

# Physiology Mnemonics

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Compiled by→ **Ussama Maqbool**

**Skin vasoconstriction and temperature** When the skin needs to **CON**Serve heat, the blood vessels of the skin **CON**strict.  
When the skin is **CO**ld, the blood vessels of the skin **CO**nstrict.

**Vitamin D: site of conversion** Vitamin **D** is made in the **D**ermis

**Fluid compartments: volumes 12345:**

**12** liters of interstitial fluid

**3** liters plasma volume and **30** liters inside cells

**45**liters total body water

**Potassium: causes of potassium leaving cells ASSES**

Acidosis: H<sup>+</sup> ions move in.

Starvation: catabolism of cells.

Stress: catabolism of cells (postoperative).

Exercise: catabolism of cells.

Sodium chloride lost: K<sup>+</sup> replaces it and is then excreted.

**Heart valves: placement of valves on standard heart anterior view**

"**T**ry before you **B**uy": When read across the page, the **t**ricuspid valve comes before the **b**icuspid valve.

Also, the **lunar** valves are near the top (in the sky), like the **moon**.

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**Aldosterone: regulation of secretion from adrenal cortex**

**RNAs**

Renin-angiotensin mechanism

Na concentration in blood

ANP (atrial natriuretic peptide)

Stress

**LH vs FSH: function in male LH: Leydig cells**

stimulated to produce testosterone.

FSH: Spermatogenesis stimulated.

**Alkalosis vs. acidosis: directions of pH and HCO<sub>3</sub> ROME:**

Respiratory= Opposite:

· pH is high, PCO<sub>2</sub> is down (Alkalosis).

· pH is low, PCO<sub>2</sub> is up (Acidosis).

Metabolic= Equal:

· pH is high, HCO<sub>3</sub> is high (Alkalosis).

· pH is low, HCO<sub>3</sub> is low (Acidosis).

**Adrenal cortex layers and products "Great Attire**

**And Fast Cars Are Really Sexy Attributes":**

Granulosa secretes Aldosterone in response to Angiotensin II.

Fasiculata secretes Cortisol in response to ACTH.

Reticularis secretes Sex steroids in response to ACTH.

**Adrenal cortex layers and products "Get My**

**Freakin' Gun Right Away":**

Glomerulosa: Mineralcorticoid (aldosterone)

Fasiculata: Glucocorticoid (cortisol)

Reticularis: Androgens

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**Heart electrical conduction pathway** "If patient's family are all having **Heart** attacks, you must **SAVE HIS KIN!**"  
**SA** node --->**AV** node --->**His** (bundle of) -->Pur**KIN**je fibers

**Osteoblast vs. osteoclast** Osteo**B**last **B**uilds bone.  
Osteo**C**last **C**onsumes bone.

**Heart valves: closure sequence** "Many Things Are Possible":  
**M**itral, **T**ricuspid, **A**ortic, **P**ulmonic

**Oestrogen: functions OESTROGEN SUX:**  
**O**rgan development (sex organs)  
**E**ndocrine: FSH and LH regulation  
**S**econdary sex characteristics development  
**T**ropic for pregnancy  
**R**eceptor synthesis (of progesterone, oestrogen, LH)  
**O**steoporosis decrease (inhibits bone reabsorption)  
**G**ranulosa cell development  
**E**ndocrine: increases prolactin secretion, but then blocks its effect  
**N**ipple development  
**S**ex drive increase  
**U**terine contractility increase  
o**X**ytocin sensitivity increase

**Electrical conductivity of tissues** "Be Careful To Shock My Best Nerve":  
In order of least conductive to most conductive:  
**B**ones  
**C**artilage

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**Tendon**  
**Skin**  
**Muscle**  
**Blood**  
**Nerve**

**Prolactin and oxytocin: functions** **PRO**lactin stimulates the mammary glands to **PRO**duce milk.  
**Oxy**tocin stimulates the mammary glands to **Ooze** (release) milk.

**Gut intrinsic innervation: myenteric plexus vs. submucosal plexus**  
**function** **My**enteric: **Motility**.  
**Submucosal**: **Secretion and blood flow**.

**V/Q gradient in lung** Infinity, a lung and a zero stack nicely.  
V/Q is lowest at bottom, highest at top.

**Prostaglandins: dilatation abilities** **Pros**pectors keep mineshafts open:  
Mineshaft 1: Patent ductus arteriosus.  
Mineshaft 2: renal afferent arteriole dilatation.

**Hyperthyroidism: signs and symptoms** **THYROIDISM**:  
**Tremor**  
**Heart rate up**  
**Yawning [fatigability]**  
**Restlessness**  
**Oligomenorrhea & amenorrhea**  
**Intolerance to heat**  
**Diarrhea**  
**Irritability**

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Sweating

Muscle wasting & weight loss

**Adrenal gland: functions ACTH:**

Adrenergic functions

Catabolism of proteins/ Carbohydrate metabolism

T cell immunomodulation

Hyper/ Hypotension (blood pressure control)

**MAO isoenzyme form locations** · MAO-A in:

Adrenergic peripheral structures

Alimentary mucosa [intestine]

· MAO-B in:

Brain

Blood platelets

**Carotid sinus vs. carotid body function** carotid Sinus:

measures pressure.

carotid body measures O<sub>2</sub>.

**Hemoglobin and myoglobin: binding strengths, sites "ABC"**

of glycosylated Hb (Hb1c):

· Glucose binds to Amino terminal of Beta Chain.

"HbF binds Forcefully":

· HbF binds oxygen more forcefully than HbA, so Oxy-Hb dissociation curve shifts to left.

Stored blood is **SOS**:

· Stored blood Hb binds to Oxygen Strongly because of decrease in 2,3 BPG.

2,3 BPG binding site is **BBC**:

· BPG binds to Beta Chain of Hb.

Myoglobin binding strength is **MOM**:

· Myoglobin binds Oxygen More strongly than Hb.

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**Pepsin-producing cells "Chief of Pepsi-Cola":**

· **Chief** cells of stomach produce **Pepsin**.

**Hb-oxygen dissociation curve shifts: effect, location** Left

shift: causes **Loading** of O<sub>2</sub> in **Lungs**.

**Right** shift: causes **Release** of O<sub>2</sub> from Hb.

**Rods vs. cone function** RoD: **Dim** light.

**Cones:** **Color**.

**Pituitary: anterior hypophysis hormones FLATPiG:**

FSH

LH

ACTH

TSH

Prolactin

ignore GH

**Heart valves: sequence of flow TRIPS BIAS:**

**TRI**cuspid

**Pulmonary**

**Semilunar**

**BI**cuspid

**Aortic**

**Semilunar**

Alternatively: "TRIPS, MI ASs!" (uses **MI**tral instead of **BI**cuspid)

**Adrenal cortex layers and products "Get your Facts**

**Right, Men are Glued to their Gonads":**

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**Glomerulosa**  
**Fasciculata**  
**Reticularis**  
**Mineralocorticoids**  
**Glucocorticoids**  
**Gonadocorticoids** [androgens]

**Intrinsic vs. extrinsic pathway tests "PeT PiTTbull":**

**PeT:** PT is for **extrinsic** pathway.

**PiTTbull:** PTT is for **intrinsic** pathway.

**Compliance of lungs factors COMPLIANCE:**

Collagen deposition (fibrosis)

Ossification of costal cartilages

Major obesity

Pulmonary venous congestion

Lung size

Increased expanding pressure

Age

No surfactant

Chest wall scarring

Emphysema

· All but L/A/E decrease compliance.

By: Ussama Maqbool(N61)

**Diabetes Insipidous: diagnosing subtypes** After a

desmopression injection:

Concentrated urine = **Cranial**.

No effect = **Nephrogenic**.

**Progesterone: actions PROGESTE:**

Produce cervical mucous

Relax uterine smooth muscle

Oxycotin sensitivity down

Gonadotropin [FSH, LH] secretions down

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Endometrial spiral arteries and secretions up

Sustain pregnancy

Temperature up / Tit development

Excitability of myometrium down

**Oxytocin-producing nucleus of hypothalamus Paraventricular nucleus--> Parturition** (childbirth is oxytocin's most important role).

**Temperature control: cerebral regions "High Power**

Air Conditioner":

Heating = Posterior hypothalamo [hypothalamus].

Anterior hypothalamo [hypothalamus] = Cooling.

**Cochlea: inner vs. outer hair cell function "Outer**

cells are **Out** of the brain. **Inner** cells are **Into** the brain":

Outer hair cells are motor efferents to amplify signal.

Inner hair cells are sensory afferents that actually pick up the sound.

**Nervous stimulus: the 4 ways to classify "A MILD**

stimulus":

**Modality**

**Intensity**

**Location**

**Duration**

**Muscle spindle: origin of primary vs. secondary endings "1**

from **1**, **2** from **2**":

**Primary** ending is from Group **Ia**.

**Secondary** ending from Group **II**.

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**Pituitary hormones FLAGTOP:**

Follicle stimulating hormone

Luteinizing hormone

Adrenocorticotropin hormone

Growth hormone

Thyroid stimulating hormone

Oxytocin

Prolactin

Alternatively: **GOAT FLAP** with the second 'A' for **Anti-diuretic** hormone/vasopressin

· Note: there is also melanocyte secreting hormone and Lipotropin, but they are not well understood.

**Adrenal cortex layers and products "Go Find Rex, Make Good Sex":**

· Layers:

Glomerulosa

Fasciculata

Reticulata

· Respective products:

Mineralcorticoids

Glucocorticoids

Sex hormones

· Alternatively for layers: **GFR** (Glomerular Filtration Rate, convenient since adrenal glands are atop kidney).

By: Ussama Maqbool(N61)

**Balance organs** Utricle and Saccule keep **US** balanced.

**VO<sub>2</sub> normal value is 250 mL/min** "VO<sub>2</sub>" is the numbers, just need to rearrange the order.

**V** is roman numeral for 5, so rearrange to **2V<sub>0</sub>**, or **250mL/min**.

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### **PGI<sub>2</sub> vs. TxA<sub>2</sub> coagulation function** TxA<sub>2</sub> Aggregates

platelets.

PGI<sub>2</sub> Inhibits aggregation.

· Note: full name of PGI<sub>2</sub> is prostaglandin I<sub>2</sub> or prostacyclin, full name of TxA<sub>2</sub> is thromboxane A<sub>2</sub>.

**Einthoven's Triangle: organization** Corners are at RA (right arm), LA (left arm), LL (left leg).

Number of L's at a corner tell how many + signs are at that corner [eg LL is ++].

Sum of number of L's of any 2 corners tells the name of the lead [eg LL-LA is lead III].

For reference axes, the **negative angle** hemisphere is on the half of the triangle drawing that has all the **negative signs; positive angle** hemisphere contains only **positive signs**.

**Heart: -tropic definitions** Lusitropic: **loose**

is relaxed. Definition: relax heart.

Inotropic: when heart wall **contracts**, moves **inward**.

Definition: contract heart.

**Chronotropic**: 'chrono-' means 'time'. Definition: heart rate (of SA node impulses).

Dromotropic: only one left, it must be conduction speed by default.

By: Ussama Maqbool(N61)

## **NERVOUS SYSTEM**

### **Cochlea: inner vs. outer hair cell function**

"**Outer** cells are **Out** of the brain. **Inner** cells are **Into** the brain":

Outer hair cells are motor efferents to amplify signal.

Inner hair cells are sensory afferents that actually pick up the sound.

### Nervous stimulus: the 4 ways to classify

"A **MILD** stimulus":

**M**odality  
**I**ntensity  
**L**ocation  
**D**uration

### Balance organs

**U**tricle and **S**acculle keep **US** balanced.

### Rods vs. cone function

**RoD**: **D**im light.

**Cones**: **C**olor.

### Temperature control: cerebral regions

"**H**igh **P**ower **A**ir **C**onditioner":

**H**eating = **P**osterior hipothalamo [hypothalamus].

**A**nterior hipothalamo [hypothalamus] = **C**ooling.

### MAO isoenzyme form locations

· MAO-**A** in:

**A**drenergic peripheral structures

**A**limentary mucosa [intestine]

· MAO-**B** in:

**B**rain

**B**lood platelets

### Electrical conductivity of tissues

"**B**e **C**areful **T**o **S**hock **M**y **B**est **N**erve":

In order of least conductive to most conductive:

**B**ones

Cartilage

Tendon

Skin

Muscle

Blood

Nerve

## GIT

### Gut intrinsic innervation: myenteric plexus vs. submucosal plexus function

**Myenteric:** Motility.

**Submucosal:** Secretion and blood flow.

### Pepsin-producing cells

"Chief of Pepsi-Cola":

· **Chief** cells of stomach produce **Pepsin**.

By: Ussama Maqbool(N61)

## ENDOCRINE SYSTEM

### Pituitary hormones

#### **FLAGTOP:**

**F**ollicle stimulating hormone

**L**utinizing hormone

**A**drenocorticotropin hormone

**G**rowth hormone

**T**hyroid stimulating hormone

**O**xytocin

**P**rolactin

Alternatively: **GOAT FLAP** with the second 'A' for **Anti-diuretic hormone/vasopressin**

· Note: there is also melanocyte secreting hormone and Lipotropin, but they are not well understood.

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## Adrenal cortex layers and products

"Go Find Rex, Make Good Sex":

· Layers:

**G**lomerulosa

**F**asciculata

**R**eticulata

· Respective products:

**M**ineralcorticoids

**G**lucocorticoids

**S**ex hormones

· Alternatively for layers: **GFR** (Glomerular Filtration Rate, convenient since adrenal glands are atop kidney).

## Pituitary: anterior hypophysis hormones

**FLATPiG**:

**F**SH

**L**H

**A**CTH

**T**SH

**P**rolactin

ignore **G**H

## Adrenal cortex layers and products

"Get your Facts Right, Men are Glued to their Gonads":

**G**lomerulosa

**F**asciculata

**R**eticularis

**M**ineralocorticoids

**G**lucocorticoids

**G**onadocorticoids [androgens]

## Diabetes Insipidus: diagnosing subtypes

After a desmopression injection:

Concentrated urine = **C**ranial.

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No effect = **N**ephrogenic.

### Progesterone: actions

#### **PROGESTE:**

- P**roduce cervical mucous
- R**elax uterine smooth muscle
- O**xytocin sensitivity down
- G**onadotropin [FSH, LH] secretions down
- E**ndometrial spiral arteries and secretions up
- S**ustain pregnancy
- T**emperature up / **T**it development
- E**xcitability of myometrium down

### Oxytocin-producing nucleus of hypothalamus

**Par**aventricular nucleus--> **P**arturition (childbirth is oxytocin's most important role).

### Prostaglandins: dilatation abilities

- P**rospectors keep mineshafts open:
- Mineshaft 1: Patent ductus arteriosus.
  - Mineshaft 2: renal afferent arteriole dilatation.

### Hyperthyroidism: signs and symptoms

#### **THYROIDISM:**

- T**remor
- H**eat rate up
- Y**awning [fatigability]
- R**estlessness
- O**ligomenorrhoea & amenorrhoea
- I**ntolerance to heat
- D**iarrhoea
- I**rritability
- S**weating
- M**uscle wasting & weight loss

## Adrenal gland: functions

### ACTH:

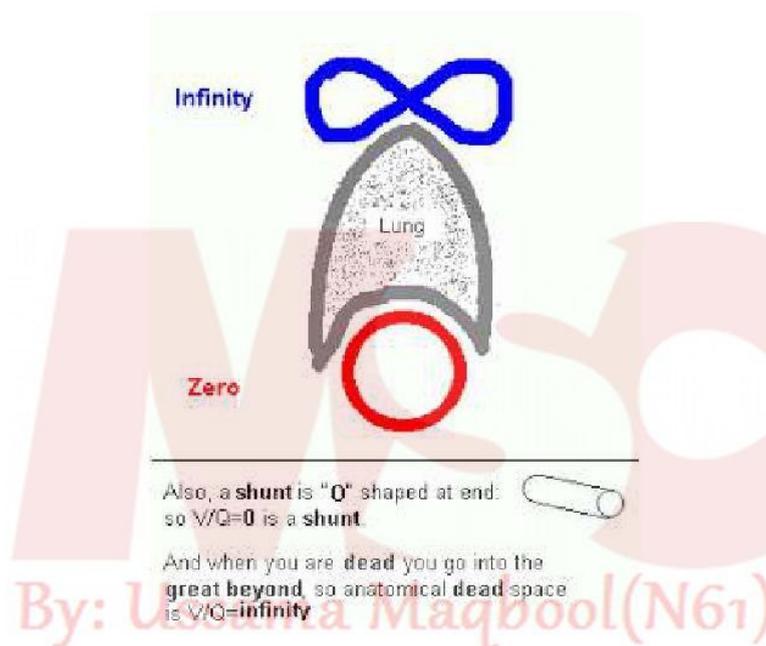
Adrenergic functions

Catabolism of proteins/ Carbohydrate metabolism

T cell immunomodulation

Hyper/ Hypotension (blood pressure control)

## RESPIRATORY SYSTEM



**VO<sub>2</sub> normal value is 250 mL/min**

"**V<sub>02</sub>**" is the numbers, just need to rearrange the order.

**V** is roman numeral for 5, so rearrange to **2V<sub>0</sub>**, or **250** mL/min.

**Compliance of lungs factors**

### COMPLIANCE:

Collagen deposition (fibrosis)

Ossification of costal cartilages

**Major obesity**  
**Pulmonary venous congestion**  
**Lung size**  
**Increased expanding pressure**  
**Age**  
**No surfactant**  
**Chest wall scarring**  
**Emphysema**  
· All but L/A/E decrease compliance.

### V/Q gradient in lung

Infinity, a lung and a zero stack nicely.  
V/Q is lowest at bottom, highest at top.  
· See diagram.

### Alkalosis vs. acidosis: directions of pH and HCO<sub>3</sub>

#### **ROME:**

**R**espiratory= **O**pposite:

- pH is high, PCO<sub>2</sub> is down (Alkalosis).
- pH is low, PCO<sub>2</sub> is up (Acidosis).

**M**etabolic= **E**qual:

- pH is high, HCO<sub>3</sub> is high (Alkalosis).
- pH is low, HCO<sub>3</sub> is low (Acidosis).

By: Ussama Maqbool(N61)

**Potassium: causes of potassium leaving cells**

#### **A\$\$E\$**

**Acidosis: H<sup>+</sup> ions move in.**

**Starvation: catabolism of cells.**

**Stress: catabolism of cells (postoperative).**

**Exercise: catabolism of cells.**

**Sodium chloride lost: K<sup>+</sup> replaces it and is then excreted.**

## REPRODUCTIVE SYSTEM

### LH vs FSH: function in male

**LH:** Leydig cells stimulated to produce testosterone.

**FSH:** Spermatogenesis stimulated.

### Prolactin and oxytocin: functions

**PRO**lactin stimulates the mammary glands to **PRO**duce milk.

**O**xytocin stimulates the mammary glands to **O**oze (release) milk.

**Compiled By Ussama Maqbool(N61) NMC.**



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