Normal range for pCO2 is 35-45

PTs with restrictive lung disease should not have extended EXP time (I:E)

Acids give up hydrogen ions.

**LV and RV waveform** (LV will have higher pressures) looks like V-Tach

Ra Waveform** (more rhythmic) a wedge is more dampended in appearance and less rhythmic

**PA Waveform** (looks like an A) more rounded on top, with dicrotic notch

**Boyle's Law** – Gas Expands with altitude increase

**Non-Anion Gap metabolic acidosis** is often referred to as hyperchloremic metabolic acidosis.

Respiratory Failure is defined as – pCO2 >60 pO2 <50

**Anion Gap**   Na – Cl + HCO3 (NORMAL = 12 ± 4)
High = Met Acidosis
Low = hypoalbuminemia

Charles Law – increased temp = increased volume

Variable Decelerations is most likely cord compression or other cord issues

Mother’s knees against chest is **McRoberts** maneuver – widens pelvic opening, stretches pelvic joints – used to aid delivery with shoulder distocia

Formula to assess respiratory compensation is called Winter’s
\[ pCO2 = (1.5 \times HCO3) + 8 \]  plus or minus 2

Acute Asthma pathology suggests broncho-spasm and mucus plug block insp and exp.

CO2 production and excretion occur in the lungs.

Dalton’s Law = total pressure is equal to sum of partial pressures

**Trauma PT with no sensation from nipple line down is T4 dermatome.**
FP-C EXAM STUDY GUIDE

Henry’s Law = Amt of gas dissolved in liquid (bends)

CO2 is an acid.

Acid – Gives up hydrogen ions
Base – accepts hydrogen ions

Hamman’s sign is indicative of trancheobronchial injury.

Hamman’s = Hangman’s / Hangman’s = Neck / Trancheobronchial is in lower neck

ST Depression is Ischemia

Inverted T = sub-endocardial MI

ST elevation is Damage

EKG Interpretation

1-aVL = Lateral
2,3 aVF = Inferior
V1-2 = Septal
V3-4 = Anterior
V5-6 = Lateral

RBB = QRS > .12, inverted T V1, P waves
LBB = QRS > .12, R waves or Q waves in V1, inverted T in V6, P waves

RCA - R vent, inferior wall of L vent, Posterior wall of L vent
LCA - circumflex, lateral wall of L vent, posterior wall of L vent
LAD - septal wall L vent, anterior wall of L vent

Tall R waves in V1-3 = Posterior MI
Peaked P waves = Hypokalemia
Peaked T waves = Hyperkalemia
Posterior MI is ST depression in V1-V4 with abnormal tall R waves

IABP, the balloon should show augmentation at the dicrotic notch on wave form.

The balloon is inflated throughout diastole.

<table>
<thead>
<tr>
<th>Balloon</th>
<th>Ventricles</th>
<th>Balloon</th>
<th>Ventricles</th>
</tr>
</thead>
<tbody>
<tr>
<td>♦ Inflates</td>
<td>♦ Diastole</td>
<td>♦ Deflates</td>
<td>♦ Systole</td>
</tr>
</tbody>
</table>

Cardiac Output – Norm = 4-8 lpm

CVP – norm = 2-6 mmHg

PCWP – norm = 8-12 mmHg (Preload Left Ventricle)

Meds that decrease Afterload
Nipride, Dobutrex, Natrecor, Corlopam

Meds that Increase Afterload
Dopamine, Neosynephrine, Levophed, EPI

Arterial Waveform looks like an A (more pointed, with a distinct dicrotic notch)
**FP-C EXAM STUDY GUIDE**

**SHOCK**
- SVR <800 - Septic = Cardiac Index High (Septic has a fever – Fever is High)
- SVR <800 - Neuro = Cl low, brady, low BP (Neuro is Low and Slow)
- SVR 800 - Anaph = Cl low, tachycardia
- SVR >1200 - Hypov = CVP Low (Hypo=Low)
- SVR >1200 - Cardio = CVP elevated, PAWP decreased (Cardio/Pump = Pump=Pressure=elevated)

Balloon Waveform with rounded wave is a Kink in the Tube.

If you have an IABP failure, shut off, cycle the balloon manually every 30 minutes.

**PHI Protocol is every 5 minutes – the test is 30 minutes.**

Dicrotic notch to INFLATION POINT
- Deflects downward is Late inflation - 🛠️
- Level is normal - ⬅️
- Deflects upward is early inflation - ⬇️

DEFLATION – Low point after dicrotic notch to diatsole
- Deflects upward is late Deflation ⬆️
- Deflects downward is early deflation ⬇️

VAD allows the ventricle to rest by diverting blood to an artificial pump.

IAB has been dislodged distally, most common complication is limb ischemia Left Radial Pulse Decreases

Counter pulsation action of the IABP – Decreases afterload stress of the left ventricle

Myxedema coma is also known as Hypothyroidism.

Hypothyroidism is NOT primarily found in men. 90+% in winter, mostly over age 60, coarse hair and cold intolerance

Normal ICP readings are 0-10 mmHg

MAP formula is 2 x DBP + SBP divided by 3

Severe hypothermic PTs are at risk of V-Fib

Drug of choice for malignant hyperthermia is DANTROLENE

TCA overdose does NOT cause ‘early sinus bradycardia’

Rhabdomylosis can be treated with – Thorazine, H2 Blockers, Alkalinizing urine with NaHCO3

**NOT TREATED WITH CALCIUM CHANNEL BLOCKERS**

CPP = MAP-ICP (cerebral)

**Grey-Turner’s sign** - flank bruising - may indicate – Pancreatitis

“turn on your side, you have PanGreyatitis”

Do Not neutralize Chemical Burns, Neutralize thermal, electrical, and contact

Hydrofluoric Burns can be managed copious water and 10% Calcium Gluconate

DO NOT hyperventilate approaching herniations.

SCUBA diving to 66’ is 2 atmospheres of pressure (every 33’ is one atmosphere)

Pericardiocentesis insertion is just left of the subxyphoid process
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Chest Pain x 3 days with fever is pericarditis

Stressors of Flight
   Decreased O2, Barometric Pressure, Thermal, Humidity, Noise, vibration,
   Fatigue, G-Forces, 3rd spacing

**Henry's Law** – Gas in Liquid
**Boyle's Law** – Increased altitude=increased gas
**Dalton's Law** – total pressure = sum of partial pressures
**Charles Law** – Increased temp = increased pressure

Minute Ventilation is Vt x RR

Vt is calculated – 6-10 ml/kg

Assist Control = set volume, set rate
SIMV = allows pt to initiate breath
Pressure Control = set pressure, volume can fluctuate

V/Q scan is used to diagnose pulmonary embolism

Rapid infusion of PHENYTOIN can cause SVT and ventricular dysrhythmias

PPEs for meningitis is Mask and Gloves

Target EtCO2 = 35 mmHg
Notch in EtCO2 waveform = PT may need more sedation
"SharkFin" appearance of EtCO2 waveform = may be allergic reaction

Most common decompression sickness is the Bends

Left Shift in oxygen-hemoglobin dissociation curve include: everything is LOW
   Alkalosis, Hypocapnia, Hypothermia

Scaphoid Abdomen – Diaphragmatic Hernia

Hypoglycemia in Neonate treated with D 10% 2-4 ml/kg

Hypoglycemia of <40 mg/dl in Neonate should be treated.

Repeated doses of ETOMIDATE can cause Acute Adrenal Insufficiency

CPP = DBP+PCWP

Inferior MI is caused by blockage of RCA (right coronary artery)

Normal CVP/RAP is 2-6 mmHg

PCWP evaluates **Preload** of the Left Side of Heart (W is one the LEFT side of compass map)

SVR measures afterload for the left heart and are decreased in Distributed Shock

PARA = # Births
GRAVA = # Pregnancies

**KEHR's Sign** = Shoulder Pain (spleen injury, ruptured uterous)

Severe Chest/Abdominal pain, diaphoresis, and restless 170/p and rate 116
   Nipride and B-Blockers
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Hyperventilation and Hypocalcemia is TRAUSSEAU’s sign (H and H = S and S)

CXR – Ground Glass = ARDS

Pre-Eclampsia = Late Decels

Placenta Previa = Painless/Bright Red

Placenta Abruptio = PAIN. Dark Blood

Urine Rupture = Hx C-section, Excessive Pitocin, Fetal Parts may be palpated, KEHR’s sign

Mauriceau’s Maneuver – for breech delivery – head stuck – use finger/hand to create airway

Mauri = MARY - MARY gave birth - Mauriceau is used in breech delivery

ARDS you should increase PEEP

Hypothermic Head Injured – oxyhemoglobin dissociation curve shifts LEFT

Glucose and Sodium should be maintained in Head Injured

Stages of Labor

#1 – onset of contractions to full dilation
#2 – from full dilation to delivery of fetus
#3 – delivery of fetus to delivery of placenta

Pneumocephalus – unresponsive with increased BP and changed resp patterns

CPP = MAP – ICP
MAP = 2 x DBP + SBP divided by 3

Henry’s Law describes the Bends

Clotting Cascade – Triggered by – Tissue Thromboplastin

Poisoning of the cytochrome oxidase enzyme system causes HISTOXIC HYPOXIA

Water in ET cuff counteracts BOYLE’S LAW

Cardiac Tamponade = Pulses Paradoxus, Kussmals Sign, PEA

Layngotraceobronchitis = Steeple Sign (xray)

Head Injury, Extreme Urine output, low urine osmolarity
Aggressive fluid replacement and Vasopressin

Brudenski’s sign = neck rigidity – sub arachnoid or meningitis

Neurogenic Shock – decreased BP, decreased HR, cool/pale below injury

Anterior Cord Injury – Motor, Pain, Temp Loss

Central Cord Injury – Lower motor OK, upper motor loss – (you can dance but you Can’t Clap)

Needle Decompression site – 2-3 IC space mid-clavicular

BECKs Triad = Tamponade – JVD, Muffled Heart, Narrowing Pulse Pressure

Electrical Alternans = pericardial effusion
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Chest Tube site = 4 IC space anterior axillary

**Cullens sign** = bruising of flank and/or umbilicus - Pancreatitis  
**Kernigs Sign** = Stiffness of Hamstrings – Meningitis  
**Murphy’s sign** = gall bladder – palpating RUQ LUQ for tenderness during respirations  
**Waddell’s Triad** = Trauma – Fx Femoral shaft, intra thoracic/abdominal injury, head injury

Upper body obese, thin legs and arms, Fatigue, Rounded Face – CUSHING's SYNDROME

Harsh Murmor, Scapular Pain, SOB, HTN in Upper Extremities – Aortic Rupture

After Pitocin – Still Bleeding – you can give METHERGINE

Overdue aircraft procedures start 15 min after no contact

Platelets are considered LOW at <300/L

Normal Serum Osmolality is 185-295 mOsm/kg water

Flight suit should fit .25” from body

BNP evaluates Congestive Heart Failure

ELT takes 4g crash to activate

Pre-Eclampsia = HTN, Edema, Proteinuria *(NOT low Platelet Count)*

OB patient is Rh-  Most likely get RHOGAM

**Stagnant** Hypoxia – Pooling, Poor Cardiac Output

Vecuronium stimulates acetylcholine receptors

Defasciculating Neuromuscular Blockade – 10% normal RSI dose of NMBA

Compartment Syndrome Labs – Elevated K+, BUN, Creatinine, CPK

You can fly IFR in VMC but not VFR in IMC

“Rusk Flakes” in IABP tubing – STOP – Ruptured balloon or tube

IABP Inflation – onset of Vent Diastole

IABP Deflation – Prior to onset of Vent Systole

Parkland Formula = is now the consensus burn formula  
Consensus Burn Formula = 4 x KG x %burns = ## then ## divided by 2 = 8hr bolus

Antidote for Cyanide Poisoning – Amyl Nitrite, Sodium Nitrite, Sodium Thiosulfate

**Hyperthermic** – Vasodilation necessitates increased CO2 thus increasing O2 demand

**ARDS** and **DIC** are a result of **LYSOSOMAL** enzymes in **Hyperthermic** PT

**Levine’s Sign** = clinched fist over chest – CARDIAC

Circulating Blood Volume of Child = 75-80 ml/kg (children are 7-8 yrs old)

Narrowest portion of airway is at cricoid cartilage - <10 yrs of age
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Late Decelerations always means Uteroplacental Insufficiency

Left Ventricle Failure = Increase the Preload (Tx= Left is Low = Increase)

Overdose – pH 7.55, pCO2 20 - early salicylate acid overdose

High Pressure Alarms – Secretions, Obstructions, ET dislodged

Normal Right Atrial Pressure = 2-6 mmHg

PCWP obtained by – inflating balloon until wave form changes

SVR measures – After-Load of LEFT side of heart

Metabolic Acidosis – Vomiting, NG suctioning, Diuretics (NOT Diarrhea)

Digitalis Toxicity is exacerbated by Electrolyte Imbalance

Ingested unknown toxin – wide tachycardia = TCA overdose

CVP or PA pressures should be assessed at – End of Exhalation

Waveform suddenly changed into wedge – have PT cough

Cullen’s Sign = Pancreatitis

Kussmaul’s Sign = rise in pressure with inspiration (wave with resp)

Know Rule of Nines

Fluid =  4 x kg x %burn = 24hr fluid / Divide by 2 = amt given in first 8 hrs, remaining over next 16 hrs

On burn questions, use the answer with the Higher range that has your calculation

PCWP – measures Preload on Left side of heart – P=Preload  W=West (always on the LEFT of compass)

SVR measures afterload of Left Side of Heart – decreased in septic shock

Urinary Output for an adult = 30-50 ml/hr
Urinary Output for BURN patient = 30-50 ml/hr
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A patient in EARLY SHOCK is most likely in Respiratory Alkalosis

Low pressure alarms are not caused by pneumothorax

SVR measures AFTERLOAD of the LEFT, Decreased in Distributed Shock

Platelets are low if <100

Contraindications for thrombolytics –
Hx of hem. Stroke, CVA last 12 months, BP over 180, Pregnancy-1 mo. Post partum

Hyperkalemia on ECG - Flat Ps, peaked T’s (Treat with Calcium)

Normal potassium - 3.5-5.5

Thrombolytics must be administered within - 3 hours of onset of chest pain