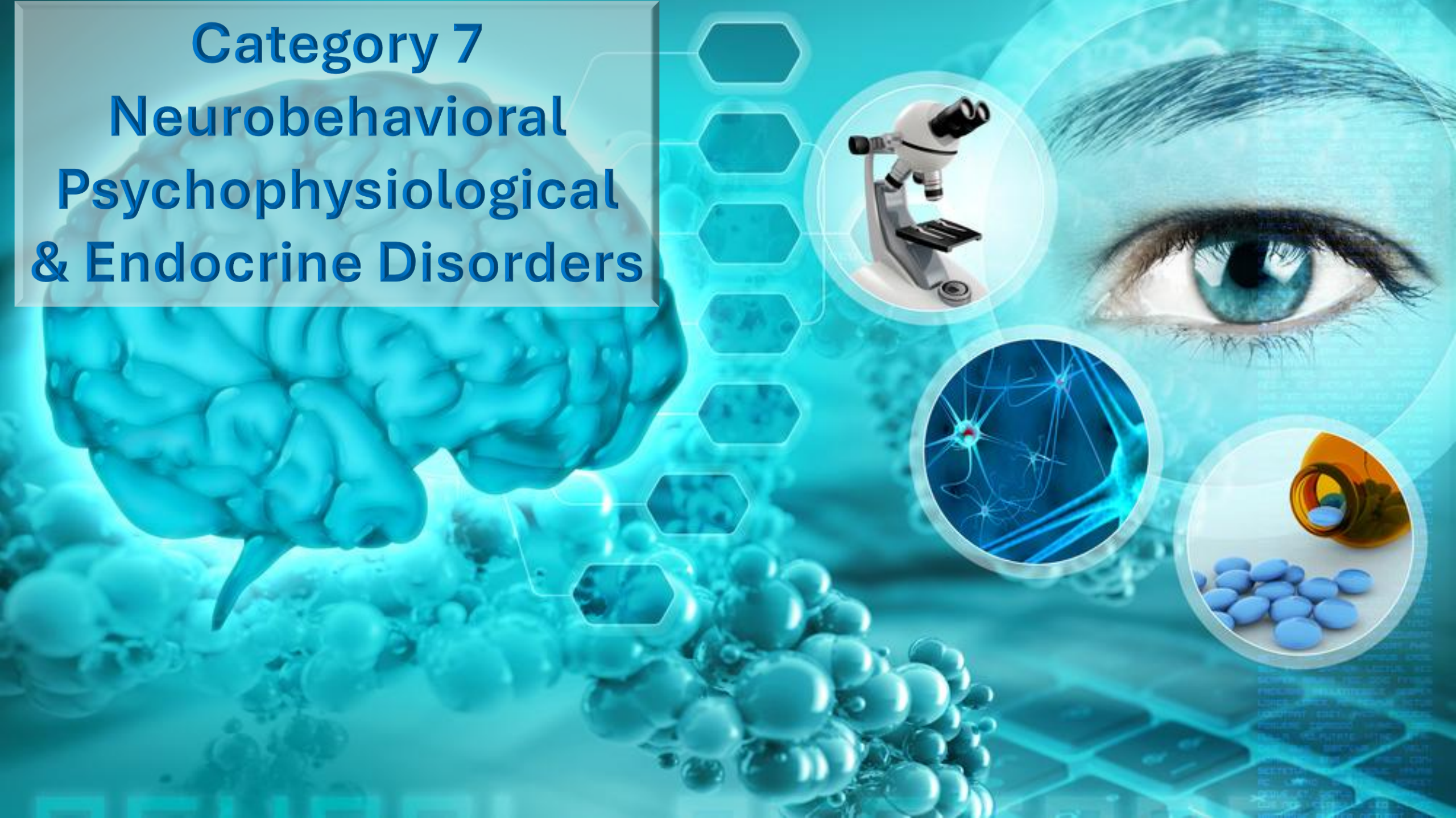


# Category 7

## Neurobehavioral Psychophysiological & Endocrine Disorders



# WHAT'S THE DIFFERENCE?

## neurobehavioral disorder

a condition where brain-related issues lead to significant changes in behavior, emotions, and cognitive function.

Traumatic Brain Injury  
Cerebrovascular Accident  
Disorders of Movement  
Seizure Disorders  
Multiple Sclerosis

## psychophysiological disorder

a condition characterized by physical symptoms that are caused, maintained, or exacerbated by emotional factors.

Hyperventilation  
Hypertension  
Fibromyalgia  
Migraine Headache  
Premenstrual Syndrome

## endocrine disorder

is a condition caused by abnormal hormone levels

Pituitary Gland Disorders  
Thyroid Gland Disorders  
Pancreatic Gland Disorders

# Traumatic Brain Injury

Also called a traumatic head injury or cerebral trauma

Caused by an external force that produces temporary or permanent impairment in cognitive, emotional, behavioral and/or physical functioning.

## OPEN HEAD INJURY:

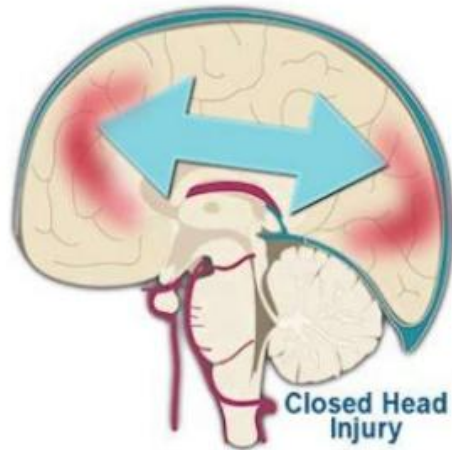
There is penetration to the skull.



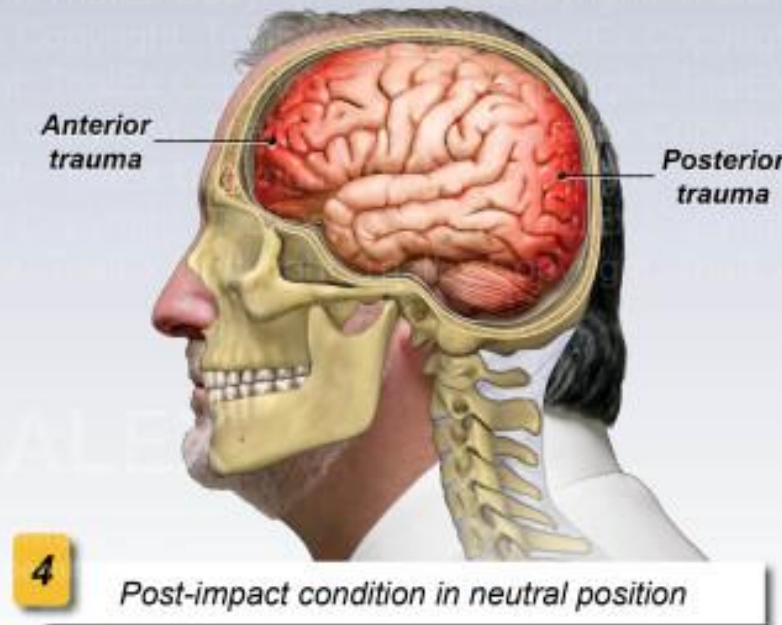
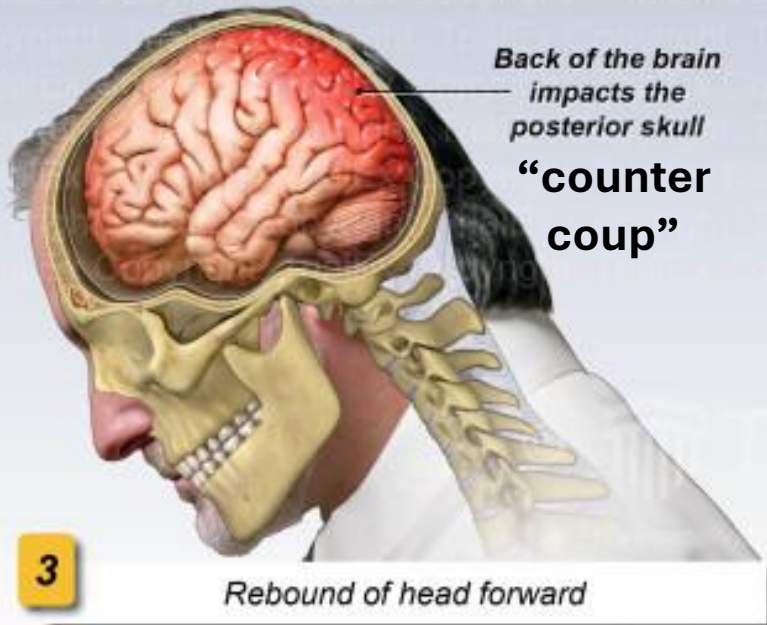
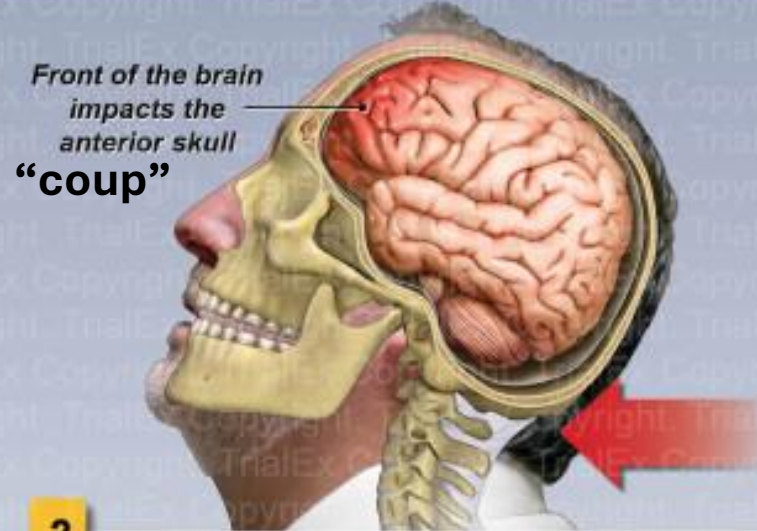
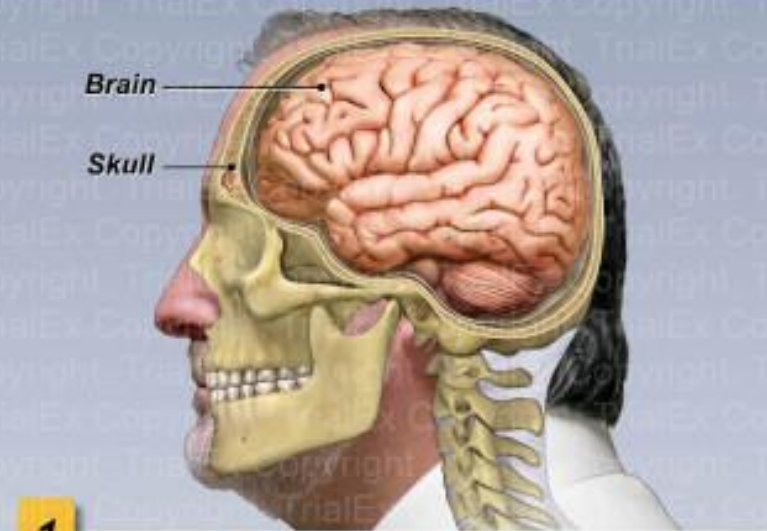
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## CLOSED HEAD INJURY

There is NO penetration to the skull.



# Mechanism of Closed Head Injury



May see hemorrhaging (bleeding) and edema (fluid around the damaged tissue)

Typically associated with alteration or loss of consciousness, and anterograde/retrograde Amnesia

OPEN head injuries typically no loss of consciousness, produces more localized damage, and more highly specific symptoms



# Classification of TBI Severity

<b>Injury severity</b>	<b>Initial GCS</b>	<b>PTA</b>	<b>LOC</b>
<b>mild</b>	<b>13-15</b>	<b>Less than 1 hour</b>	<b>Less than 30 min</b>
<b>moderate</b>	<b>9-12</b>	<b>1 to 24 hours</b>	<b>30 min-24 hours</b>
<b>severe</b>	<b>8 or less</b>	<b>More than 24 hours</b>	<b>More than 24 hours</b>

GCS = Glasgow Coma Scale

LOC = loss of consciousness

PTA = posttraumatic amnesia



# TBI Common Cognitive Consequences

## **Altered consciousness**

**Occurs in many but not all cases. Length correlated with severity. Six levels: conscious, confused, delirious, obtunded, stuporous, and comatose.**

## **Disorientation**

**Common in moderate and severe cases and usually results from diffuse cerebral injury. Recovery pattern follows orientation to person, place, then time.**

## **Memory impairment**

**Often includes both retrograde and anterograde. Severity of anterograde amnesia predicts persistence of cognitive, motor, personality, and other symptoms. Retrograde amnesia follows a “shrinking” pattern – oldest memories return first.**



# Recovery from TBI

**Moderating factors: severity of injury, age, gender, SES, pre-injury health status (mental & physical)**

**Some genetic factors impede recovery: presence of allele e4 on the Apolipoprotein gene**

**Most patients see greatest recovery during first 3 months but continues through the first year**

A gene is a segment of DNA that codes for a specific trait. An allele is a variation or version of that gene. In humans, you will always have two alleles of each gene – one from your mother and one from your father.



# Postconcussional Syndrome

**Occurs in up to 50% of mild concussions: initially headache, dizziness, nausea, blurred vision, drowsiness**

**Later symptoms: insomnia, fatigue, tinnitus, cognitive impairment, irritability, depression, anxiety**

**Biological causal factors: diffuse axonal injury  
Psycho. causal factors: perception of the injury, premorbid personality, desire for secondary gain, social support.**

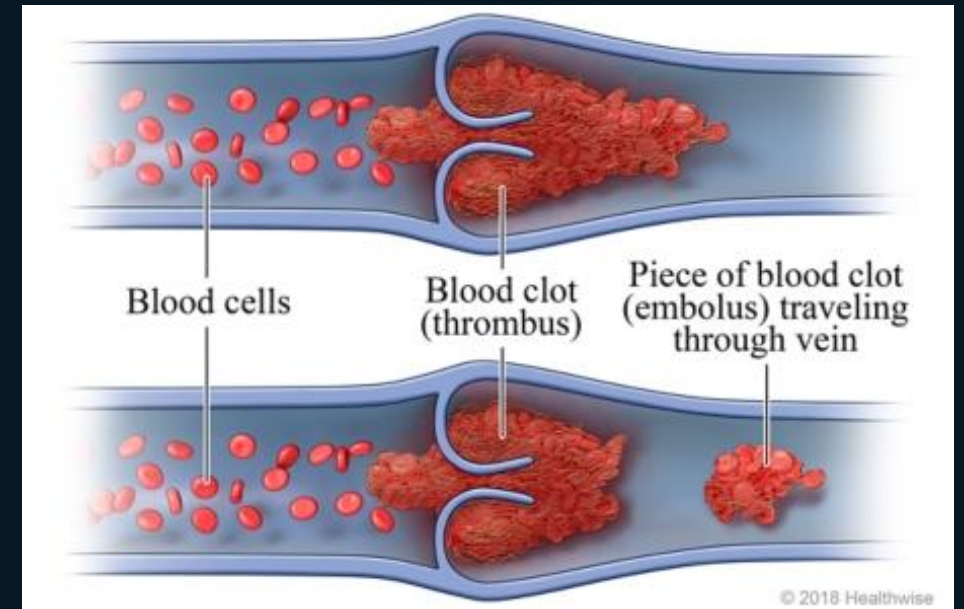
Majority recover within 3 months. If symptoms persist for more than 1 year, syndrome may be permanent – see DSM5 “Neurocognitive Disorder due to Traumatic Brain Injury.”

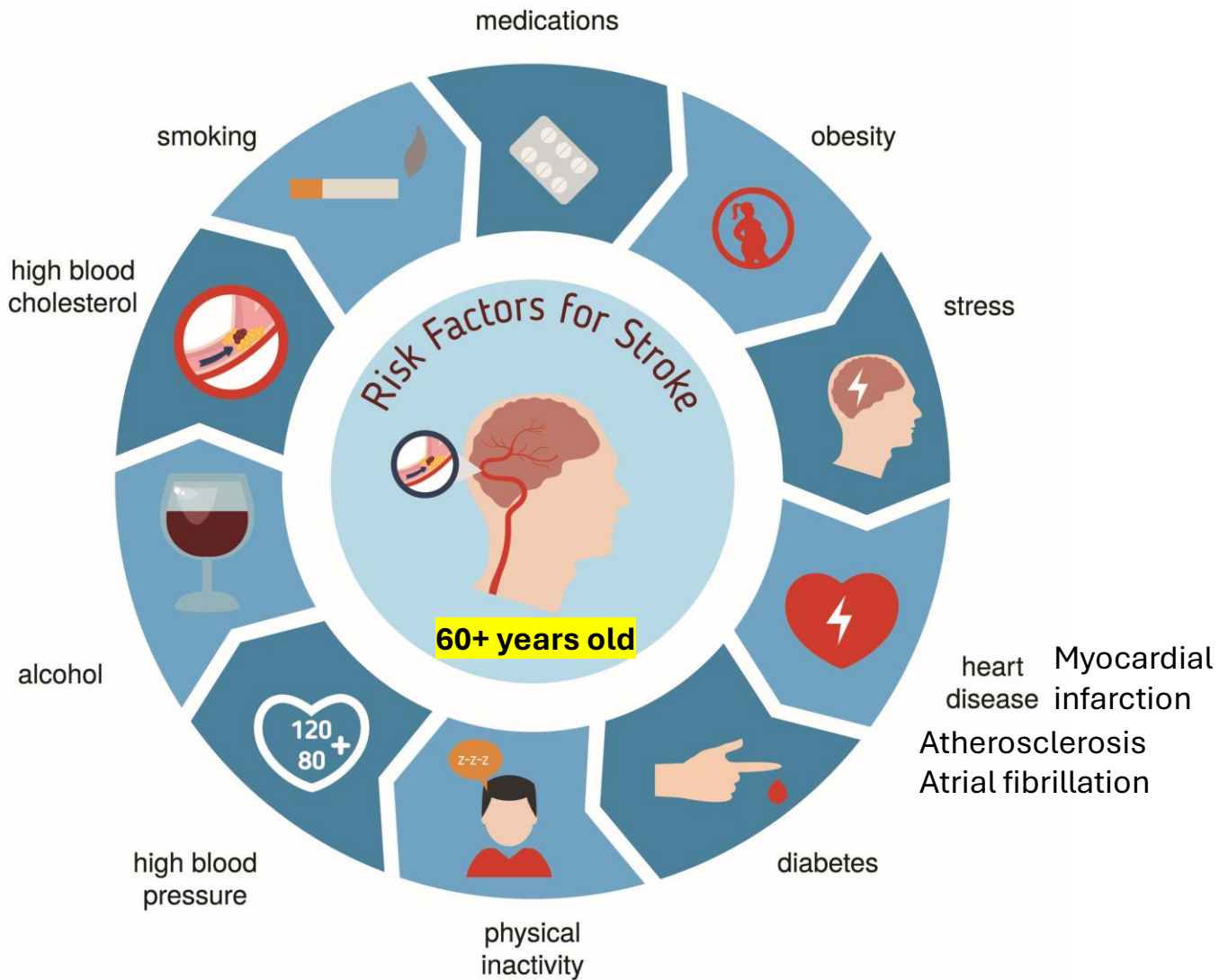
# Cerebrovascular Accident (CVA) a.k.a. Stroke

A sudden or gradual onset of neurological  
Symptoms resulting from a disruption of  
blood to the brain.

## Potential Likely Causes

1. **Thrombosis: blood clot blocks an artery**
2. **Embolism: sudden blockage of an artery by material from another part of the bloodstream**
3. **Hemorrhage**





Location	Symptoms
<b>Middle cerebral artery</b>	Contralateral hemiplegia & hemianesthesia, contralateral homonymous hemianopia, dysarthria, aphasia (if in left hemisphere), apraxia & sensory neglect (if in right hemisphere)
<b>Posterior cerebral artery</b>	Contralateral homonymous hemianopia, memory loss, unilateral cortical blindness, visual agnosia
<b>Anterior cerebral artery</b>	Contralateral hemiplegia, gait apraxia, apathy, depression, confusion, impaired judgement & insight, bowel & bladder incontinence, mutism

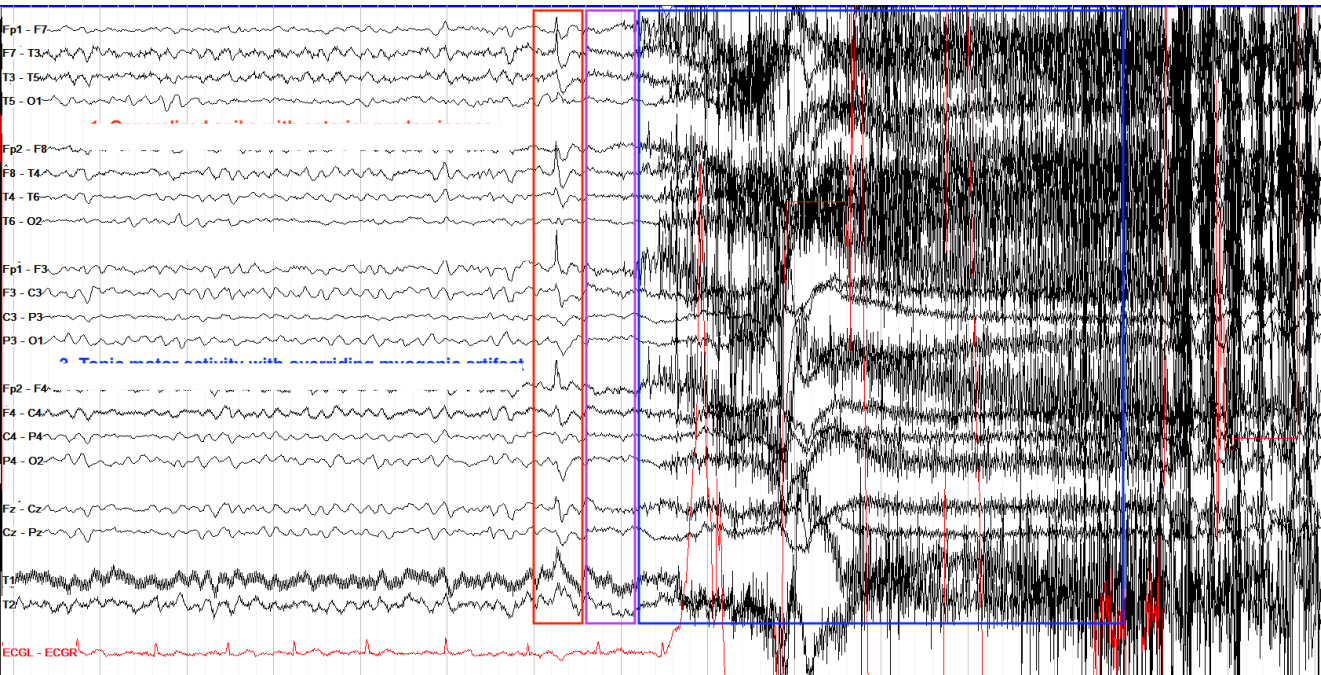
**Common symptoms:** depression, anxiety, mania, apathy, pathological laughing/crying, psychosis, dementia

**Hemi:** one side      **Anesthesia:** loss of sensation      **Dysarthria:** difficulty speaking      **Aphasia:** cannot communicate/understand

**Plegia:** paralysis      **Homonymous hemianopia:** half the visual field is lost in both eyes, affecting the same side of each eye

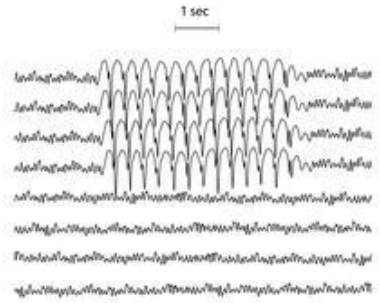
**Apraxia:** inability to plan and coordinate movement      **Agnosia:** inability to recognize or identify objects, people, sounds

# Epilepsy – Seizure Disorder

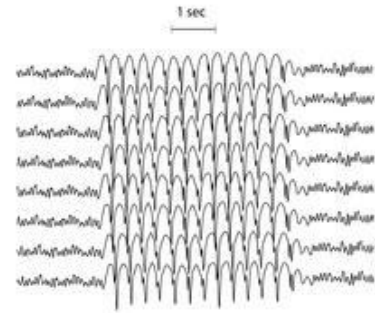


**Seizure: abnormal electrical activity in the brain resulting in a. an aura (feeling, order, noise) signaling the onset of the seizure, b. loss of consciousness, and/or c. some type of abnormal movement**

**Diagnosis:** medical history, physical exam, EEG, CT/MRI to look for lesions, tumors etc.



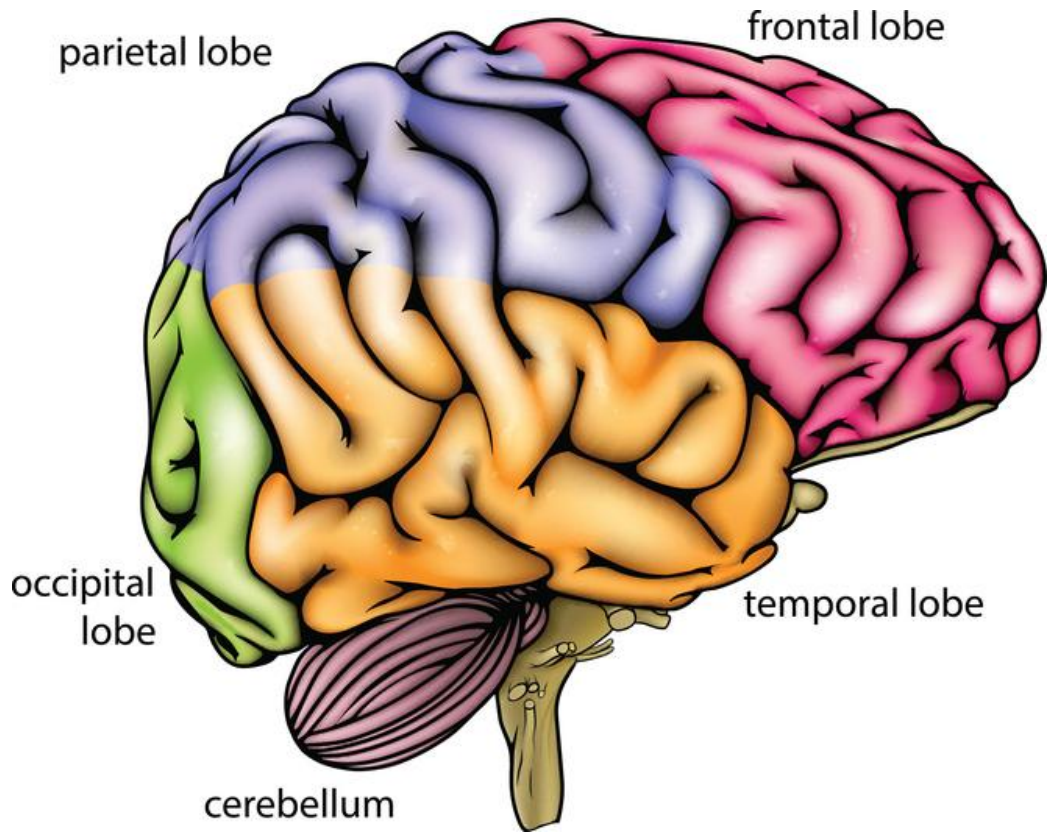
Partial seizure



Generalized seizure

<b>generalized</b>	<b>Bilaterally symmetrical no focal onset</b>
<b>Tonic-clonic (grand-mal)</b>	<b>Tonic: muscles contract, body stiffens Clonic: rhythmic shaking of limbs Postseizure depression or confusion with amnesia for the event</b>
<b>Absent (peitit-mal)</b>	<b>Brief and with loss of consciousness, no prominent motor symptoms, blank stare with frequent eye blinks. Thalamus has been implicated.</b>
<b>partial</b>	<b>Begin in one hemisphere and in one lobe (most often temporal) but can spread to both hemispheres.</b>
<b>simple</b>	<b>No loss of consciousness,</b>
<b>complex</b>	<b>Some alteration of consciousness</b>

# Epilepsy Symptoms by Affected Lobe



Automatisms (lip smacking, chewing, stereotyped swimming motions), hallucinations, sudden feeling of fear, happiness, sadness, or other emotional changes, sense of déjà vu or jamais vu, changes in personality, changes in sexual behavior (hypo or hyper), autonomic signs (flushed face, pupil dilation, heart and breathing rates).

Motor symptoms (contralateral jerky limb movements), “speech arrest” or other speech disturbance, olfactory hallucinations or illusions, autonomic symptoms

Unusual physical sensations on the opposite side of the body (numbing, tingling, burning)

Rapid eye blinking, unusual visual phenomenon (flashing lights, ball of light, strange colors in the contralateral visual field)

# Psychophysiological Disorders

physical illnesses caused or influenced by psychological factors

Most involve a single organ system

Many are related to activity in the ANS

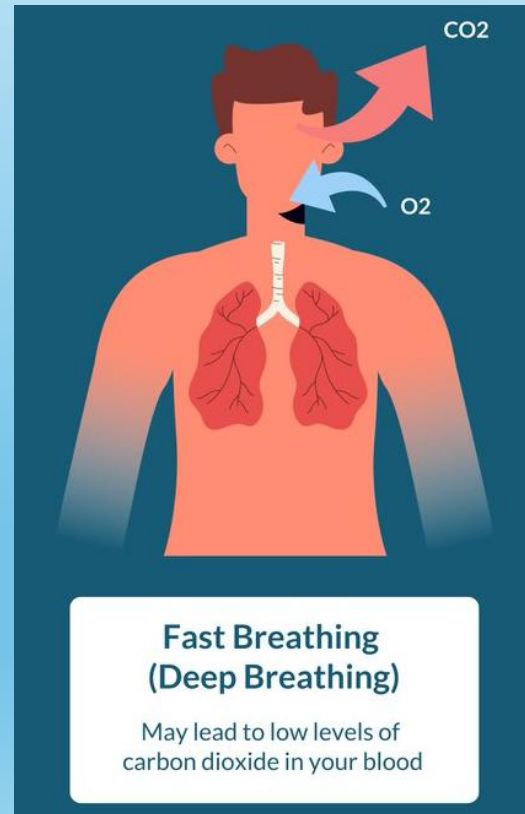


## Hyperventilation

Produces a drop in CO<sub>2</sub> in the blood, leading to respiratory alkalosis (blood is too alkaline) and cerebral hypoxia (low oxygen in the brain). Often includes chest pain, paresthesia (numbing & tingling) in hands & feet, dizziness, impaired concentration & memory, and tinnitus.

Often triggered by anxiety or other emotional state.

Treatment: relaxation or if severe, breathing into a paper bag or sedation.



## Hypertension

### PRIMARY (ESSENTIAL) HYPERTENSION

High BP with no known physical cause accounts for 85-90% of all cases of high BP. Untreated, can lead to CVD, major cause of heart failure, kidney failure, stroke. The “silent killer” – often asymptomatic

**Risk Factors:** family history, obesity, smoking, salt use, stress, males in general except older females, and female African Americans.

**Treatment:** lifestyle change (diet, drinking, exercise), BP meds (diuretics, e.g. relaxation, beta blockers), relaxation + biofeedback, breathing retraining exercises

### SECONDARY HYPERTENSION

High BP related to a known disease

## Migraines

Severe, recurrent, throbbing, usually one side of the head.

Often with nausea, vomiting, diarrhea, constipation, sensitivity to light, sound, odors.

Made worse by bending forward, lifting, jarring motions.

~ 12% have “classic migraines” that start with an aura.  
88% have “common migraines” without aura but may be signaled by a specific physical symptom.

Precipitated or aggravated by menstruation, stress & relaxation after stress, barometric pressure changes, alcohol, decongestant & analgesic overuse, foods with tyramine/phenylethylamine/nitrates.

Risk factors: female, perfectionistic, orderliness, neuroticism, inflexibility, ambitiousness.

Cause uncertain: maybe low serotonin & rapid dilation of cerebral blood vessels following constriction

## TYPES OF HEADACHES

### Primary headaches



Tension headaches



Migraine



Cluster headaches

### Secondary headaches



Sinus



New daily persistent headaches (NDPH)



Hypertension



TMJ disorders

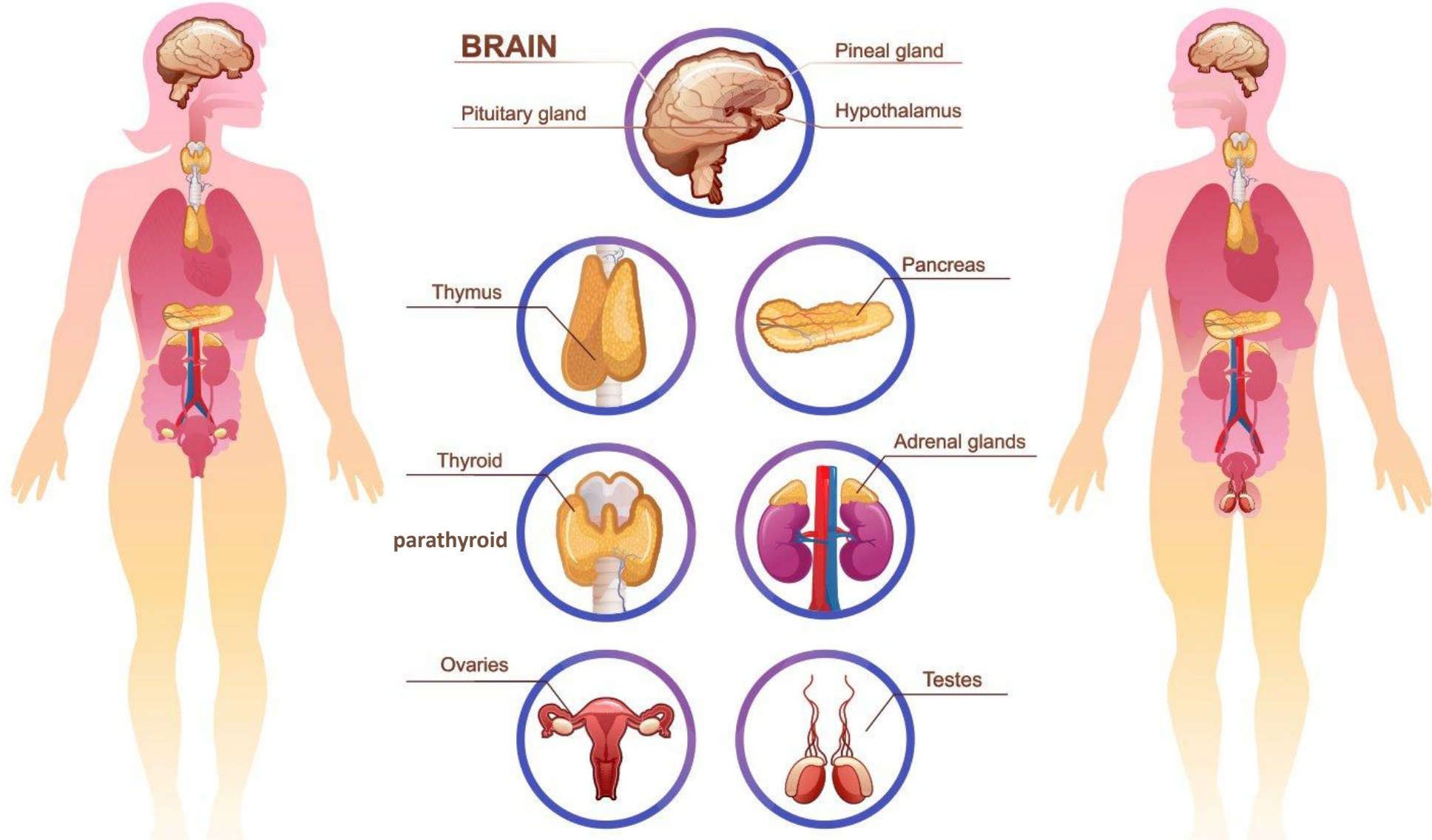
## Migraine Treatment

Non-steroidal anti-inflammatory drugs (NSAIDs) combined with caffeine

Serotonin agonists (ergotamine, sumatriptan, SSRIs), beta blockers, medical marijuana

Thermal biofeedback & Autogenic Training

# ENDOCRINE SYSTEM



# The Pituitary

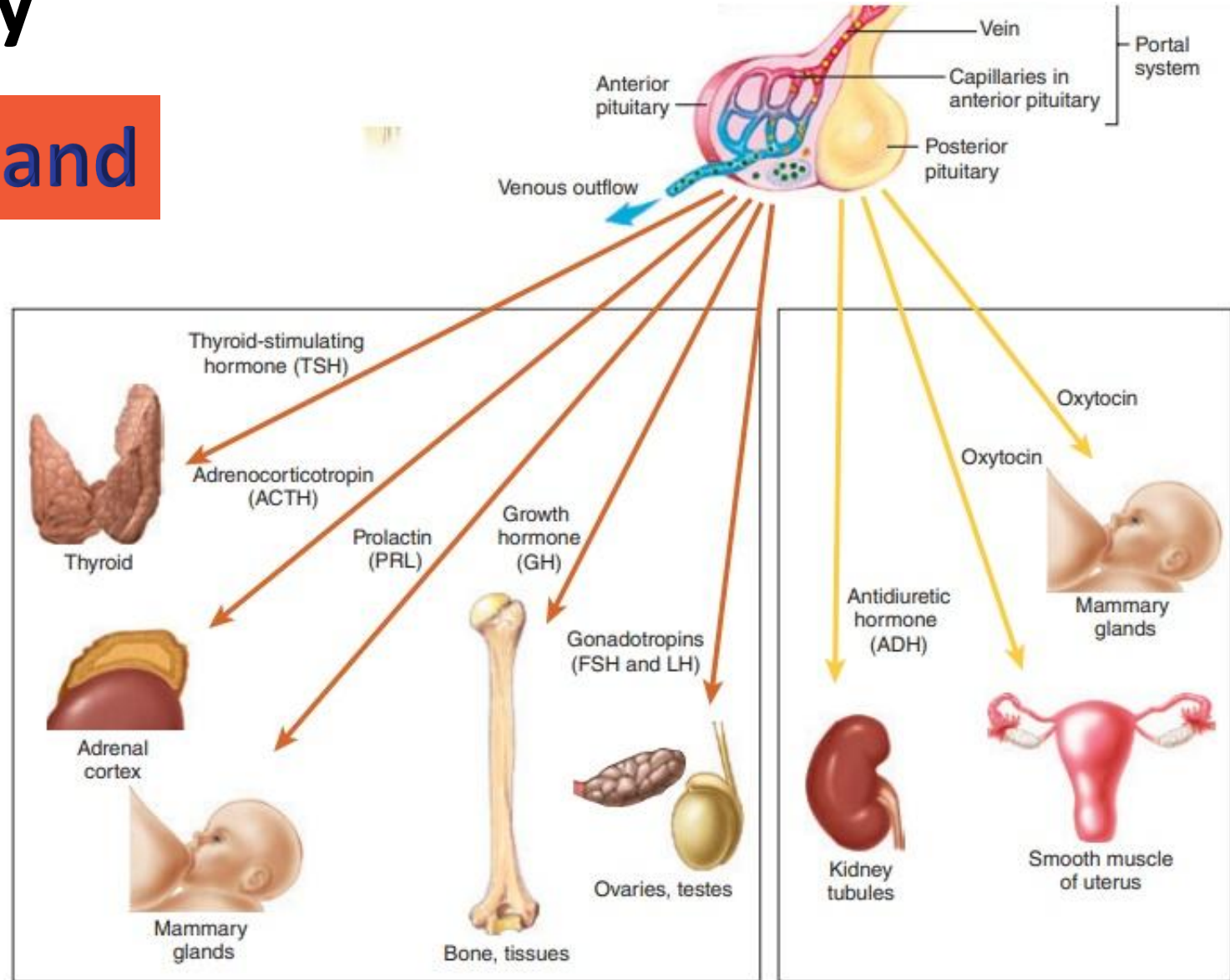
## The Master Gland

## Or is it?

Glands release hormones into the blood where they travel to target organs.

Some hormones initiate chemical reactions in cells by activating enzymes.

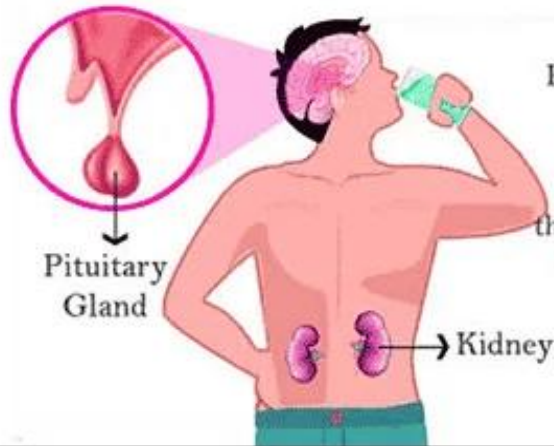
Some hormones act like neurotransmitters – alter the permeability of the cell membrane.



## Disorders of the Pituitary Gland

Antidiuretic hormone

### DIABETES INSIPIDUS



Pituitary gland produces insufficient ADH, hence the kidneys make a lot of urine.

You need to drink a lot to keep up

Obesity or weight gain, **95%**

Facial plethora, **90%**

Rounded face, **90%**

Decreased libido, **90%**

**Thin skin, 85%**

Menstrual irregularity, **80%**

Hypertension, **75%**

Hirsutism, **75%**

Depression/emotional lability, **70%**

**Easy bruising, 65%**

Glucose intolerance, **60%**

**Proximal myopathy, 60%**

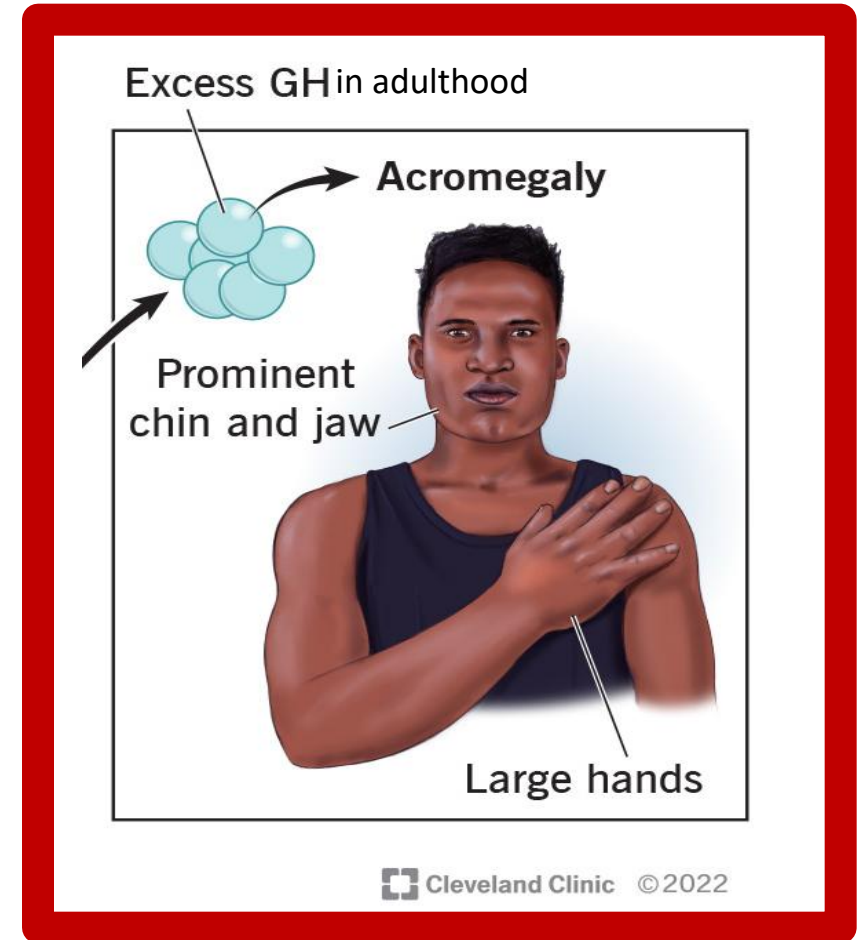
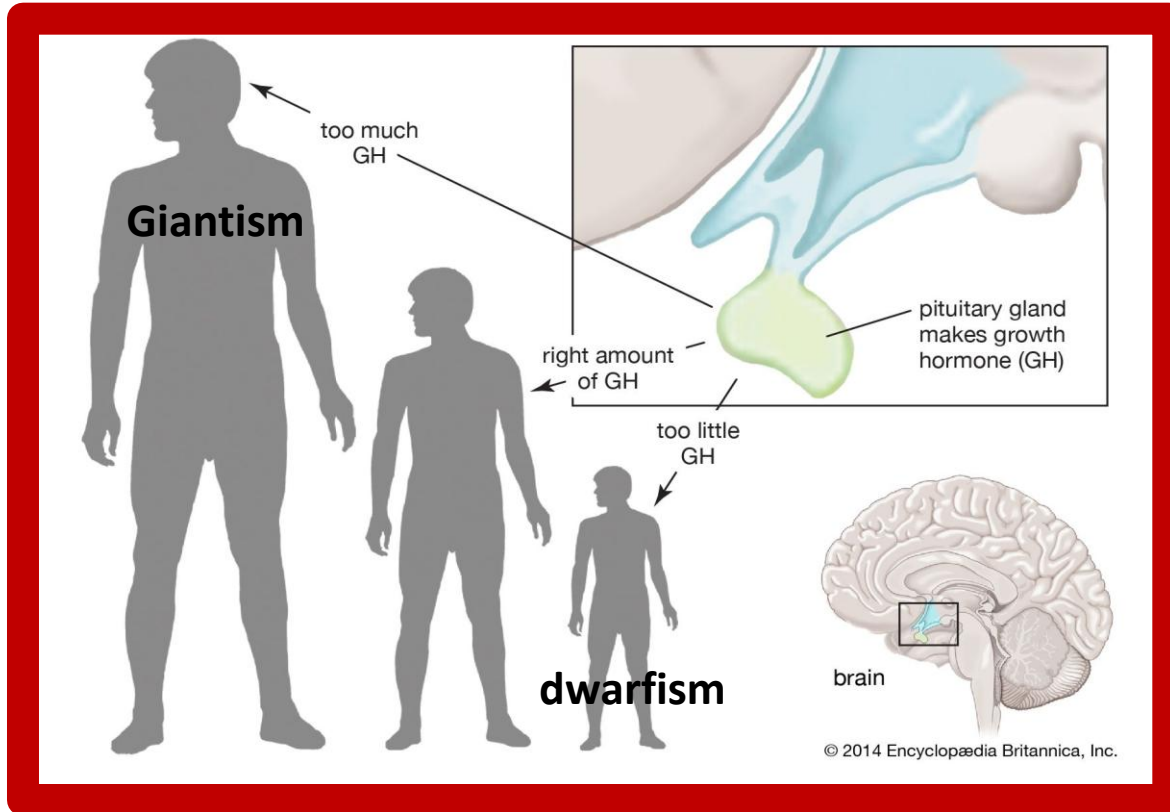
Osteopenia or fracture, **50%**

Nephrolithiasis, **50%**

**CUSHING'S SYNDROME**  
hypersecretion of cortisol

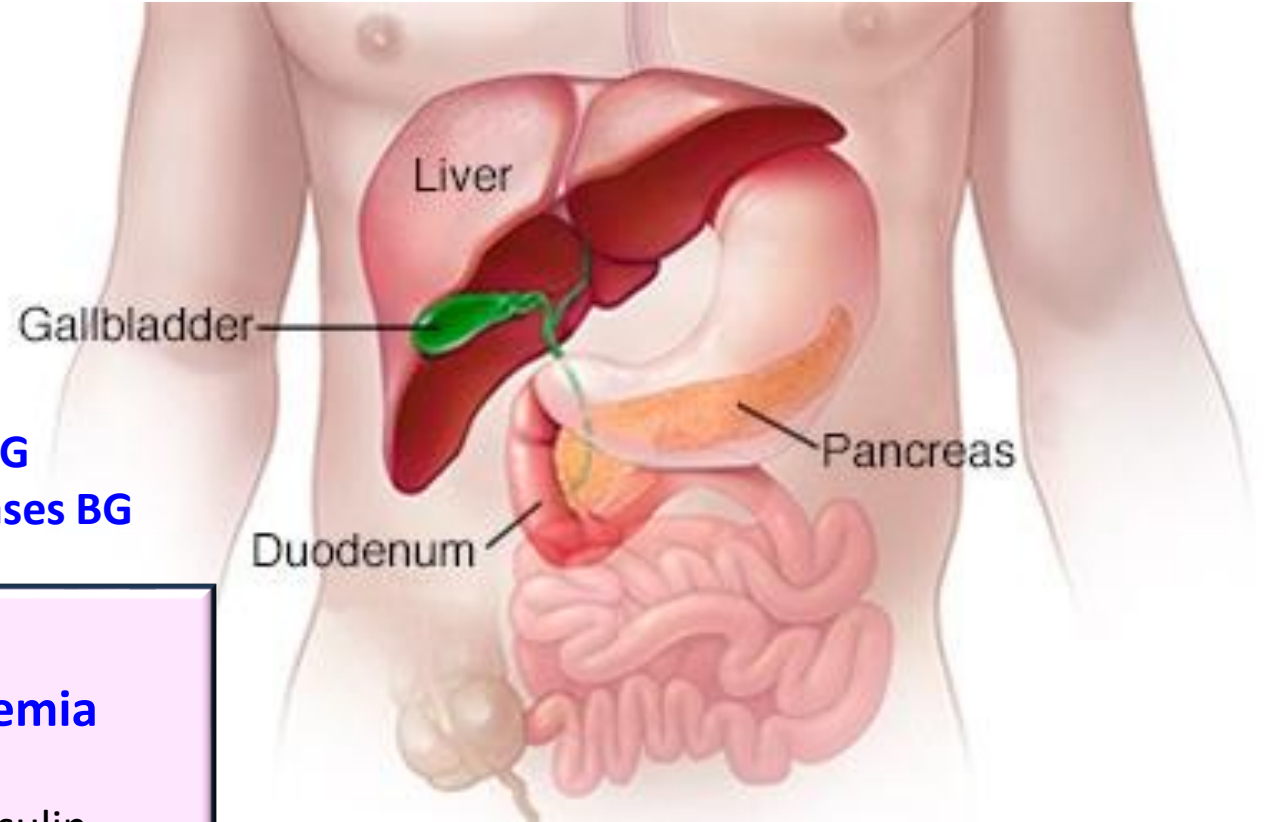


# Disorders of the Pituitary Gland



## The pancreas has two main functions:

1. helps in digestion
2. regulates blood sugar by secreting insulin & glucagon



**Insulin lowers BG**  
**Glucagon increases BG**

### Hypoglycemia

Too much insulin  
Low blood glucose  
hunger, dizziness, headaches  
blurred vision, palpitations  
anxiety, depression  
confusion

Can be primary or the result  
of diabetes, severe liver  
disease, pancreatic tumor

Can be drug-induced

### Hyperglycemia

Too little insulin  
High blood glucose  
Diabetes mellitus  
Increased appetite with  
weight loss, polyuria,  
polydipsia, apathy,  
confusion, mental  
dullness, increased  
vulnerability to infections

### Diabetes

Pancreas does not  
produce enough insulin  
or  
Body does not respond to  
insulin

**Polyuria** =  
increased urine  
Production

**Polydipsia** =  
increased thirst  
and fluid intake