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Contributing authors are members of the American Academy of Oral Medicine. This monograph represents a consensus of the contributing authors and not necessarily the private views of any of the individuals.
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The 8th edition of this Guide is dedicated to the memory of Sol Silverman Jr., MA, DDS. Dr. Silverman was an inspiration to a generation of students, oral medicine residents and colleagues and a revered member of the American Academy of Oral Medicine. His contributions in oral, head and neck cancer will serve the professional community and society for generations. His friendship, guidance, professionalism are sorely missed by everyone who knew and loved him. Dr. Silverman has contributed extensively to this Guide.

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2. To promote access to quality, affordable, and cost-effective expert Oral Medicine care.
3. To increase professional and public awareness of the field of Oral Medicine.

The Academy achieves these goals by holding national meetings annually; by presenting lectures, workshops, and seminars; by sponsorship of the American Board of Oral Medicine; by the editorship of the Oral Medicine Section of *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology*, and by publishing monographs and position papers on timely subjects relating to oral medicine.

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The presented information is based on current knowledge. Following the guidelines set forth in this monograph may not ensure successful management of every patient. This monograph represents a consensus of the editors and authors and not necessarily the private views of any individual.

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Introduction

This monograph is intended as a quick reference to the etiologic factors, clinical description, currently accepted therapeutic management, and patient education of common oral conditions.

All recommended treatments were current at the time of the publication of this guide. However, new medications are constantly made available to the clinician and therapeutic strategies evolve, as new knowledge becomes known. The prudent clinician is well advised to consider this when using this guide.

Some of the recommended treatments have been more thoroughly investigated than others, but all have been reported to be of clinical value.

For many conditions described in this monograph, there is currently no cure, but there are treatment modalities that can relieve discomfort, shorten the clinical duration and frequency, and minimize recurrences. Some of the treatments recommended in this manuscript are considered as “off-label” use.

 Clinicians are reminded that an accurate diagnosis is imperative for clinical success.

Every effort should be made to determine the diagnosis prior to initiating treatment. Infection and malignancy must be ruled out. Where signs, symptoms, microscopic and other laboratory evidence do not support a definitive diagnosis, empirical treatment may be initiated and evaluated as a therapeutic trial. Further treatment can be determined by the patient’s response. However, when healing of a lesion or when an expected response to treatment is not achieved within an expected period of time, a biopsy is recommended.

Patient management should be governed by the natural history of the oral condition and the fact that there is either a palliative, supportive, or curative treatment.

 Referral of patients should be made when the patient’s problems are beyond the scope of the clinician.

All drugs require a prescription unless identified as over-the-counter (OTC) drugs. Please note that the Food and Drug Administration (FDA) has been active in recent years with allowing OTC status for drugs formerly available by prescription only. Be sure to check on the dosages of the newly released (OTC) drugs because they are usually of a different strength than those available by prescription.

 The literature accompanying the prescription topical medications suggested in this guide may recommend “for external use only.”

We hope you will find this monograph a useful resource in your daily practice.

For the Authors:
Michael A. Siegel
Thomas P. Sollecito
Eric T. Stoopler
## Standard Abbreviations

<table>
<thead>
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<th>Abbreviation</th>
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<td>I</td>
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<td>ii</td>
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<td>a</td>
<td>Before</td>
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<td>ac</td>
<td>before meals (ante cibum)</td>
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<td>ad lib</td>
<td>as desired (ad libitum)</td>
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<td>as soon as possible</td>
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<td>AAOM</td>
<td>American Academy of Oral Medicine</td>
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<td>bid</td>
<td>twice a day (bis in die)</td>
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<td>With</td>
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<td>cap</td>
<td>Capsule</td>
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<td>CBC</td>
<td>complete blood count</td>
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<td>U. S. Center for Disease Control and Prevention</td>
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<td>crm</td>
<td>Cream</td>
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<td>disp</td>
<td>dispense on a prescription label</td>
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<td>elix</td>
<td>Elixir</td>
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<td>Gram</td>
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<td>Hour</td>
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<td>at bedtime</td>
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<td>herpes simplex virus</td>
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<td>Intravenous</td>
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<td>every bedtime</td>
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<tr>
<td>Qid</td>
<td>four times a day (quarter in die)</td>
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<td>Qpm</td>
<td>every evening</td>
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<td>qsad</td>
<td>add a sufficient quantity to equal</td>
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<tr>
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<td>every week</td>
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<td>recurrent aphthous stomatitis</td>
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<td>RAU</td>
<td>recurrent aphthous ulcer</td>
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<tr>
<td>RBC</td>
<td>red blood cell count</td>
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<td>recurrent herpes labialis</td>
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<td>recurrent intraoral herpes</td>
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<td>patient dosing instructions on prescription label</td>
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<td>Solution</td>
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<td>sun protection factor</td>
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<td>stat</td>
<td>Immediately</td>
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<td>Syrup</td>
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<td>Tablespoon</td>
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<td>Td</td>
<td>three times a day (ter in die)</td>
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<td>Top</td>
<td>Topical</td>
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<td>Tsp</td>
<td>Teaspoon</td>
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# Standard Abbreviations (continued)

<table>
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<th>Abbreviation</th>
<th>Definition</th>
<th>Unit</th>
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<td>Oint</td>
<td>Ointment</td>
<td>U</td>
<td>Unit</td>
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<tr>
<td>OTC</td>
<td>over-the-counter</td>
<td>ut dict</td>
<td>as directed (ut dictum)</td>
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<tr>
<td>Oz</td>
<td>Ounce</td>
<td>UV</td>
<td>Ultraviolet</td>
</tr>
<tr>
<td>P</td>
<td>After</td>
<td>Visc</td>
<td>Viscous</td>
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<tr>
<td>Pc</td>
<td>after meals</td>
<td>VZV</td>
<td>varicella-zoster virus</td>
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<tr>
<td>PABA</td>
<td>para-aminobenzoic acid</td>
<td>WBC</td>
<td>white blood cell count</td>
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<tr>
<td>PHN</td>
<td>postherpetic neuralgia</td>
<td>Wk</td>
<td>Week</td>
</tr>
<tr>
<td>PLT</td>
<td>platelet count</td>
<td>Yr</td>
<td>Year</td>
</tr>
<tr>
<td>Po</td>
<td>by mouth (per os)</td>
<td>Zn</td>
<td>Zinc</td>
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1 Burning Mouth Disorder

ETIOLOGY
Multiple conditions have been implicated in the causation of burning mouth disorder. Current literature favors neurogenic, vascular, and psychogenic etiologies. However, other conditions, such as xerostomia, candidosis, referred pain from the tongue musculature, chronic infections, reflux of gastric acid, medications, blood dyscrasias, nutritional deficiencies, hormonal imbalances, and allergic and inflammatory disorders, need to be considered.

CLINICAL DESCRIPTION
Burning mouth disorder is characterized by the absence of clinical signs (Figure 1-1).

RATIONALE FOR TREATMENT
To reduce discomfort by addressing possible etiologic factors.

TREATMENT
It is of the utmost importance to reassure the patient that this disorder is not infectious or contagious and does not progress to a premalignant or malignant condition. On the basis of history, physical evaluation, and specific laboratory studies, rule out all possible organic etiologies. Minimal blood studies should include CBC with differential, fasting glucose, iron, ferritin, folic acid and vitamin B12, and a thyroid profile (thyroid-stimulating hormone, triiodothyronine, thyroxine).

Rx: Diphenhydramine (Children’s Benadryl) elix 12.5 mg/5 mL (OTC).
Disp: 1 btl.
Sig: Rinse with 1 tsp (5 mL) for 2 minutes before each meal and swallow. (Children’s Benadryl is alcohol free.)

When the burning mouth is considered psychogenic or idiopathic, tricyclic antidepressants or benzodiazepines in low doses exhibit the properties of analgesia and sedation and are frequently successful in reducing or eliminating the symptoms after several weeks or months. The dosage is adjusted according to patient reaction and clinical symptomatology. The following five systemic therapies for burning mouth disorder may be best managed by appropriate specialist or the patient’s physician due to the protracted nature of this therapy.

Rx: Clonazepam (Klonopin) tabs 0.5 mg.
Disp: 100 tabs.
Sig: Take half to one tab three times daily and then adjust the dose after 3-day intervals. The patient should not be titrated to a dosage of greater than 2.0 mg daily.

Rx: Clonazepam (Klonopin) wafers 0.25 mg.
Disp: 60 wafers
Sig: Dissolve slowly against the inside of the cheek and then swallow three times daily.

Rx: Amitriptyline (Elavil) tabs 25 mg.
Disp: 50 tabs.
Sig: Take 1 tab at bedtime for 1 week and then 2 tabs hs. Increase to 3 tabs hs after 2 weeks and maintain at that dosage or titrate as appropriate.

FIGURE 1-1: Normal appearance of the tongue in a female patient complaining of chronic lingual burning. Her symptoms were controlled with chlordiazepoxide (Librium).
The rationale for the use of tricyclic antidepressant medications and other psychotropic drugs should be thoroughly explained to the patient, and the patient’s physician should be made aware of the therapy. These medications have a potential for addiction and dependency.

**Rx**: Chlordiazepoxide (Librium) tabs 5 mg.
Disp: 50 tabs.
Sig: Take 1 or 2 tabs three times daily.

**Rx**: Alprazolam (Xanax) tabs 0.25 mg.
Disp: 50 tabs.
Sig: Take 1 or 2 tabs three times daily.

**Rx**: Diazepam (Valium) tabs 2 mg.
Disp: 50 tabs.
Sig: Take 1 or 2 tabs three times daily. The dosage should be adjusted according to the individual response of the patient. Anticipated side effects are dry mouth and morning drowsiness.

**Rx**: Tabasco sauce (capsaicin) (OTC).
Disp: 1 btl.
Sig: Place one part Tabasco sauce in 2 to 4 parts of water. Rinse with 1 tsp (5 mL) for 1 min four times daily and expectorate.

**Rx**: Chlordiazepoxide (Librium) tabs 5 mg.
Disp: 50 tabs.
Sig: Take 1 or 2 tabs three times daily.

**Rx**: Alprazolam (Xanax) tabs 0.25 mg.
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**Rx**: Tabasco sauce (capsaicin) (OTC).
Disp: 1 btl.
Sig: Place one part Tabasco sauce in 2 to 4 parts of water. Rinse with 1 tsp (5 mL) for 1 min four times daily and expectorate.

**Rx**: Capsaicin (Zostrix) crm 0.025% (OTC).
Disp: 1 tube.
Sig: Apply sparingly to affected site(s) four times daily. Wash hands after each application and do not use near the eyes.

Topical capsaicin may serve to improve the burning sensation in some individuals. As with topical capsaicin, an increase in discomfort for a 2- to 3-week period should be anticipated.
2 Candidosis

ETIOLOGY
Candida albicans is a yeast-like fungus. It is an opportu-
nistic organism that tends to proliferate with the use of
broad-spectrum antibiotics, corticosteroids, medications
that reduce salivary flow, and cytotoxic agents. Conditions
that contribute to this disease include xerostomia, uncon-
trolled diabetes mellitus, anemia, poor oral hygiene, pro-
longed use of prosthetic oral appliances, and suppression
of the immune system, such as human immunodeficiency
virus (HIV) infection, or as a side effect of many medica-
tions, including steroid inhalants. Antibiotics may shift the
microflora and allow overgrowth of Candida. It is import-

ant to determine predisposing factors prior to initiating
therapy.

CLINICAL DESCRIPTION
This disease is characterized by soft, white, slightly eleva-
ted plaques that usually can be wiped away (pseudo-
membranous form), generalized erythematous sensitive
areas (erythematous form), or confluent white areas
that cannot be wiped away (hyperplastic form). Angular
cheilitis, which is also described in this monograph, is
frequently associated (Figure 2-1).

FIGURE 2-1: Clinical types of candidosis.
A – Pseudomembranous form;
B – erythematous form;
C – hyperplastic form;
D – angular cheilitis.
CHAPTER 2
Candidosis

RATIONALE FOR TREATMENT

The rationale for the treatment of candidosis is to reestablish a normal balance of oral flora and improve oral hygiene. The disinfection of all removable oral prostheses with antifungal denture-soaking solutions and the application of antifungal agents on the tissue-contacting surfaces is necessary to remove a potential source of fungal reinfection.

Medication should be continued for a few days after disappearance of clinical signs to prevent immediate recurrence. However, several contributing authors suggest that it is advisable to empirically treat candidosis for a 10- to 14-day period. Identification and correction of contributing factors will minimize recurrence.

It is important that salivation be within normal limits. Many medications and systemic conditions, including immunosuppression, will decrease salivary flow, thereby predisposing the patient to candidosis. Increasing oral moisture by using sugarless gum or candy, mouthrinses without alcohol, or salivagogues, such as pilocarpine or cevimeline, is often an important adjunctive measure when managing candidosis (see Chapter, “Xerostomia [Reduced Salivary Flow and Dry Mouth]”)

TOPICAL ANTIFUNGAL AGENTS

**Rx**: Clotrimazole (Mycelex) troches 10 mg.
Disp: 70 troches.
Sig: Let 1 troche dissolve in mouth five times daily.
Do not chew.

**Rx**: Mycostatin pastilles 200,000 U.
Disp: 70 pastilles.
Sig: Let 1 pastille dissolve in mouth five times daily.
Do not chew.

**Rx**: Nystatin vaginal suppositories 100,000 U.
Disp: 40 suppositories.
Sig: Let 1 suppository dissolve in the mouth four times daily. Do not rinse for 30 min.

Although some contributing authors disagree with the use of vaginal creams intraorally, their efficacy has been observed clinically in selected cases where other topical antifungal agents have failed.

Creams and ointments are ideal for treating patients wearing complete or partial dentures. Application of an antifungal cream or ointment to the tissue-bearing surfaces of a denture serves to localize the medication to the affected soft tissues while simultaneously treating the denture. Patients must be reminded to remove their prostheses prior to going to bed. They should be instructed to apply the cream or ointment directly to the oral soft tissues at bedtime while cleaning their denture in a commercially available denture cleanser.

A few drops of nystatin oral suspension can be added to the water used for soaking acrylic prostheses. However, most commercially available denture cleansers have some degree of antifungal activity. Dentures may be soaked in a sodium hypochlorite solution (1 tsp of sodium hypochlorite in a denture cup of water) for 15 min and thoroughly rinsed for at least 2 min under running water (longterm soaking of dentures in even a mild bleach solution will fade the pigment in the denture acrylic). Chlorhexidine gluconate and Listerine both exhibit antifungal activity.
**SYSTEMIC ANTIFUNGAL AGENTS**

Ketoconazole (Nizoral) and fluconazole (Diflucan) are effective and well-tolerated systemic drugs for mucocutaneous and oropharyngeal candidosis. They should be used with caution in patients with impaired liver function (a history of alcoholism or hepatitis). Liver function tests should be conducted periodically and/or monitored by the patient’s physician when ketoconazole is prescribed for an extended period. Diminishing response over time with fluconazole may indicate development of fungal resistance or the need to temporarily increase the medication dosage.

Rx: Nystatin (Mycostatin, Nilstat) oral suspension 100,000 U/mL
Disp: 240 mL.
Sig: Rinse with 5 mL four times daily for 3 min by the clock and expectorate.

Rx: Ketoconazole (Nizoral) tabs 200 mg.
Disp: 14 tabs.
Sig: Take 1 tab daily with a meal or orange juice. Do not take together with buffered medications or with gastric acid blockers.

Rx: Fluconazole (Diflucan) tabs 100 mg.
Disp: 15 tabs.
Sig: Take 2 tabs stat and then 1 tab daily until gone.

This is especially good for use in children because liquids are well tolerated and this medication is not toxic. If swallowed, less than 5% of this medication is absorbed systemically. This medication is of limited usefulness in the adult patient. Because of the high-sugar content, good oral hygiene must be reinforced.

Ketoconazole and fluconazole are potent inhibitors of cytochrome P-450 isoenzymes. These antifungal medications can significantly inhibit the hepatic metabolism of medications such as antihistamines, cholesterol-lowering medications, antihypertensive medications, warfarin compounds, and antiasthmatic medications that are primarily metabolized by this liver isoenzyme system. Toxic drug interactions have been reported with both ketoconazole and fluconazole; be sure to check appropriate pharmacology references. A new class of antifungal medications, Echinocandins, are available for I.V. administration to patients who are severely immunocompromised. The medications in the Echinocandin class include caspofungin, micafungin and anidulafungin.
3 Chapped/Cracked Lips

ETIOLOGY
Alternate wetting and drying of the lip surface result in inflammation and possible secondary infection.

CLINICAL DESCRIPTION
The surface of the vermilion border is rough and peeling and may be ulcerated with crusting (Figure 3-1).

RATIONALE FOR TREATMENT
To interrupt the irritating factors and allow healing.

**Rx:** Oral Balance Moisturizing Gel (OTC).
Disp: 42 g tube.
Sig: Apply to lips whenever necessary.

**Rx:** Betamethasone valerate (Valisone) oint 0.1%.
Disp: 15 g tube.
Sig: Apply to lips after meals and at bedtime.

Some contributing authors suggest that three times daily application of these treatments is sufficient.

Prolonged use of corticosteroids (greater than 2 wk) should be done cautiously to minimize the potential for side effects.

For maintenance, OTC lip care products such as Oral Balance, unflavored Chapstick, Vaseline, lanolin, or cocoa butter may be considered moisturizers. Avoid products containing desiccants, such as phenol or alcohol.

If the lesion(s) does not resolve with treatment, consider a biopsy to rule out dysplasia or malignant actinic changes.

**Rx:** Triamcinolone acetonide (Kenalog) 0.1%.
Disp: 15 g tube.
Sig: Apply to lips after meals and at bedtime.

**Rx:** Nystatin–triamcinolone acetonide (Mycolog II, Mytrex) oint.
Disp: 15 g tube.
Sig: Apply to lips after each meal and at bedtime.

FIGURE 3-1: Severely chapped lips in a patient sensitive to lipstick.
4 Cheilitis/Cheilosis (Actinic, Solar)

ETIOLOGY
Prolonged exposure to sunlight results in irreversible degenerative changes in the vermilion zone of the lips.

CLINICAL DESCRIPTION
The normal red translucent vermilion zone with regular vertical fissuring of a smooth surface is replaced by a white flat surface or an irregular scaly surface that may exhibit periodic ulceration (Figure 4-1).

FIGURE 4-1: Sun-induced damage of the lower lip that should be managed to rule out malignant change. Note the indistinct margin between the skin and the vermilion border.

RATIONALE FOR TREATMENT
Elimination of exposure to UV light. Educate patient regarding malignant potential because degenerative changes may progress to malignancy.

Rx: PreSun 15 lip get (OTC)
Disp: 15 oz.
Sig: Apply to lips 1 hr before sun exposure and every hour thereafter.

Several OTC sunscreen preparations are available (e.g., PreSun 15 or PreSun 30 lotion and lip gel). For those patients allergic to PABA, non-PABA sunscreens should be suggested. For patients who have had a history of a lip malignancy, a zinc oxide product should be used. Many over-the-counter lip products contain sunscreen with SPF 15 – SPF 30. Patients should be advised to use a sunscreen-containing lip protectant at all times when outdoors.

When the lesion persists, a biopsy is required to rule out dysplasia, carcinoma in situ, or squamous cell carcinoma.
Cheilitis/Cheilosis (Angular)

ETIOLOGY
Fissured lesions in the corners of the mouth are caused by a mixed infection of the microorganisms Candida albicans, staphylococci, and streptococci. Predisposing factors include excessive licking, drooling, a decrease in the intermaxillary space, anemia, vitamin deficiency immunosuppression, and an extension of oral infections.

CLINICAL DESCRIPTION
The commissures may appear wrinkled, red and fissured, cracked or crusted (Figure 5-1).

FIGURE 5-1: Cracking, erythema, and pseudomembrane formation of the labial commissures bilaterally in a patient with angular cheilitis.

RATIONALE FOR TREATMENT
Identification and correction of predisposing factors, elimination of primary and secondary infections, eradication of inflammation.

Rx: Nystatin–triadecinolone acetonide (Mycolog II, Mytrex) oint.
Disp: 15 g tube.
Sig: Apply to affected area after meals and at bedtime.

Rx: Polymyxin B/Bacitracin (Polysporin) oint (OTC).
Disp: 15 g tube.
Sig: Apply to affected area after meals and at bedtime.

Rx: Clotrimazole–betamethasone dipropionate (Lotrisone) crm.
Disp: 15 g tube.
Sig: Apply to affected area after each meal and at bedtime.

Rx: Hydrocortisone-iodoquinol (Vytone) crm 1%.
Disp: 15 g tube.
Sig: Apply to affected area after each meal and at bedtime.

Rx: Ketoconazole (Nizoral) crm 2%.
Disp: 15 g tube.
Sig: Apply sparingly to corners of mouth after each meal and at bedtime.

Rx: Clotrimazole (Gyne-Lotrimin, Mycelex-G) vaginal crm 1% (OTC).
Disp: One tube.
Sig: Apply sparingly to corners of mouth after each meal and at bedtime.

Rx: Miconazole (Monistat 7) nitrate vaginal crm 2% (OTC).
Disp: One tube.
Sig: Apply sparingly to corners of mouth after each meal and at bedtime.

Although some contributing authors disagree with the use of vaginal creams intraorally, their efficacy has been observed clinically in selected cases where other topical antifungal agents have failed.
6 Denture Sore Mouth

ETIOLOGY
Discomfort under oral prosthetic appliances may result from combinations of candidal infections, poor denture hygiene, an occlusive syndrome, and overextension or excessive movement of the appliance. This condition may be erroneously attributed to an allergy to denture material, which is a rare occurrence. This condition may also represent a pressure neuropathy owing to advanced mandibular alveolar resorption exposing the mental foramen.

The retention and fit of the denture should be idealized, and mechanical irritation should be ruled out.

CLINICAL DESCRIPTION
The tissue covered by the appliance, especially one made of acrylic, is erythematous and smooth or granular. It may be either asymptomatic or associated with burning (Figure 6-1).

FIGURE 6-1: Denture stomatitis in a patient who did not remove his upper denture prior to bedtime.

TREATMENT
1. Institute appropriate antifungal medication (see Chapter 2, “Candidosis”).
2. Improve oral and appliance hygiene. The patient may have to leave the appliance out for extended periods of time and should be instructed to leave the denture out overnight. The appliance should be soaked in a commercially available denture cleanser or soaked in a 1% sodium hypochlorite solution (1 tsp of sodium hypochlorite in a denture cup of water) for 15 min and thoroughly rinsed for at least 2 min under running water.
3. Reline, rebase, or fabricate a new appliance.
4. Apply an artificial saliva or oral lubricant gel, such as Laclede Oral Balance or Sage gel, to the tissue contact surface of the denture to reduce frictional trauma.

If all of the above fail to control symptoms, a biopsy or short trial of topical steroid therapy may be used to rule out contact mucositis (an allergic reaction to denture materials). If a therapeutic trial fails to resolve the condition, a biopsy should be performed to establish the diagnosis. If the patient’s differential diagnosis includes any condition that may be premalignant or malignant, a biopsy should be immediately procured to determine the definitive diagnosis for the lesion.

RATIONALE FOR TREATMENT
Therapy is directed toward controlling all possible etiologies and improving oral comfort. If therapy is ineffective, consider underlying systemic conditions, such as diabetes mellitus and poor nutrition.
7 Erythema Multiforme

ETIOLOGY
Erythema multiforme is believed to be an allergic condition. In many patients, erythema multiforme seems to be an autoimmune condition because an antigen cannot be identified. It may occur at any age. Drug reactions to medications such as penicillin and sulfonamides may play a role in some cases. It has been observed in a limited number of patients who develop oral erythema multiforme that a herpetic infection occurred immediately prior to the onset of clinical signs.

CLINICAL DESCRIPTION
Signs of erythema multiforme include “blood-crusted” lips, “targetoid” or “bull’s-eye” skin lesions, and a non-specific mucosal slough. The name multiforme is used because its appearance may take multiple different forms (Figures 7-1 to 7-3). A severe form of erythema multiforme is called Stevens Johnson syndrome or erythema multiforme major. Erythema multiforme as a skin disease occurs most frequently due to an allergic reaction. This condition may occur chronically or periodically in cycles.

RATIONALE FOR TREATMENT
Treatment is primarily anti-inflammatory in nature. Steroids are initiated and then tapered. Due to the possible relationship of erythema multiforme with herpes simplex virus, suppressive antiviral therapy may be necessary prior to initiation of steroid therapy. Patients should be carefully questioned about a previous history of recurrent herpetic infections as well as prodromal symptoms that might have preceded the onset of the erythema multiforme. Dosing must be titrated to specific situations.
### Steroid Therapy

**Rx:** Prednisone tablets 10 mg.
Disp: 100 tablets.
Sig: Take 6 tablets in the morning until lesions recede, then decrease by 1 tablet on each successive day. Do not exceed 14 days of therapy. If therapy exceeds 14 days, steroids should be tapered.

### Suppressive Antiviral Therapy

**Rx:** Acyclovir (Zovirax), 400 mg capsules.
Disp: Sufficient quantity.
Sig: Take 1 tablet 2 times daily.

**Rx:** Valacyclovir (Valtrex), 500 mg caplets.
Disp: Sufficient quantity.
Sig: Take 1 tablet 2 times daily.
8 Geographic Tongue (Benign Migratory Glossitis, Erythema Migrans)

ETIOLOGY
The etiology is unknown. Since its histologic appearance is similar to psoriasis, some have associated it with psoriasis. This may be purely coincidental. Oral lesions should not be associated with psoriasis if there are no cutaneous signs of this disorder. It has also been associated with Reiter’s syndrome and generalized atopy.

CLINICAL DESCRIPTION
A benign inflammatory condition caused by desquamation of superficial keratin and filiform papillae. It is characterized by both red, denuded, irregularly shaped patches of the tongue dorsum and lateral borders surrounded by a raised, white-yellow border (Figures 8-1 and 8-2).

RATIONALE FOR TREATMENT
Generally, no treatment is necessary because most patients are asymptomatic. When symptoms are present, they may be associated with secondary infection with Candida albicans (see “Candidosis, page 7”). Topical steroids, especially in combination with topical antifungal agents, are the treatment modality of choice. Patients must be told that this condition does not suggest a more serious disease and is not contagious. In most cases, biopsy is not indicated because of the pathognomonic clinical appearance. Some clinicians mix topical steroid ointments with equal parts of Orabase B paste to promote adhesion and prolong contact of the medication with the lesion being treated.

---

**Rx:** Nystatin–triamcinolone acetonide (Mycolog II, Mytrex) oint.
Disp: 15 g tube.
Sig: Apply to affected area after each meal and at bedtime.

---

**Rx:** Clotrimazole–betamethasone dipropionate (Lotrisone) crm.
Disp: 15 g tube.
Sig: Apply to affected area after each meal and at bedtime.

---

**Rx:** Betamethasone valerate (Valisone) oint, 0.1%.
Disp: 15 g tube.
Sig: Apply to affected area after each meal and at bedtime.

---

**Rx:** Nystatin oint.
Disp: 15 g tube.
Sig: Apply to affected area after each meal and at bedtime.

---

**FIGURE 8-1:** Geographic tongue of the tongue dorsum.

**FIGURE 8-2:** Close-up of geographic tongue of the tongue tip. Note the white, raised, irregular lesion border with central erythema and atrophy of the filiform lingual papillae.
9 Gingival Overgrowth

ETIOLOGY
Antiepileptic medications such as phenytoin sodium (Dilantin), calcium channel blocking agents (e.g., nifedipine, diltiazem, verapamil), and cyclosporine are drugs known to predispose some patients to gingival overgrowth, especially those with poor oral hygiene practices. Poor oral hygiene, blood dyscrasias, and hereditary fibromatosis should be ruled out by clinical history, family history, and laboratory tests.

CLINICAL DESCRIPTION
The gingival tissues, especially in the anterior region, are dense, resilient, nontender, and enlarged but essentially of normal color (Figure 9-1).

RATIONALE FOR TREATMENT
Local factors such as plaque and calculus accumulation contribute to secondary inflammation and the hyperplastic process. This, in turn, further interferes with plaque control. Specific drugs tend to deplete serum folic acid levels, which may result in compromised tissue integrity.

TREATMENT
- Meticulous plaque control.
- Gingivoplasty or gingivectomy when indicated and only after oral hygiene is optimal.
- When possible, replace calcium channel blockers, cyclosporine, or other implicated medications in consultation with the patient’s physician.
- Test for serum folate level and supplement folic acid if necessary. When testing for serum folate level, it is judicious to also check for the vitamin B12 level because a vitamin B12 deficiency can be masked by the patient’s use of folic acid supplement.
- Folic acid oral rinse.

Rx: Folic acid oral rinse 1 mg/mL.
Disp: 16 oz.
Sig: Rinse with 1 tbs (5 mL) for 2 min twice daily and expectorate.

Rx: Chlorhexidine gluconate (Peridex, PerioGard) oral rinse 0.12%.
Disp: 473 mL (16 oz).
Sig: Rinse with 15 mL twice for 30 seconds and spit out.
Avoid rinsing or eating for 30 min following treatment.
Rinse after breakfast and at bedtime.

FIGURE 9-1: Drug-induced (cyclosporine) gingival overgrowth.
10 Herpetic Gingivostomatitis (Primary Herpes)

ETIOLOGY
Infection with Herpes Simplex Virus (HSV) produces a disease that has a primary acute phase and a secondary or recurrent phase. Primary herpetic gingivostomatitis is a transmissible infection with HSV, usually type I or, less commonly, type II.

CLINICAL DESCRIPTION
Clear or yellowish vesicles develop intra- and extraorally. These rupture within hours and form shallow, painful ulcers. The gingivae are often red, enlarged, and painful (Figure 10-1). The patient may have systemic signs and symptoms, including regional lymphadenitis, fever, and malaise. Usually, it is self-limiting, with resolution in 10 to 14 days.

Systemic antiviral medications appear to be more effective if administered within the first 2 days of onset of symptoms. Topical steroid medications must be avoided because they tend to permit spread of the viral infection on mucous membranes, particularly ocular lesions. Patients should be cautioned to avoid touching the herpetic lesions and then touching the eye, genital, or other body areas because of the possibility of self-inoculation.

TOPICAL ANESTHETICS AND COATING AGENTS

**Rx:** Folic acid oral rinse 1 mg/mL.  
Disp: 16 oz.  
Sig: Rinse with 1 tbs (5 mL) every 2 h and spit out.

**Rx:** Dyclonine HCl throat loz (Sucrets) (OTC).  
Disp: 1 package.  
Sig: Dissolve slowly in mouth every 2 h as necessary.  
Do not exceed 10 lozenges per day.

**Rx:** Diphenhydramine (Children’s Benadryl) elix 12.5 mg/5 mL (OTC) 4 oz mixed with Kaopectate or Maalox (OTC) 4 oz (to make a 50% mixture by volume).  
Disp: 8 oz.  
Sig: Rinse with 1 tbs (5 mL) every 2 h and spit out.

When topical anesthetics are used, patients should be cautioned concerning a reduced gag reflex and the need for caution while eating and drinking to avoid possible airway compromise. Allergies are rare but may occur.

FIGURE 10-1: Primary herpetic gingivostomatitis in a child. Note the generalized erythema and edema of the gingival papillae.

RATIONALE FOR TREATMENT
Treatment should focus on early intervention with antiviral agents and relieving symptoms, preventing secondary infection, and supporting general health. Supportive therapy includes forced fluids, protein, vitamin and mineral food supplements, and rest.
SYSTEMIC ANTIVIRAL THERAPY

Acyclovir oral capsules may relieve and decrease the duration of symptoms. Acyclovir oral capsules must be initiated during the viral prodromal stage or this therapy will be ineffective.

<table>
<thead>
<tr>
<th>Rx:</th>
<th>Acyclovir (Zovirax) caps 200 mg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disp:</td>
<td>35 caps.</td>
</tr>
<tr>
<td>Sig:</td>
<td>Take 2 caps three times daily for 7 days.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Rx:</th>
<th>Valacyclovir (Valtrex) caplets 500 mg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disp:</td>
<td>20 caplets.</td>
</tr>
<tr>
<td>Sig:</td>
<td>Take 2 caplets twice daily for 5 days.</td>
</tr>
</tbody>
</table>

ANALGESICS

<table>
<thead>
<tr>
<th>Rx:</th>
<th>Acetaminophen tablets 325 mg (OTC).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disp:</td>
<td>1 btl.</td>
</tr>
<tr>
<td>Sig:</td>
<td>Take two tabs every 4 – 6 h when necessary for pain and fever. Do not exceed 4 g per 24 h period.</td>
</tr>
</tbody>
</table>

FOR MODERATE TO SEVERE PAIN

<table>
<thead>
<tr>
<th>Rx:</th>
<th>Acetaminophen 300 mg with codeine 30 mg (Tylenol No. 3).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disp:</td>
<td>20 tabs.</td>
</tr>
<tr>
<td>Sig:</td>
<td>Take 1 or 2 tabs four times daily for pain.</td>
</tr>
</tbody>
</table>

If the patient chooses to take only one tab of Tylenol No. 3 (30 mg of codeine), the patient should be instructed to take one regular-strength acetaminophen tab (Tylenol [OTC]) to ensure the administration of the recommended strength of acetaminophen.

NUTRITIONAL SUPPLEMENTS

<table>
<thead>
<tr>
<th>Rx:</th>
<th>Meritene (protein, vitamin, mineral food supplement) (OTC).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disp:</td>
<td>1 lb can (plain, vanilla, chocolate, and eggnog flavors).</td>
</tr>
<tr>
<td>Sig:</td>
<td>Take three servings daily. Prepare as indicated on the label. Serve cold.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rx:</th>
<th>Ensure Plus (P-V-M Food Supplement) (OTC).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disp:</td>
<td>Twenty cans.</td>
</tr>
<tr>
<td>Sig:</td>
<td>Three to five cans in divided doses throughout the day as tolerated. Serve cold.</td>
</tr>
</tbody>
</table>
ETIOLOGY
Reactivation of virus from latency in sensory ganglion of the trigeminal nerve. Precipitating factors include fever, stress, exposure to sunlight, trauma, and hormonal alterations.

CLINICAL DESCRIPTION
Intraoral* – single or small clusters of vesicles that quickly rupture, forming painful ulcers. The lesions usually occur on the keratinized tissue of the hard palate and gingiva at or near the sites of the original infection (Figure 11-1). Labialis* – clusters of vesicles on the lips and perioral region that rupture within hours and then crust (Figure 11-2).

RATIONALE FOR TREATMENT
Treatment should be initiated as early as possible in the prodromal stage with the objective of reducing the duration and symptoms of the lesion. Antiviral medications prophylactically as well as therapeutically may be considered when episodes are frequent (greater than six per year). Recurrent herpetic episodes interfere with daily function and nutrition. The current recommendation from the Food and Drug Administration is that systemic acyclovir be used to treat oral herpes only for immunocompromised patients. Valacyclovir has been approved for the prevention and management of oral recurrent herpes simplex infections.

PREVENTION
If a recurrence on the lips is usually precipitated by exposure to sunlight, the lesion may be prevented by the application to the area of a sunscreen with a high skin protection factor (SPF 15 or higher).

**FIGURE 11-1:** Recurrent intraoral herpes following a dental appointment. Note the localized distribution of the superficial lesions.

**FIGURE 11-2:** Recurrent herpes labialis. Note fluid-filled vesicles.

* In immunocompromised patients, herpes simplex virus lesions can occur on any mucosal surface and may have atypical appearances.

TOPICAL ANTIVIRAL AGENTS
Topical antiviral medications are most effective when initiated as early in the course of the episode as possible.
Patients should be instructed to dab on the medication as soon as prodromal symptoms are felt. These medications should be dabbed on, not rubbed in, to minimize mechanical trauma to the lesions. Patients should be instructed to apply the antiviral agent with a cotton-tip applicator.

**Rx:** Penciclovir (Denavir) cream 1%.
Disp: 2 g tube.
Sig: Dab on lesion every 2 hours during waking hours, for 4 days beginning when symptoms first occur.

**Rx:** Docosanol (Abreva) cream (OTC).
Disp: 2 g tube.
Sig: Dab on lesion 5 times daily during waking hours, for 4 days beginning when symptoms first occur.

**SYSTEMIC ANTIVIRAL THERAPY**
Systemic antiviral therapy is most effective when initiated as early in the course of the episode as possible. Patients should be instructed to take the systemic medication exactly as directed as soon as prodromal symptoms are felt. Total dosing is limited to 1 day.

Patients should be advised that viral lesions are infectious until they are healed and in a small subset of patients, for a few days after resolution. Transfer of saliva (e.g., kissing, sharing of eating utensils, etc.) should be avoided during this time.

**Rx:** Valacyclovir (Valtrex) caplets 500 mg.
Disp: 8 caplets
Sig: Take 4 caplets as soon as prodromal symptoms are recognized and then 4 caplets 12 hours later.
12 Herpes Zoster (Shingles)

ETIOLOGY
Herpes zoster (shingles) represents reactivation of VZV following previous infection with chickenpox. Precipitating factors include thermal, inflammatory, radiologic, and mechanical trauma, as well as immunosuppression.

CLINICAL DESCRIPTION
Usually painful segmental eruption of small vesicles that later rupture to form punctate or confluent ulcers (Figure 12-1). Acute herpes zoster follows a portion of the trigeminal nerve distribution in about 20% of the cases. It is rare in a young individual and found more commonly in the elderly patient.

RATIONALE FOR TREATMENT
Promptly initiate antiviral therapy to reduce the duration and symptoms of the lesions. Patients over 60 years of age are particularly prone to post herpetic neuralgia (PHN). In the absence of specific contraindications, consideration should be given to prescribing short-term, high-dose, corticosteroid prophylaxis for PHN in conjunction with oral antiviral therapy.

| Rx: Acyclovir (Zovirax) caps 800 mg. |
| Disp: 35 caps. |
| Sig: Take 1 cap five times daily for 7 days. |

| Rx: Valacyclovir (Valtrex) caplets 500 mg. |
| Disp: 50 caplets. |
| Sig: Take 2 caplets three times daily for 7 days. |

FIGURE 12-1: Herpes zoster of the skin, left lower lip, and tongue. Note that the lesions are strictly limited by the midline.
13 Lichen Planus

ETIOLOGY
It is postulated to be a chronic mucocutaneous autoimmune disorder with a genetic predisposition that may be initiated by a variety of factors, including emotional stress and hypersensitivity to drugs, dental products, or foods.

CLINICAL DESCRIPTION
Lichen planus varies in clinical appearance. Oral forms of this disorder include lacy white lines representing Wickham’s striae (reticular), an erythematous form (atrophic), and an ulcerating form that is often accompanied by striae peripheral to the ulceration (ulcerative) (Figure 13-1). The lesions are commonly found on the buccal mucosa, gingiva, and tongue but can be found on the lips and palate. Lichen planus lesions are chronic and may also affect the skin (Figure 13-2). The dental and medical literature remains controversial as to whether certain forms of lichen planus transform into malignant neoplasia. Therefore, any persistent or refractory lesion(s) should be biopsied to establish a definitive diagnosis and to rule out a malignancy.

RATIONALE FOR TREATMENT
To provide oral comfort if the lesions are symptomatic. There is no known cure. Systemic and local relief with anti-inflammatory and immunosuppressant agents is indicated. Identification of any dietary component, dental product, or medication (lichenoid drug reaction) should be undertaken to ensure against a hypersensitivity reaction. Treatment or prevention of a secondary fungal infection with a systemic antifungal agent should also be

FIGURE 13-1: Clinical types of lichen planus.
A – Reticular lichen planus. Note the striae of Wickham.
B – Atrophic lichen planus of the gingivae. Note the erythema of the free gingival margins even though the patient’s plaque control appears adequate.
C – Severe atrophic lichen planus of the left buccal mucosa. Note the atrophy of the buccal mucosa when compared with A.
D – Ulcerative lichen planus of the tongue. Note the frank ulceration of the tongue dorsum.
considered. Therapies with steroids and immunomodulating drugs are presented to inform the clinician that such modalities are available. Because of the potential for side effects, close collaboration with the patient’s physician is recommended when these medications are prescribed. These modalities may be beyond the scope of clinical experience of general dentists, and referral to a specialist in oral medicine or to an appropriate physician may be necessary.

**TOPICAL STEROIDS**

**Rx**: Fluocinonide (Lidex) gel 0.05%.  
Disp: 30 g tubes  
Sig: Coat the lesion with a thin film after each meal and at bedtime.

**Rx**: Dexamethasone elixir 0.5mg/5mL.  
Disp: 100 mL.  
Sig: Rinse with 1 tsp (5 mL) for 2 min four times daily and spit out. Discontinue when lesions become asymptomatic.

Other topical steroid preparations (cream, gel ointment) include the following:

**Ultrapotent**  
Clobetasol propionate (Temovate) 0.05%  
Halobetasol propionate (Ultravate) 0.05%

**Potent**  
Fluticasone propionate (Cutivate) 0.05%  
Dexamethasone 0.5 mg/5 mL  
Fluocinonide (Lidex) 0.05%

**Intermediate**  
Aclometasone dipropionate (Aclovate) 0.05%  
Betamethasone valerate (Valisone) 0.1%  
Triamcinolone acetonide (Kenalog) 0.1%

**Low**  
Hydrocortisone probutate (Pandel) 0.1%  
Hydrocortisone 1%

Mixing any of the above topical steroid ointments with equal parts of Orabase B paste promotes adhesion and prolongs contact of the medication with the lesion being treated.

Prolonged use of topical steroids (greater than 2 weeks continuous use) may result in mucosal atrophy and secondary candidosis and increase the potential of systemic absorption. It may be necessary to prescribe antifungal therapy with steroids. Therapy with topical steroids, once the lichen planus is under control, should be tapered to alternate-day therapy or less depending on disease control and tendency to recur.

Oral candidosis may result from topical steroid therapy. The oral cavity should be monitored for emergence of fungal infection on patients who are placed on therapy. Prophylactic antifungal therapy should be initiated in patients with a history of fungal infections with previous steroid administration (see Chapter 2, “Candidosis”).

**SYSTEMIC STEROIDS AND IMMUNOSUPPRESSANTS**

**Rx**: Dexamethasone elixir 0.5mg/5mL.  
Disp: 320 mL.  
Sig: As directed in writing not to exceed 2 continuous weeks.

**Directions for using dexamethasone elixir:** Rinse for 1 min by the clock, four times daily, after meals and before bedtime. Do not drink or eat for 30 min after rinsing with dexamethasone elixir. Discontinue medication when lesions resolve.

- For 3 days, rinse with 1 tbsp (15 mL) four times daily and swallow. Then,  
- For 3 days, rinse with 1 tsp (5 mL) four times daily and swallow. Then,  
- For 3 days, rinse with 1 tsp (5 mL) four times daily and swallow every other time. Then,  
- Rinse with 1 tsp (5 mL) four times daily and expectorate.

If oral discomfort recurs, the patient should return to the clinician for reevaluation.

Therapy with medications such as systemic steroids, immunosuppressants, and immunomodulators is presented to inform the clinician that such modalities have been reported effective for patients suffering from ulcerative lichen planus (Figure 13-2). Medications such as azathioprine, mycophenolate mofetil, tacrolimus, pimecrolimus, hydroxychloroquine-sulfate, acitretin, and cyclosporine are used to treat patients with severe persistent ulcerative lichen planus but should not be
routinely used because of the potential for side effects. Close collaboration with the patient’s physician is recommended when these medications are prescribed.

Topical tacrolimus, and to a lesser degree, pimecrolimus, have been associated with neoplastic disease, such as lymphoma, and, therefore, should not be used indiscriminately for long periods of time. These medications are indicated for patients who cannot tolerate or are refractory to topical or systemic steroid therapy. All patients with lichen planus must be periodically followed for control of discomfort and to ensure against the very low risk of malignant transformation.

**Rx:** Tacrolimus 0.1% oint.
Disp: 30g tube.
Sig: Apply to affected site(s) twice daily as directed.

**Rx:** Prednisone tabs 10 mg.
Disp: 26 tabs.
Sig: Take 4 tabs in the morning for 5 days and then decrease by 1 tab on each successive day.

**Rx:** Prednisone tabs 5 mg.
Disp: 40 tabs.
Sig: Take 5 tabs in the morning for 5 days and then 5 tabs in the morning every other day until gone.

**FIGURE 13-2:** A 66-year-old male patient with lichen planus for a duration of 1 year. A, Lesions prior to treatment; B, lesions controlled after 10 days with systemic steroids.
14 Management of Patients Receiving Antineoplastic Agents and Radiation Therapy

ETIOLOGY
Head and neck radiation treatment of oral cancer can reduce saliva volume and alter composition when a major salivary gland is in the primary radiation field. Oral tissue delivery of multiple antimicrobial components of saliva, including histatins, lactoferrin, and lysozyme, is typically decreased. The balance of oral flora is then disrupted, allowing overgrowth of opportunistic organisms, such as Candida albicans. Advances over the past several years, including salivary gland protection during radiation dosing (via amifostine) and/or saliva stimulant (secretogogue) intervention (via pilocarpine hydrochloride or cevimeline), have helped reduce the morbidity associated with long-term salivary gland hypofunction in these patients.

Patients receiving anticholinergic medications during high-dose chemotherapy may also experience salivary compromise. However, glandular function tends to return to normal in the weeks following discontinuation of these medications.

Cytotoxic cancer therapy can also impair normal, rapidly dividing cells, including those of the oral mucosa. This can result in painful, ulcerative oral mucositis with important clinical consequences. One drug, palifermin, is approved by the FDA for reducing the severity of oral mucositis in patients with hematologic malignancies who are receiving a bone marrow transplant. Other drugs for mucositis management are in development but are not FDA approved at this time for use outside a research environment. The information listed below is intended to assist the practicing dentist in the management of oncology patients once they are in an outpatient setting.

CLINICAL DESCRIPTION
The oral mucosa becomes red, inflamed, and/or ulcerated. The saliva may be viscous or absent (Figure 14-1).

RATIONALE FOR TREATMENT
The treatment of these patients is symptomatic and supportive and should be aimed at patient comfort and education, maintenance of proper nutrition and oral hygiene, and prevention of opportunistic infection. Frequent monitoring and close cooperation with the patient’s physician are important.

All patients must have a preradiation therapy oral evaluation to eliminate any source of infection. Whenever possible, 14 days of oral healing time should be allowed prior to initiation of radiation therapy following oral surgical procedures. Oral hygiene is of paramount importance prior to, during, and after radiation therapy.

The oral discomfort may be relieved with topical anesthetics such as lidocaine HCl (Xylocaine) viscous, diphenhydramine elixir (Benadryl), and throat lozenges containing dyclonine HCl. Artificial salivas (eg, Sage Moist Plus, Moi-Stir, Salivart) will reduce oral dryness. Mouth moisturizing gels such as Laclede Oral Balance Gel are helpful. Nystatin and clotrimazole preparations will control fungal overgrowth. Chlorhexidine rinses help control plaque and candidosis. Fluorides are applied for caries control (denti-frices, gels, rinses).
MOUTH RINSES (See Chapter 18, “Xerostomia [Reduced Salivary Flow and Dry Mouth]”)

**Rx:** Alkaline saline (salt/bicarbonate) mouthrinse.
Disp: Mix ½ tsp each of salt and baking soda in 16 oz of water.
Sig: Rinse with copious amounts at least five times daily.

Commercially available as Sage Salt & Soda Rinse.

GINGIVITIS CONTROL

**Rx:** Chlorhexidine gluconate (Peridex, PerioGard) 0.12%.
Disp: 473 mL (16 oz).
Sig: Rinse with 15 mL twice for 30 seconds and spit out.
  Avoid rinsing or eating for 30 min following treatment.
  Rinse after breakfast and at bedtime.

In xerostomic patients, chlorhexidine gluconate should be used concurrently with artificial saliva to provide the needed protein-binding agent for efficacy and substantivity.

Caries Control (See Chapter 18)

**Rx:** Neutral NaF gel (Thera-Flur-N) 1.1% or PreviDent 1.1%.
Disp: 1 tube.
Sig: Place 1 inch ribbon on toothbrush; brush for 2 min daily and expectorate. Avoid rinsing or eating for 30 min following treatment.

TOPICAL COATING AGENTS AND ANESTHETICS

**Rx:** Sucralfate (Carafate) suspension 1 g/ 10 mL.
Disp: 420 mL (14 oz).
Sig: Rinse with 1 tbs (5 mL) every 2 h and spit out.

**Rx:** Diphenhydramine (Children’s Benadryl) elix 12.5 mg/5 mL (OTC) 4 oz mixed with Kaopectate or Maalox (OTC) 4 oz (to make a 50% mixture by volume).
Disp: 8 oz.
Sig: Rinse with 1 tbs (5 mL) every 2 h and spit out.

**Rx:** Dyclonine HCl throat loz (Sucrets) (OTC).
Disp: 1 package.
Sig: Dissolve slowly in mouth every 2 h as necessary. Do not exceed 10 lozenges per day.

When topical anesthetics are used, patients should be cautioned concerning a reduced gag reflex and the need for caution while eating and drinking to avoid possible airway compromise.

ANTIFUNGAL AGENTS (See Chapter 2, “Candidosis”)

SALIVA STIMULANTS (See Chapter 18, “Xerostomia [Reduced Salivary Flow and Dry Mouth]”)

15 Pemphigus Vulgaris and Mucous Membrane Pemphigoid

These are relatively uncommon conditions. They should be suspected when there are chronic, multiple oral ulcerations and a history of oral and skin blisters. Often, they occur only in the mouth. Diagnosis is based on the history and the histologic and immunofluorescent characteristics of a biopsy of the primary lesion.

ETIOLOGY
Both are autoimmune diseases with autoantibodies against antigens appearing in different portions of the epithelium (mucosa). In pemphigus, the antigens are within the epithelium (desmosomes), whereas in pemphigoid, the antigens are located at the base of the epithelium in the hemidesmosomes.

CLINICAL CHARACTERISTICS
In pemphigus, the lesion may stay in one location for a long period of time with small flaccid bullae. The bullae may rupture, leaving an ulcer. Approximately 80 to 90% of the patients have oral lesions. In approximately two-thirds of patients, the oral manifestations are the first sign of the disease. All parts of the mouth may be involved (Figure 15-1). The bullae rupture almost immediately in the mouth but may stay intact for some time on the skin. One of the classic signs, Nikolsky’s sign (blister formation induced with gentle rubbing of a normal, perilesional mucosal site), is positive in pemphigus but is not pathognomic because it may be observed in other disorders. Because the vesicle or bulla is intraepithelial, it is often filled with clear fluid. Histologically, there is a cleavage (Tzanck cells, acantholytic cells) within the spinous layer of the epithelium.

In pemphigoid, the cleavage or split is beneath the epithelium, resulting in bullae that are usually blood filled. Mucous membrane pemphigoid is often limited to the oral cavity, but some patients have ocular lesions (symblepharon, ankyloloblepharon) that require evaluation by an ophthalmologist. The gingiva is the most common oral site involved (Figure 15-2). Pemphigoid may appear clinically as a red, nonulcerated gingival lesion. Patients should be queried with regard to ocular or pharyngeal involvement.

RATIONALE FOR TREATMENT
Since both pemphigus and pemphigoid are autoimmune disorders, the primary treatment is topical or systemic steroids or other immunomodulating drugs. Pemphigus

FIGURE 15-1: Pemphigus vulgaris of the buccal mucosa and hard palate. Note the extensive distribution of these superficial erosive lesions.

FIGURE 15-2: Mucous membrane pemphigoid of the gingivae. Note the intact blood-filled bullous lesions of the gingivae.
requires the use of systemic medications. Custom trays may be used to localize topical steroid medications on the gingival tissues (occlusive therapy). Please see Chapter 13 for topical medication recommendations. Because they can resemble other ulcerative-bullous diseases, a biopsy is necessary for a definitive diagnosis. Specimens should be submitted for light microscopic, immunofluorescent, and immunologic testing. Because of the potential serious nature, referral to specialists in oral medicine, dermatology, otorhinolaryngology, and ophthalmology must be considered. When ocular lesions are present, an ophthalmologist must be consulted immediately to prevent blindness.

Therapy with medications such as systemic steroids, immunosuppressants, and immunomodulators is presented to inform the clinician that such modalities have been reported effective for patients suffering from vesiculobullous disorders such as pemphigus vulgaris and mucous membrane pemphigoid. Therapies such as dapsone, methotrexate, mycophenolate mofetil, cyclosporine, niacinamide with tetracycline, and plasmapheresis are used to treat patients with vesiculobullous disorders such as pemphigus vulgaris and mucous membrane pemphigoid but should not be routinely used because of the potential for side effects. Close collaboration with the patient’s physician is recommended when these medications are prescribed.
16 Recurrent Aphthous Stomatitis

ETIOLOGY
An altered local immune response is the predisposing factor. Patients with frequent recurrences should be screened for diseases such as anemia, diabetes mellitus, vitamin deficiency, inflammatory bowel disease, and immunosuppression. Precipitating factors include stress, trauma, allergies, and endocrine alterations, as well as dietary components, such as acidic foods and juices and foods that contain gluten. Inspect the oral cavity closely for sources of trauma.

CLINICAL DESCRIPTION
Minor aphthae (canker sore): < 0.5 cm, small, shallow, painful ulceration covered by a gray membrane and surrounded by a narrow erythematous halo (Figure 16-1A and 1B). They usually occur on nonkeratinized (moveable) oral mucosa. These lesions heal without scarring. Minor aphthae are the most commonly occurring lesions of recurrent aphthous stomatitis.

Major aphthae: > 0.5 cm, large, painful ulcers. Major aphthae represent a more severe form of recurrent aphthous stomatitis that may last from 6 weeks to 3 months (Figure 16-1C). Healing may result in mucosal scarring. These ulcerations may mimic other diseases, such as granulomatous or malignant lesions.

Herpetiform ulcers: crops of small, shallow, painful ulcers (Figure 16-1D). They may occur anywhere on nonkeratinized mucosal tissues.

FIGURE 16-1: Clinical types of recurrent aphthous ulceration.
A – Minor aphthous ulcerations of the tongue and soft palate. Note the round to ovoid shape of these lesions and their occurrence on nonkeratinized tissues.
B – Minor aphthous ulceration on the lateral border of the tongue in a child.
C – Major aphthous ulceration on the floor of the mouth.
D – Herpetiform aphthous ulcerations of the floor of the mouth. Note that the distribution is limited to nonkeratinized mucosal tissues.
tinzized oral mucosa and resemble recurrent, intraoral herpes simplex infection clinically but are of unknown etiology.

**RATIONALE FOR TREATMENT**
Effective treatment involves barriers, cauterization, topical or systemic corticosteroids, and immunosuppressant or combination therapy when indicated. Treatment should be initiated as early in the course of the lesions as possible. Identification and elimination of precipitating factors may serve to minimize recurrent episodes. Medications such as mycophenolate mofetil, pentoxifylline, colchicine, and thalidomide are used to treat patients with severe, persistent recurrent aphthous ulcers (RAU) but should not be routinely used. Mixing topical steroid ointments with equal parts of Orabase B paste promotes adhesion and prolongs contact of the medication with the lesion being treated.

**NONSTEROIDAL TOPICAL PREPARATIONS**
Therapies with steroids and immunomodulating drugs are presented to inform the clinician that such modalities are available. Because of the potential for side effects, close collaboration with the patient’s physician is recommended if these medications are prescribed. These modalities may be beyond the scope of clinical experience of general dentists, and referral to a specialist in oral medicine or to an appropriate physician may be necessary.

**TOPICAL STEROIDS**

**Rx:** Dexamethasone elixir 0.5mg/5mL.
Disp: 100 mL.
Sig: Rinse with 1 tsp (5 mL) for 2 min four times daily and expectorate. Discontinue when lesions become asymptomatic.

**Rx:** Triamcinolone acetonide (Kenalog) in Orabase 0.1%.
Disp: 5 g tube.
Sig: Coat the lesion with a thin film after each meal and at bedtime.

Other topical steroid preparations (cream, gel ointment) include the following:

**Ultrapotent**
- Clobetasol propionate (Temovate) 0.05%
- Halobetasol propionate (Ultravate) 0.05%

**Potent**
- Fluticasone propionate (Cutivate) 0.05%
- Dexamethasone 0.5 mg/5 mL
- Fluocinonide (Lidex) 0.05%

**Intermediate**
- Aclometasone dipropionate (Aclovate) 0.05%
- Betamethasone valerate (Valisone) 0.1%
- Triamcinolone acetonide (Kenalog) 0.1%

**Low**
- Hydrocortisone probutate (Pandel) 0.1%
- Hydrocortisone 1%

Mixing any of the above topical steroid ointments with equal parts of Orabase B paste promotes adhesion and prolongs contact of the medication with the lesion being treated.

Prolonged use of topical steroids (greater than 2 weeks continuous use) may result in mucosal atrophy and secondary candidosis and increase the potential of systemic absorption. Their chronic use is discouraged. It may be necessary to prescribe antifungal therapy with steroids.

Oral candidosis may result from topical steroid therapy. The oral cavity should be monitored for emergence of fungal infection on patients who are placed on therapy. Prophylactic antifungal therapy should be initiated in patients with a history of fungal infections with previous steroid administration (see Chapter 2, “Candidosis”).

**SYSTEMIC STEROIDS AND IMMUNOSUPPRESSANTS**

**Rx:** Dexamethasone elixir 0.5mg/5mL.
Disp: 320 mL
Sig: As directed in writing not to exceed 2 continuous weeks.

Directions for using dexamethasone elixir:
Rinse for 1 min by the clock, four times daily, after meals and before bedtime. Do not drink or eat for 30 min after rinsing with dexamethasone elixir. Discontinue medication when lesions resolve.

- For 3 days, rinse with 1 tbsp (15 mL) four times daily and swallow. Then,
- For 3 days, rinse with 1 tsp (5 mL) four times daily and swallow. Then,
For 3 days, rinse with 1 tsp (5 mL) four times daily and swallow every other time. Then,
• Rinse with 1 tsp (5 mL) four times daily and expectorate.

Rx: Prednisone tabs 5 mg.
Disp: 40 tabs.
Sig: Take 5 tabs in the morning for 5 days and then 5 tabs in the morning every other day until gone.

For very severe cases,

Rx: Prednisone tabs 10 mg.
Disp: 26 tabs.
Sig: Take 4 tabs in the morning for 5 days and then decrease by 1 tab on each successive day until gone.

Therapy with medications such as systemic steroids, immunosuppressants, and immunomodulators is presented to inform the clinician that such modalities have been reported effective for patients suffering from severe, persistent, recurrent aphthous stomatitis. Medications such as azathioprine, pentoxifylline, levamisole, colchicine, dapsone, and thalidomide are used to treat patients with severe, persistent recurrent aphthous stomatitis but should not be routinely used because of the potential for side effects. Close collaboration with the patient’s physician is recommended when these medications are prescribed.
17 Taste and Smell Disorders (Chemosensory Disorders)

ETIOLOGY
Taste acuity may be affected by medications and by neurologic and physiologic changes. Complaints of taste loss should be differentiated from alterations in flavor perception, which is primarily derived from smell. Clinical examination and diagnostic procedures may identify potential etiologic factors such as nasal sinus disease (nasal polyps), viral infection, oral candidosis, neoplasia, malnutrition, metabolic disturbances, chemical and physical trauma, drugs, and radiation sequelae. In some patients, anxiety or depression might be considered. Quantitative tests that assess salivary flow and the patient’s ability to identify and discriminate odorants and taste stimuli may be useful. Laboratory studies for trace elements may be necessary to identify any existing deficiencies.

RATIONALE FOR TREATMENT
A reduction in salivary flow may concentrate electrolytes in the saliva, resulting in a salty or metallic taste (dysgeusia) (see Chapter 18, “Xerostomia [Reduced Salivary Flow and Dry Mouth]”). Several medications, including angiotensin-converting enzyme inhibitors and lithium carbonate, are known to cause taste alterations. It may be prudent to contact the patient’s physician to substitute these medications when practical. Oral hygiene must be optimal because patients may compensate for changes in taste or flavor acuity by overusing sugars. A deficiency of zinc, albeit rare, has been associated with a loss of taste (and smell) sensation. To prevent deficiency, the current recommended dietary allowance for zinc is 12 to 15 mg for adults. Additional zinc supplementation should be reserved for individuals with true deficiency states.

TO ENSURE DIETARY ALLOWANCE FOR ZINC

Rx: Z-BEC tabs (OTC).
Disp: 60 tabs.
Sig: Take 1 tab daily with food or after meals.

Rx: Zinc gluconate lozenges (OTC).
Disp: 48 lozenges.
Sig: Dissolve, by mouth, 1-2 lozenges daily.
Xerostomia (Reduced Salivary Flow And Dry Mouth)

ETIOLOGY
Acute or chronic salivary flow alterations or xerostomia may result from drug therapy, mechanical blockage, dehydration, emotional stress, bacterial infection of the salivary glands, local surgery, avitaminosis, diabetes, anemia, connective tissue diseases, Sjögren’s syndrome, radiation therapy, viral infections, and certain congenital disorders.

CLINICAL DESCRIPTION
The saliva may be ropey, with a film forming over the teeth. The tissue may be dry, pale or red, and atrophic. The tongue may be devoid of papillae, atrophic, fissured, and inflamed. Multiple carious lesions may be present, especially at the gingival margin and on exposed root surfaces (Figure 18-1). The quantity and the quality of saliva may be altered.

SALIVA SUBSTITUTES

Rx: Sodium carboxymethylcellulose 0.5% aqueous solution (OTC).
Disp: 8 fl oz.
Sig: Use as a rinse as frequently as needed. Generic carboxymethylcellulose solutions may be prepared by a pharmacist.

Plain water in a small plastic bottle is often used with success by many xerostomic patients.

COMMERCIAL SALIVA SUBSTITUTES (OTC)
- Glandosane
- Moi-Stir
- Mouth Kote
- Oasis
- Roxane Saliva Substitute
- Sage Moist Plus
- Salivart
- Ask your pharmacist

COMMERCIAL ORAL MOISTURIZING GELS (OTC)
- Laclede Oral Balance
- Sage Mouth Moisturizer

Relief from oral dryness and accompanying discomfort can be achieved conservatively by
- Sipping water frequently all day long
- Letting ice melt in the mouth
- Restricting caffeine and cola intake
- Avoiding mouth rinses, drinks, and medications containing alcohol
- Avoiding tobacco products
- Humidifying the sleeping area
- Coating the lips (see Chapter 3, “Chapped/Cracked Lips”)
SALIVA STIMULANTS

The use of sugar-free gum, lemon drops, or mints is a conservative method to temporarily stimulate salivary flow in patients with medication-induced xerostomia or with salivary gland dysfunction. Patients should be cautioned against using products that contain sugar or have a low pH.

**Rx:** Biotene Dry Mouth Gum (OTC).
Disp: 1 package.
Sig: Chew as needed

Owing to problems of abrasion of the mucosa under the denture and potential adhesion of the gum to the denture, use caution if the patient wears removable dentures.

**Rx:** Pilocarpine HCl (Salagen) tabs 5 mg.
Disp: 21 tabs.
Sig: Take 1 tab three times daily 30 min prior to meals.
Dose may be titrated to 2 tabs three times daily.

Some contributing authors recommend using 1 tab of pilocarpine four to five times daily.

**Rx:** Cevimeline (Evoxac) caps 30 mg.
Disp: 21 caps.
Sig: Take 1 cap three times daily.

**Rx:** Pilocarpine HCl sol 1 mg/mL.
Disp: 100 mL.
Sig: Take 1 tsp (5 mL) four times daily.

**Rx:** Bethanechol (Urecholine) tabs 25 mg.
Disp: 30 tab.
Sig: Take 1 tab up to 5 times daily.

Cholinergic drugs should be prescribed in consultation with the physician-of-record or specialist owing to significant side effects. The pilocarpine and cevimeline dosage should be adjusted to increase saliva while minimizing the adverse side effects (e.g., sweating, stomach upset). Patients should be warned that there is a wide range of sensitivity and that the adverse side effects may exceed the desired increased salivation; if this occurs, then the cholinergic drug should be discontinued.

CARIES PREVENTION

**Rx:** Fluoride gel (see examples below).
Disp: 1 tube.
Sig: Place a 1-inch ribbon in a custom tray; apply for 5 min daily. Avoid rinsing or eating for 30 min following treatment.

**Rx:** Fluoride gel (see examples below).
Disp: 1 tube.
Sig: Place a 1-inch ribbon on a toothbrush; brush for 2 min daily and expectorate. Avoid rinsing or eating for 30 min following treatment.

Fluoride gels available are shown in Table 18-1.

<table>
<thead>
<tr>
<th>0.4% Stannous Fluoride</th>
<th>1.1% Neutral or Acidulated Na Fluoride</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aclean Home Care gel</td>
<td>ControlRx</td>
</tr>
<tr>
<td>Alpha-Dent</td>
<td>Denti-Care</td>
</tr>
<tr>
<td>Gel-Kam</td>
<td>FluideX</td>
</tr>
<tr>
<td>Gel-Tin</td>
<td>FluorSHIELD</td>
</tr>
<tr>
<td>Omnii Gel</td>
<td>NeutraCare</td>
</tr>
<tr>
<td>Perfect Choice</td>
<td>NeutraGard</td>
</tr>
<tr>
<td>Plak Smacker</td>
<td>PreviDent gel</td>
</tr>
<tr>
<td>Periocheck Oral Med</td>
<td>Pro-DenRx</td>
</tr>
<tr>
<td>Stop</td>
<td>Topex</td>
</tr>
<tr>
<td>Super-Dent</td>
<td></td>
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<tr>
<td>Take Home Care</td>
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</tbody>
</table>

**Rx:** PreviDent 1.1% gel.
Disp: 1 tube.
Sig: Place a 1-inch ribbon in a custom tray; apply for 5 min daily. Avoid rinsing or eating for 30 min following treatment.

**Rx:** Thera-Flur-N 1.1% gel.
Disp: 1 tube.
Sig: Place a 1-inch ribbon on a toothbrush; brush for 2 min daily and expectorate. Avoid rinsing or eating for 30 min following treatment.
**Rx:** Neutral NaF 1.1% dental crm. PreviDent 5000 Plus toothpaste.
Disp: 1 tube.
Sig: Place a 1-inch ribbon on a toothbrush; brush for 2 min daily and expectorate. Avoid rinsing or eating for 30 min following treatment.

When the taste of acidulated fluoride gels is poorly tolerated or when there is etching of ceramic restorations, neutral pH sodium fluoride gel 1% (Thera-Flur-N, PreviDent) should be considered. FDA regulations have limited the size of bottles of fluoride owing to toxicity if ingested by infants. Since most preparations do not come in childproofed bottles, the sizes of topical fluoride preparations vary; 24 mL is approximately a 2-week supply for application to a full dentition in custom carriers.

Xerostomia, reduced salivary flow, and dry mouth provide an excellent environment for the overgrowth of Candida albicans. The patient is likely to require treatment for candidiasis along with the treatment for dry mouth. Refer to Chapter 2, “Candidosis.” In a dry oral environment, plaque control becomes more difficult. Meticulous oral hygiene is essential.
Supportive Care

Management of oral mucosal conditions may require topical and/or systemic interventions. Therapy should address patient nutrition and hydration, oral discomfort, oral hygiene, management of secondary infection, identification of possible drug interactions, and local control of the disease process. Depending on the extent, severity, and location of oral lesions, consideration should be given to obtaining a consultation from a dentist who specializes in oral medicine, oral pathology, or oral surgery. When there is a question involving a medical condition, a physician should be consulted.

Symptomatic relief of painful conditions can be provided with topical preparations such as 2% viscous lidocaine hydrochloride or dyclonine hydrochloride throat lozenges (OTC). Topical anesthetics can be used as a rinse in adults but should be applied with a cotton swab in a child so that the child does not swallow the medication. Swallowing these anesthetics is contraindicated, in part, because they may interfere with the patient’s gag reflex. Symptomatic relief can also be obtained by mixing equal parts of diphenhydramine hydrochloride elixir and magnesium hydroxide or aluminum hydroxide. Children’s formula diphenhydramine hydrochloride elixir does not contain alcohol. Sucralfate suspension may also be used prior to meals. The diphenhydramine mixture and the sucralfate suspension coat the ulcerated lesions and may allow the patient to eat more comfortably.

Mouth rinses containing a hydroalcoholic vehicle should be avoided because of the oral discomfort that will result from their use. The amount of oral discomfort experienced by patients with oral mucosal lesions varies and can often be controlled without the use of narcotic analgesics. Non-narcotic analgesics are often helpful.

Meticulous oral hygiene is absolutely mandatory for these patients. Mucosal lesions contacting bacterial plaque present on the dentition are more likely to become secondarily infected. Patients should be seen by the dentist or hygienist for scaling and root planing, under local anesthesia when necessary, in all cases in which oral hygiene is suboptimal. Patients must be encouraged to brush and floss their teeth after meals in a gentle yet efficient manner. Placing a soft toothbrush under hot water to further soften the bristles may enhance this. Tartar control toothpastes containing calcium pyrophosphate should be avoided because of their irritating nature and reported involvement in circumoral dermatitis. Furthermore, peroxide-based bleaching agents may be associated with tooth sensitivity and irritation of soft tissues, particularly the gingiva.
References


REFERENCES


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