Healthy Smile Happy Child (HSHC) Presents the 11th MBTelehealth Topic:

Healthy Eating, Healthy Teeth

HEALTHY CHILD

Presented by: Daniella DeMaré
Date: March 31, 2015
Time: 11am – 12pm
Oral Health & Nutrition Relationship

- Nutrition affects:
  - Tooth development
  - Tooth maintenance
  - Progression of oral health problems

- Oral health can affect diet and nutritional status
Overview

I. Nutritional Status and Oral Health for Children
   I. Pregnancy
   II. Early Childhood

II. Diet and Oral Health for Children
   I. Infant Nutrition
   II. Early Childhood Nutrition
Section 1
Nutritional Status and Oral Health
How Nutritional Status Influences Childhood Oral Health

- The Pregnancy Connection
  - Vitamin D and Calcium Recommendations
  - Dietary Sources of Vitamin D
  - Dietary Sources of Calcium
- Nutrition in Early Childhood
Teeth begin forming at 6 weeks in utero, and start to calcify during the 2nd trimester.

Dental caries may have their beginnings in fetal life.

Studies suggest that pregnant women who are 
**VITAMIN D** or **CALCIUM** deficient may put their infants at risk for enamel defects in primary and permanent teeth.
Vitamin D or Calcium deficiency may predispose infants to:

- **Enamel hypoplasia** (a defect in which the enamel of teeth is hard but thin)
- Developmental defects of enamel

Enamel hypoplasia is a risk factor for early childhood caries (ECC)
Eating enough food as well as a variety of foods is important during pregnancy for mom and baby.

**Calcium** and **Vitamin D**: important during pregnancy to promote optimal fetal development.

- Canadian Paediatric Society recommendations for Vitamin D intake during pregnancy and lactation are: **2000 IU daily**.

- Health Canada recommendations for calcium intake during pregnancy and lactation are: **1000 mg daily**.*

*1300 mg daily for pregnant women 14-18 years old*
<table>
<thead>
<tr>
<th>Dietary Sources of Vitamin D</th>
<th>Salmon</th>
<th>2.5 ounces/75 grams</th>
<th>203 - 699 IU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk/Fortified soy beverage</td>
<td>1 cup/250mL</td>
<td>100 - 123 IU</td>
<td></td>
</tr>
<tr>
<td>Egg yolks</td>
<td>2 large eggs</td>
<td>57-88 IU</td>
<td></td>
</tr>
<tr>
<td>Margarine</td>
<td>1 teaspoon</td>
<td>27 IU</td>
<td></td>
</tr>
</tbody>
</table>

![Image](150 grams!)
## Dietary Sources of Calcium

<table>
<thead>
<tr>
<th></th>
<th>Serving Size</th>
<th>Calcium Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk or Fortified soy beverage</td>
<td>1 cup</td>
<td>291-324 mg</td>
</tr>
<tr>
<td>Cheddar or Mozzarella Cheese</td>
<td>1.5 ounces/50 grams</td>
<td>252-366 mg</td>
</tr>
<tr>
<td>Yogurt</td>
<td>¾ cup</td>
<td>221-291 mg</td>
</tr>
<tr>
<td>Cooked Spinach</td>
<td>½ cup</td>
<td>129 mg</td>
</tr>
<tr>
<td>Roasted Almonds</td>
<td>¼ cup</td>
<td>93 mg</td>
</tr>
</tbody>
</table>
Oral Health and Childhood Nutritional Status

- Essential Nutrients
- Vitamin D Deficiency
- Iron Deficiency
Nutrients Essential for Tooth Development and Maintenance

- Vitamin C
- Vitamin A
- Vitamin D
- Calcium
Severe Early Childhood Caries (S-ECC) and Vitamin D Deficiency

Vitamin D:

- Plays a role in the maintenance of good oral health
- Has a critical role in enamel, dentin and oral bone formation

Connection between S-ECC and nutritional status:

- Vitamin D and calcium disturbances during tooth development may result in dentin and enamel defects – which can increase risk for caries
- Pain caused by severe decay may alter eating habits and preferences, which may contribute to nutritional deficiencies
Severe Early Childhood Caries (S-ECC) and Vitamin D Deficiency

- Children with S-ECC were significantly more likely to have low serum vitamin D and calcium concentrations, compared to caries free controls.

- Regular milk drinkers had better vitamin D concentrations.
Severe Early Childhood Caries (S-ECC) and Iron Deficiency

- Children with S-ECC were nearly twice as likely to have low ferritin levels and were over six times more likely to have iron deficiency anemia than caries free children.

- Specific nature of the relationship is currently unknown.
Section 2
Diet and Oral Health for Children
Nutrition for Infants

- Breastfeeding
- Bottles
- Sippy cups
- Introduction of Solid Foods

Photo: Bruce Fileborough
Breastfeeding & Baby Teeth

- Breastfeeding helps baby develop stronger jaw muscles and properly positioned teeth.
- Breastfed babies may still develop tooth decay, so mouth care and healthy dental habits are still important.
- Breastfed babies need daily Vitamin D3 drops (minimum 400 IU/day from 0-12 months of age*) to help develop strong teeth.
Bottle-feeding Frequency & Use

- Limit bottle use to feeding times only.
- Discourage propping of bottles – leads to continual exposure of teeth to bottle contents. Parents should be encouraged to hold bottle while infant is feeding.
- Leaving child in bed with bottle (even naptime) can INCREASE RISK for ECC.
- Sipping from bottle frequently between meals can INCREASE RISK for ECC.
Bottle-feeding Frequency & Use

- **Bottle contents:**
  - Breast milk or formula for feeding
  - Between meals: only plain water in bottle is safe for teeth
  - Juice, pop, drink mixes, sweetened liquids in bottle → ↑ risk for ECC

- **Age of weaning:**
  - By first birthday
  - Late weaning → ↑ risk for ECC
Sippy Cups & Training Cups

- **Problems associated with “no spill” sippy cups:**
  - Become a substitute for the bottle
  - Equally as dangerous as bottles if used inappropriately, or contain drinks with sugars and/or acids
  - Often used past optimal weaning age

- **Lidless training cups (“Open Cups”):**
  - Safer alternative for teeth and may help transition to regular drinking cup
Introducing Solid Foods

- Age solids introduced may influence caries risk
- Recommendation: introduce solids at 6 months of age.
- Delayed introduction of solids may → ↑ risk for ECC
Introducing Solid Foods

- In some cultures mothers may pre-chew their infant’s food.
  - Share information in a culturally sensitive way.
  - Let parents know they may be passing along cavity-causing bacteria to their child.
  - Recommend parent maintains good oral health.
- Pre-chewed rice $\rightarrow$ ↑ risk for ECC
Questions?
Eating Habits & Cavities: Young Children

- Cavity Formation
- Types of Foods that Increase Cavity Risk
  - Foods High in Carbohydrates
  - pH of Foods
  - Foods that Slowly Clear the Mouth
- Snack Foods Found to Contribute to ECC
- Snack Drinks Contributing to ECC
Cavity Formation

- Food containing carbohydrates enters the mouth
- Bacteria (*Streptococcus mutans*) break down the carbohydrates and decrease the oral pH
- The acidic environment breaks down the tooth enamel
What is an “Acid Attack”?

- An “acid attack” is when the pH in your mouth becomes acidic (lower than 5.5) after eating a meal or snack.
- Saliva acts as a buffer system to bring the pH back up after the ingestion of foods.
- This process takes at least 20 minutes.
- Constant grazing increases the amount of time that the mouth stays in the acidic phase, leading to possible enamel demineralization.
- Drinking a glass of water or eating some cheese at the end of a snack helps to increase the pH of the mouth.
The Stephan Curve

- **Neutral pH**
- **Critical pH** - at which teeth start to demineralize

- **Breakfast**
- **Snack**
- **Lunch**
- **Snack**
- **Dinner**
- **Snack**
A Less Healthy Stephan Curve

- Safe Zone
- Danger Zone

Breakfast
Snack
Lunch
Snack
Dinner
Snack

Critical pH!

Juice
Chips
Cookies
Types of Foods Increasing Cavity Risk

Cavity risk increases in foods that are:

- High in carbohydrates
- Acidic
- Slowly cleared from the oral cavity
Foods High in Carbohydrates

- **Sweet foods:**
  - Sugar: beets, cane, molasses
  - Honey, agave nectar

- **High starch vegetables:**
  - Corn, potatoes, yams

- **Grain-based foods:**
  - Wheat: bread, pasta, couscous
  - Rice, oatmeal, quinoa, barley, rye
## pH of Common Foods

<table>
<thead>
<tr>
<th>pH Level</th>
<th>Foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;3</td>
<td>Lemons, limes, grapes, soft drinks</td>
</tr>
<tr>
<td>3-5</td>
<td>Apple, apricot, beet, blueberry, cherry, pickle, grapefruit, ketchup, nectarine, orange, peach, pineapple, plum, strawberry, tomato, honey</td>
</tr>
<tr>
<td>5-7</td>
<td>Coffee, banana, corn, cabbage, maple syrup, onion, potato, watermelon</td>
</tr>
<tr>
<td>&gt;7</td>
<td>Crackers, egg whites</td>
</tr>
<tr>
<td>&gt;9</td>
<td>Baking soda</td>
</tr>
</tbody>
</table>
Foods That Slowly Clear the Mouth

- Dried fruit (ex: raisins)
- Fruit snacks (fruit roll-up, fruit by the foot)
- Gummy candies
- Hard candies/lollipops
How Much Sugar Is In...

A Tim Horton’s “Fruit Explosion” muffin?

a) 2 teaspoons  b) 4.5 teaspoons  c) 6.75 teaspoons
A Tim Hortons “Fruit Explosion” muffin contains 6.75 tsp of sugar, which equals 56% of the daily sugar intake recommended by the World Health Organization (WHO) for adults.
How Much Sugar Is In...

A cup of apple juice?

a) 10 teaspoons  
b) 12 teaspoons  
c) 15 teaspoons
An average cup of apple juice contains 12 tsp of sugar, which equals 100% of the daily sugar intake recommended by the World Health Organization (WHO) for adults.
Snack Foods Found to Contribute to Caries in the ECC Literature

- High fat / high sugar snacks
- Chips daily
- Cake daily
- Chocolate daily
- Candy
  - ≥ 1/week
  - > 1/day
Snack Drinks Contributing to ECC

- Soda pop
- Frequency of carbonated drinks with sugar
- Bedtime drink with sugar
- Fruit juices
- Sweetened condensed milk
- Sugar added to cow’s milk
- Powdered beverages/drink crystals
- Syrups, cordial
Eating Habits for Healthy Teeth: Young Children

- Dental Smart Snacks
- Solutions:
  - Less Sugary Foods
  - Meals and Snacks
  - Beverages
  - Cheese
- AAPD Policy on ECC and Nutrition
Dental Smart Snacks

- Yogurt or cottage cheese
- Nut butter with whole grain toast
- Bean spreads (ie: hummus) with pita
- Cheese
- Fruit and veggies

Drink water to rinse out the mouth after snacking!
Solution: Less Sugary Foods

Limit the amount of sugary foods and beverages.

- For example: only have sugary foods as a dessert after a meal, instead of as snacks throughout the day

Moderation is key!
Solution: Meals and Snacking

Children have small stomachs and need to eat frequently.

- This means: 3 meals and 2-3 snacks each day
- This does not mean: grazing throughout the day
- Grazing continuously exposes teeth to an "acid attack"
Solution: Beverages

- Satisfy thirst with water, drink milk at meal times
- Children do not need juice or any beverage other than milk and water
- Milk (dairy) → non-cariogenic
- Phosphoproteins in milk prevents demineralization
- Milk is a good source of calcium, phosphorous, and vitamin D, all needed for tooth mineralization
Solution: Cheese

- Helps remove food particles from tooth surface
- Provides an alkaline buffer
- Increases flow of saliva
- Increase remineralization of enamel
AAPD Policy on ECC - Prevention Strategies Related to Nutrition

- Don’t allow infants or young children to sleep with a bottle containing fermentable carbohydrates
- If infant falls asleep while feeding, clean the teeth before laying down to bed
- Wean to regular cup by 1st birthday
AAPD Policy on ECC - Prevention Strategies Related to Nutrition

- Avoid repetitive consumption of liquids with fermentable carbohydrates from bottle or no-spill sippy cups
- Avoid between-meal snacks & prolonged exposure to foods & juice or beverages with fermentable carbohydrates
Risk of dental caries depends on:

- What is eaten (good, bad, neutral)
- How long the food is kept in the mouth
- How often the teeth are exposed to an acid attack

Dental care:

- Brushing 2x a day for 2 minutes – especially important before bedtime
- Regular visits to dental team
Questions?
Upcoming Telehealth Session:
Tentative Date: June 16, 2015
Topic: Challenges and Strategies in Oral Health
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