Compounding for the Dental Patient:
TOP 5 FORMULAS

AMY LAMB
COMPOUNDING PHARMACIST
SASKATOON FAMILY PHARMACY

Compounding Pharmacists
"traditional" Pharmacist role
preparing special dosage forms

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<thead>
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<table>
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<tr>
<th>Cocaine Toothache Drops</th>
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<tr>
<td>manufacturers</td>
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<td>Lloyd Manufacturing Co.</td>
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What is “Compounding”?

- Customized medications, prescribed by a Physician/Dentist
- Designed and prepared by the Pharmacist for individual patients.
- Beneficial when commercially manufactured medication is:
  - Not available
  - Inadequate to address a patient’s need

What is Compounding

- Customizes medication to the individual, for example:
  - Topical pain relief when oral agents cannot be given
  - Short supply or discontinued medications
  - Flavoring for children to make medicine easier to take
  - Veterinary compounding
  - Bio-identical hormone replacement for women and men
  - Medication needed in a difficult area to treat:
    - for ex: Oral mucosa

PCCA – Professional Compounding Centres of America

- Member program to assist the compounding Pharmacist with formulation requests, ongoing continuing education, chemicals, equipment, etc.
- PCCA answers more than 500 calls per day from member Pharmacists about preparing medicine for patients.
- Conducts research and studies on their product bases:
  - Ex: Mucolax oral base used in compounding for oral mucosa.
Compounding for Dental patients

- Analgesics
- Antibiotics
- Topical anesthetics
- Sedatives
- Dry socket mixtures
- Root canal paste
- Plaque removal solutions
- Plaque disclosure solutions
- Oral rinses
- Adhesives
- Bleaching gels
- Crown preps

Problem Areas/Disease States

- Bleaching/whitening agents
- Mucositis
- Xerostomia
- Aphthous ulcers/canker sores/oral lesions
- Stomatodynia
- IV/IM
- Angular cheilitis/herpes labialis
- Fungus, candida
- Pre and post procedural anxiety syndromes
- Gum disease (gingivitis)

Dosage Forms

- Troches/sublinguals
- Capsules
- Lozenges
- Gels, oral and topical
- Mucosal bandages (polyox)
- Mouthwashes and rinses
- Dental cements and pastes
- Chapstick/lip balms
- Oral and topical sprays
- Powder puffer
- Popsicles
- Injectables
Ulcers of the Mouth

- Aphthous Ulcer (Recurrent Aphthous Stomatitis – RAS)
- Recurrent Herpes (cold sore)
- Lichen Planus

Recurrent Aphthous Ulcers (RAS)

- Most common oral ulcer
- Occurring in 20-60% of the population
- Adherence of drug at the site can be an issue.

Top 5 Dental Compounding Formulas:

#1
- For Recurrent Aphthous Stomatitis:
  - Misoprostol 0.0024%/Diphenhydramine 0.1%/Lidocaine HCl 1% in either:
    - Polyox 301 Mucosal Bandage or:
    - Mucolox (Rinse)
Misoprostol

- Synthetic prostaglandin
- Stimulates bone growth
- Stimulates collagen repair
- Reduces peripheral sensitization

Aphthous Ulcers

- Powdered POLY-OX 301 BANDAGE
- Applied with an insufflator or “powder puffer” device
- Powder is “puffed” onto a wet surface and congeals with moisture to form a sticky gel.
- Sticky gel now protects the area and forms protective barrier
- Stays in place for hours, even if rubbed
- Increases contact time and adherence for drug delivery

Poly Ox 301 Oral Bandage

- Patients instructed to rinse mouth with water prior to administration to ensure adequate mucosal hydration
- After application, additional water rinse further hydrates the gel and completes barrier formation.
- Additional ingredients used in mucosal bandage are:
  - Antivirals
  - Antifungals
  - Antibiotics
  - Corticosteroids
  - Phenytoin (for wound healing)
  - Aloe vera
Here's how it works:

**Oral Application**
- Safe and easy to use or swallow for maximal comfort.

**Direct Contact**
- Direct contact with mucosal membranes for targeted relief.
- Neutralizes dryness effectively.

**Mucosal Membrane**
- Provides relief from dryness.
- Enhances comfort and hydration.
Mucolox information:
- Water soluble base that can be used alone or with active pharmaceutical ingredients (API's)
- Composed on a polymer network that enhances contact time with oral mucosa
- Long-lasting adhesion for mouth ulcers and other mucosal conditions.
- Won’t easily wash away with saliva
- Bonds to mucosa to provide a lightweight, but powerful cooling effect.
- Coating properties create a gradual and continued release of API to the mucosa
- Can also be made into a popsicle.

Mucolox Base
- Mucolox can be used as a stand-alone base, or can be diluted out to 30% mucolox with distilled H2O.
- Both will work and the dilution will decrease overall cost/retail price to the patient.
- Only need 0.2-0.5ml per dose. Can swish/swallow or swish/spit.
- Can consider adding other actives, for ex: aloe vera 0.2% - no taste and noticeable improvement to patient.

Mucolox Base
- Is highly stable when active ingredients are added.
- Pleasant taste with slight sweetness
- Sweetened with isomalt, low glycemic index and does not promote dental caries
- Isomalt is safe for diabetics
- Free of gluten, casein, dye, and parabens among other allergens
Mucolox Base

- Contains no:
  - Dye
  - Gluten
  - Casein
  - Dairy
  - Soy
  - Egg
  - Nitrates
  - Alcohol
  - Parabens
  - Propylene glycol
  - Flavors

- Safe for use in:
  - Infants and children
  - Pregnancy

Mucolox Formulations examples

- Oral Rinse – General Formula: 30% Mucolox in distilled water
- Amitriptyline 2%/Gabapentin 6%/Lidocaine 0.5% Oral Rinse
- Dexamethasone 0.05% Mouthwash
- Chlorhexidine Gluconate 0.2% Oral Rinse
- Hydrogen Peroxide 1.5%/Sodium Fluoride 0.5mg/ml Oral Rinse
- Tretinoin 0.1%/Clobetasol 0.05% Oral Rinse
- Dexamethasone 3.3mcg/ml/Tetracycline 13.5mg/ml/Nystatin 14.44U/ml/Diphenhydramine 2.5mg/ml Mouthwash
- Nystatin 100,000 U/ml Oral Suspension (sugar-free)
- Stanford Mouthwash
- Electrolyte saliva gel (Mucolox)
- Acyclovir 5%/Lidocaine 1%/Deoxy-D-Glucose 0.2% Oral Rinse
Which base? PolyOx Mucosal Bandage or Mucolox?

- Misoprostol 0.0024%/Diphenhydramine 0.1%/Lidocaine HCl1% in either:
  - Polyox 301 Mucosal Bandage:
    - For single ulcer or confined to smaller area.
    - Patient has good manual dexterity and hand-eye coordination
  - Mucolox (Rinse)
    - For larger area, further back, or esophageal

Herpes Simplex

- Can customize compound #1 with additional antiviral agents:
  - Acyclovir 5% or
  - 2-deoxy-D-glucose 0.2%
  - Anti-metabolite of glucose
  - Glycolytic pathway inhibitor leading to antiviral activity

2-deoxy D-Glucose Natural Antiviral

- Known inhibitor of both herpes simplex virus replication and glycoprotein synthesis in HSV-infected cells
- 2DDG is capable of suppressing the transcription of HPV 18 in cervical carcinoma cells and derived non-tumorigenic somatic cell hybrids at the level of transcription initiation.
  - Arch Virol 1980;45(3-4):201-9
- We use this in many formulations where a virus may be causing the problem (oral suspensions, cream, inhalation)
Lichen Planus

- Inflammatory disorder: unknown cause.
- 2 forms: reticular and erosive
- Erosive: displays ulcerative areas with mucosal atrophy; painful and requires long-term pharmacologic therapy.
- Some thoughts that agents affecting mast cells and/or TNF-alpha may have some clinical benefit.

Lichen Planus

- Pentoxifylline: anti-inflammatory with TNF-alpha inhibiting properties
- Tranilast: mast cell stabilizer
  - Chiba et al described the use of tranilast in the successful treatment of cheilitis granulomatosis, an inflammatory condition of the lip thought to have mast cell involvement.
- May be beneficial in a mouth rinse:
  - Pentoxifylline 1% / Tranilast 1% in Mucolox mouth rinse

Top 5 Dental Compounding Formulas:

#2
Tranexamic Acid 4.8%
Poloxamer 10% Dental Gel
Or
Tranexamic Acid 4.8% Solution (Mucolox 30%)
Need for Hemostatics in Dentistry:

Patient Groups with specific Coagulation Defects (genetic or acquired):

- Genetic Hemophilia, von Willebrand’s disease, Factor deficiencies, Protein C deficiencies, Antithrombin III deficiency
- Acquired: Vitamin K deficiency, Drug induced hemorrhage, Blood transfusion, Drug induced platelet dysfunction, Bypass patients

A Quick Note on New Anti-Coagulants in Dental Procedures

As with warfarin, it may not always be necessary to withhold these newer anti-coagulants for minor procedures. Holding of anti-coagulants should be considered for major dental procedures:

- Xarelto (Rivaroxaban): Hold at least 24 hours if standard bleed risk or at least 48 hours if higher bleeding risk.
  - Resumption should not be initiated until adequate hemostasis has been achieved and clinical situation allows (usually 1-2 days)
  - Xarelto should not be used in patients with CrCl less than 30ml/min but if so 36 hours withholding required in these patients if standard risk and 48 hours if higher bleeding risk

- Pradaxa (Dabigatran):
  - Resumption should not be initiated until adequate hemostasis has been achieved and clinical situation allows (usually 1-2 days)

<table>
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<tr>
<th>Renal function (CrCl)</th>
<th>Last intake of drug prior to procedure</th>
<th>Standard bleed risk</th>
<th>High risk of bleed</th>
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<tbody>
<tr>
<td>≤ 30 ml/min</td>
<td>Hold at least 5 days</td>
<td>Hold of least 5 days</td>
<td>Hold of least 5 days</td>
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<tr>
<td>31-70 ml/min</td>
<td>Hold at least 36 hours</td>
<td>Hold at least 72 hours</td>
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<tr>
<td>48-99 ml/min</td>
<td>Hold at least 48 hours</td>
<td>Hold at least 16 hours</td>
<td></td>
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<tr>
<td>≤ 50 ml/min</td>
<td>Hold at least 24 hours</td>
<td>At least 48 hours</td>
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- Pradaxa (Dabigatran):
  - Resumption should not be initiated until adequate hemostasis has been achieved and clinical situation allows (usually 1-2 days)
A Quick Note on New Anti-Coagulants in Dental Procedures

As with warfarin, it may not always be necessary to withhold these newer anti-coagulants for minor procedures. Holding of anti-coagulants should be considered for major dental procedures:

- **Eliquis (Apixaban)**

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<th>Renal function (CrCl mL/min)</th>
<th>Local intake of drug prior to procedure</th>
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<td>30 or more</td>
<td>Standard bleed risk</td>
</tr>
<tr>
<td>15-29</td>
<td>At least 24 hours</td>
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- Limited clinical data for CrCl less than 25mL/min; if CrCl less than 15mL/min, longer duration likely necessary.
- Resumption should not be initiated until adequate hemostasis has been achieved and clinical situation allows (usually 1-2 days).

**Tranexamic Acid 4.8%**

- Hemostatic agent:
  - Competitively inhibits multiple plasminogen binding sites, decreasing plasmin formation and fibrinolysis.
  - Poloxamer gel can be applied right at the surgical site to stop bleeding in the area.

- Renal function (CrCl mL/min) Last intake of drug prior to procedure
  - Standard bleed risk
  - High Risk of Bleed
  - 30 or more At least 24 hours At least 48 hours
  - 15-29 At least 36 hours At least 48 hours

- Limited clinical data for CrCl less than 25mL/min; if CrCl less than 15mL/min, longer duration likely necessary.
- Resumption should not be initiated until adequate hemostasis has been achieved and clinical situation allows (usually 1-2 days).
Poloxamer Gel

- Poloxamer gel is a bioadhesive, thermoreversible gel.
- At cold temperatures it is liquid.
- At room temperature it becomes a gel.
- When poloxamer is injected or administered in the liquid form it can take the shape of and adhere to various body cavities allowing prolonged contact with the drug. Various drugs may be incorporated into the gel for a therapeutic effect.
- Promotes stabilization of included drugs.
- Promotes water dissolution of various chemicals.
- Bioadhesive characteristics.

Hemostatic Treatment: Tranexamic Acid Rinse

- Used after oral surgery for patients on anticoagulants.
- After surgery the field is irrigated with 10 mL of a 4.8% solution.
- Patients then rinse for 2 minutes with 10 mL qid x 7 days.
- Patients should not eat or drink for 1 hour.

Top 5 Dental Compounding Formulas:

#3
Lidocaine 10%/Prilocaine 10%/Tetracaine 4%
Dental Gel

Can also be made with Mucolox if needing to coat a larger area.
MegaPumps: accurate dosing

- Megapumps ensure accurate dosing "per pump" when dispensing local anesthetics for oral use.
- 1 pump = 0.2, 0.5 or 1ml depending on size of pump used.
- Prevents over-use and allows for metered dosing of gels.

Top 5 Dental Compounding Formulas:

#4
Benzocaine 16.7% Dry Socket Gel (Mucolox)

Alveolar Osteitis (Dry Socket)

- Post extraction complication
- Precise etiology unknown, but thought to be related to break down of blood clot---leading to bone exposure and symptomology.
- Usually presents 2 to 5 days post extraction.
- Intense throbbing pain not relieved by analgesics.
Top 5 Dental Compounding Formulations

#5 Tetracaine HCL 0.5% Lollipops

- Used for relief of severe pain of the oral mucosa or to numb the gag reflex
- Strengths 0.4% to 4%
- Patient sucks on lollipop for 10-20 seconds every 1-2 hours

Onset of anesthesia: 10 minutes
Duration: approx. 90 minutes
Work very well when supplied by the office in waiting room before dental work is to begin.
Caution: not to eat or drink until numbness wears off.
Topical Pain Options for TMJ

- Temporomandibular Joint Disorder (TMJ)
  - Topical products can be applied to nerve bundles on outside of face and inside of mouth if required
- PCCA Formula # 9380: Ketoprofen 5%/Cyclobenzaprine HCl 0.5%/Lidocaine HCl 5%/Bupivacaine HCl 1% Topical LipodermR
- PCCA Formula # 9874: Ketoprofen 10%/Cyclobenzaprine HCl 2% Topical LipodermR (FormulaPlus™ BUD study)

Child-Resistant Medicated Lollipop Packaging

- Lollipop Dispensing Vial with Child-Resistant Closure
  - Allows for multiple uses

Flavoring and sweetening for all formulas

- All formulas mentioned can be custom made for individual patients if needed
- Over 200 flavors available through PCCA:
  - Crème De menthe, Rootbeer, Peanut butter, tutti-fruiti
- Sweetening agents include:
  - Stevia, Acesulfame, Magnasweet
- Bitter Stop can be added to reduce bitterness of medications.

These items do not have to be mentioned on the prescription, we can talk to patients at the Pharmacy and customize.
Conclusion

- Please see handout: "Commonly Requested Dental Compounding Ideas" for many more compounding ideas for various conditions.
- Dentists are continually challenged with finding adequate therapy for many of these conditions.
- Compounding Pharmacists are "problem-solvers" capable of working with the Dentist to help with these difficult challenges.

**DO NOT HESITATE TO CALL US**
- You are NOT bothering us.
- As compounders this is what we do – problem solve patient challenges with the Prescriber.
- Compounding encompasses the "triad" relationship:
  - Prescriber
  - Compounding Pharmacist
  - Patient

By working with a compounding Pharmacist:

- Therapeutic options are increased.
- Chances for treatment success improved.
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