



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

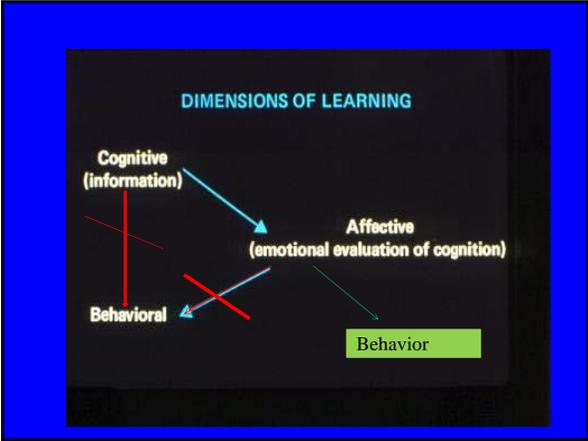
Team strategies for fostering child feeding practices to beneficial oral and general health

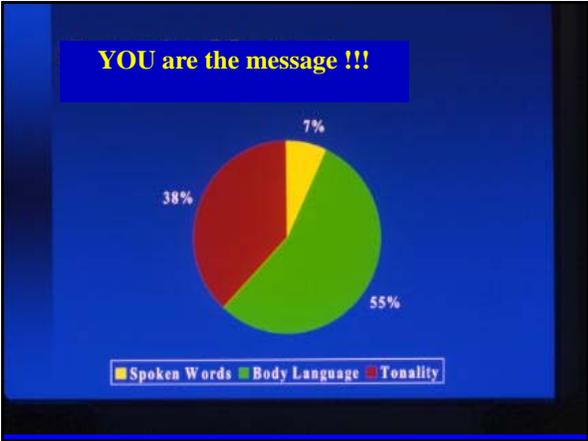
Unique Issues for Clinicians

- 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.





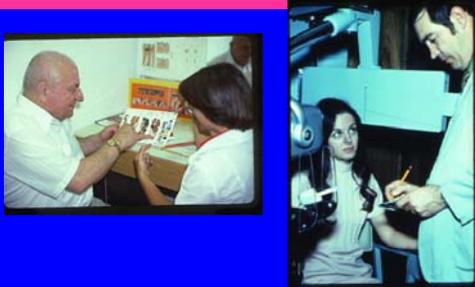
THE 'HOW' IS MORE IMPORTANT THAN THE "WHAT"
e.g. Subject May be Different but Principles are the same

diet care
fluoride
Treatment Plan
home care

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

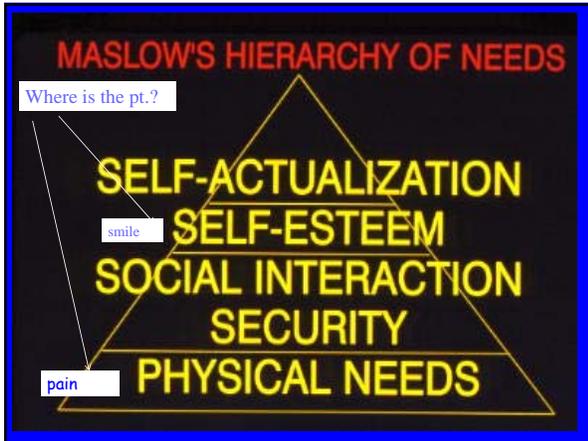
Motivation ??

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

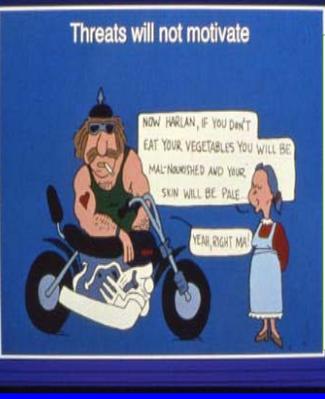
<ul style="list-style-type: none"> • Bad breath ? • Discomfort ? • Appearance ? • Tooth Preservation ? • Expense ? 	<p>There's NO WAY to know which</p> <p>If any of these motivations apply</p> <p>So NEVER ASSume</p> <p>What motivates people</p>
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Threats will not motivate



NOW HARLAN, IF YOU DONT EAT YOUR VEGETABLES YOU WILL BE MAL-NOURISHED AND YOUR SKIN WILL BE PALE.

YEAR-RIGHT MA!

❖ 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 !!!

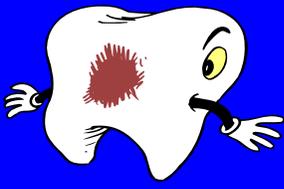
Connect Patient Values to Nutrition/Oral Health



Brian T Weber DDS

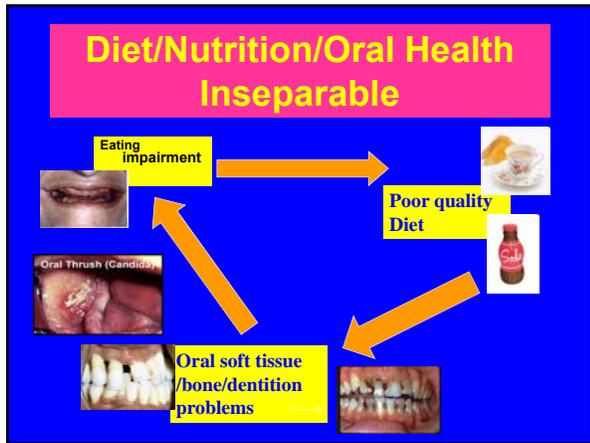


So what are the big dental and nutrition issues



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

These Issues Overlap in Many Ways



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

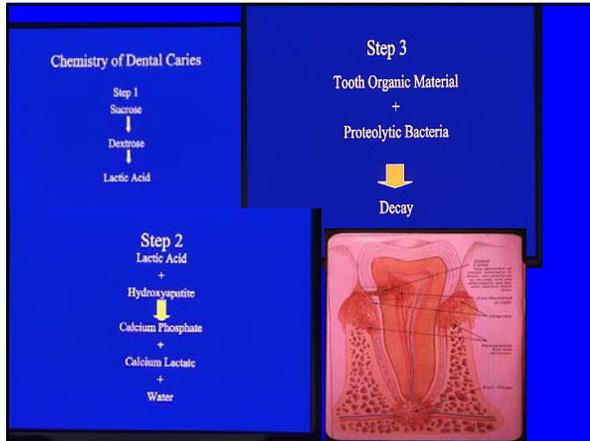
Undernutrition	Overnutrition (supplements)
Teeth: Pre-eruptive malnutrition can result in enamel defects	Teeth - developmental defects (vitamin D toxicity) - tissue regeneration (vitamin A toxicity)
	
Bone & Soft Tissue: <ul style="list-style-type: none"> - Slowed healing/rapid tissue turnover rate - Decreased resistance to oral infections - Ultimately may result in increased tooth loss 	

Enamel in Balance

Protective Factors	Demineralizing Factors
<ul style="list-style-type: none"> • Salivary flow • Fluoride • Calcium, phosphate from foods/bevs • Proteins buffers, from foods & bevs. 	<ul style="list-style-type: none"> • Xerostomia • Acid foods/beverages • Acid stomach • Caries process • Physical abrasion
	

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

Demineralization	
	<ul style="list-style-type: none"> • Regular & diet sodas both cause demineralization • non-colas & iced tea worst • sugar content not relevant
<ul style="list-style-type: none"> - acid bevs: soda & diet soda - vitamin C tablets - eating disorders 	
Von Fraunhofer, General Dentistry July-August 2004, pp.308-312	



The Sugar Controversy

Getting To Know Sugars
 Names of sugars found in foods

SUGAR	DEXTROSE	MALTOSE
Syrup	CORN SWEETENER	SORGHUM SYRUP
SUCROSE	fructose	MANNITOL
Honey	HIGH-FRUCTOSE CORN SYRUP	FRUIT JUICE CONCENTRATE
GLUCOSE	LACTOSE	SORBITOL
MOLASSES		

Ancient History

~~sugar~~

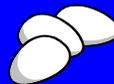
When your Sweet Tooth says **CANDY**

Make your Wisdom Tooth say **NO!**

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

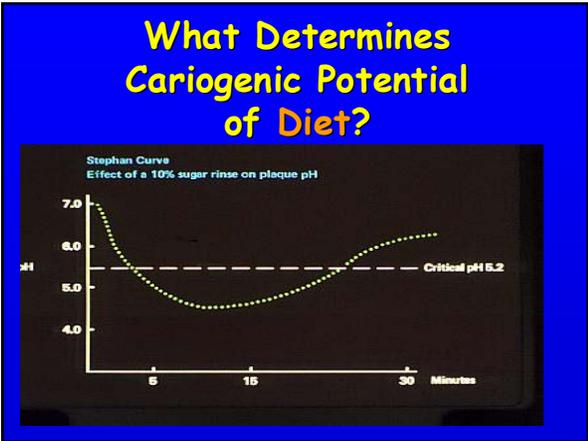
- All simple sugars can be.
(glucose, fructose, lactose, maltose, sucrose, honey, high fructose corn syrup)
- Starch can be under some circumstances
(amylase)
- Sugars are rarely eaten alone. Other foods &/or components can affect cariogenic potential (e.g. water, fiber, Calcium/Ph, starch)
- Cariogenic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

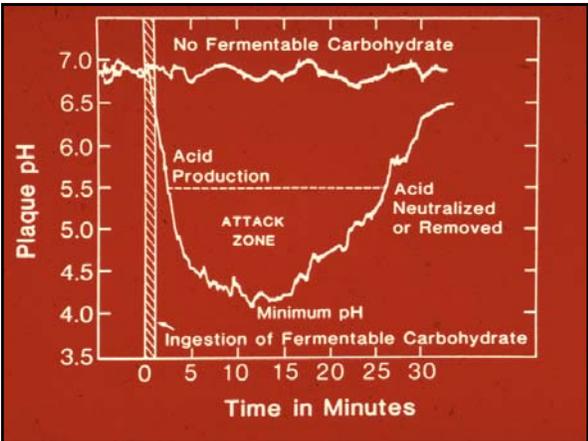


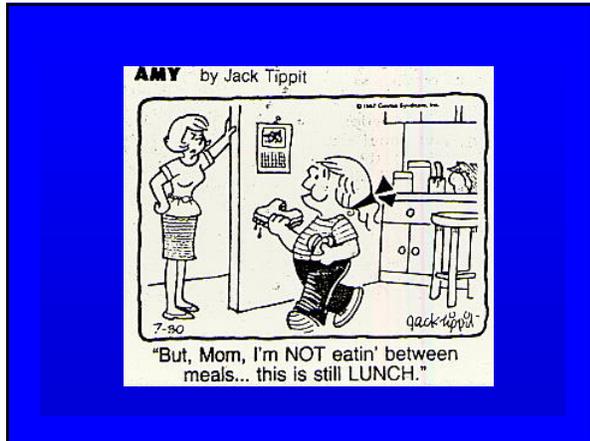
The **AMOUNT** of sugars eaten or drunk (drank, drunked??)

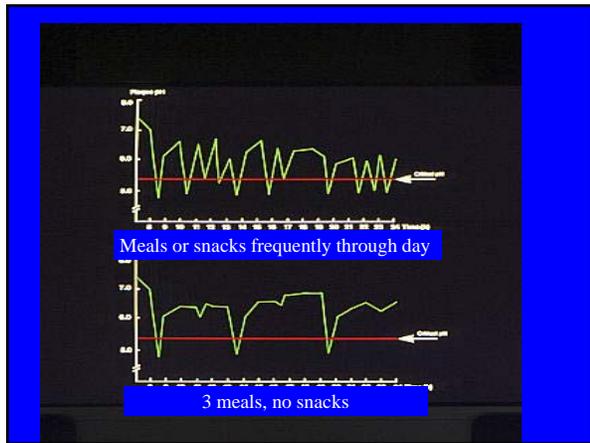
is **NOT** the most important factor

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











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**



This block contains two images. On the left is a photograph of various candies, including hard candies, lollipops, and gummies. On the right is a cartoon by Dan Piraro. The cartoon shows a dentist talking to a patient. The dentist says, "4 OUT OF 5 DENTISTS RECOMMEND... ALWAYS SLEEP WITH A TOUTIE ROLL POP IN YOUR MOUTH AND LET IT DISSOLVE SLOWLY THROUGH THE NIGHT." The patient replies, "...STAYING AWAY FROM THE 5TH DENTIST." The cartoon is signed "By Dan Piraro" and "© 1998".

Summary: Which is More Cariogenic ?

hard candy OR soda



Which is More Cariogenic ?

- one hard candy
- consumed slowly

OR

- one soda
- 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 ↑ in risk with meals
- Greater risk **between** meals
- Oral contact time is 

Dental Caries



- **Factors:**
 - Freq. CHO intake
 - Between meals
 - Slowly dissolving worst
 - Freq. Sipping also

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, remin., etc.

Considered Safe Meal Pattern

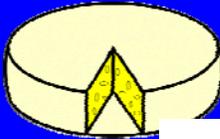
- 3 meals
- No more than 3 snacks



- **remember:** kids need snacks
diabetics need snacks

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

Caries Protective Foods



Zahnschonend

(Safe for Teeth)

Used on Food Labels in Switzerland





Artificial Sweeteners



Not considered Cariogenic

Xylitol Gum

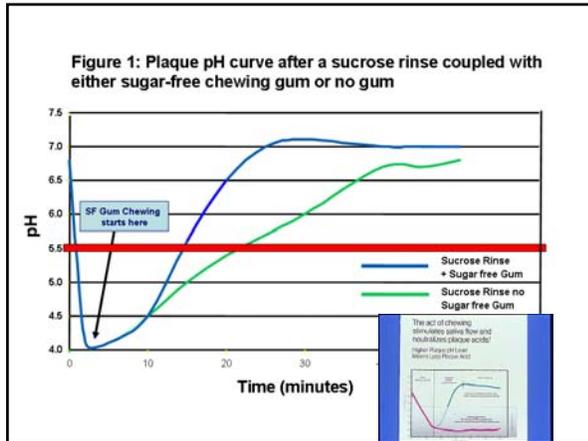


Xylitol interferes with StrepMutans: inhibits their ability to produce acids.
Interferes with their ability to colonize and stick to oral tissues.
chewing action stimulates salivary flow

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

ChooseMyPlate.gov

Nutrition and Oral Health of Children and Adolescents



1 to 3 years

- Needs based upon BMI, growth & activity
- Energy:
 - 1300 kcals. 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



Children

Sleeptime Habits



- Immature dentition
- Plaque-filled mouth
- Low saliva
- Long bottle contact

Early Childhood Caries




The "Sippy" & Juice Issue





- Consumed constantly
- Considered nutritious
- Contributes to ECC
- Contributes to childhood obesity

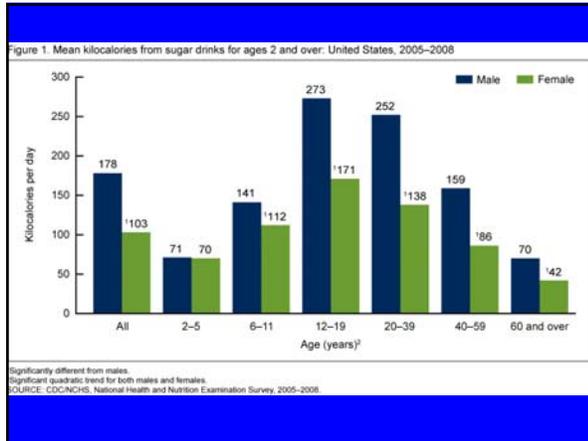
No more than 6 oz/day

American Academy of Pediatrics

Juice vs. Soda



Simple sugars		
Calories per 12 oz	150	170
Carbohydrates (gm)	38	42
Vitamin C (mg)	0	140
Potassium (mg)	0	700
Soft Drink 12 oz. (1 can)		Orange Juice 12 oz. (half glass)





The "Terrible Twos" Independence and Experimentation

Why is this man smiling?

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

Teens: The Soda Issue



- single biggest source of refined sugars in American Diet
- incentives to schools
- increased caries rate
- substitutes for more nutritious drinks like milk

* Nat. Soft Drink Association

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#

Approximate caffeine content in selected drinks

Drink	Serving size	Caffeine
Soft drinks		
Coca-Cola	12 oz.	34 mg
Diet Coke	12 oz.	40 mg
Peppi	12 oz.	38 mg
Spike	12 oz.	0
Collins		
McDonald's Iced	16 oz.	100 mg
Starbucks Caffe latte	16 oz.	150 mg
Starbucks Pike Place Blend	16 oz.	330 mg
Energy drinks		
Amp	16 oz.	100 mg
Fuel Thrust	16 oz.	197 mg
Maverick	16 oz.	100 mg*
NOS	16 oz.	200 mg
Red Bull	16 oz.	104 mg
Rockstar	16 oz.	100 mg
Spike Shooter	8.4 oz.	300 mg
Wired X 344	16 oz.	344 mg
Energy shots		
5-hour Energy	2 oz.	207 mg

* -Maverick energy drinks do not include caffeine content on the label, but company and independent reports put it at about 100 milligrams per 16-ounce serving.

Source: Procter & Gamble, AllergoChew.com, company reports

Best Oral Health/Nutrition Messages for Kids

- Balanced diet high in fruits & veggys
- 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

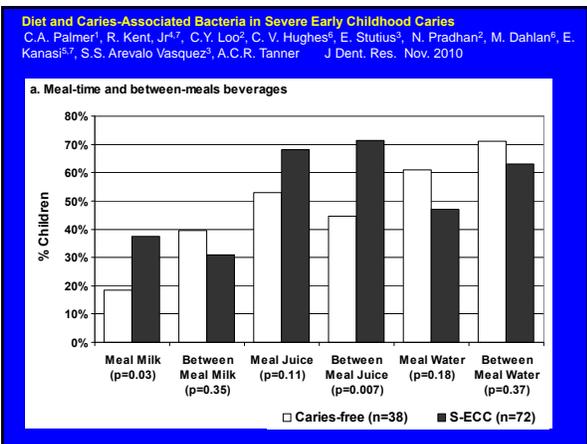


Issues in Diet/Caries Research

- **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 2-10 Cluster analysis :
 - Carbonated soft drinks =8%of total fluid = significantly higher primary caries
 - Juice = 13.7%
 - Milk = 19.4%
 - Plain water = 31.6% *Sohn, Burt, Sowers J Dent Res. 85(30) 262-266 2006*
- Finnish Adults Oral Health: positive assn. 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.952-58, 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)** *Marshall et. al. Pediatrics, 112 (3) pp.184-91, 2003*



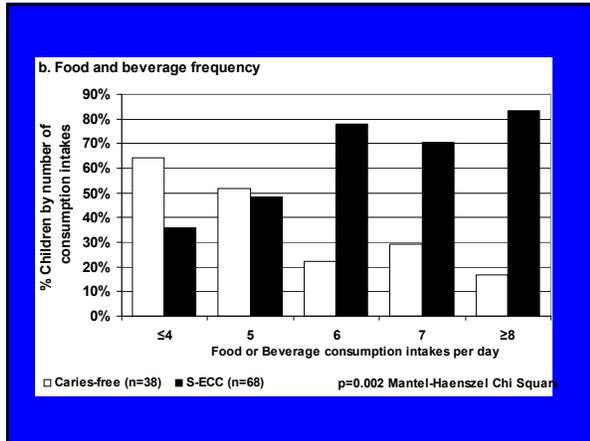


Table 2. Cariogenicity of Daily Food Intake Palmer et al. J Dent Res. 89(11) p.1224-26, 2010

	Caries Free n=38 ^a	Severe-Early Childhood Caries n=68 ^b
Food intake in a typical day (mean± SEM)		
Caries Protective (carioid)	1.05 ± 0.24	1.21 ± 0.16
Cheese, nuts, xylitol	3.90 ± 0.26	3.47 ± 0.20
Non-cariogenic (carioid)		
Meat, fish, poultry, butter/oil, eggs, beans, raw vegetables	6.05 ± 0.42	5.41 ± 0.28
Low cariogenicity (carioid)		
Rice, pasta, cooked vegetables, milk, fresh fruit, unsweetened yogurt	2.69 ± 0.33	4.12 ± 0.31*
Liquids (carioid)		
Juice and juice drinks, ice cream, sweetened yogurt, diet and regular soda	2.72 ± 0.34	4.66 ± 0.36*
Solid/irregular food (carioid) ^c		
Bread, potato chips, crackers, jam/jelly, sweetened cereal, bananas, cookies	16.41 ± 0.63	8.87 ± 0.49*
Total food and beverage items	5.39 ± 0.19	6.13 ± 0.14*
Food and beverage consumption frequency (mean± SEM)		
Estimated cariogenicity by food or beverage (Food cariogenicity score) ^d	2.00 ± 0.05	2.31 ± 0.04*
Total foods and beverages		

^a 24 hr survey data was not available for one caries-free and four S-ECC children.
^b p < 0.005 caries-free compared with S-ECC
^c p < 0.0005 caries-free compared with S-ECC
^d Includes hard candies
^e Food cariogenicity score: 0(carioid0)+1(carioid)+2(carioid1)+3(carioid2)+4(carioid)

- 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 product 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

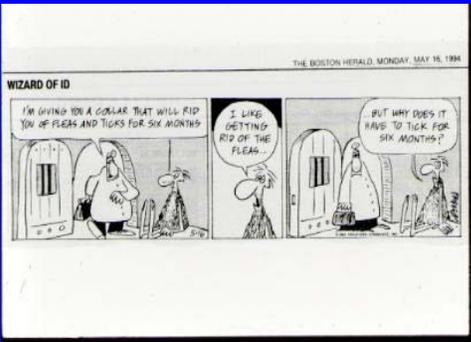
What Are we doing?

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

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

WHAT	HOW
<ul style="list-style-type: none"> • Find out patient expectations 	<p>“Why did you come here today ?”</p>
<ul style="list-style-type: none"> • Explain purpose in positive way 	<p>– “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”.</p>
<ul style="list-style-type: none"> • Get commitment 	<p>– How does that sound to you?</p>

- **Take a 24 hr. recall**
 - 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.
- **Have pt. explain good diet and caries risk**
 - What do you know about what causes cavities and what you should eat?
- **Explain myplate and cariogenicity**
- **Evaluate for general food groups and cariogenic risk**
 - So now let’s look at what you’re doing and have you tell me what you think about your diet.
- **Have patient make dx.**
 - So what do you think about your diet in general and the decay risk?
- **Work with pt. to improve**
 - Any improvements you might make?

Begin Where the Patient Is



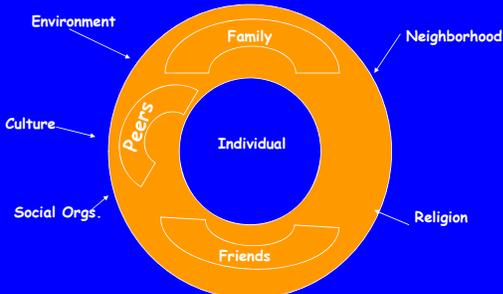
Establish and Pursue Goals

- 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

Open-ended questions lead to UNDERSTANDING



A cartoon illustration showing a woman in a red dress standing by a washing machine. A young boy is asking her several questions. The woman's responses are short and defensive. The boy's questions are: 'MAMMY, WHY DOES MAMMY?', 'MAMMY, WHY DOES MAMMY?', 'MAMMY, WHERE IS...?' and 'MAMMY, WHERE IS...?'. The woman's responses are: 'MAMMY, WHY DOES MAMMY?', 'MAMMY, WHERE IS...?' and 'MAMMY, WHERE IS...?'. The cartoon illustrates how closed-ended questions can lead to defensiveness and short responses, while open-ended questions can lead to understanding.

Do not pass judgement



The top photo shows a doctor in a white coat sitting at a desk with a patient. The doctor is looking at the patient with a neutral expression. The bottom photo shows the same doctor and patient. The doctor is pointing at the patient's arm, and the patient is looking at the doctor with a neutral expression.

Behavioral Model: Transactional Analysis

You



Patient



Parent

Adult

Child

Parent

Adult

Child

Diagram illustrating the Behavioral Model: Transactional Analysis. It shows a grid with 'You' on the left and 'Patient' on the right. The vertical axis represents ego states: Parent, Adult, and Child. Arrows indicate transactions between these states. A thick orange arrow points from the Adult state of 'You' to the Adult state of 'Patient'. Other thinner arrows show transactions between Parent and Parent, Parent and Adult, Adult and Parent, Adult and Child, and Child and Child.

Listen

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

Information Density

Information Retention

↑ ↓



Child/Teen Learners

- u Need relevance to something they care about
- u Figure out who controls eating/when
 - Involve that person
- u Problem-oriented
- u Need Individualization
- u 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 😊

Work with Patient to Set Manageable Goals



Goal Setting Reality Check

- Q:** “since you’ve never flossed before, is it really realistic for you 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?”

FOLLOW UP AND RE-EVALUATE!

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



