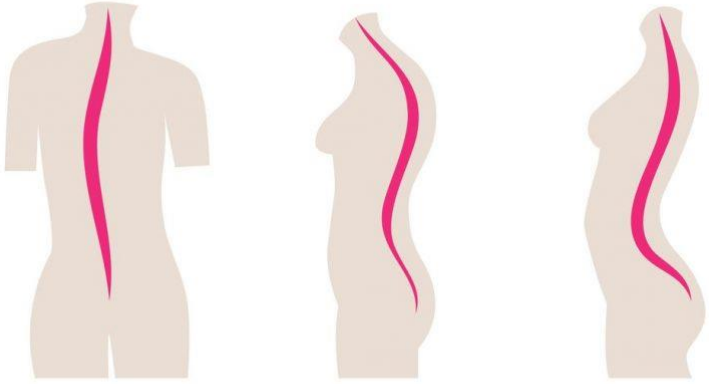
Goniometer: Measures range of motion of a joint

Muscle Strength Scale

0 = No muscle contraction
1 = A barely detectable contraction
2 = Active muscle contraction without gravity
3 = Active muscle contraction against gravity
4 = Active muscle contraction against some resistance
5 = Active movement against full resistance

Abnormalities

Atrophy: Decrease Size / Strength of a muscle
Ankylosis: Stiffness at a joint
Kyphosis: Thoracic curvature of spine
Myalgia: General Muscle Pain / Tenderness
Scoliosis: Asymmetrical elevation of shoulders
Paresthesia: Pins + Needles
Lordosis: Excessive inward curve of spine (pregnancy)



Diagnostics

X – Ray: Remove any radiopaque obj.
CT scan: Verify no shellfish allergy if contrast dye is used
Bone Scan: Ensure bladder is empty

ASSESS

- Joints + muscles for crepitation or tenderness
- Muscle strength
- Range of motion

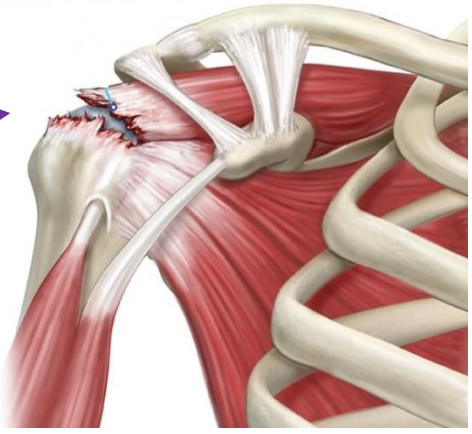
Fall Prevention

- Eliminate scatter rugs
- Use supportive shoes that have good grip
- Use a walker or cone for support

SPORT RELATED INJURY

Impingement Syndrome
Soft tissue/nerves trapped under coracoacromial arch
Give: NSAIDS, Rest, ROM + Strengthening

Rotator Cuff Tear
Rest, NSAIDS + Strengthening + Surgery if Severe



Shin Sprints
Periostitis in calf -> ice, stretching + supportive shoes

Tendonitis
Inflammation of a tendon -> Rest, Ice, NSAIDS, brace, gradual return

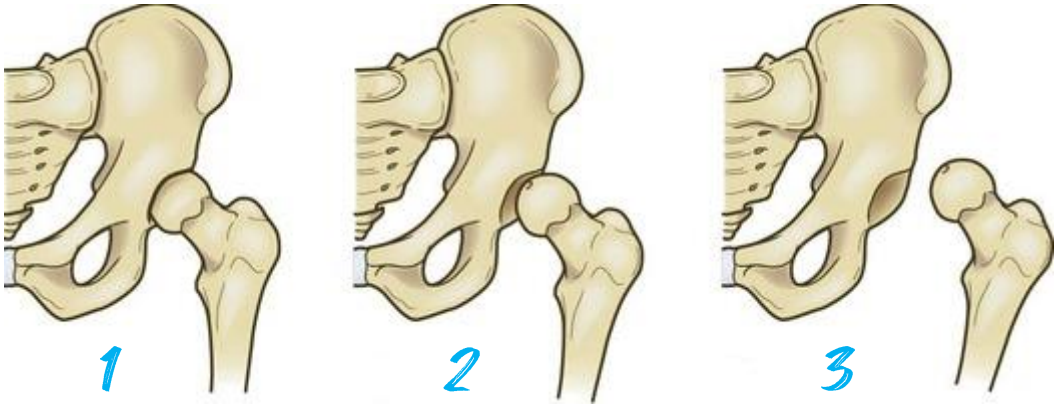
Meniscus Injury
Injury to fibrocartilage discs in knee -> R.I.C.E and arthroscopic surgery PRN

DISLOCATION / SUBLUXATION

Dislocation: Complete displacement or separation of the articular surfaces of a joint
Subluxation: Partial or incomplete dislocation

Nursing Care
Dislocation is an orthopedic emergency r/t the risk of vascular injury. Assist with realignment and pain management. Physical therapy and Rom exercise are imperative to achieve full recovery

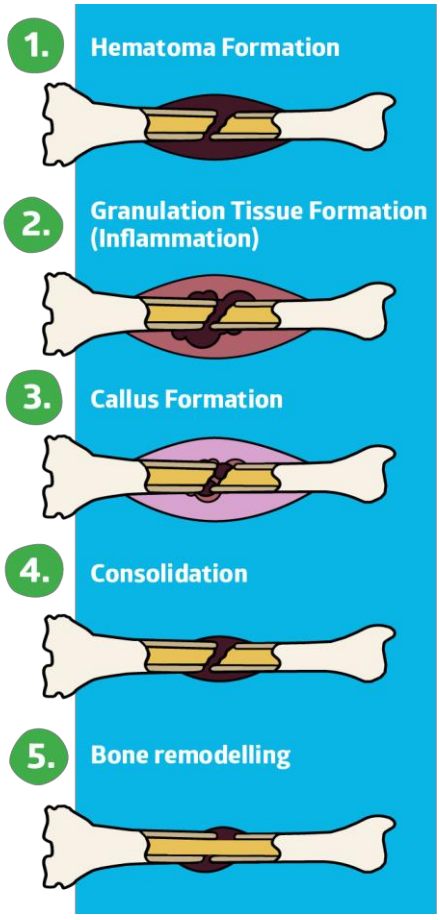
1- Normal
2- Subluxation
3- Dislocation



COMMON FRACTURE TYPES

Colles' Fracture: Fracture of the distal radius
TX: Closed reduction
Long Bone Fracture
TX: Immobilization, traction, int./ext. fixation
Hip Fraction
TX: Hip compression screw, partial replacement or total replacement
N: encourage early ambulation, assess color, temperature, cap refill, pulses, edema, sensation motor function + pain, do not position on the affected side. Do not allow > 90° knee flexion
Ed: Teach pt. to avoid crossing legs, internally rotate hip or sit in the low chairs
Stable Vertebral Fracture
TX: Immobilize spine, evaluate existence of cord damage, pain meds, kyphoplasty

FRACTURE HEALING



POSSIBLE COMPLICATIONS

Infection: A serious complication
Tx: Antibiotics + surgical debridement
Compartment Syndrome
Swelling causes increased pressure that can compromise nerves and blood vessels.
S/Sx: pain, pressure, paresthesia pallor, paralysis, pulselessness. Cool skin at extremities
Tx: Do not elevate or apply cold.
Fat Embolism
Fat globules from the fracture travel to the lungs, blood vessels or other organs
S/Sx: tachypnea, cyanosis, dyspnea, and low O_2 sat.
Tx: Fluid resuscitation, blood transfusion, intubation
N: encourage cough + deep breathe, provide O_2 therapy

NURSING CARE OF THE ORTHOPEDIC PATIENT

TRACTION

Pulling force to an affected extremity
- Reduces muscle spasm
- Immobilizes
- Reduces a fracture
- Can treat pathologic joint conditions

Skin Traction
- short term (48-72 hours)
- reduce muscle spasms
- applied directly to the skin
- 5-10 pounds

Skeletal Traction
- Long term (>72 hours)
- alignment of bone
- pins or wires are surgically inserted into the bone
- 5-45 pounds

NURSING CARE

1. Ensuring traction weights never touch the floor
2. Keep patient in the correct body alignment to enhance traction
3. Assess for S/Sx of Compartment Syndrome
4. If pulleys are being used, make sure knots have enough slack
5. Check skin integrity around pins or skin traction site frequently
6. Apply ice to prevent swelling
7. Suggest the use of a hairdryer on cool to help relieve itching
8. Teach pt. importance of keeping proximal joints mobile
9. Ensure pt. never inserts any objects inside the cast

Possible Complications

Atrophy: teach isotonic muscle strengthening
Muscle Spasms: heat application reduces spasms
Contracture: reposition frequency + provide ROM
Pain: determine / treat underlying cause

CASTS

A device used for long term immobilization / Allows freedom to perform most ADLS
Hip spica cast: used for femur fx in children
Body jacket brace: used for stable spiral spinal injury

NURSING CARE

- Never cover a plaster cast until it's dry because the heat will build up and cause a burn
- Handle with an open palm to avoid denting
- Ensure edges of cast are smooth to avoid skin irritation or breakdown
- Check color, temperature, cap. refill and pulses
- monitor for S/Sx of compartment syndrome
- S cast on a lower extremity should be elevated for the first 24hrs after application
- When a sling is used, ensure the axillary area is well padded.

Hematology Disorders

IRON DEFICIENCY

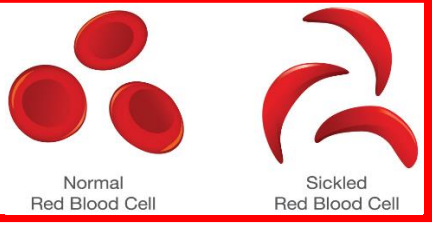
E: Inadequate diet, malabsorption, blood loss, hemolysis - microcytic & hypochromic
L: ↓Hgb, ↓Hct, ↓MVC, ↓MCH ↓MCHC retic. Serum iron, TIBC
S/Sx: Pallor, glossitis, Cheilitis, black stool
T: Replace iron, transfusion, diet teaching, emphasize compliance
R: Pregnancy, premenopausal women, blood loss, older adults, low socioeconomic backgrounds

COBALAMIN ≥B12≤ DEFICIENCY

MEGALOBLASTIC

E: Impaired DNA synthesis, GI surgery, ETOH, Smoking, *Gastric bypass, PPI use.
L: ↓B12, macrocytic RBCs, MCV >100
S/Sx: Neurological - tingling, paresthesia, beefy tongue, weakness
T: B12 injection or intranasally 1/week

SICKLE CELL DISEASE



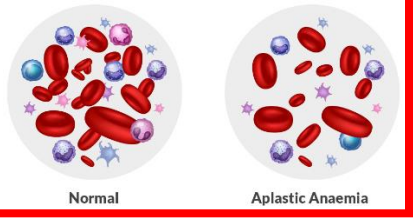
E: Genetically - Autosomal Recessive
L: Sickled RBC
S/Sx: Occlusions, necrosis, ↓perfusion, pain on exertion
T: Avoid ↑Altitude + ↑Temp, bone marrow transplant, O_2 therapy

FOLIC ACID DEFICIENCY ANEMIA

E: Celiac, Crohn's, alcoholism, hemodialysis, malabsorption
L: Macrocytic (MCV > 100) ↓folate
S/Sx: Weakness, fatigue, bruising, No neuro symptoms, weight loss
T: Replacement (green leafy veg) 1 mg/day tablet

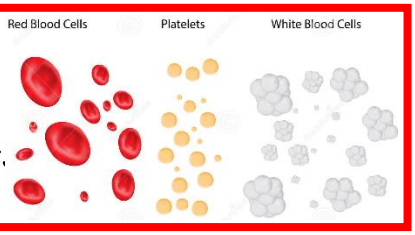
APLASTIC ANEMIA

PANCYTOPENIA



E: Infection or Autoimmune
L: ↓RBC ↓WBC ↓Platelets
S/Sx: Respiratory Fatigue, Weakness
T: Transfusion, ↑WBC, Bone Marrow Transplant

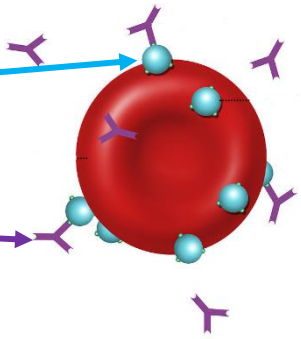
THROMBOCYTOPENIA



L: ↓Platelets ↑INR + ↑PT/PTT
S/Sx: Prolonged bleeding time.
T: Platelet Transfusion, Bone Marrow Transplant or Corticosteroid Treatment.
N: Avoid lacerations - use electric razors, monitor Hgb, Hct and bleeding times.

Antigens on the blood Identifies the cell

Antibodies protect the cell from certain antigens



BLOOD TYPE

A	A antigen [B antibodies]	Donates to: A, AB Receives from: A, O
B	B antigen [A antibodies]	Donates to: AB, B Receives from: B, O
AB	AB antigen [NO antibodies]	Donates ONLY to: AB Receives from: Universal Recipient
O	NO antigen [AB antibodies]	Donates: Universal Donor Receives ONLY from: O

BLOOD PRODUCTS

Contains:	Uses
RBC WBC Platelets Plasma	To Increase Oxygen Carrying capacity. Restoration of Blood Volume

	Contains:	Uses
	Fresh Frozen Plasma 1 Unit=250mL	Bleeding, r/t coag. factor deficiencies, DIC, Hemorrhage, Vit K Deficiency, Liver disease, Anticoagulated patients.
	**Packed RBC** 1 Unit=250mL Replaces 500mL Loss Will ↑ HgB 1%, HcT 3%	Increase RBC mass Symptomatic Anemia
	**Platelets** 1 Unit=50mL Rapid Infusion ↑ Platelets by 10,000/ Units	To Prevent / Control Bleeding
	**Cryoprecipitate** 6 pooled units prepared from Plasma, contains clotting factors	Significant hypofibrinogenemia. Hemophilia. Excessive anticoagulation DIC Von Willebrand's
	**Albumin** Moves water – intravascular space Infuse Slowly 5% Isotonic 25% Hypertonic	Hypovolemia Shock Burns Peritonitis Pancreatitis Post-Op Albumin Loss
	**Washed RBC** Rinsed w/ 1-3L of NS	Given when there is an anticipated risk of Reaction

Adverse Effects
- Pulmonary Edema
- CHF Precipitation
- HTN
- Anaphylaxis
- Hypervolemia
- Tachycardia

Overview

Used to replace blood volume, preserve oxygen-carrying capability, or increase coagulation capabilities; autologous blood transfusions: donating your own blood before anticipated surgery; religious considerations.

Initiating a Blood Transfusion

Type and cross-matching; informed consent; infuse each unit of blood within 2 to 4 hours; begin with normal saline with Y administration set to prime tubing; do not infuse any solution containing dextrose (causes blood to lyse or be destroyed); inspect for leakage, unusual appearance (bubbles or purplish color indicate contamination); roller clamp; remain with patient for first 15 to 20 minutes; after transfusion, flush tubing with normal saline; if giving more than one unit, use fresh tubing.

Blood Transfusion Reactions

- "Not feeling right," sense of impending doom, chills, fever, low back pain, pruritus (itching), hypotension, nausea and vomiting, decreased urine output, back pain, chest pain, wheezing, dyspnea (BRONCO CONSTRICTION) ; stop infusion immediately; infuse normal saline solution with new tubing then call provider; keep remaining blood product and send it back to pharmacy, lab, or blood bank for analysis; document all findings; reactions generally happen within first 15 minutes but some reactions occur 60 to 90 minutes or days to weeks later; asses for circulatory overload.
- LOW BACK PAIN DUE TO KIDNEY PAIN/ENLARGEMENT. (SYSTEM WIDE INFLAMMATION) LOW BACK PAIN = BAD
- FEVER IS A SIGN OF INFLAMMATION & INFECTION

Nursing Process

Data Collection / Patient Problems

- Assess risk for fluid, electrolyte, and acid-base imbalances and presence of alterations; monitor vital signs, height, weight, neurological function, intake and output, laboratory studies, past and present medical history, medication history.
- The RN will choose the patient problem such as "compromised blood flow to tissue," "inadequate fluid volume," etc. The LPN must act accordingly.

Expected Outcomes and Planning / Goal / Outcomes

- Prioritize fluid, electrolyte, and acid-base balance.
- Baseline normal vital signs, normal skin turgor, moist mucous membranes, baseline weight, no edema, clear breath sounds; normal urine electrolytes ABG's, intake and output.

Implementation / Evaluation / Goal / Evaluative Measures

- Prevention of fluid, electrolyte, and acid-base imbalances.
- Obtain daily weight, vital signs, intake and output; auscultate lung sounds, check oral mucous membranes, check tissue turgor, monitor serum electrolyte levels.

POLYCYSTIC OVARIAN SYNDROME (PCOS)

P: Abnormalities with the metabolism of androgens and estrogen
S/Sx: Hirsutism, Infertility, Diabetes, Sleep Apnea, Obesity and menstrual dysfunction
Tx: Diet, Exercise, Weight loss, Oral contraceptives, anti-androgens, hypoglycemic agents

ENDOMETRIOSIS

P: The endometrium lining the uterus growth in places it should not which can cause cramping or infertility
S/Sx: Intense pelvic pain. Painful intercourse, diagnosis is confirmed by laparoscopy
Tx: Monitor for S/Sx of anemia during menses, educate about the importance of annual exams, help patient relieve painful cramp with ordered meds and heat compress

PELVIC INFLAMMATORY DISEASE

P: Infection of the reportative system usually caused by STDs
S/Sx: Pelvic pain, fever, discharge, cramping, painful menses
Tx: Antibiotics, education about using protection

VARICOCELE

P: An enlargement of the veins in the scrotum caused by blood pooling in veins
S/Sx: A Dull, recurring pain in the scrotum, visibly large and twisted veins, a lump or swelling
N: Encourage pt to wear supportive underwear or jock strap.

STERILITY

P: Inability to reproduce as a result of various causes including low sperm count, chromosomal abnormalities or inadequate hormones
Tx: Hormone replacement, fertility drugs, surgery, artificial insemination, Psychosocial counselling to help pt. develop coping methods

ERECTILE DYSFUNCTION

P: Inability to keep an erection long enough for sexual intercourse
Tx: Vasodilator or hormone therapy, Smoking Cessation

CARCINOMA

P: Any cancer originating in the epithelium
S/Sx: A growing lump with a crusty surface, slow growing flat patch of redness
R: Overexposure to sun, repetitive irritation, genetic predisposition, lighter skin, older than 60 years

SARCOMA

P: Cancer originating in the connective tissues
S/Sx: Visible lump or mass in the soft tissue
R: Lymphedema. Von Willebrand disease. Genetic predisposition

MELANOMA

P: A cancer originating in melanocytes which are located in the basal layer of epithelium
S/Sx: New marks on skin, mole that changes shape or size, new pigments of the skin

LEUKEMIA

P: Cancer of blood-forming cells. Either acute or chronic
S/Sx: Prevent infection by avoiding invasive procedures such as catheterizations and injections. Prevent excessive bleeding due to possible low platelet count

GENERAL NURSING INTERVENTIONS

- Treat nausea, educate about carbohydrate ↓ for prevention
- Maintain meticulous infection control for yourself, the patient and visitors
- Provide non pharmacological and pharm pain control

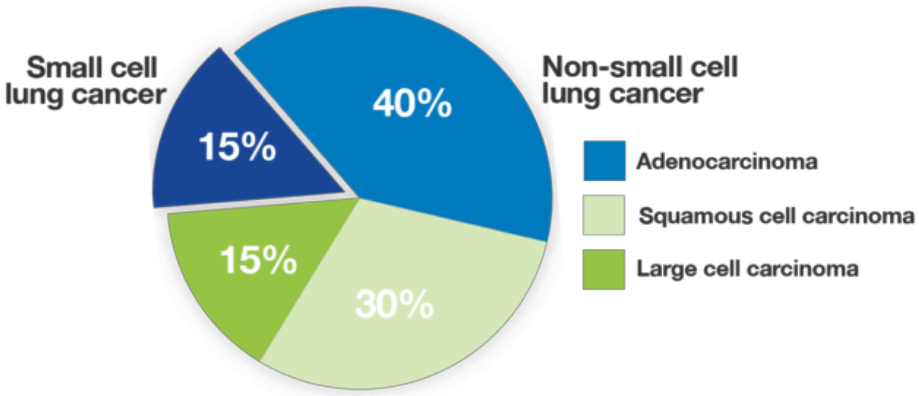
TREATMENTS

Surgery: Tumor is removed or destroyed
Radiation: Localized destruction of cancer cells. Can cause local irritation + fatigue
Chemotherapy: Kills + stops the reproduction of neoplastic cells.
-Skin, hair, nail, GI cells also impacted

WARNING SIGNS

- Change in bowel/bladder
- Any sore that doesn't heal
- Unusual bleeding/discharge
- Thickening or lumps
- Indigestion
- Obvious skin changes
- Nagging cough/hoarseness

LUNG CANCER



SMALL CELL LUNG CANCER ≤NSCLC≤

- Usually begin in the bronchi
- Spread more quickly than NSCLC
- Early metastasis to Lymph
- Poorest Prognosis
- Survival Rate of 12-18 months
- Staging not useful due to aggressive nature

NON-SMALL CELL LUNG CANCER ≤NSCLC≤

Adenocarcinoma
- Associated with scarring (chronic fibrosis)
- Resection attemptable
- Most common in non-smoker

Squamous Cell
- Slow growing
- Resectable
- Often causes Bronchial Obstructions

Large Cell
- Associated with Tobacco abuse
- Highly metastatic
- High reoccurrence
- Surgery not attempted

Occult-stage:
Cancer cells are found in sputum, but no tumor can be found in the lung by imaging tests or bronchoscopy, or the tumor is too small to be checked.

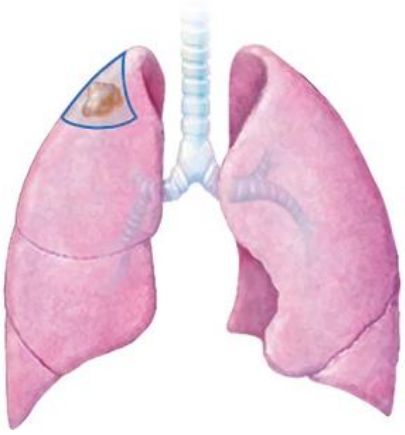
Stage 0
Cancer at this stage is also known as carcinoma in situ. The cancer is tiny in size and has not spread into deeper lung tissues or outside the lungs.

Stage I
Cancer may be present in the underlying lung tissues, but the lymph nodes remain unaffected.

Stage II
The cancer may have spread to nearby lymph nodes or into the chest wall.

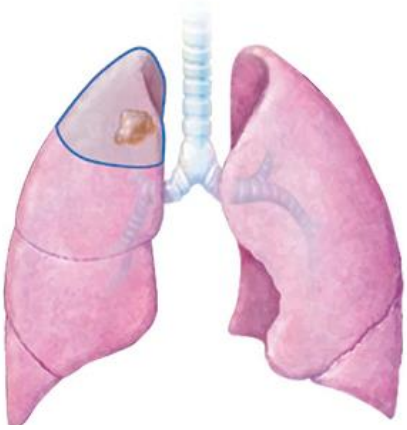
Stage III
The cancer is continuing to spread from the lungs to the lymph nodes or to nearby structures and organs, such as the heart, trachea and esophagus.

Stage IV
The most advanced form of the disease. In stage IV, the cancer has metastasized, or spread, beyond the lungs into other areas of the body.



Wedge Resection

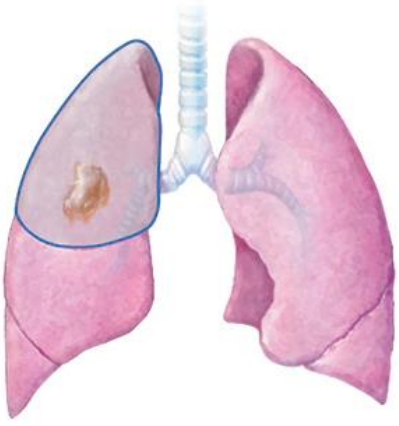
Removal of "wedge" of lung tissue



Segmentectomy - Segmental Resection

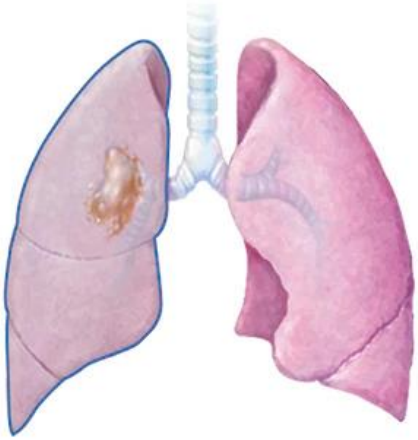
A portion of the lung is removed.

Larger than a wedge, while leaving a portion of the lobe.



Lobectomy

Removal of a Single Lobe



Pneumonectomy

Removal of the entire lung.

Post Op Consideration – Place pt. on operative side to facilitate expansion of remaining lung.

Electrolytes:

Sodium (Na^+): 135-145 mEq/L
Chloride (Cl^-): 98-106 mEq/L
Calcium (Ca^{2+}): 9-10.5 mg/dL
Potassium (K^+): 3.5-5.0 mEq/L
Phosphate (PO_4): 3-4.5 mg/dL
Magnesium (Mg^{2+}): 1.5-2.5 mEq/L

Anticoagulant Therapy Coagulation Times

Therapeutic INR: 2-3 sec
(Normal Range: 0.8-1.1)
PT: 11-12.5 sec
Platelets: 150,000 - 400,000 mm^3

Liver Enzymes

ALT: 4-36 u/L
AST: 0-35 u/L
ALP: 30-120 u/L

BMI Ranges

Underweight: <18.5
Healthy: 18.5-24.9
Overweight: 25-29.9
Obese: ≥30

Blood Glucose Levels

Glucose (fasting): 70-110 mg/dL
Glycosylated hemoglobin (HbA1c): 4-6%

Thyroid

T3: 70-205 ng/dL
T4: 4-12 mcg/dL
Thyroid Stimulating Hormone (TSH): 2-10 mU/L

Urinalysis

Specific gravity: 1.005-1.030
Protein: 0-0.8 mg/dL
Glucose: 50-300 mg/day
pH: 4.6-8

Arterial Blood Gases (ABGs)

pH: 7.35-7.45
$PaCO_2$: 35-45 mmHg
PaO_2: 80-100 mmHg
HCO_3: 22-26 mEq/L
SaO_2: 95-100%; <95% Indicates Hypoxemia

WBC Differential Count:

Neutrophils: 55-70%
Lymphocytes (T & B Cells): 20-40%
Monocytes: 2-8%
Eosinophils: 1-4%
Basophils: 0.5-1.5%

Liver Function Tests

Albumin: 3.5-5.0 g/dL
Ammonia: 10-80 mg/dL
Total bilirubin: 0.3-1.0 mg/dL
Indirect/unconjugated bilirubin: 0.2-0.8 mg/dL
Total protein: 6-8 g/dL;
Prealbumin: 19-38 mg/dL

Intake & Output [I&O]

Fluid intake: 2,000-3,000 mL/day
Daily urine output: 1,200-1,500 mL/day
Hourly urine output: ≥30 mL/hour; <30 mL for >2 consecutive hours = CONCERN!!
Polyuria (consistently high urine volume): >2,000-2,500 mL/day

Therapeutic Medication Monitoring

Digoxin level: 0.8-2.0 ng/mL
Lithium level: 0.4-1.4 mEq/L
Phenobarbital: 10-40 mcg/mL
Theophylline: 10-20 mcg/mL
Dilantin: 10-20 mcg/mL
Carbamazepine level: 4-10 mcg/mL
Valproic Acid level: 50-100 mcg/mL

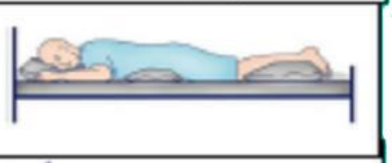
Bed Positions

Fowler's: A bed position where the head and trunk are raised, typically between 40-90°. This position is often used for patients who have cardiac issues, trouble breathing, or a nasogastric tube in place.

Lateral: This position involves the patient lying on either her right or left side. Right lateral means the patient's right side is touching the bed, while left lateral means the patient's left side is touching the bed. A pillow is often placed in between the legs for patient comfort.

Lithotomy: This position involves the patient lying flat on her back with legs elevated to hip level or above, often supported by stirrups. It is commonly used for gynecological procedures and childbirth.

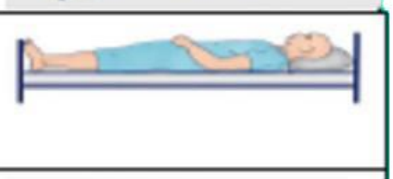
Prone: A position where the patient lies on his stomach with his back up. The head is typically turned to one side. This position allows for drainage of the mouth after oral or neck surgery. It also allows for full flexion of knee and hip joints.



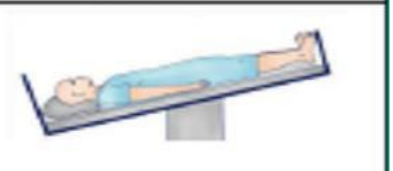
Reverse Trendelenburg: The patient is supine with the head of the bed elevated and the foot of the bed down. This position may be used in surgery to help promote perfusion in obese patients. It can also be helpful in treating venous air embolism and preventing pulmonary aspiration.

Sim's Position: A prone/lateral position in which the patient lies on his side with his upper leg flexed and drawn in towards the chest, and the upper arm flexed at the elbow. Sim's position is useful for administering enemas, perineal examinations, and for comfort in pregnancy.

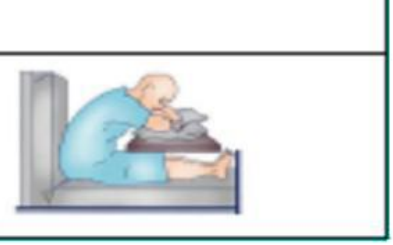
Supine: A position where the patient is flat on his back. Supine is considered the most natural "at rest" position, and is often used in surgery for abdominal, facial, and extremity procedures.



Trendelenburg: his position involves a supine patient and sharply lowering the head of the bed and raising the foot, creating an "upside down" effect. In the past, this position was frequently used to treat hypotension, although this has fallen out of favor in recent years due to studies showing it to be ineffective and potentially dangerous. It is helpful during gynecological and abdominal hernia surgeries, and in the placement of central lines.



Orthopneic or tripod position places the patient in a sitting position or on the side of the bed with an overbed table in front to lean on and several pillows on the table to rest on. Widely used for patient with COPDS. This position helps to open up lungs.



STEPS TO ABG ANALYSIS:

1- Look at the pH (7.35 - 7.45)

- If the pH is HIGH, this is ALKALOSIS
- If the pH is LOW, this is ACIDOSIS

2- Look at the PaCO2 (35 - 45) - PaCO2 – Respiratory

- If PaCO2 is HIGH, this is ACIDOSIS
- If PaCO2 is LOW, this is ALKALOSIS

3- Look at the HCO3 (22 - 26) - HCO3 – Metabolic

- If HCO3 is HIGH, this is ALKALOSIS
- If HCO3 is LOW, this is ACIDOSIS

PH:	7.35 - 7.45
$PACO_2$	35 - 45
HCO_3	22 - 26
PAO_2	80 - 100
O_2SAT	>95%

Interpret

Step 1: Analyze the pH. It will tell you ACIDOSIS or ALKALOSIS

Step 2: Analyze the PaCO2 and the HCO3

- Is PaCO2 below 35? It is Alkalotic. Above 45 it is Acidic
- Is HCO3 below 22? It is Acidic. Above 26 it is Alkalotic

Step 3: Match the PaCO2 or the HCO3 with the pH

For example, if the pH is acidotic, and the PaCO2, then the Acid-Base disturbance is being caused by the respiratory system. Therefore, we call it Respiratory Acidosis

Step 4: Does the PaCO2 or the HCO3 go the opposite direction of the pH?

If so, there is compensation by the systems. For example, if the pH is acidotic, and the PaCO2 is acidotic, and the HCO3 is alkalotic.

If they don't go the opposite direction, It is UNCOMPENSATED

Step 5: Is the pH in normal range? Fully Compensated / Partially Compensated / Uncompensated

If there is Compensation, and the pH is in normal range (7.35-7.45), then it is Fully Compensated

If there is Compensation, and the pH is out of range, then it is Partially Compensated

Step 6: Are the pO2 and the O2 saturation normal?

If they are below normal, there is evidence of Hypoxemia

PH:	7.35 - 7.45
$PACO_2$	35 - 45
HCO_3	22 - 26
PAO_2	80 - 100
O_2SAT	>95%

1- Practice Question

A 72 yr. old with pneumonia.

pH - 7.31 (Acidic)

PaCO2 – 60 (Acidic)

HCO3 - 34 (Alkalotic)

pO2 – 50 (LOW)

#1 – pH is below 35, so It is Acidosis
#2 – Who is doing the same as the pH (Acidic)? PaCO2
It is Respiratory
#3 – Does the HCO3 go in opposite direction as the pH? YES – Alkalotic
So, there is Compensation
#4 – Is the pH in normal range? NO
So, it is Partially Compensated
#5 – Is the pO2 in normal range? NO
The patient has Hypoxemia
The full Diagnosis is:
Partially Compensated Respiratory Acidosis with Hypoxemia

2- Practice Question

A 20 years old, acute renal failure
pH - 7.18 (Acidic)
PaCO2 – 44 (Normal)
HCO3 - 16 (Acidotic)
pO2 – 92 (Normal)

#1 – pH is below 35, so It is Acidosis
#2 – Who is doing the same as the pH (Acidic)? HCO3
It is Metabolic
#3 – Does the PaCO2 go in opposite direction as the pH? NO
So, there is NO Compensation
#4 – Is the pH in normal range? NO
So, it is Uncompensated
#5 – Is the pO2 in normal range? YES
The patient doesn't have Hypoxemia
The full Diagnosis is:
Uncompensated Metabolic Acidosis.

PRACTICE

1. pH: 7.11 CO2: 51 HCO3: 27

2. pH: 7.39 CO2: 54 HCO3: 38

3. pH: 7.14 CO2: 51 HCO3: 28

4. pH: 7.39 CO2: 53 HCO3: 27

5. pH: 7.45 CO2: 40 HCO3: 22

6. pH: 7.50 CO2: 44 HCO3: 31

7. pH: 7.35 CO2: 20 HCO3: 17

8. pH: 7.12 CO2: 44 HCO3: 14

9. pH: 7.28 CO2: 54 HCO3: 26

10. pH: 7.30 CO2: 35 HCO3: 17

11. pH: 7.19, CO2: 39, HCO3: 18

12. pH: 7.7, CO2: 52, HCO3: 35

13. pH: 7.42, CO2: 54, HCO3: 28

14. pH: 7.84, CO2: 49, HCO3: 30

15. pH: 7.75, CO2: 43, HCO3: 37

16. pH: 7.87, CO2: 26, HCO3: 24

17. pH: 7.37, CO2: 20, HCO3: 15

18. pH: 7.14, CO2: 31, HCO3: 20

19. pH: 7.58, CO2: 50, HCO3: 36

20. pH: 7.43, CO2: 32, HCO3: 12

ANSWER

1. pH: 7.11, CO2: 51, HCO3: 27 - Partially Compensated Respiratory Acidosis
2. pH: 7.39, CO2: 54, HCO3: 38 - Fully Compensated Respiratory Acidosis
3. pH: 7.14, CO2: 51, HCO3: 28 - Partially Compensated Respiratory Acidosis
4. pH: 7.39, CO2: 53, HCO3: 27 - Fully Compensated Respiratory Acidosis
5. pH: 7.45, CO2: 40, HCO3: 22 - Normal
6. pH: 7.5, CO2: 44, HCO3: 31 - Uncompensated Metabolic Alkalosis
7. pH: 7.35, CO2: 20, HCO3: 17 - Fully Compensated Metabolic Acidosis
8. pH: 7.12, CO2: 44, HCO3: 14 - Uncompensated Metabolic Acidosis
9. pH: 7.28, CO2: 54, HCO3: 26 - Uncompensated Respiratory Acidosis
10. pH: 7.3, CO2: 35, HCO3: 17 - Uncompensated Metabolic Acidosis
11. pH: 7.19, CO2: 39, HCO3: 18 - Uncompensated Metabolic Acidosis
12. pH: 7.7, CO2: 52, HCO3: 35 - Partially Compensated Metabolic Alkalosis
13. pH: 7.42, CO2: 54, HCO3: 28 - Fully Compensated Metabolic Alkalosis
14. pH: 7.84, CO2: 49, HCO3: 30 - Partially Compensated Metabolic Alkalosis
15. pH: 7.75, CO2: 43, HCO3: 37 - Uncompensated Metabolic Alkalosis
16. pH: 7.87, CO2: 26, HCO3: 24 - Uncompensated Respiratory Alkalosis
17. pH: 7.37, CO2: 20, HCO3: 15 - Fully Compensated Metabolic Acidosis
18. pH: 7.14, CO2: 31, HCO3: 20 - Partially Compensated Metabolic Acidosis
19. pH: 7.58, CO2: 50, HCO3: 36 - Partially Compensated Metabolic Alkalosis
20. pH: 7.43, CO2: 32, HCO3: 12 - Fully Compensated Respiratory Alkalosis