The Oral-Systemic Myth
A Provocative Course in Bridging the Medical & Dental Professions

KATRINA M SANDERS
RDH, BSDH, M.ED, RF
WELCOME

A clinical dental hygienist, author and international speaker, Katrina is a vibrant, passionate and charismatic award-winning educator with a unique approach to delivering continuing dental education. Katrina is the Clinical Liaison, Hygiene Excellence and Innovation for AZPerio, the country’s largest periodontal practice. She works alongside Diplomates to the American Board of Periodontology to instruct on collaborative professionalism and standard of care protocols while delivering education through hygiene boot camps and study clubs. Known as “The Dental Resultant”, Katrina is the co-founder of The Core Group, LLC, a boutique-style consulting firm focused at high-level standards, excellence and production. Katrina is the founder, CEO and keynote speaker for Sanders Board Preparatory and is a published author with Dentaltown, Today’s RDH, a columnist and advisory board member for Modern Hygienist and brand ambassador for Dimensions of Dental Hygiene. Her philanthropic efforts include dental humanitarian work in developing countries, supporting abused and homeless animals and spreading awareness about the benefits of organ and tissue donation.

Katrina Sanders

AUTHOR   EDUCATOR   BUSINESS OWNER

www.katrinasanders.com
• ORAL INFLAMMATION:
  ○ 4Q SRP
  ○ CHLORHEXIDINE IRRIGATION

• MAINTENANCE PROCEDURES:
  ○ PROPHYLAXIS
  ○ 6 MONTH HYGIENE RECALL
• ORAL INFLAMMATION:
  ○ 4Q SRP
  ○ CHLORHEXIDINE IRRIGATION

• MAINTENANCE PROCEDURES:
  ○ PROPHYLAXIS
  ○ 6 MONTH HYGIENE RECALL
Evolution of Dentistry

- INFECTION CONTROL
- DISEASE PREVENTION
- TECHNOLOGY
- RESEARCH
- PATIENTS
  - CO-MORBIDITIES
  - LONGER LIFE EXPECTANCY
- RENEWED FOCUS OF HEALTH & WELLNESS
- COSMETIC DENTISTRY

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Course Objectives

- Identify the microbiological and bacterial markers involved in microflora imbalances contributing to the periodontal disease process.

- Analyze the biological processes responsible for the connection between oral and systemic disease.

- Explore abstracts for current and newly suspected diseases related to active periodontal disease.

- Discuss evidence-based guidelines for the implementation of adjunctive services and their CDT codes to aide in the management of oral inflammation.

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Primary Care Physician
09:36

Dentist
05:00

Dental Hygienist
40:00 – 60:00
Periodontium
Caries
Infection Control
Pathology
Airway Management
Myofunctional Therapy
Oral-Systemic
Inflammation of the periodontium has been identified as the second most frequent modifiable contributor to systemic inflammation.

In children aged 10-17 years, prevalence of gingivitis is as high as 91%.1

The CDC (2016) revealed that nearly half of all U.S. adults age 30-79 have some form of periodontal disease.2

Healthy People 2030 Oral Health Core Objectives3

Inflammation of the periodontium has been identified as the second most frequent modifiable contributor to systemic inflammation.4
• THE AIRWAY BEGINS WITH THE ORAL CAVITY
• DIGESTION BEGINS IN THE MOUTH
• DENTAL PLAQUE IS ASPIRATED INTO THE LUNGS
• PERIODONTAL PATHOGENS ENTER THE BLOODSTREAM VIA ULCERATION OF THE SULCULAR LINING

P. GINGIVALIS

• LINKED TO ALZHEIMER’S DISEASE
• CORRELATION WITH ADVANCED STAGES OF PANCREATIC CANCER
• LINKED TO ERECTILE DYSFUNCTION

• P. INTERMEDIA IS LINKED TO PRE-TERM LOW BIRTH WEIGHT DELIVERY
• F. NUCLEATUM IS LINKED TO COLORECTAL CANCER

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Bacterial Components

- Endotoxin
- Leukotoxin
- Waste products: Ammonia, Hydrogen Sulfide
- Proteases

Cytokines / Host Response

- Tumor Necrosis Factor: Insulin resistance and cardinal signs of inflammation.
- Interleukin-1: Raises body temperature. Genetic susceptibility to disease.
- Prostaglandins: Causes vasodilation, inhibits aggregation of platelets.
- Leukotrienes: Causes inflammation. Causes bronchoconstriction and airway obstruction.

We see patients in a perceived state of health
"The mouth is the barometer to the body"
-SARAH COTTINGHAM
"Our clinical decision making is our compass"
- KATRINA SANDERS
Staging

- Permits moving beyond a one-dimensional approach of using past destruction alone
- Permits assessing of prognosis and complexity
- Relies on standard dimensions of severity and extent of periodontitis at present
  - Introduces the dimension of complexity for managing the individual patient

1. Rate of periodontitis progression
2. Recognized risk factors for periodontitis progression
3. Risk of an individual’s case affecting the systemic health of the subject

<table>
<thead>
<tr>
<th>PERIODONTITIS</th>
<th>STAGE I</th>
<th>STAGE II</th>
<th>STAGE III</th>
<th>STAGE IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severity</td>
<td>Interdental CAL (at site of greatest loss)</td>
<td>1-2mm</td>
<td>3-4mm</td>
<td>≥5mm</td>
</tr>
<tr>
<td>RBL (radiographic bone loss)</td>
<td>Coronal third (&lt;15%)</td>
<td>Coronal third (15%-33%)</td>
<td>Extending to middle third of root and beyond</td>
<td>Extending to middle third of root and beyond</td>
</tr>
<tr>
<td>Tooth loss (due to periodontitis)</td>
<td>No tooth loss</td>
<td>No tooth loss</td>
<td>≤ 4 teeth</td>
<td>≥ 5 teeth</td>
</tr>
<tr>
<td>Complexity</td>
<td>Local</td>
<td>Maximum probing depth 4mm</td>
<td>Maximum probing depth 5mm</td>
<td>In addition to stage II complexity:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mostly horizontal bone loss</td>
<td>Mostly horizontal bone loss</td>
<td>• Probing depths ≥6mm</td>
</tr>
<tr>
<td>Extent and distribution</td>
<td>Add to stage as descriptor</td>
<td>For each stage, describe extent as:</td>
<td></td>
<td>• Vertical bone loss 3mm or less</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Localized (&lt;30% of teeth involved); Generalized; or molar/incisor pattern</td>
<td></td>
<td>• Furcation involvement Class II or III</td>
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<td></td>
<td></td>
<td>• Moderate ridge defects</td>
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<td></td>
<td>• Need complex rehabilitation due to:</td>
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<td></td>
<td>• Masticatory dysfunction</td>
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<td></td>
<td></td>
<td>• Secondary occlusal trauma</td>
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<td></td>
<td></td>
<td>• Severe ridge defects</td>
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<td></td>
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<td>• Bite collapse, drifting or flaring</td>
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</tbody>
</table>

w w w . k a t r i n a s a n d e r s . c o m
## Grading Periodontitis

<table>
<thead>
<tr>
<th>Primary Criteria</th>
<th>Progression</th>
<th>Grade A Slow</th>
<th>Grade B Moderate</th>
<th>Grade C Rapid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct evidence</td>
<td>RBL or CAL</td>
<td>No loss over 5 years</td>
<td>&lt;2mm over 5 years</td>
<td>2+mm over 5 years</td>
</tr>
<tr>
<td>Indirect evidence</td>
<td>%bone loss/age</td>
<td>&lt;.25</td>
<td>.25 to 1.0</td>
<td>&gt;1.0</td>
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<tr>
<td>Case Phenotype</td>
<td>Heavy biofilm, low destruction</td>
<td>Destruction commensurate with deposit</td>
<td>Destruction exceeds expectations. Rapid progression/early onset</td>
<td></td>
</tr>
<tr>
<td>Grade modifier</td>
<td>Risk factors</td>
<td>Smoking</td>
<td>Non-smoker (&lt;10 cigarettes/day)</td>
<td>10+ cigarettes/day</td>
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</tbody>
</table>
|                        |             | Normal | HbA1c <7.0% | HbA1c 7.0+%

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“STAGE I PERIODONTITIS IS THE BORDERLAND BETWEEN GINGIVITIS AND PERIODONTITIS AND REPRESENTS THE EARLY STAGES OF ATTACHMENT LOSS. AS SUCH, PATIENTS WITH STAGE I PERIODONTITIS HAVE DEVELOPED PERIODONTITIS IN RESPONSE TO PERSISTENCE OF GINGIVAL INFLAMMATION AND BIOFILM DYSBIOSIS.”
~AAP, 2017
Research has determined that the average probing depth for “efficient” removal of biofilm, calculus and necrotic cementum is 3.73mm. (Westphal, 2015).

Because endotoxins are weakly bound to the root surface, it is not necessary to spend a great deal of time debriding. (Westphal, 2015).

Cementum removal was generally achieved on periodontally healthy roots with 20 strokes of a curet, but residual calculus remained.
When inadequately treated, the periodontal lesion results in ulceration of the epithelium due to destruction of the underlying connective tissue…

…this creates a portal of entry for bacteria, bacterial byproducts and the inflammatory mediators released by the resident periodontal cells; all of which penetrate the ulcerated epithelium, ending up in the bloodstream.

- 74.2% of patients with periodontitis and 71.7% of patients with peri-implantitis harbor pathogens resistant to at least one standard antibiotic.
- Strains of P. gingivalis are resistant to amoxicillin (25.49%), clindamycin (23.52%) and metronidazole (21.56%).
Follow these 6 simple steps:
Care that is personalized to the individual, rather than treating every patient according to an average standard is the best way to identify, address and prevent disease.
• Leukotrienes
  • Derived from leukocytes, specifically neutrophils, basophils, macrophages, eosinophils and mast cells
  • Cause inflammation, bronchoconstriction, airway obstruction and increase cellular infiltration and cytokine release (including interleukins)

• Inflammatory cytokines such as TNF-α, IL-1, IL-6 are shown to be increased in patients with chronic periodontitis.1

• Respiratory distress of SARS-CoV-2 patients is associated with increased cytokine levels (IL-6, IL-10 and TNF-α).2
  • Cytokine storm syndrome noted in severe COVID-19 cases

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Clinical Paradigm Shifts: Inflammation

- Cytokine Storm Syndrome
  - Responsible for the 1918 Spanish Flu
  - Linked to COVID-19 propagation

- Susceptible Hosts

Risk Factors Associated with:

**COVID-19**
- 65 years and older
- Serious heart conditions
- Diabetes
- Smoking habit
- Severe obesity
- Chronic kidney disease
- Liver disease
- Chronic lung disease or moderate to severe asthma
- Immunocompromised patients

**Periodontal Disease**
- 65 years or older (70% of Americans 65 and older have periodontal disease)
- Cardiovascular conditions
- Diabetes
- Smoking/tobacco use
- Obesity
- Rheumatoid arthritis
- Poor nutrition
- Clenching or grinding
- Medications such as oral contraceptives, anti-depressants and certain heart medications
- Genetics
- Stress
Could there be a link between oral hygiene and the severity of SARS-CoV-2 infections?

Victoria Sampson,*1 Nawar Kamona2 and Ariane Sampson3

Meanwhile, we recommend that oral hygiene be maintained, if not improved, during a SARS-CoV-2 infection in order to reduce the bacterial load in the mouth and the potential risk of a bacterial superinfection. We recommend that poor oral hygiene be considered a risk to post-viral complications, particularly in patients already predisposed to altered biofilms due to diabetes, hypertension or cardiovascular disease. Bacteria present in patients with severe COVID-19 are associated with the oral cavity and improved oral hygiene may play a part in reducing the risk of complications.
COVID-19 and Oral Health

- HIGH IL-6 LEVELS ACCURATELY PREDICTED RESPIRATORY FAILURE, WITH 22 TIMES HIGHER RISK FOR RESPIRATORY COMPLICATIONS

- A STUDY CONDUCTED AT A HOSPITAL IN TOKYO HAS FOUND THAT POOR ORAL HYGIENE COULD LEAD TO PROLONGED VIRAL SHEDDING IN PATIENTS WITH COVID-19
• Approximately 91% of US adults aged 20-64 had dental caries in permanent teeth.

• By age 65, 96% of Americans have tooth decay.

• 19% of people 65 and older have no teeth.

• 26% of people 75 and older have no teeth.
Anti-Water Fluoridation

- THE US FDA CLASSIFIES FLUORIDE AS A DRUG USED TO CONTROL DISEASE
- INFORMED CONSENT
- SPECIFIC POPULATION DISCUSSIONS
  - DECAY IS HIGH IN LOW SES DESPITE FLUORIDATION
  - MINORITIES ARE VULNERABLE DUE TO LACK OF INFORMATION ABOUT FLUORIDATED WATER
- POLITICIANS REFUSE TO DEbate OVER WATER FLUORIDATION

Fluoride / Skeletal Fluorosis

- FLUORIDE SEQUESTERING QUANTITIES OF CALCIUM ARE ESSENTIAL FOR CORRECT DEVELOPMENT OF BONES
- IN THE UNITED STATES, CRIPPLING SKELETAL FLUOROSIS HAS BEEN CONFIRMED IN 5 CASES OVER THE PAST 40 YEARS
  - DUE TO: EXPOSURE TO HIGH (5+ PPM) LEVELS OF FLUORIDE OVER 10+ YEARS TO DEVELOP OSTEOSCLEROSIS

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Indications for Fluoride Varnish

- XEROSTOMIA
- CARIOGENIC DIET
- EXPOSED ROOT SURFACES
- ELEVATED DECAY RISK
- EXISTING DECAY THE BLOODSTREAM.

Water pH 8.4-10

"Post WWII Economic Miracle"

Utilizes School-Delivered Fluoride Supplements

SES Disparities: 95% of low SES children have decay
Cervitec+ Plus

- Chlorhexidine diacetate + thymol
- Preserves implant oxide layer
- Time-released, up to three months
- Non-staining

Cervitec+ Plus Benefits

- Reduction in cariogenic microorganisms in vivo
- Decreased concentration of inflammatory PGE2 in GCF
- Reduction in bacterial infiltration in implant components
SDF

- The Board of Dental Examiners agreed that SDF is a fluoride and that all relevant statutes and rules pertaining to “topical fluorides” for dental hygienists and dental assistants also apply to SDF. They decided that no substantive policy was necessary since the law is clear on fluorides and SDF is a fluoride.

- D1354: interim caries arresting medicament application – per tooth

Advantage Arrest

- Does not stain sound enamel or dentin
- Does not stain when preventing sensitivity
- Does discolor when applied on demineralization
  - The color changes are like naturally arrested caries or darker. It is a signal to both clinician and patient that something is happening.

- Discolors soft tissue, and any other objects it touches
  - A few hours to appear
  - Soft tissue fades in a few days
Indications for 38% Silver Diamine Fluoride

- **pH 10-13 | 75% efficacy with one application | 95% efficacy with two applications**
- **Stand Alone Treatment**
- **As a Liner Under Restorations**
- **Indirect Pulp Cap Material**
- **Around Existing Restoration Margins**
- **SMART Technique**
- **Sealant**

**5 Year Survival Rate (Major Cancer Types)**

- All Cancers
- Breast Cancer
- Leukemia
- Prostate Cancer
- Hodgkin Lymphoma

Survival Rate (%)

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<tr>
<th>Year</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
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• More than 30% of cancers could be prevented by addressing risk factors such as
  • A healthy diet
  • Avoiding tobacco
  • Being physically active
  • The prevention of infection
• 1 in 3 cancers could be cured if detected and treated early and adequately

Horowitz et al demonstrated that currently, less than 15% of those who visit a dentist regularly report having had an oral cancer screening.
HPV-16 | HPV-18

- HPV is the most common sexually transmitted disease.

- Administration of Gardasil, Cervarix and Gardasil 9
  - 25% of 15 year-olds are sexually active
  - 50% of 18 year-olds are sexually active

- Almost all sexually active people will have HPV at some point in their lifetime

- HPV is found encased in biofilm in pockets of the tonsils, in tonsillary “crypts”
  - Coughing up blood
  - Lump in the neck or in the cheek
  - Hoarseness that doesn’t go away
GERD has long been considered a risk factor for oral/pharyngeal cancer.

Melatonin supplement reduces G.E.R.D by improving sphincter function.
In approximately 70% of patients with tissue tags, colon polyps were discovered.

**Risk Evaluation**

- Association between reduced Vitamin B12 levels and Lichen Planus
- Curcumin has been determined to be a safe and effective treatment for managing Lichen Planus
- Associated with increased dysbiosis | Fungal microbiome

**Lichen Planus**
Systemic Diseases

**DIABETES**
- Diabetic patients are more susceptible to oral disease.
- Uncontrolled diabetes elevates blood glucose.
- Periodontal scaling and root planing could control HbA1C readings.

**CARDIOVASCULAR DISEASE**
- Connection between myocardial infarction and oral disease.
- 50% increased risk for heart disease.
- 30% increased risk of stroke.

**ADVERSE PREGNANCY OUTCOMES**
- Oral disease elevates risk of premature, low-birth-weight delivery.
- Occurs in approximately 1 in 10 deliveries.
- Peridontal scaling reduced risk.

**RESPIRATORY DISEASE**
- Oral bacteria is easily aspirated.
- P. gingivalis, F. nucleatum and B. oralis contribute to diseases: bronchitis, pneumonia and emphysema.

**ALZHEIMER’S DISEASE**
- Early exposure to inflammation poses a risk.
- May be related to elevation of C-reactive proteins.

**CANCER**
- P. gingivalis as a two-fold risk of pancreatic cancer.
- F. nucleatum linked to colorectal cancer.
- Oral cancer linked to patients with greater than 1.5mm attachment loss.
Hidden Risk Factors for Cardiovascular Disease

- MIGRAINE HEADACHES
  - WOMEN ARE FOUR TIMES MORE LIKELY TO EXPERIENCE A CARDIOVASCULAR EPISODE
- RHEUMATOID ARTHRITIS
  - RAISES HEART ATTACK RISK BY 45%
  - IN CONJUNCTION WITH HIGH CHOLESTEROL, HEART ATTACK RISK SOARS TO 700% RISK
- GOUT
  - ELEVATED RISK FOR INSULIN RESISTANCE
- LACK OF SLEEP/SLEEP APNEA
  - 1 ADDITIONAL HOUR OF REST REDUCES CALCIUM BUILDUP AND HEART DISEASE RISK BY 33%
- ERECTILE DYSFUNCTION
  - 30 MILLION MEN AFFECTED
- DEPRESSION & ANXIETY
  - DOUBLES THE RISK OF STROKE AND HEART DISEASE
- VITAMIN D DEFICIENCY
  - INCREASES RISK OF HYPERTENSION & DIABETES AND 30% INCREASED RISK OF CARDIOMYOPATHY
- PSORIASIS
  - 40% OF THOSE WITH PSORIASIS EXPERIENCE A METABOLIC DISORDER. SAME RISK AS SMOKING.
7.2 million (23.8%) Americans are unaware of their active diabetic condition or are living without a diagnosis.

84.1 million Americans have prediabetes.

9.4%

100 million adults live with diabetes.

30.3 million Americans have diabetes.
6.5%-7.9%
“Stable” Diabetic Patient

8.0%-8.9%
Poorly Controlled

9.0%-10.9%
No Elective Procedures

11.0% +
PROCEED WITH CAUTION

Below 50 mg/dL
Hypoglycemia Patient

50-119 mg/dL
Otherwise Healthy Patient

120-179 mg/dL
Stable Diabetic Patient

180-214 mg/dL
Poorly Controlled Diabetes

215-279 mg/dL
Extremely Uncontrolled Diabetes

280 + mg/dL
PROCEED WITH CAUTION
**Nutritional Status**

- VITAMIN B
- VITAMIN C
- VITAMIN D
- PROTEIN
- OMEGA-3 & OMEGA-6
- OBESITY
- MALNOURISHMENT | DEFICIENCIES
- GI DISORDERS
- AUTOIMMUNE DISORDERS

**Nutrition Facts**

- **VITAMIN B12 DEFICIENCY**
  - PROTON PUMP INHIBITORS & METFORMIN CAN INHIBIT ABSORPTION
  - LOW VITAMIN B-12 CONTRIBUTES TO DIABETIC NEUROPATHY

- **ZINC**
  - USED FOR IDIOPATHIC TASTE DISORDER

- **VITAMIN D**
  - REDUCES RESPIRATORY INFECTIONS

- **TURMERIC**
  - REDUCES INFLAMMATION | DIVERSIFIES THE GUT FLORA

- **LACTOBACILLUS REUTERI COULD BE EFFECTIVE IN THE TREATMENT OF GINGIVITIS**
CDT Codes

- D1310 NUTRITIONAL COUNSELING FOR CONTROL OF DENTAL DISEASE
- COUNSELING ON FOOD SELECTION AND DIETARY HABITS AS A PART OF TREATMENT AND CONTROL OF PERIODONTAL DISEASE AND CARIES
- D1320 TOBACCO COUNSELING FOR THE CONTROL AND PREVENTION OF ORAL DISEASE

TOBACCO PREVENTION AND CESSATION SERVICES REDUCE PATIENT RISKS OF DEVELOPING TOBACCO-RELATED ORAL DISEASES AND CONDITIONS AND IMPROVES PROGNOSIS FOR CERTAIN DENTAL THERAPIES
Mayo Clinic Prospective, Case-Controlled Study

- 339 patients with PJI | 339 uninfected patients

1. Antibiotic premedication before dental treatment was not associated with lower risk
2. Staphylococci were most commonly encountered organisms isolated from the infection sites
3. 13.5% of joint infection cases were associated with bacterial flora of oral or dental origin
4. Good oral hygiene was associated with lower risk of PJI

Oral Hygiene & Respiratory Infections

- Flossing and regular dental visits in patients with COPD is associated with fewer days with worse respiratory symptoms.
- Incidence of pneumonia significantly decreases with periodontal therapy.
- Good oral hygiene has been recognized as a means to prevent airway infections.
- Respiratory epithelium may be altered by periodontal-associated cytokines to promote infection by respiratory pathogens.
- Tongue thrusting is estimated to range between 33%-50.5% of the general population of school-aged children.

- In individuals with a temporomandibular disorder, the percentage of those with orofacial variables is estimated to be 97.92%.

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**Parafunctional Cascade**

- Ankyloglossia
- Lip-ties
- Malocclusion
- High palates
- Narrow arches
- Receded chins

**Habits**

- Bottle feeding
- Non-orthodontic pacifiers

**Sleep Apnea**

- Bed wetting
- ADHD
- Noisy breathing
- Snoring
- High blood pressure
- Heart disease

**Elimination of Gagging**

**Elimination of Reflux**

**Increased O2 Saturation**
Clinical Observations

- **Open mouth, habitual lips-apart resting posture**
- **Restricted lingual frenum**
- **Excessive anterior overjet, open bite, under bite**
- **Abnormal tongue rest posture**
- **Distorted speech**
- **Drooling, poor oral control**
- **Nonnutritive sucking habits: pacifier use after 12 months**
- **Lack of a consistent linguopalatal seal during swallows**
Kotlow’s Classification of Maxillary Lip-Tie Attachments

Class I: Normal

Class II: Inserting just above or in between central incisors

Class III: Beginning to insert into anterior papilla

Class IV: Inserts into anterior papilla
Mallampati Classification

Notes:

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The Petri Dish of Dentistry

- 63% of RDHs reported not delivering preprocedural rinses prior to mechanized scaling.
- 84% of RDHs reported not using high-speed evacuation during mechanized scaling.
- 24 out of 50 states claim to follow the CDC Infection Control Guidelines.
- 25% of dental professionals are not wearing a face shield when performing procedures.
- 44% of dental professionals are not routinely wearing N95 masks during procedures.
Angiotensin Converting Enzyme 2 Receptor

- Present in many cell types and tissues: lungs, heart, blood vessels, kidneys, liver and GI tract.
- Present in the epithelium in the nose, mouth and lungs.
- Highly expressed in salivary tissue.
- Critical for regulating blood pressure and inflammation, wound healing.
- Some evidence suggests that ACE2 may be higher in patients with hypertension, diabetes and coronary heart disease.

The average diameter of the virus particles is around 0.12μm.

The envelope of the virus is 0.08μm and each spike is 0.02μm.
Treating the Dental Unit Water Lines

- Flush lines at the beginning of every day [2 min]
- Flush lines in between patients [30 seconds]
- Ensure ultrasonic filters have been replaced appropriately
- Use water that meets EPA regulatory standards
- Test water in dental unit every 4 weeks with a monitoring device
- Chemical debridement of dental unit water lines every 4 weeks

Subtle Signs of Previous Coronavirus

- Runny nose or congestion
- Muscle pain
- Pink eye
- Loss of smell or appetite
- Shortness of breath
- Fatigue
- Sore throat
- Diarrhea or nausea

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Enanthem & COVID tongue
LET'S CONSIDER ASYMPTOMATIC CARRIERS

Pulse Oximeter Reading

- NORMAL BLOOD OXYGEN SATURATION: 95%–100%
- ABNORMAL: BELOW 90% OR BELOW BASELINE.
- SILENT HYPOXIA MAY BE ASYMPTOMATIC IN COVID-19 PATIENTS
Aerosol Production

- RESPIRATORY SECRETIONS
  - BREATHING
  - TALKING
- ADVANCED RESPIRATORY DROPLETS
  - SNEEZING
  - COUGHING
- MIXED AEROSOLS
  - CLEAN OR ANTIMICROBIAL WATER SPRAY
  - POOLED SALIVA
  - MOIST COMPLEX SURFACE OF THE TONGUE
  - GINGIVAL CREVICAL FLUID
  - BLOOD
  - PULVERIZED BIOFILM, ENAMEL, DENTIN, RESTORATIVE MATERIALS
  - RESPIRATORY SECRETIONS
  - HIGH VELOCITY
ULTRASONIC SCALERS AND HIGH SPEED HANDPIECES PRODUCE MORE AIRBORNE CONTAMINATION THAN ANY OTHER INSTRUMENT IN DENTISTRY

• SARS-COV WAS DISCOVERED IN URINE, STOOL AND OROPHARYNGEAL WASHING FLUID1
  ◦ WASTE WATER WAS TREATED BY DELIVERY OF CHLORINE DIOXIDE AT 2.19 PPM

• THE VIRICIDAL ACTIVITY OF CLO2 AT 10PPM IS 99.99% OR GREATER2
  ◦ ANTIVIRAL EFFECT IS DEFINED AS GREATER THAN 95% INFECTION OF THE VIRUS AFTER EXPOSURE.

• VIRICIDAL ACTIVITY VIA BROAD SPECTRUM APPROACH WAS NOTED DUE TO:3
  ◦ CHANGES IN SALIVARY CONCENTRATIONS OF VIRUSES
  ◦ ALKALIZED PH IN THE ORAL CAVITY RETARDING THE DEVELOPMENT OF VIRUS
  ◦ OXIDATIVE TRANSFORMATION OF AMINO ACIDS TYROSINE AND TRYPTOPHAN

Chlorine Dioxide
The greatest concentration of particles are present at the end of the procedure, and mean aerosol amount of 0.022 units was still present two hours past the procedure.

- Droplet nuclei can contaminate surfaces in a range of 3 feet
  - Primarily contaminate the operator zone

- Dental procedures that use low- and high-speed handpieces, laser or electrosurgery units, ultrasonic scalers, air polishers, prophy angles, hand instrumentation, and air/water syringes can create bioaerosols and spatter.

High Volume Evacuation

- HVES offer the best solution for controlling aerosol particles before they leave the mouth.

- Compared to saliva ejectors, HVE devices can reduce up to 90% of particles reaching the clinician.

- The diameter of a saliva ejector is too small to be effective in removing aerosols.

- A standard HVE tip could remove 90% to 98% of aerosols, regardless of the source, and HVES prove an effective solution for containing aerosols and reducing the risks of contamination.

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THE AVERAGE PERSON TOUCHES THEIR FACE 23 TIMES PER HOUR

HAIR
Average touches 4 per hour
Average duration range 3 (1-10) seconds

EYE
Average touches 3 per hour
Average duration range 1 (1-53) second

NOSE
Average touches 3 per hour
Average duration range 1 (1-10) second

MOUTH
Average touches 4 per hour
Average duration range 3 (1-12) seconds

CHEEK
Average touches 4 per hour
Average duration range 5 (1-12) seconds

NECK
Average touches 1 per hour
Average duration range 5 (1-23) seconds

CHIN
Average touches 4 per hour
Average duration range 4 (1-10) seconds
Personal Protective Equipment

SURGICAL CAP | NOT OSHA MANDATED

PROTECTIVE EYE WEAR | OSHA MANDATED
BEFORE ENTERING THE PATIENT ROOM OR CARE AREA PUT ON EYE PROTECTION. CONSIDER TOUCHLESS SYSTEMS WHenever POSSIBLE.

ASTM III WITH FACE SHIELD | OSHA MINIMUM STANDARD
IF A RESPIRATOR IS NOT AVAILABLE FOR AN AGP, USE BOTH A SURGICAL MASK AND A FULL-FACE SHIELD. ENSURE THAT THE MASK IS CLEARED BY THE US FDA AS A SURGICAL MASK. IF A SURGICAL MASK AND A FULL-FACE SHIELD ARE NOT AVAILABLE, DO NOT PERFORM ANY AGPS

N95 OR HIGHER RESPIRATOR | OSHA PREFERRED, IF AVAILABLE
DURING AGP CONDUCTED ON PATIENTS ASSUMED TO BE NON-CONTAGIOUS, CONSIDER THE USE OF AN N95 RESPIRATOR OR A RESPIRATORY THAT OFFERS A HIGHER LEVEL OF PROTECTION. RESPIRATORS SHOULD BE USED IN THE CONTEXT OF A RESPIRATORY PROTECTION PROGRAM WHICH INCLUDES MEDICAL EVALUATIONS, TRAINING AND FIT TESTING. OF NOTE: IT IS UNCERTAIN IF RESPIRATORS WITH EXHALATION VALVES PROVIDE SOURCE CONTROL.

SURGICAL GOWN | OSHA MANDATED
DISCARD DISPOSABLE GOWNS AFTER EACH USE. LAUNDER CLOTH GOWNS AFTER EACH USE. IF THERE ARE SHORTAGES OF GOWNS, THEY SHOULD BE PRIORITIZED FOR AGP AND PROCEDURES WHERE SPLashes AND SPRAYS ARE ANTICIPATED.

CLINIC SHOES OR SHOE COVERS | NOT OSHA MANDATED
Cover Story

Estimating COVID-19 prevalence and infection control practices among US dentists

Cameron G. Estrich, MPH, PhD; Matthew Mikkelsen, MA; Rachel Morrissey, MA; Maria L. Geisinger, DDS, MS; Effie Ioannidou, DDS, MDS; Marko Vujicic, PhD; Marcelo W.B. Araujo, DDS, MS, PhD

ABSTRACT

Background. Understanding the risks associated with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission during oral health care delivery and assessing mitigation strategies for dental offices are critical to improving patient safety and access to oral health care.

Methods. The authors invited licensed US dentists practicing primarily in private practice or public health to participate in a web-based survey in June 2020. Dentists from every US state (n = 2,195) answered questions about COVID-19-associated symptoms, SARS-CoV-2 infection, mental and physical health conditions, and infection control procedures used in their primary dental practices.

Results. Most of the dentists (82.2%) were asymptomatic for 1 month before administration of the survey; 16.6% reported being tested for SARS-CoV-2; and 3.7%, 2.7%, and 0% tested positive via respiratory, blood, and salivary samples, respectively. Among those not tested, 0.3% received a probable COVID-19 diagnosis from a physician. In all, 20 of the 2,195 respondents had been infected with SARS-CoV-2; weighted according to age and location to approximate all US dentists, 0.9% (95% confidence interval, 0.5 to 1.5) had confirmed or probable COVID-19. Dentists reported symptoms of depression (8.6%) and anxiety (19.5%). Enhanced infection control procedures were implemented in 99.7% of dentists’ primary practices, most commonly disinfection, COVID-19 screening, social distancing, and wearing face masks. Most practicing dentists (72.8%) used personal protective equipment according to interim guidance from the Centers for Disease Control and Prevention.

Conclusions. COVID-19 prevalence and testing positivity rates were low among practicing US dentists. This indicates that the current infection control recommendations may be sufficient to prevent infection in dental settings.

Practical Implications. Dentists have enhanced their infection control practices in response to COVID-19 and may benefit from greater availability of personal protective equipment. ClinicalTrials.gov: NCT04423770.

Key Words. SARS-CoV-2; COVID-19; dentistry.
Society was told to cover their mouth to protect their body...

**Host Immunity**

**EXERCISE:**
ARDS (ACUTE RESPIRATORY DISTRESS SYNDROME) ACCOUNTS FOR 67%-85% OF PATIENTS ADMITTED TO INTENSIVE CARE FROM COVID-19. 1

**PROBIOTICS:**
DIVERSIFICATION OF THE GUT FLORA HAS BEEN ASSOCIATED WITH THE PROMOTION OF HEALTH BUT ALSO DISCOVERED ON THE TONSILS OF HEALTHY SUBJECTS WHEN COMPARED WITH PLACEBO. 2

**VITAMIN D::**
VITAMIN D SUPPLEMENTATION IS ADVISED FOR THE PROTECTION AGAINST SARS-COV-2. 3

**FLU VACCINE:**
QUADRIVALENT VACCINES ISSUED IN THE UNITED STATES PROTECT AGAINST INFLUENZA A (H1N1), (H3N2) AND TWO INFLUENZA B VIRUSES.4

**Society was told to cover their mouth to protect their body...**
“ILLNESSES DO NOT COME UPON US OUT OF THE BLUE. THEY ARE DEVELOPED FROM SMALL DAILY SINS AGAINST NATURE. WHEN ENOUGH SINS HAVE ACCUMULATED, ILLNESSES WILL SUDDENLY APPEAR.”

~HIPPOCRATE
“I will only do what insurance covers”

“If it doesn’t hurt, nothing is wrong”

Fear of being “sold” something unnecessary
Communication

- Inflammation
- Infection
- Disease
- Gum treatment
- Active therapy
- Scaling
- Deep cleaning

“A LITTLE BIT” RECOMMENDATION
“YOU HAVE STAGE I PERIODONTITIS” “PRESCRIBED TREATMENT”

Medical History
Dental History
Risk Assessment
Evaluation
Visual AIDS

Link consequences of disease to patient
Familial history
Etiologic factors

Production-boosting treatment plan
Patient-centered solution

infection
[inˈfɛkʃ(ə)n]

The process of infecting or the state of being infected

- Contamination
- Septicity
- Ulceration
- Suppuration
- Inflammation

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Top Barriers to Accepting Treatment

1. LACK OF TRUST IN THEIR DENTAL HEALTHCARE PROFESSIONAL
2. NOT UNDERSTANDING THE CONSEQUENCES OF NOT UNDERGOING TREATMENT
3. LACK OF UNDERSTANDING THE RECOMMENDED TREATMENT

COST RANKED 5TH IN THIS SURVEY.
In Loving Memory of

Linda Marie Sanders