

Gum Gardeners Dental Hygiene Study Club
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Diagnosis and Management of the Burning Mouth

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Burning Mouth Syndrome vs. Symptoms

Burning Mouth Syndrome BMS

- Primary BMS- idiopathic burning symptoms
- Secondary BMS- burning symptoms due to one or more identifiable causes
- To avoid confusion, best to use “syndrome” only for symptoms with no identifiable cause

Burning Mouth Symptoms Local Causes

- Candidiasis
- Viral infection
- Geographic and/or fissured tongue
- Allergies
- Mucositis
 - Lichen planus
 - Lichenoid mucositis
 - Aphthous stomatitis
 - Other
- Xerostomia
- Mouth breathing
- Mechanical trauma
- Parafunctional habits
- Trigeminal neuralgia
- Peripheral nerve damage
- Burning mouth syndrome

Burning Mouth Symptoms Systemic Causes

- Hematologic disorders
- Nutritional deficiencies
 - Vitamin B₁, B₂, B₁₂, niacin, folic acid, iron
- Diabetes mellitus
- Hypothyroidism
- CNS disorder
- Vascular disorder
- Psychiatric disorder
 - Anxiety
 - Stress
 - Depression
- AIDS
- Sjögren's syndrome
- Menopause/Estrogen deficiency??
- Food or drug allergies
- Medication side effect
 - ACE inhibitors
- Gastric disorder
 - GERD
 - Chronic gastritis

Evaluation of Burning Mouth

- History
- Clinical examination
- Cytologic preparations
 - Evaluate for candidiasis
- Blood studies
- Other studies as indicated

Medical History

- Diagnosed medical conditions
- Undiagnosed symptoms
- Surgical history
- Medications
 - Current
 - Recent

Dental History

- Patterns of dental care
- Recent dental treatment
- Protheses
 - Patterns of use
 - Care
- Oral habits
- Homecare products
 - Toothpaste
 - Tarter control
 - Whitening agents
 - Cinnamon flavor
 - Herbal ingredients
 - Mouthwash
 - Alcohol content
 - Cinnamon flavor
 - Herbal ingredients

Social/Behavioral History

- Tobacco use
- Alcohol use
- Recreational drug use
- High-risk behavior for HIV infection
- Parafunctional habits
- Cinnamon exposure (gum, candy...)
- Nutritional habits
- Living situation
- Other...

History of Condition

- Duration
- Onset
 - How rapidly
 - Associated with any event
- Recurrence
 - Frequency of episodes
 - Duration of episodes
 - Triggers
- Previous treatments and response
- Symptoms
 - Quality
 - Severity
 - Time of day variation?
 - Persistent vs. intermittent
 - Precipitating factors
 - Exacerbating factors
 - Relieving factors

Clinical Examination Description of Condition

- Location
- Distribution
- Size
- Color
- Shape
- Borders
- Surface contour
- Surface texture
- Consistency
- Blanchable
- Fixed or moveable
- Drainage/bleeding
- Association with dental or periodontal disease
- Association with xerostomia
- Radiographic findings

Causes of Xerostomia

- Developmental
 - Salivary gland aplasia
- Dehydration
 - Inadequate fluid balance
 - Vomiting/Diarrhea
 - Hemorrhage
- Local Factors
 - Decreased mastication
 - Smoking
 - Mouth breathing
- Radiation therapy
- Medications
- Systemic disease
 - Sjögren's disease
 - Connective tissue disorders
 - Diabetes mellitus
 - Diabetes insipidus
 - Sarcoidosis
 - HIV-disease
 - Graft vs. host disease
 - Parkinson's disease
 - Psychogenic disorders

Complications of Xerostomia

- Dental caries
- Periodontal disease
- **Mucosal burning**
 - Atrophic glossitis
 - Candidiasis
 - Other types of mucositis
- Sialadenitis
- Halitosis
- Difficulty chewing, swallowing, tasting and wearing oral prostheses often interfere with eating, which decreases quality of life and may lead to nutritional deficiencies
- In some cases, problems with speaking, eating, wearing prostheses, halitosis or chronic mucosal pain may have significant negative psychosocial effects

Diagnosis of Xerostomia

- Patient history
 - Medical history
 - Systemic diseases
 - Medications
 - Medical treatments
 - Patient perception of oral condition
- Clinical examination
 - Diminished saliva
 - Unable to express clear saliva on massage of major glands
 - Unable to stimulate saliva on manipulation of mucosa
 - Condition of mucosa
 - Dry to touch
 - Ulcers
 - Atrophy
 - Erythema
 - White plaques
 - Fissured tongue
 - Major salivary glands tender to palpation
 - Accumulation of plaque and debris
 - High caries rate
 - Halitosis

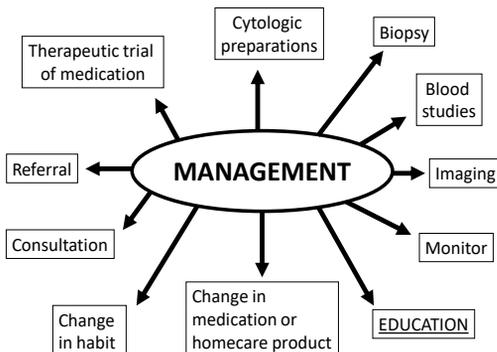
Burning Mouth Symptoms Clinical Examination

- Visible abnormality → numerous possible causes
 - Ulcers
 - Reddened mucosa
 - White patches
- No visible abnormality → think neuropathic or vascular

Diagnosis and Management

- Integrate historical and clinical findings
- Make a clinical diagnosis
OR
- Develop a clinical differential diagnosis
- Plan appropriate management for that patient

MANAGEMENT



Cytologic Preparations to Evaluate for Candidiasis

- Scrape area(s) of concern*
 - White areas
 - Red areas
 - Use light pressure on atrophic mucosa
 - Inner surface of denture
- Spread thin film on glass slide labeled with name, date and location sampled
- Spray with cytologic fixative or cheap hairspray

*For suspected BMS scrape symptomatic areas

Blood Studies to Evaluate Burning Mouth Symptoms

- Complete blood cell count
- Vitamin B12
- Folic acid
- Iron studies- iron, ferritin, TIBC
- HgbA1C
- Thyroid studies- TSH

Burning Mouth Symptoms

Conditions without Visible Signs

Neuralgia

- Pain extending along the course of one or more nerves
- Neuralgias of the head and neck may mimic odontogenic pain
- Neuralgias of the head and neck
 - Trigeminal neuralgia
 - Pretrigeminal neuralgia
 - Glossopharyngeal neuralgia
 - Post-traumatic neuralgia
 - Dysfunctional neuralgia
 - Postherpetic neuralgia
 - Burning mouth syndrome

Burning Mouth Syndrome “BMS”

Stomatopyrosis
Stomatodynia
Burning Tongue Syndrome
Glossopyrosis
Glossodynia
Oral Dysesthesia

BMS

- A burning sensation in the tongue or other oral sites, in the absence of clinical and laboratory findings
- Idiopathic
- Probably neuropathic, possibly due to damage to sensory nerves (pain and taste)

BMS

- Reported prevalence 0.7-15% of population
- Most common in middle-aged or older women
 - Most 45+ years of age
 - 8 female:1 male
- Many BMS patients have anxiety, depression, or personality disorder

BMS

- Most commonly involves*
 - Tongue (usually tip and lateral borders)
 - Lips (usually lower)
 - Palate (usually anterior hard palate)
- Usually bilateral

*Can involve other areas or be widespread

BMS Patterns of Pain

- Usually mild to moderate in severity
- Usually absent or mild in the morning on awakening
- Begins or increases mid to late morning and builds to a peak by evening, and often subsides at night
- May be constant or intermittent
 - May have some pain-free days
- Often less noticeable when patient is engaged in activities
- Often relieved by eating or chewing gum or drinking cold water

BMS Associated Oral Symptoms

- Patient may report
 - Dry mouth
 - Taste alteration
 - Tingling or numbness
 - Gritty feeling
 - Sensation of drainage
 - Sloughing

BMS Complications

- Difficulty sleeping
- Irritability
- Depression
- Anxiety
- Decreased socializing

BMS Diagnosis

- Diagnosis of exclusion
 - Cytology negative for candidiasis
 - Blood studies rule out diabetes, anemia, hypothyroidism
 - Other conditions ruled out based on history, clinical findings, and/or other studies

BMS Prognosis

- No treatment predictably effective for all patients
- About half have spontaneous resolution in 6-7 years

BMS Proposed Treatments

- Topical
 - Clonazepam tabs
 - Capsaicin rinse
 - Benzylamine hydrochloride rinse
 - Tongue protector
- Systemic
 - Antidepressants
 - Tricyclics (amitriptyline, nortriptyline)
 - Benzodiazepines (clonazepam, chlordiazepoxide, clordemetildiazepam)
 - SSRIs (paroxetine, sertraline)
 - Trazodone
 - Antipsychotic/Antidepressant (amisulpride)
 - Anticonvulsant (gabapentin, clonazepam)
 - Alpha lipoic acid
 - Hormone replacement
 - Vitamin supplements
 - Capsaicin capsules
- Behavioral
 - Cognitive behavioral therapy

BMS Treatment

- Research provides limited evidence to guide clinicians

Cochrane Review 2012: Interventions for the treatment of burning mouth syndrome

- The objectives of this review are to determine the effectiveness and safety of any intervention versus placebo for relief of symptoms and improvement in quality of life and to assess the quality of the studies.

Cochrane Review 2012

- Selection criteria
 - Study design
 - Randomized control trials
 - Clinical control trials
 - Participants
 - Clear diagnosis of BMS (mucosal pain with no dental or medical cause)
 - Interventions
 - All treatments compared to placebo
 - Primary outcome
 - Relief of burning/discomfort

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Cochrane Review 2012

- Only nine studies met selection criteria
 - Antidepressants (2)
 - Cognitive behavior therapy (1)
 - Analgesics (1)
 - Hormone replacement therapy (1)
 - Alpha-lipoic acid (3)
 - Anticonvulsants (1)

Cochrane Review 2012

- Reduction of BMS symptoms were shown with three interventions
 - Alpha lipoic acid
 - 200 mg TID
 - Clonazepam
 - 1 mg tablet sucked for 3 minutes without swallowing and expectorated TID
 - Cognitive behavioral therapy

“My Experience”

- No treatment predictably effective for all BMS patients
- Had some success
 - Alpha lipoic acid
 - Capsaicin
 - Nortriptyline*
 - Neurontin*
- Avoided clonazepam due to risk of dependency

*Work with primary care MD or neurologist

Alpha Lipoic Acid (ALA)

- A fatty acid antioxidant (neutralizes free radicals)
- Unlike other antioxidants, which work only in water (vit C) or fatty tissues (vit E), ALA functions in both water and fat
- Certain nerve diseases, like BMS, are thought to be at least partially caused by free radical damage
- Due to its combined fat and water solubility, ALA can get into all the parts of a nerve cell and potentially protect it against such damage

Alpha Lipoic Acid (ALA)

- 300 mg TID or 600 mg BID
 - More effective than 200 mg TID
- Allow 2 months before determining effectiveness
- Nutritional supplements are not well regulated
- Purchase only through a reputable source

Alpha Lipoic Acid (ALA) Side Effects & Safety

- Skin rash is rare
- Heartburn is rare and manageable
- People with diabetes should monitor blood glucose as ALA might lower blood glucose
- Can contribute to thiamine deficiency in heavy alcohol drinkers
- Safety in pregnancy and breast feeding is unknown

Capsaicin

Instructions for use of Dilute Tabasco Sauce Mouthrinse

- Mix 1 part Tabasco sauce with 4 parts water.
 - For maximum effect, gradually increase concentration to 1 part Tabasco sauce with 2 or 3 parts water as tolerated.
- Mouthrinse for 2 minutes with 1-2 teaspoons and then spit out excess.
 - May need to begin with shorter time and gradually increase to 2 minutes as tolerated.
- If significant burning follows, rinse with milk or suck on an ice cube.
- Do this 5 times a day.

Nortriptyline

- 10 mg HS; increase dosage by 10 mg every 4 to 7 days as tolerated until oral burning is relieved
- If not effective at 50 mg unlikely that it will be
- Less drying than amitriptyline
- Can dose in AM if sleep disturbance is a side effect

Neurontin

- 100 mg HS; increase dosage by 100 mg every 4 to 7 days as tolerated until oral burning is relieved
- As dosage increases, medication is taken in three divided doses
- May increase up to 1600 mg QD
- FDA warning regarding risk of suicidal behavior and Ideation

BMS Adjunctive Management

- Sip water frequently to help ease the feeling of dry mouth
- Suck on ice chips
- Don't use tobacco products
- Avoid products with cinnamon or mint
- Avoid spicy-hot foods
- Avoid acidic foods and liquids, such as tomatoes, orange juice, vinegar, soft drinks and coffee
- Try different brands of toothpaste
 - Avoid SLS, pyrophosphates, whitening agents
- Take steps to reduce excessive stress
- Psychiatric evaluation and management may be required

BMS Stress Reduction

- Practice relaxation exercises, such as yoga
- Join a pain support group
- Engage in pleasurable activities, such as exercise or hobbies, especially when you feel anxious
- Make an effort to stay socially active by connecting with understanding family and friends

BMS The Role of the Dental Team

- Identify the problem
- Assist in establishing the diagnosis
 - Rule out other oral mucosal disease based on history and clinical examination
 - Perform cytology to rule out candidiasis
- Provide patient education and support
- Communicate with primary care physician (PCP)
 - May need to educate PCP regarding the nature, diagnosis and management of BMS
 - Request blood studies to rule out systemic disease

BMS Patient Education

- Nature of the disorder
 - Benign, not well understood, a problem with nerve function
- Diagnosis of exclusion
 - Testing needed to rule out other causes
- Treatment options
 - Realistic expectations
- Adjunctive management strategies

BMS

The Role of the Physician

- Order blood studies to rule out systemic disease
- Perform or order additional testing as indicated
- Provide treatment as indicated
 - PCP may refer to neurologist or pain management specialist

Trigeminal Neuralgia

- Neuralgia of CN V
- Most frequently diagnosed neuralgia
- Causes
 - Most idiopathic
 - Vascular malformations
 - Intracranial neoplasms
 - Acoustic neuroma most common
 - Multiple sclerosis

Trigeminal Neuralgia Clinical Features

- Most > 50 years of age
- Slightly more common in females
- Distribution
 - Right > left
 - 15% bilateral
 - Most V₂ or V₃
 - 15% affect more than one division
- Symptoms
 - Abrupt onset
 - Severe, electrical, stabbing pain
 - Trigger point(s) on skin or mucosa
 - Trigger stimulus: light touch or wind
 - Pain < 60 seconds
 - Pain may occur at frequent intervals
 - Non-responsive to analgesics

Trigeminal Neuralgia Diagnosis

- Historical features
- Trigger demonstrated on examination
- Local anesthetic nerve block
- Imaging
 - Magnetic resonance imaging

Trigeminal Neuralgia Surgical Management

- Intracranial microvascular nerve decompression
- Other techniques less often used because of nerve destruction resulting in sensory deficit
 - Radiofrequency rhizotomy
 - Glycerin or alcohol rhizotomy
 - Peripheral neurectomy

Trigeminal Neuralgia Pharmacotherapeutic Management

- Tegretol
 - Anticonvulsant
 - Effective in 80% of cases
 - Titrate dose based on pain control
 - Side effects:
 - Drowsiness
 - Dizziness
 - Blurred vision
 - Myelosuppression and liver dysfunction
 - Other

Trigeminal Neuralgia Pharmacotherapeutic Management

- Phenytoin (Dilantin)
 - Anticonvulsant
 - Effective in 20% of cases
 - Side effects same as Tegretol
- Baclofen
 - GABA analog central acting skeletal muscle relaxant
 - Unapproved use for trigeminal neuralgia
 - Most effective with Tegretol or phenytoin
- Nortriptyline
- Neurontin

Glossopharyngeal Neuralgia

- Neuralgia of CN IX
- May also effect sensory branches of CN X (Vagus nerve)
- Rarely diagnosed condition

Glossopharyngeal Neuralgia Clinical Features

- Most > 50 years of age
- Equal sex prediliction
- Cause probably same as trigeminal neuralgia
- Most cases unilateral

Glossopharyngeal Neuralgia Clinical Features

- Symptoms
 - Abrupt onset of severe, sharp, lancinating pain
 - Short bursts of pain which may be multiple
 - Precipitated by talking, chewing, swallowing, yawning, touching ear, or wind
 - May involve ear, infra-auricular area, tonsil, base of tongue, pharyngeal wall, and/or posterior mandible

Glossopharyngeal Neuralgia Clinical Features

- Symptoms
 - Often previous similar pain in same location
 - Unpredictable remissions and recurrences
 - Pain usually has awakened patient
 - Non-responsive to analgesics
 - Trigger may be difficult to identify on clinical exam
- Symptoms may mimic Eagle syndrome
 - Panoramic radiograph to rule out

Glossopharyngeal Neuralgia Management

- Pharmacotherapeutic
 - Same as for trigeminal neuralgia
 - Local anesthesia for temporary relief
- Surgical
 - Glossopharyngeal nerve resection

Postherpetic Neuralgia

- Pain lasting > 1 month following episode of herpes zoster or, less commonly, herpes simplex
- Occurs in ~ 15% of cases
- More common seen
 - Elderly
 - V-1 involvement
 - More severe cases of zoster
- ~ 1/2 resolve in 2 months
- Most resolve < 1 year

Zoster sine Herpete

- Recurrent herpes zoster without skin or mucosal lesions
- Abrupt onset of severe pain over area of nerve distribution
- May be associated with fever, headache, myalgia, and lymphadenopathy

Recurrent Varicella-zoster Infection Post Herpetic Neuralgia

- Treatment options
 - Capsaicin- Zostrix 0.025% cream on skin
 - Tricyclic antidepressants
 - Carbamazepine
 - Neurontin

Cranial Arteritis (Temporal Arteritis or Giant Cell Arteritis)

- Multifocal vasculitis of cranial arteries
- Etiology unknown
 - Possible autoimmunity to elastic lamina
- Demographics
 - Age: 50-85 years (average 70)
 - Sex predilection: Women 2:1
 - 77-130 cases per 100,000 over 50 years of age

Cranial Arteritis Historical Features

- Throbbing headache
 - Usually unilateral
 - Often coincides with heartbeat
- May have retro-orbital pain, visual disturbance or loss of vision
- May have fever, malaise, fatigue, nausea, anorexia, or vomiting

Cranial Arteritis Historical Features

- May have
 - Scalp tenderness
 - Ear pain
 - Claudication of masticatory muscles (increasing pain with jaw function, resolves with rest)
 - Pain on mastication
 - May mimic toothache
 - Muscle ache and stiffness
 - May mimic TMD
 - Areas of mucosal burning

Cranial Arteritis Clinical Features

- Involved arteries may be
 - Painful to palpation
 - Erythematous, swollen, tortuous
 - Firm and pulseless
- Rarely lingual or labial tissue necrosis

Cranial Arteritis Diagnostic Tests

- Erythrocyte sedimentation rate (ESR)
- C-reactive protein (CRP)
- Temporal artery biopsy- segmental involvement so multiple sections of a 1-2 cm specimen
 - Chronic inflammation, edema, necrosis
 - Multinucleated giant cells
 - +/- thrombosis and/or occlusion

Cranial Arteritis

- Treatment
 - Long-term, high-dose systemic corticosteroids
 - Symptoms respond within a few days
- Prognosis
 - Untreated 25-50% result in blindness
 - Rarely widespread vascular involvement fatal even with treatment

Burning Mouth Symptoms

Conditions with Visible Signs

Burning Symptoms

- | | |
|--|---|
| <ul style="list-style-type: none"> • Reddened Mucosa <ul style="list-style-type: none"> – Atrophic glossitis/mucositis – Benign migratory glossitis – Fissured tongue – Transient lingual papillitis – Candidiasis – Lichen planus – Lichenoid mucositis – Traumatic mucositis – Contact allergic mucositis | <ul style="list-style-type: none"> • White Patches <ul style="list-style-type: none"> – Benign migratory glossitis – Candidiasis – Lichen planus – Lichenoid mucositis – Traumatic mucositis – Contact allergic mucositis |
|--|---|

Atrophic Glossitis

- | | |
|---|---|
| <ul style="list-style-type: none"> • Loss of filiform papillae → patchy or diffuse, smooth red appearance of dorsal tongue • Typically associated with burning symptoms | <ul style="list-style-type: none"> • Causes <ul style="list-style-type: none"> – Candidiasis – Iron deficiency anemia – Pernicious anemia – Xerostomia – Erosive lichen planus – Anemia-related glossitis may be associated with candidiasis, however, the condition does not resolve with antifungal therapy alone |
|---|---|

Clinical Manifestations of Vitamin B₁₂ Deficiency

- Hematologic
 - Megaloblastic anemia
 - Pancytopenia (leukopenia, thrombocytopenia)
- Neurologic
 - Paresthesias
 - Peripheral neuropathy
 - Combined systems disease (demyelination of dorsal columns and corticospinal tract)
- Psychiatric
 - Irritability, personality change
 - Mild memory impairment, dementia
 - Depression
 - Psychosis
- Cardiovascular
 - Possible increased risk of myocardial infarction and stroke

B₁₂ Deficiency Nutritional Deficiency

- Dietary sources primarily meats and dairy products
- Recommended daily allowance 2 mcg
 - Typical Western diet provides 5 to 15 mcg daily
- Normally, humans maintain a large vitamin B₁₂ reserve, which can last 2 to 5 years even in the presence of severe malabsorption
- Nutritional deficiency can occur in specific populations
 - Chronic alcoholics
 - Elderly patients
 - Vegans

B₁₂ Deficiency Malabsorption Syndromes

- Lack of intrinsic factor or parietal cells
 - Pernicious anemia
 - Atrophic gastritis
 - Gastrectomy
- Food-bound malabsorption
 - Prolonged use of H₂ receptor blockers or proton pump inhibitors
 - Atrophic gastritis
 - Subtotal gastrectomy
 - Acidic environment of the stomach facilitates the breakdown of vitamin B₁₂ that is bound to food
 - Decreased stomach acid → breakdown of vitamin B₁₂ from food → decreased vitamin B₁₂ absorption

B₁₂ Deficiency Malabsorption Syndromes

- Schilling Test
 - Tests for gastrointestinal absorption of vitamin B₁₂
 - A dose of the radiolabeled vitamin is taken orally, a dose of the nonradiolabeled vitamin is given by injection to impede uptake of the absorbed radiolabeled dose by the liver, and the proportion of the radiolabeled dose absorbed is determined by measuring the radioactivity of the urine
 - Not often used
 - Complicated to perform
 - Radiolabeled vitamin B₁₂ is difficult to obtain
 - Interpretation difficult in patients with renal insufficiency

B₁₂ Deficiency

- Other Gastrointestinal Causes
 - Ileal malabsorption
 - Crohn's disease
 - Ileal resection
 - Biologic competition
 - Bacterial overgrowth
 - Tapeworm infestation
- Defective Transport
 - Transcobalamin II deficiency
 - Transcobalamin II binds to vitamin B₁₂ in the epithelium of the terminal ileum and transports it into and through the blood stream

Pernicious Anemia

- Anemia due to malabsorption of vitamin B₁₂
- Autoimmune disease → destruction of gastric parietal cells → decreased production of intrinsic factor → decreased vitamin B₁₂ absorption
- Laboratory testing
 - Parietal cell antibodies
 - 85 to 90% sensitive for the diagnosis of pernicious anemia
 - Nonspecific and occurs in other autoimmune states
 - Intrinsic factor antibody
 - Only 50% sensitive
 - More specific for the diagnosis of pernicious anemia

Pernicious Anemia Signs and Symptoms

- Systemic
 - Weakness
 - Fatigue
 - Shortness of breath
 - Headache
 - Faintness
 - GI symptoms
 - Chest pain
- Oral
 - Mucosal burning
 - Perioral paresthesia
 - Atrophic glossitis
 - Erythema and atrophy of other mucosal surfaces

Pernicious Anemia Diagnosis

- Complete blood cell count
 - Low red cell count, hematocrit, hemoglobin
 - High mean cell volume (MCV)
- Vitamin B₁₂
- Serum intrinsic factor antibody
- Serum parietal cell antibody
- Serum methylmalonic acid (MMA)
- Serum homocystiene
- Bone marrow biopsy
- Schilling Test

Pernicious Anemia Treatment

- Intramuscular injections of vitamin B₁₂
 - Initial dosage: 100 to 1,000 mcg every day or every other day for one to two weeks
 - Maintenance dosage: 100 to 1,000 mcg every one to three months
- High dose oral vitamin B₁₂
 - Initial dosage: 1,000 to 2,000 mcg per day for one to two weeks
 - Maintenance dosage: 1,000 mcg per day for life

Pernicious Anemia Prognosis

- Rapid response to treatment
- Oral involvement resolves in about 5 days
- 1-2% develop gastric carcinoma

Candidiasis

- Most common oral fungal infection
- Development of infection depends on
 - Immune status of host
 - Oral mucosal environment
- Predisposing Factors
 - Xerostomia
 - Mucosal disease
 - Corticosteroid therapy
 - Oral prosthesis
 - Antibiotic therapy
 - Other immune suppression or disturbance
 - Endocrine disturbance
 - Anemia
 - Radiation therapy
 - Cancer chemotherapy

Candidiasis Clinical Variants

- White
 - Pseudomembranous- wipes off
 - Hyperplastic- does not wipe off
- Red
 - Chronic erythematous
 - Acute erythematous
 - Angular cheilitis
 - Cheilitis/perioral dermatitis

Not Candidiasis

- Hairy Tongue
 - Elongation of filiform papillae with accumulation of keratin
 - White, yellow, brown, or black
 - Usually due to lack of mechanical stimulation
 - Other factors including smoking, general debilitation, poor oral hygiene and head and neck radiation may predispose
- Coated Tongue
 - Accumulation of oral bacteria and debris

Management of Candidiasis

- Determine and, if possible, eliminate predisposing factor(s)
- Antifungal therapy
 - Treatment of established infection
 - May need maintenance therapy to prevent recurrence
- If burning symptoms persist following resolution of candidiasis, consider BMS

Antifungal Mouthrinses

- Directions are 5 mL mouthrinse 1-2 minutes and spit out, then NPO ½ hour after
- Usually use QID (PC and HS) for active disease and then decrease to frequency required for maintenance therapy
- *Can be compounded with triamcinolone acetonide 0.1% or 0.2% if needed

Medication	Notes
nystatin oral suspension 100,000 units/mL*	<ul style="list-style-type: none"> • Commercial products usually contain 30-50% sucrose • Should not be used long term or in patients with xerostomia (unless edentulous)
sugar-free nystatin 100,000 units/mL*	<ul style="list-style-type: none"> • Must be compounded • Must be refrigerated • Shorter shelf-life
sugar-free amphotericin-B oral suspension 25mg/mL *	<ul style="list-style-type: none"> • Must be compounded • Better tasting than nystatin • More efficacious than nystatin • More expensive than nystatin

Antifungal Creams and Ointment

- Directions are apply thin film to involved oral mucosa and/or to corners of mouth and/or to inner surface of denture(s), then NPO ½ hour after
- Usually use QID (PC and HS) for active disease and then decrease to frequency required for maintenance therapy

Medication	Notes
ketoconazole 2% cream	<ul style="list-style-type: none"> • Also has mild anti-inflammatory properties • Excellent for denture candidiasis • Use alone or mix 1:1 with mupirocin 2% ointment or cream for angular cheilitis • Commercial product can be mixed with commercial topical steroid • Can be compounded with topical steroid and/or misoprostol
clotrimazole 1% or 2% cream OTC or Rx	<ul style="list-style-type: none"> • OTC labeled for athletes foot, jock itch or vaginal use • Can be used for denture candidiasis or angular cheilitis • Can be mixed with commercial topical steroid
nystatin 100,000 units/gram cream or ointment	<ul style="list-style-type: none"> • Can be used for denture candidiasis or angular cheilitis • Yellow color not ideal for angular cheilitis

Antifungal Troche or Tablet

- Directions are dissolve slowly in mouth, then NPO ½ hour after

Medication	Notes
clotrimazole 10 mg oral troche	<ul style="list-style-type: none"> • Need to use 5 per day for active infection • Can dose with 2 AM, 1 midday and 2 PM for better compliance • Decrease to minimum number and frequency as needed for maintenance therapy • Difficult to use with significant xerostomia • Contain dextrose
OTC Mycelex-7 Combo Pack: clotrimazole vaginal tablet 100 mg (7) and vaginal cream 1% (7 g)	<ul style="list-style-type: none"> • Dissolve ½ tablet slowly in mouth BID • Use cream for angular cheilitis up to QID

Systemic Antifungals

- Use with caution and consult with physician. Hepatotoxicity reported for both medications.

Medication	Notes
ketoconazole 200 mg tablet Sig: Take 1 tablet PO QD for 7-14 days. Do not take antacids within 2 hours of this medication.	<ul style="list-style-type: none"> • Less expensive than fluconazole • Many contraindications, precautions, drug interactions and side effects • Requires acidic stomach for absorption and should be avoided in patients that are on H2 blockers, proton pump inhibitors etc...
fluconazole 100 mg tablet Sig: Take 1 tablet PO BID for first day, then take 1 tablet PO daily for 7-14 days.	<ul style="list-style-type: none"> • More expensive than ketoconazole • Fewer contraindications, precautions, drug interactions and side effects than ketoconazole but still these are a concern

Benign Migratory Glossitis (Geographic Tongue)

- Common idiopathic condition
- Red patches often surrounded by an irregular white border
- Red patches migrate over time
- May be sensitive to hot or spicy foods, toothpastes, carbonated beverages, or alcohol
- No treatment is required unless symptomatic

Fissured Tongue

- Benign condition considered a variant of normal anatomy
- Usually asymptomatic but may be sensitive to hot or spicy foods, toothpastes, carbonated beverages, or alcohol
- May be associated with benign migratory glossitis

Transient Lingual Papillitis

- Painful enlargement of fungiform papillae
- Cause unknown- inflammation possibly due to local irritation, stress, GI disease, URI, viral infection, or topical hypersensitivity to food, drink or oral hygiene products
- Various patterns
 - Localized vs. generalized
 - Red vs. white or yellow
- Usually self-limiting (hours to days) but may require topical corticosteroid, topical anesthetic ,or coating agent

Lichen Planus

- Chronic idiopathic immunologically mediated mucocutaneous condition
- Usually multifocal and bilateral
- May involve any mucosal surface
- Varied clinical presentations- all have some degree of keratosis
 - Hyperkeratotic forms
 - Reticular
 - Plaque-like
 - Papular
 - Erosive/Bullous
- ~25% have concomitant candidiasis

Allergic Contact Stomatitis

- Mucosal reaction to contact with allergen
 - Food
 - Chewing gum
 - Dentifrices and mouthwashes
 - Cinnamon
 - Latex
 - Acrylic denture materials
 - Dental impression materials and adhesives
 - Topical anesthetics
 - Other dental materials

Allergic Contact Stomatitis

- Chronic
 - Erythema
 - Hyperkeratosis
 - +/- erosions
 - +/- desquamation
- Acute
 - Burning
 - Mild to intense erythema
 - +/- edema
 - Vesicles rare, rupture to form erosions

Management of Inflammatory Burning Mouth Symptoms

- Recognition of the condition
- Patient education
- Elimination of potential irritants
 - Avoid pyrophosphates, cinnamon, menthols, phenols, irritating foods, etc...
 - Avoid SLS (sodium lauryl sulfate), avoid alcohol if possible
- Maintain saliva: Reduce or eliminate xerogenic agents if possible, maintain good hydration
- Symptomatic treatment
 - Diphenhydramine (+/- Maalox, +/- 2% viscous lidocaine) mouthrinse
 - Topical steroid mouthrinse

Diphenhydramine HCl Mouthrinse

for Management of Symptomatic Geographic or Fissured Tongue

- Use diphenhydramine HCl 12.5 mg/5ml alcohol-free solution.
 - Brand name is Benedryl, but generic is less expensive. Children's formulas are alcohol-free but do contain sugar.
- Use 1-2 teaspoon, mouthrinse for 1-2 minutes and spit out.
- Do not rinse, eat or drink for 15-20 minutes after use.
- Use up to 4 times daily as needed.
 - Using 15-20 minutes before meals should make eating more comfortable.

* Diphenhydramine HCl can also be mixed 1:1 with Maalox (or generic) for a coating effect and used the same way.

Topical Corticosteroid Mouthrinses

- Useful for
 - Symptomatic geographic and/or fissured tongue
 - Transient lingual papillitis
 - Allergic stomatitis
 - Lichen planus or lichenoid mucositis
- Patients should be educated regarding signs and symptoms of candidiasis as a potential side effect of corticosteroids
 - New and different burning or soreness
 - New red or white patched
 - Change in taste

Mouthrinses

• Directions are 5 mL mouthrinse 1-2 minutes and spit out, then NPO ½ hour after

• Usually use QID (PC and HS) for active disease and then decrease to frequency required for maintenance therapy

* Oral solution preferred to elixirs, which contain sugar, alcohol and often dye

Medication	Potency	Notes
dexamethasone 0.5 mg/5 mL oral solution*	Low	<ul style="list-style-type: none"> • For sugar-free, dye-free and only trace of alcohol prescribe Roxane brand: NDC # 00054-3177-57 for 240 mL bottle NDC # 00054-3177-63 for 500 mL bottle • If candidiasis is a concern, can have patient dissolve clotrimazole 10 mg oral troche slowly in mouth immediately after mouthrinse and then begin NPO ½ hour
triamcinolone acetone aqueous suspension mouthrinse 0.1% or 0.2%	Intermediate	<ul style="list-style-type: none"> • Must be prepared by a compounding pharmacist • Specify sugar-free • Usually use 0.1% but may need 0.2% for more severe cases • If candidiasis is a concern, can have pharmacist compound in <u>sugar-free</u> nystatin 100,000 units/mL or amphotericin-B 25 mg/mL suspension, or have patient dissolve clotrimazole 10 mg oral troche slowly in mouth immediately after mouthrinse and then begin NPO ½ hour