Oral Lesions in Older Adults

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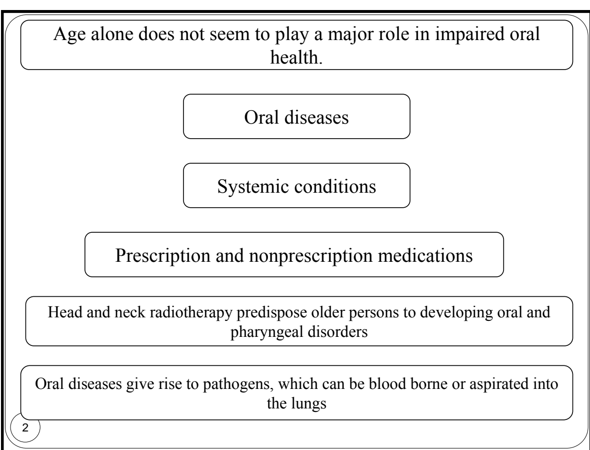

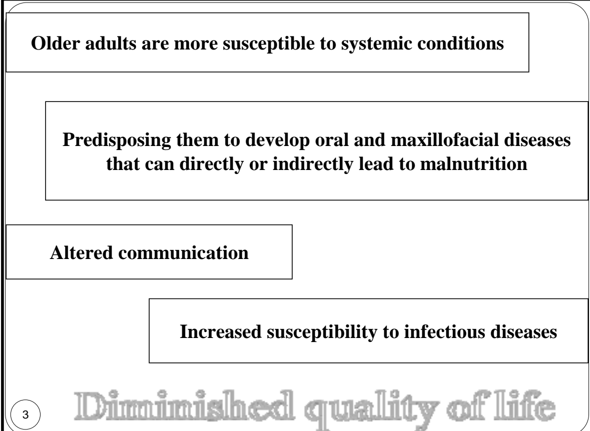

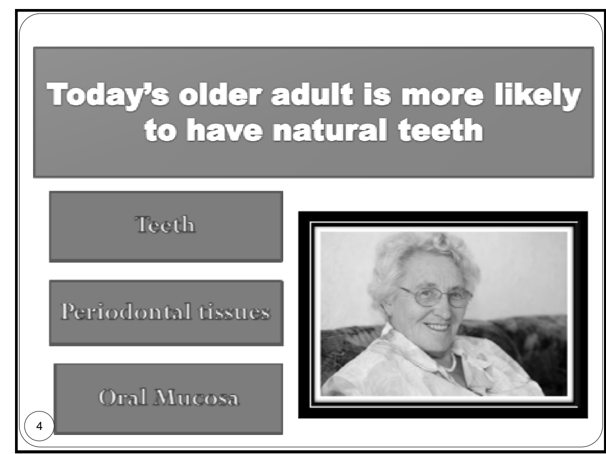

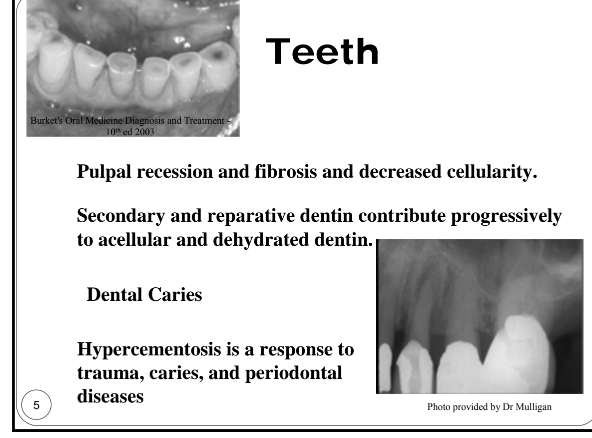

Oral Mucosa

- The masticatory mucosa of the gingiva and hard palate
- The lining mucosa of the cheek, soft palate, floor of the mouth and ventral surface of the tongue
- Specialized mucosa such as those of the dorsum of the tongue and the lips

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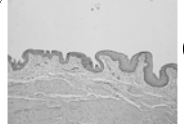


Oral Mucosa

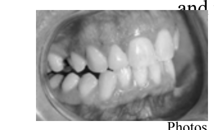
- Is lined by a stratified squamous epithelium which has the primary function of forming a barrier between the internal and external environment and thus providing protection against fluid exchange and against mechanical damage.

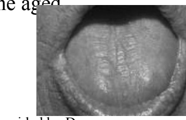
Becomes thinner **Atrophies**

Loses elasticity

Clinical and histological changes of epithelium

The clinical appearance of the oral mucosa and skin commonly differs between the young and the aged





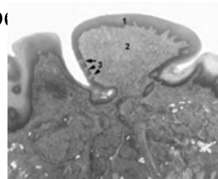
Photos provided by Dr

Epithelial Component Variations

- Cell density and volumen
- Degree of keratinization
- Cell flattening
- Surface imbrication of superficial cells

Lamina Propria Variations

- Density of collagen
- Size and organization of collagen fibers bundles
- Quantity of elastic fib



Lack of collagen means more difficulty in differentiating the muco-gingival margin

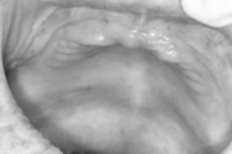
The tissue is more friable and more difficult to handle

Gingival tissue handles like mucosa and is more readily traumatized by the dentist or by a prosthesis

It is harder to suture as the sutures tend to tear more readily

Aged Oral Mucosa

- Increasingly thin
- Smooth and dry
- Satin-like, edematous appearance with loss of elasticity and stippling
- More susceptible to inju



Tongue

- Clinical changes with loss of filiform papillae
- Disturbance of the sensory elements resulting in deterioration in the sense of taste.
- Burning sensation.
- Dietary deficiencies can lead to atrophic changes of the mucosa.

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Tongue

- Mucosal changes may result from systemic influences.
- Sublingual varicosities.
- Increased susceptibility to candidal infection.
- Decrease rate of wound healing.

Structural Changes

- Diminished keratinization
- Alteration in the morphology of the epithelium-connective tissue interface.
- Thinning of the epithelial cells layers.
- Reduction in the thickness of the lingual epithelium > atrophy

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Filiform papillae Circumvallate papillae Fungiform papillae

Age changes in periodontal connective tissue

Gingival connective tissue becomes more dense and coarsely texture

Decreases in the number of fibroblast, cellularity is related to growth and regeneration rather than to age

Decrease in fiber content and a relative increase in the size of interstitial compartments containing blood vessels, but contradictory…

Collagen synthesis: with aging fibers become more stable showing increased thermal stability, insolubility and mechanical strength

Changes in width of the periodontal ligament

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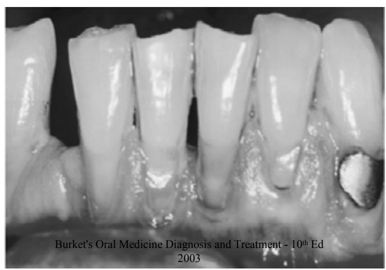
Age changes in periodontal connective tissue



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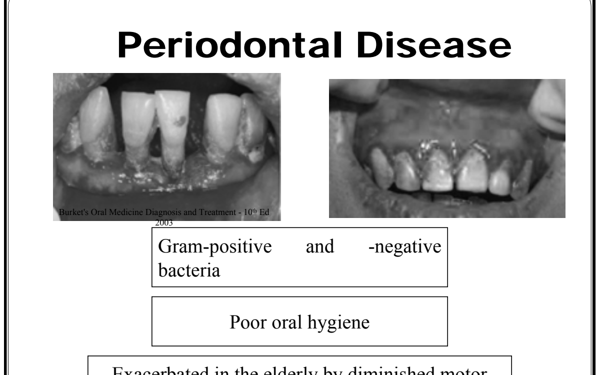
Periodontal Disease



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Gram-positive and -negative bacteria

Poor oral hygiene

Exacerbated in the elderly by diminished motor dexterity (arthritis, stroke)

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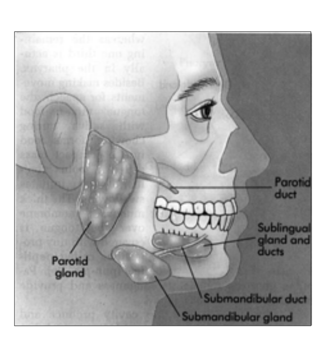
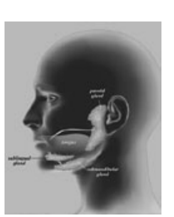
Saliva Functions

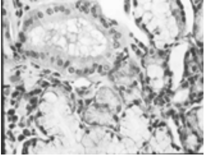
•Lubricatory proteins to keep the oral mucosa pliable and hydrated.
•Antibacterial factors to regulate the distribution and numbers of oral microorganisms.
•"Remineralizing" proteins which allows for saliva to exist supersaturated with respect to calcium and phosphate salts and thus able to limit enamel dissolution.

Saliva Functions

- Inorganic and organic buffers to neutralize proton production by cariogenic bacteria.
- Appropriate viscosity for such functions as dissolving tastants for proper presentation to taste buds and contributing to food bolus formation.
- Aiding initial stages of deglutition.





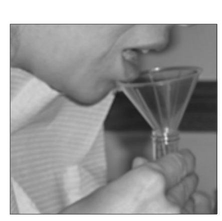


Age Changes in Salivary Glands and Salivary Secretion

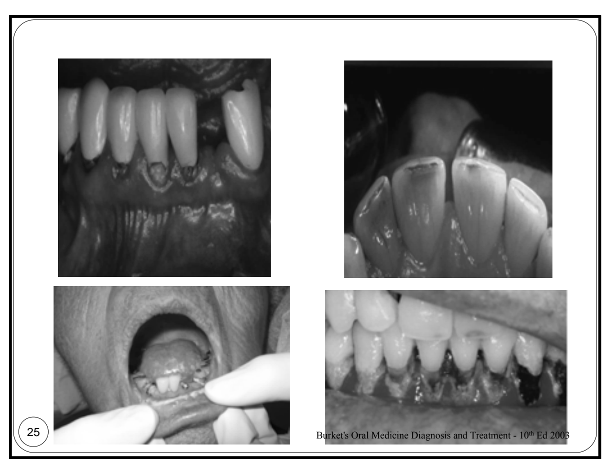
- There is not generalized diminution in salivary gland performance with increase age, those changes were primarily reflective of disease- or therapy-induced alterations.
- Since saliva is critically important to the maintenance of oral health, any general disturbance in salivary gland function whether due to specific age related changes or pathology, would result in severe morbidity.

Salivary Hypofunction

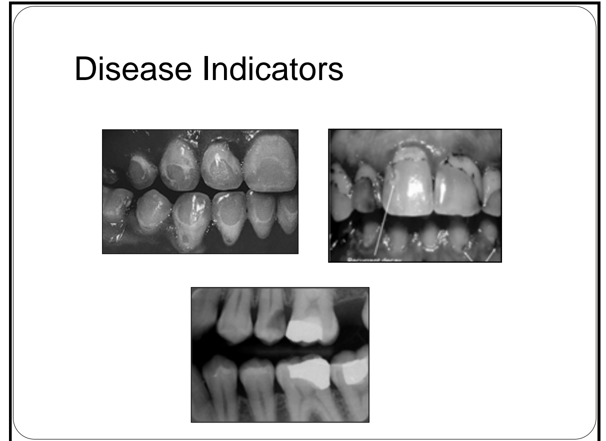
- Dry and friable oral mucosa
- Decreased antimicrobial activity
- Diminished lubrication
- Difficulty with mastication, deglutition, gustation, and impaired retention of removable prostheses
- Caries development
- Oral fungal infections
- Pain



Unstimulated Whole Saliva
0.1 ml/min
Chewing Stimulated Whole Saliva
0.5 ml/min for women
0.7 ml/min for men



Disease Indicators



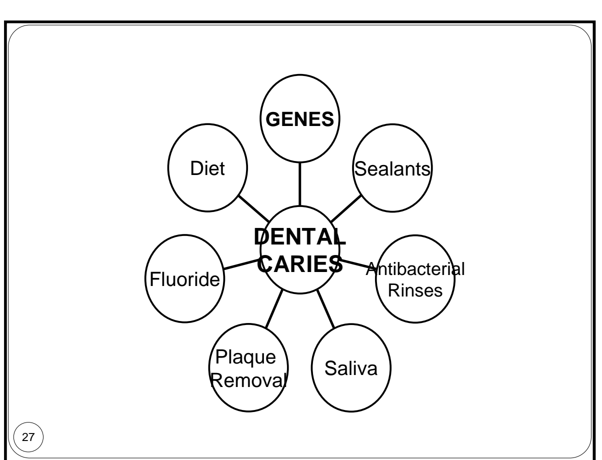


Table 7. The 35 most prevalent conditions ranked by mean age.

Diagnosis/ICD-9	n	Mean age	± one SD	Male/Female ratio
Glossodynia (Burning Mouth)/ 529.6	17	68.1	±14.7	1: 1.1
Xerostomia / 527.7	13	64.5	±15.3	1:2.2
Nasopalatine cyst / 526.1	4	63.7	±14.8	All female
Mucogingival Cancer (1st diagnosis)	3	63.5	±12.4	All male
Candidiasis and Chelitis / 112.0	29	61.2	±19.7	1:1.4
Orofacial Dyskinesia / 333.82 or Dystonia / 333.6	7	61.1	±17.9	1:1.3
Lichen Planus / 697.0	23	60.7	±16.7	1:1.8
Hemangioma / 210.4	2	59.5	±2.1	All female
Trigeminal neuralgia / 350.1	47	59.3	±13.9	1:1.8
Lip and cheek biting / 528.9	2	58.5	±14.8	All male

Piedad Suarez , Glenn Clark. Spec Care Dentist 27(5):192-6, 2007

TABLE 24-7 Summary of Oral Disorders in Elderly Persons

Oral Tissue or Function	Disorders
Oral mucosa	Cancers Vesiculobullous diseases Ulcerative diseases
Oral and pharyngeal mucosa; dentition	Viral diseases Fungal diseases Bacterial diseases
Dentition	Root surface caries Coronal caries Attrition
Periodontium	Gingivitis Periodontitis Abscesses
Salivary glands	Obstructions Bacterial infections Hypofunction Cancers
Chemosensory function	Taste dysfunction Smell dysfunction
Swallowing	Delayed swallowing Aspiration
Edentulousness	Osteoporosis Atrophic mandible Denture difficulties Pain over the mental foramen
Pain sensation	Atypical facial pain "Burning mouth" syndrome Postherpetic neuralgia Trigeminal neuralgia

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Skin Changes

- Skin in older individuals is wrinkled
- Dry
- Shows areas of patchy pigmentation
- Also the skin that is protected from environmental insults shows similar changes
- Irregular thickness (thinner with fewer layers of cells)
- Variation in cells size
- Changes at cell level (Pyknotic nuclei, loss of epithelial rete pegs)

CANCER

- **Basal cell carcinomas:** This is the most common neoplasm of the facial skin, appearing as well-circumscribed, nonhealing, crusting, and ulcerative lesions.
- **Squamous cell carcinomas:** Head and neck squamous cell skin cancers are usually larger, crusting, and ulcerative lesions with poorly demarcated margins .
- **Salivary gland cancers:** Tumors of the parotid, submandibular, and sublingual glands can be detected by the presence of nonresolving unilateral head and neck swellings.

Laryngeal cancer: Hoarseness or other alteration of speech quality.

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Signs of Oral Cancer

- **Signs** can be very variable: ulcerative, leukoplakic, erythroplakic, crusting, or a combination of all four.
- Typically a lesion is exophytic, nonhealing, with poorly demarcated margins.
- Pain may or may not be present, whereas paresthesia is a sign of progressive disease.
- **Metastatic lesions** can appear in oral mucosal and bony tissues.

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Signs of Oral Cancer

- **Metastatic jaw lesions** are usually painful, with accompanying swelling and numbness.
- They most commonly result from primary tumors of the breast, lung, renal,

other bone, colon, and melanoma.

- **Hematologic malignancies** These present with gingival (erythema, edema, hypertrophy, bleeding) and mucosal changes (purpura, pallor, nonhealing ulcers, secondary infections).

Cancer

Actinic cheilitis

Ears lesions

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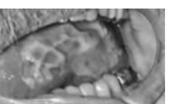
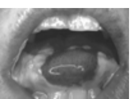
Oral Mucositis



- Patients should be instructed to rinse frequently
- Continue oral hygiene during radiation therapy with an extra soft toothbrush, which can be softened in warm water if needed.
- Avoid alcohol-containing mouthwash.
- Topical analgesics may provide relief
- Systemic pain medication.



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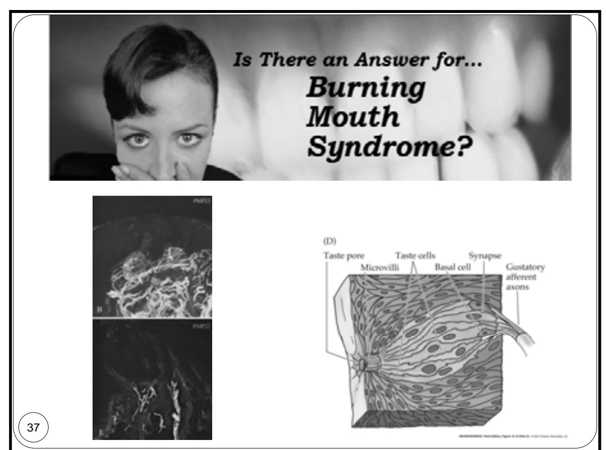
Medications

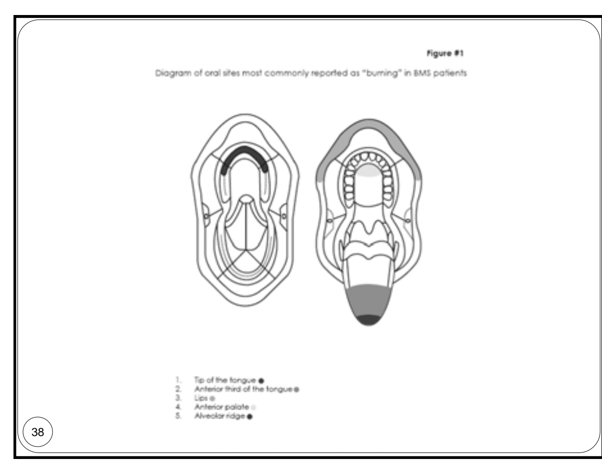
Rx: Add 1⁄4 teaspoon baking soda and 1⁄8 teaspoon salt to 1 cup water.
Disp: 1 cup.
Sig: Rinse several times a day, especially after meals.

Rx: 2% viscous lidocaine HCl.
Disp: 250 mL.
Sig: Swish and spit 5 mL for 5 minutes qid for pain.

Rx: Diphenhydramine 12.5 mg/5 mL elixir.
Disp: 250 mL.
Sig: Swish and spit 5 mL qid for 5 minutes.

Rx: Lidocaine or diphenhydramine can be mixed 1:1 with either kaolin and pectin (Kaopectate), aluminum hydroxide and magnesium hydroxide (Maalox), or sucralfate to increase mucosal binding. If an oral fungal infection is suspected, add nystatin 100,000 U/mL.





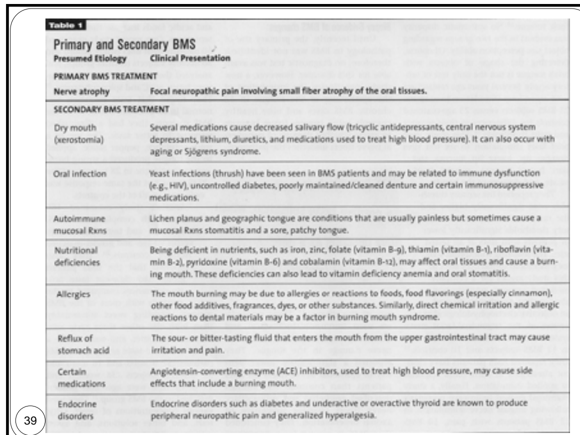


Table 1

Primary and Secondary BMS

Presumed Etiology	Clinical Presentation
PRIMARY BMS TREATMENT	
Nerve atrophy	**Focal neuropathic pain involving small fiber atrophy of the oral tissues.**
SECONDARY BMS TREATMENT	
Dry mouth (xerostomia)	Several medications cause decreased salivary flow (tricyclic antidepressants, central nervous system depressants, lithium, diuretics, and medications used to treat high blood pressure). It can also occur with aging or Sjögrens syndrome.
Oral infection	Yeast infections (thrush) have been seen in BMS patients and may be related to immune dysfunction (e.g., HIV), uncontrolled diabetes, poorly maintained/cleaned denture and certain immunosuppressive medications.
Autoimmune mucosal Rxns	Lichen planus and geographic tongue are conditions that are usually painless but sometimes cause a mucosal Rxns stomatitis and a sore, patchy tongue.
Nutritional deficiencies	Being deficient in nutrients, such as iron, zinc, folate (vitamin B-9), thiamin (vitamin B-1), riboflavin (vitamin B-2), pyridoxine (vitamin B-6) and cobalamin (vitamin B-12), may affect oral tissues and cause a burning mouth. These deficiencies can also lead to vitamin deficiency anemia and oral stomatitis.
Allergies	The mouth burning may be due to allergies or reactions to foods, food flavorings (especially cinnamon), other food additives, fragrances, dyes, or other substances. Similarly, direct chemical irritation and allergic reactions to dental materials may be a factor in burning mouth syndrome.
Reflux of stomach acid	The sour- or bitter-tasting fluid that enters the mouth from the upper gastrointestinal tract may cause irritation and pain.
Certain medications	Angiotensin-converting enzyme (ACE) inhibitors, used to treat high blood pressure, may cause side effects that include a burning mouth.
Endocrine disorders	Endocrine disorders such as diabetes and underactive or overactive thyroid are known to produce peripheral neuropathic pain and generalized hyperalgesia.

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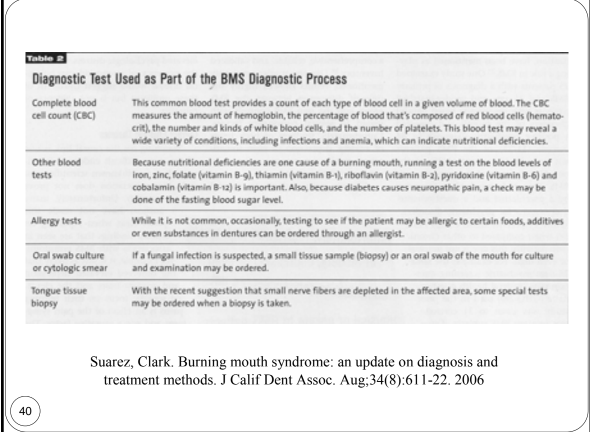

Table 2

Diagnostic Test Used as Part of the BMS Diagnostic Process

Test	Description
Complete blood cell count (CBC)	This common blood test provides a count of each type of blood cell in a given volume of blood. The CBC measures the amount of hemoglobin, the percentage of blood that's composed of red blood cells (hematocrit), the number and kinds of white blood cells, and the number of platelets. This blood test may reveal a wide variety of conditions, including infections and anemia, which can indicate nutritional deficiencies.
Other blood tests	Because nutritional deficiencies are one cause of a burning mouth, running a test on the blood levels of iron, zinc, folate (vitamin B-9), thiamin (vitamin B-1), riboflavin (vitamin B-2), pyridoxine (vitamin B-6) and cobalamin (vitamin B-12) is important. Also, because diabetes causes neuropathic pain, a check may be done of the fasting blood sugar level.
Allergy tests	While it is not common, occasionally, testing to see if the patient may be allergic to certain foods, additives or even substances in dentures can be ordered through an allergist.
Oral swab culture or cytologic smear	If a fungal infection is suspected, a small tissue sample (biopsy) or an oral swab of the mouth for culture and examination may be ordered.
Tongue tissue biopsy	With the recent suggestion that small nerve fibers are depleted in the affected area, some special tests may be ordered when a biopsy is taken.

Suarez, Clark. Burning mouth syndrome: an update on diagnosis and treatment methods. J Calif Dent Assoc. Aug;34(8):611-22. 2006

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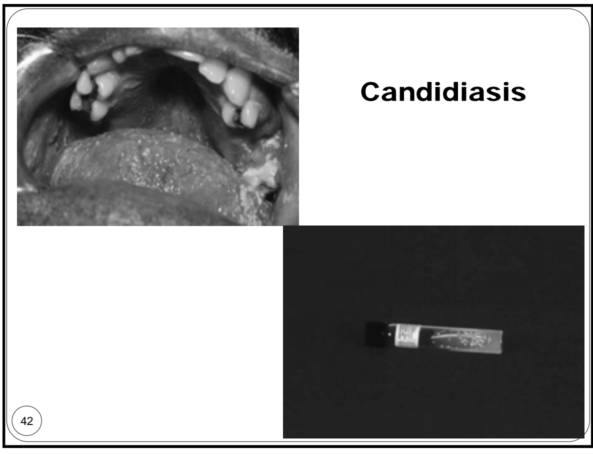
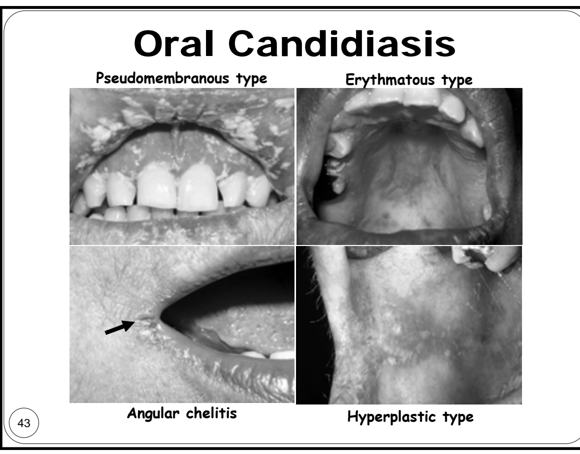
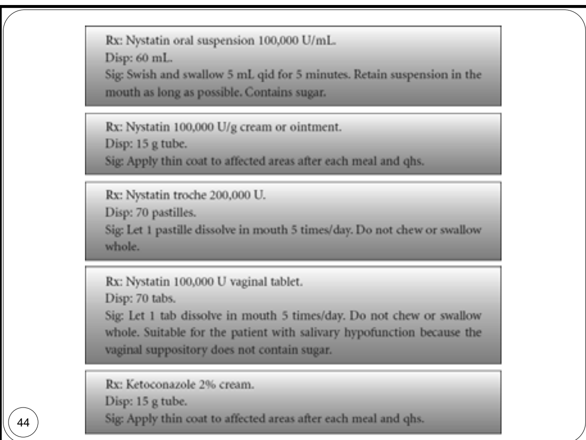
Medications for BMS

Medications (class of drug)	Common Dosage Range	Prescription	Mechanisms of Action/ FDA Approval Status	Evidence Basis for Use
Nortriptyline (tricyclic antidepressant)	10 to 75 mg per day	10 mg at bedtime; increase dosage by 10 mg every four to seven days until oral burning is relieved or side effects occur.	Tricyclic antidepressants inhibit the activity of such diverse agents as histamine, 5-hydroxytryptamine, and acetylcholine. It increases the pressor effect of norepinephrine. This drug is approved for use of the symptoms of depression, but is used off-label for neuropathic pain.	No published evidence for BMS but used commonly for neuropathic pain.
Oral clonazepam (benzodiazepine)	0.25 to 2 mg per day	0.25 mg at bedtime; increase dosage by 0.25 mg every four to seven days until oral burning is relieved or side effects occur. As dosage increases, medication is taken as full dose or in three divided doses.	Mechanism is unknown, although it is believed to enhance the activity of gamma aminobutyric acid (GABA), the major inhibitory neurotransmitter in the CNS. This agent is approved by the FDA for seizures and for panic disorders. It is used off-label for neuropathic pain and BMS in particular.	Open clinical trials show some efficacy for BMS. No randomized, blinded placebo-controlled study (note exception below).
Topical clonazepam (benzodiazepine)	1 mg tablet tid, after meals	Let tablet dissolve and hold fluid in mouth in area of most intense burning for three minutes, then spit.	Same as above	RBCT is available showing this approach is helpful in many BMS patients and is better than placebo.
Gabapentin (anticonvulsant)	300 to 2,400 mg per day	100 mg at bedtime; increase dosage by 100 mg every four to seven days until oral burning is relieved or side effects occurs. As dosage increases taken in three divided doses.	Anticonvulsant action is unknown, gabapentin is known to prevent seizures as do other marketed anticonvulsants. This drug is FDA-approved for partial seizures and for post-herpetic neuralgia pain.	Case report data suggests this agent may be helpful in some patients. No RBCT study performed.
Pregabalin (anticonvulsant)	100 mg PO tid	100 mg PO tid	This is a new drug that is being suggested for use in neuropathic pain patients. Its mechanism of action is thought to be similar to gabapentin. It is approved by the FDA as an adjunctive agent in adult patients with partial onset seizures and for post-herpetic neuralgia and diabetic neuropathy.	No data for BMS is yet available, but it should work similar to gabapentin and it thought to have better pharmacokinetics. No RBCT study performed.
Topical lidocaine (anesthetic)	Viscous gel 2%	5 ml qid. Rinse for two minutes and expectorate.	This agent is a sodium channel-blocking agent and provides analgesic effects when applied topically. It is FDA-approved as a topical anesthetic agent but its use is specified as an aid for minor surgeries or skin abrasions.	No data for BMS is yet available. No RBCT study performed.






Rx: Nystatin oral suspension 100,000 U/mL.
Disp: 60 mL.
Sig: Swish and swallow 5 mL qid for 5 minutes. Retain suspension in the mouth as long as possible. Contains sugar.

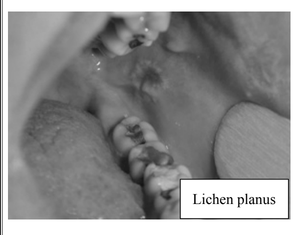
Rx: Nystatin 100,000 U/g cream or ointment.
Disp: 15 g tube.
Sig: Apply thin coat to affected areas after each meal and qhs.

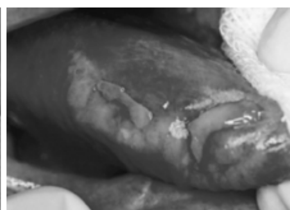
Rx: Nystatin troche 200,000 U.
Disp: 70 pastilles.
Sig: Let 1 pastille dissolve in mouth 5 times/day. Do not chew or swallow whole.

Rx: Nystatin 100,000 U vaginal tablet.
Disp: 70 tabs.
Sig: Let 1 tab dissolve in mouth 5 times/day. Do not chew or swallow whole. Suitable for the patient with salivary hypofunction because the vaginal suppository does not contain sugar.

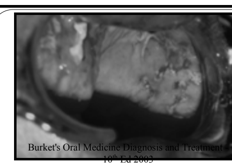
Rx: Ketoconazole 2% cream.
Disp: 15 g tube.
Sig: Apply thin coat to affected areas after each meal and qhs.

Erosive Lichen Planus


Lichen planus



Patients should be advised that the condition is often chronic and may recur when therapy is stopped. The therapeutic objective is to control the disease by reducing inflammation, especially when painful.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Pemphigus

- Pemphigus is a potentially life-threatening disease that causes blisters and erosions of the skin and mucous membranes.
- Myasthenia gravis.
- The bulla rapidly breaks but continues to extend peripherally, eventually leaving large areas denuded of skin
- Nikolsky sign.
- 80-90 % of patients with pemphigus vulgaris develop oral lesions sometime during the course of the disease.

Bullous Pemphigoid

- BP, which is the most common of the subepithelial blistering diseases.
- Occurs chiefly in adults over the age of 60 years.
- Self-limited and may last from a few months to 5 years.
- BP may be a cause of death in older debilitated individuals.
- BP has occasionally been reported in conjunction with other diseases, particularly multiple sclerosis and malignancy, or drug therapy, particularly diuretics.

MUCOUS MEMBRANE PEMPHIGOID (CICATRICIAL PEMPHIGOID)

- MMP is a chronic autoimmune subepithelial disease.
- Primarily affects the mucous membranes of patients over the age of 50 years.
- Resulting in mucosal ulceration and subsequent scarring.
- Oral lesions occur in over 90% of pa MMP.

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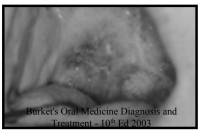
MUCOUS MEMBRANE PEMPHIGOID (CICATRICIAL PEMPHIGOID)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- Desquamative gingivitis is the most common manifestation and may be the only manifestation of the disease.
- Lesions resemble of erosive lichen planus and pemphigus.
- Cases of desquamative gingivitis should be biopsied

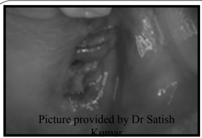
TOPICAL STEROIDS AND IMMUNOSUPPRESSANTS

Rx: Dexamethasone elixir 0.5 mg/5 mL.
Disp: 250 mL.
Sig: Swish and spit 5 mL qid for 5 minutes.

Rx: Clobetasol propionate 0.05% gel.
Disp: 15 g tube.
Sig: Apply to affected regions tid.

Rx: Fluocinonide 0.05% gel.
Disp: 15 g tube.
Sig: Apply to affected regions tid.

Rx: Tacrolimus 0.1% ointment.
Disp: 15 g tube.
Sig: Apply to affected regions tid.


Picture provided by Dr Satish Kumar

BON

- **Defined as exposed bone in the maxillofacial area, not associated with radiation or any other known cause and not healing for 8 weeks.**
- **BON has been described in patients taking several different forms and brands of BP.**
- **Risk factors have been recognized and may be classified as systemic or local.**
- **Most cases have followed dental extractions, other invasive dental procedures, or poorly fitting dentures.**

Risk Factors for ONJ/BON

- Drug Related
  - BIS IV exposure > PO
  - Zoledronate>pamidronate>oral bisphosphonates
- Local Factors
  - Intraoral dental surgeries
  - Mandible> maxilla; where mucosa overlies bony prominences
  - Concurrent oral disease such as abscesses
- Demographic and systemic factors
  - Increasing age
  - Being of Caucasian race
  - Cancer diagnosis w/ multiple myeloma> breast CA> other cancers
  - Osteopenia/osteoporosis with concurrent CA dx

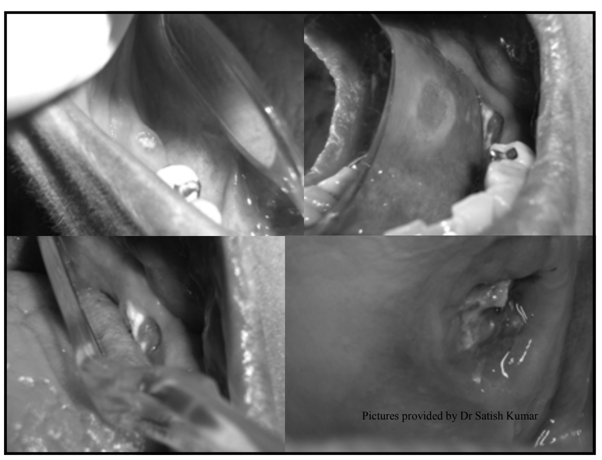
Other Possible Risk Factors for ONJ/BON

- Corticosteriod therapy
- Diabetes
- Smoking
- Alcohol use
- Poor oral hygiene
- Chemotherapeutic drugs

STAGING AND TREATMENT STRATEGIES

American Assoc of Oral and Maxillofacial Surgeons (AAOMS) – Position Paper

•**At risk category:** No apparent exposed/necrotic bone in patients who have been treated with either oral or IV bisphosphonates	•No treatment indicated •Patient education
•**Stage 1**: Exposed/necrotic bone in patients who are asymptomatic and have no evidence of infection	•Antibacterial mouth rinse •Clinical follow-up on a quarterly basis •Patient education and review of indications for continued bisphosphonate therapy
•**Stage 2**:Exposed/necrotic bone associated with infection as evidenced by pain and erythema in the region of the exposed bone with or without purulent drainage	•Symptomatic treatment with broad-spectrum oral antibiotics, eg, penicillin, cephalexin, clindamycin, or first generation fluoroquinolone • Oral antibacterial mouth rinse • Pain control • Only superficial debridements to relieve soft tissue irritation
•**Stage 3**: Exposed/necrotic bone in patients with pain, infection, and one or more of the following: pathologic fracture, extraoral fistula, or osteolysis extending to the inferior border	•Antibacterial mouth rinse •Antibiotic therapy and pain control •Surgical debridement/resection for longer term palliation of infection and pain



HIV Impact on health and quality of life

- ❖ **Oral manifestations may be the first sign of HIV infection/AIDS**
- ❖ **People with HIV infection are living longer**
- ❖ **These patients will seek regular dental care as well as care for the oral complications from this disease**

Issues

- ❖Post- op bacteremia / opportunistic infections
- ❖Post - op bleeding
- ❖Drug allergy
- ❖Drug interaction
- ❖Transmission of infection

Lab Values

Laboratory Test

- Viral Load
- CD4-T lymphocyte Helper Cell
- CD4 %
- Neutrophil (ANC)

- Hemoglobin
- Platelets
- INR

Viral Load

- Number of HIV RNA/ ml of plasma
- Antiviral drugs are to keep viral load down
- Test done regularly every 3-6 months to monitor the progress of the disease
- High Viral Load is indication of rapid progress to AIDS
- Evaluate other markers before treatment

Viral Load

- > 10.000
- Marker of disease progression
- No contraindication for dental care.
- Can assess efficacy of treatment.
- Association with oral lesions.

CD4-T Helper Lymphocyte

- CD4 count: gives general idea about the health of HIV-Infected patient
- Normal CD4: 500-1500 cell/ mm^3
- Low CD4 is reflection of advanced disease, only 1 indicator of the patient's health
- < 200 cell/mm^3 risk for opportunistic infection

CD4-T Helper Lymphocyte

- Marker of immune suppression.
- No contraindication for dental treatment.
- Evaluate long term benefit.
- Association with oral lesions.
- Not an indicator for antibiotic prophylaxis.

Normal Range Lab Values Neutrophils

- Normal range: 3,000-7,000/ mm
- Neutropenia: <1000/mm^3
- **Severe neutropenia <500/mm^3**

  **May require antibiotic prophylaxis before invasive dental treatment

Normal Range: Lab Values

Coagulation

Platelets: **150 – 400 x 10^3/ul**

INR: **0.9 – 1.1 (2-3.5) 2.5**

Bleeding Time: **< 5 - 6 min**

Thrombin Time: **10 -14 sec**

Coagulation

- Platelets < 60,000 risk of bleeding invasive dental procedure
- Platelets ≤ 20,000, spontaneous bleeding

Factors that predispose to HIV-related oral conditions

- CD4 count of <200/μl
- Viral load of >3,000/ml
- Xerostomia
- Poor oral hygiene
- Smoking