“Nutrition for the Dental Team”

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You and Food

• What is your first “food” memory?
• What is your favorite food?
• How mindful are you when you eat?
• Who makes the food choices at home?
• Do you shop the perimeter of the store?
• Do you consciously choose “healthy” food?

Rapid Increases in Adult Obesity in the U.S.

Diet and Obesity in US
Nutrition in the 21st Century

Do Not Focus on Weight

• Focus on:
  • Healthy food
  • Healthy movement
  • Healthy rest
  • Healthy relationships

CARBOHYDRATES

• Provide majority of calories in most diets
• The body’s preferred fuel source
• Largest contributor to glucose control
• Half of carbohydrates in North American diet come from: bread, soft drinks, cakes, cookies, donuts, quick breads, sugars, syrups, jams, white potatoes (including chips) and breakfast cereals
Soda

- One 12 ounce soda per day contains 10 grams of sugar
- That equals 31 pounds of sugar per year

Glycemic Index and Load

- Glycemic Index: ranks carbohydrates based upon the impact of 50 grams of carbohydrate food on blood glucose response.
- Glycemic load: helps predict blood glucose response to more typical serving size of a specific carbohydrate food.
Influences on Glycemic Load of Foods

- Amount of processing (increases surface area)
- Fiber content (decreases GL)
- Fat content and protein slow stomach emptying and lower the glycemic load
- Many “fat-free” foods are high GL and contribute to obesity

Food and Mood

- 82 healthy weight and healthy overweight/obese, adults enrolled in randomized, crossover controlled feeding study.
- Consumption of high GL diet resulted in 38% higher score for depressive symptoms (P = 0.002), 55% higher score for TMD (P = 0.05), and 26% higher score for fatigue/inertia (P = 0.04), compared to low GL diet.


Glycemic Index & Glycemic Load Rating Chart

<table>
<thead>
<tr>
<th>Glycemic Index (GI)</th>
<th>Glycemic Load (GL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (&lt;55)</td>
<td>Low (&lt;10)</td>
</tr>
<tr>
<td>56-69</td>
<td>11-19</td>
</tr>
<tr>
<td>High (&gt;=70)</td>
<td>High (&gt;=20)</td>
</tr>
</tbody>
</table>

Glycemic Load

<table>
<thead>
<tr>
<th>Individual Food Portion</th>
<th>Whole Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>0-10</td>
</tr>
<tr>
<td>Moderate</td>
<td>11-19</td>
</tr>
<tr>
<td>High</td>
<td>20+</td>
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<tr>
<td>Low</td>
<td>&lt; 80</td>
</tr>
<tr>
<td>Moderate</td>
<td>80-120</td>
</tr>
<tr>
<td>High</td>
<td>&gt;120</td>
</tr>
</tbody>
</table>
Food | Serving Size | Glycemic Load
--- | --- | ---
Grapefruit | ½ large | 3
Apple | 1 medium | 6
Banana | 1 large | 14
Raisins | 1 small box | 20
Watermelon | 1 cup | 8
Carrots | 1 large | 5
Orange | 1 medium | 6
Sweet potato | 1 cup | 17
Baked potato | 1 medium | 28
French fries | 1 medium serving | 26
Snickers | 1 bar | 35
Reese’s cup | 1 miniature | 2
White table wine | 5 ounces | 1
Red table wine | 5 ounces | 1
Grape juice | 6 ounces | 12

Food | Serving Size | Glycemic Load
--- | --- | ---
Asparagus | ½ cup | 2
Broccoli | 1 cup | 4
Green beans | 1 cup | 3
Tomato | 1 medium | 2
Subway sandwich | 6 inch | 17
Turkey breast | 5.5 ounces (small) | 22
Vanilla ice cream cone | 4.5 ounces (small) | 19
Potato chips, fat free | 1 bag (8 ounces) | 49
Tortilla chips, white corn | 3.5 ounces | 38
Egg-yolks waffles | 1 serving | 13
Maple syrup | 4 Tbsp | 29
Egg, hard boiled | 1 | 2
White wine | 5 ounces | 1
Red wine | 5 ounces | 1
Grape juice | 6 ounces | 12

Pictures of Low/High GI Meals & Snacks

GI = 60   GL = 48
GI = 42   GL = 31
Celiac Sprue

- Gluten is the name for the storage proteins found in wheat, barley, rye and related cereal grains – triticale, spelt and kamut.
- In patients with celiac disease, a strict gluten-free diet is the only treatment and requires lifelong elimination of all gluten containing foods.
- Prevalence ~ 1% of population

Symptoms of Celiac (many people go undiagnosed)

- Recurring bloating, gas, or abdominal pain
- Chronic diarrhea or constipation or both
- Unexplained weight loss or weight gain
- Pale, foal-smelling stool
- Unexplained anemia
- Bone or joint pain
- Behavior changes/depression/irritability
- Vitamin K Deficiency
- Fatigue, weakness or lack of energy
- Delayed growth or onset of puberty
- Failure to thrive (in infants)
- Missed menstrual periods
- Infertility male & female
- Spontaneous miscarriages
- Canker sores inside the mouth
- Tooth discoloration or loss of enamel

Resources

- The New Glucose Revolution by Jennie Brand-Miller, PhD
- The Glycemic Load Diet by Rob Thompson MD
- The Glycemic Load Diet Cookbook by R. Thompson
- The Easy GL Diet Handbook by Fedon Lindberg MD
- The 150 Healthiest 15-Minutes Recipes on Earth by Jonny Bowden, PhD
Fermentable Oligo-, Di- and Mono-saccharides And Polyols

- FODMAP: highly fermentable but poorly absorbed short-chain carbohydrates and polyols.
- Can increase small intestinal water volume, colonic gas production, and intestinal motility.
- Studies suggest elimination of wheat derivatives, lactose-containing dairy products, many vegetables and pulses, and several types of fruits (low FODMAP) can improve IBS.

Sugar Substitutes/
Non-Caloric Sweeteners

- Aspartame (Equal & Nutrasweet)
- Sucralose (Splenda)
- Saccharin (Sweet ‘N Low, Sweet Twin)
- Acesulfame K (Sunett, Sweet One)
- Stevia (Truvia, Pure Via, Sun Crystals)
  - From *Stevia rebaudiana* leaves
  - Monk Fruit (Nectresse)

Sugar Alcohols

- Erythritol
- Hydrogenated starch hydrolysate
- Isomalt
- Lactitol
- Malitol
- Mannitol
- Sorbitol

Natural Sweeteners

- Agave nectar
- Date sugar
- Fruit juice concentrates
- Honey
- Maple syrup
- Molasses
Eating an organic diet for one week significantly reduced pesticide exposure in adults. Mean total organophosphate metabolites were 89% lower than when participants were eating conventional foods. Similar results have been shown in children.


FAT

• Most concentrated source of energy, more than twice that of carbohydrates or proteins.
• Act as messengers in reactions that help control growth, immune function, reproduction and basic metabolism.
• Help absorb fat soluble vitamins (A, D, E, K).
• Certain fats, like linoleic acid and alpha linolenic acid, are “essential” because our bodies cannot produce them.
• Make foods flavorful and help us feel full.
Saturated Fat Debate

- Three large meta analyses (21 studies, 12 studies, and 76 studies) have all failed to show any significant evidence that saturated fat increases the risk for heart disease.
- It also has failed to find any significant evidence that increasing polyunsaturated fats and decreasing saturated fats lowers your heart risk.
- Choose a healthy variety of fats in the diet………

Eggs

- Provide essential fatty acids, proteins, choline, vitamins A and B12, selenium, and other critical nutrients at levels above or comparable to those found in other animal-source foods.
- Meta-analysis suggests that egg consumption is not associated with the risk of CVD and cardiac mortality in the general population.
- New dietary guidelines does not limit cholesterol. Eggs are back on the good list.

Choline

• Water soluble nutrient in the B-vitamin family that is particularly crucial during pregnancy and the first three years of a child’s life.
• Deficiency may be associated with permanent changes in brain function that negatively impact intelligence, memory, mood regulation, and stress response.
• Preclinical studies show choline partially ameliorates memory and learning deficits from prenatal alcohol exposure.
• New DV set by FDA in 2016: 550 mg per day


Choline and Cognition

• Prospective study involving 154 healthy mother-infant pairs conducted in Vancouver, Canada (72% white, 15% Asian). All women were taking PNV.
• Maternal blood collected at 16 and 36 weeks gestation and infant neurodevelopment assessed at 18 months age for 154 mother-infant pairs. Babies were all singletons and full-term.
• Significant positive associations found between infant cognitive test scores and maternal plasma free choline and betaine (p=0.009) and a strong trend towards gross motor development.

Omega 3 Fatty Acids from Plants and Animals

- Dark green vegetables, walnuts, freshly ground flax seeds and other plant foods.
  - ALA
  - Converts to
  - Intermediate Molecules

- Cold water fish, fish oil, fresh seaweed, clean animal foods like free range chicken, eggs, and grass fed beef.
  - DHA
  - Supplies
  - EPA
  - Supplies

Omega 3 Index

- Omega-3 Index test is now the gold standard for omega-3 biostatus testing. It is used as a compliance marker for randomized controlled trials with fish oil supplements, and in epidemiological research.
- In 2008 Dr. Bernadine Healy, cardiologist and past President of the AHA and first woman Director of the NIH said, “Before long, your personal Omega-3 Index just could be the new cholesterol—the number you want to brag about.”
American Heart Association

- “Omega-3 fish oil supplements prescribed by a healthcare provider may help prevent death from heart disease in patients who recently had a heart attack and may prevent death and hospitalizations in patients with heart failure.”
- There was insufficient evidence to evaluate the role of fish oil supplements in primary prevention of CVD.

Omega 3 and Pregnancy

- Critical for neurological and early visual development, particularly in 3rd trimester.
- Reduces risk of allergies
- Reduces risk of preterm labor and birth
- Increases birth weight
- FDA recommends 2-3 servings of low mercury fatty fish per week during pregnancy.

Omega 3 and Asthma

- Reduced intake of omega-3 fatty acids may be a contributing factor to the increasing prevalence of wheezing disorders.
- Reviewers found that supplementation with omega-3 fatty acids in the third trimester of pregnancy reduced the absolute risk of persistent wheeze or asthma and infections of the lower respiratory tract in offspring by approximately 33%.
Different Types of Fish Oil

- Supplementation is an alternative to eating fish; however, all supplements are not equal.
- Randomized, crossover study of 35 healthy individuals compared four popular brands/types of omega 3 fatty acids:
  - Concentrated triglyceride (rTG)
  - Ethyl ester (EE)
  - Phospholipid krill oil (PL)
  - Triglyceride salmon oil (TG)

Olive Oil

- Cornerstone of Mediterranean diet. Rich in antioxidants, particularly vitamin E.
- Oleocanthal mimics effect of ibuprofen in reducing inflammation.
- Protects against heart disease; lowers total blood cholesterol, LDL-C, triglycerides; improves HDL.
- Nurses Health Study found that greater adherence to Mediterranean diet was associated with longer telomeres (health and longevity).


Avocado

- Avocados second only to olives for level of monounsaturated fat.
- Randomized, crossover trial of 45 overweight/obese participants found inclusion of one avocado per day was superior to low-fat or moderate fat diet high in oleic acid for lowering cholesterol.
- Only avocado group had significantly decreased LDL particle number, small dense LDL-C and ratio of LDL/HDL.


Protein

- From the Greek word protos, “first.”
- Used to build new cells, maintain tissues (e.g., muscles, inner bone, hair, nails), create enzymes, make hemoglobin to carry oxygen, lipoproteins to transport cholesterol; present in inner and outer membrane of every living cell.
- Sources include meat, poultry, seafood, beans and peas, eggs, soy products, nuts, nut butters, and seeds.

Protein Rich Foods
WCRF/AICR Recommendations to Reduce Cancer Risk

• Limit consumption of red meats (beef, pork, lamb) and avoid processed meats.
• Strive for less than 18 ounces per week of red meat.

Red meat refers to beef, pork and lamb – foods like hamburgers, steak, pork chops and roast lamb.

Processed meat is red meat that is preserved by smoking, curing, salting or adding other chemical preservatives. Sausage, bacon, ham and lunch meats (such as bologna, salami and corned beef) are processed meats.

The evidence is convincing that processed meats raise your risk of colorectal cancer, but the risk is considerably greater. For every ounce and half of processed meat eaten per day, risk rises by 21 percent.
Studies show dairy products are beneficial in muscle building, lowering blood pressure, preventing tooth decay, diabetes, colorectal cancer, and obesity.

- Emphasis on yogurt and cheese.


Soy

- Soy contains isoflavones (which have been studied most), saponins, phenolic acids, phytic acid, phytosterols, and protein kinase inhibitors.
- Soy inhibits the growth of prostate cancer cells and studies suggest that consuming soy in childhood and adolescence may help protect against breast cancer later in life.
- Including 1-2 servings/d of minimally processed and/or fermented soy in diet can be a healthy practice.
**Soy and Breast Cancer**

- LACE trial saw a 60% reduction in risk of breast cancer recurrence in women taking tamoxifen who were in the highest quintile of soy intake.
- Supplemental soy isoﬂavones signiﬁcantly reduce hot ﬂash frequency and severity, particularly those that provide a minimum of 18 mg/d of genistein.


**HEALTHY PROTEIN SOURCES**

- Soy and other legumes (lentils, beans, etc)
- Nuts and seeds
- Low mercury cold water ﬁsh
- Organic poultry
- Grass fed beef, pork, lamb
- Wild game
- Milk and dairy without hormones
- Omega 3 enriched eggs

Roughly 8 grams of protein per 20 pounds of body weight is generally recommended

**Sodium Recommendations?**

- In May 2013, Institute of Medicine found limited evidence linking association between low sodium intake (1500-2300 mg/d) and improved health outcomes in those with diabetes, kidney disease, heart disease, hypertension or borderline hypertension; those 51 years of age and older; or African Americans (National Research Council).


**Iodine in Pregnancy**

- Many reproductive aged women in US have marginal iodine status; salt in processed foods is not iodized.
- Deﬁciency associated with pregnancy loss and prematurity, cretinism, and neurocognitive defects in the fetus.
- Mild to moderate iodine deﬁciency associated with higher incidence of ADHD and lower IQ in the baby.
- American Thyroid Association recommends pregnant/lactating women supplement: 150 mcg/d potassium iodide.

Traditional Asian Diet

- Little question many people in Asian countries have low rates of diabetes, heart disease and cancer.
- There is no one “Asian” diet but some generalizations that can be made.
- Traditional Chinese diets have been explored through the China-Cornell-Oxford project. This long-term study is discussed at length in the recent film Forks over Knives, which promotes better health through a plant-based diet.

Okinawan Dietary Pattern

- High consumption of vegetables
- High consumption of legumes (mostly soy)
- Moderate consumption fish products
- Low consumption meat and meat products
- Low consumption of dairy products
- Moderate alcohol consumption
- Low caloric intake
- Emphasis on low GL carbohydrates