

A large number '2' is formed by a dense arrangement of various colorful pills and capsules in shades of blue, yellow, green, red, and white. The pills are of different shapes and sizes, creating a textured, mosaic-like effect.

**ANTIBIOTICS and PHARMACOLOGY
in
PEDIATRIC DENTISTRY**

**Sarah Ahn DDS
SBH**

QUESTIONS TO ASK ??

- **Medical history**
- **Medications**
 - Prescribed, homeopathic, OTC?
 - Interactions
- **Allergies**
 - Familial tendencies to adverse drug reactions
- **Capsules, chewable tablets, liquid?**
- **Compliance?**
- **Weight of child -- get weight or ask**

DRUG SCHEDULES

□ **Schedule I**

- Research purposes only
- E.g., heroin, marijuana, LSD

□ **Schedule II**

- Cannot be refilled or phoned in
- E.g., codeine, morphine, oxycodone, meperidine

□ **Schedule III**

- E.g., codeine combinations, hydrocodone

□ **Schedule IV**

- E.g., chloral hydrate, benzos, barbiturates

□ **Schedule V**

- E.g., anti-diarrheals, codeine cough meds

- **DEA:** you indicate on your application, which classes you are applying for

APPROXIMATE PEDIATRIC DOSAGES AND CONVERSIONS

- **Young's Rule** (age dependent):
 $(\text{age} / \text{age} + 12) \times \text{adult dose}$
- **Clark's Rule** (weight dependent):
 - for lbs: $(\text{weight} / 150) \times \text{adult dose}$
 - for kg: $(\text{weight} / 70) \times \text{adult dose}$
- **Weight conversions:**
 $1 \text{ kg} = 2.2 \text{ lbs}$
- **Volume conversions:**
 $5 \text{ cc} = 5 \text{ ml} = 1 \text{ teaspoon (tsp)}$
 $120 \text{ cc} = 4 \text{ oz}$



OFFICIAL NEW YORK STATE PRESCRIPTION

ST. BARNABAS HOSPITAL

Heading - Doctor's name, address, phone #

WONG S AHN DDS

License #: 053772

NPI: 1285684209

DEPT OF DENTISTRY 4422 THIRD AVENUE BRONX, NY 10457 (718) 960-6628

PRACTITIONER DEA NUMBER

Grid for DEA number

Patient Name _____ Date _____

Superscription - patient's name, address, age, DOB

City _____ State _____ Zip _____ Age _____ Sex M F

Inscription - Rx: drug and unit dose/conc

Subscription - Disp: instructions to pharmacy

Sig- Instructions for patient

Prevent medication errors. Please see back of prescription.

Prescriber Signature X

Signature - Doctor's signature & degree

THIS PRESCRIPTION WILL BE FILLED GENERICALLY UNLESS PRESCRIBER WRITES 'daw' IN THE BOX BELOW

REFILLS None Refills: _____

0PJPG8 00



Other - DEA #, refills, generic substitution

PHARMACIST TEST AREA:

Dispense As Written.

SW CNYRxPadMV589732 SQ8828-1 PQ23901 Carton 1 of 1

ANTIBIOTICS

Odontogenic Infections

- Odontogenic infections → more anaerobes than aerobes (if no external access)
- If Pen doesn't work, consider Clindamycin since broad spectrum (anaerobes, aerobes, gram+ cocci) and β -lactamase resistant
- Bacteriostatic or bacteriocidal abx?

Penicillin V

- <12 yrs: 25-50 mg/kg/day t/qid
- >12 yrs: 1-2.0 g t/qid
- 3g max/day
- Supply:
 - 125mg/5ml or 250mg/5ml
 - 250mg tabs
- Pen V better than Pen G since higher plasma concs



Amoxicillin

- <20kg/12yrs: 20-40 mg/kg/day tid
25-45 mg/kg/day bid
- >20kg/12yrs: 250-500mg tid
500-875 mg bid
- Max 2-3g/day
- Supply:
 - 125 or 250 or 400 mg/5ml oral suspension
 - 125/250 mg tabs
- Better oral absorption than Pen V
- Better compliance than Pen V since taken tid instead of qid



Clindamycin

- <12 yrs: 10-25 mg/kg/day in 3-4 divided doses
- >12 yrs: 150-300 mg qid
- Max: 1.8 mg/day PO
- Supply:
 - 75mg/5ml oral suspension
 - 150/300 mg caps (150 mg caps are cheaper)
- Bactericidal
- Kills everything (broad spectrum)
 - Including GI bacteria → GI upset



Azithromycin

- Kids >6mth-16yrs: 5-12 mg/kg/day once a day (max 500mg)
30 mg/kg single dose (max 1500mg)
- Adults: 250-600 mg once a day (Zpak - 500mg tab)
1-2g as single dose
- Supply:
 - Tabs, suspension, caps, injectable
 - Peds: 100 or 200 mg/5ml suspension
- Endocarditis: 15 mg/kg (max 500mg) PO/IM/IV

Cephalexin

- Kids >1 yrs: 25-100 mg/kg/day qid or tid
- Adults: 250-1000mg qid
- Max: 4g/day
- Supply:
 - Tabs, suspension, caps
 - 125 or 250/5ml oral suspension
 - 125/250 mg tabs
- Endocarditis: 20mg/kg (max 600mg) PO/IM/IV

Example Script – Antibiotic

Example: Barney. 44 lb male comes in with abscess of L with slight buccal swelling. No allergies, healthy. Will prescribe Amoxicillin 250mg/5ml susp tid for 7 days.

1. Convert to kg \rightarrow 44lbs divided by 2.2 = 20 kg
2. Max amt needed: 20 kg x 40 mg/kg/day = 800 mg per day
3. Min amt needed: 20kg x 20mg/kg/day = 400mg per day
4. Amt needed per dose (tid) is: 800 (400) mg / 3 = 267(133) mg per dose
5. Amox comes in 250mg/5ml conc. To make it easy for the parent to dispense and because Amox has a range between 20-40 mg/kg, you can round it to 250 mg per dose.
6. For the amt to dispense in the bottle: 250mg x 3 x 7 days = 5250mg
7. The total amt (ml) needed is 5250mg x 5ml / 250mg = 105 ml.
8. To accommodate for “accidental spillage”, you may want to give 125ml

Final Script

SW CNYRxPad/MV589732 P Pad 5 of 5 2/8/2012 N 000240

OFFICIAL NEW YORK STATE PRESCRIPTION

ST. BARNABAS HOSPITAL
YOUNG S AHN DDS
LIC: 053772
NPI: 1285684209

DEPT OF DENTISTRY 4422 THIRD AVENUE BRONX, NY 10457 (718) 960-6628

PRACTITIONER DEA NUMBER

Patient Name Barney Hosp Date 4/22/13

Address _____

City _____ State _____ Zip _____ Age 5 Sex M F

Inscription - Rx: drug and unit dose/conc
Amoxicillin 250mg/5ml oral susp
Disp 125ml
Take 250mg tid for 7 days

Subscription - Disp: instructions to pharmacy

Signa - Instructions for patient

Signature - Doctor's signature & de

Prevent medication errors. Please see back of prescription.

Prescriber Signature X

THIS PRESCRIPTION WILL BE FILLED GENERICALLY UNLESS PRESCRIBER WRITES 'daw' IN THE BOX BELOW

REFILLS None Refills: _____

PHARMACIST TEST AREA: _____

Dispense As Written.

MAXIMUM DAILY DOSE (controlled substances only)
0PJPG8 00

Barcode

Heading - Doctor's name, address, phone #

Inscription - Rx: drug and unit dose/conc

Subscription - Disp: instructions to pharmacy

Signa - Instructions for patient

Other - DEA #, refills, generic substitution

Abx Cheat Sheet

Weight (Kg)	Amoxicillin (125/250 mg/5cc) ^{25/50} 20-40mg/kg/day	Amoxicillin <i>SBE Prophylaxis</i> 50mg/kg 1 hr. pre-op	Clindamycin (75mg/5cc) 15-25mg/kg/day	Clindamycin <i>SBE Prophylaxis</i> 20mg/kg 1 hr. pre-op
10	125mg TID (66-133)	500mg	75mg TID	200mg
11	125mg TID (73-147)	550mg	75mg TID	220mg
12	125mg TID (80-160)	600mg	75mg TID	240mg
13	125mg TID (87-173)	650mg	75mg TID	260mg
14	125mg TID (93-187)	700mg	75mg TID	280mg
15	125mg TID (100-200)	750mg	75mg TID	300mg
16 (34/68)	125mg TID (107-213)	800mg	75mg TID	320mg
17	125mg TID (113-227)	850mg	75mg TID	340mg
18	125mg TID (120-240)	900mg	150mg TID	360mg
19	250mg TID (127-253)	950mg	150mg TID	380mg
20	250mg TID (133-267)	1000mg	150mg TID	400mg
21	250mg TID (140-280)	1050mg	150mg TID	420mg
22 (49/98)	250mg TID (147-293)	1100mg	150mg TID	440mg
23 (49/98)	250mg TID (153-307)	1150mg	150mg TID	460mg
24	250mg TID (160-320)	1200mg	150mg TID	480mg
25	250mg TID (167-333)	1250mg	150mg TID	500mg
26	250mg TID (173-347)	1300mg	150mg TID	520mg
27	250mg TID (180-360)	1350mg	150mg TID	540mg
28	250mg TID (187-373)	1400mg	225mg TID	560mg
29	250mg TID (193-387)	1450mg	225mg TID	580mg
30 (62/124)	250mg TID (200-400)	1500mg	225mg TID	600mg
31 (62/124)	250mg TID (207-413)	1550mg	225mg TID	600mg
32	250mg TID (213-427)	1600mg	225mg TID	600mg
33	250mg TID (220-440)	1650mg	225mg TID	600mg
34	250mg TID (227-453)	1700mg	225mg TID	600mg
35	250mg TID (233-467)	1750mg	225mg TID	600mg
36	250mg TID (240-480)	1800mg	300mg TID	600mg
37	250mg TID (247-493)	1850mg	300mg TID	600mg
38	500mg TID (253-507)	1900mg	300mg TID	600mg
39	500mg TID (260-520)	1950mg	300mg TID	600mg
40	500mg TID (267-533)	2000mg	300mg TID	600mg
41	500mg TID (273-547)	2000mg	300mg TID	600mg
42	500mg TID (280-560)	2000mg	300mg TID	600mg
43	500mg TID (287-573)	2000mg	300mg TID	600mg
44	500mg TID (293-587)	2000mg	300mg TID	600mg
45 (90/180)	500mg TID (300-600)	2000mg	375mg TID	600mg
46	500mg TID (307-613)	2000mg	375mg TID	600mg
47	500mg TID (313-627)	2000mg	375mg TID	600mg
48	500mg TID (320-640)	2000mg	375mg TID	600mg
49	500mg TID (327-653)	2000mg	375mg TID	600mg
50	500mg TID (333-666)	2000mg	375mg TID	600mg

INFECTIVE ENDOCARDITIS

Infective Endocarditis

- Bacteria colonize in area of turbulent blood flow
 - ▣ Heart valves, endocardium, valvular abnormality, defect, surgical repair, vascular lesion
- Flu-like illness, fever, chills, malaise, heart murmur
- Significant morbidity/mortality → heart failure, pulmonary emboli, cerebral abscess, 10-40% mortality
- Types:
 - ▣ Acute - sudden onset, fatal (6 wks), Staph aureus, older folks, males
 - ▣ Sub-acute - slower onset, Strep viridians, children
- May develop even if Abx given
- No relationship between magnitude of bacteremia and IE

Cardiac Conditions: AHA guidelines

- Prosthetic cardiac valve(s)
- Previous endocarditis
- Congenital heart disease only in the following categories:
 - Unrepaired cyanotic congenital heart disease, including those with palliative shunts and conduits (e.g., Tetralogy of Fallot, Transposition of the great vessels, Pulmonic stenosis with an atrial or ventricular septal defect, Coarctation of the aorta)
 - Repaired congenital heart disease with prosthetic material or device during the first six months after the procedure (*endothelialization of prosthetic material occurs within six months after the procedure*)
 - Repaired congenital heart disease with residual defects at the site or adjacent to the site of a prosthetic patch or prosthetic
- Cardiac transplantation recipients with cardiac valvular disease

Dental Situations for Prophylaxis

- Oral procedures that cause bleeding → transient bacteremia
- Manipulation of gingival tissue or the periapical region of teeth, perforation of the oral mucosa
- **NOT** recommended for:
 - Routine anesthetic injections through noninfected tissue
 - Placement of removable prosthodontic or orthodontic appliances
 - Placement of orthodontic brackets
 - Bleeding from trauma to the lips or oral mucosa

Rx for Infective Endocarditis

- Rx (common regiments) for PEDS:
 - Amoxicillin: 50mg/kg 1 hr pre-op (max 2g)
 - Clindamycin: 20mg/kg pre-op (max 600mg)
 - Others:
 - Ampicillin 50mg/kg IV/IM 30 mins pre-op
 - Cephalexin 20mg/kg (max 600mg) PO/IM/IV
 - Azithromycin 15mg/kg (max 500mg)

- **Never round down the dose for “convenience”**

LOCAL ANESTHESIA

- Idea concentration - lowest possible to avoid toxicity
- Onset depends on:
 - pH of injection area
 - Higher pH → faster onset (more uncharged molecules that pass through memb)
 - Lower pH (infection) → fewer molecules → slower onset
 - Total dose
- Duration depends on:
 - Total dose
 - Vasoconstrictor
 - Plasma protein binding

LA - ESTERS

- E.g. Cocaine, Benzocaine
- Aromatic portion derived from PABA (allergic rxn)
- Metabolized via pseudocholinesterase enzyme in plasma
- Shorter duration than amides
- Water insoluble
 - ▣ Topical use only

LA - AMIDES

- E.g. Lidocaine, Mepivacaine, Articaine, Prilocaine
- Metabolized by liver - cytochrome p450
- Decrease toxicity
- Decrease allergy risk
- Intraoral use
- If true allergy → GA, nitrous
 - Esters are not an alternative

LA - MAX DOSAGES

DO NOT EXCEED MAX DOSAGES

**If conscious sedation is employed –
Dosage should be well below the MRD due to possible
potentiation of cardiorespiratory depressant effects**

Anes	2%Lido	3%Mep	4%Septo
Max Dose	4.4mg/kg (2mg/lb)	4.4 mg/kg (2mg/lb)	7.0 mg/kg (3.2 mg/lb)

OVERDOSES

- **Causes:**
 - Excess dosage
 - Intravascular injection
- **Effects:**
 - CNS: excitement, depression, seizures, disorientation, loss of consciousness
 - Respiratory depression
 - CV: tachycardia; vasodilation; myocardial depression (bradycardia) → decreased cardiac output → cardiovascular collapse
 - GI: nausea

LIDOCAINE (XYLOCAINE)

- Wide usage, dependable
- Dosage:
 - Max: 4.4mg/kg or 2mg/lb
 - Max: 300mg
- Avail as 2% solution
 - w/ or w/o epi (1:50000, 1:100000) in 1.8ml/1.7ml cartridges
- Avail in 2% topical, viscous liquid form

MEPIVACAINE (CARBOCAINE)

- Useful:
 - Short procedures
 - Epi-free
 - Use when epi should be avoided -- medically compromised
- Toxicity similar to lidocaine
- Dosage:
 - Max: 4.4 mg/kg (2mg/lb); up to 300mg
- Available in 3% concentration

ARTICAINE (SEPTOCAINE)

- Has ester group (in addition to amide group)
- Higher lipid solubility compared to lidocaine
 - Faster acting -- onset (2-3mins vs 3-5mins)
- Concentration – 4%
- Max dosage: 7.0 mg/kg or 3.2 mg/lb
- Avail in 4% conc with epi 1:100,000 or 1:200,000
- Inferior alveolar nerve parasthesia risk -- greater than other LA (infiltration ok)
- Recent studies show similar effectiveness as 2% lido
- Data doesn't support use for kids under 4years

BUPIVACAINE (MARCINE)

- Kids less than 12 years not recommended as data is incomplete
- Duration: 2-3x Lidocaine/Mepivacaine (avg: 7 hrs)
- For surgical procedures - 8-12 hours of post-op pain
 - Decreased use of analgesics
- Common concs: 0.25% to 0.5% w/ 1:200,000 epi in 1.8ml carp
- Accidental oral trauma

BENZOCAINE

- Ester
- Gels, ointments
- Duration of action: 10-20 mins
- Dry area increases uptake
- Caution: concentrations much higher than injectable LA
 - Potential for toxicity greater if large quantities

ANALGESICS

Acetaminophen (Tylenol)

- Uses: mild pain, fever; no anti-rheumatic, anti-inflammatory
- Mechanism of action:
 - Inhibits CNS prostaglandin production; blocks peripheral pain impulse generation; inhibits hypothalamic heat-regulating center to cause antipyresis
- Dosages:
 - <12 yrs: 10-15mg/kg/dose every 4-6 hrs (max 1625mg in 24 hrs)
 - >12 yrs: max 4000mg in 24 hrs

Ibuprofen (Advil, Motrin)

- NSAID, antipyretic, antirheumatic
- Contraindications: allergy to NSAIDs, GI bleeding, ulcer
- Adverse reactions: heartburn, nausea, GI bleed, rash, dizziness; increase bleeding (can inhibit platelet aggregation)
- Oral dosage: 2-8mg/kg/dose every 6-8 hrs

Acetaminophen with Codeine

- Uses: severe pain, antipyretic
- Disadvantages: CNS, resp depression; constipation; potentiates sedative drugs; contraindicated with head trauma
- 300/15, 300/30, 300/60 tabs; 120/12/5ml oral susp
- Dosages:
 - ▣ codeine: 0.5mg/kg
 - ▣ 3-6yrs: 12mg q4-6h
 - ▣ 7-12 yrs: 24mg q4-6h
 - ▣ MAX: 75mg/kg/day
- Drug seekers!

OTHER IMPORTANT DRUGS



OXYGEN

- Important to have portable oxygen system separate from central system
- Deliver high flow 100% O₂ for 30 minutes
 - ▣ Portable oxygen tank with regulator (E cylinder)



EPINEPHRINE (ADRENALINE)

- Uses:
 - ▣ Anaphylactic reactions
 - ▣ Bronchodilator
 - ▣ Adjunct in LA
 - ▣ Cardiac arrest
- Contraindications: hypersensitivity to epi; cardiac arrhythmias
- Precautions: diabetes mellitus; CV disease (angina, tachycardia, MI); thyroid disease

EPINEPHRINE (ADRENALINE)

□ Dosages:

- Hypersensitivity: 1:1000 conc. → 0.01mg/kg q 5 mins IM/subQ
- Bronchodilator: 1:1000 conc. → 0.01mg/kg q 15 mins
 - if using 1:10000 conc. → 0.1mg/kg

□ Forms:

■ Injectable:


- 1mg/ml (1:1000 conc) (1ml, 30ml vials)
- 0.1mg/ml (1:10000) (10ml)
- 0.01mg/ml (1:100000) (5ml)
- Epi Pen adult >5yrs - 0.3mg
- Epi Pen jr child <5yrs - 0.15mg

■ Topical:

- 1mg/ml (30ml)

Downloadable Resources

- Epocrates (free)
 - ▣ Includes a BMI calculator
 - ▣ www.epocrates.com
- Medscape (free)
 - ▣ www.medscape.com



WHAT'S THE
SECRET OF YOUR
GRIMING SUCCESS?

I DON'T PLAY FAVORITES!
RICH OR POOR, WHITE,
BROWN OR BLACK, YOUNG
OR OLD, 'A' STUDENT
OR DROPOUT... I'M AN
EQUAL-OPPORTUNITY
REAPER!

HEROIN

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