How to Integrate Nutrition into Dental Practice Easily and Successfully

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Outline

Introduction: what and why
Relationships between nutrition, diet, and oral health
Diet and dental health, fact vs. fallacy
Team strategies for fostering child feeding practices to beneficial oral and general health

Unique Issues for Clinicians

• Loss of control of outcome
• Responsibility lies with patient
• Different skill set:
  – e.g. requires understanding the person, not just the mouth
Dentist Fatal Flaw!!

I'M ONLY RESPONSIBLE FOR WHAT I SAY NOT FOR WHAT YOU UNDERSTAND.

DIMENSIONS OF LEARNING

Cognitive (information) -> Affective (emotional evaluation of cognition) -> Behavioral

YOU are the message !!!
THE ‘HOW’ IS MORE IMPORTANT THAN THE “WHAT”
e.g. Subject may be different but Principles are the same

Health Belief Model: Factors Determining Readiness to Act
- Perceived susceptibility
- Condition is potentially serious
- Course of action to prevent or alleviate the condition is readily available

Who’s the Authority???
Approaches to Guidance

- **DIRECTIVE** (Adler)
  - Directs patient

- **NON-DIRECTIVE** (Motivational Interviewing (Rogers)
  - Patient centered

Motivation ??

Laws of Nature:
1. You CAN'T motivate anyone
2. Motivation comes from within
3. You CAN harness existing motivation and direct it towards dental issue

General Motivations For Dental Improvement

- Bad breath ?
- Discomfort ?
- Appearance ?
- Tooth Preservation ?
- Expense ?

There’s NO WAY to know which
If any of these motivations apply
So NEVER ASSume
What motivates people
Where is the pt.?

Why is this Important
What's in it for Me and Mine ???

SELF-ACTUALIZATION
SELF-ESTEEM
SOCIAL INTERACTION
SECURITY
PHYSICAL NEEDS
Threats- only short term

Information and guided practice – feedback allows progress

Begin Where the Patient Is

Establish and Pursue Goals

• Patient attitude
• Patient goals
• Counselor goals

Myth: Teeth are NOT important

• Primary Teeth:
  – Path for permanent tooth eruption
  – Decay can destroy crowns of permanent teeth
• Mastication (nutrition)
• Speech
• Self esteem/employment/productivity
Medical Implications of Oral Problems

- Severe caries in children requires surgery under general anesthesia
- Severe caries in adults due to radiation/chemo can result in osteoradionecrosis
- Poor oral hygiene can cause VAP (ventilator-associated pneumonia)
- Periodontal disease is assoc. with preemies
- Edentulousness is major risk for choking and malnutrition

Teeth Should Last a Lifetime

Dental problems are preventable !!!

Connect Patient Values to Nutrition/Oral Health
So what are the big dental and nutrition issues

- dental caries
- childhood obesity
- failure to thrive
- iron def. anemia
- food allergies

These Issues Overlap in Many Ways

Diet/Nutrition/Oral Health Inseparable

Eating impairment → Poor quality Diet → Oral soft tissue/bone/dentition problems

How the Oral Condition affects Diet and Nutrition

Dental status/pain can affect:
- eating desire and ability
- diet quality/soft food
- taste & swallowing
- delayed growth (FTT)

Dentures is a major risk factor for malnutrition in elders
Dentures is the primary contributor to deaths from choking
Systemic Nutrition Affects the Oral Cavity

Undernutrition
Teeth: Pre-eruptive malnutrition can result in enamel defects

Bone & Soft Tissue:
- Slowed healing/rapid tissue turnover rate
- Decreased resistance to oral infections
- Ultimately may result in increased tooth loss

Overnutrition (supplements)
Teeth:
- Developmental defects (vitamin D toxicity)
- Tissue regeneration (vitamin A toxicity)

Enamel in Balance

Protective Factors
- Salivary flow
- Fluoride
- Calcium-phosphates from foods/bevs
- Proteins buffers, from foods & bevs

Demineralizing Factors
- Xerostomia
- Acid foods/beverages
- Acid stomach
- Caries process
- Physical abrasion

How Diet Effects Teeth:
Like politics: all effects are local

Demineralization
- Regular & diet sodas both cause demineralization
- Non-colas & iced tea worst
- Sugar content not relevant

Von Fraunhofer, General Dentistry July-August 2004, pp.308-312
pH of Enamel demineralization is:
5.2-5.5

When is water not water

Flavored Waters: Range greatly in acidity
All tested showed pH in range of 2-4*
erosive potential =OJ

Club Soda: carbonation reduces pH to 3-4
alkaline salts often added to reduce acidity

Fizzy Waters: Perrier, San Pellegrino: 5.6-6

* Int J Ped Dent. 17:2, 2007

Dental Caries is an Infectious Disease

- Bacterial plaque colonize in protected areas
- Metabolize simple sugars to acid
- Acid demineralizes enamel
  - Bacteria and acid invade dentin
- Bacteria can invade pulp and migrate throughout the body

Abscess
What we DO know about Foods and Caries

- Mutans streptococcus and lactobacilli in plaque feed on carbohydrates (CHO)
- Metabolize the CHO to acids
- Acids decalcify enamel
  - Bacteria invade dentin

What is NOT Cariogenic?

- Protein
- Fat
- Artificial Sweeteners

What is Cariogenic

- All simple sugars can be.
  - (glucose, fructose, lactose, maltose, sucrose, honey, high fructose corn syrup)
- Starch can be under some circumstances (amylase)
- Sugars are rarely eaten alone. Other foods &/or components can affect cariogenic potential (e.g. water, fiber, Calcium/P, starch)
- Cariogenic for ME may not be cariogenic for YOU
The AMOUNT of sugars eaten or drunk (drank, dranked??)

is NOT the most important factor

"the relative cariogenicity of a food is NOT correlated with its carbohydrate content" (Kandelman, D 1997)

What Determines Cariogenic Potential of Diet?
Stephan Curve: Metabolic Cycle

- Sugar exposure
- Acid produced for 20-30 minutes (with sugar rinse)
- Buffered by saliva, physical removal
- Return to neutral

Not Useful

Factors Increasing Risk
- Eaten or sipped often
- Eaten or sipped for prolonged periods
- Highly retentive in mouth
- No rinsing or brushing after
- Xerostomia

Factors Decreasing Risk
- Consumed infrequently
- Consumed fast
- Liquid or fast removal from mouth
- Oral hygiene after
- No xerostomia
Snacking cartoon

Meals or snacks frequently through day

3 meals, no snacks
Food Characteristics that can affect Cariogenicity

- Fiber content
- Water content
- Retention around tooth surfaces
- Mineralizing minerals (Ca, P, F)
- Usage patterns

Betcha Can't Eat One

Summary: Which is More Cariogenic?

hard candy         OR         soda
Which is More Cariogenic?

- one hard candy OR one soda
- consumed slowly consumed slowly
- once a week every day

Cariogenic Ranking may be misleading

Cariogenic
- dried fruits
- candy, hard candy
- cake, cookies, pie
- crackers
- chips
- fruit juice
- sweetened, canned fruit
- soft drinks
- breads

Low Cariogenicity
- raw vegetables
- raw fruits
- milk

Non-cariogenic
- meat, fish, poultry
- fats and oils

Cariostatic
- cheeses
- nuts
- xylitol

IS BEER Cariogenic?

It Depends!
**Diet Pattern**

Counts most

- Frequency of cariogenic food consumption
- Caries risk

- Only small increase in risk with meals
- Greater risk between meals
- Oral contact time is

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**Dental Caries**

Factors:
- Frequent CHO intake
- Between meals
- Slowly dissolving worst
- Frequent sipping also

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**What we DON’T know**

- Caries-“safe” diet for individuals
  (Some say 3 meals/2 snacks)

- Extent of protection of other food components
  (Ca, P, cocoa, etc.)

- Protective mechanisms of cariostatic foods:
  - e.g. salivary stimulation, remineralization, etc.
Considered Safe Meal Pattern

- 3 meals
- No more than 3 snacks
- *remember: kids need snacks
diabetics need snacks*

Van Issemen, Duggal. Caries Research: vol 38 (suppl 1), 2004

Caries Protective Foods

Zahnshonen (Safe for Teeth)

Used on food labels in Switzerland
Artificial Sweeteners

Not considered Cariogenic

Xylitol Gum

Xylitol interferes with StrepMutans:
- inhibits their ability to produce acids.
- interferes with their ability to colonize and stick to oral tissues.
- chewing action stimulates salivary flow.

Sugar-Free Gum

Stimulates salivary flow.
Eating for Oral Health

Minimize use of sugar-containing foods and beverages between meals

AVOID: hard candies & breath mints
**Nutrition and Oral Health of Children and Adolescents**

**1 to 3 years**

- Needs based upon BMI, growth & activity
- **Energy:**
  - 1300 kcal. Age 1-3
  - 2000 kcal. Age 7-10
- **Distribution:** same as adults
  - 50-60% CHO
  - 25-35% Fat
  - 10-15% Protein

**Severe Fat Restriction NOT recommended**

**1 year**

- off breast/bottle
- onto cup
- solid foods
The “Sippy” & Juice Issue

Consumed constantly
Considered nutritious
Contributes to ECC
Contributes to childhood obesity

No more than 6 oz/day
American Academy of Pediatrics

Juice vs. Soda

Simple sugars

<table>
<thead>
<tr>
<th></th>
<th>Calories per 1 cup</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrate</td>
<td>150</td>
<td>120</td>
<td>180</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Potassium</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Soft Drink
12 oz = 240 kcal
Orange Juice
12 oz = 150 kcal
Figure 1. Mean intakes from sugar drinks for ages 2 and over: United States, 2005–2008

The “Terrible Twos” Independence and Experimentation
Food Habits for a Lifetime

- Introduce new foods without emotion
- Do not force or cajole
- Take away and try again
- Role model
- De-emphasize food, emphasize socialization
- No ad-lib eating/drinking
- No foods for rewards or punishments

Obesity in Kids !!!

- The MOST prevalent disease in American kids
  - Obese kids → obese adults
  - > 60% of obese kids have risk of DM, Htn, & disease
    - type II DM in kids
  - adult mortality & morbidity

- Sugar bevs. assoc. with increased wt.
  - Obesity Rev. 14(8), 606-19, 2013

So Who / What’s Responsible??

- individuals
- families
- schools
- fast food places
- TV
- computers
- No sidewalks
Energy Drinks

- $7.7 billion industry
- #1 Monster Energy
- #2 Red Bull (1997-first)
- #3 Rockstar

Energy Drinks: Issues

- risk of dehydration, increase the chance of potentially fatal heat illnesses.
- Adding dehydration or flu or muscle-building supplements like creatine to energy drink usage can increase risk of fatal cardiac arrhythmia
- Increase risk of heart problems e.g. persistent tachycardia, or rapid heartbeats
- Interactions with prescription medications — including stimulants used to treat ADHD, or attention-deficit hyperactivity disorder
- Most adverse reactions: two to eight energy drinks or more than 200 milligrams of caffeine.
Energy Drinks: Issues

• Stimulant-containing energy drinks have no place in the diets of children or adolescents (pediatrics)
• Most have about 80 mg./8 oz., sold often as 20-24 oz.
• Mix your own can have 50-500 mg/serv.
• FDA limits cola-type drinks to 71 mg./12 oz, but not e-drinks
• Canada—law. No>180 mg/20 oz.
• guarana, green tea and yerba mate boost caffeine.
• yohimbine and bitter orange can increase heart rate, cause changes in blood pressure and interact with certain antidepressant medications

<table>
<thead>
<tr>
<th>Approximate caffeine content in selected drinks</th>
<th>Servings</th>
<th>Servings</th>
<th>Can/Fizzie</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft drinks</td>
<td>16 mg</td>
<td>20 mg</td>
<td>39 mg</td>
</tr>
<tr>
<td>Fanta</td>
<td>10 mg</td>
<td>13 mg</td>
<td>33 mg</td>
</tr>
<tr>
<td>Fanta Light</td>
<td>9 mg</td>
<td>12 mg</td>
<td>30 mg</td>
</tr>
<tr>
<td>Fanta Black</td>
<td>10 mg</td>
<td>13 mg</td>
<td>28 mg</td>
</tr>
<tr>
<td>Fanta Zero</td>
<td>14 mg</td>
<td>18 mg</td>
<td>11 mg</td>
</tr>
<tr>
<td>Fanta Energy</td>
<td>16 mg</td>
<td>20 mg</td>
<td>20 mg</td>
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<tr>
<td>Fanta Light Energy</td>
<td>18 mg</td>
<td>22 mg</td>
<td>4 mg</td>
</tr>
<tr>
<td>Fanta Black Energy</td>
<td>16 mg</td>
<td>20 mg</td>
<td>3 mg</td>
</tr>
<tr>
<td>Fanta Zero Energy</td>
<td>14 mg</td>
<td>18 mg</td>
<td>4 mg</td>
</tr>
<tr>
<td>Fanta Black Zero</td>
<td>10 mg</td>
<td>13 mg</td>
<td>5 mg</td>
</tr>
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<td>12 mg</td>
<td>16 mg</td>
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<td>18 mg</td>
<td>22 mg</td>
<td>5 mg</td>
</tr>
</tbody>
</table>

Best Oral Health/Nutrition Messages for Kids

• Balanced diet high in fruits & veggies
• Have sweets with meals
  - Stay away from slowly dissolving candies and lozenges
• No overnight bottle unless H₂O
• Limit juice to 6 oz/day
• Limit sippy cup, and sodas any time
• Limit the frequency of snacks to no more than 2
Issues in Diet/Caries Research

- Methodological Problems Abound: Good dental design, bad nutritional more often
- Separating added sugars from natural (intrinsic vs. extrinsic) without controlling for naturals
- Correlating current diet with caries incidence (happens over time)
- Correlating total amount of “sugars” consumed (NHANES) with caries
- Not controlling for other variables (fluoride, saliva, prolonged sipping vs. quick drinking, snack vs. meal, etc.)
- Inappropriate grouping of what constitute “sweet beverages”;

Some Relevant Studies

- Kids 3-11 Cluster analysis :
  - Enriched milk drinks <6% of total fluid = significantly higher primary caries
  - Juice = 13.7%
  - Milk = 19.8%
  - Plain water = 31.6%
  - Sohn, Burt, Sowers J Dent Res. 85(30) 262-266 2006

- Finnish Adults Oral Health: positive assoc. found between sugar sweetened bev. consumption and 4 yr net DMFT increment. Those with 3+ /day had greater net DMFT than those with 1-2 /day. Summary: dose response relationship is likely.
  - Bernabe et. al., J Dentistry, 42(8) pp.892-90, 2014

- Consumption of regular soda pop, regular powdered beverages, and 100% juice in early childhood is assoc. with increased caries risk.
  - Milk had a neutral association (HIGH BUFFERING CAPACITY OF MILK SO TAKES LONGER FOR CARIES TO OCCUR)

- Diet and Caries-Associated Bacteria in Severe Early Childhood Caries
  - J Dent. Res. Nov. 2010
Table 2. Cariogenicity of Daily Food Intake

<table>
<thead>
<tr>
<th></th>
<th>Caries Free (n=38)</th>
<th>Severe-Early Childhood Caries (n=68)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caries Protective (cario0)</td>
<td>1.05 ± 0.24</td>
<td>1.21 ± 0.16</td>
</tr>
<tr>
<td>Non-cariogenic (cario0)</td>
<td>3.90 ± 0.26</td>
<td>3.47 ± 0.20</td>
</tr>
<tr>
<td>Low cariogenicity (cario1)</td>
<td>6.05 ± 0.42</td>
<td>5.41 ± 0.28</td>
</tr>
<tr>
<td>Cariogenic (cario2)</td>
<td>2.69 ± 0.33</td>
<td>4.12 ± 0.30</td>
</tr>
<tr>
<td>Solid/retentive food (cario3)</td>
<td>2.72 ± 0.34</td>
<td>4.66 ± 0.35</td>
</tr>
</tbody>
</table>

Summary Tips

- Eat a balanced diet rich in whole grains, fruit, and vegetables and practice good oral hygiene—particularly the use of fluoridated toothpastes.
- Have cariogenic foods WITH rather than BETWEEN meals. Drink sweetened and acidic beverages with meals. Include foods that can buffer the acidogenic effects.
- Minimize the between meal frequency of snacks and cariogenic beverages.
- Have raw fruit or vegetables with meals to increase salivary flow.
- Rinse mouth with water after eating and drinking.
- Eat dairy products such as cheese after the consumption of fermentable carbohydrates.
- Chew sugarless gum between meals and snacks to increase salivary flow.
- Drink, rather than sip, sweetened and acidic beverages.
- Avoid putting an infant or child to bed with a bottle of milk, juice, or other sugar-containing beverage.
**What Should we do?**

- Increase activity - fight for PE and lunch
- More nutritious foods at schools, and in machines
- Monitor weight

**What Are we doing?**

- Nutritionists, MDs, Dentists, Parents, Educators fighting back against soda perks
- Schools banning ‘junk foods’

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**Fostering Behavioral Change**

in

Dental Practice
HOW TO
Optimize Patient Communications

If You Don’t Know Where You’re Going
You’ll end up somewhere else!
The Roadmap to Success

- Data Gathering
  - Subjective
  - Objective
- Patient Education
- Assessment
- Plan
  - Implementation
  - Followup-reassessment

Set the Stage for Success

<table>
<thead>
<tr>
<th>WHAT</th>
<th>HOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Find out patient expectations</td>
<td>“Why did you come here today?”</td>
</tr>
<tr>
<td>Explain purpose in positive way</td>
<td>“In order to provide you the best possible care, we don’t want to overlook any factors that might contribute to your dental problem. So I’d like to work with you to rule out diet as a possible factor.”</td>
</tr>
<tr>
<td>Get commitment</td>
<td>How does that sound to you?</td>
</tr>
</tbody>
</table>

- Take a 24 hr. recall
- Have pt. explain good diet and caries risk
- Explain myplate and cariogenicity
- Evaluate for general food groups and cariogenic risk
- Have patient make dx
- Work with pt. to improve

- so, let’s go over a usual normal day for you including what you usually eat or drink. Let’s start from the time you get up in the morning until you go to bed at night.
- What do you know about what causes cavities and what you should eat?
- So now let’s look at what you’re doing and have you tell me what you think about your diet.
- So what do you think about your diet in general and the decay risk?
- Any improvements you might make?
Begin Where the Patient Is

Establish and Pursue Goals

- Patient attitude
- Patient goals
- Counselor goals

Find Out As Much As Possible
By Encouraging Clients To Talk About Themselves

- Current habits and daily routine
- Knowledge level
- Family nutrition history & behaviors
- Attitudes about nutrition/health
- Socio-economic status

Factors Influencing Behavior
Types of Questions

- **Open Ended:**
  - how, what, could you tell me
  - NOT – WHY (defensiveness)

- **Closed Ended:**
  - is, are, do, did, when
  - Gives short response

Do not pass judgement

Behavioral Model: Transactional Analysis

You: Parent
Patient: Parent

You: Adult
Patient: Adult

You: Child
Patient: Child
Active Listening
- prevents cutting patient off
- picks up on verbal cues

Maintain eye to eye contact

Effective Teaching
- build on what is already known
- provide information rather than advice
- provide relevant information
- don't overload
- get feedback to ensure learning
Child/Teen Learners

- Need relevance to something they care about
- Figure out who controls eating/when
  - Involve that person
- Problem-oriented
- Need Individualization
- Need measurable, realistic goals

Initiating Change

- Have patient determine what changes are indicated (with your assistance)
- Have patient come up with suggestions for improvements
Improving Food Habits

• Link Nutrition with something valued (smile, breath, stamina, weight, etc.)

• Guide Patient to Realistic, Practical Improvements 😊

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Work with Patient to Set Manageable Goals

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Goal Setting Reality Check

Q: “since you’ve never flossed before, is it really realistic for you to floss every night?”
A: “well, I can try”

Q: “is it realistic for you to stop using sugar in your coffee?”
A: “maybe you’re right, how about if I try Splenda instead?”
Self-Monitoring Tools

- disclosing solution
- soreness, bleeding
- record-keeping

Summary: Dynamics of Influencing Others

- Personalization
- Acceptance/client focus
- Rapport
  - Assess patient motives and needs
  - Actively listen, observe, and respond to feedback (verbal and non-verbal)
  - Educate at the patient’s level
- Leave all decisions to the patient
  - plan strategy with patient
  - Get commitment to course of action
- Monitor and reinforce progress, re-evaluate, adapt
THOSE CONVINCED AGAINST THEIR WILL

ARE OF THE SAME OPINION STILL

Shameless Promotion!!

Shameless Promotion!!

Diet and Nutrition in Oral Health
Second Edition

Carole A. Palmer

THE END