NAPLEX SECRET

Calculations:

ung-ointment WA-while awake

PR-per rectum BM-bowel movement

1 pint= 473 ml 1 quart = 946 ml

1 gallon = 3785 ml 1 pound = 454 g

Percentage Strength: g/100ml (w/v); ml/100ml (v/v) ; g/100g (w/w)

Ratio Strength: (1:X) ex. 0.04% = 0.04g/100ml = 1g/2500ml = 1:2500 **Put in grams

PPM: (parts of drug/1,000,000) parts of whole ex. 0.00022g/100ml = 2.2g/1,000,000 = 2.2PPM

BMI: ($kg/m^{2)}$ *2.54cm/inch <18.5 = Underweight, 18.5-24.9 = normal 25-29.9=overweight >30 =obese

IBW: Male: 50+2.3 (inches above 5 feet) Female: 45.5 + 2.3(inches > 5 feet)

Adjusted BW: IBW + 0.4(TBW-IBW)

CrCl: { (140-age) x weight }/SCr x72 Multiply by 0.85 for females

Dilutions: (Changing a strength or quantity) Q1 * C1 = Q2 * C2

Alligation: (Combining two strengths to get a strength in between) **Watch for **ADD TO**

****Corrected Calcium: Ca^{2+}(from lab) + {(4-albumin) x(0.8)}**

** **Phenytoin correction= PHT measured/{(0.2x Alb) + 0.1}**

- Choose calcium gluconate over chloride bc it dissociates less and less chance of binding to phosphate and precipitating

mEq : Electrical charges provided per mole

mOsmol/L = {(g/L)/(g/mole)} x (# of particles it splits up into) x 1000

Isotonicity (osmolarity in body fluids, when we want to make something isotonic to blood): "E Value"

- First find out how much NaCl would make it isotonic. 0.9g/100ml = X g/X mL
- E= sodium chloride equivalents of a drug = (58.5 x i) / (MW of drug x 1.8) *i = dissociation factor of drug
- example: if calculated E value is 0.23 and you have 0.4g of drug, this represents 0.4g x .23 = 0.092 g NaCl
- Then subtract them from each other.

Fahrenheit = (C x 1.8) +32

pH = pka + log (salt/acid) For Acids

pH = 14 – pK_b + log (base/salt) For Bases

eAG: (28.7 x A1C) – 46.7

Calcium Carbonate: 40% elemental calcium Calcium Citrate: 21% elemental calcium

Absolute Neutrophil Count: WBC x ((%segs+%bands)/100)

Anion Gap: Na^{+}-Cl-HCO_3^{-} *>12 is high (gapped)

Minimum Weighable Quantity (MWQ) : SR/error

Absolute Bioavailability: $F = (AUC_{extravascular} \times Dose_{intravenous})/(AUC_{intravenous} \times Dose_{extravascular})$

IV Bolus VD= Dose/Co or Co = Dose/VD

Oral VD= (Dose x F) /(ke xAUC) Cl=(Dose x F)/AUC

Cl=ke x VD

ke= {ln(Cmax/Cmin)}/ Time interval

Enteral/Parental Nutrition:

-**Linezolid (Zyvox):** (Bacteriostatic)

- binds to 23S ribosomal RNA of the 50S subunit
- **CI with MAOI inhibitors or within 2 weeks use of them**
- **IV to PO 1:1 (600mg Q12)**
- **MRSA, PRSP, VRE**
- associated with bone marrow suppression and peripheral neuropathy

-**Daptomycin (Cubicin):** (Bactericidal)

- depolarizes cell membrane
- **MRSA, PRSP, VRE**
- Side Effects: ****Myopathy and increased CK**
- ****Do not use for pneumonia b/c its inactivated by surfactant**
- **can cause false elevations in INR with no increased bleeding**
- **compatible with NS but not D5W**

-Tigacycline (Tygacil):

- related to tetracyclines
- **BBW: increased risk of DEATH**
- **Lipophilic and distributes to tissues so not for bloodstream infections**

-Clindamycin (Cleocin):

- binds 50s subunit
- **Covers gram + (not enterococcus) and most anaerobes**
- **BBW for severe or fatal colitis**
- **"D-test" for macrolide-induced resistance**
- **no renal adjustments**

-Metronidazole (Flagyl) and Tinidazole (Tindamax):

- DNA damage which blocks translation and protein synthesis
- **Anaerobes and protozoal infections**
- **BBW for possible carcinogenicity**
- ****CI: Pregnancy(1st trimester), *Alcohol and no alcohol for 3 days after discontinuing**
- **Can increase INR if used with warfarin**
- **IV to PO 1:1**
- **Can cause metallic taste in mouth**
- **Do not refrigerate b/c crystals can form**

-Rifaximin(Xifaxan) : for traveler's diarrhea and hepatic encephalopathy

-Fosfomycin: single dose for UTI, ok for pregnancy

-Nitrofurantoin (Macrobid or Macrodantin): for uncomplicated UTI, ****CI with CrCl<60ml/min, rarely can cause pulmonary toxicity.(Darkens urine rust colored.)

Refrigeration of antibiotics:

Refrigerate: Penicillins (amoxicillin just for taste), Cephalosporins (except Cefdinir(Omnicef)), Erythomycin

Do Not Refrigerate: Cefdinir, Azithromycin, Clarithromycin, Clindamycin, Ciprofloxacin, Levofloxacin, Doxycycline, Fluconazole, Voriconazole, linezolid (Zyvox), SMT/TMP

Specific Disease Treatments with Antibiotics:

Surgery Prophylaxis:

- Usually initiated within 60 minutes before the procedure unless FQ or Vanco is used then its 120 min. before.
- Second doses may need to be given for longer procedures or if there is significant blood loss.
- **1st or 2nd Gen. Cephalosporins** usually given **unless PCN allergy then Vanco** is used.

days post travel. Well tolerated but **CI in pregnancy.** Once Daily.
    - **Primaquine:** Once daily**. Started 1-2 days before** travel and for 7 days post travel**. CI in pregnancy. CDC requires screening for G6PD deficiency before use.**

- **Meningococcal vaccine: required for Saudi Arabia.** Also prevalent in the meningitis belt of Africa. **Menactra** (2 doses for 9-23 months, 1 for 2-55 yrs), **Menveo** (2-55 yrs.), **Menomume** (56 and older). **7-10 days for protective antibodies.**
- **Yellow Fever Virus Vaccine:** for certain parts in sub-saharan Africa and South America. Watch for allergies to eggs and gelatin. It is a live vaccine so don't use in immunocompromised. ASA and NSAIDs should not be used b/c of increased risk of bleeding.
- **Typhoid Fever:** bacteria spread through consumption of food/water contaminated with feces or sexual contact. **Use safe food and water precautions.** Vaccine is **Vivitof Berna, 4 capsules, 1 every other day taken with cool liquid or IM shot ≥ 2 weeks before exposure.**
- **Altitude Sickness: acetazolamide (Diamox Sequels). CI in sulfa allergy.**
- **International certificate of vaccination (Yellow Card)**

HIV:

- **CD4+ counts are the major laboratory indicator of immune function and need for prophylaxis against opportunistic infections.**
- **HIV-1 RNA (Viral Load): most important indicator of response to anti-retroviral therapy (ART).** Used to help assess disease progression and possible drug resistance. **Measured at baseline and then on a regular basis thereafter.**
- Spread through **blood, semen,** and **vaginal secretions.** Also spread through vertical transmission **during pregnancy**, **at birth**, or **breastfeeding.**
- ****ART is recommended in ALL HIV-infected patients**
- ****Need adherence of 95% or greater to be effective long-term**
- **PI's and stavudine** associated with **lipodystrophy/lipoatrophy** and **fat redistribution/lipohypertrophy**
- **Diarrhea** is a common side effect of ART. **Crofelemer(Fulyzaq)** is approved for non-infectious diarrhea in adult patients on ART.

NRTI's: (**Abacavir, lamivudine, emtricitabine, tenofovir**, didanosine, stavudine, zidovudine)

- ****All have BBW for lactic acidosis and hepatomegaly with steatosis(fatty liver)**
- **Suspend treatment if there is lactic acidosis or hepatomegaly with steatosis.**

- **abacavir: BBW for severe hypersensitivity reaction. Must test for HLA-B*5701.**
  Ziagen (abacavir)
  Epzicom (abacavir + lamivudine) – Once Daily

- **emtricitabine: BBW for Hep B exacerbation once discontinued or HBV resistance. Can cause hyperpigmentation of soles and feet.**
  Emtriva (emtricitabine)
  ****Truvada (emtricitabine + tenofovir): Once Daily**
  ****Atripla (emtricitabine + tenofovir + efavirenz):** Once Daily. Take on empty stomach.

Blurred Vision, altered color perception, greenish-yellow halos, confusion, delirium.

- **Hypokalemia, hypomagnesemia, and hypercalcemia increase the risk of toxicity**

Acute Decompensated Heart Failure:

- Congestion: Diuretics and/or IV vasodilators
- Hypoperfusion or Cardiogenic Shock: **Milrinone** or Dobutamine
- Vasodilators used in ADHF:
  - Nitroglycerin: Venous at low dose, Arterial at higher doses, effectiveness limited to 2-3 days.
  - Nitroprusside (Nitropress): equal arterial and venous, protect from light by covering with foil or opaque material, blue solution indicates degradation to cyanide.
  - nesiritide (Natrecor): B-type natriuretic peptide, arterial and venous dilation.

Anticoagulation:

- Some risk factors for VTE: Surgery, Major Trauma, Immobility, Cancer, previous VTE, Pregnancy, estrogen or SERM use etc..
- Heparin and LMWH can cause **HIT**: Body forms antibodies to heparin which leads to further platelet activation and pro-thrombotic state. **Diagnosed by a profound drop in platelets >50% from baseline. **Argatroban is the DOC if this happens. DTI's do not cross react with heparin induced antibodies.**

Unfractionated Heparin:

- binds to antithrombin and inactivates Factor Xa and IIa.
- **VTE prophylaxis: 5,000 units SC Q8-12hrs**
- Also used for VTE treatment and ACS/STEMI treatment
  - **VTE: 80 units/kg IV bolus** then 18 units/kg/hr infusion
  - ACS/STEMI: 60 units/kg IV bolus then 12 units/kg/hr inusion
- Do not mix-up the heparin injection with the HepFlush heparin line flushes
- monitor **aPTT** and want to be 1.5-2.5 x control
- **Antidote: Protamine**; **1mg will reverse 100 units; max 50mg.**
- unpredictable anticoagulant response
- IV and SC
- **osteoporosis** with long term use

- **LMWH:**
  - binds to antithrombin and inactivates Factor Xa mostly and some Factor IIa.
  - **BBW for hematomas and subsequent paralysis with spinal punctures.**(Bleeds then pushes on the spine)
  - **enoxaparin (Lovenox)**
    - ****VTE prophylaxis: 30mg SC BID** CrCl< 30ml/min, 30mg SC daily.
    - ****Tx of VTE and UA/NSTEMI: 1mg/kg SC BID** CrCl< 30ml/min, 1mg/kg SC daily
    - ****Tx for STEMI (<75): 30mg IV bolus plus 1mg/kg SC followed by 1mg/kg Q12 (Max 100mg for 1st two doses)**
    - **STEMI (>75) No bolus, just 0.75mg/kg SC Q12 (Max 75mg for 1st two doses)**
  - **dalteparin (Fragmin)**
  - **Anti-Xa levels can be monitored but not done routinely unless Pregnant or Mechanical heart valve, severe renal impairment, extreme weights.**
  - **no antidote but protamine can help some**

Factor Xa inhibitors:

- **Fondaparinux (Arixtra):**

- **lorazepam (Ativan)**
- **midazolam**
- **propolol (Diprivan):** propofol infusion related syndrome(PRIS), rare but can be fatal. **Hypertriglycerides**
- **dexmedetomidine (Precedex): **Sedation without Respiratory Depression**
- **morphine: has active metabolite M6G, hypotension from histamine release**
- **fentanyl:** less hypotension than morphine b/c no histamine release
- **hydromorphone (Dilaudid)**
- **haloperidol (Haldol): QT prolongation, EPS**

Acid-Base Homeostasis:

- **pH < 7.35 is acidosis, pH > 7.45 is alkalosis**
- **Metabolic or Respiratory**
- **Anion gap: Na^+ - (Cl^- + HCO_3^-) > 12 is gapped**

Electrolyte Disorders:

- **Sodium: Don't correct more than 12mEq/L in 24 hours** to prevent central pontine myelinosis which is a devastating neurological complication.
- **Potassium:** IV potassium should **not be faster than 10-20 mEq/hr.**

Stress Ulcer Prophylaxis:

- Critical illness leads to reduced blood flow to gut which results in breakdown of gastric mucosal defense mechanisms
- Patients without risk factors should not receive prophylaxis (Mechanical Vent, Coagulopathy, Sepsis, Brain Injury, Burns, Renal Failure, High Dose Steroids)
- **H2 blockers**

VTE prevention:

- **High Risk:** Surgery, trauma, immobility, cancer, previous VTE, pregnancy, estrogen etc..
- **UFH: 5,000 units SC BID-TID**
- **LMWH: Enoxapin 30mg SC BID or 40mg SC Daily. If CrCl<30, use 30mg SQ Daily**

Anesthesia:

- **must be closely monitored**
- **Inhaled anesthetics can cause malignant hyperthermia and should be given dantrolene.**
- **Neuromuscular blockers: cisatracurium (Nimbex)** and **Vecuronium . Do not provide sedation or analgesia.**

IV compatibility resources:

- **Trissel's**
- **King Guide**

Poison Management:

- **Insecticide Poisoning/Nerve Agents:** Organophosphates that inhibit acetlycholinesterase, leads to increase Ach. MUDDLES: miosis (pinpoint pupils), urination, diarrhea, diaphoresis, lacrimation, excitation, salivation

Antidotes for select toxicities:

- **APAP: N-acetylcysteine**
- **Anticholinesterase: Atropine**
- **Benzos: Flumazenil (Romazicon)**
- **Beta Blockers: Glucagon**
- **Digoxin: Digoxin Immune Fab (Digifab)**
- **Heparin: Protamine**
- **Iron: deferoxamine (Desferal)**
- **Isoniazid: (Pyridoxine Vit B6)**
- **Opioids: Naloxone**
- **Warfarin: phytonadione (Mephyton) = Vitamin K**

Depression:

- **Bulk-Producers:** psyllium (Metamucil), calcium polycarbophil (FiberCon), methylcellulose (Citrucel). **DOC in pregnancy and 1st line for constipation.**
- **Emollients, Lubricants (Stool Softener): docusate sodium (Colace),** mineral oil
- **Stimulant: Senna (Ex-Lax), bisacodly (Dulcolax).** Caution that brand names can refer to multiple products.
- **Osmotics:** PEG, Lactulose, Gycerin, Sorbitol, Salines (various ions)
- **Rx Agents: Lubiprostone (Amitiza) – Nausea (30%),**

  alvimopan (Entereg) – blocks opioid receptors in the gut

➢ **For STAT treatments and Bowel Preps: bisacodyl rectal, magnesium salts (MOM**), lactulose, sorbitol, sodium phosphate (Osmoprep), **polyethylene glycol (Golytely, Miralax, Carbowax).**

Diarrhea:

➢ Most cases are viral, some bacterial (E.Coli), some drugs (antibiotics, Mg), some diseases.
➢ **Antidiarrheals: Bismuth Subsalicylate (Pepto-Bismol), loperamide (Immodium), diphenoxylate + atropine (Lomotil)**
➢ **Treatment should include fluids and electrolytes, especially in children.**
➢ **Not used with C. Difficile infections, body needs to clear the toxin, not retain it.**
➢ **Rule out lactose intolerance by avoiding dairy.**

Inflammatory Bowel Disease:

- Ulcerative Colitis and Crohn's Disease: Idiopathic Bowel Inflammation
- **Treatment:**
  - ➢ Anti-diarrheals: Immodium, Lomitil
  - ➢ Anti-spasmodics: **dicyclomine(Bentyl)**
  - ➢ Short courses of oral or IV steroids: Prednisone or **budesonide (Entocort).** Budesonide preferred for ileum or colon problems, it has extensive first pass so lower systemic exposure.
  - ➢ **Maintenance therapy** to reduce inflammation and flare-ups.

mesalamine (Asacol, Pentasa, Canasa, Rowasa)

methotrexate

TNF Inhibitors: adalimumbad (Humira), infliximab (Remicade), golimumab (Simponi), natalizumab (Tysabri): for refractory diseases.

Erectile Dysfunction:

- **Reduced blood flow to the penis.** Often caused by diabetes, HTN, heart disease, nerve damage, drugs (antidepressants, blood pressure meds, antipsychotics, finasteride, dutaseride, cimetidine, opioids, chemo, nictotine), hormone imbalances (testosterone), stress etc..

PDE5 inhibitors:

➢ ***CI with nitrates**
➢ **Do not confuse with PAH/BPH drugs/doses:**
sildenafil (Revatio): 20mg TID
tadalafil (Adcirca): 40mg QD for PAH or tadalafil (Cialis): 5mg QD for BPH
➢ **sildenafil (Viagra): 1 hour before sex, start at 50mg unless ≥65 use 25mg**
➢ **vardenafil (Levitra, Staxyn ODT): 1 hour before sex. ,start at 10mg unless ≥ 65 use 5mg**