

CE Course Handout

It's (Medically) Complicated

Thursday, June 9, 2016 9:30 a.m.-12:30 p.m.









Program Objectives Pharmacology



- Review the prominent disease states found in the medically-complex patient
- Distinguish between the states of xerostomia and hyposalivation
- Recognize the protective functions of saliva and its role in prevention
- Explain and compare disease-induced and medication-induced xerostomia

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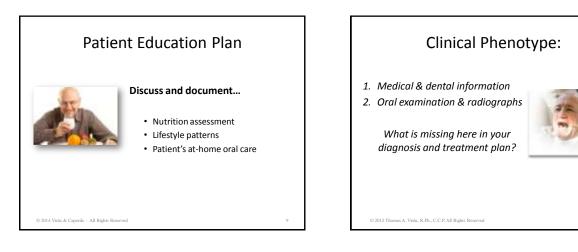


- Discuss the changing paradigm in caries prevention utilizing risk assessments and consideration with complex polypharmacy patients
- Select effective fluoride therapy using calcium & phosphate in professional and take-home care.
- Integrate critical thinking skills and implement effective patient care strategies considering the most common chronic diseases.

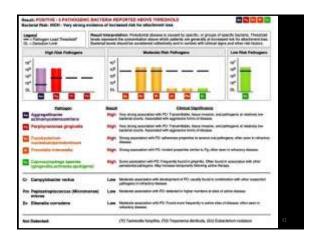




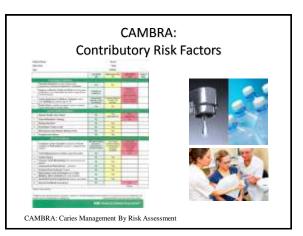


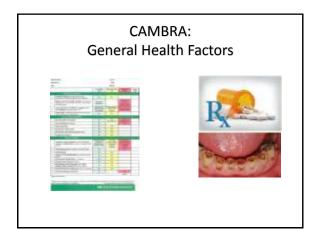


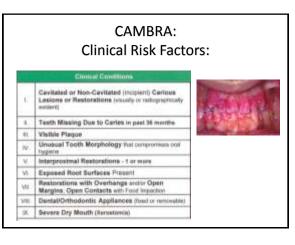


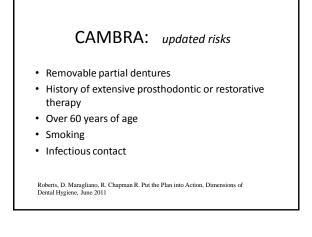










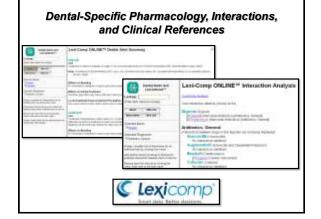


Dental Hygiene Treatment Plan:

- Recent hospitalization and reason?
- General observation of patient's appearance, gait and cognitive capabilities
- Take vital signs and record/w date
- List names of drugs/herbal supplements
 - Record the daily dosage and frequency (compliance?)
- Research the drug list:
 - side effects
 - interactions that may alter treatment outcomes

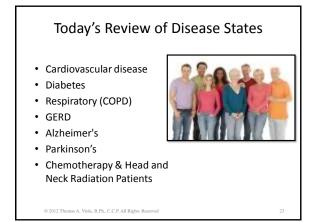
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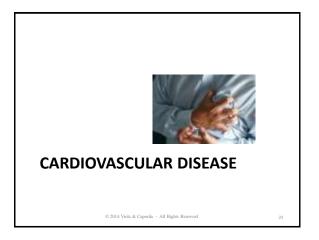


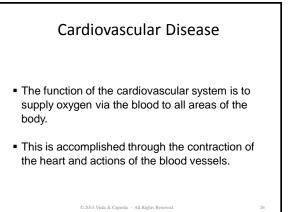


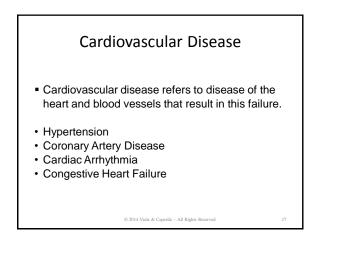
• The mean annual spending on adult dental care peaks between the **ages of 55 to 64** del Aguillo et al, 2002

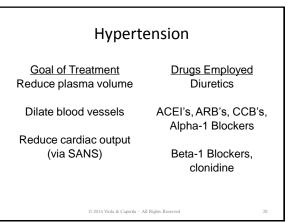
dental caries account for about half of this spending

- Americans spent an estimated \$108 billion on dental services in 2010
- Projected increase to <u>\$180 billion</u> by 2020. Truffer et al 2010









Coronary Ar	tery Disease
Goal of Treatment Increase coronary artery flow	Drugs Employed Nitrates, CCB's
Reduce oxygen demand	Beta-1 Blockers
Inhibit progression of disease	Antihyperlipidemic Agents
Prevent thromboembolism	Antithromboembolic Agents
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Congestive Heart Failure			
Goal of Treatment Reduce plasma volume	Drugs Employed Diuretics		
Dilate blood vessels	ACEI's, ARB's, CCB's		
Reduce contraction rate	Beta-1 Blockers		
Increase cardiac contractility	Digoxin		
Prevent thromboembolism	Antithromboembolic Agents		
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The Epinephrine Question

- The benefit of using epinephrine to achieve profound anesthesia may outweigh the risk in patients with controlled cardiovascular disease.
- Pain-induced stress leads to the release of endogenous epinephrine.
- This may exacerbate cardiovascular disease.

Classification of Cholesterol levels

Total Cholesterol

- Under 200 — 200-239
- 240 and above
- Desirable Borderline high
- oove High

Classification of Cholesterol levels

Optimal!

Near-optimal

LDL Cholesterol

- Less than 100
- 100-129
- 130-159 Borderline high
- 160-189
- 190 and above Very high

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High

Classification of Cholesterol levels

HDL Cholesterol

- Under 40 Low
- Over 60 High
- *Optimal HDL should be >50 for women

Triglycerides

- Under 150 Optimal
- 150-199 Borderline high
- 200 and above High

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Dental Hygiene: Cardiovascular

- ✓ When is best time to schedule this patient?
- ✓ What should be in your office emergency kit?
- ✓ At visit Ask if experienced an MI in past 30 days?

http://www.dentistryiq.com/articles/2013/06/heart-disease-and-stroke-update.html

Dental Hygiene: Cardiovascular

Observation during examination:

- Face, arms or legs: numbness or weakness mainly on one side of body
- Brain: confusion, trouble speaking, dizziness, loss of balance, bad headaches
- Eyes: trouble seeing from one or both
- · Stomach: throwing up or urge to
- Legs/Body: feeling tired and trouble walking

http://www.dentistryiq.com/articles/2013/06/heart-disease-and-stroke-update.html

Emergency Protocol*

Patients with risk factors for coronary heart disease and experience "chest pain"

- 1. Take & record vital signs (BP over 180/110 contraindicated for treatment that day)
- Administer 0.4mg tab of nitroglycerin sublingually or 1-2 metered dose of spray (0.3 - 0.6mg)
- Provide Oxygen flow rate 4 liters/min. to 6 liters/min. via nasal cannula
- If pain doesn't subside in 3 minutes, repeat dose of nitroglycerin 5-15 minutes
- 5. Chest pain that persists after 3 doses is most likely an MI
- Pain persists administer a 325 mg uncoated aspirin and CALL 911
- 7. Record all events in patient's record

Tolle & Walters. Strategies for the Safe Treatment of Cardiovascular Patients. Dimensions in Dent Hyg. March 2015

Dental Hygiene: Cardiovascular

Therapeutic Treatment:

- Pain management pre-treatment
- Mechanical removal of biofilm, pathogens
- · Altering immune response with selective antibiotics
- Treating hypersensitivity topical fluoride varnish

Take-home agents:

- Antimicrobial dentifrice/rinses
- Supplemental fluoride & calcium/phosphate products
- Power toothbrush, dental floss, proximal brushes

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Dental Hygiene: Cardiovascular "dry mouth symptoms"

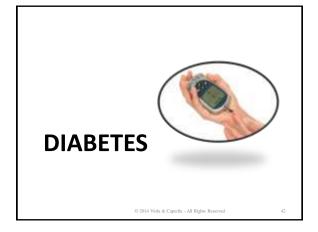
✓ Avoid use of petroleum jelly on lips = causes dehydration

<u>Rx: cocoa butter</u>

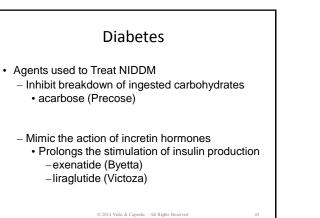
- ✓ Avoid lemon glycerin swabs or crushing pills in fruit jam to assist in swallowing
 = dental caries risk
- ✓ If hydrogen peroxide mouthrinse used must be diluted to neutralize acidity

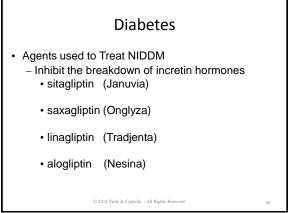
Morris, D, & Sadowsky, J. Heart-Friendly Oral Health Care. Dimensions in Dent Hygiene. March 2011: Vol. 9, No 3. pp74-79.











Diabetes

Insulin

- Mechanism of action
 - Replacement of endogenous insulin
- Adverse effects
 - · Hypoglycemia, weight gain
- Patient care considerations
 - Treat hypoglycemia with glucagon, glucose

	Diabetes	5
Short Acting	Intermediate Acting	Long Acting
 Humulin R Insulin aspart (Novolog) Insulin lispro (Humalog) Insulin glulisine (Apidra) 	 Humulin N Humulin L Humulin 70/30 Humalog Mix 75/25 	Humulin U Insulin detemir (Levemir) Insulin glargine (Lantus)** **discard 28 days after 1st use
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Dental Hygiene: Diabetes



- Medical, Dental and Risk Assessments
- Determine Type of Diabetes and A1C test results
- Emergency kit: glucose gel or tablet or orange juice
- New Diabetes PPOD Tool Kit for collaborative care "Working Together to Manage Diabetes. A Toolkit for Pharmacy, Podiatry, Optometry and Dentistry (PPOD)"

*Available through the National Diabetes Education Program http://www.cdc.gov/diabetes/ndep/pdfs/ppod-guide-dental-professionals.pdf

Dental Hygiene: Diabetes

- Look carefully at oral cancer screening for:
 - Dry mouth, gingival inflammation, poor healing of oral tissues, thrush (thrives on high glucose level) and burning of mouth or tongue
- Listen allow patient to tell their stories since many of these diseases have "silent symptoms" when undiagnosed

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- Feel - be empathetic to gain their trust and compliance

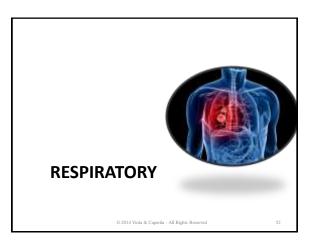
Diabetes: **Dental Hygiene Care** · Confirm appointment: remind to eat meal check glucose level • Dietary review: Scheduling in late morning after meal • Home care (glucose high/insulin activity is lower) · Antimicrobials, stannous fluoride treatment gel

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Pain management for invasive procedures



- Balanced meals to include high nutrients and reduce intake of high sugar drinks and alcohol.
- Maintenance 2-3 months



Respiratory

Asthma

- Reversible airway obstruction, inflammation · Reduction in expiratory airflow
- Precipitated by

 - allergens, pollution, exercise, stress
 - local anesthetics containing sulfites

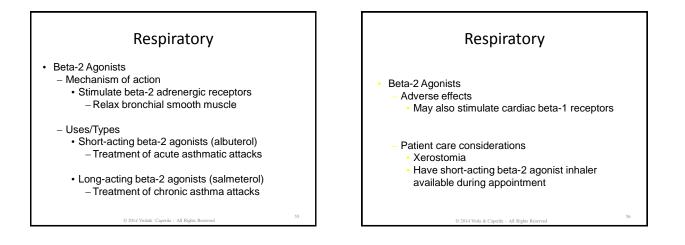
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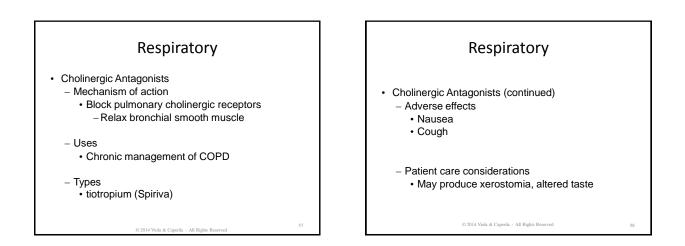
- Symptoms
 - · shortness of breath, wheezing

Respiratory

- Chronic Obstructive Pulmonary Disease (COPD)
 - Irreversible airway obstruction
 - Types
 - Emphysema
 - Alveolar destruction, enlargement
 - · Airway collapse
 - Chronic Bronchitis
 - Chronic inflammation of airways
 - Excessive sputum production

http://www.ncbi.nlm.nih.gov/pubmedhealth/?term=COPD







- · Inhaled Corticosteroids
 - Mechanism of action
 - Reduce airway inflammation
 - Uses
 - · Treatment of chronic asthma, COPD

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- Types
 - fluticasone (Flovent)
 - budesonide (Pulmicort)

Respiratory
Inhaled Corticosteroids (continued)

Adverse effects
Less than orally administered agents
Hoarse voice
Cough

Patient care considerations

Xerostomia
Oral candidiasis and fungal pharyngitis

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Dental Hygiene: Respiratory

- INHALERS accessible during care
- CAMBRA: focus on salivary function and adverse effects of medications
- NaF Varnish applied post-prophy
- Home self-care:
 - SnF2 Gel (970ppm) delivering ACP
 - Xylitol products
 - Saliva stimulants, hydrate
 - Avoid alcohol-based products

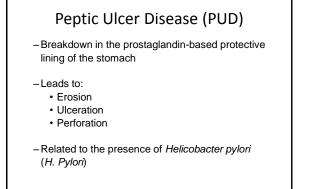


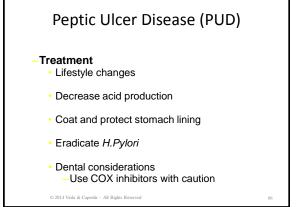
Dental Hygiene: Respiratory
Patient management during procedures:
Patient should be upright
during procedures
Inhaler or oxygen should be
available
Assess and note salivary flow

- Instrumentation:
 - Hand instrumentation
 - Avoid sprays and aerosols
 Ultrasonic scaler & prophyjet









GERD

- Stomach contents "reflux" into esophagus
- Burning in the middle of the chest (heartburn)
- Leads to esophageal tissue damage
- Related to position of stomach and cardiac sphincter
 >Hiatal hernia

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GERD

- -Treatment
 - Lifestyle changes

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- Change in diet
- -Elevation of head in sleeping position
- · Decrease acid production
- Dental considerations
 Semi-supine dental chair position
 Use COX inhibitors with caution

Treatment of PUD/GERD

Histamine-2 Receptor Antagonists

- Mechanism of action
 - Block histamine-2 receptors in stomach wall
 - Decrease gastric acid production

- Types

- cimetidine (Tagamet)
- famotidine (Pepcid)
- ranitidine (Zantac)

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Treatment of PUD/GERD

- Histamine-2 Receptor Antagonists
 Adverse effects
 - Headache, dizziness
 - GI upset

 - Patient care considerations
 - Halitosis
 - Drug interactions at liver microsomal enzymes

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Treatment of PUD/GERD

- Proton-Pump Inhibitors
 - Mechanism of action
 - Inhibit "proton pump" in stomach wall

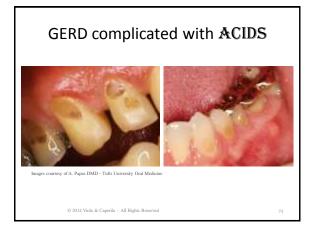
Types

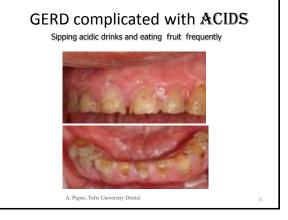
- esomeprazole (Nexium)
- lansoprazole (Prevacid)
- rabeprazole (Aciphex)
- omeprazole (Prilosec)

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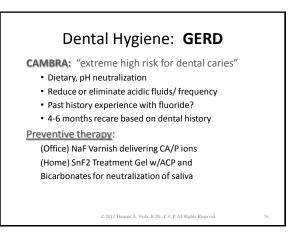
Treatment of PUD/GERD

- Proton-Pump Inhibitors (continued)
 - Adverse effects
 - Headache
 - GI upset
 - Patient care considerations
 - · Halitosis, xerostomia, taste alteration
 - Drug interactions at liver microsomal enzymes
 - -clopidogrel (Plavix)



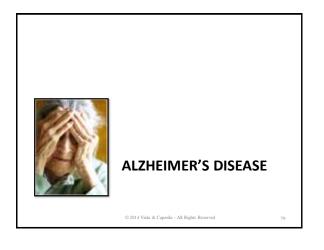












Alzheimer's Disease

Alzheimer's disease is neurodegenerative disorder characterized by the loss of memory, language, visiospatial skills, problem-solving ability and abstract reasoning. It is also frequently associated with behavioral abnormalities.

Alzheimer's Disease

The cause of Alzheimer's disease is unknown but it appears to involve the loss of cortical and cholinergic neurons. Deposits of beta-amyloid plaques initiate inflammation, neurofibrillary tangles and oxidative damage that result in a decrease of neurotransmitters necessary for normal cognition, memory and behavior.

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Alzheimer's Disease

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Patients with Alzheimer's disease have a greater incidence of xerostomia, oral lesions, candidiasis, periodontal disease, and root caries. In addition, these patients often sustain oral injuries from falls as well as lacerations of the tongue, and cheeks (as a result of impaired mastication) and are at an increased risk for aspiration pneumonia (due to dysphagia).

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Alzheimer's Disease

- NMDA receptor antagonists —Mechanism of action
 - Decrease overstimulation of NMDA receptors
 - -Types
 - memantine (Namenda)
 - -Patient care considerations
 - May result in agitation, dizziness and poor coordination

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Alzheimer's Disease
Cholinesterase inhibitors
Alechanism of action
Alecasea acetycholine activity
Alengesi (Aricept)
Potent care considerations
Alecasea incidence of cardiac abnormalities
Bosible hypersalivation

10 Warning signs: Alzheimer's

- 1. Memory life that disrupts 4. Confusion with time & daily life
- 2. Challenges in planning or 5. Trouble understanding solving problems
- 3. Difficulty completing familiar tasks at home, at 6. New problems with work or at leisure
- place
- visual images and spatial relationships
 - words in speaking and writing

10 Warning signs: Alzheimer's

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Continued ...

- 7. Misplacing things and losing ability to retrace steps
- 8. Decreased or poor judgment 9. Withdrawal from work or
- social activities 10. Changes in mood and personality

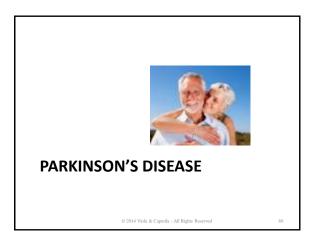


Hygiene Care Plan CAMBRA conducted with family member Typically: high risk for either or both dental caries & periodontal disease • Plaque assessment is critical to guide care · At home therapies decided based on patient's abilities - Antimicrobial rinses and treatment gel for home use to minimize oral disease progression · Supervised dietary schedules • Printed materials for home guidance · Simplest interproximal aids

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Parkinson's Disease

Parkinson's disease is associated with the degeneration and loss of dopamine-producing neurons in the nigrostriatal portion of the brain, as well as the formation of destructive lesions and loss of function in the limbic, motor, and autonomic systems

Parkinson's Disease

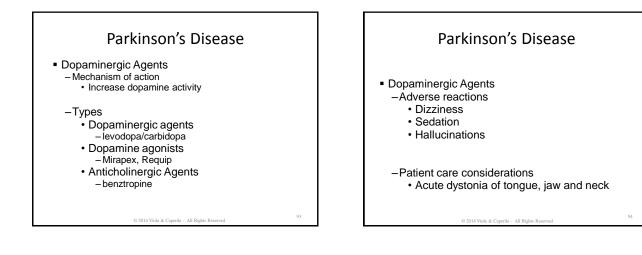
Parkinson's disease is characterized by the presence of Lewy bodies; structures that are strongly correlated with neuron degeneration and are considered a diagnostic marker for the disease.

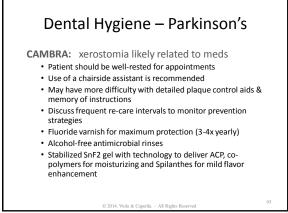
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Parkinson's Disease

The associated neuromuscular and cognitive deficits result in an inability to perform and maintain adequate general and oral hygiene, enhancing the progression of dental disease, impairing home care regimens and encumbering-office dental treatments.

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Dental Hygiene: Parkinson's

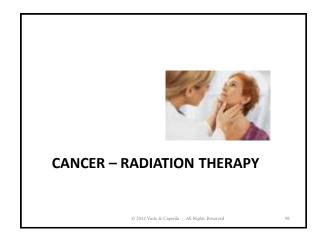
3 - 4 month re-care schedules:

- Adequate time alleviate stress
- Morning appointments if better rested & alert
- Review proper dietary suggestions that reduce plaque and soft food accumulation
- Reduce stress with multiple visits
- Interactive home care technique

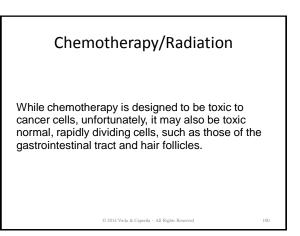


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Chemotherapy/Radiation Many cancer patients and their families are unaware that cancer treatments may affect the oral tissues and that visiting their dentist is an important part of the overall treatment. Cancer treatments affect dental treatment planning, prioritization, and timing.

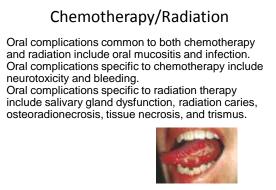


Chemotherapy/Radiation

However, the mouth is also a prime target for the adverse effects of chemotherapy. This leads to an array of oral complications as a result of chemotherapy.

Necessary dental treatment and proper oral hygiene prior to, during, and after cancer treatments can reduce the incidence and severity of oral complications.

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Chemotherapy/Radiation

Finally, oral complications not related to chemotherapy or radiation include osteonecrosis of the jaw (associated with the use of bisphosphonates and other medications). While not as severe, other complications, such as dysphagia, dysgeusia and head and neck pain can lead to secondary complications, such as dehydration and malnutrition.

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Hygiene Care : Cancer/Radiation

CAMBRA - "extreme high risk for caries & adverse oral effects" *Coordinate with Oncology/Radiation team

Scheduling:

- Prophylaxis 2-3 weeks prior to oncology therapy
- NaF Varnish/ACP every 4-6 weeks throughout care
- · Emphasize importance in biofilm control at home
- Rx: morning & evening application of preventive treatment SnF2 gel without water rinsing
- Rx: products to treat mucositis or ulcerations if needed

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Young Radiation Patient





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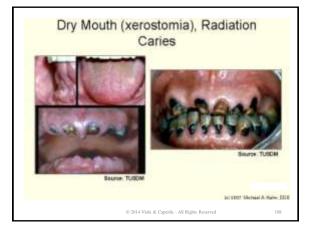


Oct 22, 2008 Post 5 months of radiation therapy compromises tooth structure Sept 23, 2009 Fluoride therapy improves or halts the demineralization process

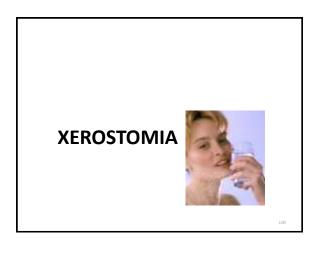
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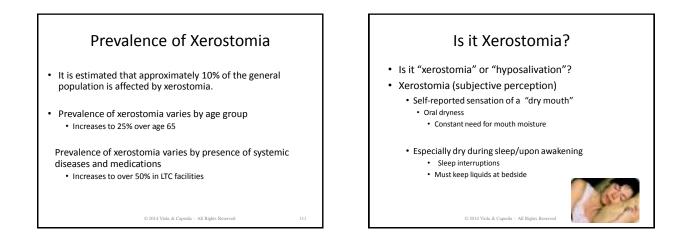
Effects of radiation vs. demineralization patterns













Is it Xerostomia?

- Hyposalivation (salivary gland dysfunction)
 - Clinically measured decrease in quantity
 - Change in quality of saliva ("ropey")
 - Palpation of glands reveals enlargement and tenderness
 - Attempts to "milk" the glands produce little or no secretion > checking stimulated salivary flow

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Is it Xerostomia?

Hyposalivation continued

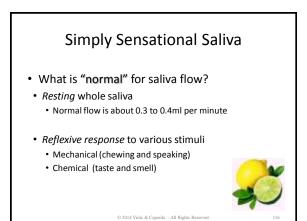
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 Physical changes in appearance of oral mucosa and soft tissues — Dry, pale or red

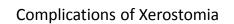
- -Signs of atrophy
- Physical changes in appearance of tongue -Fissured, inflamed
 - -Loss of papillae

-Multiple caries on tooth surfaces

urfaces



Complications of Xerostomia
Serostomia results in a functional decrease in the quantity and quality of saliva
Loss of protective mucins
Dry, fragile oral mucosa
Loss of antimicrobial defenses
Imbalance of microbial ecosystem



- This functional decrease in quantity and quality of saliva leads to oral complications
 - Increased susceptibility to caries
 - Cervical, interproximal, buccal and other "unexpected" surfaces involved
 - Increased susceptibility to periodontal disease or exacerbation of existing disease

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Complications of Xerostomia

Increased susceptibility to opportunistic infection
Candidiasis
Viral infections
Increased susceptibility to trauma of tissues
Increased difficulty in wearing dental appliances and
prostheses



Immune Diseases

Extreme high risk

Sjögren's Syndrome

- 9:1 ratio of women to men
- 1-4 million individuals affected in USA
- Typical diagnosed patient is perimenopausal or postmenopausal female
- Documented pediatric cases exist

Disease-Induced Xerostomia

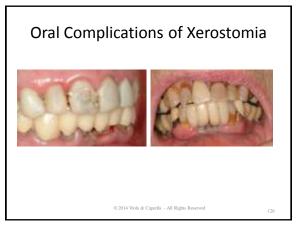
- Medically complex patients are most at risk for disease-induced xerostomia.
- Multiple organ system diseases and illnesses contribute to the development of xerostomia
- Multiple organ system diseases and illnesses exacerbate the complications of xerostomia

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Disease-Induced Xerostomia Cardiovascular disease Hypertension Stroke Congestive heart failure Respiratory disease Asthma and COPD Mouth-breathing Sleep apnea

Disease-Induced Xerostomia Gastrointestinal disease Acid reflux Prosion Damage to nerves, salivary glands Diabetes mellitus Neuropathy Polyphagia, polydipsia, polyuria

Disease-Induced Xerostomia Cancer: • High dose chemotherapy • Radiation therapy of head and neck CNS: • Parkinson's Disease • Alzheimer's Disease • Alzheimer's Disease • Anxiety • Depression • Psychoses



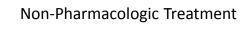
Xerogenic Medications			
Antispasmodics	Bronchodilators		
Antiemetics	Decongestants		
Antihistamines	Antiparkinsonian Agents		
Antihypertensives	Psychotherapeutic Agents		
Anti-acne Agents	Antianxiety Agents		
• NSAIA's	Antidepressants		
Muscle relaxants	Anticonvulsants		
Opioid analgesics	Antineoplastic Agents		
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Popular drugs causing xerstomia			
DRUG	BRAND NAME	CONDITION	
Albuterol	Proventil, Ventolin	Respiratory problems	
Atorvastatin	Lipitor	High cholesterol	
Diazepam	Valium	Anxiety	
Diphenhydramine	Benadryl	Allergies	
Hydrochlorothiazide	Esidrix, HCTZ	High blood pressure	
Hydrocodone	Lorcet, Lortab, Vicodin	Pain (narcotic)	
Metformin	Fortamet, Glucophage	Diabetes	
Phenobarbital	Luminal	Anxiety	
Tamoxifen	Nolvadex	Cancer	

Non-Pharmacologic Treatment

- Non-pharmacologic treatment includes maintaining and increasing hydration.
 - Frequent hydration and ice chips
 - Difficult for patients with diabetes/HTN
 - Sugar free candy and gum without citrus flavors (acidic)
 - Xylitol proven activity against S. mutans
 - Use humidifier during sleep, use lip balm

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- Non-pharmacologic treatment includes changes in eating and drinking behavior.
- Avoid carbonated and sports drinks (acidic)
- Avoid caffeine (increased urination)
- Avoid foods high in sodium
- Avoid irritants
- (spicy foods, alcohol, tobacco)

Pharmacologic Treatment
Pharmacologic treatment includes agents to stimulate or simulate saliva and minimize oral and con-oral complications.
Salivary stimulants
Saliva substitutes
Fluorides
Calcium & Phosphate additives

Pharmacologic Treatment

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- Ora Moist Dry Mouth Patch

- Adheres to roof of mouth or buccal mucosa
- Extended release (2 to 4 hours)
- Sugar and alcohol free (contains xylitol)
- Contains naturally-occurring enzymes

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	ACP	CPP-ACP	CSPS	ТСР
	Amorphous Calcium Phosphate	Casein Phosphopeptide Amorphous Calcium Phosphate	Calcium Sodium Phosphosilicate	Beta Tri-calcium Phosphate
	ADA license	(Recaldent®)	(Novamin®)	(Functionalized TCP)
Mechanism of Action	Specialized salt compounds No defined structure or crystalline structure Highly reactive	Casein binds to tooth surface until pH is lowered/ acidic challenge frees ions	Silica binds Ca/P until sodium elevates pH to free CA/P ions	Blended beta tricalcium phosphate is insoluble crystalline form
Solubility and Bioavailability	Rapid delivery Highly soluble & Bioavailable Greater Fluor uptake	Becomes soluble only during lowered pH/acidity	Becomes soluble when sodium elevates and buffers pH	Low to moderate rate of solubility
Professional Products	Enamel Pro: Pro-paste delivers ACP NaF Varnish & Gel/ACP ENAMELON/ACP Day White/Nite White & Relief /ACP Arm & Hammer Complete Care /ACP	MI Paste* MI Paste Plus MI Varnish (all w/Recaldent) * Tooth Mousse only available International	NUPRO NuSolutions Prophy paste GSK Sensodyne Repair & Protect	VANISH F varnish with TCP Clinpro 950 Clinpro 5000





