FRESH BREATH ASSURANCE: A PATIENT CENTERED APPROACH

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- This course is designed to give the dental professional the tools necessary to expand treatment options of the preventive appointment. Social and aesthetic factors are the primary motivation behind successful daily oral hygiene and yet discussing bad breath with patients can be challenging. This session will focus on options to address social concerns such as oral malodor, including etiology, chairside education and treatment strategies, as well as methods to assure fresh breath. In addition, attendees will have the opportunity to develop treatment strategies to motivate patients to optimal oral health. This interactive seminar is ideal for the progressive clinician.

Our Opportunities:

- △ Review the causes of oral malodor and develop strategies to comfortably discuss oral malodor with patients.
- △ Understand the relationship between volatile sulfur compounds and periodontal infection.
- △ Identify the benefits of daily tongue deplaquing and incorporate in-office tongue deplaquing.
- △ List chemotherapeutic and mechanical options for controlling oral malodor

I. Total Body Health and Oral Health

Optimal Oral Health 1999 ADHA Definition*"... a standard of health of the oral and related tissues which enable an individual to eat, speak, or socialize without active disease, discomfort or embarrassment and which contributes to general well-being and overall health."*

II. Aesthetic/ Social Factors = Patient Motivation

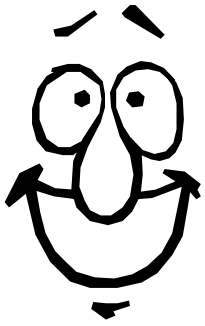
A. Breaking the Barriers
   1. Social concerns as patient motivation
   2. Patient expectations of the dental professional

III. The Oral Malodor Patient

A. Terminology
   1. Ozostomia
   2. Stomatodysodia
   3. Halitosis
   4. Fetor oris/ Fetor ex ore

B. Types of oral malodor
   1. Transitory and Chronic

C. Oral Malodor Patient Types
   1. Type I: Those that have if and know it.
   2. Type II: Those that have it, but deny or do not know they have it.
   3. Type III: Those that do not have it, but think they do.



D. Seven Common Malodor Sources
   1. Mouth and Tongue
   2. Nasal, Nasopharyngeal, Sinus & Oropharyngeal
   3. Xerostomia Induced
   4. Primary Lower Respiratory Tract & Lung
   5. Systemic Disease
   6. Gastrointestinal Diseases & Disorders
   7. Odiferous Ingested Foods, Fluids and Medications

Nasal, Nasopharyngeal, Sinus & Oropharyngeal Sources

- Odor from nose (mouth closed) ~ Suspect nasopharyngeal sources
- Morning odor (tongue appears normal) or allergy sufferer ~ Suspect nasal mucous as source
- Elevated temperature, regional lymphadenopathy of the throat ~ Suspect infection or other disease

Xerostomia Induced Malodor

- Salivary flow is diminished ~ Suspect xerostomia related malodor
- Presence of root caries or frequent secondary caries ~ Suspect poor "antibacterial" quality of saliva

Mouth and Tongue Sources

- Odor from the mouth (nose pinched)
- Tongue is coated on posterior 1/3 and odor stops after thorough tongue cleaning
- Food debris present around or under restorations
- Xerostomia induced
- Oral tissue lesions are present
- Periodontal probing is greater than 4 mm, marginal gingivitis, purulent exudate, or excessive bleeding on probing
- Bacteria accumulation Sites
- Periodontal probing, a measurement of the space between the tooth and gum where bacteria, food and debris collect if not maintained…

Conditions Causing Oral Malodor

- Periodontitis
- Apthous Ulcers
- Dental Abscesses
- Candidiasis
- Xerostomia
- Gingivitis
- Traumatic Ulcers
- Herpetic Infection
- Oral Cancer
- Poor Oral Hygiene

IV. Oral Malodor: Causes, Sources, and Characteristics

A. Causes of Oral Malodor
   1. Gram negative, anaerobic bacterial
   2. Food debris
   3. Production of volatile sulfur compounds
   4. Basic pH

B. Sources of Oral Malodor
   1. Tongue
   2. Gingival crevice/ pocket
   3. Tonsillar region (tonsolliths)

C. Types of Volatile Sulfur Compounds
   1. Hydrogen sulfide (associated with periodontally health patients)
   2. Methymercaptan (associated with periodontal patients)
   3. Dimethyl sulfide
   4. Dimethyl disulfide

D. Characteristics of Oral Malodor
   1. Varies with the time of the day
   2. Varies with age, gender and hunger state
   3. Varies in intensity & quality
   4. Primary sites include the tongue & gingival crevices

Smell the Rest of the Story

- Hydrogen Sulfide = Rotten eggs
- Methyl Mercaptan = Present in feces
- Skatole = Present in feces
- Cadaverine = Corpses
- Putrescine = Decaying meat
- Isovaleric Acid = Feet

V. Oral Malodor: Diagnosis & Periodontal Disease

A. Diagnosis
   1. Self-Assessment
   2. Counter-part Assessment
   3. Volatile Sulfur Monitors
   4. BANA Test
   5. Organoleptic Judges

B. Periodontal Disease
   1. Connection with volatile sulfur compounds
   2. Process of care
   3. Importance of daily plaque control

Relationship of Periodontal Disease to Oral Malodor

- Bleeding on probing and pocket depth has been correlated with production of VSC's
- Deep pockets are more likely to promote growth of VSC-producing organisms
- Tongue coating 4 - 6x greater
- Periodontal Pathogenesis of VSC
- Increase in permeability of oral mucosa
- Increase of penetration of endotoxin
- Suppression of DNA synthesis
- Interference with collagen and protein synthesis

BOX 38-1

PERIODONTAL INFECTION AND ORAL MALODOR

1. Periodontal disease is caused by anaerobic and facultative protein–utilizing bacteria.
2. Bacteria are located in periodontal pockets, deeper than 4 mm, and older established plaque biofilm where sulfur-containing substrates are available.
3. Subgingival anaerobes, such as *Porphyromonas gingivalis, Prevotella* spp., and many others, reduce sulfur-containing amino acids to hydrogen sulfide (H_2S), methyl mercaptan (CH_3SH), and dimethyl sulfide (CH_3SCH_3), referred to as *volatile sulfur compounds (VSCs)*. VSCs are some of the specific by-products of bacterial metabolism of many different host substrates, including, but not limited to, crevicular fluid constituents, leukocytes, gingival bleeding, epithelial cells, and other bacteria and their constituents.
4. VSCs are released into the oral environment where they mix with expired air and contribute to malodor.
5. VSCs might contribute to the pathogenesis of periodontitis because they have pathogenic potential on a variety of host cells and processes.
6. The plaque biofilm associated with periodontitis lesions lead bacteria to other oral sites, such as the tongue dorsum, where they colonize and contribute to the total oral malodor status.

Adapted from Newman M: The role of periodontitis in oral malodour: clinical perspectives. In van Steenberghe D, Rosenberg M, eds: *Bad breath: a multidisciplinary approach,* Leuven, Belgium, 1996, Leuven University Press, pp 3-14.

VI. Oral Malodor: Treatment vs. management

A. Primary Factors in Oral Malodor
   1. Saliva flow
   2. Gram negative bacteria
   3. pH
   4. Presence of cellular protein and food debris

B. Goals of Oral Malodor Management
   1. Increase salivary flow
   2. Eliminate gram negative bacteria
   3. Neutralize VSC

C. Techniques to Increase Salivary Flow
   1. Consumption of foods that require chewing
   2. Use of inert objects
   3. Consumption of citric acid

D. Techniques to Eliminate Gram Negative Bacteria
   1. Daily tongue deplaquing
   2. Adequate plaque control
   3. Identification and repair of old restorations
   4. Use of chemotherapeutic agents
E. Methods to Neutralize VSC
   1. Eliminate bacteria producing VSC
   2. Use antibacterial mouthrinse/ spray specific for VSC neutralization
      - Zinc – best known VSC neutralizer
      - Chlorhexidine gluconate – affects bacteria & neutralizes BVSC
      - Chlorine dioxide – neutralizes VSC

VII. Clinical Management of Oral Malodor

A. Reduce Bacteria & VSC
   1. Pre & post procedural rinse
   2. Scaling and root planing
   3. Subgingival irrigation/ full mouth disinfection
B. Eliminate Debris
   1. Tongue deplaquing
   2. Interdental plaque removal
   3. General oral hygiene instruction
C. Integrate chemotherapeutic agents
D. Mechanics + chemotherapy = effective oral malodor control

Full-Mouth vs. Partial-Mouth Disinfection

Partial-Mouth Disinfection

- Traditional quadrant scaling and root planing over a 6 week period of time at 2 week intervals
- 4 – 6 consecutive sessions
- Quadrant or sextant therapy
- Reinfection potential?
- Patient/ Client centered approach?

FMD Research Protocol

- Full-mouth scaling and root planing within 24 hours, approx. one hour in length
- Irrigation of 1% chlorhexidine gel prior to instrumentation
- Tongue brushing for 60 seconds
- Rinsing 2x with 0.2% chlorhexidine
- Spraying the pharnyx with 0.2%
- Irrigation repeated 3x within 10 minutes

FMD Research Results

- Reduction in probing depth and gain in clinical attachment for up to 8 months
- Reduction in oral malodor
- Greater reduction in spirochetes and motile organisms in subgingival flora
- Eradication of *P. gingivalis*
- Chronic, advanced and aggressive populations

Contemporary research on adjunctive therapies always begins with full-mouth therapy that is completed in one to two weeks using both hand and powered instrumentation. This substantial body of research utilizing this process of care provides the full rationale to accelerate periodontal instrumentation in daily practice.

VIII. Integrating Oral Malodor Assessment & Management into the Preventive Appointment

A. Health History/ Patient Update Form
   1. Review medical history
   2. Review current oral hygiene routine
   3. Determine current usage & frequency of usage of oral malodor products

B. Dental Hygiene Assessment
   1. Clinical examination & Cancer Screening
   2. Periodontal examination
   3. Note condition of the surface of the tongue
   4. Identification of restorations that need replacement
   5. Note any oral lesions and/or presence of tonsolliths

C. Integrate Oral Malodor Management Protocol into Every Dental Hygiene Appointment
   1. Pre-procedural rinse with antibacterial agent
   2. Perform tongue deplaquing procedure
   3. Present oral malodor management to the patient

IX. Mechanical & Chemotherapy Options for Oral Malodor

A. Mechanical Devices for Plaque Control
   1. Brushes
   2. Interdental devices
   3. Tongue Deplaquing Devices

B. Benefits of Daily Tongue Deplaquing
   1. Removal of food debris
   2. Removal of bacteria that cause odor
   3. Excellent visual motivation
   4. Scraping more effective than brushing in removing bacteria & food debris

C. Chemotherapeutic Options
   1. Essential Oil Based products – only affects bacteria
   2. Chlorohexidine Rinses – affects bacteria & neutralizes VSC
   3. Chlorine Dioxide – only neutralizes VSC
   4. Essential Oil/ Zinc /CPC combination – affects bacteria & neutralizes VSC

D. Patient Instructions of Oral Malodor Management
   1. Brush/ floss
   2. Scrape the tongue daily with antibacterial agent
   3. Rinse with antibacterial mouthrinse
   4. Refresh throughout the day with antibacterial gum, mints, and spray

The Tongue

- Major contributor in healthy mouths to oral malodor
- The tongue coating contains dead epithelial cells; food debris; blood cells & bacteria
- The geography of the tongue provides ideal environment for oral malodor production
- Similar bacteria found on the tongue are also found in periodontal pockets
- The increase in bacteria found on the tongue and in periodontal pockets greatly increase oral malodor
- Scraping/ Deplaquing the tongue will reduce malodor significantly

Tongue Cleaning with Scraper More Effective then Brushing

- Groups refrained from tongue cleaning 48 hours prior and switched regimes with a wash out period
- 45% reduction in VSC with toothbrush
- 75% reduction in VSC with plastic scraper

Brushing vs. Scraping and Taste

- Improvement in taste was seen in both groups
- 2 weeks taste improvement especially with the tongue scraper group
- Tongue cleaning improves taste sensation & seems to reduce the substrata for putrefaction, rather than microbial load…

Tongue Scraping vs. Brushing

- More effective in reducing total number of organisms
- Safer than brushing
- Produces a cleaner tongue
- More comfortable than brushing

Effect of 4 Mouthrinses on Oral Malodor

- 4 Week study/ 99 subjects
- Compared BreathRx, Listerine & Oxyfresh with Zinc
- BreathRx the most effective
    - Reduced OM within 4 hours
    - Only rinse to reduce OM from baseline

BOX 38-4

TONGUE DEPLAQUING PROCEDURE

1. With the patient observing the procedure, have the patient extend his or her tongue and place an antibacterial agent to the surface of the tongue.
2. Apply light pressure and place the tongue-cleaning device as far posterior on the surface of the tongue as possible.
3. Gently move the cleaning device forward and remove the tongue coating or debris via suction or 2- × 2-inch gauze square. Repeat as needed.
4. Take the opportunity to explain that this process will help reduce oral malodor when implemented on a daily basis.

Considerations for Alcohol-Free Rinses

- Mucosal & bacterial dehydrogenases that metabolize alcohol to acetaldehyde are present in the oral cavity
- Acetaldehyde is a toxic & carcinogenic substance
- Acetaldehyde remains in the oral cavity after consumption of alcohol beverages
- Enzyme deficits can lead to greater concentrations of acetaldehyde
- Alcohols effect on membrane lipids can also enhance the penetration of carcinogenic substances into deeper layers of the oral mucosa

Populations Warranting Alcohol-Free Options

- Certain Oral Conditions
  - Xerostomia
  - Radiation therapy
  - Sjorgrens Syndrome
  - Previous history of/ or suspected oral cancer
- Smokers
- High alcohol consumption
- Recovering alcoholics
- Children
- Asian population (genetic deficiency)

Fresh Breath Opportunities!

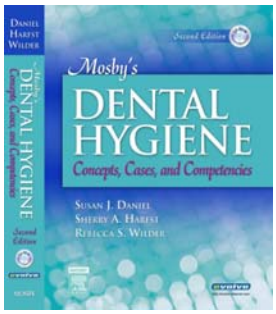
- Only 16% of Americans regularly use a tongue-cleaning device
- Only 1 in 4 regularly clean the back of the tongue
- 85% sited bad breath as their #1 turn off
- 96% feel more confident when they have fresh breath ~ many are NOT aware of the tongue connection!

BOX 38-5

ACTIVE AGENTS FOR NEUTRALIZING VOLATILE SULFUR COMPOUNDS AND CONTROLLING GRAM-NEGATIVE ORAL FLORA

- Zinc: recognized and effective VSC-neutralizing agent
- Essential oils: recognized antimicrobial agents affecting VSC-producing organisms
- Chlorhexidine gluconate: broad-spectrum antimicrobial agent that also neutralizes VSCs
- Chlorine dioxide: recognized VSC-neutralizing agent
- Cetylpyridinium chloride: recognized mild antimicrobial agent affecting VSC-producing organisms
- Triclosan: recognized mild antimicrobial agent affecting VSC-producing organisms
- Combination of these agents to achieve antimicrobial and VSC-neutralizing results (i.e., for oral malodor control, an antimicrobial agent and neutralizing agent; products that combine agents for optimal oral malodor control)

VSCs, Volatile sulfur compounds.



BOX 38-6

DISCUSSING ORAL MALODOR DURING THE DENTAL HYGIENE EXPERIENCE

- Assess use of oral malodor–related products.
- Correlate probing depth of more than 4 mm with oral malodor.
- Deplaque the tongue, and *show* patients the biofilm or tongue coating substance.
- Use positive dialog (maintain fresh breath versus eliminate bad breath).

Resources and Protocols:

RDH Magazine ~ FREE/PRINT & ONLINE ~ www.subscribe-rdhmag.com
Dimensions of Dental Hygiene ~ FREE/PRINT & ONLINE ~ www.dimensionsofdentalhygiene.com/
Modern Hygienist ~ FREE/ONLINE ~ https://www.advanstar.com/subscriptions/subscribe.asp?subid=183
PERIO Reports ~ FREE/ONLINE with HygieneTown ~ www.perioreports.com/ www.hygienetown.com
eColleagues Newsletter of the California Dental Hygienists' Association ~ www.cdha.org to sign up for FREE newsletter

Online Dental Hygiene List Serves/ Groups/Resources:
www.dentalcompare.com – Product comparison site, clinical application articles and more!
www.hygienetown.com – Join an electronic hygiene community with a vast variety of topics!
amyrdh.com – Click on purple ribbon to join as a RDH "lister"!

CE Article:
Advancing the Art & Science of Dental Hygiene through Oral Malodor Management – online at www.EducationalDesigns.com in the Professional Resources page/tab.

Seminar Bibliography and Resources Available Upon Request - Kristy Menage Bernie, RDH, BS • info@EducationalDesigns.com • 925-735-3238 **-** *Visit www.EducationalDesigns.com!*

7 Action Items!

1.

2.

3.

4.

5.

6.

7.

Assessment Phase:

1) Review medical history
    a. Include questions regarding family history of systemic illnesses, dry mouth, etc.
2) Review current oral hygiene routine
    a. Assess "real" time and tools utilized as well as technique
3) Determine current usage & frequency of usage of oral malodor and/or whitening related products
    a. Toothpaste: Specific brand/ times per day
    b. Mouthrinse: Specific brand/ times per day and amount of time rinsing
    c. Breath Mints: Specific brand/ times per day
    d. Chewing Gum: Specific brand/ times per day
    e. Other: Tongue gels, breath sprays, etc.
4) Perform oral cancer screening
5) Perform comprehensive periodontal examination/risk assessment
    a. Pocket depths of 4 mm or greater are more likely to produce VSCs
6) Note the condition of the surface of the tongue
    a. Tongue coating in periodontal patients is 4 – 6 times greater
7) Perform additional assessments:
    a. CAMBRA – Caries Management by Risk Assessment
    b. Occlusal evaluation
8) Identify restorations, crown, bridges that need replacing
9) Note the presence of oral lesions and tonsilloliths

Clinical Protocol:

1) Use pre & post procedural antibacterial mouth rinse to neutralize volatile sulfur compounds
2) Eliminate/ reduce plaque and calculus
    a. Perform pre-instrumentation polishing as indicated
    b. Instrumentation as indicated - Initiate FMD/API protocol for periodontal cases
    c. Subgingival irrigation to neutralize VSC via automated scalers or other irrigation device
    d. Remove remaining plaque from interproximal regions
    e. Perform tongue deplaquing procedure using tongue scraper and antibacterial/ VSC neutralizing agent
3) Evaluate for additional preventive/CAMBRA-based care:
    a. Sealants
    b. Topical chlorhexidine varnish if indicated
    c. Topical fluoride treatment (varnish)
4) Patient Education/Daily Care recommendations
    a. Daily use of remineralization agents (fluoride, calcium, phosphate, products).
    b. Mechanical plaque control recommendations (powered toothbrushes, flossers, etc.)
    c. Tongue cleaning considerations and VSC neutralizing agents
5) Discussion of aesthetic opportunities
    a. Whitening, veneers, orthodontic therapy
6) Reappoint as indicated and evaluate oral health/aesthetic management success.

PROPOSED ACCELERATED INSTRUMENTATION (FMD) PROTOCOL:

2 appointments of appropriate length scheduled within 24 hours – to 2 weeks • ½ mouth per appointment

1. Pre-procedural antimicrobial rinse for 30 seconds
2. Anesthesia administration/ pain control procedures
3. Instrumentation
    a. Pre-procedural polishing with desensitizing agent
    b. Powered instrumentation with self-contained water / medicament reservoir and antimicrobial irrigant
    c. Hand instrumentation
4. Laser Therapy
    a. Bacterial decontamination of pocket sites (prior and post instrumentation)
    b. Removal of diseased epitheal lining (post instrumentation in sites greater than 5mm)
5. Placement of locally delivery/ control release medicaments
6. Tongue deplaquing/ scraping with antimicrobial/VSC neutralizing agent
7. Post-procedural rinse for 30 seconds with antimicrobial/VSC neutralizing agent
8. Professional remineralization therapies/application (CHX varnish, Fl varnish, etc.)
9. Appropriate daily care recommendations from calcium phosphate products to CHX to prescription strength fluoride to automated plaque control devices.
10. 2 to 3 month evaluation
11. Utilization of diagnostic devices to assess clinical outcome
    a. Placement of local delivery / controlled release agent for nonresponsive sites / or prescription for subgingival dosage doxycycline:
        i. 2.5 mg chlorhexidine chip
        ii. 10% doxycycline gel
        iii. 1 mg minocycline microsphere power
        iv. 20 mg systemic/ subgingival dosage doxycycline bid
    b. Appropriate recare schedule
12. Re-evaluation at appropriate time with referral for non-responsive cases.

- *Daily oral hygiene should include toothbrushing (power/sonic); interdental cleansing and tongue deplaquing along with appropriate adjunctive chemotherapy for caries prevention, sensitivity control and antimicrobial benefits.*

IMPLEMENTING & INTEGRATION:

- Full-mouth disinfection, or accelerated instrumentation, accounts for a client- and clinician centered approach to periodontal therapy that maximizes clinical outcomes while providing immediate benefits (eliminating oral malodor).
- Utilization of ultrasonics and or lasers in FMD protocols will greater increase the likelihood of success and provide patients with the high-tech therapy they appreciate and deserve.
- Completing periodontal instrumentation within 1 to 2 weeks is an easy factor to control that will lend to fast-tracking aesthetic treatment plans, healing, and referral.