ECHO IDAHO

Oral Health in Primary Care

Understanding Medication Impacts on Oral Health

3/17/26

Ann Eshenaur Spolarich, RDH, PhD, FSCDH
Professor and Assistant Dean for Research
Arizona School of Dentistry and Oral Health
A.T. Still University

University of Idaho
School of Health and Medical Professions

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Learning Objectives

- Discuss the role of polypharmacy and occurrence of drug side effects, including oral side effects.
- Discuss the role of saliva in maintaining oral homeostasis.
- Describe the impact of chronic dry mouth on oral comfort and ability to function.
- Identify and describe common oral complications of medication use.

Multimorbidity and Polypharmacy

Two or more co-occurring chronic health conditions

Common in older adults

Treatment is more difficult: multiple providers

Negative impact on health outcomes:

Decreased:

- quality of life
- self-rated health
- mobility and functional ability

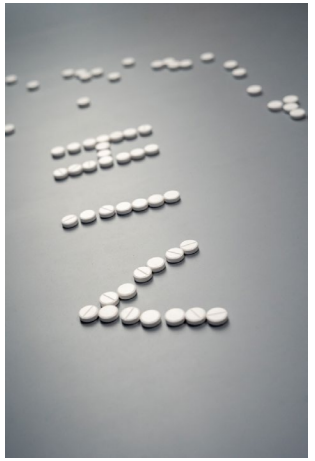
Increased:

- Side effects, toxicity reactions
- hospitalizations
- physiological and psychological distress
- use of health care resources/healthcare costs
- mortality

Masnoon N et al.What is polypharmacy? A systematic review of definitions. BMC Geriatr. 2017 Oct 10;17(1):230; Salive ME. Multimorbidity in older adults. Epidemiol Rev. 2013:1–9; Roughead EE et al. Multimorbidity, care complexity and prescribing for the elderly. Aging Health. 2011;**7**(5):695–70; Caughey GE et al. Comorbid chronic diseases, discordant impact on mortality in older people: a 14-year longitudinal population study. J Epidemiol Community Health. 2010;64(12):1036–1042; Marengoni A et al. Aging with multimorbidity: a systematic review of the literature. Ageing Res Rev. 2011;10(4):430–439.

Who do we see with polypharmacy?

- Cardiovascular disease
- Diabetes
- Autoimmune diseases
- Organ transplant recipients
- Cancer
- HIV
- Behavioral health disorders/mental illness/SUD
- Respiratory disease
- Gastrointestinal disorders



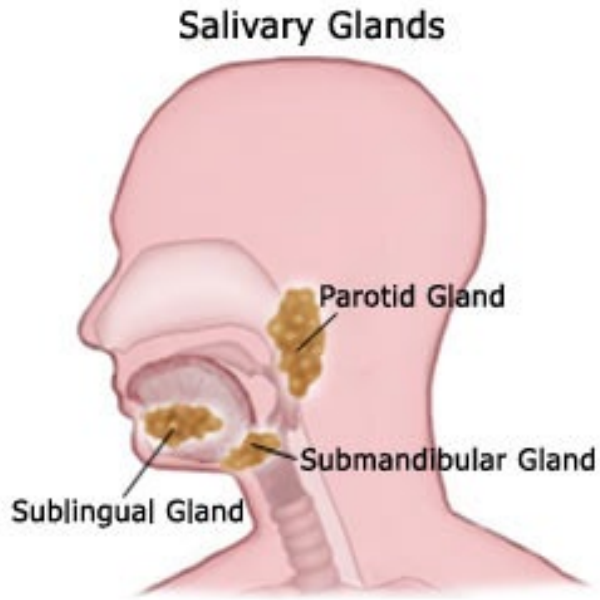
Background

- Thousands of medications cause oral side effects, although most are rare, affecting less than 5% of users
- Exception: dry mouth
  - Associated with multiple classes of medications used to control the chronic diseases of aging
  - Antihistamines, antidepressants, anti-anxiety medications, anticonvulsants, antihypertensives, sedatives and sleeping pills, allergy and cold medications, and anticholinergic drugs used to treat dementia
- Medications alter saliva production, flow rate into the mouth, and chemical composition

Green JL, et al. Prevalence of Prescription and Over-the-Counter Medication Use Among U.S. Adults. JAMA Network Open, 2026;9(2):e2559479. doi:10.1001/jamanetworkopen.2025.59479; Teoh L, Moses G, McCullough MJ. A review and guide to drug-associated oral adverse effects-Dental, salivary and neurosensory reactions. Part 1. J Oral Pathol Med. 2019 Aug;48(7):626-636; DeRossi SS, Hersh EV. A review of adverse oral reactions to systemic medications. Gen Dent. 2006 Mar-Apr;54(2):131-8; Cassolato SF, Turnbull RS. Xerostomia: clinical aspects and treatment. Gerodontology. 2003 Dec;20(2):64-77; Tan ECK, et al. Medications That Cause Dry Mouth As an Adverse Effect in Older People: A Systematic Review and Metaanalysis. J Am Geriatr Soc. 2018 Jan;66(1):76-84.

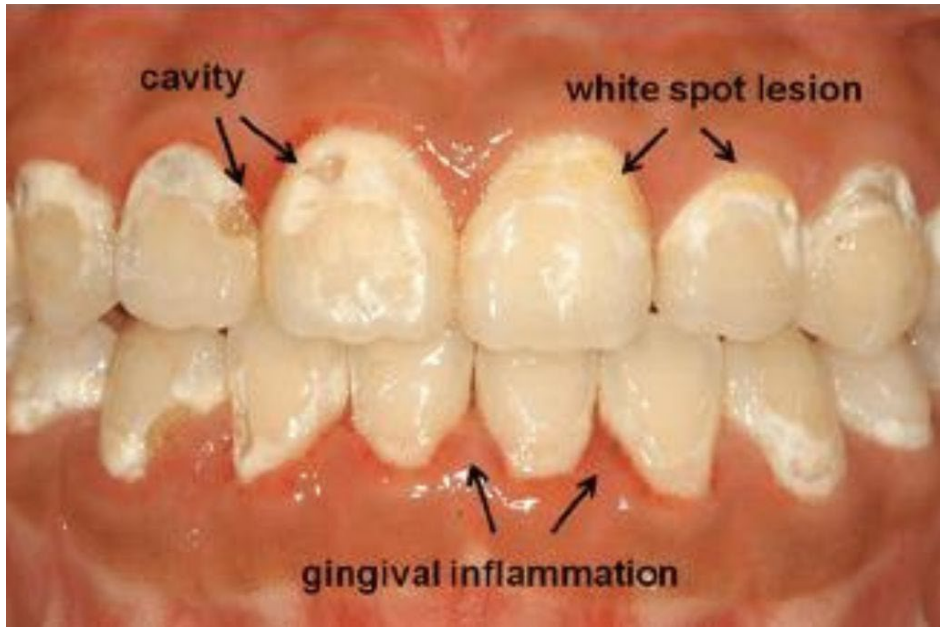
Normal Salivary Physiology

- Parasympathetic (serous saliva)
  - Fluid component of saliva
  - High in volume and ions
  - Low in protein
- Sympathetic (mucous saliva)
  - High in protein
  - Low in volume



Salivary components and function

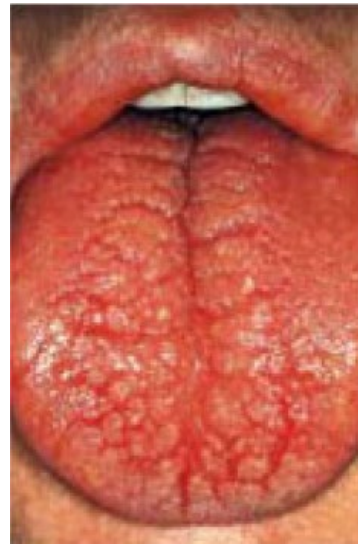
- Mucins = tissue integrity
- Mucins = protection
- Immunologic, antimicrobial processes and enzymes = microbial balance
- Sodium bicarbonate, phosphate = buffers
- Pellicle, electrolytes, Ca, phosphorus = structural integrity of teeth
- Proteins = digestion
- Fluids = cleansing, taste



Complications of Xerostomia

- **Acidic oral and biofilm pH** (quality)
  - demineralization, caries and dentinal hypersensitivity
- **Loss of antimicrobial properties** (quality)
  - Bacterial infections: caries, gingival disease
  - Recurrent fungal infections
  - Viral infections
- **Loss of lubrication** – trauma, oral ulcerations, pain, difficulty with normal functions
  - wearing prostheses/oral appliances
  - speaking
  - swallowing

- **Decreased quantity of saliva**
  - Digestive problems
  - Oral discomfort
  - Friable mucosa
  - Atrophic tongue
  - Infections
  - Difficulty with oral function



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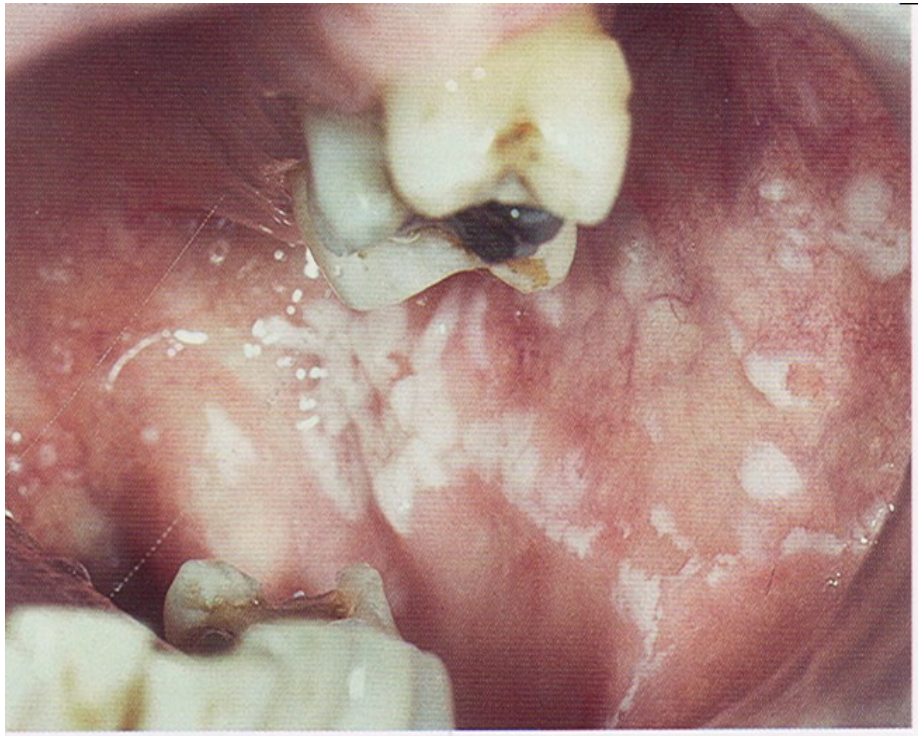
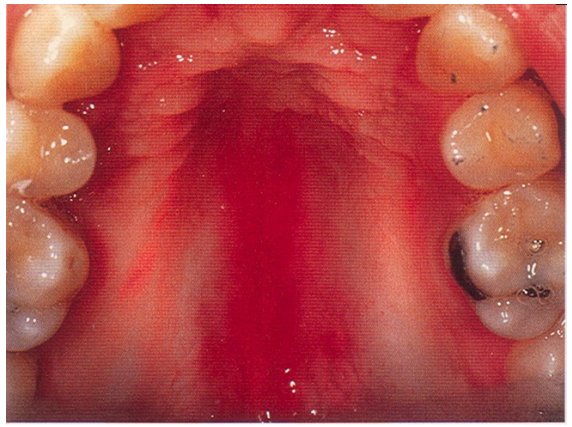
Fungal Infections



- Inhaled steroids for asthma and COPD
- Oral steroids for autoimmune diseases
- Immunosuppressants
- Antibiotics and hormones
- Proton pump inhibitors (esophageal)

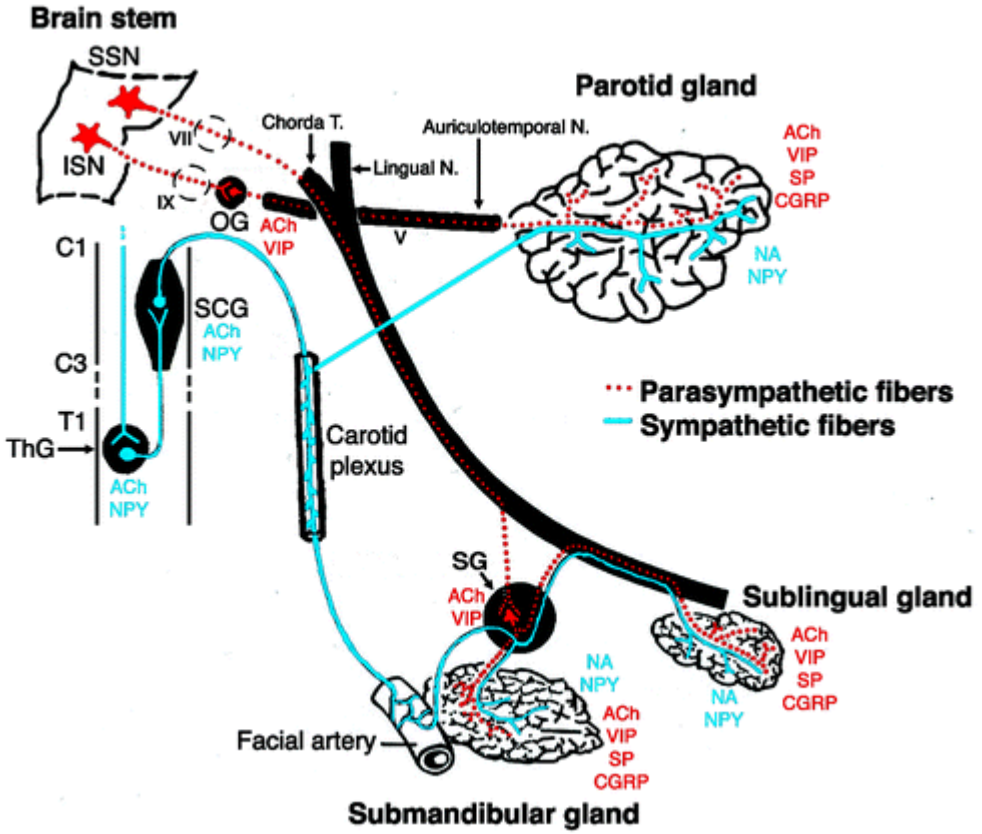
Clinical Presentation

- Pseudomembranous appearance
- Atrophic tongue
- Hyperkeratotic appearance
- Symptomatic geographic tongue
- Angular cheilitis



Parasympathetic nerves

- Produce increase in fluid volume (serous)
  - **Cholinergic effect**
  - Cholinergic drugs increase saliva (e.g. pilocarpine or cevimeline)
- **Anticholinergic** drugs reduce volume
  - Antihypertensives
  - Antihistamines
  - Antidepressants
  - Antiemetics
  - Antispasmotics
  - Antiparkinsonian drugs
  - Drugs for dementia



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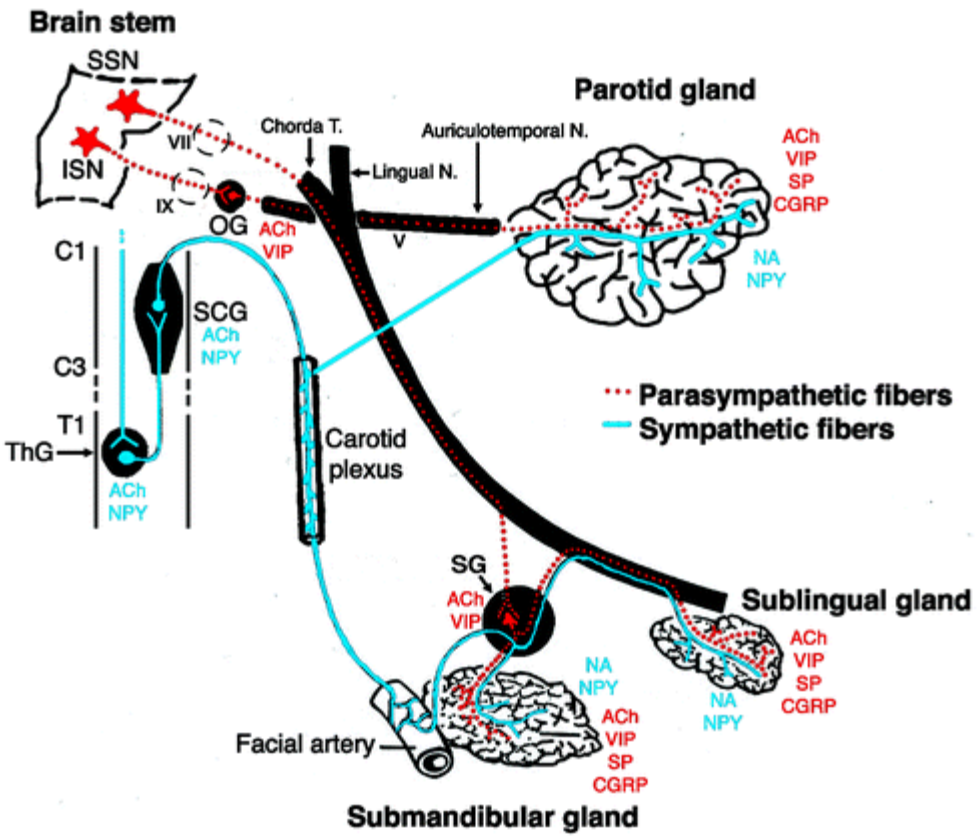
Sympathetic nerves

- Fight or flight response
- Produce less volume and more viscous (mucinous) saliva
- Sympathomimetic drugs
  - Decongestants
  - Bronchodilators
  - Appetite suppressants
  - Amphetamines



Drug Classes that Cause Dry Mouth

- Anorexiants
- Antiacne agents
- Antianxiety agents
- Anticholinergics
- Antispasmodics
- Anticonvulsants
- Antidepressants
- Antiemetics
- Antihistamines
- Antihypertensives
- Anti-inflammatory analgesics
- Antinauseants
- Antiparkinsonian agents
- Antipsychotics
- Bronchodilators
- Decongestants
- Diuretics
- Muscle relaxants
- Opioid analgesics
- Sedatives

Head and Neck Radiation

- Salivary glands highly sensitive to radiation
- Serous acinar cells (parotids) more radiosensitive than mucous cells
- Serous cells contain more heavy metals and absorb more radiation
    - Promotes the release and action of free radicals

Dental Caries

Osteoradionecrosis

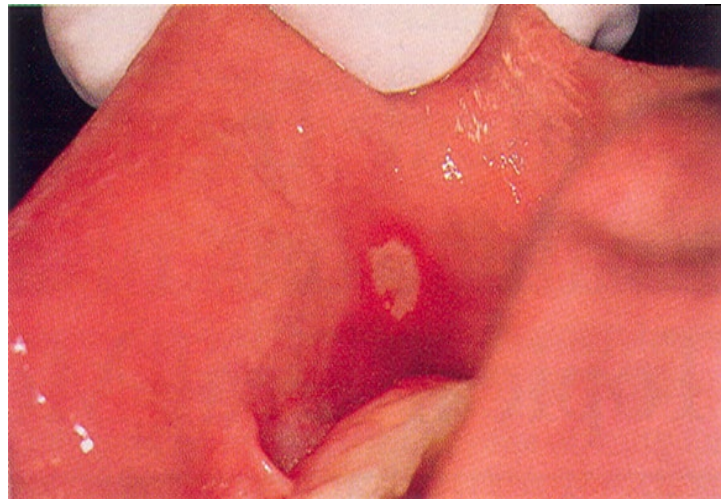
- An area of exposed, devitalized, irradiated bone that fails to heal over a period of 3-6 months in the absence of neoplastic disease
- Higher risk in mandible
- Early vs. late occurrences
- Risk factors:
  - >60 Gy of radiation/high # of fractionations
  - Mandible is in field of radiation
  - Local trauma
  - Proximity of tumor to bone
  - Tumor site is within the bone
  - Poor oral health/oral hygiene

Chemotherapy and Mucositis

- Alters salivary flow rate and salivary composition
- Effects vary with type and duration of treatment
- Systemic immunosuppression alters concentration of salivary immunoglobulins
- ***Results in mucositis, infections***
- Many chemo drugs cause xerostomia:
  - Severity = total number of agents used
- Exact mechanism of action is unknown
  - Increased salivary drug concentration and contact with oral epithelium = low flow rates
  - ***High concentration of biologically active drug may result in toxicity to oral tissues***

Oral Ulcerations

- Painful conditions that make eating, speaking, swallowing and sleeping difficult
- Topical anesthetics
- Many run their course
- More severe cases may require steroids or other interventions to treat the condition, or occasionally, the causative drug may need to be stopped temporarily or permanently discontinued
- Most common drug families:
  - Non-steroidal anti-inflammatory agents (NSAIDS)
  - Beta blockers and ACE inhibitors
  - Anticonvulsants
  - Antidepressants
- Follow-up care for any ulcer that does not go away on its own within two weeks



DeRossi SS, Hersh EV. A review of adverse oral reactions to systemic medications. Gen Dent. 2006 Mar-Apr;54(2):131-8; Teoh L, at al. A review and guide to drug-associated oral adverse effects-Oral mucosal and lichenoid reactions. Part 2. J Oral Pathol Med. 2019 Aug;48(7):637-646; Elad S, et al. The broadening scope of oral mucositis and oral ulcerative mucosal toxicities of anticancer therapies. CA Cancer J Clin. 2022 Jan;72(1):57-77; Yuwanati M, et al. Oral health-related quality of life in oral cancer patients: systematic review and meta-analysis. Future Oncol. 2021 Mar;17(8):979-990; Yousefi H, Abdollahi M. An Update on Drug-induced Oral Reactions. J Pharm Pharm Sci. 2018;21(1):171-183.

Clenching/Grinding/Movement Disorders

- SSRI/SNRI antidepressants
- Stimulant medications (ADHD), illicit stimulant drugs, such as cocaine, methamphetamine or methylenedioxymethamphetamine (Ecstasy)
- Antipsychotic medications used to treat schizophrenia, bipolar disorder

Kannarkat GT, Caroff SN, Morley JF. Risk of Drug-induced Movement Disorders with Newer Antipsychotic Agents. Tremor Other Hyperkinet Mov (N Y). 2022 Jun 8;12:19. doi: 10.5334/tohm.695;
Clark GT, Ram S. Four oral motor disorders: bruxism, dystonia, dyskinesia and drug-induced dystonic extrapyramidal reactions. Dent Clin North Am. 2007 Jan;51(1):225-43, viii-ix.

Taste Alteration

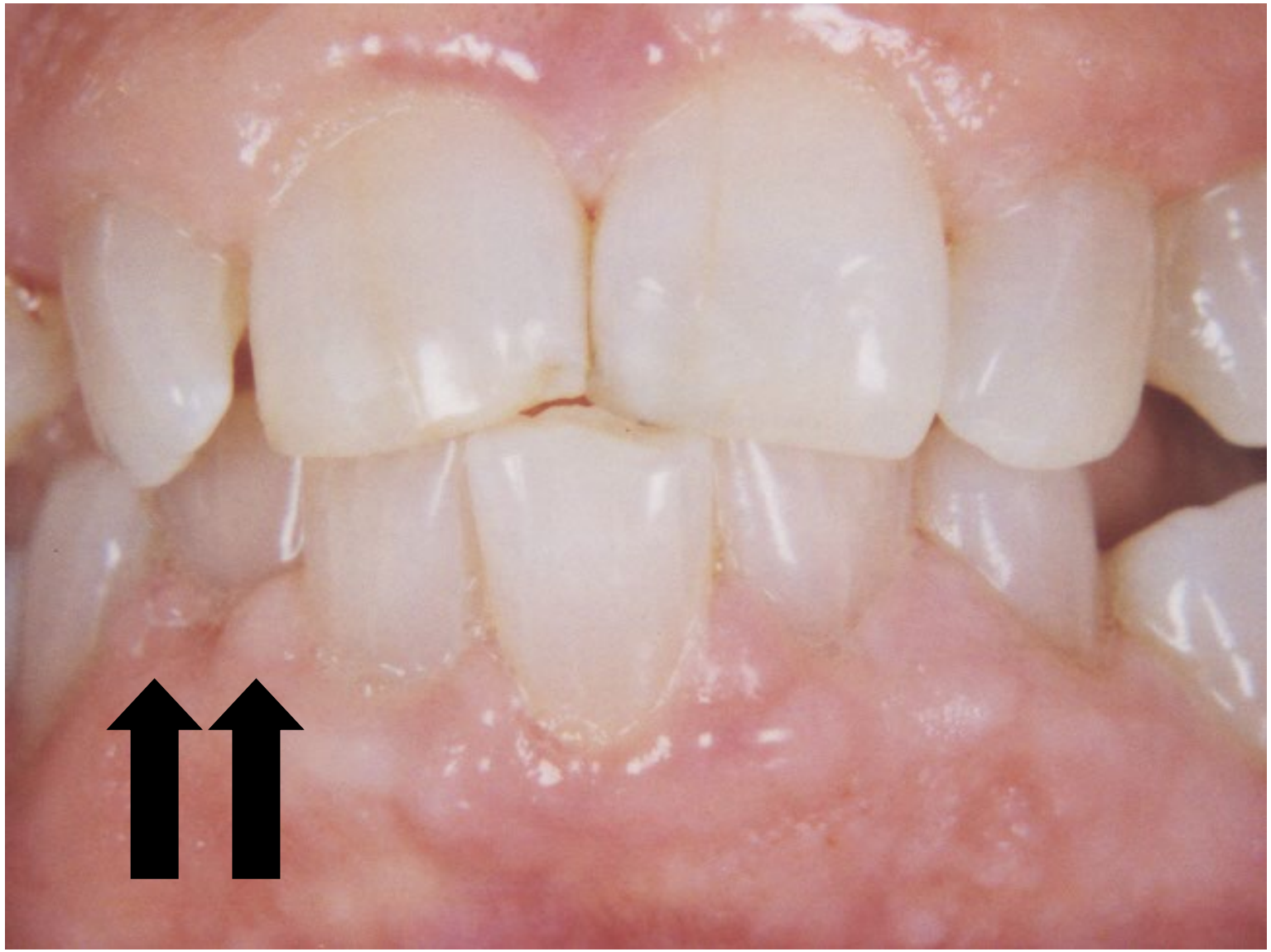
- Over 350 drugs alter taste and smell, including more than half of the top 100 most commonly prescribed medications in the US
- Metallic aftertaste or have reduced taste sensation with sweet, salty, sour or bitter tastes
- Antibiotics, antihypertensives, some medications for GERD, and metformin
- Saliva is necessary to carry tastants from foods over the taste buds, so taste alteration also occurs in those with medication-related dry mouth

Rademacher WMH, Aziz Y, Hielema A, Cheung KC, de Lange J, Vissink A, Rozema FR. Oral adverse effects of drugs: Taste disorders. Oral Dis. 2020 Jan;26(1):213-223. doi: 10.1111/odi.13199.

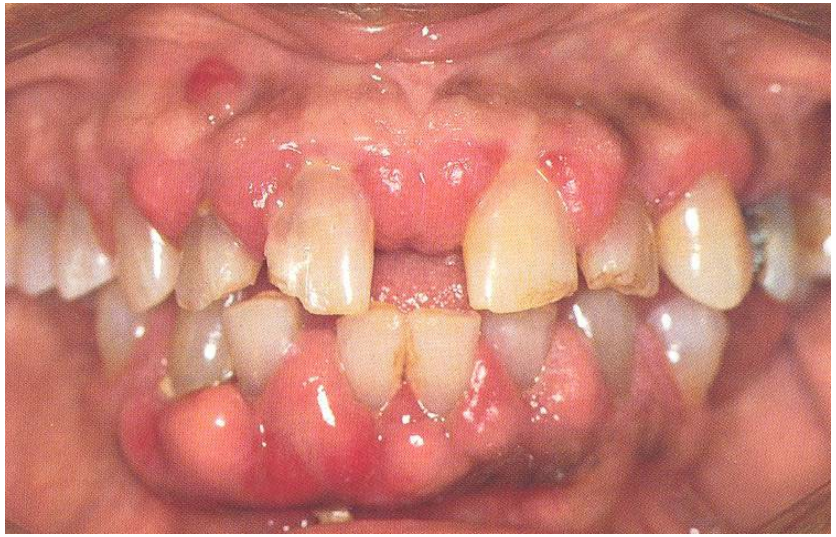
Enlargement of the Gum Tissue

- Gingival hyperplasia
- Calcium channel blockers, anticonvulsants, immunosuppressants
- Gingival tissue grows and appears swollen, but is firm in texture
- Genetic predisposition
- Benign
- Good oral hygiene will not prevent tissue overgrowth, but it will help to limit the severity for as long as the patient remains on the drug

Tungare S, Paranjpe AG. Drug-Induced Gingival Overgrowth. 2022 Sep 19. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan–. PMID: 30860753;
Barsoum F, Prete BRJ, Ouanounou A. Drug-Induced Gingival Enlargement: A Review of Diagnosis and Current Treatment Strategies. Compend Contin Educ Dent. 2022 May;43(5):276-285



Nifedipine



Phenytoin

Cyclosporine

Medication-Related Osteonecrosis of Jaws (MRONJ)

- Rare, but serious condition where sores develop in the mouth that expose the underlying bone
- Failure to heal
- Requires professional intervention
- Associated with medications used to treat osteoporosis that are taken orally or by infusion, and some medications used for cancer chemotherapy
- Some patients may be at greater risk: smoking, steroids, diabetes, chemotherapy, poor bone quality
- An oral surgeon should be consulted for evaluation and treatment

Kuroshima S, Sasaki M, Sawase T. Medication-related osteonecrosis of the jaw: A literature review. J Oral Biosci. 2019 Jun;61(2):99-104. doi: 10.1016/j.job.2019.03.005.

Stage 1

Stage 2

Stage 3

Key Points

- Chronic dry mouth is most common oral complication of medication use
- Oral side effects negatively impact comfort, function and quality of life
- Discontinuance may be necessary if oral side effects are severe
- Collaborative care is essential for proper patient management

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