COLLIN COLLEGE DENTAL HYGIENE

ADALYN CRABTREE AND BETTY TANG

SALIVARY DIAGNOSTIC

Advantages

- Non-invasive
- Cost-effective
- Time efficient
- Easy to use
- Monitor of Oral and Systemic health
- Patient education

Salivary diagnostics is a non-invasive and cost-effective form of collecting saliva to detect pathogens in the oral cavity that cause periodontitis. It can offer many advantages to patient care in the dental office and the early identification of systemic diseases.

Traditional assessment methods are believed to focus more on the disease severity than its activity. Therefore, additional methods such as salivary diagnostics are expected to assist in the diagnosis of periodontal disease, evaluate its activity, monitor its progression, and deliver information on the risk of developing a new condition along with the effectiveness of periodontal therapy.

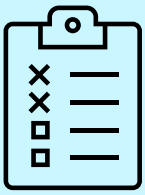
Besides the ability to provide a prognosis for associated systemic diseases, saliva as a diagnostic medium could aid in the early diagnosis of oral cancer. More advanced technology in microbiome identification with increased accuracy and sensitivity promises a future of salivary diagnostics for personalized individual medicine applications, including clinical decisions and post-treatment outcome predictions.

Pre-test

Implement

Post-test

Decide Treatment



Assessment

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Collin College Dental Hygiene

SLEEP LOSS & ORAL HEALTH

Noor Ajaz & Alise Plemmons

Sacrificing Sleep

When the word *hygiene* comes to mind, one doesn't typically think of sleep habits. Then again, sleep has become expendable in the eyes of many. Maslow's Hierarchy of Needs shows sleep at an equivalent level of human needs as air, water, and food. Yet, the industrialization of society has left sleep on the wayside as a necessity for health. However, recent studies are bringing to light how the sleep cycle interconnects through the systems and how acute and chronic sleep inadequacy can even present or exacerbate conditions in other areas of the body, such as the oral cavity.

Acute sleep loss can occur after only 24 hours, whereas chronic sleep loss, including interrupted sleep patterns, occurs after three months. Acute loss can affect mood and decisions, whereas chronic loss has been shown to have a positive relationship with diabetes, obesity, and decreased immune and inflammatory responses. Through these systemic conditions, oral manifestations may present as gingivitis, periodontitis, xerostomia, and dental caries. Additionally, parafunctional habits are shown to be affected by the sleep cycles and fluctuations of the stages involved.

When the body is at rest, there are varying stages in the sleep cycle, which include REM and NREM. Through these stages and the multiple cycles taking place each night, our body and mind repair and reset. Mood, memory, healing, and recovery are just a few benefits occurring while we sleep that can be affected by the loss of sleep or an interrupted sleep pattern.

HOW TO ACHIEVE ADEQUATE SLEEP:

Routines can aid in feelings of productivity and be an anchor when life gets unpredictable; a sleep routine is no different.

Ways to help set good **sleeping habits** include:

- Going to sleep at a set time
- Getting more than 7 hours of sleep nightly
- Sufficient sunlight exposure during the day

Try to **avoid** before bed:

- Caffeine, nicotine, alcohol
- Exercise
- Eating large meals
- Blue light exposure from electronic devices

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Emerging Benefits of Nano-hydroxyapatite: A Revolutionary Approach to Preventive and Restorative Treatment

By: Jessica Alexander, Tiana Rogers, and Yesica Gallegos

FROM NASA TO THE DENTAL OFFICE

★What is nano-hydroxyapatite?

Hydroxyapatite is an inorganic material that is the primary source of calcium and phosphate and is the major component of the tooth structure. In 1970, NASA took hydroxyapatite and refined it into nano-hydroxyapatite in order to aid in the mineral repair of astronauts who presented with diminishing bone and tooth structure. Nano-hydroxyapatite is a novel material with outstanding physical, chemical, mechanical, and biological properties that make it suitable for multiple interventions. With its biomimetic/nontoxic properties, this mineral can accommodate a wide array of patient-based needs; specifically, noncooperative young children and special needs patients that are more inclined to systemic toxicity from swallowing or not adequately spitting out the toothpaste can greatly benefit from this material. On top of its biological properties and through the healing encouraged by osteoblastic activity, nano-hydroxyapatite provides both preventive and restorative support.

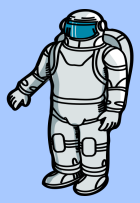
★Nano-hydroxyapatite in dentistry:

Nano-hydroxyapatite has the ability to chemically bond to bone, stimulate bone growth through a direct action on osteoblasts, and not induce toxicity or inflammation. This substance also has excellent osteoinductive capacity and improves bone-to-implant integration. Due to these unique properties, nano-hydroxyapatite has been widely used in periodontology, oral maxillofacial surgeries, implantology surgeries, and other orthopedic surgeries. Research has proven that nano-hydroxyapatite has significant remineralizing effects on initial enamel lesions as well as good results on the sensitivity of the teeth.

Benefits:

- Oral Microbiome-Friendly
- Kid-Friendly
- Biocompatible and Non-Toxic
- Remineralizes Enamel
- Natural Whitening Effects
- Aids In Tooth Sensitivity
- Improves Appearance of Fluorosis
- Fights Against Cavities
- Osteoinductive Capacity
- Aids In Tooth Sensitivity

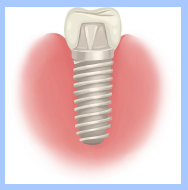
Where Nano-hydroxyapatite has been used:



NASA

Periodontology

Oral Maxillofacial Surgeries



Implantology Surgeries

Orthopedic Surgeries

★ To Sum It Up...

With mounting evidence that continues to grow, research has allowed nano-hydroxyapatite to hold its name high in the list of scientific breakthroughs in the betterment of achieving an overall state of health in America.

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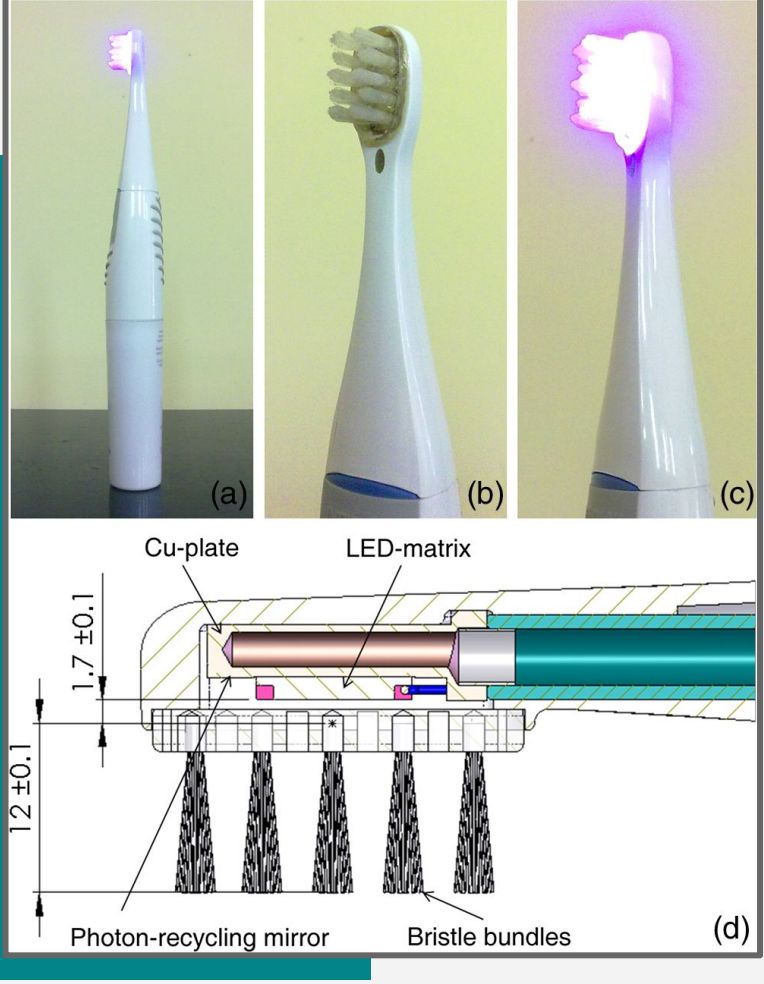
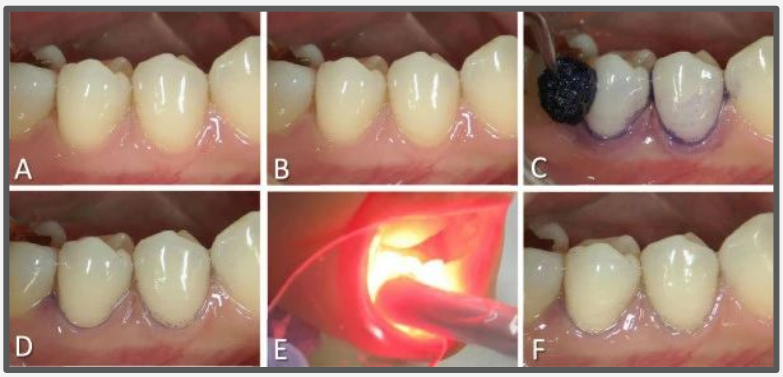
Collin College Dental Hygiene

Red and Blue Light Therapy in the Treatment of Gingivitis and Periodontitis

Studies have shown that solely brushing, flossing and rinsing is effective in REDUCING signs of active disease in patients with periodontal diseases, but when examined on a cellular level, these conventional methods are not able to remove the disease markers and can only SLOW the disease processes involved in periodontitis. New research has shown that employment of red and blue light therapies may be able to further slow and potentially reduce these disease markers in patients with periodontitis and gingivitis.



- 47.2 % of adults ages 30 or older have some form of periodontal disease
- Plaque- induced gingivitis is prevalent in all age groups
- 10,047 per 100,000 people in the Americas have periodontal disease



What improvements can red and blue light produce on a cellular level?

Researchers have found that blue light has antimicrobial properties due to reactive oxygen species (ROS). It can more significantly reduce proinflammatory mediators in the periodontium when combined with conventional methods. Blue light reduced biofilm CFUs by 49.8% compared with mechanical removal alone. Red light LED reduced the inflammatory reaction of PDL stem cells. When combined with the photosensitizer, toluidine blue O, red LED suppressed the formation of supragingival plaque even without mechanical removal.

What can I take away from this?

More research is warranted for this new possible adjunctive therapy for periodontal diseases. Some patients' diseases cannot be controlled by conventional methods alone and others cannot employ antibiotic therapies due to allergies, contraindications, or side effects. Conventional methods depend on patient compliance and technique. Red and blue light therapy could give dental professionals another option to their patients that is not as technique sensitive and safer for use by those with conditions contraindicating other antimicrobial therapies.

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The Ketogenic Diet

EXPLORING THE ORAL AND SYSTEMIC EFFECTS

By: Tami Bailey, Becca Bittle, and Alex Nguyen

Effects on Systemic Health

The keto diet was the most Googled diet in the United States in 2020, with more than 25 million unique searches. It was first developed in the 1920s when physicians learned the positive effects of starvation on the brains of pediatric epilepsy patients. The keto diet gained widespread popularity in the 21st century with the obesity epidemic in the United States due to its success in rapid weight loss.

The classic keto diet is a low-carb regimen with macronutrients divided into approximately 60% fat, 30% protein, and 10% carbohydrates.

Under normal conditions, the body uses carbs for energy. When carbohydrate intake is drastically reduced, glycogen stores are depleted. Once glycogen stores are absent; the body is forced to use two other metabolic pathways for energy; gluconeogenesis and ketogenesis.

Ketogenesis is the process by which ketones are produced by lipid metabolism and become the primary energy source for all cellular activity in the body. This second metabolic pathway is called ketosis.

It has been well-documented that following a low-carb, high-fat diet yields rapid weight loss. However, there are questions about the long-term effects of this regimen on the body. Research has shown that long-term adverse effects of the ketogenic diet include vitamin and mineral deficiencies, kidney stones, hypoproteinemia, hepatic steatosis, and increased low-density lipoproteins.

More commonly, however, the diet's initial side effects include what is referred to as the "keto flu." The keto flu is characterized by halitosis, nausea, headache, fatigue, dizziness, constipation or fatty diarrhea, vomiting, and difficulty in exercise tolerance.

The ketogenic diet was developed as a therapeutic diet for treating epilepsy patients; however, it is currently being studied for its effect on cancer patients. Researchers have found evidence that elevated cancer risk is linked to obesity. Most of the data collected on the ketogenic diet results in humans are case studies and cohort studies; however, "a meta-analysis of 24 human studies found that 42% found that the ketogenic diet can reduce tumor growth.

Effects On Oral Health

Apart from halitosis, the oral effects of the ketogenic diet are not well documented. Vitamin and mineral deficiencies manifest as cheilitis, and dehydration can cause xerostomia.
More in-depth studies are warranted concerning the effects of the keto diet on oral health since it is well-documented that sugar and fermentable carbohydrates are the main contributors to dental caries. Furthermore, obesity and high blood sugar are major risk factors for inflammatory responses, which can contribute to periodontal diseases.

Role of Dental Professionals

- Refer to PCP for blood work.
- Look for signs of vitamin deficiencies during EIOE.
- Allay xerostomia with xylitol lozenges and alcohol-free mouth rinse.
- Nanohydroxyapatite toothpaste to reduce caries risk.

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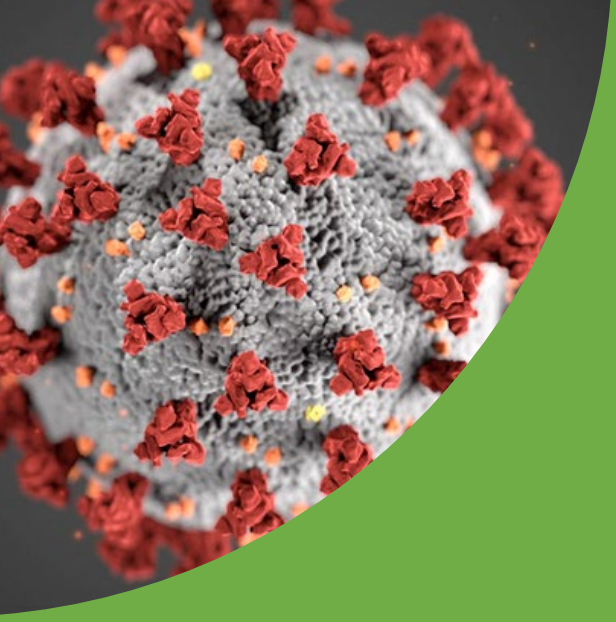

Numerous studies have established periodontitis as an added risk factor to the already identified COVID- 19 comorbidities such as diabetes, the cardiac, pulmonary, and gastrointestinal conditions.

It has been proposed that periodontally-involved patients infected with COVID-19 have worse oral health conditions than periodontitis patients uninfected with the virus.

CONTINUUM OF PERIODONTITIS IN THE WIDE SPECTRUM OF COVID- 19

Correlations

A common immunologic response in both conditions is hyperstimulation of inflammatory biomarkers leading to cytokine storm syndrome. Exaggerate immune response ought to favor the growth of periodontal pathogens in the oral cavity due to an imbalance of oral microbial flora and worsening patient's periodontal disease.

Access to dental care

The sudden bleak situation regarding the clinical protocol further impacted periodontal health due to the lack of access to dental care.

The positive occurrence is the introduction to Teledentistry.

COVID- 19 long haulers

Stress from long-COVID symptoms lowers the defense against inflammation of infected individuals, further deteriorating their preexisting medical conditions.

There is a need of further studies to be conducted to specify the main cause.

Bottom line

Numerous studies have shown a positive association between periodontitis and the severe disease of COVID-19. However, further research is needed to establish a causal link between these two entities.

DENTAL HYGIENE STUDENTS

Umaizil Dhamrah & Chau Tang

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