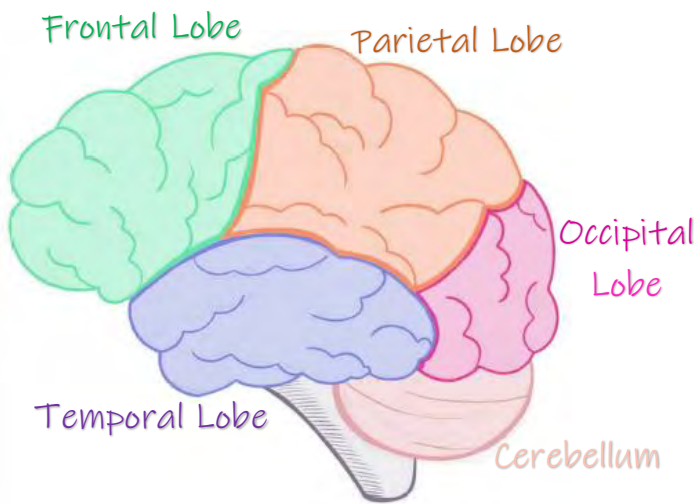


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# NEURO



## 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.
Cerebellum	Assist with walking
Brain Stem	Monitor Vital Signs
Parietal Lobe	Provide simple, one-step instructions

## BRAIN ANATOMY

### - Cerebrum

Consists in the Right and Left hemisphere. Each one receives sensory info from the opposite side of the body.

### - Cerebral Cortex

Outer grey matter

**Frontal Lobe:** Contains the motor cortex and Broca's area (speech function)

**Parietal Lobe:** Contains the sensory cortex.

**Occipital Lobe:** Contains the visual cortex.

**Temporal Lobe:** Contains the auditory cortex and **Wernicke's area** (comprehension of verbal/written language).

### - Basal Ganglia

Cell bodies in white matter that help cerebral cortex produce voluntary movements.

### - Diencephalon

**Thalamus:** relays sensory impulses to the cortex. Provide a Pain gate. Part of Reticular activating system.

**Hypothalamus:** Regulates responses of Sympathetic/Parasympathetic Nervous System. Regulates Stress response, sleep, appetite, body temperature, fluid balance, and emotions. Responsible for production of Hormones secreted by the Pituitary Gland and hypothalamus.

### - Brainstem

**Midbrain:** Motor coordination. Visual reflex and auditory relay centers.

**Pons:** Respiratory center and regulates breathing.

**Medulla Oblongata:** Contains Afferent and efferent tracts, and cardiac, respiratory, vomiting, and vasomotor center. Controls Heart Rate, respiration, blood vessel diameter, sneezing, swallowing, vomiting and coughing.

### - Cerebellum

Coordinates muscle movement, posture, equilibrium, and muscle tone.



## INFLUENZA

Highly contagious acute viral respiratory infection.

**Patho:** Influenza A, B, or C virus is spread primarily through **droplets** from person to person. The virus attaches to epithelial cells in the respiratory tract and replicates.

**Prevention:** Hand washing, annual vaccination, avoid close contact with infected pts.

**S/S:** Fever/chills, malaise, muscle aches, headache, rhinorrhea, cough, sore throat.

**Labs/Dx:** Rapid Influenza diagnostic test.

**Tx:** Saline gargles, rest, High fluid intake.

**Medication:** Antiviral agents (**take within 48 hours after onset of symptoms**), analgesics, antitussives.

## TUBERCULOSIS

Infection in the Lungs caused by **Mycobacterium tuberculosis**.

**Patho:** Organism is transmitted via aerosolization and attaches to the alveoli. This triggers an immune response, ingestion of the bacilli by macrophages, and formation of granulomas (lesions).

**S/S:** Cough lasting >3 weeks, purulent and/or bloody sputum, night sweats, weight loss, lethargy.

**Labs/Dx:**

- **QuantIFERON Gold blood test.**
- **Mantoux Skin Test:** Intradermal injection, read in 48-72 hrs. **Induration 10mm= Positive Result** (5mm for immunocompromised patients). Past BCG vaccination may produce a false-positive result.
- **Acid-fast bacilli culture:** Use 3 early morning sputum samples.
- **Chest X-ray:** Shows active lesions in lungs.

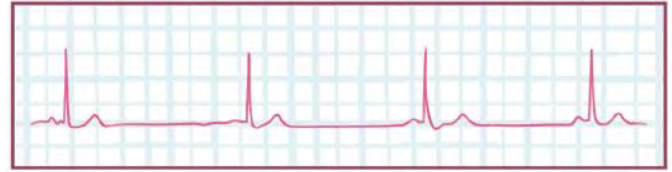
**Tx:** Combination Drug Therapy, up to 4 antibiotics for 6-12 months of treatment (Rifampin, Isoniazid, Pyrazinamide, Ethambutol).

**Nurse:** Place patient in Negative Airflow Room. Wear mask N95 in the room. Patient should wear surgical mask when leaving the room. Screen family member for TB. Teach patient that sputum samples will be needed every couple week. Patients are considered not infectious after 3 Negative sputum cultures.

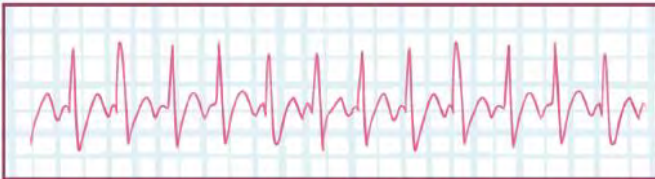
Normal Sinus Rhythm



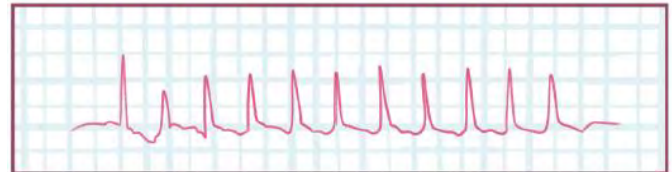
Sinus Bradycardia



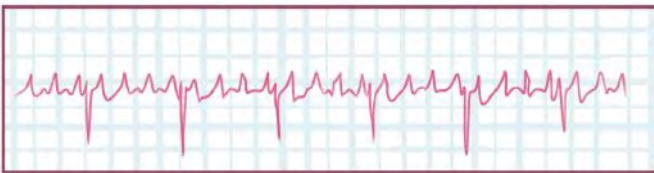
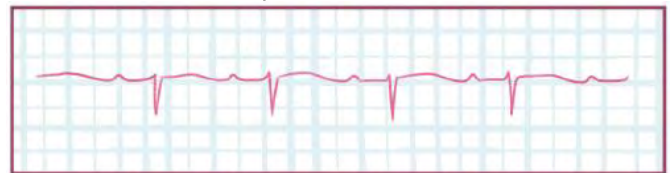
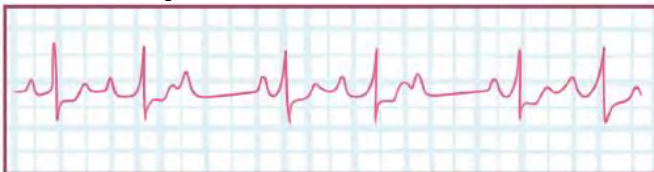
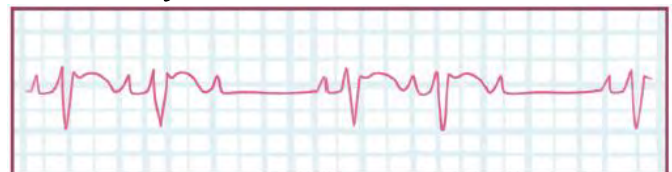
Sinus Tachycardia



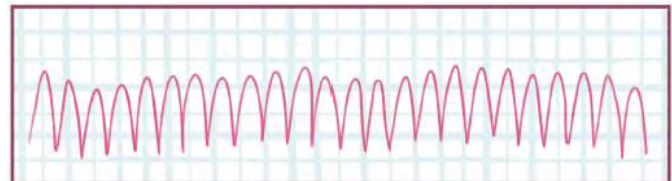
Paroxysmal Supraventricular



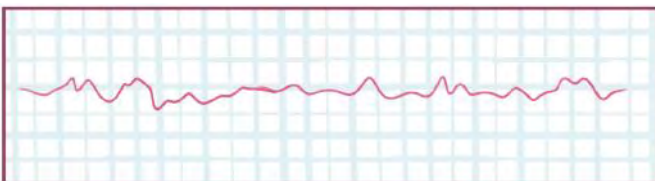
Atrial Flutter

1<sup>st</sup> Degree AV Block2<sup>nd</sup> Degree AV Block – Type I2<sup>nd</sup> Degree AV Block – Type II3<sup>rd</sup> Degree AV Block

Ventricular Tachycardia



Ventricular Fibrillation



# Cirrhosis

## DIAGNOSTICS

- Radioisotope Liver Scan: Uneven uptake of isotopes
- Abdominal ultrasound: Shows ascites
- Laparoscopy: Can visualize tissue directly
- ERCP: Shows biliary structures
- CT Scan: Shows dense fatty areas
- MRI: Shows neoplasms, cysts, obstructions
- Liver Biopsy: Large needle inserted into liver.  
pt. has risk for hemorrhage

## LABS

- ALP -Increased
- ALT + AST -Increased
- LDH -Increased
- PT / INR -Prolonged
- Electrolytes: ↓K<sup>+</sup>, ↓Na<sup>+</sup>
- Bilirubin: Increased levels
- Protein: ↓Albumin/globulin
- Ammonia: Increased levels
- BUN: ↓Decreased

## LIVER DISEASE

### Pathophysiology

- Usually a gradual decline in function as liver tissue is slowly destroyed.
- hepatocyte + liver lobule destruction causes decreased metabolic function
- Fibrous connective tissue forms which disrupts the flow of blood and bile, causing portal hypertension

### Manifestations

- Jaundice: r/t increased bilirubin levels
- Portal HTN: r/t Narrowed Vessels
- Ascites: r/t portal HTN
- Esophageal varices: r/t portal HTN

## POSSIBLE COMPLICATIONS

### Portosystemic Encephalopathy

r/t Accumulation of Neurotoxins

S/Sx: Asterixis, alteration in mental status, Sleep

I. Normal LOC + Some lethargy

II. Lethargy, disoriented, agitation

III. Stupor, difficulty waking, incoherent

IV. Comatose, no response to stimuli

Tx: Small frequent meals, ↑ protein intake

### Hemorrhage

r/t ↓ clotting factors

S/Sx: Tachycardia, hypotension

Tx: Transfusion, fluid

replacement emergency surgery



# Diabetes Mellitus

## DIABETES KETOACIDOSIS ≡DKA≡

Life threatening condition. **Associated with Type 1.** Related to Infection, Stress, missed Insulin dose.

### Signs/Symptoms

**Rapid Onset** (4-10 hours)

**Blood Glucose >250 mg/dL**

pH < 7.35 (Acidosis)

**Kussmaul Respirations** (rapid, deep breathing)

Dehydration, Abdominal Pain, Nausea, fatigue and weight loss, Weakness

**3 Ps** Polyuria, Polydipsia, Polyphagia.

- **Ketones in Urine, Fruity breath**

Hyperkalemia (because of acidosis).

### Treatment:

1 Treat Dehydration 0.9% Normal Saline

2 Lower Blood Sugar

**>250:** IV Regular Insulin only

Add K<sup>+</sup> during IV Insulin (levels decrease with treatment)

**<200** or if Ketones resolve

SC Insulin + IV D5W

3 Hourly Glucose Checks + Heart Monitor (K<sup>+</sup>)

### Insulin administration:

Use short duration only.

IV bolus Regular (5-10 units) before continuous infusion is begun.

IV Insulin for continuous infusion prepared in 0.9% 0.45% NS. Always place Insulin infusion on an IV Infusion controller.

**Nurse:** Monitor patient for Increased ICP. If blood glucose falls too far or too fast, water is pulled from blood into the cerebrospinal fluid and the brain, causing cerebral edema and Increased ICP

## HYPEROSMOLAR HYPERGLYCEMIC SYNDROME ≡HHS≡

Extreme Hyperglycemia without Ketosis or Acidosis. **Associated with Type 2.** Related to inadequate fluid intake, Decreased Kidney function, Infection, stress, unmanaged Diabetes.

### Signs/Symptoms

**Gradual Onset**

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

**3 Ps** Polyuria, Polydipsia, Polyphagia.

**NO Ketones. NO Metabolic Acidosis.**

Potassium Normal or low.

pH > 7.40

Dehydration

### Treatment:

1 Treat Dehydration - 0.9% NS

2 Lower Blood Sugar

**IV Regular Insulin**, then titrate with SC Insulin + IV D5W

3 Hourly Glucose Checks

4 Assess Rehydration: Stable BP, Pink skin, warm temp, Urine Output >30mL/hr.

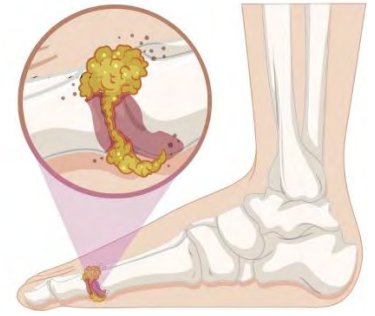
## GOUT

**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



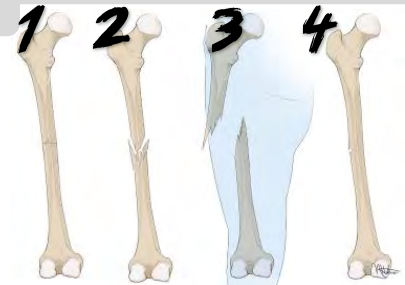
## FRACTURES

**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 in 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

**R  
I  
C  
E**



# SHOCK

## SIGNS & SYMPTOMS OF SHOCK

	RR 	HR 	BP 	SKIN 	TEMP 	URINE 	OTHER S&S 
<b>ANAPHYLACTIC</b> Severe allergic reaction.				Flushed Swollen Itchy			Urticaria, Pruritus, Decreased LOC, Bronchoconstriction
<b>CARDIOGENIC</b> Failing pumping ability of the heart.				Pale Cool Clammy			Chest Discomfort, Syncope, JVD, Pulmonary Edema, Orthopnea
<b>HYPOVOLEMIC</b> Reduced circulating blood volume.				Pale Cool Clammy			Anxiety, Thirst, Syncope, Weakness, Confusion, Dizziness, Syncope, Weak Pulse
<b>OBSTRUCTIVE</b> Physical obstruction of great vessels or the heart.				Extremities: Pale Cool			Muffled Heart Sounds, JVD, Decreased LOC, Signs of Poor Perfusion
<b>NEUROGENIC</b> Severe central nervous system damage.				Warm Flushed Dry		No Bladder Control	Paralysis Distal to Injury Site, Priapism
<b>SEPTIC</b> Extreme immune system response to an infection.				Flushed then Pale & Cool	$\geq 38^{\circ}\text{C}$ OR $< 36^{\circ}\text{C}$		Bounding Pulse, Altered LOC

### Anaphylactic Shock - Allergic Reaction

Immediate Type 1 - Anaphylaxis (Swelling, low BP, dilated Blood Vessels)

Delayed Type 2

**EpiPen Yellow** (adult-0.30mg) **EpiPen Green** (child-0.15mg) More than that - CARDIAC ARREST

### Hypovolemic Shock (Pt lost 20% or 1/5 of body blood or fluid) Low Preload

**When:** Hemorrhage, Severe Dehydration, Diaphoresis, Diabetes Insipidus (No ADH, so excessive urine and thirst - Desmopressin), Vomiting, Diarrhea, Peritonitis, **Pancreatitis**- Demerol (Cullen's Sign) (Gray-Turners: black on the sides), Severe Burns

**Tx:** **Vasoconstrictors**- Improve **MAP**, by Increasing peripheral resistance,  $\uparrow$  venous return  $\uparrow$  Myocardial contractility [i.e., Dopamine, NorEpi, Phenylephrine]

### Neurogenic Shock (Hypotension - Bradycardia)

**When:** High Injury Spinal Cord, Spinal anesthesia, Disrupted Blood Circulation, Poikilothermic (Cold Body), **WARM** Extremities

**Tx:** IV Fluids, Norepinephrine

**C7 Up-** Quadriplegia/Tetraplegia

**C7 Down-** Paraplegia (legs)

**Spinal Shock** (Vasogenic Shock) - **Autonomic Dysreflexia** (Spinal Cord Injury T6 or Higher)