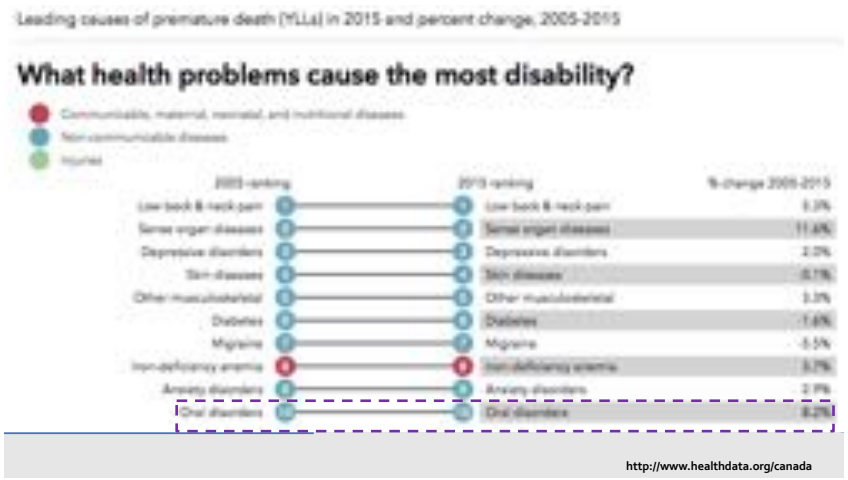
Learning Outcomes:

Periodontal disease as a risk factor or root carries

- Understanding risk factors and modifiers for dental diseases.
- Explain elements of the assessment to determine risk factors.
- Explain components of a diagnosis.
- Identify modifiers in plans
- Identify professional and oral self-care modalities



Health Canada 2007-2009. The sample represents 97% of the Canadian population aged six to seventy-nine years old

- 57% of 6-11 year olds have or have had a cavity.
- 59% of 12-19 year olds have or have had a cavity.
- 96% of adults have a history of cavities.
- 6% of adult Canadians no longer have any natural teeth.
- 21% of adults with teeth have, or have had, a moderate or a severe periodontal problem.

The average number of teeth affected by decay in aged 6-11 and 12-19 year olds is **2.5.**

CDA J Periodontol 2015; Health Canada. Report on the findings of the oral health component of the Canadian Health Measures Survey 2007 – 2009. Available online http://www.hc-sc.gc.ca

Root caries and risk profiles… periodontal disease severity groups

Conclusions.

- Root surface lesions and high caries risk were present in about one-fifth of the patients referred for periodontal treatment.
- A combination of risk indicators rather than a **single one contributed** to the increased risk.

Fadel et al., 2010

Periodontal disease and Root caries

Conclusions:

- The rate of prevalence of root surfaces with caries was 38%;
- The rate of prevalence of root surfaces with caries or restoration was 52,6%;
- the mean value obtained the presence of root caries 1,6% per patients, while the mean value obtained for root caries and restoration amounted to 1,8%
- The percentage of root surfaces with caries associated with recession was 68,5%.
- The percentage of root surfaces with caries associated with inflammation was 31,5%

https://www.researchgate.net/publication/276228163_Periodontal_disease_and_root_caries

Preventative Behaviors:

- ✓73% of Canadians brush twice a day
- ✓28% floss at least 5 times a week

Canadian Health Measures Survey 2007 - 2009. Available online http://www.hc-sc.gc.ca

Process of Care Module- ADPIE

- Assess
- Diagnosis
- Plan
- Implement
- Evaluate

Identify Etiologies and Risk Factors

- **Disease**: is the end result of an infection.
- **Infection**: leads to disease.
- **Risk factors** are described as biological reasons that cause or promote current or future disease.

Identify Etiologies and Risk Factors

- Risk factors traditionally have been associated with the etiology of disease.
- Due to their pathologic nature, risk factors can also serve as an explanation of what could be **corrected** in order to improve the imbalance that exists when disease is present.

Risk Assessment/ Factor Approach

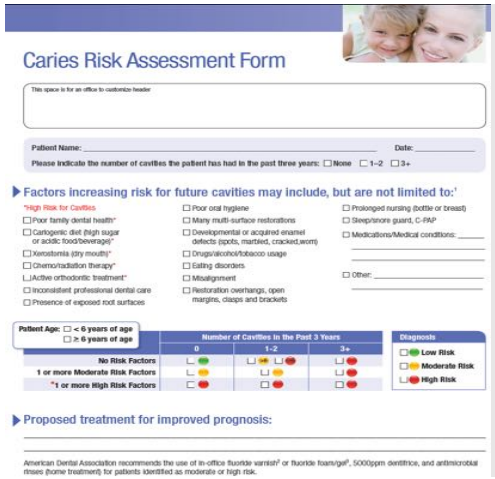
Reducing risk factors:

- In clinical practice, develops client center care plan for promoting oral and overall health
- Globally, reducing risk factors common to many diseases can benefit people on a population level.

Periodontal Risk Assessment /Factors

- The AAP Guidelines describe risk assessment as "…increasingly important in periodontal treatment planning and should be part of every comprehensive dental and periodontal evaluation."
- By using risk assessment for periodontitis, the clinician can focus on early identification and provide proactive, targeted treatment for patients who are at risk.
- Nunn (2003) ; Heitz-Mayfield (2005); Page et al (2002)

https://www.perio.org/plr/risk-factor


Caries Risk Assessment Form

Patient Name: _____ Date: _____

Please indicate the number of cavities the patient has had in the past three years: ☐ None ☐ 1–2 ☐ 3+

Factors increasing risk for future cavities may include, but are not limited to:[1]

*High Risk for Cavities

☐ Poor family dental health*
☐ Cariogenic diet (high sugar or acidic food/beverage)*
☐ Xerostomia (dry mouth)*
☐ Chemo/radiation therapy*
☐ Active orthodontic treatment*
☐ Inconsistent professional dental care
☐ Presence of exposed root surfaces
☐ Poor oral hygiene
☐ Many multi-surface restorations
☐ Developmental or acquired enamel defects (spots, marbled, cracked,worn)
☐ Drugs/alcohol/tobacco usage
☐ Eating disorders
☐ Malalignment
☐ Restoration overhangs, open margins, clasps and brackets
☐ Prolonged nursing (bottle or breast)
☐ Sleep/snore guard, C-PAP
☐ Medications/Medical conditions: _____
☐ Other: _____

Patient Age: ☐ < 6 years of age ☐ ≥ 6 years of age	Number of Cavities in the Past 3 Years			Diagnosis
	0	1-2	3+	
No Risk Factors	☐	☐	☐	☐ Low Risk
1 or more Moderate Risk Factors	☐	☐	☐	☐ Moderate Risk
*1 or more High Risk Factors	☐	☐	☐	☐ High Risk

Proposed treatment for improved prognosis:

American Dental Association recommends the use of in-office fluoride varnish[2] or fluoride foam/gel[3], 5000ppm dentifrice, and antimicrobial rinses (home treatment) for patients identified as moderate or high risk.

CAMBRA

Caries **M**anagement **B**y **R**isk **A**ssessment

cdafoundation.org/journal.

Medical History
- **SDO (Nutrition)**
- **Medications**

Saliva
- **Flow/pH/viscous**

Oral Microbiome
- **Acidogenic bacteria**
- **Biofilm**

Teeth
- **Demineralized lesion**
- **Extent/activity of demineralizati**
- **Characteristics**

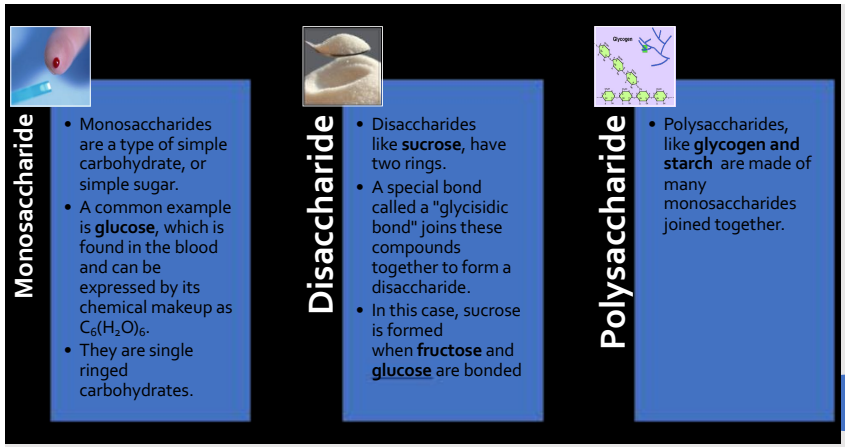
Diet- Nutritional analysis

Dental caries is more than just cavities

- Sugars and carbohydrates of low-molecular weight are major risk elevators for caries and poor overall health.

Sugars

- Monosaccharide
- Disaccharide
- polysaccharide



Medical History

Medications:

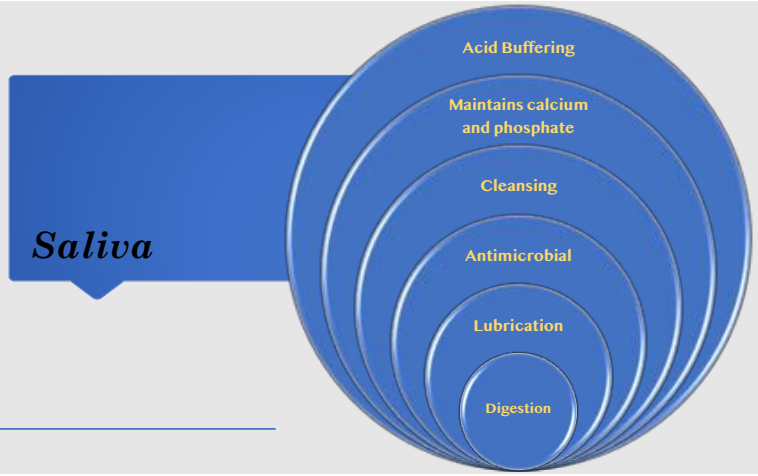
- Antihypertensive drugs
- Antidepressants
- Antibiotics
- Pain medications

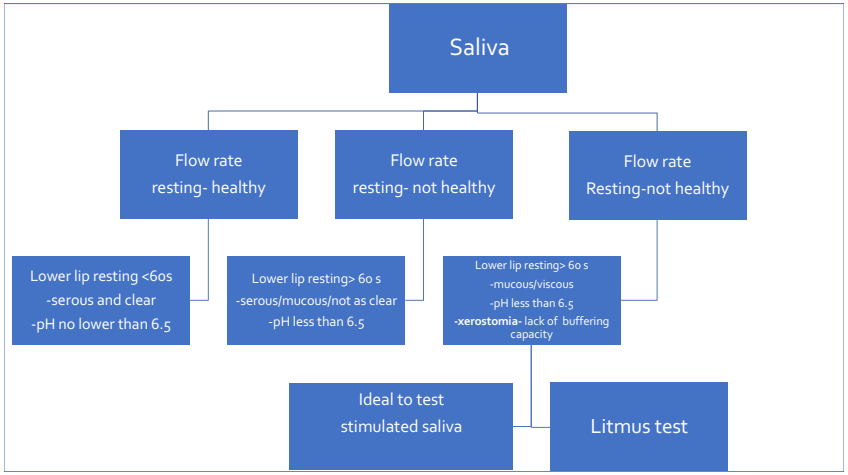
How important is it?

SALIVA

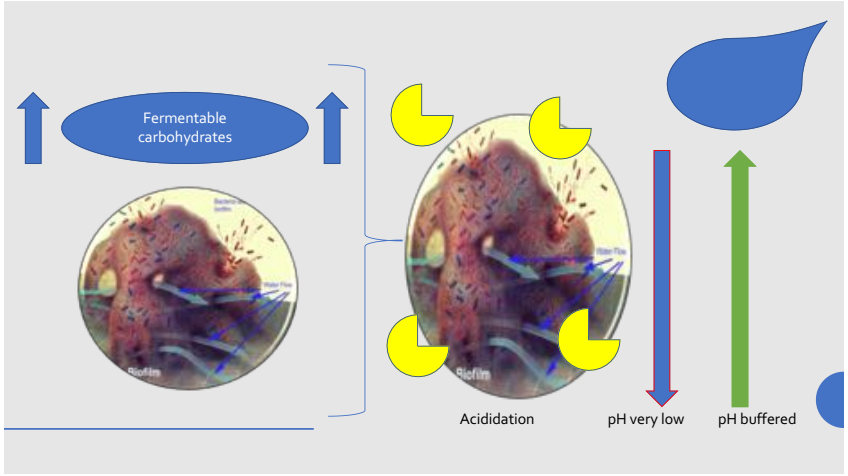
Salivary testing

- Caries management
- Xerostomia
- Periodontal assessment
- Bacterial, fungal, viruses
- Cancer screening
- HIV screening





http://www.gcamerica.com/products/preventive/Saliva_Check_BUFFER/



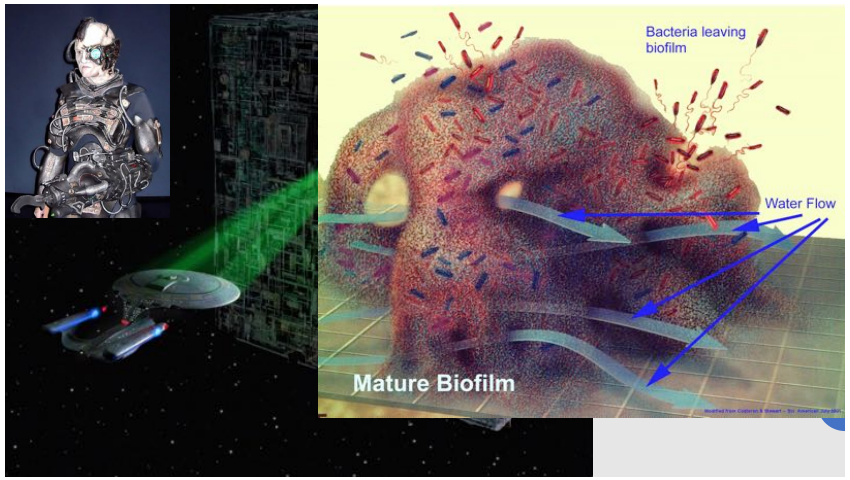
Aciduric Bacteria

- Marsh and Bradshaw (reviewed in 1993) ecological plaque hypothesis.
- Ecological changes with the consumption of large amounts of fermentable carbohydrates (sugars), lead to an intense **acidification** of dental plaque.
- Resulting in a shift in microbial composition of dental plaque with an increase of those bacteria that survive periods of high acidity (i.e., low pH).
- These aciduric bacteria usually also form high amounts of acid.

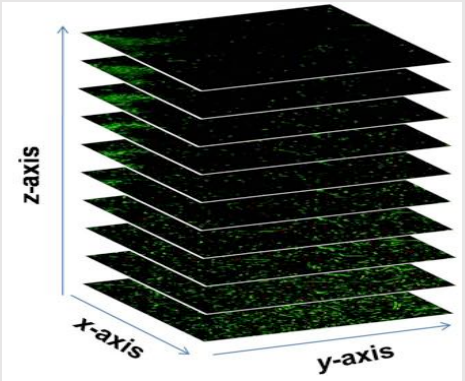
ORAL MICROBIOME

Biofilms

How biofilms form…



Confocal Image of biofilms



Microbiome

- Older term= Oral flora or skin flora
- Biofilms can be composed of
  - multiple species of bacteria or
    - a combination of biofilms

Kidney Stones

- Bacterial biofilms is the etiology to Kidney Stones
- Non-domain bacteria migrated to the area of the urinary track.

Gontier 2017, Hellstrom 1938

Paradigm shift

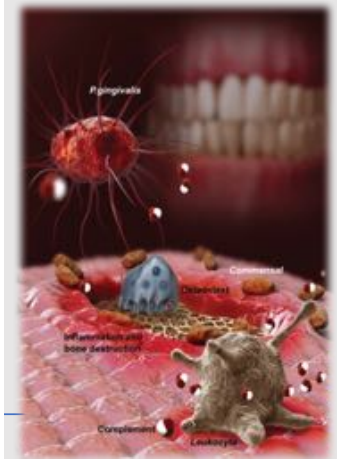
Old Model

- Only **specific periodontal pathogens** cause periodontal disease.
- And that all other bacteria present are beneficial or not related to disease.
- Bacteria load overcomes the host's ability to neutralize them.
- that one or more of the **"red complex"** bacteria (*Porphyromonas gingivalis*, *Treponema denticola*, *Tannerella forsythia*) **must be present in the biofilm colony.**
- Host-specific **genetic factors** resulting in impaired immune response also influence the development and progression of periodontal disease.

New model

- Polymicrobial Synergy and Dysbiosis.
- Initiate a **microbial imbalance** resulting in periodontal disease, rather than by a few select bacteria.
- This creates an imbalance in the microbiome leading to inflammation and periodontal destruction.
- **Entire bacterial colony** is involved in creating an increase in severity of oral inflammation and tissue destruction.

https://aaosh.org/paradigm-shift-clinical-practice/ Journal of Immunology 2014



- From the old model "Only specific periodontal pathogens cause periodontal disease".
- ✓ *New model:*
- ✓ ***Porphyromonas gingivalis***, elevates the virulence of the entire bacterial colony by altering their **gene expression**, rendering them more aggressive.
- *P. gingivalis* flips the switch that converts bacteria, previously thought to be benign, into destructive microbes that contribute to periodontal disease progression.
- Research shows that *P. gingivalis* impairs host immunity, as well.
- For these reasons, *P. gingivalis* is now known as a **keystone pathogen.**
- Your DNA doesn't change but **your gene expression** can- making you susceptible to inflammation.

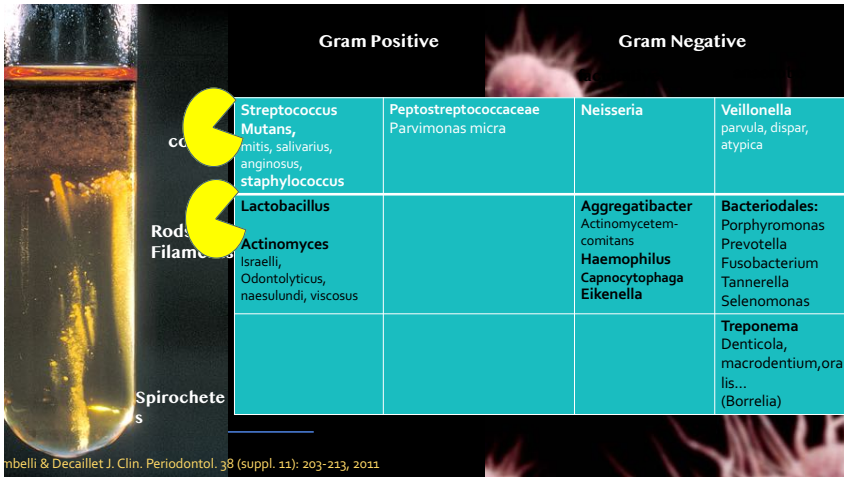
Journal of Immunology 2014

Oral Biofilms- all the same?

Peri-implant microbiome

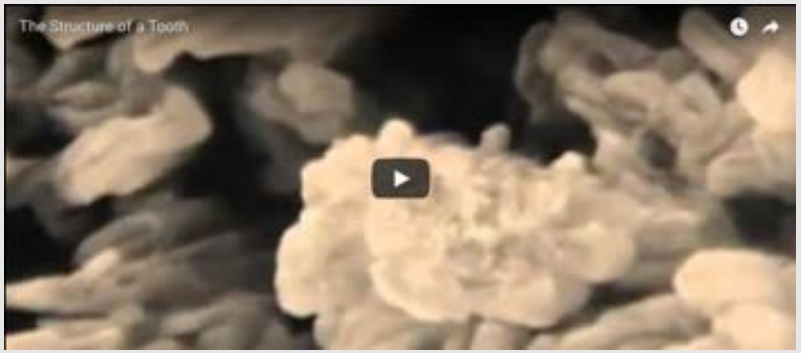
- The peri-implant microbiome (community of organisms) is similar but not exactly the same as periodontitis (teeth)
- Bacteria like, staphylococcus, which are associated with infections of dwelling devices like : joint/hip implants

Mobelli et al ., 2016



TEETH

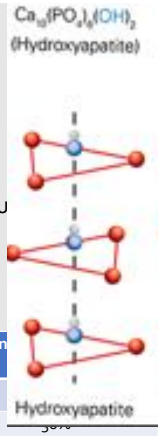
Enamel



Enamel

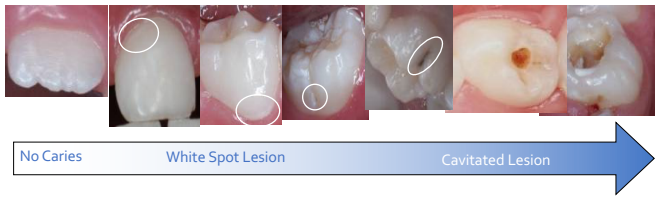
96% inorganic material — ***4% organic material & water***

- Inorganic substance comprises of hydroxyapatite, magnesiu carbonate, calcium carbonate, strontium.
- Organic substances in enamel- sulfhydryl groups, proteins (enamelin), acid mucopolysaccharides



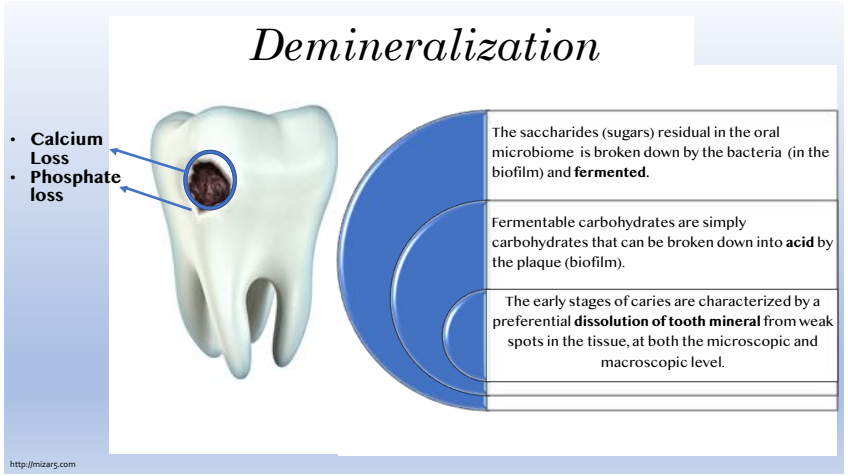
Tissue	Inorganic Content	Organ
Enamel	96%	
Dentin	70%	
Cementum	45-50%	50-55%

Assessing carious lesions



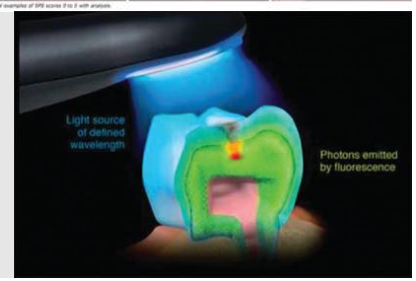
The international caries detection and assessment system: ICDAS.

Demineralization



Another tool in the Assessment Box?

- Basic: Visualize wet, removal of plaque, drying the surface, and proper illumination
- Advanced techniques: digital technology ex: intrinsic fluorescence (QLF)
  - Better evaluation of plaque (no disclosing solution)
  - Change in the optical properties of enamel. Demineralized enamel is illuminated with visible light, a change in fluorescence can be observed and quantified at a deeper level.



Root caries?

- Don't have the rich fluoride layer for protection- exposed dentin?
- No more cememtum?
- Hypersensitivity?

Process of Care Module- ADPIE

- Assess
- **Diagnosis**
- Plan
- Implement
- Evaluate

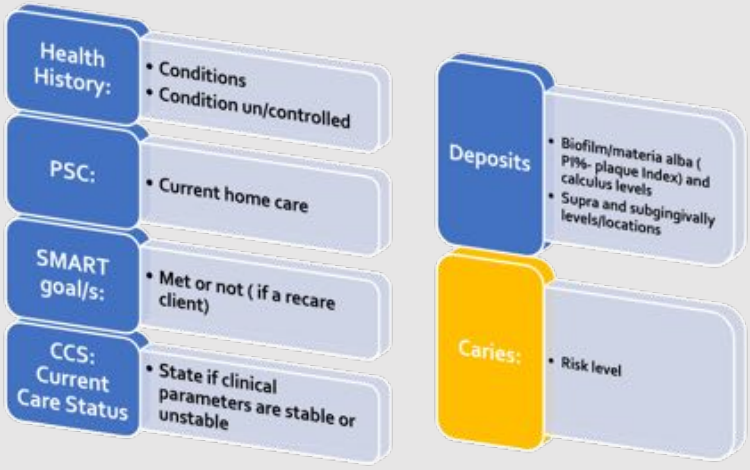
PRACTICE STANDARD POLICY #4
A dental hygienist must analyze the assessment information and make a dental hygiene diagnosis.

4.1 Dental hygienists must establish a dental hygiene diagnosis by interpreting the dental hygiene assessment findings and discussing the implications of the findings with the client or the client's representative. In a clinical setting this should include the implications of conditions that are abnormal or unhealthy, and conditions that require special care.

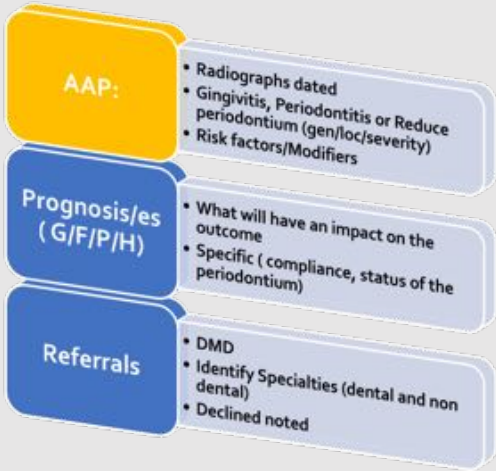
- *A dental hygiene diagnostic statement*

4.2 Dental hygienists may determine short and long-term dental hygiene prognoses.

CDHBC



Criteria for:
A dental hygiene diagnostic statement



Identify Etiologies and Risk Factors

For each "disease" identify the:

- Etiology,
- Risk factors/assessment and
- Any contributing factors

Diagnostic cautions:

Visual inspection

- to detect a demineralized lesion requires a clean and illuminated surface to judge the color and translucency of the surface

Sharp dental explorers or probes

- should ***NOT*** be used to examine a suspected (early) demineralized lesion
- It might reduce the possibility of remineralizing the matrix to its original state.

El-Adwar & MacEntee 2016

Radiographs

- show interproximal lesions,
- BUT do not provide information about the **mineral fluctuations** or **carious activity within a lesion or cavity.**

Radiographs

- radiographs alone can't always
- Sequential radiographs can provide information about the progression and regression of a lesion from the change in size of the radiolucent area.

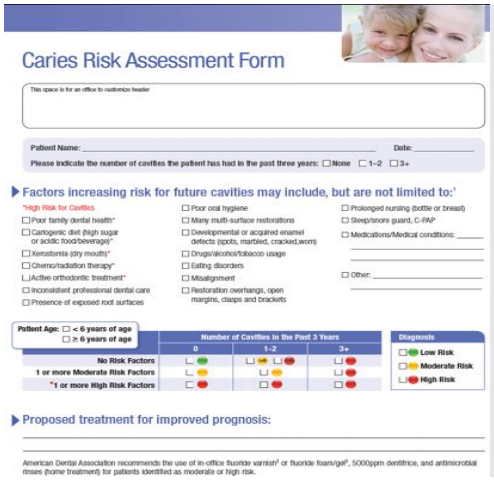
Counts of acidogenic bacteria

- Low numbers of bacteria in saliva or plaque = identifying people with low caries risk;
- BUT high numbers are **insensitive** predictors of people who will get caries lesions.

El-Adwar & MacEntee

CARIES ELEVATORS, INDICATORS & REDUCERS	Write "YES" if present
ELEVATORS	
Residence in community with non-fluoridated water-supply	
Sweet snacks or drinks between main meals	
Medications or other chemicals disturbing saliva	
Low resting salivary flow (<0.3mL/min) / stimulated flow (<1 mL)	
Visible plaque > 50% of the surfaces of 50% of the teeth	
Rough or pitted dental surfaces	
Dental appliance / prosthesis (fixed or removable)	
INDICATORS	
Clinical white (demineralized) spot lesion on smooth surface	
Cavitated carious lesions visible clinically or radiographically	
Dental restorations placed within the last three years	
Identify as HIGH RISK if ≥2 elevators or any indicators are marked	
REDUCERS Identify when patient is at high risk	
Uses of fluoride toothpaste at least once daily	
Used fluoride mouthrinse at least once a week during the previous 6 months.	
Fluoride varnish applied to teeth in previous 6 months	
Used xylitol gum or lozenges daily during previous 6 months at least 6 gm/day	
Used calcium phosphate paste / toothpaste daily in previous 6 months	
IS PATIENT AT HIGH RISK TO CARIES?	
ARE REDUCERS ADEQUATE TO MANAGE THE RISK?	

UBC
Dr. Lamia El-Adwar
Dr. Michael MacEntee


Caries Risk Assessment Form

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Patient Name: _____ Date: _____

Please indicate the number of cavities the patient has had in the past three years: ☐ None ☐ 1–2 ☐ 3+

▶ Factors increasing risk for future cavities may include, but are not limited to:[1]

*High Risk for Cavities

- ☐ Poor family dental health*
- ☐ Cariogenic diet (high sugar or acidic food/beverage)*
- ☐ Xerostomia (dry mouth)*
- ☐ Chemo/radiation therapy*
- ☐ Active orthodontic treatment*
- ☐ Inconsistent professional dental care
- ☐ Presence of exposed root surfaces
- ☐ Poor oral hygiene
- ☐ Many multi-surface restorations
- ☐ Developmental or acquired enamel defects (spots, mottled, cracked,worn)
- ☐ Drugs/alcohol/tobacco usage
- ☐ Eating disorders
- ☐ Misalignment
- ☐ Restoration overhangs, open margins, clasps and brackets
- ☐ Prolonged nursing (bottle or breast)
- ☐ Sleep/snore guard, C-PAP
- ☐ Medications/Medical conditions: _____
- ☐ Other: _____

Patient Age: ☐ < 6 years of age ☐ ≥ 6 years of age

	Number of Cavities in the Past 3 Years			Diagnosis
	0	1-2	3+	
No Risk Factors	☐	☐	☐	☐ Low Risk
1 or more Moderate Risk Factors	☐	☐	☐	☐ Moderate Risk
*1 or more High Risk Factors	☐	☐	☐	☐ High Risk

▶ Proposed treatment for improved prognosis:

_____

_____

American Dental Association recommends the use of in-office fluoride varnish[2] or fluoride foam/gel[3], 5000ppm dentifrice, and antimicrobial rinses (home treatment) for patients identified as moderate or high risk.

CAMBRA

Caries **M**anagement **B**y **R**isk **A**ssessment

cdafoundation.org/journal.

CAMBRA

RISK FACTORS

- Bacterial medium
- Visible heavy plaque
- Frequent snacks (more than 3x between meals)
- Deep pits and fissures
- Recreational drug use
- Salivary flow rate
- Exposed roots
- Orthodontic appliances

Protective Factors

- Lives/work/school fluoridated community
- Fluoride toothpaste at least once daily
- Fluoride toothpaste at least 2x daily
- Fluoride mouth rinse (0.05% NaF) daily
- 5,000 ppm fluoride toothpaste daily
- Fluoride varnish in last 6 months
- Office Fluoride topical in last 6 months
- Chlorhexidine prescribed/used one week each of last 6 months
- Xylitol gum/lozenges 4x daily last 6 months
- Calcium and phosphate paste during last 6 months
- Adequate saliva flow (> 1 ml/min stimulated)

Low risk

- No carious lesions in 36 months,
- adequate home care, fluoride,
- infrequent meals,
- no orthodontic appliances,
- no dry mouth

Moderate risk

- One or two lesions in 36 months,
- ineffective plaque removal,
- interproximal restorations present,
- exposed roots may or may not be present,
- Orthodontics, appliances,
- dry mouth

High risk

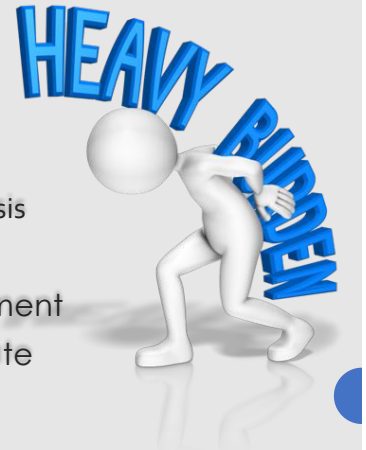
- 3 or more lesions in 36 months,
- missing teeth due to decay,
- visible plaque
- exposed root surfaces,
- overhangs or open margins on restorations,
- dry mouth, poor OHI
- & contacts,

Are you willing to consider a shift?

- Shift is not “educating” but a behavior change

Process of Care Module- ADPIE

- Assess
- Diagnosis
- **Plan**
- Implement
- Evaluate



*pre~ven~tive

Adjective:

- Designed to keep something undesirable from happening.

Noun:

- A medicine or "treatment" designed to stop disease or ill health from occurring

Fundamental concepts

- **Calcium Loss**
- **Phosphate loss**

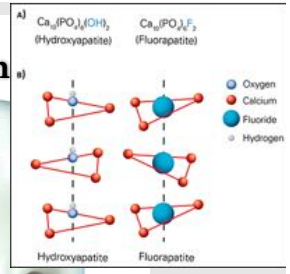
The saccharides (sugars) residual in the oral flora is broken down by the bacteria (in the biofilm) and **fermented**.

Fermentable carbohydrates are simply carbohydrates that can be broken down into **acid** by the plaque (biofilm).

The early stages of caries are characterized by a preferential **dissolution of tooth mineral** from weak spots in the tissue, at both the microscopic and macroscopic level.

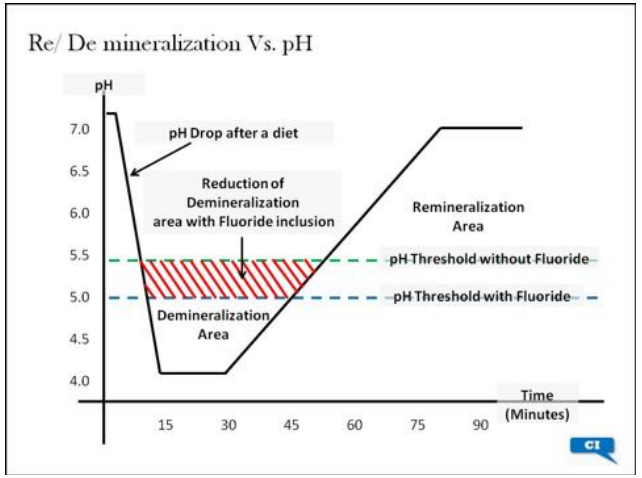
http://mizars.com

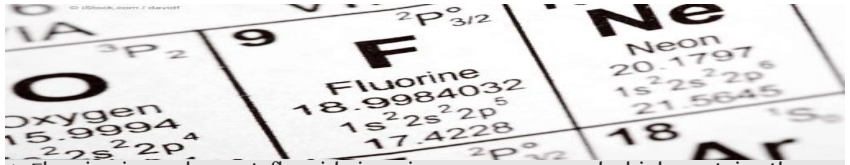
Remineralization



- Calcium and phosphate ions are deposited back into the tooth rebuilding hydroxyapatite.
- If fluoride is also added, forms fluorapatite.

Calcium + Phosphate + Fluoride = Fluorapatite
Stronger Tooth Structure!

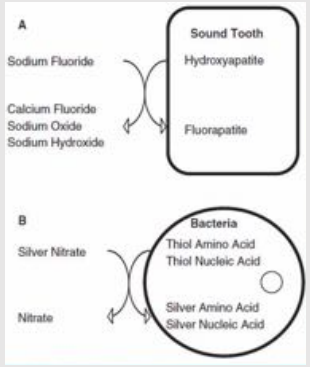




- Fluorine is an element; fluoride is an ion or a compound which contains the fluoride ion.
- Fluoride is the negative ion of the element **fluorine**.
- Any compound, whether it is organic or inorganic, that contains the fluoride ion is also known as a fluoride.
- Examples include CaF_2 (calcium fluoride) and NaF (sodium fluoride).

Silver diamine fluoride (SDF

- a colorless liquid that at pH 10 is 24.4% to 28.8% (weight/volume) silver and 5.0% to 5.9% fluoride ions.



www.ada.org

PPM? Why is relevant?

Fluoride conversion chart	
APF (10)(%)(1000)	ppm
1.0%	10,000
1.23%	12,300
NaF (4.5)(%)(1000)	ppm
0.05%	225
0.20%	900
0.44%	1,980
1.0%	4,500
1.1%	4,950
2.0%	9,000
5.0%	22,500
SnF_2 (2.4)(%)(1000)	ppm
0.40%	960
0.63%	1,512

Toothpaste:

- Most brands 0.22% - 1,000ppm and 0.312% (1,400ppm)
- Usually sodium fluoride or sodium monofluorophosphate
- 1.1% brands – 5000ppm sodium fluoride
- Stannous fluoride 0.454% -960ppm

Rinses:

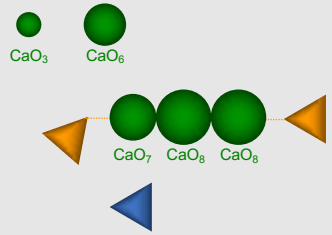
- Most brands: Sodium fluoride 0.05% to 0.2% - 225-1,000ppm
- The concentration of fluoride in ductal saliva, as it is secreted from salivary glands, is low - 0.016 parts per million (ppm)

Examples of fluoride content			
Food/Drink	Fluoride (mg per 100 g)	Portion	Fluoride (mg per portion)
Black tea (brewed)	0.373	1 cup, 240 g (8 fl oz)	0.884
Raisins, seedless	0.234	small box, 43 g (1.5 oz)	0.101
Table wine	0.153	Bottle, 750 ml (26.4 fl oz)	1.150
Municipal tap-water, (Fluoridated)	0.081	Recommended daily intake, 3 litres (0.79 US gal)	2.433
Baked potatoes, Russet	0.045	Medium potato, 140 g (0.3 lb)	0.078
Lamb	0.032	Chop, 170 g (6 oz)	0.054
Carrots	0.003	1 large carrot, 72 g (2.5 oz)	0.002

Data taken from United States Department of Agriculture, National Nutrient Database

Tri-Calcium Phosphate

- Food-Grade Source of calcium
- Comprised of*
  - Calcium oxides →
  - Calcium phosphates→
  - Free phosphates →



* Yashima et al. Crystal structure analysis of β-tricalcium phosphate $Ca_3(PO_4)_2$ by neutron powder diffraction. J Solid State Chem. 2003; 175:272-277

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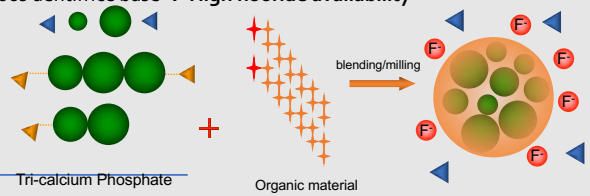
Tri-Calcium Phosphate

- When blended/milled with organic materials
  - Calcium – phosphate bonds are broken
  - Calcium oxides become 'protected' by the organic materials
- Demonstrated by an increase in free phosphates after milling
  - Process allows the Innovative functionalized TCP ingredient to coexist with fluoride ions in an aqueous dentifrice base → **High fluoride availability**



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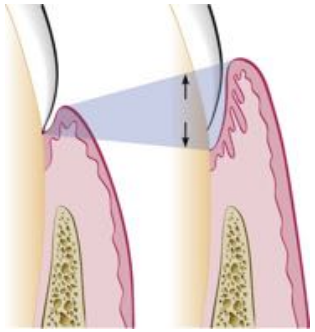
Process of Care Module- ADPIE

- Assess
- Diagnosis
- Plan
- **Implement**
- Evaluate

ADJUNCTS

Location of oral biofilms



Firmly Attached:

- Enamel,
- Cementum and
- Dentin (if exposed)
- Epithelial tissue surfaces
- Tongue
- Throat

Loosely attached:

- Crevicular Fluid

Full mouth disinfection with Glycine Air flow/ Polishing?

- Bacteria are not limited to supra and subgingival tooth surfaces.
- Recolonization- 11 days the biofilm has returned. Average 3mths?
- 2012 a study done by Flemmig et al. resulted in a reduced oral load of P. gingivalis compared to conventional treatment using hand instruments.

Recommendations for Remineralization

In office

- Sealants
- Fluoride Varnish with enhanced remineralization like TCP, ACP
- Vanish XT Extended Contact-Glass ionomer
- Cervitec* varnish

Out of office

- Antibacterial : bactericidal and bacteriostatic
- Rinses
- Toothpaste
- Xylitol
- Saliva Stimulants-xylitol
- Glycerin sticks

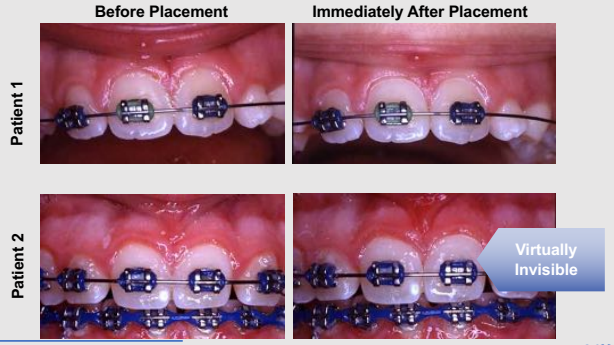
Academies rec'd

- The American Academy of Pediatrics is now recommending that children have fluoride varnish placed on their teeth every 3 to 6 months.
- The statement was added to the Academy's 2015 Recommendations for Preventive Pediatric Health Care guidelines that may be viewed in the August 31, 2015 issue of the journal Pediatrics.
- CDA, ADA

Vanish XT Extended Contact

- Site-specific, durable protective coating for enamel and dentin tooth surfaces
- Light-cured glass ionomer - two-part liquid/paste system.
  - All the major benefits of glass ionomer materials
  - Sustained fluoride and calcium release.
- Clicker™ Dispensing System
- Prolonged working time
- Short set time achieved by light curing

Orthodontic Bracket Application



Photos courtesy of Kevin J. Donly DDS, MS UTHSCSA

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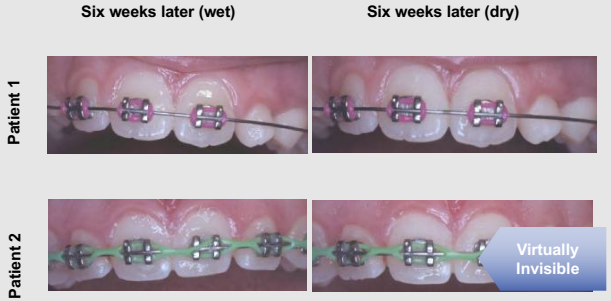
Orthodontic Bracket Application



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ANTIMICROBIAL

- Antimicrobials require repeated applications at various intervals, depending on the agent.
- Chlorhexidine gluconate rinse has been widely studied
- ,FDA-approved to treat gingivitis, when used off label as a 30-second rinse every day of the first week of every month,
- Effective in **reducing** the levels of **MS** bacteria but **is not** as effective against **LB.**

CAMBRA clinical guidelines of antimicrobials

- CAMBRA clinical guidelines recommend the use of antimicrobials for
- patients over six years of age who are classified as being at high or extreme risk for caries, and
- for caregivers of noncompliant moderate through extreme risk children under the age of six

Xylitol

- naturally occurring sugar alcohol **reduces** the amount of MS and the quantity of plaque biofilm when habitually consumed

CAMBRA Clinical Guidelines

- recommend the use of xylitol to control the cariogenic bacteria S. mutans for patients over six years of age who are classified as being at **moderate to extreme risk for caries.**

High or Extreme risk

- **Power toothbrushes** may be helpful in the delivery and retention of fluoride.
- Recent research has shown that a **sonic** toothbrush enhances fluoride effects on the plaque biofilm, causing increased fluoride delivery and retention at the tooth surface.

Salivary

- In addition, for patients at extreme risk (demonstrating hyposalivation, or reduced salivary flow), the **sonic power toothbrush** has been shown to increase salivary flow and decrease the numbers of incipient and root caries, as compared to a manual toothbrush

Aspiras M, Stoodley P, Nistico L, Longwell M, de Jager M. Clinical implications of power toothbrushing on uoride delivery: e ects on bio lm plaque metabolism and physiology. Int J Dent. 2010. doi: 10.1155/2010/651869.

Fluoride Efficacy Release in toothpaste

- All fluorides as the main ingredient are dependent on detergents (ex: sodium lauryl sulfate), abrasive and other non-ingredients to be present for sufficient fluoride efficacy.

3 categories of fluoride from toothpaste during brushing

Free ionic fluoride	Profluoride	Unavailable fluoride compounds
• Ability to react with tooth structure • Interfere with microbial metabolism • Absorb to the oral mucosa • Anticaries efficacy	• Delivered or precipitate in the oral cavity during brushing • Release ionic fluoride over time • Contribute to anticaries efficacy • Ex: Monofluorophosphate	• Do not release fluoride ions-swallowed or expectorated

Fluoride and Implants

- Conclusion: 0.05% to 2.0% concentrations of Acidulated Phosphate Fluoride (APF) solutions (corresponding to 226 to 9,050 ppm fluoride at pH 3.5 or 3.6) can remove the oxide layer on implants which makes the titanium anti-corrosion.
- Avoid straight baking soda
- Tartar/stain remover

Matono Y et al., 2006

Chlorhexidine gluconate

- Bisbiguanides
- **Cationic molecule**
- Broad spectrum antibacterial agent
- Strongly binds to the proteins . Releases slowly
- 8-12 hours substantivity; 24 hour effective period
- Strep Mutans and Lactobacilli in the biofilm : Opening up the cell membranes of the bacteria

Challenges:

- Stain and change in taste
- Slough tissues
- Increase deposits (calculus, stain)/cost $$
- Asian had one anaphylactic reaction.

PPR: Effective rinse: 10ml-15ml -60seconds

- For antiplaque/ antigingivitis effectiveness is limited to the antiseptic formulations that contain alcohol.

Essential Oils: A Definition

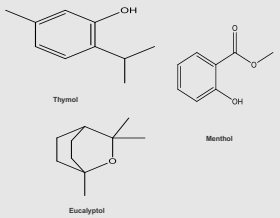
The essential oils (EO) consist of 3 different oils, each with their own antimicrobial properties and flavours

ESSENTIAL OIL	Menthol	Thymol	Eucalyptol
DERIVED FROM	Peppermint	Thyme	Eucalyptus

Disclaimer
Not all essential oils in the current formula are natural ingredients.

Listerine 2017

Essential Oils Phenolic



- Destroy microorganism by compromising the cell membrane and inhibit enzyme activity,
- Stops aggregation of bacteria,
- Slows bacterial multiplication,
- Reduces the overall bacterial load,
- Anti-inflammatory properties,
- Higher penetration of biofilms,
- Decreased microbial viability in deeper layers of the biofilms after a single.
- **Nonionic, non-substantive**
- Alteration of Neutrophil function

PPR: Effective rinse; 10ml 60 seconds 30 sec kill time

Prada & Lopez et.al 2013,Aasodorian, Sharma et al. 2004, Gontier 2017

2016 CDHA position paper on therapeutic oral rinsing

•Research demonstrates that a commercially available **essential oil oral rinse**, with a fixed combination of thymol 0.063%, eucalyptol 0.091% and menthol 0.042%, provides statistically and clinically significant **plaque** and **gingival inflammation reductions** beyond that accomplished by mechanical means, and **should be recommended** as a daily complement to tooth brushing and interdental mechanical cleaning for adults clients.

Therapeutic oral rinsing with commercially available products: Position paper and statement from the Canadian Dental Hygienists Association
Joanna Asadoorian*, PhD, RDH - Can J Dent Hyg 2016;50(3): 126-139

3 Main Risk Factors to help you…

Saliva-

– How do we enhance the quality and quantity to ensure best uptake of minerals needed for remineralization,

Bacteria-

– How do we shift the balance to protective/reducer of risk?

– Destructive lifestyle habits

– frequent ingestion of fermentable carbohydrates, and poor oral hygiene (self care)

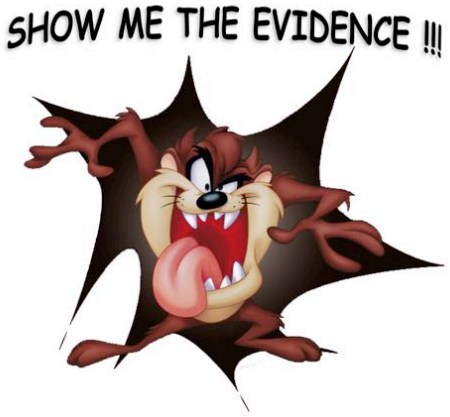
Table 6. Example of a Caries Management Protocol for ≥6 Year-Olds

Risk Category	Diagnostics	Interventions			Restorative
		Fluoride	Diet	Sealants[1]	
Low risk	– Recall every six to12 months – Radiographs every 12 to 24 months	– Twice daily brushing with fluoridated toothpaste[2]	No	Yes	– Surveillance[3]
Moderate risk patient/parent engaged	– Recall every six months – Radiographs every six to 12 months	– Twice daily brushing with fluoridated toothpaste[2] – Fluoride supplements[4] – Professional topical treatment every six months	– Counseling	Yes	– Active surveillance[3] of incipient lesions – Restoration of cavitated or enlarging lesions
Moderate risk patient/parent not engaged	– Recall every six months – Radiographs every six to 12 months	– Twice daily brushing with toothpaste[2] – Professional topical treatment every six months	– Counseling, with limited expectations	Yes	– Active surveillance[3] of incipient lesions – Restoration of cavitated or enlarging lesions
High risk patient/parent engaged	– Recall every three months – Radiographs every six months	– Brushing with 0.5 percent fluoride – Fluoride supplements[4] – Professional topical treatment every three months	– Counseling – Xylitol	Yes	– Active surveillance[3] of incipient lesions – Restoration of cavitated or enlarging lesions
High risk patient/parent not engaged	– Recall every three months – Radiographs every six months	– Brushing with 0.5 percent fluoride – Professional topical treatment every three months	– Counseling, with limited expectations – Xylitol	Yes	– Restore incipient, cavitated, or enlarging lesions

aapd.org

Oral Systemic Health

- Obesity
- Alzheimer
- Metabolic Syndrome
- Diabetes
- Cardiovascular disease
- Stroke
- Cancers
- Erectile dysfunction
- Acid reflux
- Sleep Apnea
- Pregnancy



HOW DO I DECIDE WHICH STUDIES (LEVEL OF EVIDENCE) TO USE?

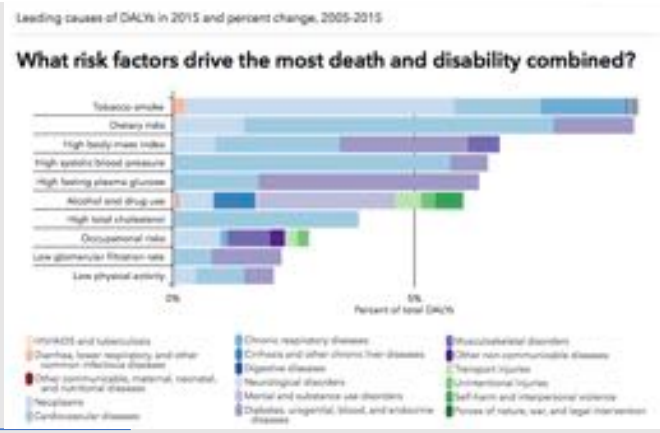
EIDM Resources

- National Guideline Clearinghouse
  - http://www.guideline.gov
- TripBase.
  - https://www.tripdatabase.com
- School of Health and Related Research (ScHARR). University of Sheffield UK
  - http://www.shef.ac.uk/library/subjects/dentir.html
- Agree tool
  - http://www.agreetrust.org/wp-content/uploads/2013/10/AGREE-II-Users-Manual-and-23-item-Instrument_2009_UPDATE_2013.pdf
- Critical Appraisal Skills Program (CASP)
  - http://www.casp-uk.net/#!appraising-the-evidence/c23r5

Motivational Interviewing- Emotional connection…evidence isn't enough

- The main focus of motivational interviewing is to help the patient overcome ambivalence to behavior change.
- Understanding the driving and the restraining forces.
- Focus on the restraining forces.

Primary Oral Health Care Provider



http://www.healthdata.org/canada

“ do what you do best and refer the rest”