

Physiology Mnemonics

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

45liters total body water

Potassium: causes of potassium leaving cells ASSES

Acidosis: H⁺ ions move in.

Starvation: catabolism of cells.

Stress: catabolism of cells (postoperative).

Exercise: catabolism of cells.

Sodium chloride lost: K⁺ replaces it and is then excreted.

Heart valves: placement of valves on standard heart anterior view

"**Try** before you **Buy**": When read across the page, the **tr**icuspid valve comes before the **bi**cuspid 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 HCO₃ ROME:

Respiratory= Opposite:

· pH is high, PCO₂ is down (Alkalosis).

· pH is low, PCO₂ is up (Acidosis).

Metabolic= Equal:

· pH is high, HCO₃ is high (Alkalosis).

· pH is low, HCO₃ 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":
Mitral, **T**ricuspid, **A**ortic, **P**ulmonic

Oestrogen: functions OESTROGEN SUX:
Organ development (sex organs)
Endocrine: FSH and LH regulation
Secondary sex characteristics development
Tropic for pregnancy
Receptor synthesis (of progesterone, oestrogen, LH)
Osteoporosis decrease (inhibits bone reabsorption)
Granulosa cell development
Endocrine: increases prolactin secretion, but then blocks its effect
Nipple development
Sex drive increase
Uterine contractility increase
oXytocin sensitivity increase

Electrical conductivity of tissues "Be Careful To Shock My Best Nerve":
In order of least conductive to most conductive:
Bones
Cartilage

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Tendon
Skin
Muscle
Blood
Nerve

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

Gut intrinsic innervation: myenteric plexus vs. submucosal plexus
function Myenteric: **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 O₂.

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.

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 O₂ in **Lungs**.

Right shift: causes **Release** of O₂ 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:

TRIcuspid

Pulmonary

Semilunar

BIcuspid

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 **e**xtrinsic pathway.

PiTTbull: **PTT** is for **i**ntrinsic 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 Insipidus: diagnosing subtypes After a desmopression injection:

Concentrated urine = **C**ranial.

No effect = **N**ephrogenic.

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).

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Balance organs Utricle and Saccule keep **US**

balanced.

VO₂ normal value is 250 mL/min "Vo₂" is the numbers, just need to rearrange the order.

V is roman numeral for 5, so rearrange to **2Vo**, or **250mL/min**.

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PGI2 vs. TxA2 coagulation function

platelets.

PGI2 Inhibits aggregation.

· Note: full name of PGI2 is prostaglandin I2 or prostacyclin, full name of TxA2 is thromboxane A2.

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.

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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":

Modality
Intensity
Location
Duration

Balance organs

Utricle and **S**accule keep **US** balanced.

Rods vs. cone function

Rods: **D**im light.
Cones: **C**olor.

Temperature control: cerebral regions

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

Heating = **P**osterior hypothalamo [hypothalamus].
Anterior hypothalamo [hypothalamus] = **C**ooling.

MAO isoenzyme form locations

· MAO-**A** in:
Adrenergic peripheral structures
Alimentary mucosa [intestine]
· MAO-**B** in:
Brain
Blood 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:

Bones

Cartilage

Tendon

Skin

Muscle

Blood

Nerve

GIT

Gut intrinsic innervation: myenteric plexus vs. submucosal plexus function

Myenteric: **M**otility.

Submucosal: **S**ecretion and blood flow.

Pepsin-producing cells

"**Chief** of **Pepsi**-Cola":

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

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ENDOCRINE SYSTEM

Pituitary hormones

FLAGTOP:

Follicle stimulating hormone

Lutinizing hormone

Adrenocorticotropin hormone

Growth hormone

Thyroid stimulating hormone

Oxytocin

Prolactin

Alternatively: **GOAT FLAP** with the second 'A' for **A**nti-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:

Glomerulosa

Fasciculata

Reticulata

- Respective products:

Mineralcorticoids

Glucocorticoids

Sex hormones

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

Pituitary: anterior hypophysis hormones

FLATPiG:

FSH

LH

ACTH

TSH

Prolactin

ignore **G**H

Adrenal cortex layers and products

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

Glomerulosa

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Reticularis

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Diabetes Insipidus: diagnosing subtypes

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PROGESTE:

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Oxytocin sensitivity down
Gonadotropin [FSH, LH] secretions down
Endometrial spiral arteries and secretions up
Sustain pregnancy
Temperature up / **T**it development
Excitability of myometrium down

Oxytocin-producing nucleus of hypothalamus

Paraventricular nucleus--> **Part**urition (childbirth is oxytocin's most important role).

Prostaglandins: dilatation abilities

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Intolerance to heat
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Irritability
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Muscle wasting & weight loss

Adrenal gland: functions

ACTH:

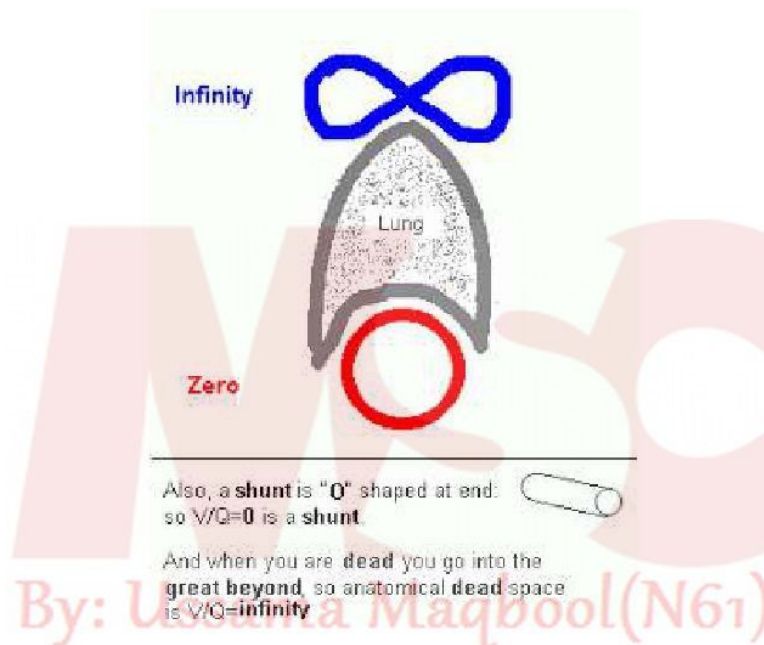
Adrenergic functions

Catabolism of proteins/ Carbohydrate metabolism

T cell immunomodulation

Hyper/ Hypotension (blood pressure control)

RESPIRATORY SYSTEM



VO₂ normal value is 250 mL/min

"V₀₂" is the numbers, just need to rearrange the order.

V is roman numeral for 5, so rearrange to **2V₀**, 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 HCO₃

ROME:

Respiratory= Opposite:

- pH is high, PCO₂ is down (Alkalosis).
- pH is low, PCO₂ is up (Acidosis).

Metabolic= Equal:

- pH is high, HCO₃ is high (Alkalosis).
- pH is low, HCO₃ is low (Acidosis).

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Potassium: causes of potassium leaving cells

A\$\$E\$

Acidosis: H⁺ ions move in.

Starvation: catabolism of cells.

Stress: catabolism of cells (postoperative).

Exercise: catabolism of cells.

Sodium chloride lost: K⁺ 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

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

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

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MSD
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