ORAL HEALTH IPE
COLLEGE OF ALLIED HEALTH/COLLEGE OF DENTISTRY

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Department of Pediatric Dentistry
Dental College of Georgia
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COMMONLY PRESCRIBED MEDICATIONS IN PEDIATRIC DENTISTRY

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My Story!


Flatwoods
KY


UNIVERSITY
OF FLORIDA


Kentucky
Fried
Chicken


UK


MASTERS

My Family!

ANTIBIOTICS

- Second most prescribed group in dentistry after local anesthetics
- Should be prescribed asap for optimal healing
- Should extend at least 5 days past substantial improvement/resolution of symptoms
- If patient on oral contraceptives, advise to use other method of birth control for at least one week beyond final dose of antibiotic
- Situations that may necessitate an antibiotic:
  - Oral wound (soft tissue lac, severe tooth displacement, avulsion, gingivectomy and severe ulcerations)
  - Dental infection- only if systemic signs such as fever or swelling are present
  - Pediatric perio disease- immune system is unable to control growth of periodontal microbes; culture and susceptibility testing is prudent in these cases

CAUSES/TREATMENTS OF ODONTOGENIC INFECTIONS

- Major pathogens in dental caries s. viridens family (alpha hemolytic) including s. mutans, s. sobrinis, and s. milleri
- Caries--Bacteria invade pulp--inflammatory reaction—necrosis and lower tissue oxidation potential—flora changes from predominately aerobic to more anaerobic (gram pos cocci and gram neg rods)—abscess formation—potential to spread into marrow, perforate cortical plate and spread to surrounding tissues
- Anaerobes in periodontal tissues may provide an additional source of odontogenic infection (A.a., p. gingivalis, others)
- 70% of odontogenic infections contained mixed aerobes and anaerobes
- Early infections = aerobic predominates
- Mature infections – mixed flora with anaerobe species determined by site of origin – perio or pulp

CHOICE OF ANTIBIOTIC

- Stage of infection
- Ability of patient to take the antibiotic
- Medical conditions
- Allergy

ANTIBIOTIC MECHANISM OF ACTION

- Bactericidal vs. bacteriostatic
- An antibiotic can be either depending on the microorganism
- Bactericidal preferable over bacteriostatic in most cases
- Common bactericidals = penicillins and cephalosporins
- Common bacteriostatics = macrolides, tetracyclines, sulfonamides

PENICILLIN VK

- Beta lactam antibiotic, inhibit cell wall synthesis
- Bactericidal against gram pos cocci and the major microbes of mixed anaerobic infections
- Adverse reactions = diarrhea, nausea, oral candidiasis
- 0.7-10% allergy rate
- 85% of allergic reactions are delayed and take 2+ days to develop
- May be given with or without food
- Preferred dosing is one hour before or two hours after meals
- Use with caution in patients with severe renal impairment, history of seizures, hypersensitivity to cephalosporins
- Dosing for dental infection in children ≤ 12: 25-50 mg/kg in divided doses q6-8h

AMOXICILLIN

- More convenient dosing regimen (2-3 doses daily vs. 4 doses)
- No more effective than Pen VK except for H. flu in acute sinus and otitis media infections
- Less effective than Pen VK against aerobic gram-positive cocci
- Dosing for children ≤ 12 = 20-40mg/kg in 2-3 divided doses
- Same contraindications as Pen VK

AUGMENTIN

- When amoxicillin is ineffective due to possible bacterial resistance
- Clavulanic acid binds and inhibits beta-lactamases that inactivate amoxicillin
- Should be taken with food
- Prolonged use may result in superinfection
- Caution for use in pts with hepatic or renal dysfunction
- Higher incidence of GI effects than with Amoxicillin alone
- Dose children < 40kg = 20-40mg/kg/day in 3 divided doses

CLINDAMYCIN

- Broad spectrum; resistant to beta lactamase degradation
- Inhibits protein synthesis
- Highly effective against almost all oral pathogens
- Can be given with or without food
- Contraindications: allergy, previous pseudomembranous colitis (overgrowth of C. Diff)
- Warnings: Use in caution in pts with liver dysfunction, can cause severe and fatal colitis. Discontinue use if diarrhea, cramps or bloody stool occurs
- Dosing for children <12 = 8-25mg/kg/day in 3 divided doses

MACROLIDES (ERYTHROMYCIN, CLARITHROMYCIN, AZITHROMYCIN)

- Spectrum of coverage similar to Pen VK with the addition of some penicillinase-producing staph species and mycoplasma
- Inhibit protein synthesis and ribosomal translation
- Azithromycin and Clarithromycin are structural derivatives of erythromycin and have a broader spectrum as well as increased bioavailability
- Bacteriostatic thus not recommended in immune compromised patients
- Warnings: Use with caution in pts with hepatic impairment
- Contraindications: allergy

ERYTHROMYCIN

- Adverse effects: mostly GI (a motilin agonist so increases production of pepsin and increases peristalsis)
- Because of the GI effects, not generally used as a first-line antibiotic
- Numerous drug interactions: statins, migraine meds, calcium channel blockers, some antihistamines
- Forms: base, estolate, ethylsuccinate, stearate
  - Different salt forms that have been formulated to overcome bioavailability issues due to gastric acid breakdown
  - EES is most common form; prodrug that is activated after hydrolysis of an ester and broken down into salt+ alcohol
- Dosing for children <12 = 30-50 mg/kg/day in 2-4 divided doses

AZITHROMYCIN (ZITHROMAX)

- Derivative of Erythromycin
- Slow elimination in the body allows for once daily dosing for 3-5 days (elimination half-life is 68 hrs)
- Side effects: mostly GI
- Inhibits protein synthesis and ribosomal translation
- Dose children > 6mos: 10 mg/kg on day 1 followed by 5/mg/kg on days 2-5

  (max = 250 mg/day)
- Can be given with or without food

ANTIBIOTIC DOSING

Antibiotic	Child Dosing
Pen VK	< 12: 25-50 mg/kg in divided doses q6-8 h (max dose = 3g/day)
Clindamycin	8-25 mg/kg in 3 divided doses
Cephalexin (Keflex)	25-50 mg/kg/day in divided doses q6h Severe infections: 50-100mg/kg (max 3g/day)
Amoxicillin	<40 kg: 20-40 mg/kg/day in divided doses q8h
Amoxicillin/clavulanic acid (Augmentin)	< 40 kg: 20-40mg/kg/day in divided doses q8h

CHECK-UP /CIRCA. 1942

ANTIBIOTIC PROPHYLAXIS FOR BACTERIAL ENDOCARDITIS

- Prosthetic cardiac valve
- Previous endocarditis
- Unrepaired cyanotic CHD* including shunts and conduits
- Repaired CHD with prosthetic material or devices for first 6 mos after repair
- Repaired CHD with residual defects at/near the site of prosthetic patch or device
- Cardiac transplant patients with valve disease
- Only recommended for procedures that involve manipulation of gingival tissues or the periapical region or perforation of oral mucosa

* Congenital Heart Defect

INFECTIVE ENDOCARDITIS PROPHYLAXIS

Administer single dose 30-60 minutes before procedure			
		Child	Adult
Oral	Amoxicillin	50mg/kg	2 grams
Allergic to penicillin	Clindamycin	20mg/kg	600 mg
Unable to take oral meds	Ampicillin	50mg/kg IM or IV	2 grams IM or IV
	Clindamycin	20mg/kg IM or IV	600 mg IM or IV

ANTIFUNGALS

- Oral fungal infections may result from alterations in oral flora subsequent to antibiotics, steroids, chemotherapy, immunosuppression, inadequate nutrition
- Most common in children is candidiasis
- Topical application of nystatin, clortrimazole
- Systemic ketoconazole, fluconazole
- Choice of form based on patient age and maturity
- Re-eval patient in two weeks and change med/dosage if no improvement
- Continue to administer until 2 days after symptoms resolve

Nystatin Oral Suspension 100,00 units/ml

Disp: 100 mL (Use a dropper supplied with this medication)

(Infants) Sig: 1 mL 4Xdaily after each meal or at least 30 min. prior to feeding

Topical effect is desired. If patches of thrush show no improvement after two days, rub nystatin directly on patches

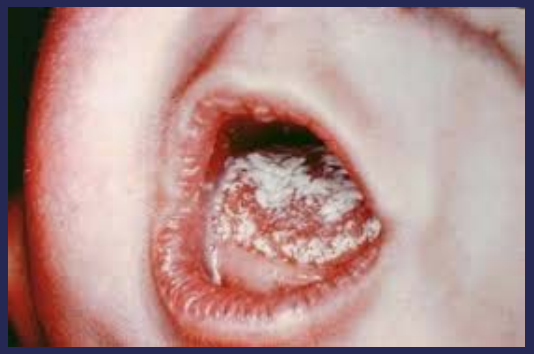
(Older infants) Sig: 2 mL 4X/day (1 ml on each side of mouth)

(Adults & Children >5) Sig: 4-6mL 4X/day (about 1 teaspoonful = ½ of dose on each side of mouth)

- Clotrimazole 10mg troches

  Disp: 70

  Sig: Dissolve 1 troche in mouth 5x day until gone



- Ketoconazole 2% cream (topical)

  Disp: 1 tube (45 gram)

  Sig: Apply locally as directed with a thin coat to the affected area 4-5x daily

- Ketoconazole 200 mg tabs
  Disp: 20 tabs
  Sig: Take one tab daily

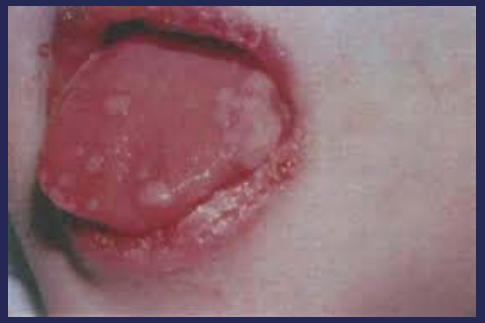
- Fluconazole 100 mg tabs
  Disp: 22 tabs
  Sig: Take 2 tabs day 1 then 1 tablet/day until finished

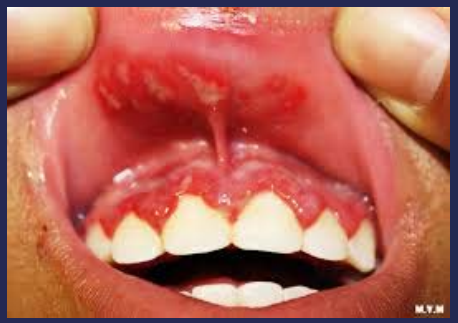
Angular cheilitis:

Nystatin and triamcinolone ointment
Disp: 45 gram tube
Sig: Apply locally as directed 4x daily x 10 days

ANTIVIRALS

- Recurrent Herpes Labialis
- Recurrent Apthous Stomatitis
- Herpetic Gingivostomatitis:
  - Acute onset of vesicular eruptions on soft tissue
  - Quickly rupture into small ulcerations
  - Ulcers are covered by grey pseudomembrane and surrounded by red halo
  - Gingiva, tongue, lips, buccal mucosa, posterior pharynx
  - High fever, malaise, irritability, pain
  - Usually found in children 6 mos- 4 years
  - Resolves within 7-10 days





ACYCLOVIR

- Only given in severe cases of HSV
- Safety/efficacy not established in children <2 yrs
- Use with caution in immune suppressed patients
- Dose in children > 2yrs: 20 mg/kg/dose (max 800mg dose) 4x daily x 5 days

ANALGESICS

- Non-narcotic vs. Narcotic
- Mild, Moderate, Severe pain
- Choose form that will relieve pain without significantly altering consciousness when possible
- Non-narcotics act directly on the peripheral nerve endings
- Narcotics act in the CNS

NON-NARCOTIC ANALGESICS

- Mild to moderate pain
- Lower degree of toxicity
- Fewer side effects
- No dependency concerns

ACETAMINOPHEN

- Most commonly prescribed analgesic in pediatric population
- Antipyretic and analgesic
- No anti-inflammatory properties
- Mild pain
- Few GI side effects
- Inhibits synthesis of prostaglandins in CNS and blocks pain impulse generation peripherally
- Antipyretic- inhibition of hypothalamic heat regulating center
- Overdose (>3 g in child under 2 or >15g in an adult) may cause acute liver failure and nephrotoxicity
- Warnings: Do not exceed max dose
- Dosage children <12 years: 10-15mg/kg every 4-6 hrs as needed

ASPIRIN

- Analgesic, antipyretic, anti-inflammatory
- Side effects: alterations in blood coagulation, gastric irritation, allergic reactions
- Association with viral infections and Reye's syndrome (inflammation of brain and liver following viral infection)
- Contraindications: allergy, asthma, bleeding disorders, pregnancy
- Warnings: avoid use in pts with severe renal or hepatic impairment
- Should be analgesic of last resort for children under 16
- Dose: Children 10-15 mg/kg dose q 4-6h up to total of 4g/day

NSAIDS

- **Two categories**: ibuprofen and naproxen
- Different molecular structures, naproxen has greater anti-inflammatory properties
- Superior to aspirin in analgesic and anti-inflammatory properties
- Inhibit prostaglandin synthesis
- Fewer bleeding issues than aspirin- inhibition on platelet aggregation is reversed as soon as NSAIDs are excreted
- Side effects: GI upset, headache
- Contraindications: allergy to aspirin or nsaid, pregnancy-3rd trimester, viral infection and assoc with Reye's syndrome?
- Warnings: can compromise renal/hepatic function, GI bleeds, ulcers
- Dosage:
  - Ibuprofen- children < 12 years: 4-10mg/kg/dose q 6-8h (max dose 40mg/kg/day
  - Naproxen – children <12: 5-7mg/kg/dose 2-3 times daily

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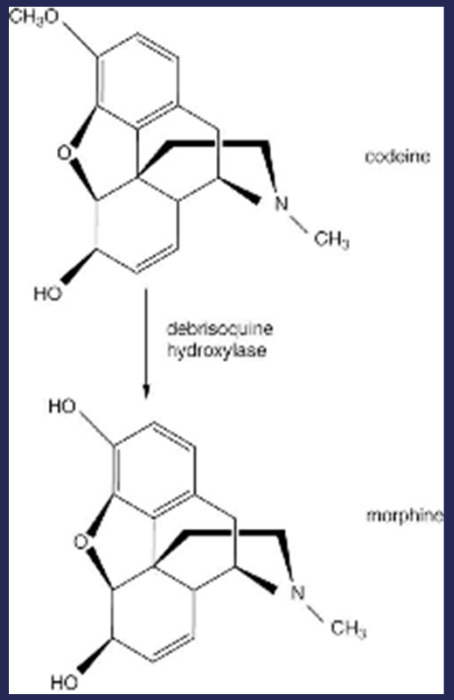
NARCOTIC ANALGESICS

- Interactions with opioid receptors in the CNS result in analgesia, sedation, and cough suppression
- Codeine is most commonly prescribed for mod-severe pain
- Usually given in combination with non-narcotic analgesics
- Narcotic acts at central sites and non-narcotic at peripheral sites = enhanced analgesic activity
- Use should be short-term (< 3 days) to avoid nausea, sedation, constipation and dependency
- Contraindications: allergy, significant respiratory depression, severe/acute asthma
- Warnings: Use with caution in pts with hypotension, CNS depression, head injury, increased ICP
- SAFETY AND EFFICACY IN PEDIATRIC PATIENTS HAS NOT BEEN ESTABLISHED

CODEINE ISSUES IN CHILDREN < 5

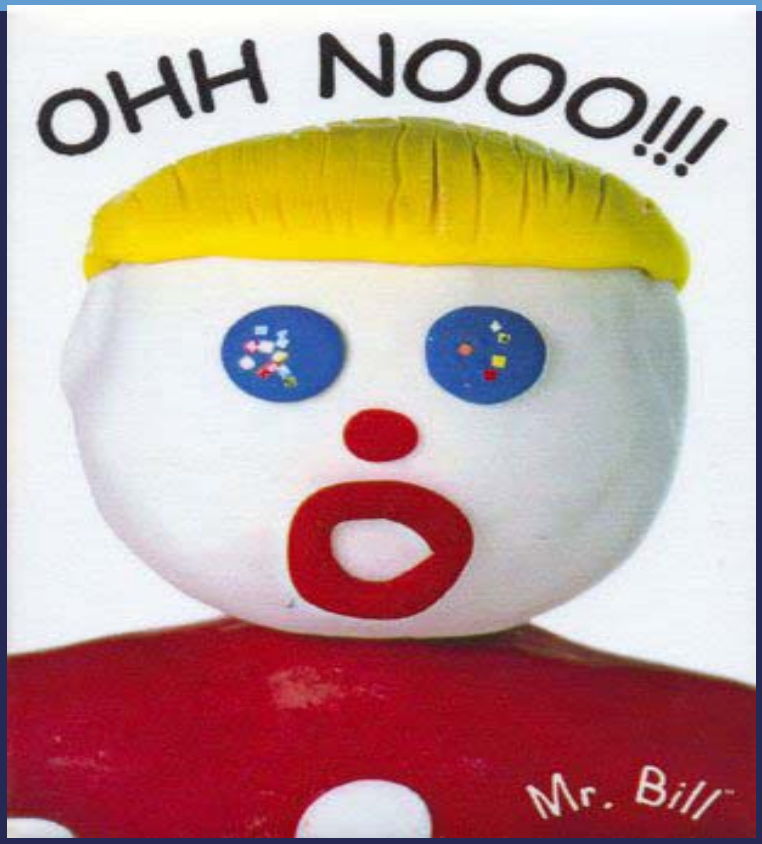
- Codeine is converted to morphine in the liver by the enzyme cytochrome P450 2D6 (CYP2D6).
- Some people have DNA variations that make this enzyme more active, causing codeine to be converted to morphine faster and more completely than in other people.
- These "ultra-rapid metabolizers" are more likely to have higher than normal amounts of morphine in their blood after taking codeine.
- High levels of morphine can result in breathing difficulty, which may be fatal.
- Taking codeine after tonsillectomy and/or adenoidectomy may increase the risk for breathing problems and death in children who are "ultra-rapid metabolizers."
- The estimated number of "ultra-rapid metabolizers" is generally 1 to 7 per 100 people, but may be as high as 28 per 100 people in some ethnic groups



CODEINE DOSING

- Codeine should be given on as "as needed" basis only
- No round-the-clock dosing
- No more than 6 doses/day
- Signs of serious side effects can include unusual sleepiness, confusion, difficult or noisy breathing and should be reported immediately
- Children < 44kg: 0.5-1mg/kg/dose with 10-15mg/kg acetaminophen as needed but not more frequently than every 4 hours

QUIZ TIME!!



QUIZ QUESTION # 1

The most prescribed group of drugs in dentistry are _____.

- **a. antibiotics**
- **b. local anesthetics**
- **c. antifungals**
- **d. systemic fluoride**

QUIZ QUESTION # 2

- **The duration of antibiotic therapy should extend _____.**

a. up to the time symptoms disappear
b. a minimum of 1 week
c. a minimum of 2 weeks
d. a minimum of 5 days after substantial improvement or resolution of symptoms

QUIZ QUESTION # 3

- In an early stage of infection the predominate bacteria are _____.

a. aerobic bacteria

b. a mix of aerobic and anaerobic bacteria

c. anaerobic bacteria

d. nonspecific bacteria

QUIZ QUESTION # 4

- **Which of the following classes of antibiotics are bactericidal?**

a. Macrolides

b. Penicillins

c. Tetracyclines

d. Sulfonamides

VERBAL INFORMED CONSENT/ CIRCA.1952

QUIZ QUESTION # 5

- **In the event of penicillin allergy, the alternative choice in treating mild or early odontogenic infections is _____.**

a. Clindamycin

b. Amoxicillin

c. Erythromycin

d. a second-generation cephalosporin

QUIZ QUESTION # 6

- A dental procedure for which endocarditis prophylaxis is recommended is _____.

a. routine anesthetic injections through non-infected tissue

b. endodontic therapy

c. bleeding from trauma to the lips and tongue

d. All of the above.

QUIZ QUESTION # 7

- **The maximum daily dose of acetaminophen in children under 12 years of age is _____.**

a. 1.3 grams

b. 2.6 grams

c. 4 grams

d. 5 grams

QUIZ QUESTION # 8

- An advantage of combining a non-narcotic analgesic with codeine is _____.

a. the codeine acts at a central site and the non-narcotic analgesic acts at a peripheral site

b. the drug combination is safe to use in patients with head injury

c. respiratory depression is reduced

d. it aids in controlling bronchial depression

QUIZ QUESTION # 9

- When prescribing systemic fluoride supplementation, the following should be considered_____.

a. the patient's age

b. the fluoride content of the community water supply

c. The patient's dietary habits

d. All of the above.

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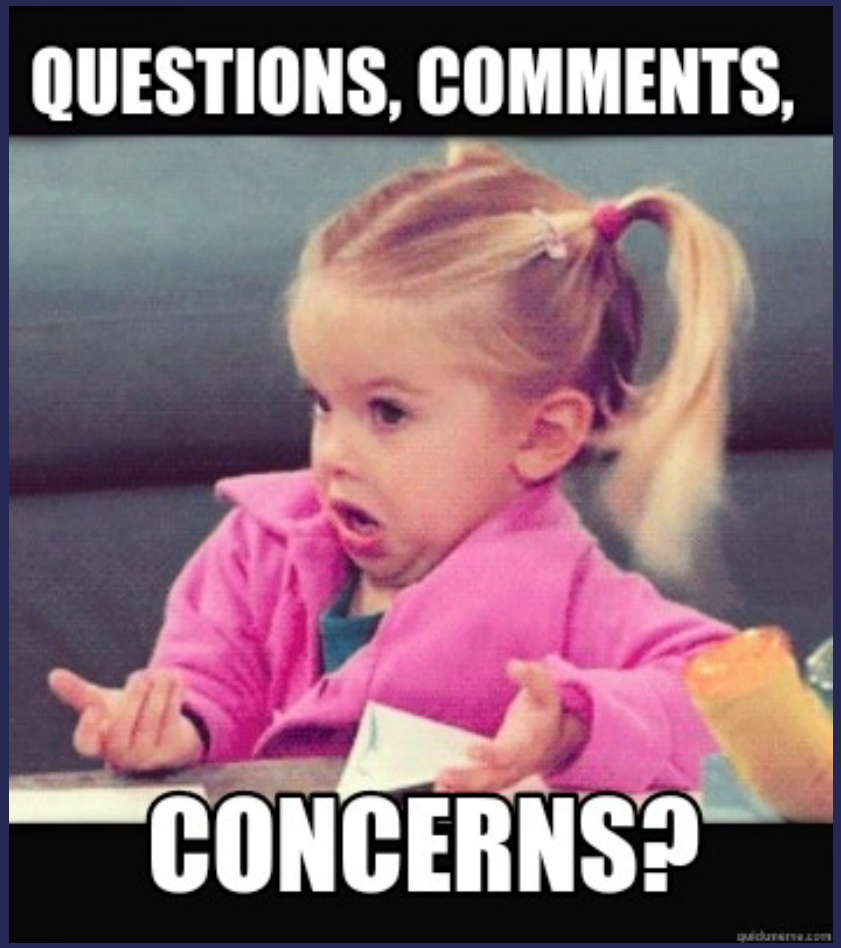
QUESTIONS, COMMENTS,
CONCERNS?


BECAUSE BABIES
SHOULD BE SEEN
AND NOT HEARD.
LAUDANUM
CREST
BRAND