PALLIATIVE MANAGEMENT OF ORAL MUCOSAL PAIN

Topical Anesthetics and Coating Agents:

Rx: Diphenhydramine hydrochloride liquid 1.25 mg/mL and aluminum hydroxide, magnesium hydroxide oral suspension (Maalox); Mix in a 1:1 ratio
Disp: 200 mL
Sig: Rinse with 1 to 2 teaspoons (5-10 mL) every 4 hours for 2 minutes; swish and spit or swish and swallow. Shake well before use and store suspension at room temperature.

Pediatric significance: Although both medications are over-the-counter (OTC), usually this mouthrinse is compounded by the pharmacy and is stable for 60 days. For children who cannot rinse, the suspension can be swabbed inside of mouth with a disposable oral swab or cotton-tipped applicator. If swallowed because of concurrent throat pain, the maximum amount is 4 mL/kg/d or 5 mg/kg/d of diphenhydramine. Because there are several diphenhydramine liquid formulas available, one that is alcohol-free should be requested. Do not substitute bismuth subsalicylate for aluminum hydroxide, magnesium hydroxide oral suspension because it contains salicylate. Bismuth subsalicylate can cause black staining of the tongue and contraindicated in children who have a hypersensitivity to salicylates.

Rx: Diphenhydramine hydrochloride liquid 1.25 mg/mL / lidocaine viscous 2% oral solution / aluminum hydroxide, magnesium hydroxide oral suspension (Maalox); Mix in a 1:1:1 ratio
Disp: 200 mL
Sig: Rinse with 1-2 teaspoons (5-10 mL) every 4 hours for 1 minute and spit out excess. Shake well before use and store suspension at room temperature.

Pediatric significance: Compounded by pharmacy and stable for 60 days. Be careful using 2% lidocaine hydrochloride in children who cannot expectorate because of potential for aspiration. Overuse of viscous lidocaine may be associated with toxicity in children due to the potential for systemic absorption. The use of viscous lidocaine has been approved for children > 2 years of age but the maximum dose is 3 mg/kg, every 3 hours or up to 4 times a day, which equals 0.15 ml/kg. For children, the maximum amount of diphenhydramine is 4 mL/kg/d or 5 mg/kg/d. (See additional information above.)

Rx: Alkaline saline (salt/bicarbonate) mouthrinse
Disp: Mix 1/4 teaspoon of salt and 1/4 teaspoon of baking soda in 1 qt of water
Sig: Rinse with copious amounts for 20-30 sec, every 2 hours. Do not swallow.

Pediatric Significance: This is a good mouthrinse for the management of diffuse mucosal irritation. If multiple oral ulcerations, or in patients who vomit frequently or who have esophageal reflux disease, then switch to ½ tsp baking soda in 1 qt of water only.

Examples of Other Commercial Products

OraMagic Rx Oral Wound Solution: 2 oz or 12 oz bottle. This rinse contains aloe vera and can be used for oral mucositis, aphthous ulcers, stomatitis and traumatic ulcers. Also comes with an added topical anesthetic – OraMagic Plus with Benzocaine Oral Wound Solution. Both rinses contain aloe vera extract. MPM Medical, Inc (www.mpmmedicalinc.com).
Rincinol™ P.R.N.™ (OTC): 4 oz bottle. Novel occlusive rinse that contains polyvinylpyrrolidone, sodium hyaluronate, glycyrrhetinic acid (licorice extract) and aloe vera. It is alcohol-free; safe for use in children and lasts up to 6 hours. It is an OTC product that is marketed by SUNSTAR Butler GUM.

PRIMARY HERPETIC GINGIVOSTOMATITIS

Systemic Antiviral Therapy:

Rx: Zovirax or generic (acyclovir) 200 mg/5 mL suspension (children)
Disp: Appropriate mL
Sig: Take appropriate mL every 4 hours or 5 times a day for 7 days.

Pediatric significance: It is not FDA-approved for this use. Limited pediatric studies have shown that systemic acyclovir may be beneficial in treating primary herpetic gingivostomatitis (see Cochran Review). The dosage for mucocutaneous herpes simplex viral infection in this age group is 15 mg/kg (maximum dose 200 mg), five times a day or 1000 mg/day PO in 3—5 divided doses for 7-10 days or until clinical resolution occurs. Maximum dosage is 80 mg/kg/day. It should be used with caution in children with renal function impairment or dehydration. Prolonged therapy may be required for immunocompromised children. This banana-flavored suspension is sweetened with sorbitol and contains no alcohol. It is a soothing preparation to swish and swallow but there is no enhancement of the therapeutic effect because of topical antiviral exposure. Systemic antiviral therapy is usually reserved for children with moderate to severe primary orolabial infections because therapy results in shortened duration of symptoms and viral shedding.

Rx: Zovirax or generics (acyclovir) capsules 400 mg (adolescents)
Disp: 21-30 capsules
Sig: Take 1 capsule 3 times daily for 7-10 days.

Pediatric significance: It is not FDA-approved for this use. Systemic antiviral therapy is usually reserved for children with moderate to severe primary orolabial infections because therapy results in shortened duration of symptoms and viral shedding. Alternative dosing includes 800 mg PO every 8 hours for 7-10 days. (CDC recommendations)

Rx: Valtrex or generics (valacyclovir) caplets 1 g (adolescents)
Disp: 14-20 caplets
Sig: Take 1 caplet BID for 7-10 days.

Pediatric significance: It is not FDA-approved for this use. Systemic antiviral therapy is usually reserved for children with moderate to severe primary orolabial infections because therapy results in shortened duration of symptoms and viral shedding. Use with caution in renal and hepatic disease. It has not been well studied in children under 12 years. Headache and nausea are does related side effects.

Topical Antimicrobial Oral Rinse

Rx: Chlorhexidine gluconate 0.12% oral rinse
Disp: 480 mL (16 fl oz)
Sig: Rinse with 15 mL for 30 seconds and expectorate. Use twice daily, after breakfast and before bed for 7 days for gingivitis.

Pediatric significance: This is useful for the management of a secondary bacterial infection of the gingiva, following herpetic infection. Most commercial brands contain 11.6% alcohol, which may be too irritating to
use with extensive oral ulcers and erosions. Alcohol-free formulation is available. Minor irritation and mucosal sloughing have been noted with use in some individuals. All foamy residues from tooth brushing should be rinsed away before using this agent. It is best to prescribe this oral rinse when most viral-induced lesions have resolved but significant gingival inflammation persists, despite oral hygiene measures. Although commonly used, the clinical effectiveness and safety have not been established in children younger than age 18. Chlorhexidine rinse has been shown to elevate blood pressure in adults as early as 1 week of use.

**RECURRENT (OROFACIAL) HERPES SIMPLEX**

**Prevention: Sunscreens**

**Rx:** Lip Balm with Sunscreen, SPF 30, PABA-free (OTC)
**Disp:** 1 tube
**Sig:** Apply to lips 30 minutes before sun exposure and every hour thereafter.

**Additional information:** For maximum protection, concurrent use of a sunscreen lotion, stick, spray, wipes or gels should be used at the same time on face and sun exposed areas. Select those with a sun protection factor of 30 or higher and provides both UVA and UVB protection. A wide-brimmed hat or visor is most effective when excessive sunlight exposure is a triggering factor. Several lip balms contain a SPF of 30 and higher and this author does not endorse a particular brand. Many of these lip balms contain several potential skin sensitizers that may result in chapped or cracked lips with chronic use (see section on chapped and cracked lips). Avoid flavored and mentholated lip balms because they increase licking and drying of the lips. Examples of other lip balms with SPF of 30 or higher are ChapStick Ultra Lip Balm, SPF30, Blistex Ultra Protection Lip Balm, SPF 30, Banana Boat with Aloe Vera, Aquaphor Lip Protectant + Sunscreen (SPF 30) and Lipcotz SPF 45 with titanium and zinc.

**Topical Anesthetic/Analgesic/Other Medication:**

**Examples of other topical agents may help to relieve symptoms:**

- **AverTEAX ointment** (Camellix) – active ingredient: benzyl alcohol; also, aloe vera and green tea extract
- **Abreva Conceal** (Invisible Cold Sore Patch) – no active ingredients – Microair technology
- **Compeed Total Care Invisible Cold Sore Patch** – no active ingredients – hydrocolloid particles
- **Compeed Total Care Night Cold Sore Patch** – no active ingredients – hydrocolloid particles
- **Lip Clear Invisible Cold Sore Bandage** (Quantum Health) – no active ingredients – hydrocolloid particles
- **Lip Clear Lysine + Cold Sore Treatment** (Quantum Health) – Lysine - ointment
- **Viractin Gel** – active ingredient, tetracaine 2%
- **Viroxyn Professional Use** – active ingredient, benzalkonium chloride, benzocaine 7.5%
- **Orajel Single Dose Cold Sore Treatment** – active ingredients, benzalkonium chloride, benzocaine 5%
- **Orajel Cold Sore Cream** – active ingredient, benzocaine 20%
- **Orajel Medicated Cold Sore Brush** – active ingredient, benzocaine 20%, camphor 3%, dimethicone 2%, menthol 1%, allantoin 0.5%
- **Orajel Cold Sore Relief and Concealer** - active ingredient, benzocaine 20%, camphor 3%, dimethicone 2%, menthol 1%, allantoin 0.5% (green tint to mask redness)
- **Zilactin Early Relief Cold Sore Gel** – active ingredient, benzyl alcohol
- **Zilactin-B 6 Hour Canker Sore and Sore Mouth Relief** – active ingredient, 10% benzocaine
- **Carmex** - active ingredients, camphor, menthol, phenol
- **Campho-phenique gel** – active ingredients: camphor, phenol, eucalyptus oil
- **Blistex Lip Medex** – active ingredients: camphor, menthol, phenol
- **Blistex Medicated Ointment** – active ingredients: camphor, menthol, phenol

**Pediatric significance:** Benzocaine should not be used in children under 2 years of age.
Topical Antiviral Medications: These are much less effective than systemic medications

**Rx:** Abreva (docosanol) cream 10% (OTC)
**Disp:** 2 g tube
**Sig:** Apply to the area 5 times a day until lip sore is healed, beginning when symptoms first occur. Rub in gently but completely and wash hands after applying cream.

**Pediatric Significance:** Docosanol exerts a nonspecific antiviral action by blocking viral entry into a cell. It is effective against acyclovir-resistant HSV. Mean duration of HSV lesions and pain were decreased by one day. Safety and effectiveness in children have not been established in children under the age of 12. (GlaxoSmithKline, [www.abreva.com](http://www.abreva.com)). Abreva Conceal (Invisible Cold Sore Patch) has no active ingredients.

**Rx:** Zovirax (acyclovir) cream 5%
**Disp:** 2 g tube
**Sig:** Apply to the area every 3 hours or 6 times a day for 7 days; begin when symptoms first occur. Apply with a cotton-tipped applicator to avoid spread to other body sites.

**Pediatric Significance:** The cream has superior skin penetration than the ointment, resulting in shorter duration of lip lesions. Zovirax cream improves healing by ½ day, and it has little effect in reducing pain, when compared to a placebo. May be used in children.

**Rx:** Denavir (penciclovir) cream 1%
**Disp:** 1.5 g tube
**Sig:** Apply to the area every 2 hours for a period of 4 days, beginning when symptoms first occur. Apply with a cotton-tipped applicator to avoid spread to other body sites. Very expensive.

**Pediatric Significance:** This topical agent should be applied at the earliest sign or symptom and is not indicated for intraoral use. Safety and effectiveness in children under age 12 have not been established. Mean duration of HSV lesions and pain were decreased by 1 day.

**Topical antiviral and anti-inflammatory**

**Rx:** Xerese (acyclovir 5%; hydrocortisone 1%) cream
**Disp:** 5-g tube
**Sig:** Dab on lesion 5 times a day during waking hours for 5 days, beginning when symptoms first occur.

**Pediatric Significance:** This topical agent reduces the likelihood ulcerative lesions developing. Safety and effectiveness has not been established for children <12 years-old. ([www.xerese.com](http://www.xerese.com))

**Systemic Intermittent Antiviral Treatment:**

**Rx:** Sitavig (acyclovir) buccal tablets 50 mg
**Disp:** 2 tablets
**Sig:** Place 1 tab on the upper canine gum area and let it slowly dissolve. If the tab falls off before 6 hours, then place a new tab on the upper canine gums.

**Pediatric Significance:** Although this drug has been approved for treating recurrent orolabial herpes simplex infection, it has not been approved for children. Therapy must be initiated at the earliest sign/symptom of
recurrence. It is not indicated for immunocompromised individuals. The drug is new and expensive.

**Rx:** Zovirax, g (acyclovir) 400 mg capsules  
**Disp:** 25 capsules  
**Sig:** Take 1 capsule 5 times a day for 5 days.

**Pediatric Significance:** This treatment may be indicated in some adolescents who develop severe, multifocal orolabial lesions or when there is a known triggering event. Therapy must be initiated at the earliest sign/symptom of recurrence. Oral acyclovir is indicated for immunocompromised children. There are limited studies evaluating the effectiveness of this drug in children and appropriate dosages in this age group are not available for management of recurrent oral and labial HSV infection. In children the dosage is 1000 mg/day PO in 5 divided doses for 5 days. Maximum dosage is 80 mg/kg/day or 1000 mg. Zovirax, generic (acyclovir) 200 mg/5 mL suspension is available for those individuals who have difficulty swallowing capsules. New formulation recently approved by FDA is Sitavig (acyclovir) 50 mg buccal tablets.

**Rx:** Valtrex, g (valacyclovir) 1 g caplets  
**Disp:** 4 caplets  
**Sig:** Take 2 caplets twice daily, 12 hours apart.

**Pediatric Significance:** Approved for treatment of herpes labialis in children > 12 years of age. Needs to be taken at the earliest symptoms. One study, evaluating adults and adolescents, showed that recurrence of herpes labialis was decreased when patients received 2000 mg before dental treatment and a second 2000 mg dose in the evening, followed on the next day with 1000 mg dose in the AM and 1000 mg dose in the PM. Drug of choice but may cause headache and nausea.

**Rx:** Famvir, g (famciclovir) 500 mg tablets  
**Disp:** 3 tablets  
**Sig:** Take 3 tablets as a single dose at the first sign or symptom of an outbreak.

**Pediatric Significance:** Approved for treatment of herpes labialis >18 years of age. However, it is not recommended in children 12 - <18 years of age because it is not as effective as other agents. Needs to be taken at the earliest sign or symptom of a cold sore, such as tingling, itching or burning. Studies show that it improved pain by one day and healing by 2 days. This dose is for immunocompetent individuals. Safe and effective use has not been established in children. May cause headache and nausea. In addition, there is no evidence that famciclovir prevents herpes labialis.

**Systemic Prophylaxis Antiviral Treatment:**

**Rx:** Zovirax, generic (acyclovir) 400 mg capsules (adolescents)  
**Disp:** 180 capsules  
**Sig:** Take 1 capsule twice a day for 1 year.

**Pediatric Significance:** This drug is a consideration for adolescents who develop 6 or more episodes per year or who develop HSV-associated erythema multiforme. For children the dosage is 800-1000 mg/day PO in 2 - 5 divided doses. Total dose should not exceed 80 mg/kg/day. There are limited studies evaluating the effectiveness of this drug in children and appropriate dosages in this age group are not available for management of recurrent oral and labial HSV infection. Decreases HSV outbreaks by 50-78%. Although acyclovir therapy has been shown to be safe and effective, the decision to continue therapy should be re-evaluated every year. Not FDA-approved for this use.

**Rx:** Valtrex (valacyclovir) 500 mg caplets (adolescents)  
**Disp:** 180 caplets  
**Sig:** Take 1 caplet daily continually for 6 months and re-evaluate.
**Pediatric Significance:** This dosing schedule is a consideration for adolescents who develop 6 or more episodes per year or who develop HSV-associated erythema multiforme. Higher dosage of 1 g daily may be more effective in some individuals. There are limited studies evaluating the effectiveness of this drug in children and appropriate dosages in this age group are not available for management of recurrent oral and labial HSV infection. Not FDA-approved for this use.

*Nutritional Supplementation:*

**Rx:** L-lysine 500 mg tablets or capsules (OTC)
**Disp:** 100 tablets
**Sig:** Take 2 tablets every morning before breakfast. Continue for 6 months and re-evaluate.

**Pediatric Significance:** This amino acid supplement works best if patients have high lysine, low arginine (chocolate, nuts) diet. May increase to 3000 mg/day, if the patient has a known trigger challenge or for the treatment of herpes labialis. T-cell immunosuppression may occur if 10 grams of lysine are taken daily. If there is skin involvement, along with the herpes labialis, some patients may benefit from vitamin E supplements, bioflavonoids, and zinc. Controlled studies have not been well documented for oral HSV infections and have shown mixed results. Studies in children are not available. The dosage of lysine for children 2 - < 12 years of age is 23 mg/kg but this is not specific for herpes labialis.

**Additional information:** Natural products that are possibly effective for managing herpes labialis are lemon balm extract and lysine. Applying aloe, tea bag or ice to the lips may be helpful. Contradictory, insufficient or preliminary studies that suggest a health benefit are citrus bioflavonoids, vitamin C, vitamin E, zinc, topical propolis and teats tree oil. Also, low level laser treatment has been reported to be successful for orofacial herpes labialis but well-designed studies are not available.

**HERPES ZOSTER**

*Systemic Antiviral Treatment:*

**Rx:** Valtrex, g (valacyclovir) 1 gm caplets (adolescents)
**Disp:** 21caplets
**Sig:** Take 1 caplet TID for 7 days.

**Pediatric Significance:** Treatment should begin within 72 hours of onset of symptoms. Better than acyclovir for disease resolution and decreases duration of post-herpetic neuralgia. However, children have a decreased risk for this complication. Use with caution in renal and hepatic disease. Despite vaccinations for varicella zoster, some children will develop this recurrent infection. Drug of choice for this disease.

**Rx:** Zovirax, g (acyclovir) 800 mg tablets (adolescents)
**Disp:** 35-50 tablets
**Sig:** Take 1 tab every 3 hours while awake or 5 times a day for 7-10 days.

**Pediatric Significance:** Treatment should begin within 48 hours after onset of symptoms.

**RECURRENT APHTHOUS STOMATITIS**

Oral care products that contain sodium lauryl sulfate, cocamidopropyl betaine (detergent), pyrophosphates, benzoic acid and alcohol have been implicated in some cases of recurrent aphthous stomatitis. Allergic reactions may be associated with Balsam of Peru, cinnamic aldehyde, menthol, peppermint and eugenol – all of which can be found in oral hygiene products, dental materials and candies, chewing gums and throat lozenges. Other allergens include nickel, parabens, dichromate, fragrance mix, methyl methacrylate, sorbic
acid, phosphorus, colophony. Food allergies may trigger these ulcers also. Although infrequently the causative agent, examples of toothpastes that do not contain sodium lauryl sulfate are Biotene Toothpaste (PBF is most gentle), Sensodyne Fluoride Original Toothpaste (SLS-free), Sensodyne Pronamel, Enamelon Preventive Treatment Gel, TheraBreath Toothpaste, CloSYSII Toothpaste, Squigle Enamel Saver Toothpaste, ACT Dry Mouth Toothpaste, and PrevIdent 5000 plus 1.1%. Hello bubble gum and blue raspberry have only 1% SLS. (This list may not be up-to-date because formulas may change)

Protective Covering Agents with or without Anesthetic Agents:

Orabase Paste with Benzocaine (Colgate Oral Pharmaceuticals) – occlusive paste with 20% benzocaine
Orajel Film-Forming Canker Sore Gel (Dwight & Church) – gel contains 15% benzocaine and 2% menthol. It lasts a couple of hours.
Canker-X Canker & Mouth Sore Treatment Gel (Sunstar Americas, Inc.) – gel contains aloe vera, long lasting and non-stinging formula – no benzocaine or alcohol.
Kank-A Professional Strength Mouth Pain Liquid (Blistex) – contains 20% benzocaine, tincture of benzoin, alcohol, tannic acid, others (long lasting barrier film)
Zilactin-B Oromucosal Solution (Blairex Laboratories, Inc.) – contains 10% benzocaine and lasts up to 6 hours
Zilactin-L Oromucosal Solution (Blairex Laboratories, Inc.) – contains 4% lidocaine and lasts up to 6 hours

Other protective barriers include bioerodible patches, such as Canker Cover (Quantum Health) – menthol, sea salt, citrus oil, Ora Film (Apothe cus Pharm) – 6% benzocaine.

Topical Anesthetic Agents:

Baby Orajel Naturals Teething Gel – contains 1% eugenol (clove oil)
Orajel Mouth Sore Gel (Dwight & Church) – contains 20% benzocaine
Orajel Medicated Mouth Sore Swabs (Dwight & Church) – contains 20% benzocaine
Dr. Sheffield’s Oral Pain Relief Gel – contains 20% benzocaine
ORA5 Liquid Band-Aid for Canker Sore Sufferers (McHenry Lab) – contains copper sulfate and iodine
Ambesol Jr Gel (Wyeth Consumer Healthcare) – contains 10% benzocaine
Ambesol Maximum Strength Gel or Liquid (Wyeth Consumer Healthcare) – contains 20% benzocaine
Ambesol Regular Strength Gel or Liquid (Wyeth Consumer Healthcare) – contains 10% benzocaine
Kank-A Soothing Beads (Blistex) – 3 mg benzocaine per bead
Kank-A Soft Brush Mouth Pain Gel (Blistex) – 20% benzocaine, 0.1% zinc chloride
Tanac - No Sting Liquid (Del Pharmaceuticals, Inc.) - contains 10% benzocaine, tannic acid, alcohol-free
CVS Oral Anesthetic Liquid (CVS) – contains 20% benzocaine
Cepacol Maximum Strength Sugar Free Throat Lozenges (Combe, Inc) – contains 10 mg benzocaine and 4.5 mg of menthol, cherry flavored, sorbitol
Halls Cough Drops Sugar Free (Cadbury) – menthol 2.5 mg – 9.4 mg, aspartame; multiple flavors
Halls Breezers Sugar Free (Cadbury) – contains pectin 7 mg, aspartame and maltitol syrup; cool berry
Sucrets Maximum Strength Lozenge (Insight Pharmaceuticals) – contains 3mg dyclonine 3 mg; corn syrup, sucrose, menthol, black cherry flavor, propylene glycol

Topical Antimicrobials:

Rx: Chlorhexidine gluconate 0.12% oral rinse
Disp: 480 mL
Sig: Rinse with 15 mL for 30 seconds and expectorate. Use twice daily, after breakfast and before bed.

Pediatric Significance: Because of the tooth staining properties of chlorhexidine, applying the medication onto a cotton-tipped applicator and placing it on the ulcer helps to minimize this side effect. Most rinses
contain 11.6% alcohol, and parental supervision is important to prevent accidental ingestion. Alcohol-free product is available. Minor irritation and mucosal sloughing have been noted with use in children. All foamy residues from toothbrushing should be rinsed away before using this agent. Clinical effectiveness and safety have not been established in children <18 years. Chlorhexidine rinse has been shown to elevate blood pressure in adults as early as 1 week of use.

Topical Steroid Medications: Ointments, Gels, and Oral Pastes
Listed in Increasing Order of Potency

Rx: Oralone, generic (triamcinolone acetonide) dental paste 0.1%
Disp: 5 g tube
Sig: Coat the lesion with a thin film 2-3 times a day after meals and before bed. Do not eat or drink for 30 minutes after application. Use until ulcer is no longer painful but not to exceed 7 days without further follow-up.

Rx: Betamethasone valerate 0.1% ointment
Disp: 15 g tube
Sig: Apply to affected areas 2-4 times a day after meals and at bedtime. Do not eat or drink for 30 minutes after application. Use until ulcer is no longer painful; not to exceed 7 days without follow-up.

Rx: Fluocinonide gel or ointment .05%
Disp: 15 g tube
Sig: Apply to the ulcer 2-4 times a day after each meal and before bed. No not eat or drink for 30 minutes after application. Use until ulcer is no longer painful but not to exceed 7 days without follow-up.

Pediatric Significance: Topical intraoral steroids are not generally recommended for children <2 years old. Short-term use of steroids is recommended to decrease the potential risk of adrenocortical insufficiency. Oral candidiasis is another side effect that some children develop. For better adherence and pain control, the steroid ointments may be mixed with equal parts of Orabase-B oral paste. Gels may sting on application and tend to separate and harden when mixed with occlusive pastes. Only triamcinolone dental paste .1% is approved for intraoral use. Other agents are formulated for external use, but are frequently used intraorally.

Rx: Betamethasone dipropionate, augmented, gel, ointment 0.05%
Disp: 15 or 45 g tube for ointment; 15 or 50 g tube for gel
Sig: Apply to affected areas after each meal and at bedtime. Do not eat or drink for 30 minutes after application. Use until ulcer is no longer painful but not longer than 7 days. (Gel is not always available.)

Rx: Temovate (clobetasol propionate) gel or ointment 0.05%
Disp: 15 g tube
Sig: Apply to the ulcer 2-4 times a day after meals and before bed. No not eat or drink for 30 minutes after application. Use until ulcer is no longer painful but not to exceed 7 days without follow-up.

Pediatric Significance: This agent is not usually recommended for children <12 years old because of the possibility of tissue absorption and potential risk for developing adrenocortical insufficiency with prolonged use. It is best to reserve this topical agent for severe aphthous major. The same recommendations and side effects apply to this topical steroid as described above.

Topical Steroid Mouth Rinses:

Rx: Dexamethasone elixir, oral solution 0.5 mg/5 mL
Disp: 200 mL
Sig: Rinse with 1 teaspoon (5 mL) for 2 minutes, four times a day, after meals and before bed and
expectorate. No not eat or drink for 30 minutes after rinsing. Use until ulcer is no longer painful, but not longer than 7-10 days.

**Pediatric Significance:** In general, liquid steroids, used as oral rinses, are indicated when there are multiple and widespread lesions or when direct topical application to individual ulcers is difficult because of the location. The alcohol content is about 5% for dexamethasone elixir. Dexamethasone elixir is sweetened with sucrose. Rinsing with these liquid steroids is not indicated for children who are unable to cooperate or expectorate. The same recommendations and potential side effects apply to these liquid steroids as those described for the ointments, gels and pastes. Rinsing with topical steroids tends to increase the risk for candidal infections.

*Examples of some of the topical steroid medications are listed below according to potency.*

**Super-High Potency:**
- Betamethasone dipropionate (augmented) 0.05%, gel, ointment
- Clobetasol propionate 0.05%, gel, ointment
- Halobetasol propionate 0.05%, ointment

**High Potency:**
- Betamethasone dipropionate 0.05%, gel, ointment
- Fluocinonide 0.05%, gel, ointment
- Dexamethasone 0.5 mg/5 mL oral solution, elixir

**Medium Potency:**
- Betamethasone valerate 0.1%, ointment
- Triamcinolone acetonide 0.1%, ointment

**Low Potency:**
- Alclometasone dipropionate 0.05%, ointment
- Desonide 0.05%, gel, ointment
- Hydrocortisone acetate 1%, gel, ointment

**Systemic Corticosteroids:**

- **Rx:** Prednisone, 5 mg, 10 mg, 20 mg tablets
- **Disp:** Dependent on professional judgment
- **Sig:** 20 to 40 mg every morning for 5 to 10 days and taper.

**Pediatric Significance:** Systemic steroids should be prescribed in consultation with a physician and limited to high dose, short-term therapy to decrease the risk of adrenocortical suppression. A maintenance phase should be instituted, which includes the use of topical steroids at the earliest sign/symptom of recurrence. The maximum dosage is 40 mg/d for the shortest duration, not to exceed 10 days. Some children will experience insomnia, headache, irritability, and candidal infections. Prednisone oral solution 1mg/mL with 5% alcohol is also available for children who are unable to swallow pills.

**Laboratory Tests:** The following tests may be helpful in evaluating patients for HPA axis suppression:
- ACTH stimulation test
- A.M. plasma cortisol test
- Urinary free cortisol test

**Systemic Immunomodulating Agent:**

- **Rx:** Cimetidine oral solution 300 mg/5 mL (children)
- **Disp:** Depends on weight
Sig:  Take 20 to 40 mg/kg/d in 2 divided doses for 3 months and re-evaluate.

Rx:  Cimetidine tablets 300 mg (adolescents)
Disp:  180 tablets (therapeutic trial is 90 days)
Sig:  Take 1 tablet bid for 3 months and re-evaluate.

**Pediatric Significance:** The effectiveness of this drug has not been documented in controlled studies for managing aphthous ulcers in children. The mechanism of action of this drug for this mucosal disease is uncertain, but it appears to be an immunomodulator. This drug has been effective in treating and preventing some cases of aphthous ulcers that are associated with the syndrome PFAPA (periodic fevers, aphthous stomatitis, pharyngitis and cervical adenitis). The average effective dose for children is 150 mg bid for 6 months. **Consultation with physician is advised.** If child has GERD, which may also contribute to oral ulcers, consult physician for management because appropriate dosing will vary from this recommendation. Not FDA-approved for oral ulcer management. This drug has also been used off-label for molluscum contagiosum and refractory verruca vulgaris/plana and other HPV-induced lesions.

*Nutritional Supplementation (Weak or no evidence of effectiveness):*

Rx:  OraCoat H-B12 Melts with B<sub>12</sub> 500 mcg (OraHealth)
Disp:  1 – 30 ct box
Sig:  Dissolve 1 disc daily for disease prevention.

**Additional information:** A recent study showed that taking vitamin B<sub>12</sub> 1000 mcg either sublingually or orally decreased recurrence of aphthous ulcers in adults.

Rx:  Vitamin B complex tablets
Disp:  1 bottle
Sig:  Take 1 tablet daily for disease prevention.

**Additional information:** Vitamin B complex + vitamin C may be beneficial in some adolescents. ([www.webmd.com/drugs](http://www.webmd.com/drugs))

**INTRAORAL CANDIDIASIS**

*Topical Antifungal Agents:*

Rx:  Nystatin oral suspension 100,000 units/mL
Disp:  240 mL
Sig:  Rinse with 4 mL for 2 minutes and swallow or expectorate, four times a day. Use for 14 days and re-evaluate. Do not eat or drink for 30 minutes are rinsing.

**Pediatric Significance:** For infants, the dosage is decreased to 2 mL, four times a day. For children who cannot rinse, 2 mL is placed along both sides of the buccal mucosa, using a disposable plastic dropper or syringe. Older children with pharyngeal involvement or tonsillar hypertrophy should gargle and swallow the solution. These products contain alcohol and 30% to 50% sucrose, so oral hygiene must be reinforced. Sugar-free formulation is now available. To mask the sulfurous taste, the pharmacist can add raspberry, grape and wild cherry flavoring drops to improve patient acceptance. Nystatin popsicles can be made by the pharmacist to improve compliance and to prolong the mucosal contact time. Freezing does not alter the efficacy.
Rx: Oravig (miconazole) buccal tablets 50 mg  
Disp: 14 tablets  
Sig: Place one tablet above the upper front teeth once daily for 14 days. Alternate side placement of the tablet.  

Pediatric Significance: Safety and efficacy has not been established for children <16 years of age. New drug delivery that is expensive.

Rx: Clotrimazole troche 10 mg  
Disp: 70 troches  
Sig: Slowly dissolve 1 troche every 3 hours while awake (4-5 troches per day). Use for 14 days and re-evaluate. No not eat or drink for 30 minutes after use.  

Pediatric Significance: For maximum effectiveness, it is important that children are instructed not to chew or swallow the medication prematurely. Young children, who may aspirate or choke on the troches, should be given another agent. Not recommended for children under the age of 3 years. Contains about 60% sucrose content; therefore, oral hygiene measures should be reinforced. A pharmacist may compound a sugarless suspension (10 mg/mL), if requested. It is recommended to treat infection for another 7 days after signs and symptoms have resolved to prevent recurrences.

Systemic Antifungal Agents:

Rx: Diflucan or generic (fluconazole) 100 mg tablets  
Disp: 15 tablets  
Sig: Take 2 tablets for the first day, then 1 tablet every day for 14 days and then re-evaluate.  

Pediatric Significance: The pediatric dose is 6 mg/kg/d on the first day and 3 mg/kg/d for 14 days. It is safe to use in infants. Suspensions are available in 10 mg/mL and 40 mg/mL strengths, are orange flavored and are sweetened with sucrose. Although a rare event, hepatotoxicity has been reported. May need to treat for a longer period of time based on the health status of the child and when the lesions resolved.

Rx: Sporanox (itraconazole) oral solution 100 mg/10 mL  
Disp: 280 mL  
Sig: Rinse with 20 mL for several seconds and then swallow once daily. Use daily for 7-14 days. Best taken with food.  

Pediatric Significance: This medication is effective for individuals who have not responded to fluconazole because of resistance or immunocompromised status. Its efficacy has not been established in children, but the AAP recommends a pediatric dose of 5-10 mg/kg/day in 2 divided doses. The solution has a pH of 2, which may be irritating to the oral mucosa. It is sweetened with saccharin and sorbitol.

Antimicrobial Mouthrinse:

Rx: Chlorhexidine gluconate 0.12% oral rinse  
Disp: 480 mL  
Sig: Rinse with 15 mL for 30 seconds and expectorate. Use twice daily, after breakfast and before bed.  

Pediatric Significance: This oral rinse may be effective when poor oral hygiene or orthodontic appliances are a contributing factor. The removable appliance needs to be disinfected also. Soaking appliance in 1% sodium hypochlorite for 10 minutes is effective. Other agents, such as chlorhexidine oral rinse and Listerine mouthwash can be used to disinfect appliances but are not effective against Candida species. Using an oral moisturizing gel such as MighTeaFlow Organic Neutral pH Dry Mouth Gel, Biotene Oral Balance Gel,
MedActive Oral Relief Gel, Orajel Dry Mouth Moisturizing Gel, GC America Dry Mouth Gel, Xyigel (17% xylitol and pH 7.4) and others under the appliance decreases the mucosal irritation. Some of the neutral gels may be helpful for children with gingivitis aggravated by lip incompetence.

**Nutritional Supplementation:**

**Rx:** Lactobacillus acidophilus (OTC)

**Pediatric Significance:** Clinical studies, evaluating the effectiveness of this treatment, are not available in children. May eat yogurt (4 oz servings - 2 containers a day) with active culture of *Lactobacillus acidophilus*. It works by increasing lactic acid and the establishment of acidic flora, which causes an unfavorable environment for fungi and certain pathogenic bacteria. There is inconclusive evidence that these supplements are effective for managing or preventing oral candidiasis.

Probiotics are also used to help prevent antibiotic-induced diarrhea. The probiotic must be taken during antibiotic treatment and up to a week afterwards. It is also important to take the probiotic 2 hours after each antibiotic dose to improve the survival of these bacteria in the GI tract.

Examples of probiotics:
- BioGaia (L reuteri Prodentis)
- Sunstar Gum Periobalance (L reuteri Prodentis)
- ProBiora Health (S oralis, S uberis, S rattus): EvoraPro
- TheraBreath (S salivarius)
- Culturelle (Lactobacillus GG)
- Swanson Ultra Oral Probiotic Formula (S salivarius, L paracasei, L reuteri, L plantarum, K rhamnosus)
- Swanson Nature’s Plus (S salivarius, L acidophilus, Vit D3, Ca)
- Oral ProbioticBlis-K12 Gum (S salivarius)
- Venus Smile Oral Care Probiotic Mints (uncertain probiotics)
- Bayer TruBiotics (Bifidobacterium animalis BB-12, Lactobacillus acidophilus LA-5)
- Lactinex (Lactobacillus acidophilus and Lactobacillus bulgaricus)

Natural food sources of probiotics include yogurt with live and active culture, unpasteurized sauerkraut (kimchi), soft cheese that is fermented (Gouda), sourdough bread, milk with probiotics (sweet acidophilus milk, buttermilk, sour pickles, naturally fermented (no vinegar), fermented soybeans (tempeh).

Prebiotics provide nutrients for the good bacteria in the GI tract. Sources of prebiotics include asparagus, bananas, garlic, cabbage, legumes and beans.

**ANGULAR CHEILITIS**

**Topical Antifungal Agent:**

**Rx:** Nystatin ointment 100,000 units/g
**Disp:** 15 g tube
**Sig:** Apply thin layer to the corners of the mouth or inside of removable orthodontic appliance. Use 2-3 times a day after meals. Avoid eating, drinking or licking lips for 30 minutes after application.

**Rx:** Lotrimin AF (OTC), Walgreens (OTC), generic (clotrimazole) cream 1%
**Disp:** 15 g for prescription and 12 g, 15g or 24 g (OTC) tube
**Sig:** Apply thin layer to the corners of the mouth. Use 2-3 times daily after meals. Avoid eating, drinking or licking the lips 30 minutes after application.
Rx: Generic (RX), Micatin (OTC), miconazole nitrate cream or ointment 2%
Disp: 15 g tube
Sig: Apply a thin layer to the corners of the mouth. Use 2-3 times daily after meals. Avoid eating, drinking or licking the lips for 30 minutes after application.

Rx: Ketoconazole cream 2%
Disp: 15 or 30 g tube
Sig: Apply thin layer to the corners of the mouth or inside of removable orthodontic appliance. Use twice daily for 5-7 days. Avoid eating, drinking or licking lips for 30 minutes after application.

**Pediatric Significance:** Concomitant oral antifungal treatment may be indicated. Ketoconazole cream has anti-inflammatory properties. In addition, the imidazoles (clotrimazole, miconazole, and ketoconazole) exert some in vitro activity against gram-positive bacteria, including *Staphylococcus aureus*, which is beneficial when managing some cases of angular cheilitis. 1% clotrimazole cream and 2% mupirocin cream that is compounded 1:1 ratio is beneficial when a secondary bacterial infection is suspected. Apply 2 times a day. Delay applying a lip moisturizer or lip balm for 30 minutes after application.

**Topical Antifungal/Steroid Agent:**

Rx: Nystatin/triamcinolone acetonide ointment or cream, 100,000 units/g; 0.1%
Disp: 15 g tube
Sig: Apply a thin layer to the corners of the mouth, 3 times a day for 3-5 days and re-evaluate.

**Pediatric Significance:** This agent is often the best choice for chronic angular cheilitis that is nonresponsive to antifungal agents. It combines anti-inflammatory and antifungal properties into one ointment, but the steroid can cause significant perioral rashes. Concomitant oral antifungal treatment may be indicated especially when recurrences are frequent. The base is petrolatum and mineral oil. Rarely, refractory cases are associated with vitamin deficiencies – riboflavin, niacin, iron. This is a generic drug but expensive.

**PERIORAL IMPETIGO**

**Topical Antimicrobial Agent:**

Rx: Bactroban, g (mupirocin) 2% ointment
Disp: 15 or 22g tube
Sig: Apply to affected area 2 times daily for 5 days.

Rx: Altabax (retapamulin) 1% ointment
Disp: 15 or 30 g tube
Sig: Apply to affected area 2 times daily for 5 days.

**Pediatric Significance:** This topical agent is often preferred to systemic antibiotics when lesions are localized because of the emergence of antibiotic drug resistance in children. Bactroban applied to the nares twice each day for 5 days significantly reduces *S. aureus* carriage in the nose for one year, which may be a source for recurrent infections. It is effective for the treatment of other perioral conditions, such as folliculitis, minor wounds, infected herpetic lesions, and infected eczema. Prolonged use may result in fungal overgrowth. Extensive multifocal lesions require systemic antibiotics. IDSA Practical Guidelines, CID 2014:59 recommend the systemic meds for children: cephalaxin, erythromycin, clindamycin, amoxicillin-clavulanate if systemic antibiotics are needed.
SEVERELY CHAPPED OR CRACKED LIPS (EXFOLIATIVE CHEILITIS)

RX: Aquaphor healing ointment (petroleum and lanolin alcohol), Lansinoh, and Purelan (100% lanolin) are good choices for children with chronically chapped and irritated lips. Lanolin may be an allergen. These are OTC products.

SYMPTOMATIC ERYTHEMA MIGRANS (GEOGRAPHIC TONGUE)

Topical Anesthetics and Coating Agents:

RX: See Palliative Treatment for Oral Mucosal Pain

Pediatric Significance: In addition, avoid mouthrinses that contain alcohol. An allergen may be causing a symptomatic tongue. Certain toothpastes and other oral hygiene products may be aggravating factors.

Topical Steroid Agents for Symptomatic Lesions:

Rx: See Aphthous Ulcers.

Pediatric Significance: Although no treatment has been proven to be universally effective for erythema migrans, some children benefit from short-term use of topical steroids.

Topical Antifungal/Steroid Agent for Symptomatic Lesions:

Rx: Nystatin/triamcinolone acetonide ointment, 100,000 units/g; 0.1%
Disp: 15 g tube
Sig: Apply a thin layer to the tender areas on the tongue; use after meals and before bed for 5-7 days and re-evaluate.

Rx: Triamcinolone acetonide 0.1% in Nystatin suspension
Disp: 200 mL
Sig: Rinse with 1 teaspoon (5 mL) for 2 minutes, four times a day, after meals and before bed, and expectorate. Do not eat or drink for 30 minutes after use. Discontinue when tongue is no longer tender.

Directions to pharmacist for formulating: Compound with triamcinolone micronized powder. QS to 200 mL with nystatin oral suspension. Shake well before using. The formulation expires in 6 months. It may be flavored with raspberry, chocolate or NutraSweet.

Pediatric Significance: This is for short-term use only, when symptoms are problematic and a secondary candidal infection is suspected.

This handout should only be used as a guide for managing oral and perioral lesions in children and adolescents. Specific dosages may require modification and/or consultation with a physician. Lesions that do not respond to therapeutic management should be referred for definitive diagnosis to the appropriate specialist. This author does not endorse any specific product when a product brand or company is listed. Well-referenced drug informational handbooks or software should be used primarily when writing a prescription.