Popular Diet Trends - Lean in on Dental Health

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- Ms. Karlin reports no conflicts of interest associated with this course. She has no relevant financial relationships to disclose.
- Dr. Karlin reports no conflicts of interest associated with this course. She has no relevant financial relationships to disclose.

Introduction – Popular Diet Trends

This course discusses popular diet trends and how they affect oral health status. Using evidence-based research, the reader is shown how diet trends and dietary patterns impact the health of the oral cavity.

Course Contents

Overview

The purpose of this course is to discuss popular diet trends your patients may be following, arming you with what you need to know as a dental healthcare professional. Evidence-based research shows us how diet trends and dietary patterns impact the health of the oral cavity. Understand the low FODMAP, Mediterranean, gluten-free, dairy-free, and plant-based diets and how they affect oral health status.

Learning Objectives

Upon completion of this course, the dental professional should be able to:

- Understand the plethora of information surrounding popular diet trends.
- Discuss the low FODMAP, gluten-free, dairy-free, plant-based and Mediterranean diets.
- Explain the effect diet trends and dietary patterns may have on oral health.
- List patient-friendly, healthy eating resources that promote oral health and sustainable weight control.

Glossary

CD - Celiac Disease
CDC- Centers for Disease Control and Prevention
DGA - 2020-2025 Dietary Guidelines for Americans
FODMAP - Fermentable oligosaccharides, disaccharides, monosaccharides and polyols
GI - Gastrointestinal
GF - Gluten-free
GFD - Gluten-free diet
HEI - Healthy Eating Index
IBS - Irritable bowel syndrome
MD - Mediterranean Diet
RCT - Randomized controlled trial
SSB - Sugar-sweetened beverages

Introduction

Overweight and obesity are prevalent nutrition-related health conditions, affecting 74% of adults and 40% of children and adolescents in the U.S.[1] According to the Centers for Disease Control and Prevention (CDC), childhood and adolescent obesity increases the risk for poor health throughout the lifespan. Obese adults are at higher risk for many chronic health conditions, including hypertension, hypercholesterolemia, cardiovascular disease, type 2 diabetes, obstructive sleep apnea, asthma, osteoarthritis, gallstones, gallbladder disease, anxiety, depression, stroke and cancer.[2] Furthermore, according to a systematic review of 28 epidemiological studies, controlled clinical trials and meta-analyses, obesity is positively associated with periodontitis.[3,4,5] A longitudinal study using data from the Public Dental Services and the Norwegian Mother and Child Cohort Study found that children of obese mothers had a 2.3 times higher risk of developing early childhood caries.[6] The CDC acknowledges that obesity is a complex problem and encourages healthcare professionals to work together to help patients achieve and maintain a healthy weight.[7] Oral healthcare providers play a key role in educating patients and helping them overcome poor dietary and lifestyle habits, thereby decreasing their risk for both obesity and oral disease. It is well established that poor dentition impacts a patient's weight and nutritional status. A recent retrospective, longitudinal study looking at over 3,500 denture wearers, published in the Journal of Prosthodontics, found that denture wearers had low nutrient profiles, particularly with regard to protein and calcium intakes.[8] Masticatory dysfunction affects the patient's ability to eat whole nutrient-dense foods such as fresh fruits, vegetables, whole grains, nuts, seeds and lean beef. Edentulous patients tend to select soft, nutrient-poor, calorie-dense foods resulting in a compromised nutrient intake. It is apparent through epidemiologic and experimental evidence that an increased consumption of soft foods high in refined carbohydrates, simple sugars and sugar-sweetened beverages (SSB) leads to weight gain, obesity and poor oral health.[9]

The need for a balanced, sustainable and holistic approach to weight loss is of paramount importance for reaching the goal of sustaining a healthy weight and optimal oral health. However, since there is a plethora of popular diet trends that proliferate through celebrity testimonials, social media and the internet, it becomes extremely difficult to discern which diet actually fosters sustainable weight loss. While many patients believe that a popular diet trend will help them safely and quickly lose weight and promote health, dental patients should be discouraged from following a diet plan that promotes quick weight loss. According to the Academy of Nutrition and Dietetics, rapid weight loss promotes loss of muscle, bone and water, increasing the chance for weight gain.[10] On the other hand, healthy dietary patterns as part of an overall healthy lifestyle, promote long-term weight management, systemic health and a healthy dentition. We will evaluate popular current diet trends, including the low FODMAP, gluten-free (GF), dairy-free, plant-based and Mediterranean.

The Low FODMAP Diet

The term FODMAP is an acronym that stands for fermentable oligo-, di-, mono-saccharides and polyols. Even though scientific evidence does not support a low FODMAP diet for weight control, the low FODMAP diet has become an increasingly popular dieting trend for weight loss. This diet was developed by researchers at Monash University to help patients with medically-diagnosed irritable bowel syndrome (IBS) control their gastrointestinal (GI) symptoms.[11] IBS is a functional GI disorder without a known cause, and is a difficult health condition to treat.[12] There is no cure for IBS, which impacts more than 11% of the population worldwide.[13] Symptoms typically consist of abdominal pain, bloating, diarrhea and/or constipation.[14] IBS negatively impacts quality of life and often contributes to a considerable economic burden in terms of health-care costs for these patients and their families.

FODMAPs are found in a variety of nutrient-dense foods, such as fruits, vegetables, dairy, wheat and in sugar-free sweeteners. When foods and sugar-free sweeteners high in FODMAPs are consumed, the small, nondigestible, fermentable carbohydrates are poorly absorbed in the small bowel resulting in GI distress in IBS patients. Each patient can tolerate different types and amounts of FODMAPS, therefore the low FODMAP diet is a three-phase, individualized approach.[15] During the first 4-8 weeks of the low FODMAP diet, the patient completely eliminates all FODMAPS. Since this first phase of the diet is the most restrictive and most challenging phase, it's important for the patient to work with a registered dietitian to make sure that they follow the diet correctly.[15] During phase two, the reintroduction phase, foods are gradually added back into the diet, while monitoring symptoms, in order to ensure nutritional adequacy. Often a food-symptom log will help determine which specific FODMAPs are problematic. Phase three is the personalization phase, which eliminates only the FODMAPs that cause GI discomfort. Q1The low FODMAP diet is effective in reducing GI symptoms in up to 86% of IBS patients.[16]

In addition to limiting or avoiding FODMAPs in foods, patients must also consider the non-food sources of FODMAPs, the sugar-free sweeteners, which include the polyols also known as sugar alcohols. We do not have the enzymes to completely metabolize sugar alcohols, therefore, they provide less calories than sugar and do not contribute to caries. Sugar alcohols are common ingredients in sugar-free chewing gum, medications, dietary supplements, chewable vitamins, candy, breath mints, throat lozenges, oral melts and other oral care products. Research suggests that frequent use of the polyol, xylitol, is associated with a significant reduction in the incidence of dental caries.[17] Sugar alcohols are often recommended by oral healthcare providers as part of an overall preventive treatment for patients at high caries risk.[18] Today, there are more oral care products than ever before in the marketplace containing different types of sugar alcohols and these products are often recommended to patients suffering with radiation-induced xerostomia.[19] Erythritol, xylitol, sorbitol, mannitol, maltitol, lactitol, and isomalt are sugar alcohols.[17] Chewing sugar-free gum made with sugar alcohols protects the teeth from cavity-causing bacteria by promoting the flow of saliva. This increased saliva and other

noncariogenic properties are the reasons why sugar alcohols are often used as a sweetener in sugar-free chewing gum and the American Dental Association and the U.S. Food and Drug Administration recognize sugar alcohols as beneficial to oral health.[20]

Even though sugar alcohols have been shown to potentially benefit oral health, they are FODMAPs and must be either limited or avoided by dental patients suffering from IBS. To take this a step further, if any dental patient, even patients without IBS, ingests sugar alcohols in large quantities, this can result in diarrhea and dehydration. Ingesting sugar alcohols has been shown to cause intestinal dysmotility, flatulence, abdominal pain and diarrhea in patients with IBS.[21]

When taking a medical history, the oral healthcare provider should inquire if the patient is following a low FODMAP diet for medically diagnosed IBS. When treating these patients, dental practitioners must be aware of the sugar alcohol content of dental products they are recommending. In many cases, especially if the patient is in the first phase of the low FODMAP diet, strict dietary avoidance of all FODMAPs is vital for the success of the diet. Therefore, a xylitol-based caries program or xylitol containing chewing gums and lozenges to treat xerostomia should not be recommended as part of the dental treatment plan for a patient with IBS.

The bottom line: Oral healthcare providers have the opportunity to provide individualized and supportive guidance when recommending dental products to patients with IBS who are following a low FODMAP diet.

The Gluten-free Diet

While patients may decide to pursue a gluten-free diet (GFD) for a variety of reasons, it has gained popularity in recent years as a weight loss diet. Despite its trendiness, patients should not follow a GFD to lose weight or to become healthier. Gluten is a protein naturally present in wheat, rye, and barley. According to the Academy of Nutrition and Dietetics "there are no published reports showing that a GFD produces weight loss…".[22] Patients should only follow a GFD if they have a gluten-associated disease confirmed by a physician, due to the potential risk for nutrient deficiencies when eliminating gluten containing nutrient-dense foods.[23]

There are three health conditions that can be treated with a GFD, and they include: wheat allergy, nonceliac gluten sensitivity, and celiac disease (CD).[24] Wheat is one of the top 9 common allergens in the U.S. Patients with a wheat allergy have an abnormal immune response to the protein found in wheat and must therefore, follow a strict wheat-free diet. Since the GFD eliminates all wheat from the diet, it is safe for patients with a wheat allergy. A wheat allergy is an Ig-E mediated reaction that can be mild, and include cutaneous, gastrointestinal or respiratory symptoms, or severe, and result in anaphylaxis. The only current management and treatment for wheat allergy is strict avoidance of wheat and the emergency medication, epinephrine, in the case of anaphylaxis.[25] The American Academy of Allergy and Immunology defines anaphylaxis as a "serious allergic response that often involves swelling, hives, lowered blood pressure and in severe cases, shock. If anaphylactic shock isn't treated immediately, it can be fatal."[26]

Patients with nonceliac gluten sensitivity have symptoms after eating gluten-containing grains but do not have medically diagnosed celiac disease or wheat allergy. Reported symptoms include: bloating, gas, abdominal pain, diarrhea, nausea, constipation, headache, joint pain, fatigue, depression, brain fog and neuropathy. Currently, even though there are no validated biomarkers for nonceliac gluten sensitivity, these patients report resolution of symptoms when following a GFD.[27]

Celiac disease is the world's most common genetic food intolerance disorder. Gluten is the trigger for an inflammatory T-cell mediated immune response, resulting in villous atrophy of the small intestine, which often leads to GI distress. CD has different pathology and symptomatology in every patient, that includes a wide range of signs and symptoms that mimic other diseases. Therefore, it is extremely difficult to accurately diagnose. Since the first recognizable symptom is often in the oral cavity, oral healthcare providers may be the

first healthcare professional to recognize CD. The most common oral symptoms of CD include recurrent aphthous ulcers, reduction of salivary flow, geographic tongue and dental enamel defects. Dental professionals should be versed in being able to recognize the manifestations of CD.[28] Dentists should refer patients to the gastroenterologist for diagnosis since early diagnosis of CD is essential to avoid long-term complications. Helping these patients begin to take the necessary steps toward correct early diagnosis and treatment will prevent development of long-term serious complications, that include infertility, miscarriage, osteoporosis, Sjogren's disease and other autoimmune diseases.[29]

Once the patient has received the diagnosis, the only treatment currently available for CD is a strict, lifelong GFD. Nutritional counseling from a registered dietitian is recommended in order to make sure that the patient is eating a healthy, nutrient-dense GF diet, thereby preventing nutrient deficiencies.[23] The patient must avoid not only all foods, beverages and condiments that contain gluten, they must also avoid any dental product that contains gluten. Dental products that may contain gluten include toothpaste and mouthwash.[30] The dental treatment plan must be modified to be certain that all in-office dental products and medications prescribed are GF. Many dental products recommended for home use will state on their label whether or not they are GF. If in doubt, it is recommended to contact the manufacturer directly to confirm GF status of the product.

The bottom line: While the GF diet is not recommended for weight control or weight loss, dental patients who have medically diagnosed CD must follow a strict GFD. A dental patient who has been diagnosed with nonceliac gluten sensitivity may choose to eliminate gluten from the diet to improve symptomatology. A strict wheat-free diet is indicated for a dental patient with an IgE-mediated wheat allergy.

The Dairy-free Diet

Milk allergy is an immune response that occurs each and every time the patient consumes milk protein. Therefore, patients with milk allergy must follow a dairy-free diet. It is a reproducible, IgE-mediated response, whereby mast cells release histamine and other potent mediators resulting in symptoms minutes (or up to 2 hours) after eating dairy or drinking milk. An allergic reaction to milk can lead to anaphylaxis. Therefore, a patient with a milk allergy must strictly avoid milk and dairy, including dental products that contain milk or milk protein. Although uncommon, there have been reported cases of accidental exposure and severe allergic reactions to the milk protein, casein, in dental products.[31,32]

Many patients are avoiding dairy because they have lactose intolerance, which is a problem digesting foods that contain lactose, the naturally occurring sugar found in dairy products. These patients may experience bloating, stomach pain or diarrhea after consuming dairy.[33] A patient with lactose intolerance lacks the enzyme, lactase, which is responsible for breaking down the milk sugar into glucose and galactose for absorption. This does not mean that the lactose intolerant patient must follow a dairy-free diet, since a few simple swaps are often all that's needed to relieve GI symptoms. These patients can incorporate dairy into their diet in the form of lactose-free milk, lactose-reduced dairy products, aged hard cheeses and/or fermented dairy products.[34]

Interest in the dairy-free diet has grown in the past few years causing it to gain significant popularity in the trending diet category. Even though the science-based research does not support a dairy-free diet for weight control, many of our patients are avoiding milk and dairy products, such as cheese and yogurt, in order to lose weight. There is evidence-based research surrounding the controversial role of milk and dairy products in weight-loss programs. While cross-sectional epidemiological studies have shown that including dairy-rich foods in the diet is associated with less adipose tissue in both adults and children; prospective studies and randomized controlled intervention trials have yielded inconsistent results.[35] Even so, most of the current evidence-based research suggests that dairy foods do not cause

weight gain and that dairy consumption actually reduces body fat and increases lean body mass. Evidence shows that yogurt consumption contributes to reduced weight gain. In addition, consuming fermented dairy, such as yogurt and aged cheese, is linked to a lower risk for cardiovascular disease, and protection against type 2 diabetes.[36] Recent studies show that including dairy as part of a healthy eating pattern results in weight loss, weight control and even improvements in body composition. A large meta-analysis of 27 randomized controlled trials (RCT) discovered that when adults ages 18-50 years old consumed low-calorie diets that included 2-4 servings of dairy per day, they had greater weight loss and fat loss, while preserving their lean mass, compared to controls.[37] A clinical trial of 100 healthy, overweight or obese premenopausal women revealed that increasing low-fat milk consumption as part of a low-calorie diet, significantly reduced obesity and that low-fat dairy intake helped to promote weight loss.[38] A recent 6-month intervention trial discovered that increasing low-fat dairy in the diet led to weight loss and more favorable bone mineral density in overweight and obese postmenopausal women.[39] Additionally, increasing dairy intake was associated with weight loss and a decrease in waist circumference in overweight and obese individuals in a weight loss community initiative.[40]

While there is limited research surrounding the role of dairy and oral health, researchers have found that milk, cheese and unsweetened yogurt play a key role in supporting the health of the hard tissues in the oral cavity. A prospective study of the Danish population found that milk and dairy intake was associated with lower future dental caries risk.[41] Wu et al found that drinking yogurt provided a protective factor against the development of dental caries among Chinese children.[42] Ohlund et al reported that cheese intake may have a caries-protective effect in 4-year-old children using fluoridated toothpaste and residing in an area where overall caries prevalence rate is low.[43] Llena et al discovered a negative association between caries and cheese consumption among 6-10 year old Spanish children; and a positive association with caries when consuming sweets, refined carbohydrates and SSB.[44] A recent study using data from the National Health and Nutrition Examination Survey (NHANES) 2011-2016, assessed the associations between milk and dairy products and the risk of dental caries in children and adolescents. This study ascertained that while a high yogurt intake was associated with a decreased risk of dental caries, cheese did not appear to offer a caries protective effect.[45] Daily yogurt consumption may decrease caries risk by preventing cariogenic biofilm according to a RCT published in the European Journal of Clinical Nutrition. In this study, when volunteers ate yogurt twice a day for 8 weeks, they had lower salivary counts for Streptococcus mutans and lactobacilli.[46] Additionally, a large systematic review and meta-analysis of 32 studies revealed that dairy products containing probiotics increased salivary pH and were effective in reducing Streptococcus mutans and Lactobacillus spp. levels.[47] The clinical relevance of these studies is the potential role of milk, cheese and yogurt consumption to support caries prevention.

To date, few studies have comprehensively explored the associations between milk and dairy consumption and the soft tissues in the oral cavity. The available research does confirm that patients who regularly consume milk and dairy have a decreased prevalence of periodontal disease. Dairy foods are good sources of nutrients needed for optimal bone development and bone health, including calcium, protein, magnesium, potassium, zinc, and phosphorous.[48] Thus, dairy calcium may have a favorable effect on periodontal health by enhancing alveolar bone density.[49] In a parallel-designed non-blinded study, 50, 25-year-old students, had better gingival health after drinking a probiotic milk drink for 8 weeks. There was a decrease in elastase activity and MMP3 in their gingival crevicular fluid.[50] A cross-sectional study looking at the intake of dairy products and periodontitis in 135 older Danish adults reported that milk and fermented foods may protect against periodontitis.[51] Shimazaki et al. learned that Japanese adults consuming yogurt and fermented milk beverages had significantly lower values in mean probing depths compared to those not eating these foods.[52] Results from a new relatively large

study including 9798 Korean adults, suggest that frequent intake of milk and dairy, defined as ≥ 7 servings per week, may have a protective effect on periodontal disease. Even after adjusting for confounding variables, including age, sex, education, income, smoking status, alcohol consumption, BMI, diabetes status, calcium intake, tooth brushing and flossing, a higher dairy intake was associated with a 26% lower risk of periodontal disease.[49]

The bottom line: Milk and dairy does not promote weight gain and may even foster weight control. Dairy fits into a healthy dietary pattern and is beneficial for a healthy oral cavity. Fermented dairy products may play a protective role against both caries development and periodontal disease. Do not use any dental product containing milk or casein to treat any patient with an Ig-E mediated milk allergy.

Plant-based Dietary Patterns

Recent trending plant-based diets, which include Vegan, Vegetarian, Flexitarian, Plant-forward and Whole-food diets align with Healthy Vegetarian eating guidelines. The Vegetarian diet pyramid can be seen in Figure 1.[53]

There are several reasons why patients may be choosing a plant-based diet, including weight loss, heart health, high fiber or sustainable eating. The science confirms that these trending plant-based dietary patterns truly are beneficial for weight control and disease prevention. Taking this further, fruits and vegetables are low in calories and fat, and provide healthy dietary nutrients and components necessary for a healthy oral cavity, including fiber, vitamins and minerals and phytochemicals. The good news is that this style of eating, which is often referred to as "plant-forward" is currently a significant culinary mega-trend according to the Culinary Institute of America. It is defined as "eating that emphasizes and celebrates, but is not limited to plant-based foods-including fruits and vegetables (produce); whole grains; beans, other legumes (pulses) and soy foods; nuts and seeds; plant oils; and herbs and spices-and that reflects evidence-based principles of health and sustainability."[54]

The newly released 2020-2025 Dietary Guidelines for Americans (DGA) recommend that our patients follow one of three dietary patterns - Healthy U.S.-Style, Healthy Vegetarian

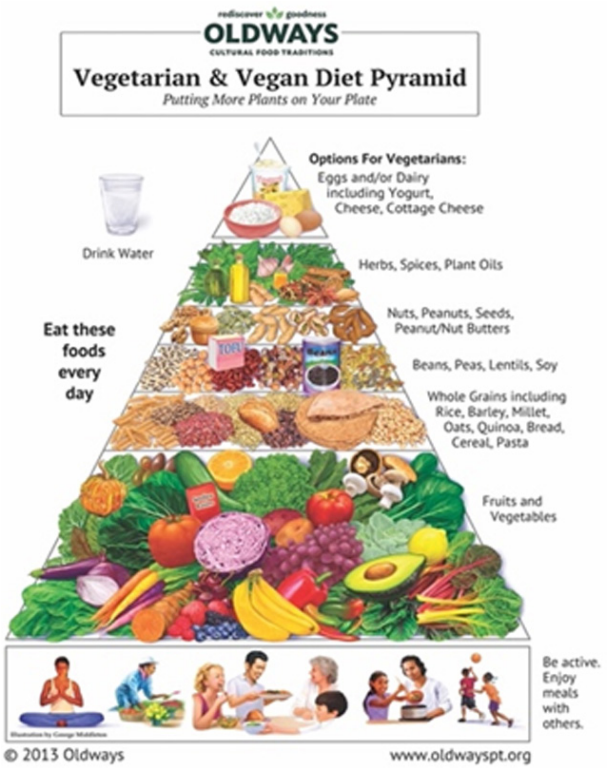

Figure 1: Healthy Vegetarian and Vegan Eating Patterns

or Healthy Mediterranean-Style, as part of a healthy lifestyle, in order to maintain a healthy weight, promote overall health and reduce risk of chronic disease. The DGA define a healthy dietary pattern as "meeting food group and nutrient needs with nutrient-dense foods and beverages, and limiting intake of foods and beverages that are not nutrient-dense."[1] All of these dietary patterns include limiting foods high in sodium, saturated fat and sugar, while emphasizing fruits, vegetables, whole grains, nuts, seeds, legumes, herbs, spices, healthy fats, dairy or alternative and lean proteins. The DGA recommends that we eat 2 cups of fruits and 2.5 cups of vegetables per day and that ½ of the grains we eat should come from whole grains. Multiple studies have concluded that fruit, vegetable and whole grain consumption is associated with weight loss and also linked to reduced risk of weight gain, overweight and obesity. A 2020 comprehensive narrative review points out how increasing intake of fruits and vegetables to the levels recommended in the DGA contributes to successful weight loss in women. Fruits and vegetables along with legumes, nuts, seeds and whole grains are fiber-rich. They are digested slowly and keep us feeling full longer. Eating foods that are high in fiber and low in calories help complement weight loss.[55] A systematic review of 14 studies evaluated the relationship between vegetable intake and change in weight-related outcomes among adults using prospective cohort studies. The studies that explored change in vegetable consumption over time discovered a beneficial relationship between increasing vegetable intake and weight control. Higher vegetable intakes were associated with the lowest risks of weight gain. The largest risk reduction was observed in a study of Spanish adults, whereby those consuming ≥ 4 vegetable servings per day over a 10-year period had an 82% reduced risk of gaining more than 3.4 kg. This evidence suggests that diets that more closely adhere to the recommended daily vegetable intake may reduce the risk of weight gain in the long term.[56]

A large meta-analysis of 12 RCTs compared weight loss among vegan and lacto-ovo-vegetarians versus low-fat and low-carbohydrate diets. Results indicated that the vegetarians and vegans had significant weight reduction compared to non-vegetarians. The individuals who were following vegan diets had the greatest weight loss.[57] Even though a vegan diet may be beneficial for weight control, there is a risk for potential nutritional deficiencies, including vitamin B12, protein, omega-3 fatty acids and iron. There are limited food options for vegans trying to meet their B12 needs, and they include: nutritional yeast, fortified plant-milks, plant-based meats, fortified cereals, tempeh, and nori seaweed. Strict vegans often benefit from the guidance of a registered dietitian.[58] It is also important to note that Vitamin B12 deficiency can show up as oral manifestations, including glossitis, glossodynia, recurrent oral ulcers, angular cheilitis, dysgeusia, lingual paresthesia, burning sensations, and pruritus. The presence of any of these oral symptoms, together with a vegan dietary history, may offer the dentist an opportunity to aid in diagnosing a vitamin B12 deficiency.[59]

A recent large-scale cross-sectional study utilizing data from the National Health and Nutritional Examination Survey (NHANES) that was published in JADA, shed light on the relationship between a healthful eating pattern and oral health benefits in adults. The researchers examined decayed, missing, filled teeth and compared this data to Healthy Eating Index (HEI) scores. This is a score that is based on how closely overall diet quality aligns with the DGA.[60] This study highlighted that higher HEI scores were associated with less untreated caries and specifically, when these individuals ate more plant-based whole foods, including whole fruits and total fruits, greens and beans this resulted in a decrease in caries risk.[61] Additionally, a small German study linked specific nutrients that are plentiful in an "anti-inflammatory" plant-based dietary pattern to potential oral health benefits and reduced gingivitis. This RCT looked at adults who following an "anti-inflammatory" whole food diet for 4 weeks, defined by researchers as a diet low in processed food and high in plants. At the end of the study, the "anti-inflammatory" diet group, eating more foods rich in omega-3 fatty acids, vitamins C and D, antioxidants and fiber, had significant reduction in gingival bleeding, compared to the adults eating their regular diet.

"Dental teams should address dietary habits and give adequate recommendations in the treatment of gingivitis, since it might be a side effect of a pre-inflammatory Western diet," is the advice written in the article.[62] Furthermore, a separate large-scale systematic review of 4 intervention studies, 3 cohort studies and 8 cross-sectional studies included 10,604 people ages 15-90. The results suggest eating at least 5 servings of fruits and vegetables a day in order to potentially prevent the progression of periodontal disease and tooth loss.[63] This guidance is in line with the DGA and the advice that healthcare professionals have been preaching for decades, "Eat your 5-a-day." Registered dietitians believe in food first and encourage patients to follow a whole food plant-based dietary pattern, per the DGA guidance. However, recent data indicates that Americans are grossly underconsuming fruits, vegetables and whole grains. 80% of the population are not meeting the fruit recommendation, 90% are not meeting the vegetable recommendation and 98% are not eating enough whole grains.[1]

By encouraging your patients to select a nutrient-dense, plant-based dietary pattern, your patients can maintain a healthy weight, healthy dentition, healthy periodontium and prevent oral and systemic disease. The need for a balanced approach to weight loss and maintenance is of paramount importance for reaching the goal of sustaining a healthy weight and oral cavity throughout the lifecycle.

The bottom line: As oral healthcare provider you can recommend that patients increase their fruit and vegetable intake, as part of a wholesome, nutrient-dense plant-based dietary pattern. There are many benefits to following a plant-based diet. Not only does eating fruits and vegetables as part of a healthful plant-based dietary pattern foster a healthy weight, it also promotes a healthy oral cavity and periodontium as well.

The Mediterranean Diet

A healthy Mediterranean eating style has begun to take on a new meaning in the past few years, as an increasing number of patients have been following the Mediterranean Diet (MD) for weight control. For the sixth consecutive year in a row, this dietary pattern was #1 in the U.S. News and World Reports "Best Diets Overall" ranking.[64] Extensive nutrition research consistently confirms an undeniable association between the MD, weight control and a whole host of other health benefits, including preventing chronic disease.

The MD is a nutrient-rich eating style based on the traditional and cultural foods eaten in the countries surrounding the Mediterranean Sea. The diet emphasizes enjoying meals with others, physical activity and intuitive eating. Individuals consume core whole foods every day, including vegetables, fruits, legumes, beans, nuts, seeds, avocados, olives, herbs, spices and whole grains. Traditional Mediterranean whole grains include bulgur, barley, farro and brown, black or red rice. Fish is eaten at least twice per week and poultry, eggs, dairy and wine are consumed in moderation. SSB, red meat, highly processed meats, refined grains, ultra-processed snacks and fast foods are rarely consumed. This makes the MD a dietary pattern that is environmentally sustainable, high in fiber, vitamins, minerals and phytochemicals and low in animal protein, saturated fat and added sugars. The MD pyramid can be seen in Figure 2.[65]

Accruing evidence has linked the MD to reducing obesity and promoting weight control and maintenance. A systematic review of controlled clinical trials and prospective studies published in 2019 concluded that a high level of evidence exists to support that the MD lifestyle reduces obesity.[66] A 2-year dietary intervention study of 322 moderately obese Israeli individuals was published in the New England Journal of Medicine. The individuals who followed the MD lost weight and had a significant decrease in waist circumference and blood pressure. Beneficial metabolic effects were also seen, as the diabetic participants in the MD group had decreased fasting plasma glucose levels.[67] Additionally, the MD has been consistently associated with lower rates of cardiovascular disease, obesity, neurodegenerative disease, cancer, depression, respiratory disease, fragility fractures and total mortality in prospective observational studies and trials in diverse populations.[68,69]

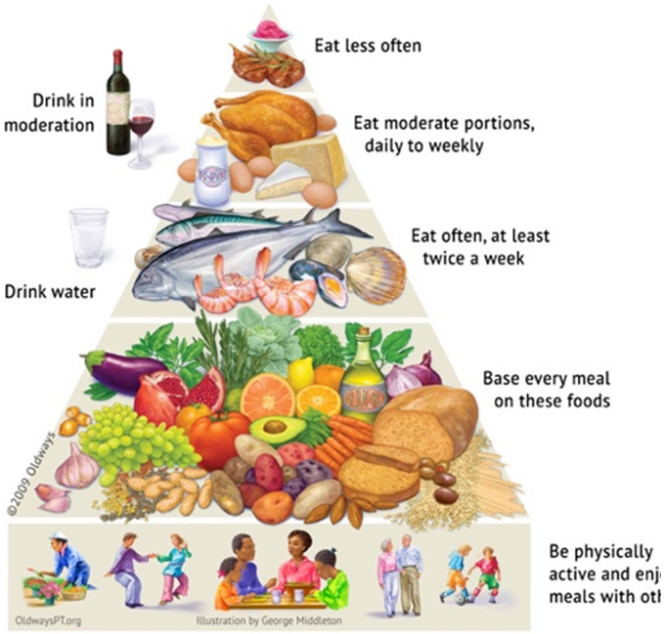

Figure 2: Healthy Mediterranean-Style Eating Pattern

It has been reported through systematic reviews and meta-analysis studies that obesity is positively associated with an increased risk of oral chronic inflammatory diseases including periodontitis.[70,71] While further research is needed to better establish how these factors work together, studies have indicated positive results regarding the MD diet, weight control and oral health. More specifically, an intervention study found a beneficial change in the salivary microbiome in obese and overweight adults after following the MD for 8 weeks. These adults had a significant decrease in the pathogenic bacteria associated with periodontal disease: Porphyromonas gingivalis, Prevotella intermedia, and Treponema denticola compared to the control group who did not change their eating habits.[72] A cross-sectional study of 6,209 participants of the Hamburg City Health Study identified a significant association between higher adherence to the MD and reduced risk for developing periodontal disease.[73] In addition, a recent RCT published in the Journal of Clinical Periodontology looked at the effect of the MD on gingivitis and reported dramatic findings. After just 6 weeks following the MD, there was a significant reduction in gingivitis, periodontal inflammatory parameters and whole-body anthropometric parameters.[74]

The bottom line: The Mediterranean-Style diet, a popular diet trend that emphasizes whole grains, fruits, vegetables, nuts, seeds, olives, avocados and legumes, fosters a healthy weight and a healthy oral cavity.

Call to Action: Role of Oral Healthcare Provider

As oral healthcare providers you are well positioned to encourage your patients to follow a healthful eating pattern. As an increasing number of dental patients have become more aware of their oral health and wellness, it is up to you to offer support and encouragement, as you provide patient-centered, personalized oral healthcare. Your professional advice regarding nutrition is vital to help your patients prevent oral disease progression and optimize the health of their dentition and periodontium. Since a balanced approach to weight loss and maintenance is of paramount importance to help your patients reach the goals of sustaining a healthy weight and oral cavity, it is important to include nutrition guidance as part of your dental treatment plan. Keep in mind that the same foods that cause caries contribute to weight gain so by including diet conversations on caries prevention, there could be an indirect benefit on weight. In addition, if a patient isn't

consuming a balance of the food groups, this could negatively impact healthy maintenance of periodontal tissues.

There are many patient-friendly, science-based nutrition information sources with credible guidance available that oral healthcare providers can recommend to patients. They include the Academy of Nutrition and Dietetics webpage on *fad diets*, and their webpage on *healthy teeth*, American Academy of Pediatric Dentistry webpages on *Parent Resources*, the American Dental Association's *MouthHealthy webpage* on nutrition, the U.S. Department of Agriculture webpage on limiting added sugars on *'MyPlate'*, consumer resources from the *Dietary Guidelines for Americans, 2020-2025*, and the *CDC webpages* on healthy weight, nutrition and physical activity. When working with a dental patient who has diabetes, the American Diabetes Association website has tips on *nutrition* and for a dental patient with cardiovascular disease, the American Heart Association has webpages on *healthy eating*. Lastly, patients requesting additional weight loss guidance can be referred to the registered dietitian, a food and nutrition professional trained to address nutrition strategies and physical activity in order to optimize and promote sustainable weight control and improved systemic and oral health outcomes.[75]

Summary

The research presented in this course underscores the growing evidence that a whole food dietary pattern is key in the preventing obesity. Furthermore, a towering body of research suggests that healthy, nutrient-dense dietary patterns have significant advantages on chronic disease prevention and maintaining optimal oral health. Based on these findings, it is important that dental patients enjoy a health-promoting dietary pattern high in nutrient-rich foods and low in ultra-processed foods with added sugars.

The most sustainable and effective health changes occur when we encourage our patients to select a whole food dietary pattern that they are comfortable following throughout their lifespan. In contrast, a poor-quality diet, low in fiber, low in whole foods, and high in ultra-processed foods and sugar, will lead to caries, periodontal disease, obesity and a variety of other chronic diseases. Healthy eating trends, such as the Healthy U.S.-Style, Healthy Vegetarian and the Healthy Mediterranean-Style diets all include a diversity of whole foods and are a sustainable approach to wellness. When it comes to diet trends, oral healthcare providers can help patients reach a better understanding of the significant impact nutrition and healthy lifestyle have on the oral cavity.

Course Test Preview

To receive Continuing Education credit for this course, you must complete the online test. Please go to: *www.dentalcare.com/en-us/ce-courses/ce663/start-test*

1. Which of the following statements applies to the low FODMAP diet?

A. It is recommended to patients for weight control.
B. Patients avoid all low FODMAP foods.
C. It is effective in reducing GI symptoms in up to 86% of IBS patients.
D. 86% of overweight patients have successful weight loss on the low FODMAP diet.

2. Many patients following a low FODMAP diet must either limit or completely avoid _____?

A. Saturated fat
B. Sugar alcohols
C. Casein
D. Sodium lauryl sulfate

3. Which of the following is an allergic reaction to wheat that involves swelling, hives and in severe cases, shock?

A. Irritable bowel syndrome
B. Wheat intolerance
C. Anaphylaxis
D. Nonceliac gluten sensitivity

4. Which statement about Celiac Disease is true?

A. Celiac Disease is rare.
B. Celiac Disease is easy to diagnose.
C. The first sign of Celiac Disease is often in the oral cavity.
D. Celiac Disease is an Ig-E mediated food allergy.

5. True or False: The most common oral symptoms of Celiac Disease include recurrent aphthous ulcers, reduction of salivary flow, geographic tongue and dental enamel defects.

A. True
B. False

6. Which describes the only current treatment for Celiac Disease?

A. A strict low FODMAP diet.
B. A strict lactose-free diet.
C. A strict gluten-free diet.
D. A strict vegan diet.

7. All of the following statements about dairy are true EXCEPT one, which is the exception?

A. Dairy is a good source of calcium, protein, magnesium, potassium, zinc, and phosphorous.
B. Low-fat dairy is beneficial for weight loss.
C. Patients with lactose-intolerance can include dairy in their diet.
D. Including dairy in the diet contributes to weight gain.

8. All of the following diets are recommended by the DGA to maintain a healthy weight and promote overall health EXCEPT one, which is the exception?

A. Healthy U.S.-Style Diet
B. Healthy Vegetarian
C. Healthy Mediterranean-Style
D. Healthy Low-Carbohydrate

9. All of the following statements related to plant-based eating are true EXCEPT one, which is the exception?

A. Recent data indicates that Americans are consuming adequate amounts of fruits, vegetables and whole grains.
B. A large meta-analysis indicated that vegetarians and vegans had significant weight reduction compared to non-vegetarians.
C. A recent cross-sectional study discovered that eating more whole fruits, greens and beans were associated with lower caries risk.
D. A large-scale systematic review pinpointed that eating at least 5 servings of fruits and vegetables a day may help to prevent the progression of periodontal disease and tooth loss.

10. All of the following statements related to the Mediterranean Diet are true EXCEPT one, which is the exception?

A. A recent RCT published in the Journal of Clinical Periodontology found a significant reduction in gingivitis after 6 weeks on the MD.
B. The MD is a nutrient-rich eating style.
C. The MD is a popular diet trend that benefits weight control and oral health.
D. An intervention study found no beneficial changes in the salivary microbiome in obese and overweight adults after following the MD for 8 weeks.

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Additional Resources

- No Additional Resources Available

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