

Systemic Medications for Special Populations, Young and Old

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Don't TX everybody the same- Special populations

- Pregnant
- Reduced renal function
 - Diabetes
 - Drugs
 - Age
- Reduced hepatic function
 - Age
 - Drugs
 - Disease
- Pediatric

Know your drug class for the pregnant patient

- A = absolutely safe in pregnancy
- B = Probably safe
- C = questionable safety
- D = Probably NOT safe
- X = Absolutely NOT safe

Reduced renal function

- Be familiar with creatinin clearance formula – age related risk
 - Cockroft Gault equation
(IBW in kg) x (140-age)
----- x (0.85 for females)
72 x (Scr in mg/dL)
- Drug risk ie NSAIDS
- Disease risk ie Diabetes

Reduced hepatic function

- Main site of metabolism
 - Phase 1
 - Phase 2
- Under 16 yrs
- Alcohol consumption
- Acetaminophen use
- Hepatitis
- 1st pass effect
- Abnormal bleeding hx

Special dosing formulas for special patients

- Age
- Weight
- Body Surface Area

Young's Rule

- Based on age
- $\frac{\text{Age (yrs)}}{\text{Age} + 12} \times \text{Adult dose} = \text{Pediatric dose}$
- Example: 6 y/o gets acetaminophen q 4h. Adult dosage = 650mg q 4h
- $\frac{6}{6 + 12} \times 650\text{mg} = 216\text{ mg}$

Webster's Rule (Modified Young's)

- Based on age (modified-Kids are fatter now)
- $\frac{\text{Age} + 1 \text{ (yrs)}}{\text{Age} + 7} \times \text{adult dose} = \text{Pediatric dose}$
- Example:
 $\frac{6 + 1}{6 + 7} \times 650 = 350\text{mg}$

Clark's Rule

- Based on weight
- More realistic and individualized
- Kids are larger today/greater obesity
- $\frac{\text{Wt (Lbs)}}{150} \times \text{adult dose} = \text{Pediatric dosage}$
- Example: 50/60/70 lb 6 Y/O's/acetaminophen at adult dose of 650mg q 4h
- $\frac{50/60/70}{150} \times 650\text{mg} = 216/260/303\text{mg}$

BSA example

- 3ft 3in tall child weighting 44 lbs has a BSA of:
- $\frac{39 \text{ in} \times 44 \text{ lbs}}{3131} = 0.548\text{-sq rt} = 0.74 \text{ sq meters}$
- $\frac{100 \text{ cm} \times 20 \text{ kg}}{3600} = 0.555\text{-sq rt} = 0.75 \text{ sq meters}$
- Quick BSA dose calculation =
Adult BSA = 1.73 sq M/adult dose acetaminophen = 650mg q 6h
- Child's dose = $\frac{0.74 \text{ sq.M}}{1.73 \text{ sq. M}} \times 650\text{mg} = 282\text{mg}$

Simple weight/dose calculations

- PDR/package insert/facts and comparisons lists dose by weight
- Weight is almost always in Kg
- Dose is the full 24 hour dose
- Must know the frequency of dosing/D
- Must know the concentration of liquid dosage forms
- Must know the strengths of all solid dosage forms

PATIENT TO EYE DOCTOR:

WHY DO YOU WANT TO KNOW ABOUT MY LIVER?

- KIDNEYS?
- HEART?
- CREDIT REPORT?

Principles of Medication Review

- Obtain a complete drug history from patient, family, physicians and others
- Review each medication for indication, therapeutic goal and compliance
- Review patient factors - personal goals, cognition, vision, dexterity, monitoring and pharmacist
- Consider medication safety and efficacy individually and within total picture



Pharmacologically: What is different about the elderly?

- Greater incidence of pre-existing conditions= contraindications
- Greater risk of drug interactions via autonomic effects
- Greater incidence of interactions via altered pharmacokinetics –Absorption distribution, metabolism and excretion
- Greater use of systemic meds with greater potential for drug interactions

Pediatric Patients

- ♦ Higher proportion of water
- ♦ Lower plasma protein levels
 - More available drug
- ♦ Immature liver/kidneys
 - Liver often metabolizes more slowly
 - Kidneys may excrete more slowly

Conclusions

- ♦ Children are not little adults
- ♦ Dosages must be based on actual pharmacokinetics factors
- ♦ Pediatric dosage formulas can only estimate a proper dose
- ♦ Pedes are always at greater risk for drug induced toxicity
- ♦ Go low and go slow
- ♦ Consult with pediatrician

Augmentin Amoxicillin/Clavulanate

- Broad spectrum penicillin (Staph, Strep, Hemophilus)
- Effective against penicillinase producers- clavulanate blocks penicillinase@@@
- High therapeutic index
- Bacteriocidal
- Low GI side-effects
- Safe in pregnancy
- Watch out for allergy
- Cheap***

Pediatric dosing-azithromycin

- 5 day: 10mg/kg day 1, then 5mg/kg
- 3 day: 10mg/kg daily
- 1 day: 30mg/kg

- The recommended daily dosage of **BIAXIN®** (clarithromycin for oral suspension, USP) is
- 15 mg/kg/day, in divided doses every 12 hours, not to exceed 1000 mg/day.
- Treatment is 7 to 10 days depending on the pathogen involved and the severity of the condition.
- Treatment for pharyngitis caused by *Streptococcal spp.* should be 10 days.
- In children with renal impairment and a creatinine clearance less than 30 mL/min, the dosage should be decreased

BIAXIN® (clarithromycin for oral suspension, USP)
BIAXIN® Oral Suspension
 Pediatric Dosage Guidelines
 Based on Body Weight in kg
 125 mg/5 mL 250 mg/5 mL
 Weight* Dosage (mL)
 given twice daily
 Dosage (mL)
 given twice daily
 8-11 kg (1-2 years)** 2.5 1.25
 12-19 kg (2-4 years) 5 2.5
 20-29 kg (4-8 years) 7.5 3.75
 30-40 kg (8-12 years) 10 5
 * Children < 8 kg should be dosed on a per kg basis (approximately 7.5 mg/kg b.i.d.).
 ** Approximate ages.
 Children

Zithromax Azithromcin

- Broad spectrum activity
- 64 hour 1/2 life@@@
- DOC in penicillin sensitive patients
- Effective in pediatric Hemophilus@@@
- Mild-medium GI side effects
- Excellent compliance (5 day TX) (1 day for chlamydia)@@@
- Moderate cost
- Drug Interactions??

Azithromycin Indications/Dosage forms

- Indications:
- Drug of choice for Chlamydia
- Pediatric Hemophilus
- Penicillin substitute
- Dosage forms:
- 250mg Z-Pak (6 capsules)
- 1 gm packet
- 100 and 200mg/5ml ped. suspension

Management Treatment of Impetigo

- Cause: *S. aureus*/Strep sp
- Oral Macrolide
- PhisoHex cleaning
- Bactroban (Mupirocin)
- 4th gen fluoroquinolone
- Can be mistaken for H. simplex

Cephalexin Indication/Dosage forms

- Indications:
- Same as Augmentin EXCEPT not effective against Hemophilus
- Dosage forms:
- 250 and 500mg capsules 3-4 times daily
- 125 and 250mg/5ml suspension

The “KIDS” (2nd) Generation Cephalosporins are Good for “HENPEK” Gram Negatives

- **H: Hemophilus**
- **E: E. coli**
- **N: Neisseria**
- **P: Proteus**
- **E: Enterococci**
- **K: Klebsiella**

DOXYCYCLINE

- **Long acting/potent tetracycline**
- **Resistant to absorption problems**
- **Medium GI upset**
- **Good compliance (1-2 X/D dosing)**
- **No activity in acute bacterial eye disease**
- **Inexpensive**
- **Contraindicated in kids and pregnant patients**

A NEW USE FOR DOXYCYCLINE?

Doxycycline inhibition of interleukin-1 in the corneal epithelium.

Solomon A, Rosenblatt M, Li DQ, Liu Z, Monroy D, Ji Z, Lokeshwar BL, Pflugfelder SC

Ocular Surface and Tear Center, Bascom Palmer Eye Institute, Department of Ophthalmology, University of Miami School of Medicine, Florida 33136, USA.

PURPOSE: To evaluate the effect of doxycycline on the regulation of interleukin (IL)-1 expression and activity in human cultured corneal epithelium. MP.

The Forgotten Antibiotics

- Sulfa
- Limited coverage
 - Allergy
 - No pregnancy
 - No sickle-cell
 - Only use with trimethoprim

The Forgotten Antibiotics

The Fluoroquinolones

- **Only if allergic to all else**
- **No pregnant**
- **No Kids under 16**



For ALL Herpes It's the Drug of Choice

- **Recurrent or resistant simplex**
- **ALL Zoster patients over 50 MARKED DECREASE IN RISK OF POST-HERPETIC TRIGEMINAL NEURALGIA@@@**

Famvir Famcyclovir

- Third generation anti-viral medication
- Pro-drug
- Selective toxicity
- Excellent anti-herpetic activity
- Expensive, but cost-effective

Famvir Indications/Dosage forms

- Indications:
- Resistant ocular simplex or Type II simplex
- 125-250mg BID
- Hpes zoster 500mg TID
- Dosage forms:
- 125/250/500mg tablets

The Bridesmaids

- Less potent
- More frequent dosing required
- longer TX period
- Not as proven in prevention of post-herpetic neuralgia

Anti-viral dosages

- SIMPLEX/ZOSTER
- Acyclovir: 400mg TID@@@/ 800 5X/D
- Valacyclovir: 500mg BID/ 1000mg TID
- Famcyclovir: 125mg -250mg BID/ 500mg TID

Salagen Pilocarpine

- Oral parasympathomimetic agent@@@@
- Stimulates exocrine gland secretion
- Monitor for GI upset@@@@
- Don't use in asthmatics
- Expensive

Salagen Indications/Dosage forms

- Indications:
- Advanced, non-responsive Sjogrens@@@@
- 5mg QID
- Dosage form:
- 5mg tablets

Evoxac: New and improved pilocarpine

- Parasympathomimetic
- Better tolerated
- 30mg TID
- No titration necessary
- NEVER in asthmatics

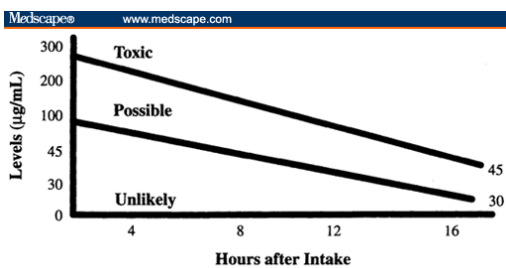
Oral Antihistamines: It's all about lipid solubility

- More lipid soluble-FASTER ACTING, but more side-effects
- Benadryl vs Claritin
- Claritin vs Zyrtec
- It's also about the liver: Pedes dosing

Allegra Indications/Dosage forms

- Indications:
- Seasonal allergy not responsive to topical or nasal therapy
- Dosage forms:
- 60mg tablets-Adults BID
- Kids: 30mg tabs BID
- 180mg SR once daily for adults
- Zyrtec and Claritin: Adult dose = Kids dose for 6 y/o and above@@@

Tylenol and kids-be careful



NSAID Fact Sheet

- Allergic to one allergic to all
- Never give to diabetics
- Pediatric OK for normal kids
- No ASA for kids