

**A MEDLEY OF CLINICAL AND PRACTICAL
DENTAL PHARMACOLOGY**

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The Art and Science of Dentistry-2018

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***MANAGING THE DENTAL
PATIENT IN PAIN***

I. *Choosing an analgesic*

- A. Quality of Pain
 - Dull, aching, inflammatory
 - Sharp, piercing, lancinating
 - Neuropathic pain
- B. Quantity of Pain
 - Mild/moderate/severe
- C. Locus of Action
 - Central nervous system
 - Locally, peripherally
 - Combination of both

II. *Acetylsalicylic acid and derivatives*

- A. pharmacologic effects - most of aspirin's useful pharmacologic effects are due to its ability to inhibit prostaglandin synthesis
 - 1. analgesic
 - 2. antipyretic
 - 3. anticoagulant
 - 4. anti-inflammatory
- B. adverse effects
 - 1. uric acid excretion
 - 2. salicylism
 - 3. allergy-0.2%-questionable
 - 4. caustic-acetylsalicylic acid plus water = **acetic acid** and **salicylic acid**

- C. contraindications
 - 1. allergy to aspirin or NSAIDs
 - 2. asthma-mechanism?
 - 3. chronic gastritis
 - 4. anticoagulant (coumadins)
 - 5. pregnancy

III. **Acetaminophen**

- A. Pharmacology of acetaminophen
- B. Mechanism of action
 - 1. COX-3 inhibitor
 - 2. located in the CNS
 - 3. peripheral effects also
- C. Clinical effects
 - 1. analgesic
 - 2. antipyretic
 - 3. **NO** gastritis ☺
 - 4. **NO** clinically significant effects on uric acid ☺
 - 5. **NO** anti-platelet effects ☺
 - 6. **NO ANTI-INFLAMMATORY EFFECTS**
- D. maximum dose
 - Adults (12 years or older)
 - 325 or 500 mg every 4 to 6 hours
 - maximum single analgesic **dose** is 1000 mg (650mg)
 - < 3000 mg/day-McNeil-January 28, 2011
 - Pediatric (less than 12 years old)
 - 10 -15 mg/kg P.O. every 4 -6 hours
 - do not exceed 5 doses in 24 hours

IV. **Non-Steroidal Anti-inflammatory Agents (NSAIDs, NSAIDs)**

- A. Mechanism of action
 - inhibition of cyclooxygenase-1 (COX-1) and/or cyclooxygenase-2 (COX-2)
- B. Combined COX-1 and COX-2 inhibitors
 - 1. ibuprofen (Advil, Motrin, Motrin-IB)
 - maximum adult daily dose-3200 mg
 - Pediatric dosing
 - 7.5 mg/kg every 6 -8 hours
 - 30 mg/kg/day-maximum dose

2. naproxen (Naprosyn)
 3. naproxen sodium-better bioavailability (Anaprox DS)
 - maximum daily dose-1100 mg
 4. Other useful NSAIDs (Cox1 and Cox 2 inhibitors)
 - etodolac (generic)-Lodine® is discontinued
 - 200-400 mg every 6 to 8 hours
 - ketoprofen (generic)-Orudis® is discontinued
 - 50-75 mg every 6 to 8 hours-immediate release
 - 200 mg per day for extended release
 - meloxicam (Mobic®)-Long acting
 - 7.5mg - 15 mg per day
 - do not exceed 15 mg per day
- C. COX-2 inhibitors
1. general information
 - a. no greater efficacy than ibuprofen as an analgesic
 - b. little or no gastric irritation
 2. celecoxib (Celebrex)
 - a. no apparent effect on platelet aggregation
 - b. 100mg/200mg daily
 - c. acute/chronic pain
 - for acute pain 400 mg stat, 200 mg within 24 hrs
- D. contraindications to all NSAIDs
1. previous hypersensitivity to these drugs or aspirin
 2. history of gastritis
 3. anticoagulants-warfarin (Coumadin)
 4. asthma
 5. pregnancy
- E. drug interactions
1. methotrexate (inc. toxicity)
 2. lithium (inc. toxicity)
 3. other NSAIDs (additive side effects)
 4. anticoagulants
 - warfarin (Coumadin)

V. *Narcotic (Opioids) derivatives*

- A. clinical goal - to obtund or diminish the patient's awareness of pain
- B. opiate metabolism-CYP2D6
 - genetic differences
 - **USE CAUTION WITH CHILDREN (See AAP and FDA Recommendations-2017)**
 - most common side effect of opiates: Nausea and vomiting
 - Hydrocodone is more efficacious than codeine as an analgesic but causes less nausea & vomiting
 - opiate-induced N/V occurs in CRTZ located in medulla
 - **analgesic efficacy is not related to N/V**
 - phenothiazines will block the CRTZ
 - drug interactions between phenothiazines and opiates

Rx Hydrocodone with acetaminophen 7.5/325 mg

Disp. Twelve (12) tablets

Sig: Take one tablet by mouth every four to six hours as needed for the relief of pain.

Do not exceed six tablets in 24 hours

- C.. Clinical drug interactions
 - 1. CNS depressants-additive effects
 - 2. phenothiazines-potentiates
 - 3. anti-depressants (MAO inhibitors-Demerol)
- D. Tramadol (Ultram)
 - 1. Ultracet-325 mg acetaminophen + 37.5 mg tramadol
 - 2. Two ultracet = 400 mg ibuprofen for pain
 - 3. side effects/contraindications
 - a. seizures
 - b. codeine allergy
 - c. medications that lower seizure threshold
 - 4. Adult dose 50-100mg every 4-6 hours
 - 5. **Controlled substance-has the potential of being addictive**

PRESCRIBE THE LOWEST STRENGTH AND FEWEST DOSES OF ALL OPIOIDS TO DISCOURAGE ABUSE

PHARMACOLOGIC MANAGEMENT OF OROFACIAL INFECTIONS

I. Choosing an Antibiotic

- A. Identification of Microorganism
- B. Determine Antibiotic Sensitivity - MIC
- C. Low Host Toxicity
- D. Bactericidal
- E. Low Resistance Potential
- F. Antibiotic resistance occurs with
 - 1. inadequate dose
 - 2. inadequate duration
 - 3. repeated administration
 - 4. topical administration

II. Types of Penicillins

- A. Penicillin V-semisynthetic
 - 1. bactericidal
 - 2. narrow spectrum
 - 3. **acid stable**
 - 4. beta lactamase labile

Rx Penicillin V Tablets 500 mg

Disp: 30 tablets

***Sig: Take two tablets to start, then one tablet
every six hours until all tablets are gone***

- C. Amoxicillin
 - 1. bactericidal
 - 2. broad spectrum
 - 3. **acid stable**
 - 4. beta lactamase labile

ANTIBIOTIC PROPHYLAXIS TO PREVENT SUBACUTE BACTERIAL ENDOCARDITIS (SBE)

Rx Amoxicillin tablets 500 mg

Disp: 4 tablets

Sig: Take four tablets by mouth 30-60 minutes before dental appointment

Cardiac Conditions Associated With the Highest Risk of Adverse Outcome from Endocarditis for Which Prophylaxis With Dental Procedures is Recommended

1. Artificial heart valves
2. A history of infective endocarditis
3. Certain specific, serious congenital (present from birth) heart conditions, including
 - a. Unrepaired or incompletely repaired cyanotic congenital heart disease , including palliative shunts and conduits
 - b. A completely repaired congenital heart defect with prosthetic material or device, whether placed by surgery or by catheter intervention during the first six months after the procedure
 - c. Any repaired congenital heart defect with residual defects at the site or adjacent to the site of a prosthetic patch or prosthetic device
4. A cardiac transplant that develops a problem in a heart valve

ANTIBIOTIC PROPHYLAXIS FOR PATIENTS WITH ORTHOPEDIC PROSTHESES

***Prophylaxis for Patients with Orthopedic Prostheses
December 18, 2012***

**“The ADA and the American Academy of Orthopaedic Surgeons have found that the evidence does not support routine prescription of antibiotic prophylaxis for joint replacement patients undergoing dental procedures. This finding is based on a collaborative systematic review of the scientific literature.”-
www.ada.org/news**

“In 2014, the ADA Council on Scientific Affairs assembled an expert panel to update and clarify the clinical recommendations found in the 2012 evidence-based guideline, *Prevention of Orthopaedic Implant Infection in Patients Undergoing Dental Procedures*. As was found in 2012, the 2014 updated systematic review found no association between dental procedures and prosthetic joint infections. Based on this review, the 2014 Panel concluded that prophylactic antibiotics given prior to dental procedures are *not recommended* for patients with prosthetic joint implants.” www.ada.org

III. Cephalosporins

- A. Properties
 - 1. bactericidal
 - 2. broad spectrum
 - 3. acid stable (oral forms)
 - 4. beta lactamase stable/labile
- B. Synthesized in generations: first generation (cephalexin-Keflex), (cefadroxil-Duricef) most effective against gram positive strep or staph- higher generations more effective against gram negative
- C. Cross-sensitivity with penicillin probably very low ~0.5%
- D. Alternative regimen for SBE prophylaxis

Rx Cephalexin tablets 500 mg

Disp: Four Tablets

**Sig: Take four tablets by mouth 30-60 minutes
before dental appointment**

IV. Clindamycin (Cleocin)

- A. Bacteriostatic/cidal
- B. Broad spectrum
- C. Acid Stable
- D. Adverse Effects
 - pseudomembranous colitis (PMC)/ulcerative colitis caused by **Clostridium difficile**

- E. Alternative regimen for SBE prophylaxis
Rx Clindamycin tablets 150 mg
Disp: 4 Tablets
Sig: Take four tablets by mouth 30-60 minutes before dental appointment

V. Extended Spectrum antibiotics

- A. clarithromycin (Biaxin)-**NOT** with calcium channel blockers
B. azithromycin (Zithromax)
C. Alternative regimen for SBE prophylaxis

Rx Clarithromycin tablets 250 mg
Disp: 2 Tablets
Sig: Take two tablets by mouth 30-60 minutes before dental appointment

Rx Azithromycin tablets 250 mg
Disp: 2 Tablets
Sig: Take two tablets by mouth 30-60 minutes before dental appointment

VI. Tetracyclines

- A. Bacteriostatic/broad spectrum
B. Adverse Reactions
1. GI Distress/Nausea
2. hepato/renal toxicity
3. teeth/bone pathology
4. superinfection
5. photosensitivity
C. Drug Interactions
1. iron/antacids/dairy products
2. oral contraceptives
3. oral anticoagulants
4. other antimicrobials
D. **Tetracyclines are contraindicated with penicillins**

VII. Metronidazole (Flagyl)

- A. Bactericidal
B. Broad spectrum

- C. Adverse effects
 - 1. gastrointestinal
 - 2. oral effects
 - 3. CNS effects
 - 4. renal toxicity
 - 5. hematopoietic system
- D. alcohol is contraindicated with metronidazole

VIII. Antifungals

- A. nystatin (Mycostatin) - topical
- B. clotrimazole (Mycelex) - topical
- C. fluconazole (Diflucan) – systemic
- D. Available preparations

Rx Mycelex Troches

Disp: 70 tablets

**Sig: Dissolve one tablet in mouth
five times a day for two weeks**

Rx Mycostatin Pastilles

Disp: 56 tablets

**Sig: Dissolve one or two tablets in mouth
four times a day for as long as 14 days
if necessary**

Rx Diflucan tablets 100mg

Disp: Fifteen tablets

**Sig: Take two tablets by mouth the first day then
one tablet daily for thirteen days**

IX. Antiviral

- A. idoxuridine (Stoxil, Herplex)
- B. acyclovir (Zovirax)

Rx Zovirax Ointment 5%

Disp: 15 gm

**Sig: Apply small amount to affected area
every three hours six times a day for
7 days**

- C. valacyclovir (Valtrex)-**systemic**
 - metabolite of acyclovir
 - approved for herpes simplex
 - 2 Grams orally twice a day (twelve hours apart) for one day
- D. penciclovir (Denavir)

Rx Denavir Cream 1%

Disp: 2 Gm tube

Sig: Apply small amount of cream to affected areas every two hours during waking hours for four days

- E. docosanol (Abreva)
 - 10% cream
 - only OTC topical preparation approved by FDA
 - expensive

X. *Aphous Ulcers*

- A. Amlexanox (Apthasol)
- B. Debacterol
 - sulphonated phenols and sulphuric acid
- C. silver nitrate sticks
- D. Alum
- E. Cola drinks

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