

© Liz Pearson, RD
Website: www.lizpearson.com,
Email: liz@lizpearson.com

Eating for Optimal Dental Health

- New definition of oral health (World Dental Federation, Oct. 2016): Oral health is a multi-faceted and includes the ability to speak, smile, smell, taste, touch, chew, swallow and convey a range of emotions through facial expression with confidence and without pain, discomfort, and disease of the craniofacial complex.

Fluoride

- Caries Prevention White Paper (World Dental Federation, Sept. 2016): “Fluoride has altered the dose-response relationship between sugar consumption and caries experience by delaying when cavitation occurs and thus a higher cariogenic diet can be tolerated before caries occurs in many individuals.”
- Fluoride helps harden the enamel coating that protects teeth from the acid produced by bacteria and also reduces the ability of bacteria to stick to teeth, so it’s easier to wash away the bacteria by saliva, brushing and other activity. The only scientifically proven risk of fluoride use, at this time, is the development of fluorosis.
- Based on a “Cochrane Database Systematic Review” of 155 studies, water fluoridation is effective at reducing levels of tooth decay among children. The introduction of water fluoridation resulted in children having 35% fewer decayed, missing and filled baby teeth and 26% fewer decayed, missing and filled permanent teeth.
- Does cessation of community water fluoridation lead to an increase in tooth decay? (review of 15 instances, 13 countries). Overall, the published research points to an increase in dental caries post-community water fluoridation cessation. (J Epidemiol Community Health, May 2016)
- Calgary stopped adding fluoride to water (2011). Calgary children have more than twice as many cavities as their counterparts in Edmonton (Community Dentistry & Oral Epidemiology, Feb. 2016).
- A five-year moratorium on fluoride use in water ends on Dec. 31, 2016 in Moncton, New Brunswick, and dentists and hygienists there are urging the city to start adding fluoride to the water again due to increase in caries.

Food & Dental Caries

- Dietary advice is rarely provided by dental practitioners (dentists or hygienists) and when provided, it is often limited. Barriers: financial considerations, time constraints, dietary education of dental practitioners (Community Dental Health, March 2014).
- “Dental practitioners agree that dietary counselling is essential for caries prevention; however, they provide advice infrequently due to a lack of confidence and competence.” (Aust Dent J., May 2017)
- Frequency of Intake: The amount of sugar is not as important as the frequency of consumption. It takes 30 minutes to an hour to restore the neutral pH of the mouth and restore minerals to tooth enamel lost in an acid attack (remineralisation). Space frequency of food and beverage intake at least 2 hours apart.

- Sugar: Cariogenicity is dose-dependent (one daily exposure is mild, three is moderate, five or more is severe). As little as one daily exposure to sucrose may initiate carious lesion formation (20% more demineralization). (Eur J Dent., July-Sept., 2016)
- Around the clock eating is harming health. Most people eat for 15 hours or longer each day. Food intake is erratic and continuous (25% of meals/snacks are within 1 hr 25 min. of next meal). The only time people really stopped eating, for any length of time, is when they are sleeping. (Cell Metabolism, Sept. 2015)
- Those who consumed free sugars within the hour before bed more than doubled their caries risk. (Community Dental Health, March 2017)
- Sequence and Combination of Foods Eaten: Sugary foods and drinks consumed at meal times causes less decay than when consumed as snacks as the exposure or frequency of acid attacks are reduced. The last food item consumed exerts the greatest influence on subsequent plaque pH. Eating a small piece of cheese or drinking milk at the end of the meal may be beneficial.
- Form & Physical Consistency of the Food: Sugary and/or acidic foods that are liquid, solid, or slow to dissolve or are retained in the mouth are more damaging than those that can be dissolved and washed away quickly.
- Some starches, while not 'sticky in the hand', can be highly retentive in the mouth (such as potato chips, crackers, and pretzels). Metabolism of starch particles can yield a prolonged acidic challenge, especially at retentive, caries-prone sites.
- Biofilms exposed to starch and sucrose were more acidogenic and caused higher demineralization on either enamel or dentine than those exposed to each carbohydrate alone. (Brazilian Oral Research, May 2016)
- High consumption of fermentable carbohydrates is associated with a reduction in bacterial diversity in the oral cavity. (PLOS One, July 2017)

Sugar & Dental Health

- Sucrose has been identified as the most cariogenic carbohydrate. In addition to being fermentable, it can be converted by certain plaque microorganisms to glucans and fructans, which help plaque adhere to tooth surface.
- Even low concentrations of sucrose significantly increase carcinogenicity of bacteria. (Appl Environ Microbiol., July 2016).
- The preference for sweet taste: is innate, has a strong genetic component, and decreases with age. It may be modified or reinforced by: pre- and postnatal exposures, feeding behaviour (reward system), food choices (senses and emotions), taste (genetic and programming effects).
- Is sugar addictive? Excessive sugar consumption increases dopamine levels in the brain, with higher levels of sugar needed to achieve the same reward levels and avoid mild states of depression (PLOS One, March 2016).
- Teens consumed milkshakes in which the concentrations of fat and sugar were increased or decreased (brains were scanned). Increasing the sugar content compared with the fat content caused significantly greater activity in brain regions associated with food reward. (Am J Clin Nutr., Dec. 2013)
- Dietary free sugars are the primary dietary factor responsible for caries. Each additional 5 grams of sugars intake has been associated with an increase in the probability of developing caries.

- Sugar & Periodontal Disease - “A high frequency of consumption of added sugars is associated with periodontal disease, independent of traditional risk factors, suggesting that this consumption pattern may contribute to the systemic inflammation observed in periodontal disease.” (Am J Clin Nutrition, Oct 2014)
- One Sweet App: A mobile app that will help Canadians track their sugar intake.
- Georgia Third Grade Oral Health Study - Caries increased 22% for each serving of sugar-sweetened beverage consumed. (J Public Health Dent., Sept. 2015)
- Finnish Adults' Oral Health Study - There is a dose-response relationship between frequency of sugar-sweetened beverage consumption and caries increment (decayed, missing and filled teeth), which did not vary according to use of fluoride toothpaste. Sugar-sweetened beverage consumption as a risk factor for dental caries is not a problem limited to children. (J Dentistry, Aug. 2014)
- Which is a stronger indicator of dental caries: oral hygiene, food, or beverage? Dietary factors and oral hygiene both contribute equally to dental caries. Sugar-sweetened beverage consumption was a much stronger indicator of dental caries than snack food consumption. (General Dentistry, May-June 2014)
- Soft drinks are an independent risk factor for periodontal disease and poor periodontal health. (Medicine, July 2016).
- Even drinking less than one sugar-sweetened beverage daily significantly increases the chance of permanent tooth loss. (J Public Health Dentistry, March 2017)
- American Heart Association (Sept. 2009) recommends a daily added sugar limit of 6 teaspoons daily for women and 9 for men.
- In March 2015, the World Health Organization released guideline recommendations on the intake of free sugars to reduce the risk of disease in adults and children, with a focus on the prevention of dental caries. Adults and children should reduce their daily intake of free sugars to less than 10% of their total energy intake. A further reduction to below 5% or roughly 25 grams (6 teaspoons) per day would provide additional health benefits. Free sugars include sugar that is added to foods, plus the sugars naturally present in honey, syrups, and fruit juices. Because there is no reported evidence of adverse effects of consumption of intrinsic sugars and sugars naturally present in milk, the recommendations of this guideline focus on the effect of free sugars intake.
- Almost 70% of packaged foods and drinks in Canada have added sugar. (CMAJ Open, Jan. 2017)
- Over 50 names for sugar can appear on food labels. Divide grams of “sugars” on food labels by 4 to determine how many teaspoons of sugar the product contains.
- American Academy of Pediatrics, Policy Statement, Fruit Juice Limits (June 2017): Before age 1 - No juice; Age 1-3 - ½ cup (125mL); Ages 4-6 - ½ to ¾ cup (125mL to 175mL); Ages 7-18 - 1 cup (250 mL) daily.
- Alternatives sweeteners (aspartame, acesulfame, erythritol, stevia, and xylitol) promote the formation of oral biofilm with lighter mass and lower bacterial adherence (thin, porous and healthier plaque). (Arch Oral Biol., Aug. 2017)
- Artificial Sweeteners & The Microbiome: Artificial sweeteners may result in indirect yet profound microbial-induced consequences, including significant metabolic effects, including weight gain, diabetes, and metabolic syndrome. (Gut Microbes, Feb. 2015)

- Stevia: Natural Herbal Sweetener - anti-hyperglycaemic, anti-hypertensive, anti-inflammatory, anti-cancer, antioxidant, anti-cariogenic, anti-bacterial role on oral bacteria flora. (Molecules, Dec. 2015)
- Erythritol more effective than sorbitol and xylitol for maintaining and improving oral health (dental plaque, cariogenic bacteria, caries, periodontal disease). Most effective: Candies containing 90% erythritol, daily consumption of 7.5 g erythritol, divided over three consumptions of 2.5 g erythritol. Candies with a hard texture - exposure time of about 4 minutes or more per eating occasion. (Int J Dent., Aug. 2016)
- The majority of xylitol chewing gums sold on the market don't provide consumers with the recommended daily dose of xylitol for caries prevention. (Oral Health Preventive Dentistry, May 2016)

Food & Dental Erosion

- "Over the last few decades, there was a drastic decline in the prevalence of dental caries world-wide which has been accompanied by a remarkable increase in the incidence of non-cariious lesions such as dental erosion." (Ann Med Health Sci Res., Sept. 2014)
- Overall prevalence of tooth erosion in permanent teeth of children and teens is 30%. (Review of 22 studies, Journal of Dentistry, January 2015)
- For certain individuals, only minimal acidic challenges may be sufficient to cause damage to the teeth, while others may never develop dental erosions despite extensive exposure to acid. (Caries Research, March 2016)
- Dental erosion due to acidic drinks is directly proportional to exposure time. Damage to tooth enamel is permanent, and without that protective outer layer, teeth are more prone to cavities and are much more likely to decay.
- "Our research has shown that permanent damage to the tooth enamel will occur within the first 30 seconds of high acidity coming into contact with the teeth. This is an important finding and it suggests that such drinks are best avoided." Dr. Ranjitkar, Dental Researcher (University of Adelaide, Aug. 2014)
- Less damage if erosive acidic drink is swallowed in big gulps in a shorter period than if it is sipped over an extended period; Retention of an acidic drink in the mouth before swallowing increases the damage, especially if it is 'swished' around the teeth. Drinking through a straw can reduce the risk of erosion, but if acidic drinks are habitually consumed through a straw or 'pull-out' drinking cap positioned in front of the teeth, the incisors can be eroded rapidly.
- Erosive potential of 379 Beverages (juices, sodas, flavored waters, teas, and energy drinks) were evaluated in the United States. Results: 54% were erosive; 39% were extremely erosive; Only 7% were minimally erosive. (J Am Dent Assoc., Dec. 2015)
- Diet and Tooth Erosion in Children and Teens (meta-analysis, 13 studies, over 16,000 participants). Carbonated drinks, acidic candy and snacks, and natural acidic fruit juice increased erosion occurrence. Milk and yogurt had a protective effect. (J Dentistry, Aug. 2015)
- The erosive potential of an acidic drink is not exclusively dependent on its pH value, but is also strongly influenced by its mineral content (calcium, phosphorus). The addition of calcium is more effective than phosphate at reducing erosion in acid solutions. Erosion proceeds more rapidly the higher the temperature of a solution. (Monographs in Oral Science, June 2014)

- Fruit smoothies (homemade or store-bought) have the potential to bring about dental erosion. (British Dental Journal, Feb. 2013)
- Sugar-free Doesn't Mean Safe For Teeth. Researchers tested 23 sugar-free and sugar-containing products, including soft drinks and sports drinks. Most soft drinks and sports drinks caused dental enamel to soften by between 30% and 50%. (Melbourne University, Nov. 2015)
- Beverages with pH levels below 5.5 are comparatively acidic (soft drinks, sports drinks, energy drinks, fruit juices, cordials and wine). Ingredients found in beverages, such as phosphoric acid, sodium citrate, citric acid and tartrates are chelators – they can bind or trap calcium and remove it from teeth. Sugar-free candy typically contains acids to produce a sour or fruity taste. (Melbourne University, November 2015)
- Non-sugared drinks (diet and zero-calorie), as a whole, were more erosive than sugared beverages (General Dentistry, July-Aug. 2015)
- Researchers Compared Acidity of 13 Sports Drinks and 9 energy drinks. After only five days damage was already evident. Energy drinks caused twice as much damage to teeth as sports drinks - percent weight loss of enamel exposed to energy drinks for five days was 3.1% compared to 1.5% for sports drinks. (General Dentistry, May/June 2012)
- Sports drinks: Consumption is high among children and teens and often not associated with sports activity. Taste is the prime reason for consumption. The popularity of these palatable high sugar and acidic drinks has implications for children's oral health. (British Dental Journal, June 2016)
- “It takes a lot more to neutralize the pH of saliva after exposure to energy drinks. As a result, it’s not just caries we see, but loss of tooth structure.” Poonam Jain, B.D.S., M.S., Southern Illinois University School of Dental Medicine
- Dental erosion can be hard to diagnose properly. Consider having all patients fill out a form that includes questions about their diet. Tactful questioning, especially when new lesions appear, can help identify problems at an early stage. Lesions associated with sugar-sweetened drinks resemble those in dental caries (more brown in colour), while those attributed to diet drinks look like those associated with mechanical wear and tear (whitish enamel and dark yellow dentin).

Tea, Coffee & Dental Health

- Green and black tea compared to soft drinks and orange juice over 20 weeks: The erosive effect of tea was similar to that of water, which has no erosion potential. Given the systemic and dental benefits of tea and the low potential for erosion, green and black tea should be highly encouraged for daily beverage consumption. (General Dentistry, July/Aug. 2008)
- Green Tea. Study: Assess the effect of rinsing with green tea in comparison with chlorhexidine and plain water on Streptococcus mutans count. Results: Green tea mouth rinse proved to be equally effective compared to chlorhexidine. (J Clin Diagn Res., Nov. 2014)
- Thirty children (age 7 to 12) used green tea mouth wash for 2 weeks. Result: Highly significant reduction in S. mutans count in plaque as well as saliva. (J Indian Soc Pedod Prev Dent., Jan-March, 2017)
- Black tea rinse inhibits alpha-amylase (enzyme that breaks down starches). (J Clin Diagn Res., March 2016)

- Tea & Xerostomia. Study (60 patients): The catechin-containing natural formula increased unstimulated saliva by 4-fold and stimulated saliva by 2-fold. (Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology Journal, Oct. 2014)
- Teeth exposed to hot coffee showed visible signs of demineralization. Teeth exposed to hot black tea showed visible signs of remineralization - scratches initially present appeared to fade away (high fluoride content may play a role). Decrease in surface hardness of teeth exposed to hot coffee was double that of teeth exposed to hot black tea. (JPMA, July 2016)
- Coffee was found to lower the salivary pH but well above the level of critical pH (may be due to the low acidogenicity of milk). (Scientifica, March 2016)
- Coffee drinking was linked to a small, but significant reduction in the number of teeth with periodontal bone loss. No evidence was found that coffee consumption was harmful to periodontal health. (J Periodontol., Aug. 2014)

Alcohol & Dental Health

- Alcohol & Periodontitis. Researchers assessed 542 regular alcohol users, occasional drinkers, and non-drinkers both with and without periodontitis. The severity of a regular alcohol user's existing periodontitis correlated incrementally with the frequency of his or her alcohol consumption. Drinkers without periodontitis were more likely to have gums that bled with gentle manipulation. Drinkers who did not have periodontitis presented clinical attachment levels of four millimeters or greater and exhibited a higher presence of plaque. Alcohol's drying effect on the mouth (it slows the production of saliva) may contribute to the formation of plaque that can trigger an inflammatory response in the gums. (J Periodontol., Sept. 2015)

Foods That Promote Good Dental Health

- Fructose contained in fresh whole fruit does not break down in the mouth so is generally less cariogenic.
- High fibre intake promotes better dental health, including increased salivary flow. (J Am Dent Assoc., Jan. 2014)
- Nuts are a healthy, non-cariogenic snack and a much better choice than granola bars or trail mix (made with dried fruit).
- Popcorn is a healthy, non-cariogenic snack and a much better choice than potato chips, pretzels or cheesies.
- Milk sugars such as lactose and galactose are regarded as less cariogenic as they are accompanied by other essential nutrients (calcium) which can counter potential damage to teeth. Among dairy products, cheese has the highest anticariogenic property. Milk and plain yogurt can be considered noncariogenic. (Academy of General Dentistry, June 2013)
- Chocolate milk is more cariogenic than plain milk, but less so than sugar-sweetened soft drinks. Cocoa may be protective.
- Danish Health Examination Survey (over 3,200 adult participants). Intakes of calcium and dairy foods were inversely associated with severe periodontitis. (Public Health Nutrition, May 2015)

- Cow's Milk Versus Soy Milk. Oral bacteria responsible for the development of tooth decay and gum disease produces five to six times more acid when feeding on soy milk when compared to cow's milk. (Journal of Dentistry, Sept. 2012)
- Vitamin D. Research review: 24 studies involving 3,000 children from United States, Great Britain, Canada, Austria, New Zealand and Sweden. Vitamin D linked to a 47% lower risk of tooth decay. (University of Washington, Nov. 2012)
- Anti-inflammatory diet is linked to significantly fewer missing teeth. (Clinical Nutrition, June 2017)
- Harvard Health Professionals Follow-Up Study (over 42,000 males, age 40 to 75, 20 year study). There was a significant inverse association between vitamin D and both tooth loss and periodontitis. (Public Health Nutrition, April 2014)
- Fish Oil & Periodontal Disease (55 adults with moderate periodontitis, 3 month study). In this randomized controlled trial, DHA supplementation (2000 mg daily) significantly improved periodontal outcomes in people with periodontitis (decreased mean pocket depth and gingival index). (Journal of Dentistry Research, June 2014)
- Omega-3 fats inhibit two enzymes that participate in the destruction of dentin following demineralization by bacteria acids. (Protein J., Aug. 2017)
- Anti-adherent and antibacterial effects of certain plant extracts have been proven to be beneficial in preventive dentistry, especially those rich in polyphenols. (Caries Research, July 2015)
- Essential Oils & Dental Health (review of 52 studies, lavender, cinnamon, clove, eucalyptus, peppermint, lemon, tea tree): Essential oils demonstrate anti-bacterial and anti-fungal properties. Combining essential oils and antibiotics can reduce antibiotic resistance in multidrug-resistant bacteria (J Int Soc Prev Community Dent., Sept.-Oct. 2015).
- Benefits of herbal products over drugs: wide biological activity (antimicrobial, antioxidant, anti-inflammatory), higher safety margin, lower cost, don't cause side effects or antibiotic resistance. (J Intercult Ethnopharmacol., Jan-Feb 2016)
- Antimicrobial Activity of Various Plants - Clove oil was the most effective of all products against microorganisms causing caries (inhibition zone of 30mm). (J Clin Diagn Res., Dec. 2016)
- American Dietetic Association - "Based on the lack of currently available evidence, oil pulling is not recommended as a supplementary oral hygiene practice, and certainly not as a replacement for standard, time-tested oral health behaviors and modalities." (May 2014)
- Coconut Oil & Gingivitis. Oil pulling using coconut oil resulted in a 50% decrease in plaque formation and gingival index scores (the decrease is comparable to what you would see with chlorhexidine). (Niger Med J., March-April 2015)
- Chewing gum stimulates salivation: clears fermentable carbohydrates, dislodges loosely bound oral bacteria from oral surfaces, and increases the concentrations of calcium and phosphates in the oral cavity required for remineralization.
- Chewing of gum can trap and remove bacteria from the oral cavity. (PLOS One, Jan. 2015)

- Probiotics. "With antibiotics or a mouthwash, you are wiping everything out, even the bacteria that are not doing you any harm. By using probiotics, the goal is to eradicate and then replace just that one type of bacteria. This is a new frontier. We have spent the last century trying to destroy bacteria. Probiotics may help us leap forward biomedically and find new ways to treat diseases." (General Dentistry, Jan 2014).
- Probiotics Review & Meta-analysis (50 studies - RCTs): Current evidence is insufficient for recommending probiotics for managing dental caries, but supportive towards managing gingivitis or periodontitis. (Journal of Dentistry, May 2016)
- Probiotics & Periodontal Disease (Review of 12 studies – RCTs): Oral probiotics improved probing pocket depth, bleeding on probing, and attachment loss, and decreased major periodontal pathogens. Continuous administration, mainly with Lactobacillus species, was necessary to maintain these benefits. (Expert Rev Anti Infect Ther., May 2016)
- Probiotics & Prevention of Dental Caries (review of 23 studies). Research-to-date is limited, but promising. A continuous, regular, almost daily intake is probably required. Inserting probiotics into other daily preventive products, like toothpaste, may work best. (Nutrients, July 2013)
- Probiotics & Candida Albicans. A probiotic rinse was equally effective as 0.2% chlorhexidine digluconate rinse in reducing salivary Candida albicans counts after 1 week of intervention. (Int J Clin Pediatr Dent., Jan-March 2016)
- Five brands of probiotic lozenges marketed for oral health were tested. Only one brand contained the manufacturer's stated starting amount of bacteria (nearly a billion). Conclusion: most probiotic brands fail to meet recommended dosage targets. (Probiotics Antimicrob Proteins, Sept. 2013)
- Clinical Guide to Probiotic Products Available in Canada - Indications, Dosage Forms & Clinical Evidence-to-Date (www.probioticchart.ca)

Dental Needs Throughout The Lifecycle

- Pregnant women need adequate calcium (1000 mg/day) and Vitamin D (600 IU) for optimal development of their babies' teeth and bones. Hormonal changes result in gums being more susceptible to inflammation. Gingivitis is the most common oral disease in pregnancy affecting 60 to 75% of women.
- Parents primarily influence the habitual behaviours of adolescents. With age, availability of sugar and peers have an increasing influence on behaviour. Teens have persistent misunderstanding of caries causality and prevention, and this lack of understanding has a detrimental impact on their behaviour. (BMC Oral Health, Nov. 2015)
- Dental Health & Eating Disorders - Dentists lack knowledge of the scope and severity of eating disorders, as well as comfort in discussing their concerns or suspicions.
- Eating disorders may cause dental caries, dental erosion, soft palate damage, impaired salivary function, salivary gland enlargement, and temporomandibular disorders. (BMC Oral Health, Oct. 2015)
- High carb diet, acidic sports drinks and eating disorders take toll on athletes' teeth (review of 39 studies on elite or professional sports men and women). Poor dental health is widespread. (British Journal of Sports Medicine, Oct. 2014)

- “The rise of sports drinks as just another soft drink option among children is a real cause for concern, and both parents and government must take note. They are laden with acids and sugars, and could be behind the decay problems we’re now seeing among top footballers. Sports drinks are rarely a healthy choice, and marketing them to the general population, and young people in particular, is grossly irresponsible. Elite athletes might have reason to use them, but for almost everyone else they represent a real risk to both their oral and their general health.” Dr. Russ Ladwa, (British Dental Association British Dental Journal, June 2016)
- Declines in oral health with age, including tooth loss, is linked to an increased risk of depression and a decrease in quality of life and life satisfaction. (J Gerontol B Psychol Sci Soc Sci., March 2016)
- Dental Health of Seniors: Many more adults keep their teeth, but have root surface exposure due to gum recession. Oral hygiene difficult for oldest and most frail. Dementia may also impact dental health. Goal: Identify older adults before they begin to manifest oral health deterioration. Regular dental visits should be strongly promoted
- Oral Health & Nutritional Status In Elderly (review of 26 studies) Well-nourished subjects had a significantly higher number of Functional Teeth Units (pairs of opposing teeth). Mean number of teeth was significantly associated with poor nutritional status. Use of prosthesis not associated with poor nutritional status. (Clinical Nutrition, March 2017)
- Eating With Dentures: Begin with small quantities of food cut into smaller pieces and balance food evenly in your mouth. Have cooked vegetables and soft or canned fruits, instead of raw (smoothies are another option). For protein enjoy eggs, fish, Greek yogurt, chicken, beans and bean dips (like hummus), tofu, ground beef and slow cooked meats. Whole grain breads, cereals and pasta may stick to teeth - eat them with liquids so they are easier to chew and swallow.
- Dry Mouth (many drugs reduce saliva flow - decongestants, antihistamines, painkillers, antidepressants, sedatives and diuretics). Treatment includes: Drink plenty of water with and after meals and medications, and throughout the day to assist in clearing food debris from the teeth and keep mouth clean. Dry foods and highly acidic and/or sugary foods or drinks should be limited or avoided. Sugar-free gum between meals can promote saliva flow. Encourage foods that stimulate chewing where possible (nuts, raw vegetables and fruit). Consider a medication which may increase saliva production.
- Dry Mouth: The importance of adequate hydration cannot be overstated. Oral lubricants, antimicrobial saliva substitutes, and salivary stimulation may help. One of the simplest and cheapest substances that may be used as an oral lubricant is olive oil. (Sports Medicine, July 2016)

Dental Health & Other Disease States

- Heart Disease & Dental Health (15,000 heart disease patients, 39 countries): Every increased level of tooth loss was associated with a 6% increased risk of major cardiovascular events, and a roughly 15% higher risk of cardiovascular death, death from any cause and stroke. Toothlessness was also associated with an 85% higher risk of cardiovascular death, 81% higher risk of death from any cause, and a 67% higher risk of stroke. (European Journal of Preventive Cardiology, Dec. 2015)

- Oral bacteria is linked to higher stroke risk - Researchers found that the number of small brain hemorrhages was significantly higher in people with a specific bacteria (cnm-positive *S. mutans*) in their saliva. (Scientific Reports, Feb. 2016)
- Adults with gum disease may be twice as likely to suffer a stroke. There is a "dose-response" relationship - the higher the level of gum disease, the worse the risk. (American Stroke Association, Feb. 2017)
- Periodontal Disease & Body Weight (review of 13 studies). The following are linked to an increased risk or worsening of periodontal disease: Overweight, Obesity, weight gain, and increased waist circumference. (J Periodontol., June 2015)
- Obesity quadruples risk of severe periodontitis. Inflammation (C-reactive protein) appears to be the culprit. (Oral Diseases, May 2017)
- Diabetes. Many studies suggest that individuals with diabetes have at least a 2-fold increase in the severity of periodontal disease. Diabetes and persisting hyperglycemia lead to an exaggerated immune-inflammatory response to periodontal pathogens, resulting in more rapid and severe periodontal tissue destruction. (Medical Science Monitor, Oct. 2014)
- Periodontal treatment is effective in diabetic patients, but more long-term recurrence can be expected when diabetes is not well controlled Severe periodontitis is more frequently found in diabetic subjects with high HbA1c levels and systemic diabetic complications. (World Journal Diabetes, July 2015)
- The salivary microbiome is altered in the presence of a high salivary glucose conc. (hyperglycemia) in a way that favours caries associated bacterial species and therefore, increases the risk of caries, gum disease and dental erosion. (PLOS One, March 2017)
- An oral bacteria (*Aggregatibacter actinomycetemcomitans*) associated with periodontal disease may trigger the production of disease-specific auto-antibodies and arthritis in susceptible individuals. (Science Translational Medicine, Dec. 2016)
- Rheumatoid Arthritis & Periodontal Disease (research review, 26 studies) Patients with arthritis are more likely to suffer from gum disease. *P. gingivalis* may play a role. Medications taken by arthritis patients, such as corticosteroids, may increase the risk of gum disease. (Mediators of Inflammation, 2015)
- Women with gum disease were significantly more likely to develop cancers of the breast, skin, lung, and gallbladder. The greatest risk was for esophageal cancer (more than three times greater risk). (Cancer Epidemiol Biomarkers Prev., Aug. 2017)

© Liz Pearson, RD

Website: www.lizpearson.com

Email: liz@lizpearson.com