AVOID LIABILITY: KNOW YOUR PATIENTS’ MEDICATIONS AND THEIR IMPACT ON DENTAL TREATMENT

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No. 1  LEVOTHYROXINE (generic)
- Synthroid®
- replacement therapy (hypothyroidism)
  - incidence is about 5% in the U. S.
  - women 9x more likely than men
- local anesthetic with vasoconstrictor is NOT contraindicated

No. 2  LISINOPRIL (generic)
- Antihypertensive Medication Compliance
- Zestril®, Prinivil®
- ACE (Angiotensin Converting Enzyme) inhibitor
- Dental Implications
  - Orthostatic (postural) hypotension
  - Scalded mouth syndrome
  - Non-productive cough
  - NSAID interaction with long-term use
  - Angioedema
- Other ACE inhibitors
  - benazepril (Lotensin®)
  - captopril (Capoten®)
  - enalapril (Vasotec®, Epaned®)
  - fosinopril (Monopril®)
  - moexipril (Univasc®)
  - pirindopril (Aceon®, Coversyl®)
  - quinapril (Accupril®)
  - trandolapril (Mavik®)
  - Tekturna ® (aliskiren)-direct renin inhibitor
**DIOVAN ® (valsarten) (#19)**
- Angiotensin Receptor Blocker (ARB)
- antihypertensive
- Dental Implications
  - Orthostatic hypotension
  - Scalded mouth syndrome
  - Non-productive cough (less than ACE Inhibitors)
  - NSAID interaction with long-term use
  - Other popular ARBs
    - candesarten (Atacand®)
    - irbesarten (Avapro®)
    - losarten (Cozaar®)
    - olmesarten (Benicar®)

**No. 3 HYDROCODONE WITH ACETAMINOPHEN** (generic)
- opiate & non-opiate analgesic
- addictive
- second most abused drug by general dentists
- Schedule II (as of **October 6, 2014**)
- opiate metabolism-CYP2D6
  - genetic differences
- **USE CAUTION WITH CHILDREN** (See AAP Recommendations-2016)
- 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
**THE PHARMACOLOGY OF ACETAMINOPHEN**

- *In vitro* acetaminophen inhibits prostaglandin synthesis
  
  **So why is it not anti-inflammatory?**

- The analgesic effect of acetaminophen occurs predominantly in the Central Nervous System (CNS)

- Mechanism of action
  - cyclo-oxygenase 3 (COX₃) inhibition
  - located in the central nervous system (CNS)
  - some peripheral effects

- Clinical Effects
  - analgesic
  - antipyretic
  - No gastritis
  - No effects on uric acid-gout
  - No anti-platelet effects

Acetaminophen clinical effects (cont.)

- **NO ANTI-INFLAMMATORY EFFECTS**

- Maximum daily dose of acetaminophen is 3000 mg
- Maximum effective dose of acetaminophen is 1000 (650) mg

**No. 4 METOPROLOL TARTRATE/SUCCINATE** (generic)

- Selective Beta Blocking Agent (Beta₁ blocking agent)

- Indications
  - antihypertensive
  - premature atrial (PACs) and/or ventricular contractions (PVCs)
  - other abnormal cardiac rhythms

- Lopressor®, /Toprol XL®

- **DO NOT DISCONTINUE ABRUPTLY**

- Long-term use of NSAIDs (~ 3 weeks) may diminish hypotensive effectiveness of beta blockers

- Other selective Beta₁ blocking agents
  - nebivolol (Bystolic®)
  - atenolol (Tenormin®)
  - bisoprolol (Zebeta®)
  - acebutolol (Sectral®)
  - esmolol (Brevibloc®)
  - betaxolol (Kerlone®)
No. 5  **ATORVASTATIN** (generic)
- HMG-CoA reductase Inhibitor
- Decrease serum total and LDL cholesterol
- grapefruit juice interactions
- Lipitor®
- Similar medications:
  - rosvastatin (Crestor®)
  - lovastatin (Mevacor®, Altoprev®)
  - simvastatin (Zocor®)
  - pravastatin (Pravachol®)*
  - pitavastatin (Livalo®)
  - fluvastatin (Lescol®)
- possible side effects of statins
  - muscle weakness
  - increased blood glucose or HbA1c
  - decreased cognitive ability-questionable
- **CONTRAINDICATED IN PREGNANCY AND BREAST FEEDING**
- Do statins have an effect on pulpal morphology?
- New cholesterol lowering medications-expensive
  - PCSK9 inhibitors-mechanism
    - alirocumab (Praluent®) –Sanofi/Regneron
    - evolocumab (Repatha®)-Amgen

No. 6  **VENTOLIN HFA®** (albuterol)
- Beta 2 receptor agonist
- bronchodilator
- asthma, COPD
- prevention of exercise-induced bronchospasm
- **use caution** with aspirin/NSAIDs in some patients
- Proair HFA® (albuterol)
- **ADVAIR DISCUS®** *(No. 16)*
  - fluticasone and salmeterol
  - maintenance treatment of asthma
  - no problems with vasoconstrictor
  - oral candidiasis/aspergillus niger
- **FLUCONAZOLE** (generic) *(No. 25)*
  - oral antifungal
  - Diflucan®
  - 100 mg BID first day and 100 mg/day for 13 days
  - contraindicated with patients taking clopidogrel (Plavix®)
No. 7  

**NEXIUM®** (esomeprazole)  
- hydrogen ion pump inhibitor (PPI)  
- GastroEsophageal Reflux Disease (GERD)  
- possible side effects related to altered stomach pH  
  - increased risk for hip, wrist, and spine fracture  
  - increased risk for *Clostridium difficile*  
  - decreased serum magnesium  
  - possible Vitamin B\textsubscript{12} deficiency  
- similar medications  
  - omeprazole (Prilosec®)  
  - lansoprazole (Prevacid®)  
  - dexlansoprazole (Dexilent®, Kapidex®)  
  - rabeprazole (Aciphex®)  
  - pantoprazole (Protonix®)  
- Zegarid®-a rapid release form of omeprazole  

**VIMOVO®**  
- naproxen 375 mg/esomeprazole 20 mg  
- naproxen 500 mg/esomeprazole 20 mg  
- “to relieve signs and symptoms of osteoarthritis, rheumatoid arthritis, and ankylosing spondylitis and to decrease the risk of developing stomach (gastric) ulcers in people who are at risk of developing gastric ulcers with NSAIDs”  

**YOSPRALA®**  
- enteric-coated aspirin 81 mg/omeprazole 40 mg  
- enteric-coated aspirin 325 mg/omeprazole 40 mg  
- “secondary prevention of cardiovascular and cerebrovascular events and who are at risk of developing aspirin-associated gastric ulcers”  

No. 8  

**IBUPROFEN** (generic)  
- NonSteroidal Anti-Inflammatory Drug (NSAID)  
- COX\textsubscript{1} & COX\textsubscript{2} inhibitor  
- Maximum daily dose is 3200 mg for acute pain  
- Motrin®, Motrin-IB®, Advil® (OTC)  

**Rx**  
Ibuprofen Tablets 400 mg  
Disp. 16 tablets  
**Sig:** Take 1-2 tablets 3-4 times per day  
as needed for the relief of pain  
**Do not exceed eight tablets within 24 hours**
- 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

No. 9 **TRAZADONE** (generic)
- Desyrel®
- Antidepressant
- Serotonin/Norepinephrine Reuptake Inhibitor (SNRI)
- **Use caution with vasoconstrictors**
- vilazodone (Viibryd®)
- lurasidone (Latuda®)

No. 10 **WARFARIN** (generic)
- Coumadin®
- Anticoagulant
- produces hypoprothrombinemia (Vitamin K antagonist)
- INR is used to measure effectiveness
- Drug Interactions
  - Tetracyclines
  - NSAIDs
  - aspirin
  - “statins”
- Newer Anticoagulants-
  - do not require lab tests
- dabigatrin (Pradaxa®)-Direct thrombin inhibitor
  - Praxbind (idarucizumab)- reversal agent
- rivaroxaban (Xarelto®)-Factor Xa inhibitor
- apixaban (Eliquis®)-Factor Xa inhibitor
- edoxaban (Sayvasa®)-Factor Xa inhibitor
- **andexanet (AndexXa)-Reversal agent for Factor Xa inhibitors-NOT APPROVED BY FDA**
No. 11  **CLOPIDOGREL** (generic)
- Plavix®
- platelet aggregation inhibitor
- blocks ADP receptor on blood platelet
- clopidogrel is a **prodrug**
- drug interactions are due to CYP enzymes
  - increased effect with tobacco users
  - decreased effect with PPIs
  - **decreased effect with fluconazole** (Diflucan)
- clopidogrel is available in generic form
- prasugrel (Effient®)
- ticagrelor (Brilinta®)

No. 12  **CYMBALTA®** (duloxetine)
- Serotonin/Norepinephrine Reuptake Inhibitor (SNRI)
- depressive episodes
- chronic fatigue syndrome
- chronic pain (neuropathic)
- adjunctive therapy for attention deficit hyperactivity disorder (ADHD)
- **Use caution with vasoconstrictors**

No. 13  **FLUTICASONE NASAL** (generic)
- corticosteroid
- management of seasonal and perennial allergic rhinitis
- Flonase®

No. 14  **SINGULAIR®** (montelukast)
- leukotriene receptor antagonist
- treatment of asthma
- **use caution** with aspirin/NSAIDs

No. 15  **HYDROCHLORTHIAZIDE** (generic)
- HCTZ
- diuretic/antihypertensive
- depletes potassium
- eat lots of bananas and drink lots of orange juice
No. 16  
**ADVAIR DISCUS®**

No. 17  
**AMOXICILLIN** (generic)  
- Broad spectrum antibiotic  
- 
  Rx  
   Penicillin V tablets 500 mg  
   Disp: 30 tablets  
   Sig: Take two tablets by mouth to start then one tablet every six hours for seven days

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**SBE prophylaxis**

  Rx  
   Amoxicillin tablets 500 mg  
   Disp: 4 tablets  
   Sig: Take four tablets by mouth 30-60 minutes before dental appointment

  Rx  
   Cephalexin tablets 500 mg  
   Disp: 4 tablets  
   Sig: Take four tablets by mouth 30-60 minutes before dental appointment

- **Patients who are allergic to penicillins**

  Rx  
   Clindamycin tablets 150 mg  
   Disp: 4 tablets  
   Sig: Take four 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

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

8
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 PROSTHESSES

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

**Guest Editorial: ADA Guidance for Utilizing Appropriate Use Criteria in the Management of the Care of Patients with Orthopedic Implants Undergoing Dental Procedures.**

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**No. 18** **AMLODIPINE BESYLATE** (generic)
- calcium channel blocker
- antihypertensive
- gingival hyperplasia
- Norvasc®
- Other calcium channel blockers
  - diltiazem (Cardizem®, Tiazac®)
  - felodipine (Plendil®)
  - nifedipine (Adalat®, Procardia®)
  - verapamil (Covera-HS®, VerelanPM®, Calan)
  - nicardipine (Cardene®)
- antibiotic interactions

**No. 19** **DIOVAN®** (valsartan)

**No. 20** **ALPRAZOLAM** (generic)
- antianxiety agent
- Xanax®
- Xerostomia (~ 10% of patients)
- most common drug found in “dirty” urine of methadone patients
- combination of Xanax and Ecstasy is called “Parachuting”
- other popular benzodiazepines
  - lorazepam (Ativan®)
  - clonazepam (Klonopin®)
  - diazepam (Valium®)

**No. 21** **METFORMIN** (generic)
- type II diabetes mellitus
- appoint in the morning
- Glucophage®
- other uses
No. 22 **GABAPENTIN** (generic)
- antiepileptic
- chronic pain
- mood stabilizer
- Neurontin®

No. 23 **OXYCODONE WITH ACETAMINOPHEN** (generic)
- More efficacious than codeine, but less nausea and vomiting
- Schedule II
- Percocet®, Tylox®
- Oxecta®-Pfizer/Acura Pharmaceuticals

No. 24 **SERTRALINE** (generic)
- Selective Serotonin Reuptake Inhibitor (SSRI)
- depressive episodes
- chronic fatigue syndrome
- chronic pain
- adjunctive therapy for attention deficit hyperactivity disorder (ADHD)
- Zoloft®
- possible side effects
  - bruxism
  - bleeding

No. 25 **FLUCONAZOLE** (generic)

**DRUGS IN THE NEWS**
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1. **HUMIRA®** (adalimumab)
   - targets TNF$_\alpha$
   - indicated for various types of autoimmune diseases
     - Rheumatoid arthritis
     - Crohn’s disease
     - Psoriatic arthritis
     - Juvenile idiopathic arthritis
   - these patients are more prone to infections
   - $8.2$ Billion in sales last year
2. **ENBREL®** (etanercept)
   - partial monoclonal antibody - targets TNF$\alpha$
   - indicated for various types of autoimmune diseases
     - Rheumatoid arthritis
     - Crohn’s disease
     - Psoriatic arthritis
     - Juvenile idiopathic arthritis
   - these patients are more prone to infections
   - $5.9$ Billion in sales last year

3. **HARVONI®** (ledipasvir and sofosbuvir)
   - inhibit Hepatitis C virus from replicating (RNA polymerase)
   - used for treatment of chronic Hepatitis C
   - $5.3$ Billion in sales last year

4. **REMICADE®** (infliximab)
   - indicated for various types of autoimmune diseases
     - Rheumatoid arthritis
     - Crohn’s disease
     - Psoriatic arthritis
     - Juvenile idiopathic arthritis
   - these patients are more prone to infections
   - $4.6$ Billion in sales last year

5. **COSENTYX®** (secukinumab)
   - inhibits protein interleukin (IL)-17A
   - indicated for moderate to severe plaque psoriasis, psoriatic arthritis, and ankylosing spondylitis
   - these patients are more prone to infections

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