Actively Engaging and Enhancing Students' Knowledge of CAMBRA through Technology

Michael Suh, DDS

Tim Verceles DDS

ADEA | THE VOICE OF DENTAL EDUCATION

AMERICAN DENTAL EDUCATION ASSOCIATION

UNIVERSITY OF THE PACIFIC

Arthur A. Dugoni School of Dentistry

"Speakers agree that neither they nor members of their immediate family have any financial relationships with commercial entities that may be relevant to their presentation."

ADEA | THE VOICE OF DENTAL EDUCATION

AMERICAN DENTAL EDUCATION ASSOCIATION

Introduction

- *College*: University of California, Davis, CA
- *Dental School*: University of the Pacific, Arthur A. Dugoni School of Dentistry, San Francisco, CA
- *Residency*: St. Barnabas Hospital (SBH Health System), Bronx, New York

UNIVERSITY OF THE PACIFIC
Arthur A. Dugoni School of Dentistry

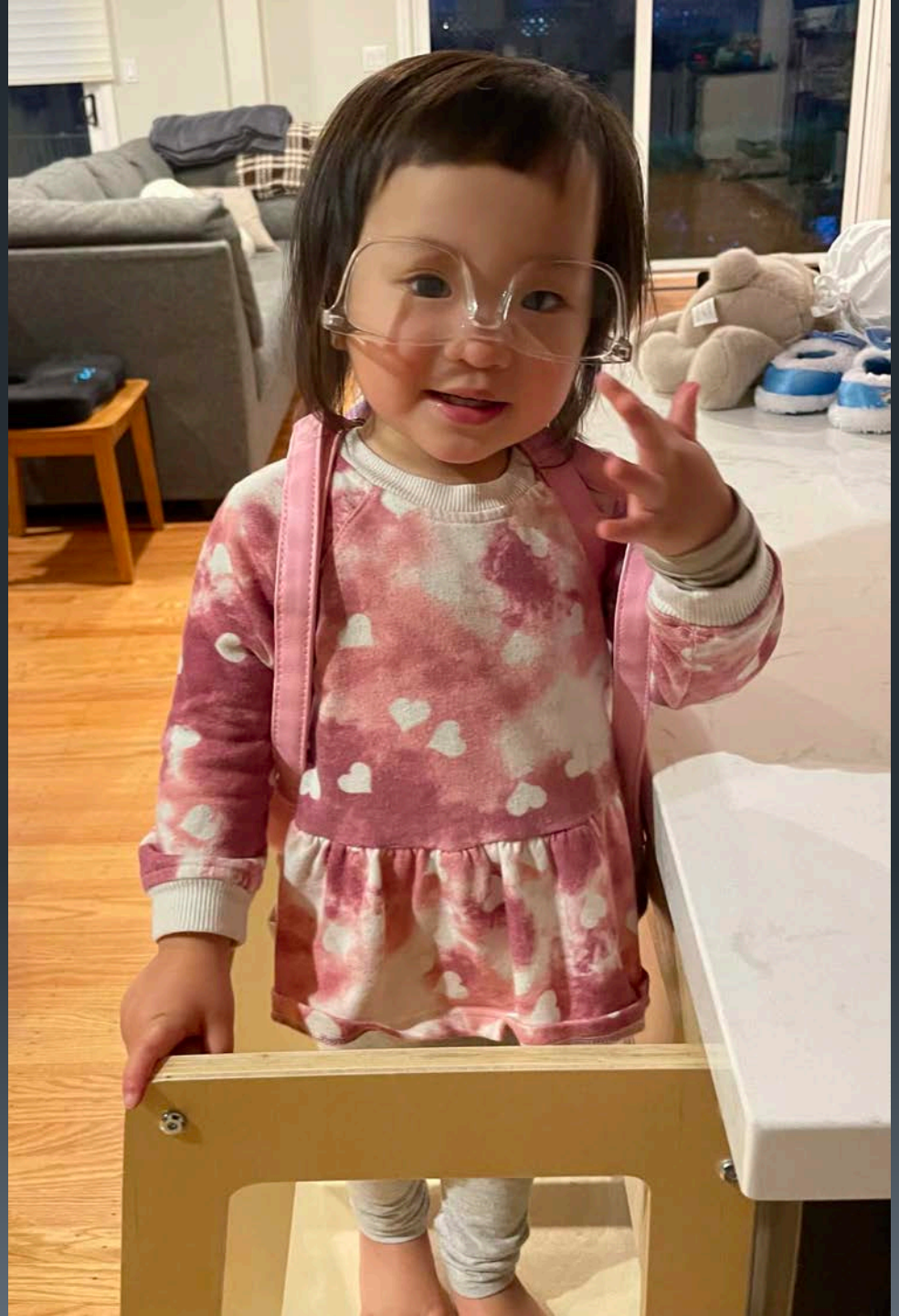
SBH Health System BRONX

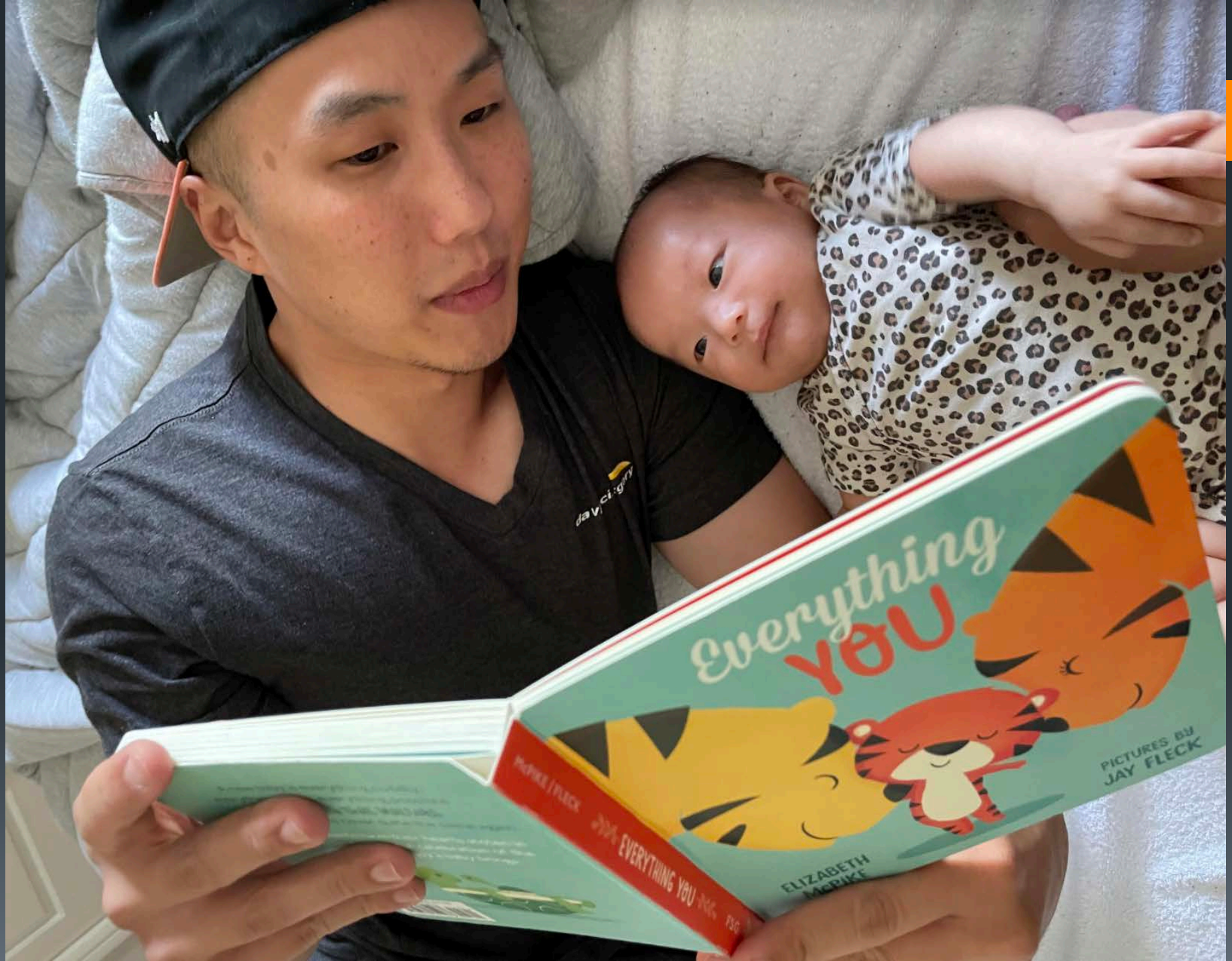
Learning Objectives

1) Introduce evidence-based strategies and tools to promote active learning for students

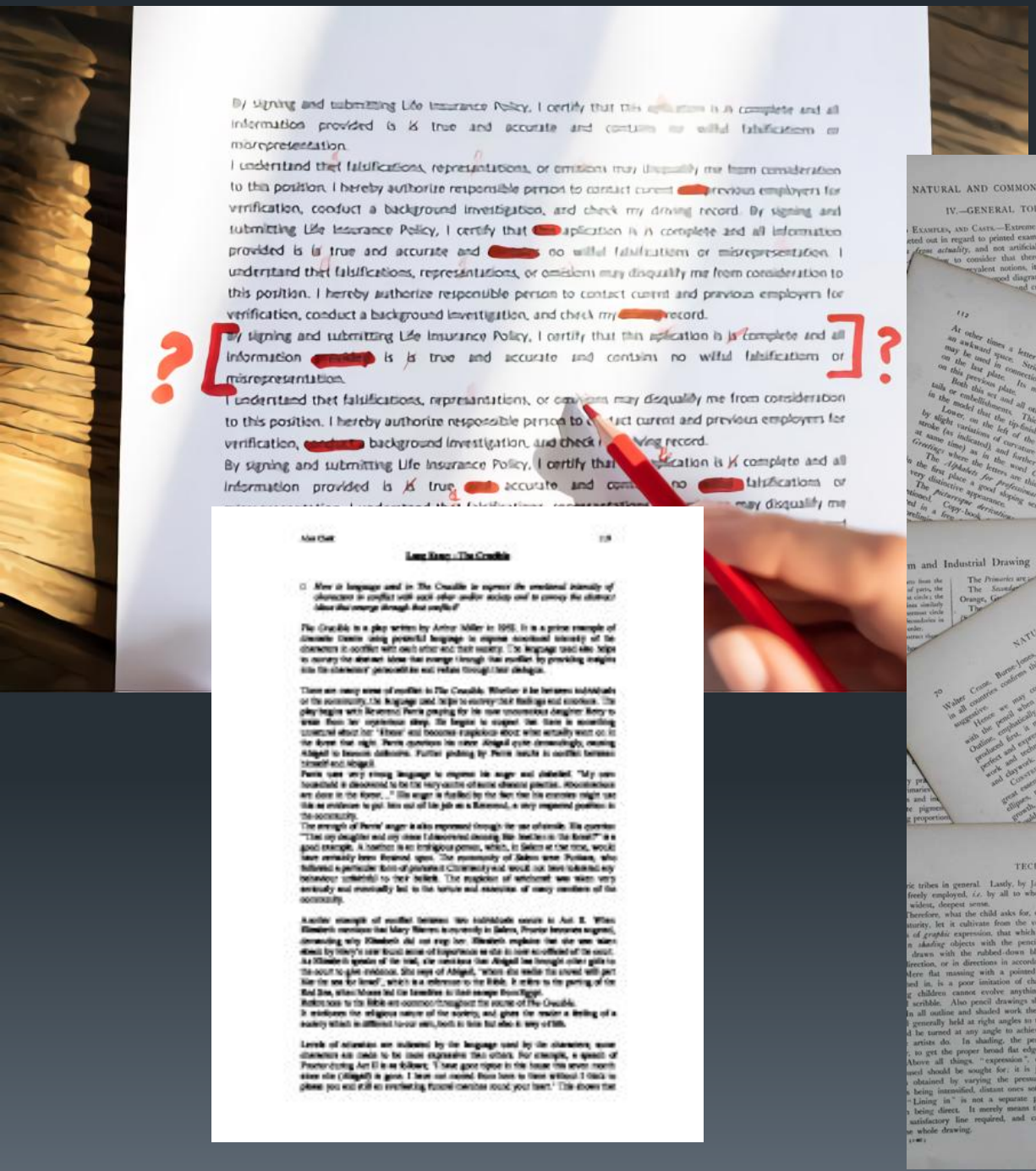
2) Apply evidence-based strategies and tools to enhance knowledge retention

3) Evaluate short-term outcomes of innovative technological tools used for active learning




Everything
YOU
PICTURES BY
JAY FLECK
ELIZABETH
EVERYTHING YOU


KIRKLAND



Long Essay - The Crucible

How is language used in The Crucible to express the emotional intensity of characters in conflict with each other and/or society and to convey the abstract ideas that emerge through that conflict?

The Crucible is a play written by Arthur Miller in 1953. It is a prime example of dramatic literature using powerful language to express emotional intensity of its characters in conflict with each other and their society. The language used also helps to convey the abstract ideas that emerge through that conflict by providing insights into the characters' personalities and values through their dialogue.

There are many areas of conflict in *The Crucible*. Whether it be between individuals or the community, the language used helps to convey their feelings and emotions. The play begins with Reverend Parris praying for his near unconscious daughter Betty to awaken from her mysterious sleep. He begins to suspect that there is something unnatural about her illness and becomes suspicious about what actually went on in the forest that night. Parris questions his niece Abigail quite demandingly, causing Abigail to become defensive. Further probing by Parris results in conflict between himself and Abigail.

Parris uses very strong language to express his anger and disbelief. "My own household is destroyed in the very centre of some obscene practice. Abominations are done in the forest..." His anger is fuelled by the fact that his enemies might use this as evidence to get him out of his job as a Reverend, a very important position in the community.

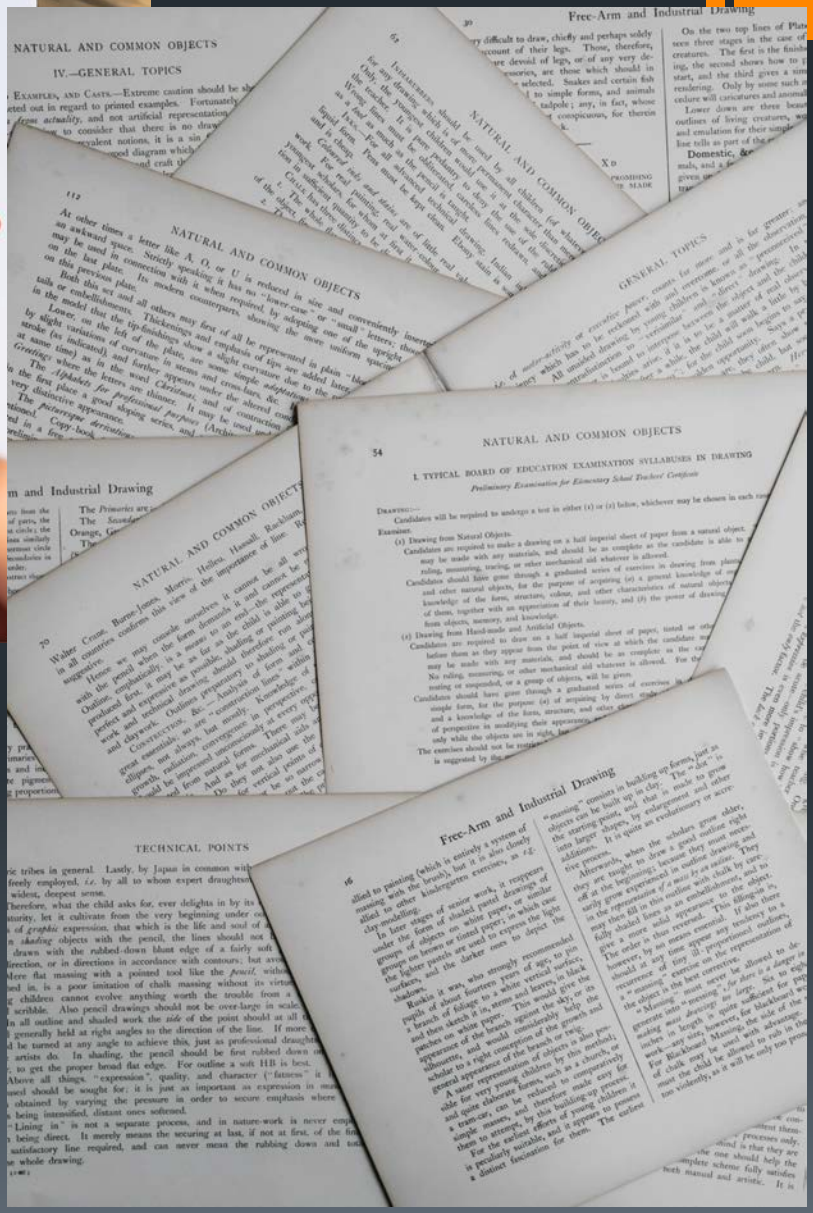
The strength of Parris' anger is also expressed through the use of irony. His question "Then my daughter and my niece I discovered dancing like heathens in the forest?" is a good example. A heathen is an irreligious person, which, in Salem at the time, would have certainly been frowned upon. The community of Salem were Puritans, who followed a particular form of protestant Christianity and would not have tolerated any behaviour unfaithful to their beliefs. The expulsion of witchcraft was taken very seriously and eventually led to the torture and execution of many members of the community.

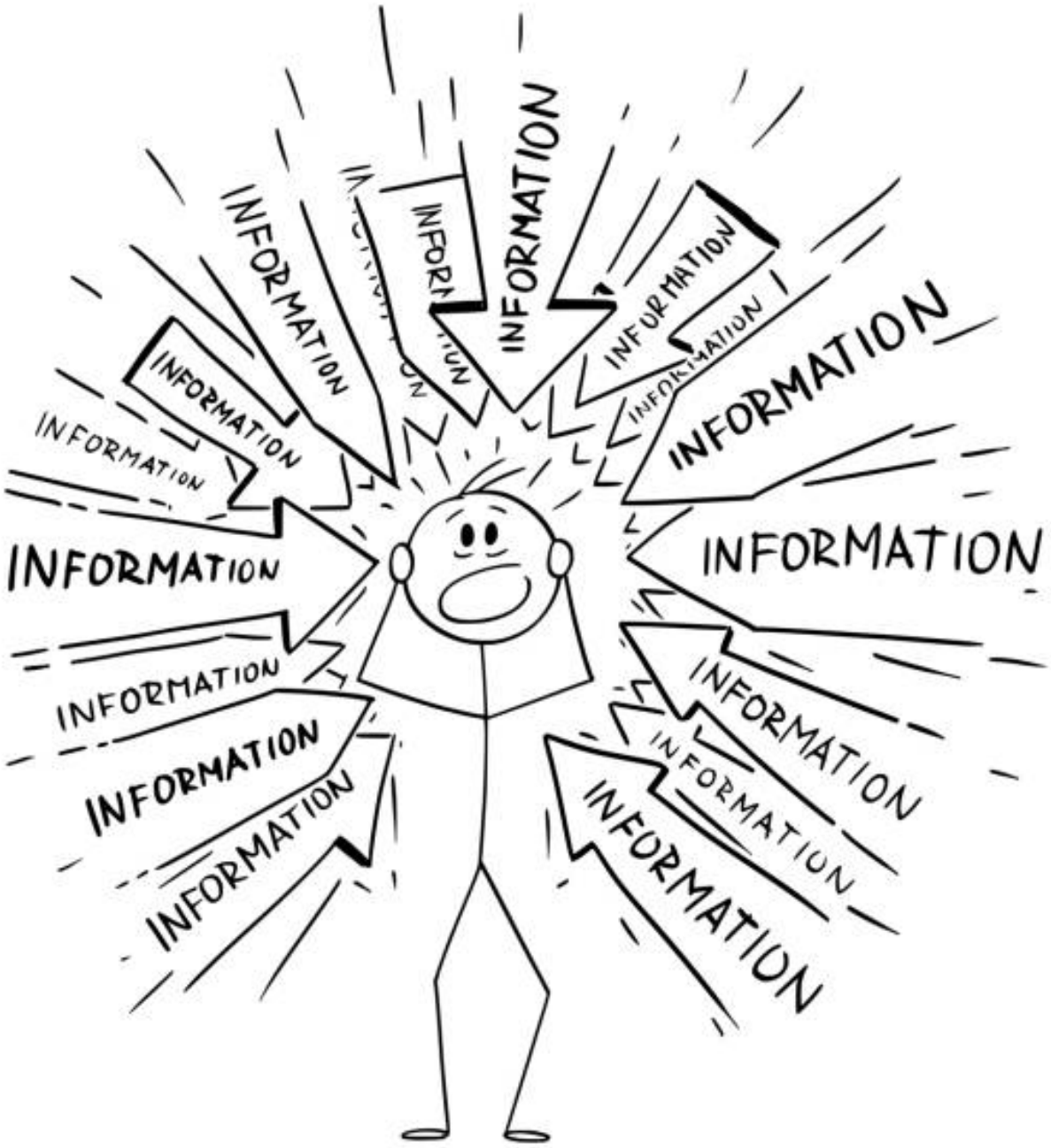
Another example of conflict between two individuals occurs in Act II. When Elizabeth mentions that Mary Warren is currently in Salem, Proctor becomes angered, demanding why Elizabeth did not stop her. Elizabeth explains that she was taken aback by Mary's new found sense of importance as she is now unaffected of the court. As Elizabeth speaks of the trial, she mentions that Abigail has brought other girls to the court to give evidence. She says of Abigail, "whom she swore she would kill me with her two fist for herself", which is a reference to the Bible. It refers to the parting of the Red Sea, when Moses led the Israelites to their escape from Egypt.

References to the Bible are common throughout the course of *The Crucible*.

It underpins the religious nature of the society, and gives the reader a feeling of a society which is different to our own, both in time but also in way of life.

Levels of emotion are indicated by the language used by the characters, some characters are made to be more expressive than others. For example, a speech of Proctor during Act II is as follows; "I have gone repose in the house this seven month since she (Abigail) is gone. I have not courted there here in three without I think to please you and still no overbearing frenzied exercise could your heart." This shows that

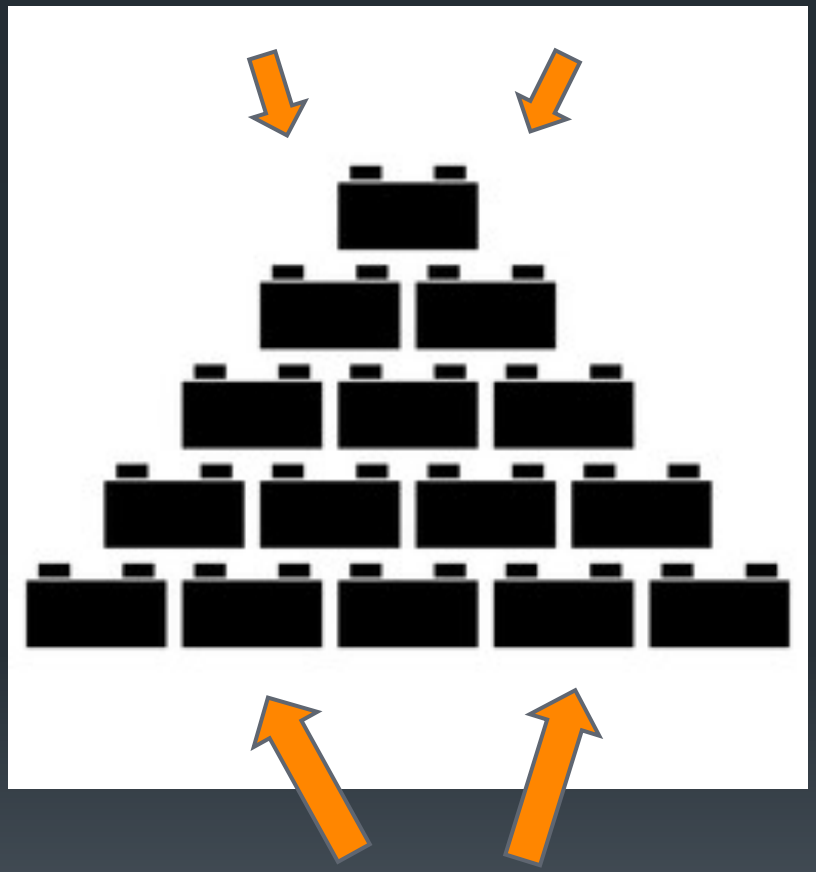



INFORMATION
INFORMATION
INFORMATION
INFORMATION
INFORMATION
INFORMATION
INFORMATION
INFORMATION
INFORMATION
INFORMATION
INFORMATION
INFORMATION
INFORMATION
INFORMATION
INFORMATION
INFORMATION
INFORMATION
INFORMATION

Memorizing details without a strong foundation

Facts will disappear and prevent students from understanding how to apply concepts

"Learners must think deeply about new information and relate it to supportive prior knowledge if they are to generate credible responses to the question, *'Why is this fact true?'*"



*Without this: *Rote memorization*

Woloshyn, V. E., Paivio, A., & Pressley, M. (1994). Use of elaborative interrogation to help students acquire information consistent with prior knowledge and information inconsistent with prior knowledge. Journal of Educational Psychology, 86(1), 79–89

Meaningful learning → sufficient time for interaction and reflection.

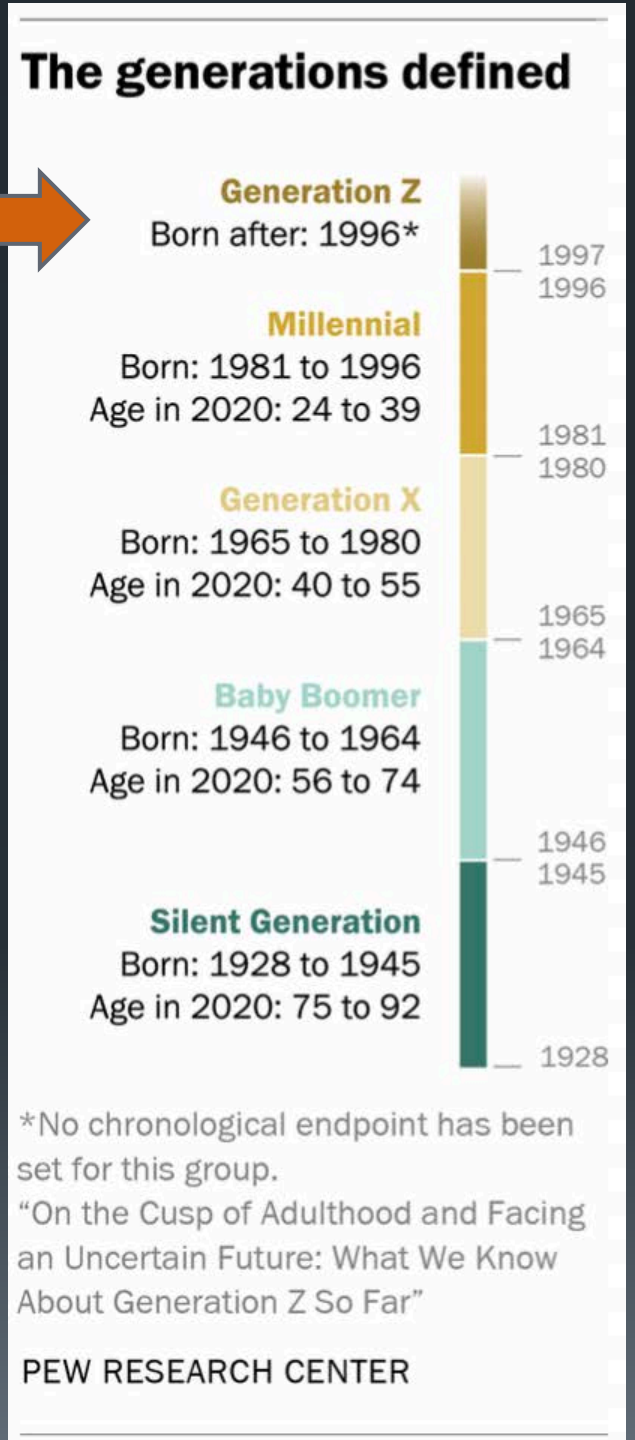
Information overload ↓

↑ of assessment directed towards a better understanding.

Hofstein, A., Shore, R., & Kipnis, M. (2004). Providing High School Chemistry Students with Opportunities to Develop Learning Skills in an Inquiry-Type Laboratory: A Case Study. International Journal of Science Education, 26, 47-62.

Generation Z

Generation Z, born after 1996… tend to be digital natives, fast decision makers, and highly connected.



Consultancy.uk. (2015). Generation Y less satisfied than other generations. http://www.consultancy.uk/news/2061/generation-y-less-satisfied-thanother-generations. Date of use: 1 August 2016.
Dauksevicuite, I. (2016). Unlocking the full potential of digital native learners. Henley Business School, Mc Graw Hill Education handouts.

Present-day schools cater to Generation Z, children aged 6 to 18 years.

Gen-zers have not seen the world without technology

60% OF GEN Z

say they like to collaborate and share their knowledge with others online

50% OF GEN Z

'Can't Live Without YouTube'

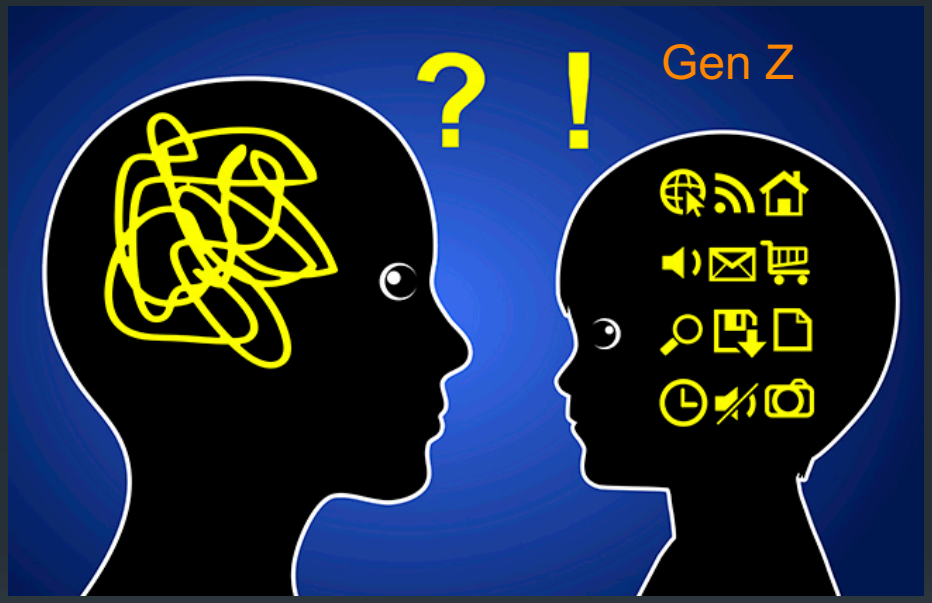
93% OF STUDENTS

students feel confident as they understand technology well

Technology is a must for schools catering to Generation Z

Global Indian International School: "Why technology is vital in education process of Generation Z"

Challenge of Teaching Generation Z



Highly-developed part of brain responsible for visual ability

Auditory learning, such as lectures and discussions, is very strongly disliked by this group, whereas interactive games, collaborative projects, advance organizers, and challenges are appreciated.

Cilliers, E. J. (2017). THE CHALLENGE OF TEACHING GENERATION Z. *PEOPLE: International Journal of Social Sciences*, *3*(1), 188–198.

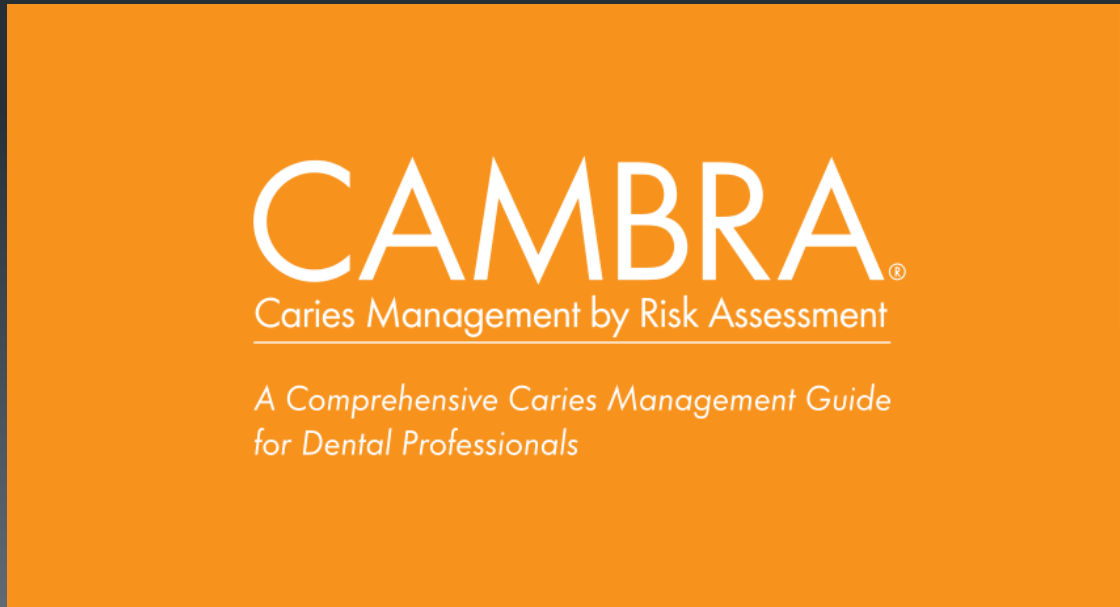
POLL

CAMBRA

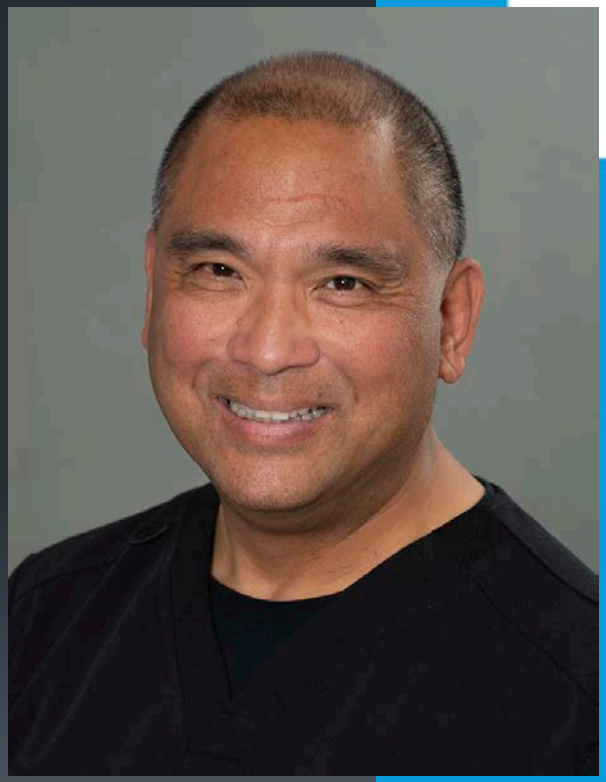
Caries Management by Risk Assessment

Special Care Rotation

UOP Dugoni School of Dentistry



Introduction



MY BACKGROUND

- BS Genetics, UC Davis
- DDS, UC San Francisco
- GPR, VA Palo Alto
- Former AEGD program director Highland Hospital
- Former Staff Dentist, GFHN, Inc (FQHC Comm. Clinic)
- Former Staff Attending Dentist, VA Palo Alto
- Former Staff Dentist, Solano County Jail
- Private Practice in Hayward, CA
- Hospital Privileges, Alameda Hospital
- Current attending dentist special care clinic, UOP Dugoni Dental School

Outline

1. UOP Dugoni School of Dentistry Special Care Clinic
2. Student Rotation
3. CAMBRA Principles
4. CAMBRA Products
5. SMART Technique

THE DUGONI SCHOOL

SPECIAL CARE CLINIC

HOSPITAL DENTISTRY IN THE OR

Tuesday AM/PM

Medical History	Consent	Tx Plan	Insurance	Procedure	Comments
Sjögren–Larsson syndrome(early childhood onset, ichthyosis, ID, spastic paraparesis				POE, CRA, RGS	BTS MC
Autism, ID mild		Annual exam	GGRC	POE	
Autism, anxiety				Del PUD	
epilepsy, seizure disorder				Exam, CRA, pano, 4 BWX	
		NP		NP exam	
ID, Seizure disorder					
ID mild, impaired hearing (hearing aids)				POE	
Seizure disorder				#3-MOD GI	
ID, combative patient				exam, CRA, pano	
DD, HTN, Diabetes Type 2, Headaches, Depression, GERD				POV, Tori Removal	
ADHD, Dev Disability NOS, OCD, mood disorder, and is severely needle phobic				OR screening	Anterior trauma in 2012, OR dentistry needed
Med clearance for dental work rec'd 3/12/21				Filling	
Down's syndrome				exam, CRA, pano	
		NP exam			
ID, Cerebral Palsy				OR screening	HD 12/2017
S/P traumatic brain injury, Seizure, ID mild, Spastic Quadriplegic, Osteoperosis, Ovarian Failure, Chronic Consitpation				Annual OR screen	Last OR dentistry 4/28/2017
				NP OR screening	
Autism, hypothyroid		POE	GGRC, Dentical	OR exam	last visit 11/2013
Autism				OR screening	
Autism			GGRC, Dentical	OR screening	
Autism				OR screening	

CAMBRA University Project

- **Caries Risk Assessment(CRA)/ Saliva Tests**
  - Can bill Denti-cal (Medicaid) for an annual assay and then a follow up test.
- **CAMBRA products**
  - Can be dispensed and billed for as needed due to the patient's caries risk.
  - For example, Cari-free Treatment rinse can be dispensed during a prophy or restorative visit as long as no CRA was performed at the same visit.

Financial Impact (CAMBRA Codes)

FY 2021

$169,497

FY 2022

$198, 962 up 17%

FY 2023 thru Feb. 3rd

$134,511

Definition of Dental Caries

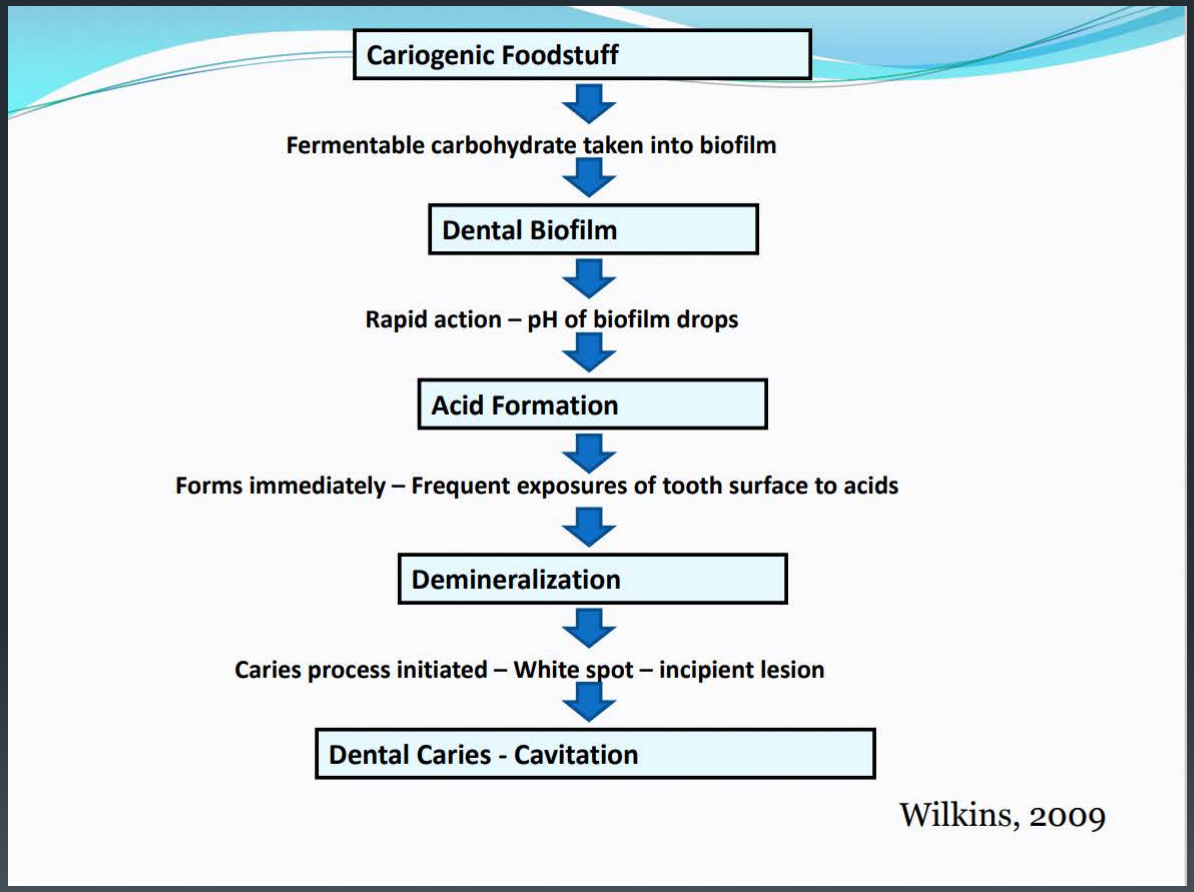
- *"Caries is an infectious transmissible disease process where a complex cariogenic biofilm, in the presence of an oral environmental status that is more pathological than protective, leads to the demineralization of dental hard tissues.*

Young et al.,2017

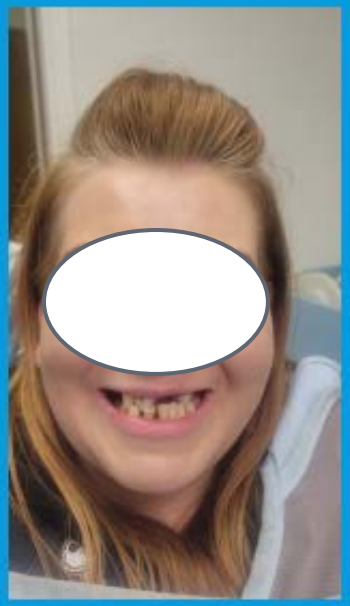
Dental Caries

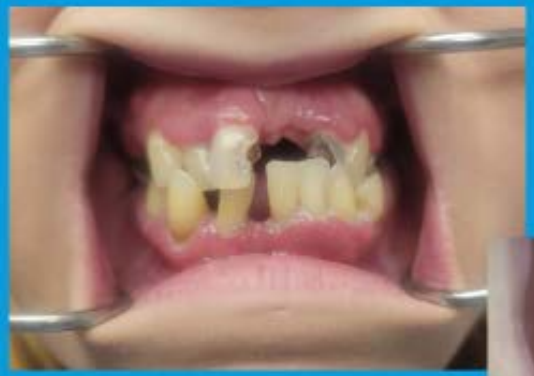
- One of the most common diseases on the planet
- Most common chronic disease of children in the United States and is on the rise
- Virtually universal among adults worldwide

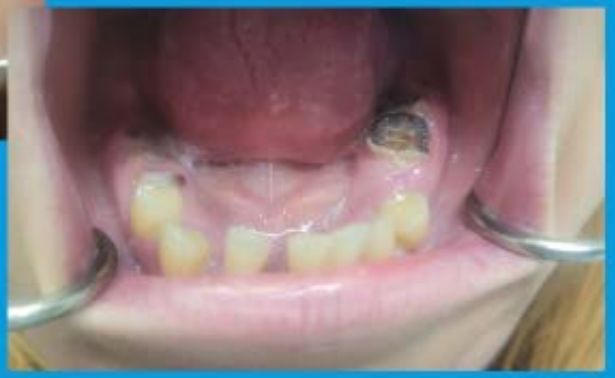
CDC, 2005
Ismal et al., 2001

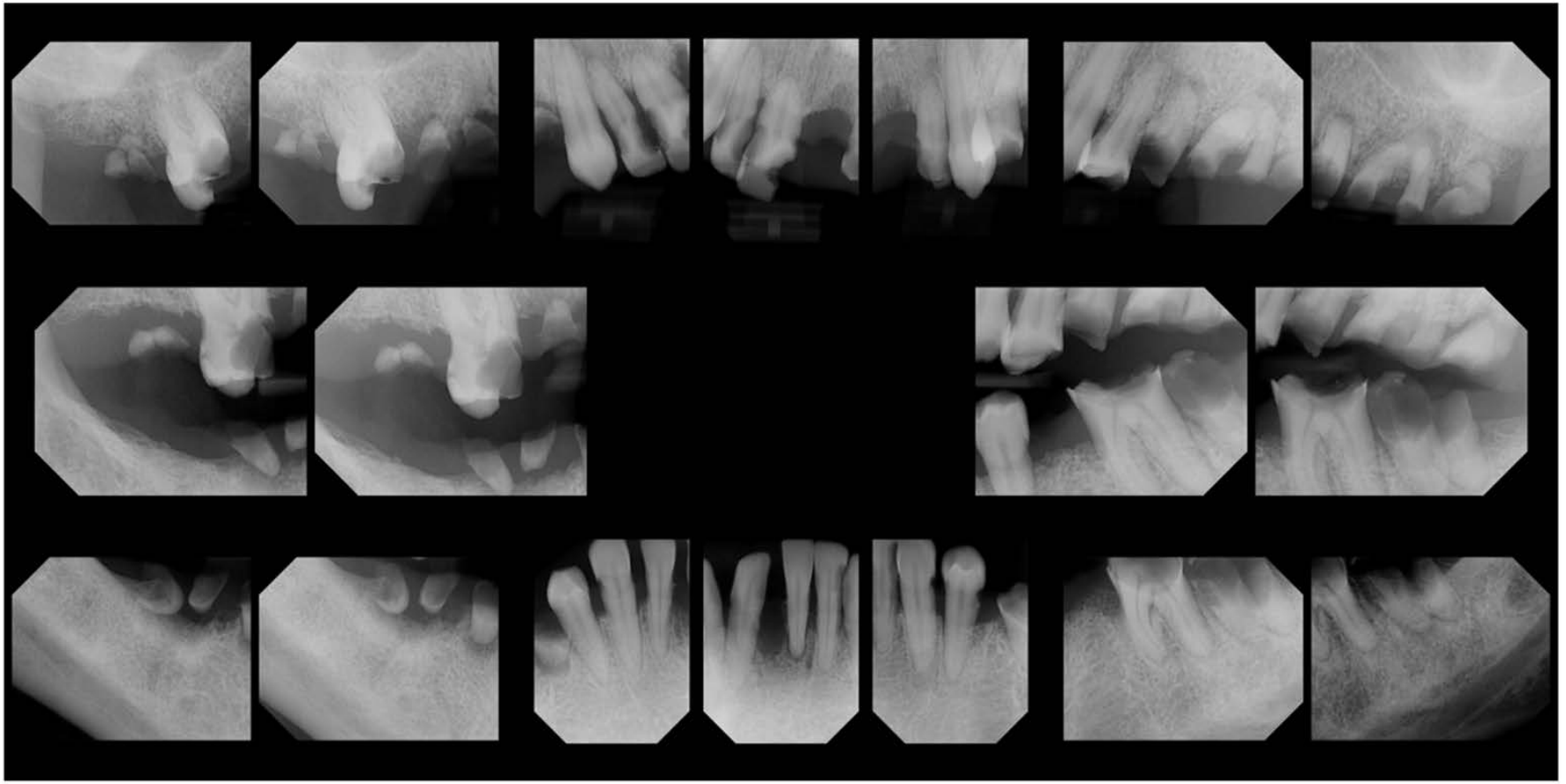

Cariogenic Foodstuff
Fermentable carbohydrate taken into biofilm
Dental Biofilm
Rapid action – pH of biofilm drops
Acid Formation
Forms immediately – Frequent exposures of tooth surface to acids
Demineralization
Caries process initiated – White spot – incipient lesion
Dental Caries - Cavitation
Wilkins, 2009

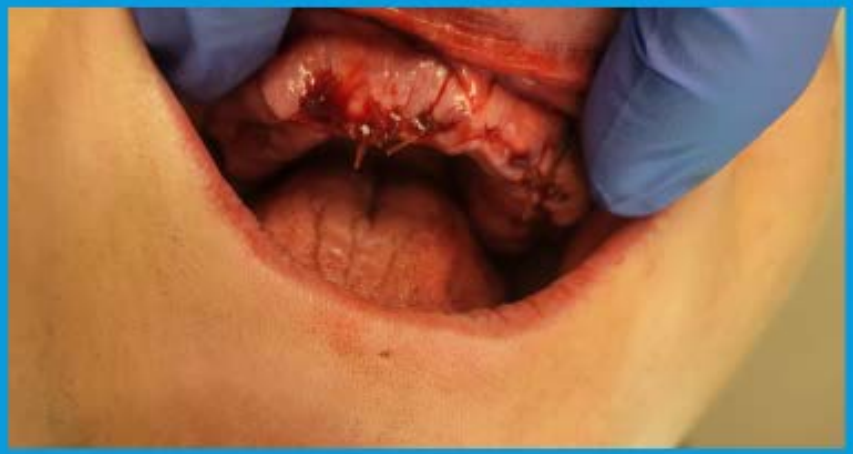
SB

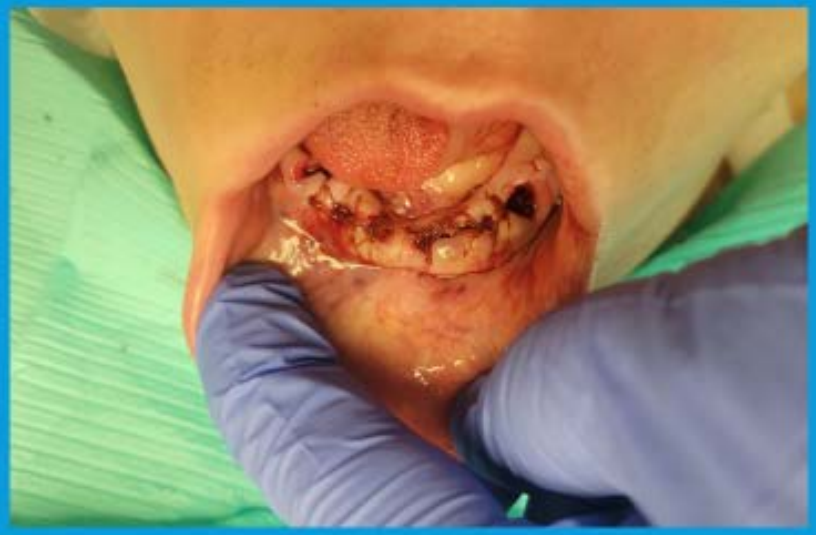


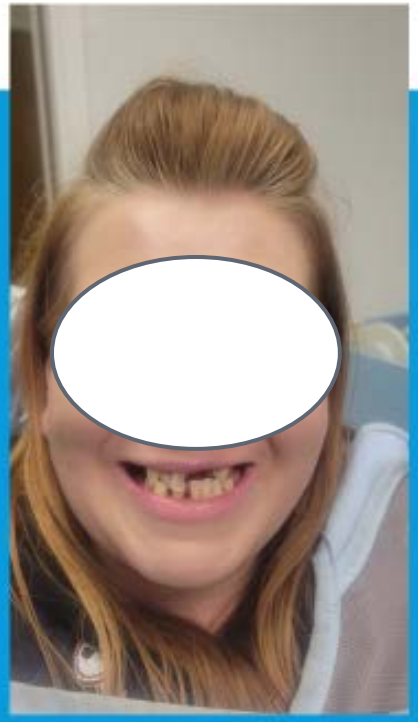












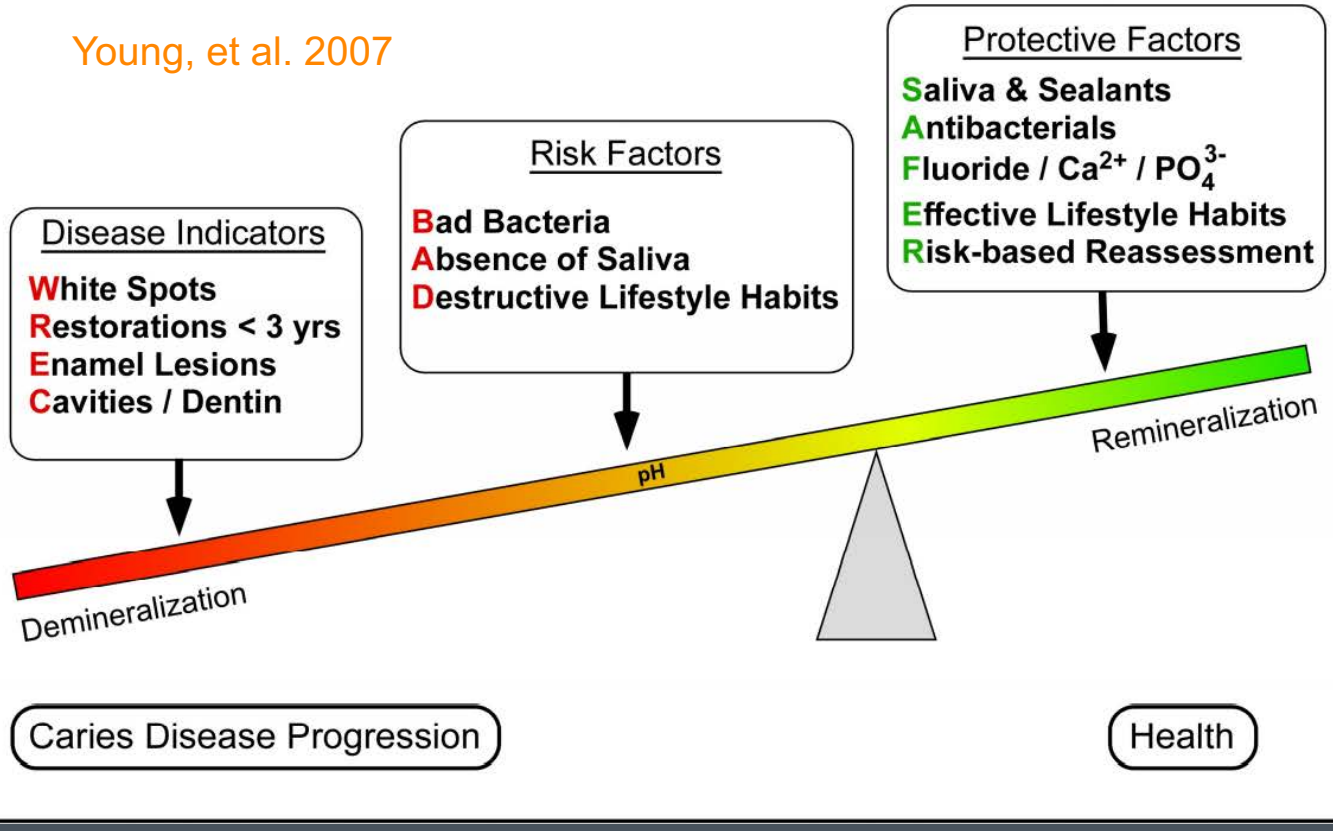
CAMBRA

Caries Management by Risk Assessment

Developed by UC San Francisco in the early 2000s

The Caries Balance / Imbalance

Young, et al. 2007



Percentage is the likelihood that the caries has penetrated into dentin histologically.

TABLE 2

American Dental Association Caries Classification System.

	AMERICAN DENTAL ASSOCIATION CARIES CLASSIFICATION SYSTEM			
	Sound	**Initial**	**Moderate**	**Advanced**
Clinical Presentation	No clinically detectable lesion. Dental hard tissue appears normal in color, translucency, and gloss.	Earliest clinically detectable lesion compatible with mild demineralization. Lesion limited to enamel or to shallow demineralization of cementum/dentin. Mildest forms are detectable only after drying. When established and active, lesions may be white or brown and enamel has lost its normal gloss.	Visible signs of enamel breakdown or signs the dentin is moderately demineralized.	Enamel is fully cavitated and dentin is exposed. Dentin lesion is deeply/severely demineralized.
Other Labels	No surface change or adequately restored	Visually noncavitated	Established, early cavitated, shallow cavitation, microcavitation	Spread/disseminated, late cavitated, deep cavitation
Infected Dentin	None	Unlikely	Possible	Present
Appearance of Occlusal Surfaces (Pit and Fissure)*,†	ICDAS 0	ICDAS 1 ICDAS 2	ICDAS 3 ICDAS 4	ICDAS 5 ICDAS 6
Accessible Smooth Surfaces, Including Cervical and Root‡		9% 50%	77% 88%	100% 100%
Radiographic Presentation of the Approximal Surface§	E0¶ or RO# No radiolucency	E1¶ or RA1# E2¶ or RA2# D1¶ or RA3# Radiolucency may extend to the dentinoenamel junction or outer one-third of the dentin. Note: radiographs are not reliable for mild occlusal lesions.	D2¶ or RB4# Radiolucency extends into the middle one-third of the dentin	D3¶ or RC5# Radiolucency extends into the inner one-third of the dentin

* Photographs of extracted teeth illustrate examples of pit-and-fissure caries.

† The ICDAS notation system links the clinical visual appearance of occlusal caries lesions with the histologically determined degree of dentinal penetration using the evidence collated and published by the ICDAS Foundation over the last decade; ICDAS also has a menu of options, including 3 levels of caries lesion classification, radiographic scoring and an integrated, risk-based caries management system ICCMS. (Pitts NB, Ekstrand KR. International Caries Detection and Assessment System [ICDAS] and its International Caries Classification and Management System [ICCMS]: Methods for staging of the caries process and enabling dentists to manage caries. *Community Dent Oral Epidemiol* 2013;41[1]:e41-e52. Pitts NB, Ismail AI, Martignon S, Ekstrand K, Douglas GAV, Longbottom C. ICCMS Guide for Practitioners and Educators. Available at: https://www.icdas.org/uploads/ICCMS-Guide_Full_Guide_US.pdf. Accessed April 13, 2015.)

‡ "Cervical and root" includes any smooth surface lesion above or below the anatomical crown that is accessible through direct visual/tactile examination.

§ Simulated radiographic images.

¶ E0-E2, D1-D3 notation system.[33]

R0, RA1-RA3, RB4, and RC5-RC6 ICCMS radiographic scoring system (RC6 = into pulp). (Pitts NB, Ismail AI, Martignon S, Ekstrand K, Douglas GAV, Longbottom C. ICCMS Guide for Practitioners and Educators. Available at: https://www.icdas.org/uploads/ICCMS-Guide_Full_Guide_US.pdf. Accessed April 13, 2015.)

ng DA, Novy BB, Zeller GG, et al. The American Dental Association Caries Classification System for Clinical Practice: A report of the American Dental Association Council on Scientific Affairs. J Am Dent Assoc 2015;146(2):79-86.

Measuring saliva flow

1- Unstimulated saliva
(~0.3-0.4 ml/min)

Ask patient to collect saliva in a cup without giving anything for chewing.

2- Stimulated saliva
(≥1ml/min)

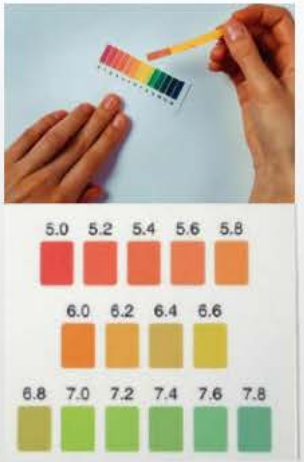
Ask patient to chew a piece of clear paraffin wax for 3-5 minutes and collect saliva in a cup. Then, measure the saliva amount.

Measuring pH

Enamel dissolves at 5.5 pH
Dentin dissolves at 6.6 pH

pH paper

Insert a piece of pH paper into the collected saliva sample.

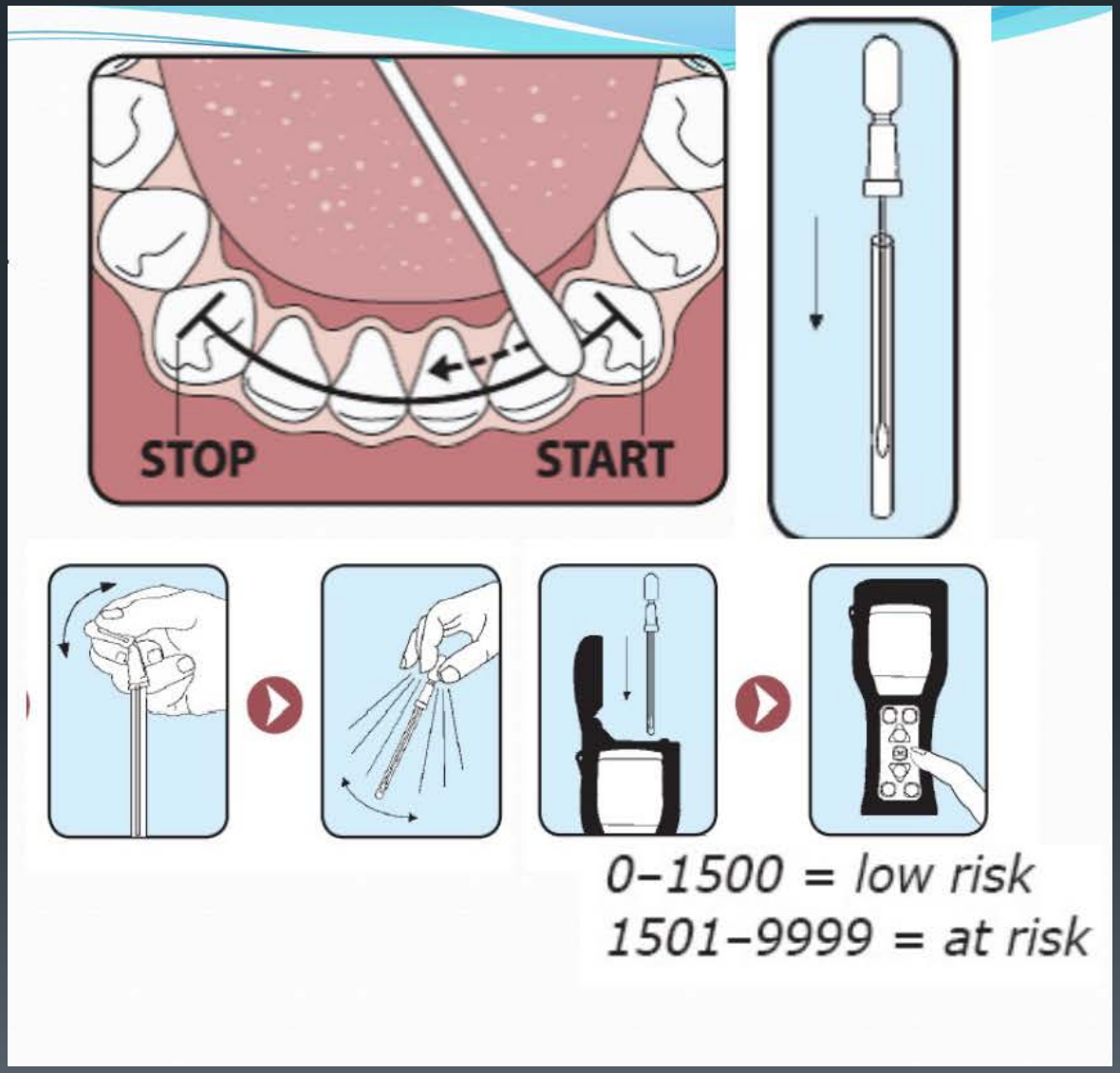


Compare the color with the provided scale.

ATP Testing-CariScreen

- **Inexpensive way to measure bacterial load.**
- **ATP Bioluminescence**
- **Correlates to caries risk levels**
- **Meter- Retails for $2095**

Cost for testing swabs


STOP
START
0–1500 = low risk
1501–9999 = at risk

ADA Council on Scientific Affairs Guidelines

LOW CARIES RISK (all age groups)
No incipient or cavitated primary or secondary lesions in past 3 years and no risk factors

MODERATE CARIES RISK (<6 years)
No lesions in last 3 years but at least 1 risk factor

MODERATE CARIES RISK (>6 years)
≥ 1 lesion in past 3 years or at least 1 risk factor

HIGH CARIES RISK (<6 years)
Any of the following: any lesion in past 3 years, multiple risk factors, low socioeconomic status, suboptimal fluoride exposure, xerostomia

HIGH CARIES RISK (>6 years)*
Any of the following: 3 or more lesions in past 3 years, multiple risk factors, suboptimal fluoride exposure, xerostomia

JADA August 2006 Special Supplement

The patient becomes extreme risk when they have Xerostomia.

Table 1
Caries Management by Risk Assessment (CAMBRA)
Clinical Guidelines for Patients 6 years and Older

Risk Level	Frequency of Radiographs	Frequency of Caries Recall Exams	SalivaTest (Appearance, pH, and ATP Test)	Antibacterials CariFree Tx Rinse Chlorhexidine Xylitol	Fluoride	pH Control	Calcium Phosphate Topical Supplements (MI Paste)	Sealants (Resin-based or Glass Ionomer)
Low Risk	Bitewing radiographs every 24-36 months	Every 6-12 months to reevaluate caries risk.	appearance/consistency (water or stringy/bubbly) Check resting & Stimulated pH Do ATP Swab test	Usually not required But if ATP > 1500 then xylitol, CHX and CariFree Tx Rinse is optional	OTC fluoride-containing toothpaste twice daily. after breakfast and at bedtime. Optional: NaF varnish if excessive root exposure or sensitivity.	Usually not required But CariFree Boost optional as per pH test	Usually not required MI Paste optional: for excessive root exposure. Or sensitivity	Optional as primary prevention as per ICDAS Sealant Protocol (see ICDAS Table)
Moderate Risk	Bitewing radiographs every 18-24 months	Every 4-6 months to reevaluate caries risk.	appearance/consistency (water or stringy/bubbly) Check resting & Stimulated pH Do ATP Swab test	Xylitol (6-10 grams/day) gum or candies. Two tabs of gum or two candies four times daily If ATP > 1500 then xylitol, CHX and CariFree Tx Rinse is optional	OTC fluoride-containing toothpaste twice daily plus: 0.05% NaF CariFree Maintenance Rinse 2X daily. Initally, NaF varnish; another at 4-6 month recall.	Usually not required But CariFree Boost optional as per pH test	Usually not required Optional: for excessive root exposure. Or sensitivity	As per ICDAS Sealant Protocol (see ICDAS Table)
High Risk*	Bitewing radiographs every 6-18 months or until no cavitated lesions are evident.	Every 3-4 months to reevaluate caries risk and apply fluoride varnish.	appearance/consistency (water or stringy/bubbly) Check resting & Stimulated pH Do ATP Swab test Monitor progress & encourage patient motivation	CariFree Treatment Rinse 10 ml rinse for one minute daily until gone (1 month) then 1 mo ITE and ATP swab again Xylitol (6-10 grams/day)	1.1% NaF toothpaste twice daily instead of regular fluoride toothpaste. 0.05% NaF CariFree Maintenance Rinse 2X daily. Initially NaF varnish; another app at 3-4 month recall.	CariFree Boost optional as per pH test	Optional Apply calcium/ phosphate paste several times daily	As per ICDAS Sealant Protocol (see ICDAS Table)
Extreme Risk** (High risk plus dry mouth or special needs)	Bitewing radiographs every 6 months or until no cavitated lesions are evident.	Every 3 months to reevaluate caries risk and apply fluoride varnish.	appearance/consistency (water or stringy/bubbly) Check resting & Stimulated pH Do ATP Swab test Monitor progress & encourage patient motivation	CariFree Treatment Rinse 10 ml rinse for one minute daily until gone (1 month) then 1 mo ITE and ATP swab again Xylitol (6-10 grams/day)	1.1% NaF toothpaste twice daily instead of regular fluoride toothpaste. OTC 0.05% NaF rinse when mouth feels dry, after snacking, breakfast, and lunch. Initally NaF varnish; another app at 3 month recall.	CariFree Boost spray as needed if mouth feels dry, after snacking, bedtime and after breakfast. Xylitol (6-10 grams/day)	Required Apply calcium/ phosphate paste twice daily	As per ICDAS Sealant Protocol (see ICDAS Table)

* Patients with one (or more) cavitated lesion(s) are high risk patients. ** Patients with one (or more) cavitated lesion(s) and severe hyposalivation are extreme risk patient *** All restorative work to be done with the minimally invasive philosophy in mind. Existing smooth surface lesions that do not penetrate the DEJ and are not cavitated should be treated chemically not surgically. For extreme risk patients use holding care with glass ionomer materials until caries progression is controlled. Patients with appliances (RPDs, Orthodontics) require excellent oral hygiene together with intensive fluoride therapy. e.g. High fluoride toothpaste and fluoride varnish every 3 mo. Where indicated, antibacterial therapy to be done in conjunction with restorative work **** For all risk levels: Patients must maintain good oral hygiene and a diet low in frequency of fermentable carbohydrates. ***** Xylitol is not good for pets (especially dogs).

Extreme Caries Risk:

1. Inadequate saliva flow by observation or measurement = Extreme Risk

(*Note: Unless the saliva returns to normal the patient should stay on the extreme risk protocol. If the protocol is followed successfully and the patient is cavity free (no progression of existing lesions and no new lesions) for at least one year from their last exam then the patient could be considered "extreme risk controlled", however they should remain on the protocol unless saliva returns to normal.)

High Caries Risk: (any of the following)

2. One or more disease indicators = high risk

(*Note: make sure you check for the risk factor question on "Inadequate saliva flow by observation or measurement" to rule out extreme risk.)

3. Or three or more risk factors in the absence of any disease indicators = High risk
4. Or just high acidogenic bacterial load by measurement alone in the absence of any disease indicators = High risk

Moderate Caries Risk:

5. One or two risk factors in the absence of any disease indicators = Moderate risk

Low Caries Risk:

6. No disease indicators and no risk factors = Low risk

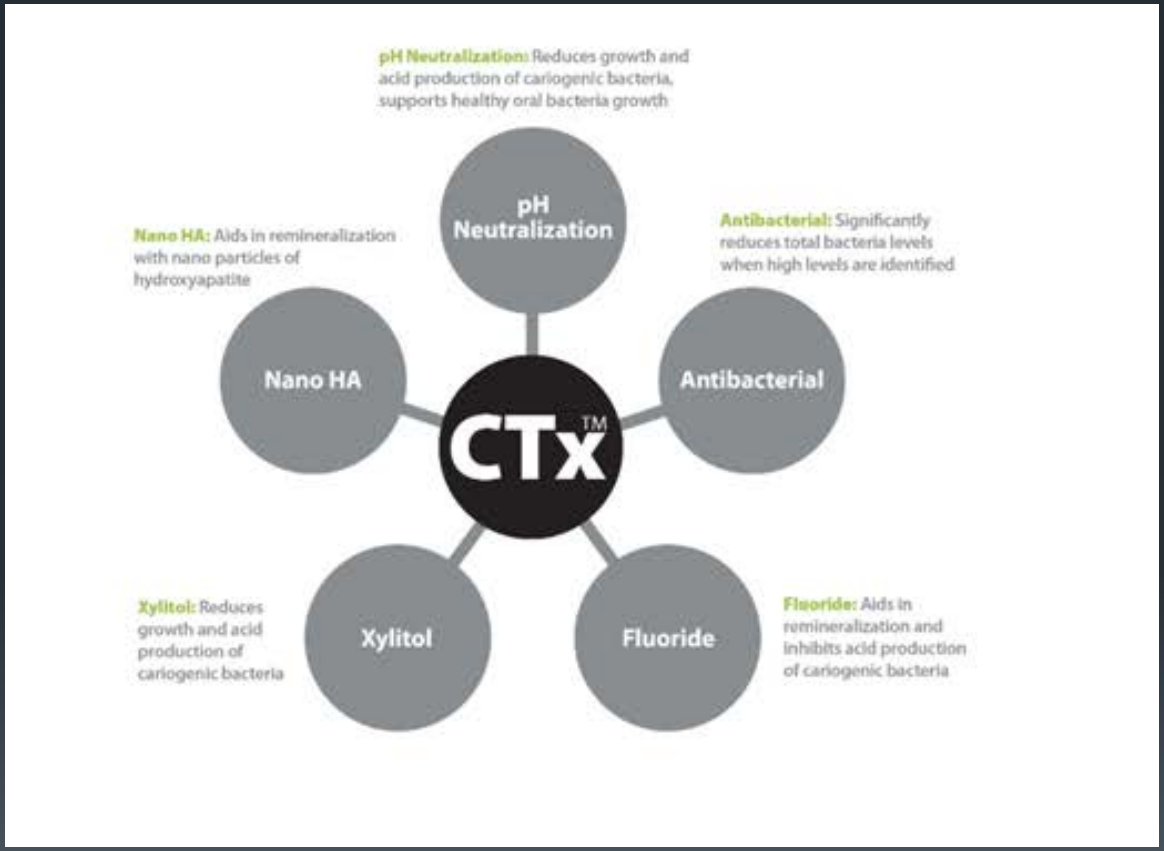
Risk Level	Home Care Recommendations	Recare Interval	Radiographs
Low	OHI, individualized diet modification: frequency and exposure , OTC fluoride toothpaste	12 months	24-36 months
Moderate	All the above plus 1) Xylitol gum/mints throughout the day 2) 0.05% NaF rinse after meals if possible Alternative therapy would be to use a 5000 ppm F toothpaste twice daily instead of OTC toothpaste, and no mouth rinse	4-6 months	18-24 months
High	All the above plus 1) 5000 ppm toothpaste instead of OTC F-toothpaste morning and night 2)*Antibacterial /pH neutralization (CTx4 Treatment Rinse) before bedtime	3-4 months	6-18 months
Extreme	All the above plus 1) pH neutralization (Boost Spray) throughout the day 2) Ca/PO^4 supplementation (MI Paste) throughout the day and right before bedtime	3 months	6 months until no new caries lesions

*Note: it is helpful to retest the bacteria after initial antibacterial treatment (about 1 month) to help motivate the patient.

Caries Risk Assessment

- **Low Risk**
- **Moderate Risk**
- **High Risk**
- **Extreme Risk**

The Five Protective Factors



Low Caries Risk Recommendations

- **Oral Hygiene Instructions**
- **Healthy Lifestyle Choices**
  - **Healthy diet**
  - **No illegal drugs**
- **Over the counter fluoride toothpaste (1000-1450ppm)**
  - **Twice a day**

Moderate Caries Risk Recommendations

- **Same as low risk plus add two caries prevention items**
- **Fluoride rinse**
- **Xylitol gum or mints**

Consider CTX3

- **Contains 3 protective factors**
- **Contains NaF, xylitol and pH+ technology to neutralize acidic oral pH**

Fluoride Rinse/Remineralization

CTX 3 Maintenance Rinse

- Alcohol Free
- Active ingredients- 0.5% NaF, 25% xylitol and pH neutralizing agent
- pH 8.0
- Rinse with 10ml twice daily to prevent dental caries

Consider CTX 4

- **Contains 4 protective factors.**
- **Treatment rinse is designed to treat the cariogenic plaque biofilm, reduce the overpopulation of cariogenic bacteria, and neutralize oral pH.**

Antibacterial Rinse

CTX 4 Treatment Rinse

- An antibacterial rinse and pH neutralizer
- Alcohol free
- Active ingredients-sodium hypochlorite, sodium hydroxide, fluoride and xylitol
- Has an extremely high pH of 11.0
- Mix equal amounts of A and B (5ml each) for 1 minute twice daily

High Caries Risk Recommendations

Same as moderate risk plus 2 more items

- **Treatment rinse as biofilm alteration is essential.**
- **High fluoride toothpaste**
- **(5000 ppm NaF)**
- **Not for young children**

Extreme Caries Risk Recommendations

Same as high risk plus two more items (due to xerostomia)

- **CTX 2 Contains 2 protective factors**
- **CTX 2 or Boost spray is an oral moisturizing spray that has xylitol and pH neutralizing capability**
- **MI Paste has calcium and phosphate supplementation**

CTX 2 or Boost Spray

- **For Extreme risk with Xerostomia**

- **2 Protective factors**
- **pH neutralization**
- **Xylitol**

pH Neutralizers/Xerostomia Management

- **CTX 2**
- **Calcium Hydroxide pH 9.0**
- **Contains 35% xylitol and glycerine**
- **Use 2-3 sprays as often as needed**
- **Raises pH and prevents demineralization**
- **Convenient size to fit in pocket**

CTx4 Gel 5000

- CTx4 Gel 5000 is a low abrasion tooth gel that combines the proven anti-caries benefits of neutral sodium (1.1%), pH+ technology, xylitol, nano hydroxyapatite, and xylitol. This product is perfect for patients with high sensitivity, Patients who are frequent brushers or patients with areas of recession. CTx4 Gel is available in mint and citrus flavor.
- **Has 4 protective factors.**
- PURPOSE:
- Strengthens outer enamel surfaces of teeth and re-mineralizes area
- Combats sensitivity
- Kills bacteria
- Neutralizes acids that dissolve enamel

CTx4 Gel 5000

- 4 Protective factors
- Prescription only due to 5000ppm Fluoride
- Xylitol
- pH neutralizer
- Nano Hydroxyapatite

CTX 4 Gel 5000 indications:

- Ages 6+
- Patients with decay
- High and high/extreme risk patients
- Patients tested with a high biofilm challenge
- Patients with a high oral bio-burden
- Patients with destructive/acidic diet
- Patients with bad breath (halitosis)
- Patients with sensitivity
- Patients undergoing cosmetic or restorative treatment plans
- Patients with dry mouth or medication induced xerostomia
- Patients using whitening products

Antibacterial Rinse

- Chlorhexidine Gluconate
- Active Ingredient:
  - 0.12% Chlorhexidine Gluconate
  - 12% alcohol or alcohol free
- pH 5.0-7.0
- Use Fluoride after CH use, effectiveness is reduced when used together

Fluoride Varnish

- 5% NaF
- 22,600ppm
- Slowly releases for months
- Safe for infants and children
- Recommend applications Q3mos to 6mos, depending on pt's CRA
- Usually white or clear
- Post prophy application

Silver Diamine Fluoride (SDF)

Recent FDA clearance = hypersensitivity.

Off label use = caries treatment.

This is the same as fluoride varnish.

Courtesy of Jeremy Horst, Steve Duffin, and John Frachella

SDF, what is it?

38% w/v silver diamine fluoride

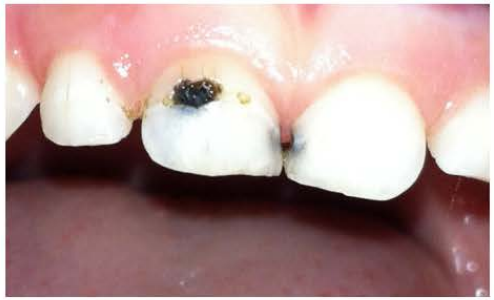
Colorless liquid

24 - 29% silver:	antimicrobial
5.0 - 6% fluoride:	remineralizer
Ammonia (NH_3^+):	solvent

Courtesy of Jeremy Horst, Steve Duffin, and John Frachella

What does it do?

Arrests caries lesions



Courtesy of Jeremy Horst, Steve Duffin, and John Frachella

When would you use it?

1) High or extreme caries risk
2) Behavior or medical management challenges.
3) More lesions than treatable at 1 visit.
4) Difficult to treat lesions.
5) Patients without access to care.

Courtesy of Jeremy Horst, Steve Duffin, and John Frachella

How often should you apply it?

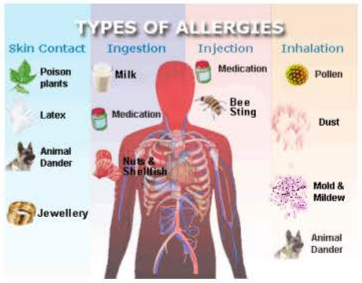
- It needs to be re-applied.
- Twice per year, or more often, depending on caries risk.
- Where? To carious lesions, without excavation.
- How long? For at least the first 2 years...

Courtesy of Jeremy Horst, Steve Duffin, and John Frachella

How safe is it?

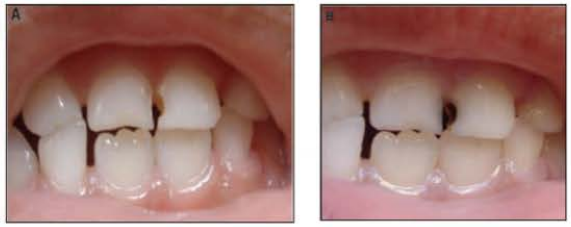
No adverse reports in >80 years of use in Japan.

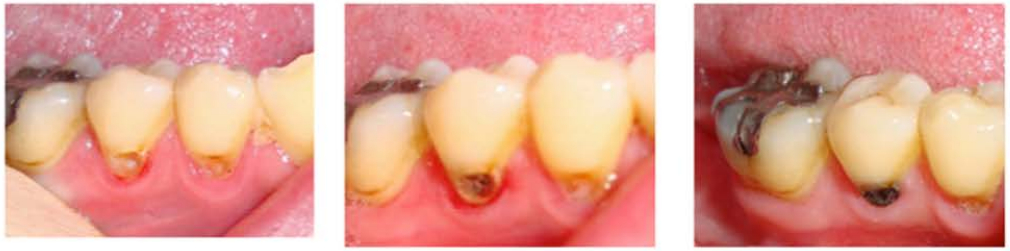
- Contraindication
  - Silver allergy.
- Relative contraindication:
  - Significant desquamative processes (e.g. ulcerative gingivitis, stomatitis)
  - → Protect by petroleum jelly
- Side effects:
  - Small, white mucosal lesions disappear in 48 hours.
  - It will stain the lesion black.
  - mild gastric inflammation.



Courtesy of Jeremy Horst, Steve Duffin, and John Frachella

SDF staining





time 0 1 day 1 week

Courtesy of Jeremy Horst, Steve Duffin, and John Frachella

J Dent Res 88:116

UCSF Consent

UCSF DENTAL CENTER INFORMED CONSENT FOR SILVER DIAMINE FLUORIDE

Facts for consideration:

- Silver Diamine Fluoride (SDF) is an antibiotic liquid. We use SDF on cavities to help stop tooth decay. We also use it to treat tooth sensitivity. SDF application every 6-12 months is necessary.
- The procedure: 1) Dry the affected area, 2) Place a small amount of SDF on the affected area, 3) Allow SDF to dry for one minute, 4) Rinse.
- **Treatment with SDF does not eliminate the need for dental fillings or crowns to repair function or esthetics. Additional procedures will incur a separate fee.**
- I should not be treated with SDF if: 1) I am **allergic to silver** 2) there are painful sores or raw areas on my gums (i.e., ulcerative gingivitis) or anywhere in my mouth (i.e., stomatitis).

Benefits of receiving SDF:

- SDF can help stop tooth decay.
- SDF can help relieve sensitivity.

Risks related to SDF include, but are not limited to:

- **The affected area will stain black permanently.** Healthy tooth structure will not stain. Stained tooth structure can be replaced with a filling or a crown.
- Tooth-colored fillings and crowns may discolor if SDF is applied to them. Color changes on the surface can normally be polished off. The edge between a tooth and filling may keep the color.
- If accidentally applied to the skin or gums, a brown or white stain may appear that causes no harm, cannot be washed off, and will disappear in 1-3 weeks.
- You may notice a metallic taste. This will go away rapidly.
- If tooth decay is not arrested, the decay will progress. In that case the tooth will require further treatment, such repeat SDF, a filling or crown, root canal treatment, or extraction.
- These side effects may not include all of the possible situations reported by the manufacturer. If you notice other effects, please contact your dental provider.
- Every reasonable effort will be made to ensure the success of SDF treatment. There is a risk that the procedure will not stop the decay and no guarantee of success is granted or implied.

Alternatives to SDF, not limited to the following:

- No treatment, which may lead to continued deterioration of tooth structures and cosmetic appearance. Symptoms may increase in severity.
- Depending on the location and extent of the tooth decay, other treatment may include placement of fluoride varnish, a filling or crown, extraction, or referral for advanced treatment modalities.

I CERTIFY THAT I HAVE READ AND FULLY UNDERSTAND THIS DOCUMENT, AND ALL MY QUESTIONS WERE ANSWERED:

_____ (signature of patient) _____(date)

_____(signature of witness) _____(date)

Courtesy of Jeremy Horst, Steve Duffin, and John Frachella

Interproximal Application

- MODIFIED from ARTICLE:
- SDF can be applied to an interproximal caries lesion

  - Floss Pik or Floss holder with Superfloss segment carefully impregnated with SDF and inserted interproximally in a gentle back and forth motion
- -Caution should be used intraorally to tongue and cheek while applying so as not to cause soft tissue staining.
- Discard contaminated material in SDF bag

Person and Clinic Protection

Permanent dark staining of clinic surfaces and clothes.

- Does not come out after setting (exceptions).
- Clean immediately with copious water, ethanol, or high pH solvents such as ammonia.

Temporary staining of skin

- Rinse.
- Will go away in days.
- No harm.

Courtesy of Jeremy Horst, Steve Duffin, and John Frachella

Documention

- Remember that the chemical treatment (SDF application) is an option like any other treatment option
- Document risks, benefits and alternatives explained to patient especially towards staining and expectations of follow up care

(should patient seek care elsewhere, they should be well informed)

- modification and credit UCSF Consent?

- Recommend Pre op and Post op pictures taken and uploaded to AxiUm

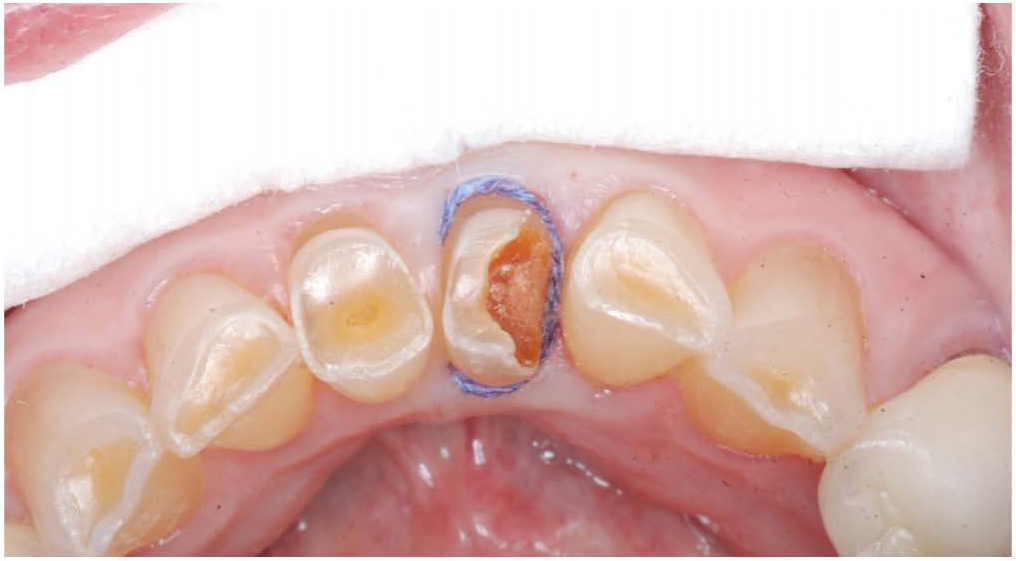
Two Strategies for Restoration

1. Arrest first with multiple applications of SDF, washout period of 2 months then restore
2. One application of SDF and immediately cover with GIC using the SMART restoration

Silver Modified Atraumatic Restorative Technique (SMART)

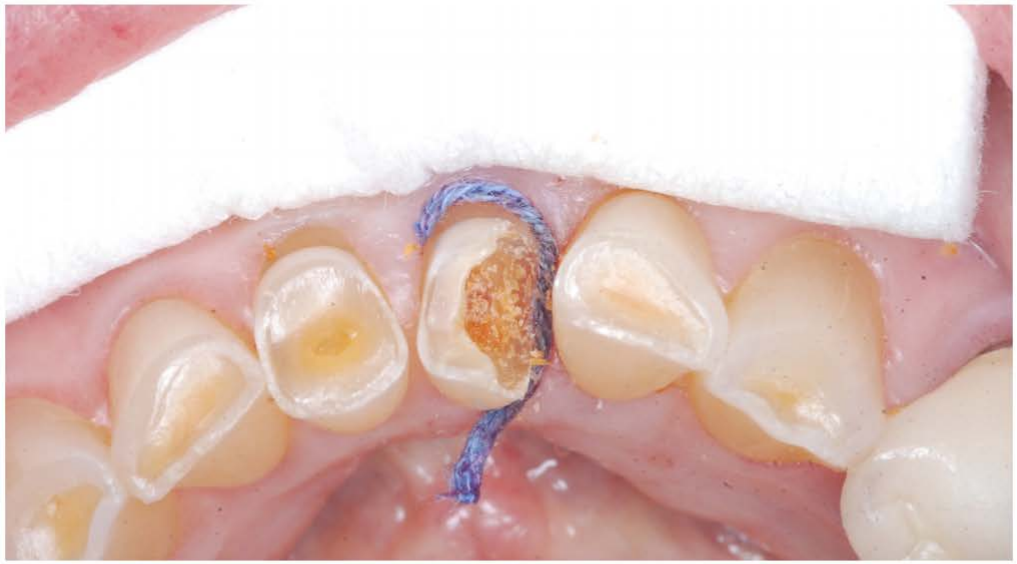
SMART = SDF + GIC

Pre-op (wet)



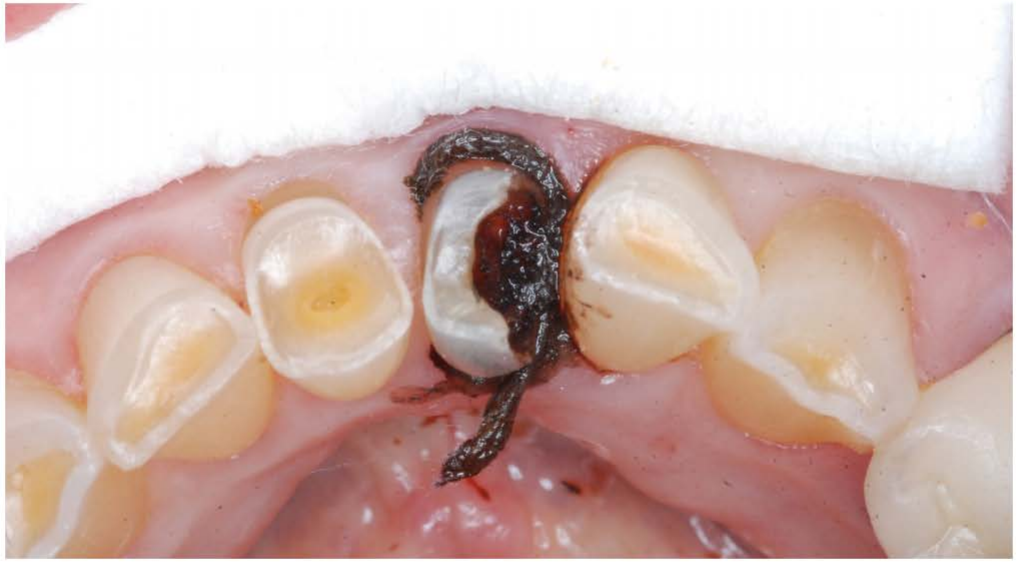
Courtesy of Vu Le

Pre-op (desiccate with air)



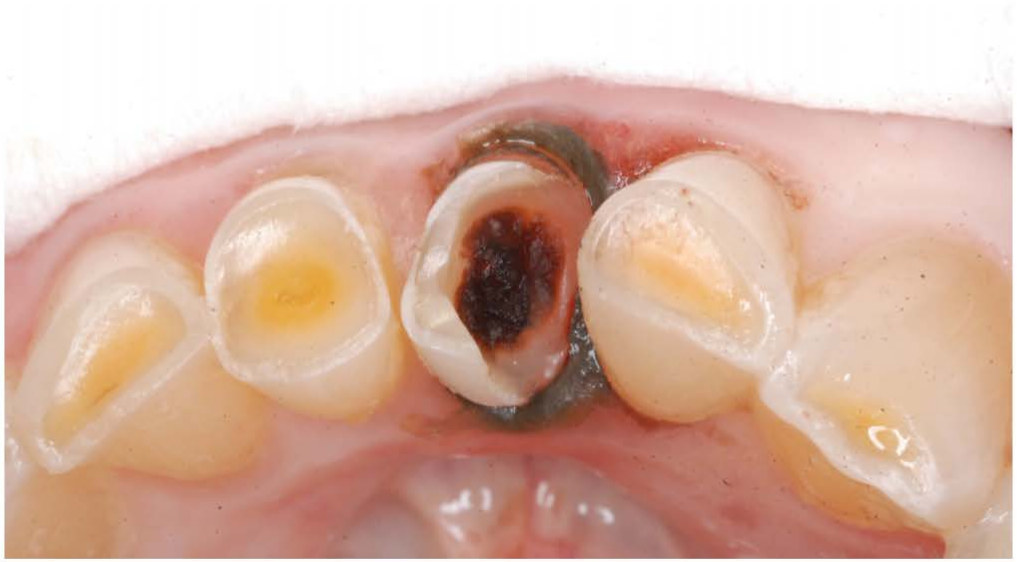
Courtesy of Vu Le

Apply SDF 1-2 mins



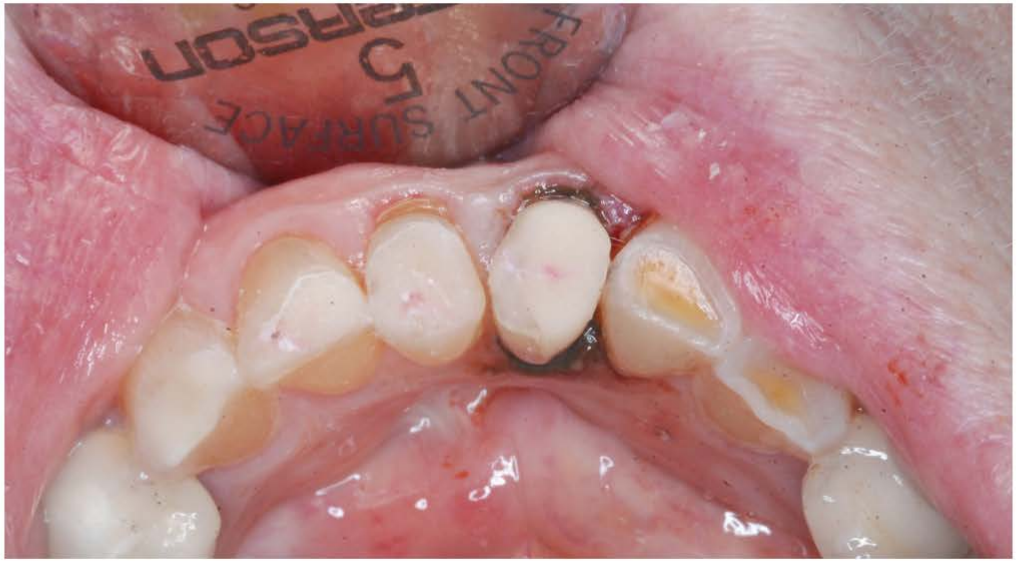
Courtesy of Vu Le

Clean Perimeter with bur or spoon



Courtesy of Vu Le

Place GIC and Check Occlusion



Courtesy of Vu Le

Glass Ionomer is a great filling material for high caries risk patients and when isolation can not be ensured

Advantages:

1. **It releases small amount of fluoride over time preventing decay under and around the filling**
2. **It chemically bonds with tooth tissue**
3. **It is available in different tooth shades (but not at the dental school)**
4. **It can be used in conjunction with composite to form a strong tooth colored filling**

Yosemite Valley

Technology

softChalk

Create. Connect. Inspire!

Interactive

Design Flexibility

Positive Learning Experience

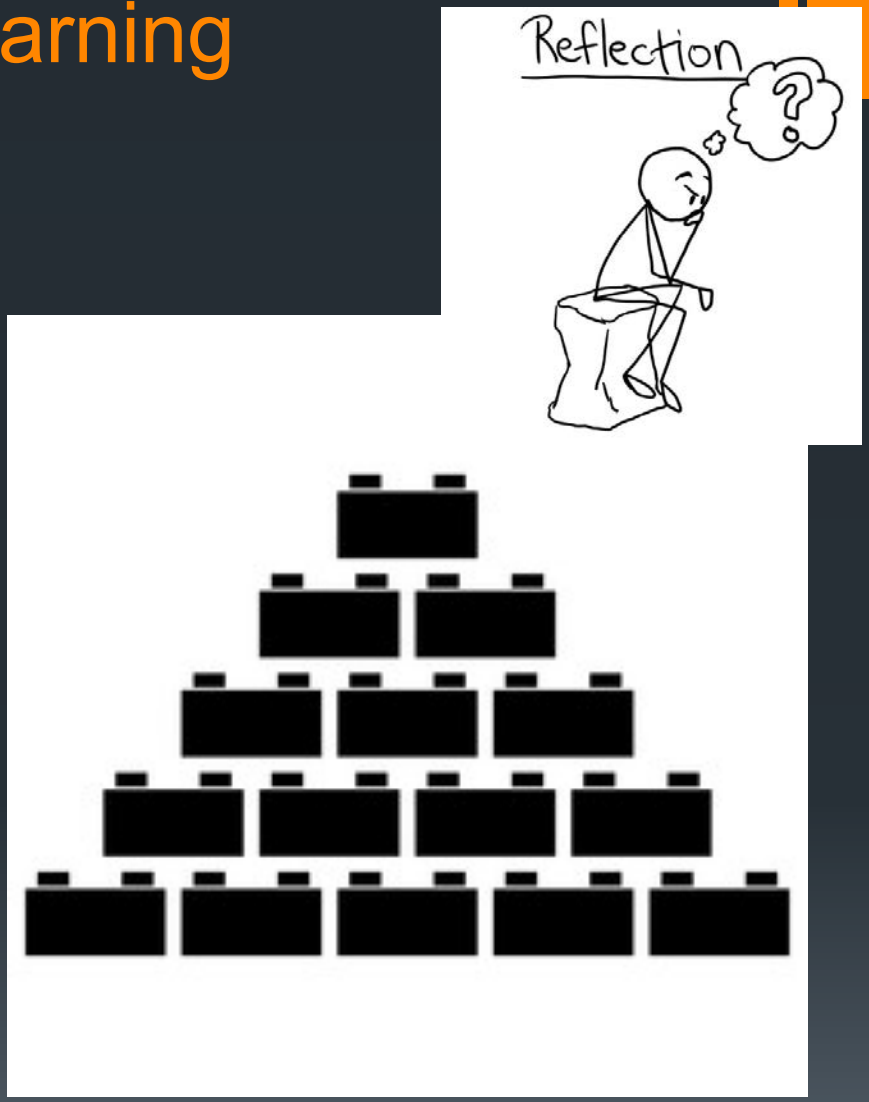
Ansong, Miriam A. et al. “Modeling with Medicinal Chemistry: Practical Innovative Technology-based Activity to Enhance Student’s Learning Through Inter-Departmental Collaboration: PART I.” (2016).

Zheng M, Bender D, Reid L, Milani J. An Interactive Online Approach to Teaching Evidence-Based Dentistry with Web 2.0 Technology. J Dent Educ. 2017 Aug;81(8):995-1003

Williams JG. Are online learning modules an effective way to deliver hand trauma management continuing medical education to emergency physicians? Plast Surg (Oakv). 201 Summer;22(2):75-8.

Active Learning

Questioning students specifically designed to trigger recall → helps them use prior knowledge to aid the integration and retention of new information



Woloshyn, V. E., Paivio, A., & Pressley, M. (1994). Use of elaborative interrogation to help students acquire information consistent with prior knowledge and information inconsistent with prior knowledge. Journal of Educational Psychology, 86(1), 79–89

Gleason BL, Peeters MJ, Resman-Targoff BH, Karr S, McBane S, Kelley K, Thomas T, Denetclaw TH. An active-learning strategies primer for achieving ability-based educational outcomes. Am J Pharm Educ. 2011 Nov 10;75(9):186.

Contents

Special Care Clinic

CAMBRA

Caries Management by Risk Assessment

Tim Verceles and Michael Suh

Case 1:

46 year old wheelchair bound male living in group home

PMH: Sjogren's syndrome, rheumatoid arthritis, lupus, hypertension, depression

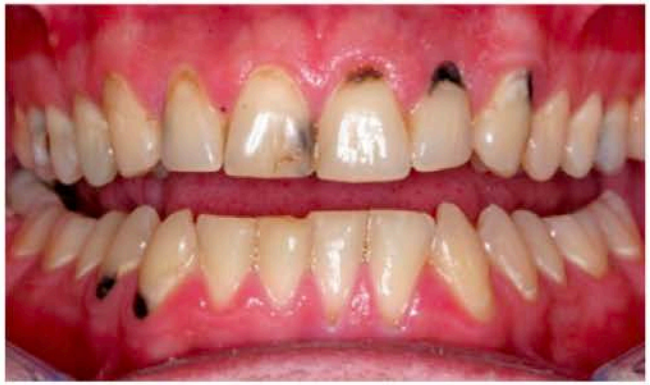
NKDA

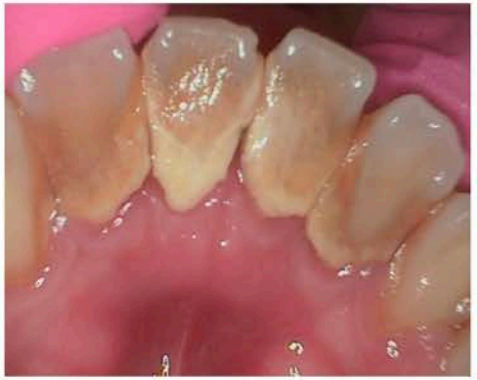
Eats candy and cake to "help with depression"

Drinks 2 diet cokes a day

Uses Colgate toothpaste twice daily, nursing aide tries to help him floss

Has had sealants placed only





Contents

Question 1: Where do caries generally occur on a tooth?

- a. Smooth surface
- b. Root surface
- c. Pit and Fissure
- d. A, B, and C

Check Answer

You diagnose tooth #9 as an ICDAS 4
What is the percentage of the lesion that histologically penetrates into dentin?

- a. 50%
- b. 77%
- c. 88%
- d. 100%

Check Answer

Question 1: Where do caries generally occur on a tooth?

- a. Smooth surface
- b. Root surface
- c. Pit and Fissure
- d. A, B, and C

Check Answer

Correct!

Carious lesions occur in three general areas of the tooth: Pit and fissure, smooth surface, and root surface

You diagnose tooth #9 as an ICDAS 4

What is the percentage of the lesion that histologically penetrates into dentin?

- a. 50%
- b. 77%
- c. 88%
- d. 100%

Check Answer

Sorry, incorrect answer.

You diagnose tooth #9 as an ICDAS 4

What is the percentage of the lesion that histologically penetrates into dentin?

- a. 50%
- b. 77%
- c. 88%
- d. 100%

Check Answer

Correct!

50% = ICDAS 2

77% = ICSDAS 3

100% = ICDAS 5 and 6

Learning Effect of Testing in Dental Education

Oral Surgery-Suturing

Oral Cancer

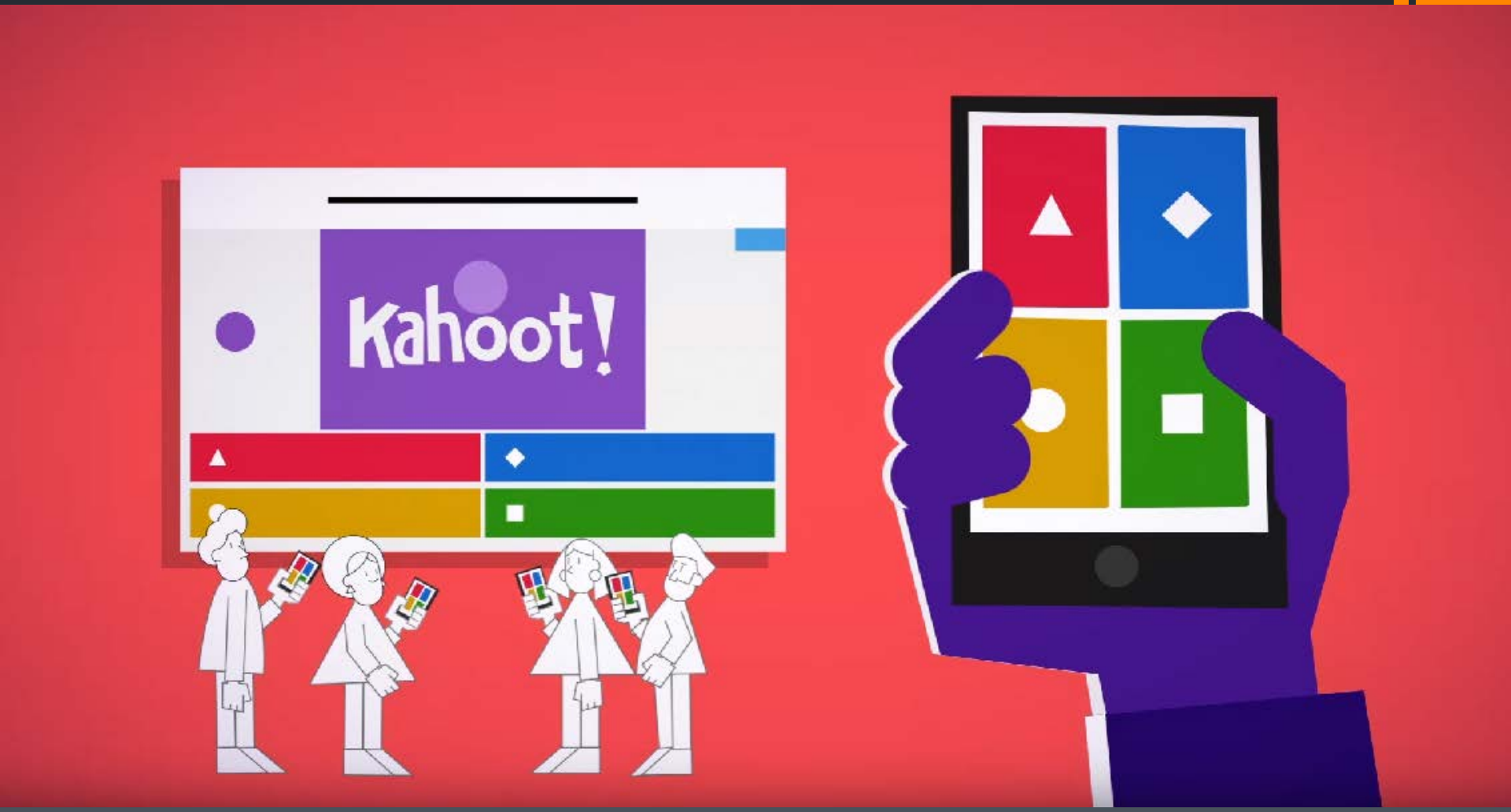
Orthodontics

Groups that experienced repeated testing with feedback performed better.

Sennhenn-Kirchner S, Goerlich Y, Kirchner B, Notbohm M, Schiekirka S, Simmenroth A, Raupach T. The effect of repeated testing vs repeated practice on skills learning in undergraduate dental education. Eur J Dent Educ. 2018 Feb;22(1):e42-e47.

Zain, R.B., Pateel, D.G., Ramanathan, A. *et al.* Effectiveness of "OralDETECT": a Repetitive Test-enhanced, Corrective Feedback Method Competency Assessment Tool for Early Detection of Oral Cancer. *J Canc Educ* **37**, 319–327 (2022).

Freda NM, Lipp MJ. Test-Enhanced Learning in Competence-Based Predoctoral Orthodontics: A Four-Year Study. J Dent Educ. 2016 Mar;80(3):348-54. PMID: 26933111.


Kahoot!

Dental caries is a preventable disease

10

30
Answers

◆ True

▲ False

Exit preview 1 of 11

The antimicrobial in CTX 4 Treatment Rinse is:

0

60
Answers

Chlorhexidine

Gluraraldehyde

Sodium Hypochlorite

Hydrogen Peroxide

Exit preview 2 of 11


Special Care Post Test 1
Michelle
1
10498
11 out of 11
Kayla
3
8439
9 out of 11
2
9269
10 out of 11

Kahoot Qualitative Feedback

Table-2: Qualitative feedback of Batch 25 (2019) students.

Qualitative feedback of Kahoot!-based learning
1. Fun and interactive app
2. Engaging and competitive activity which helped us to differentiate normal and abnormal anatomical oral structures.
3. It's not boring like lectures
4. Develops a keen interest in the subject of oral pathology
5. Afterward discussion assist in-depth understanding of the oral diseases
6. Revising what we have already learned
7. Sometimes it's a distraction as I only focus on winning
8. Enables me to improve MCQ solving skills
9. It made me a self-directed learner so I prove myself to be the best in the quizzes.
10. Effective only when we have sound knowledge, need to be attentive in lectures.
11. Kahoot! captures everyone's attention straight away
12. I am an introvert student but started participating willingly in the tutorials.

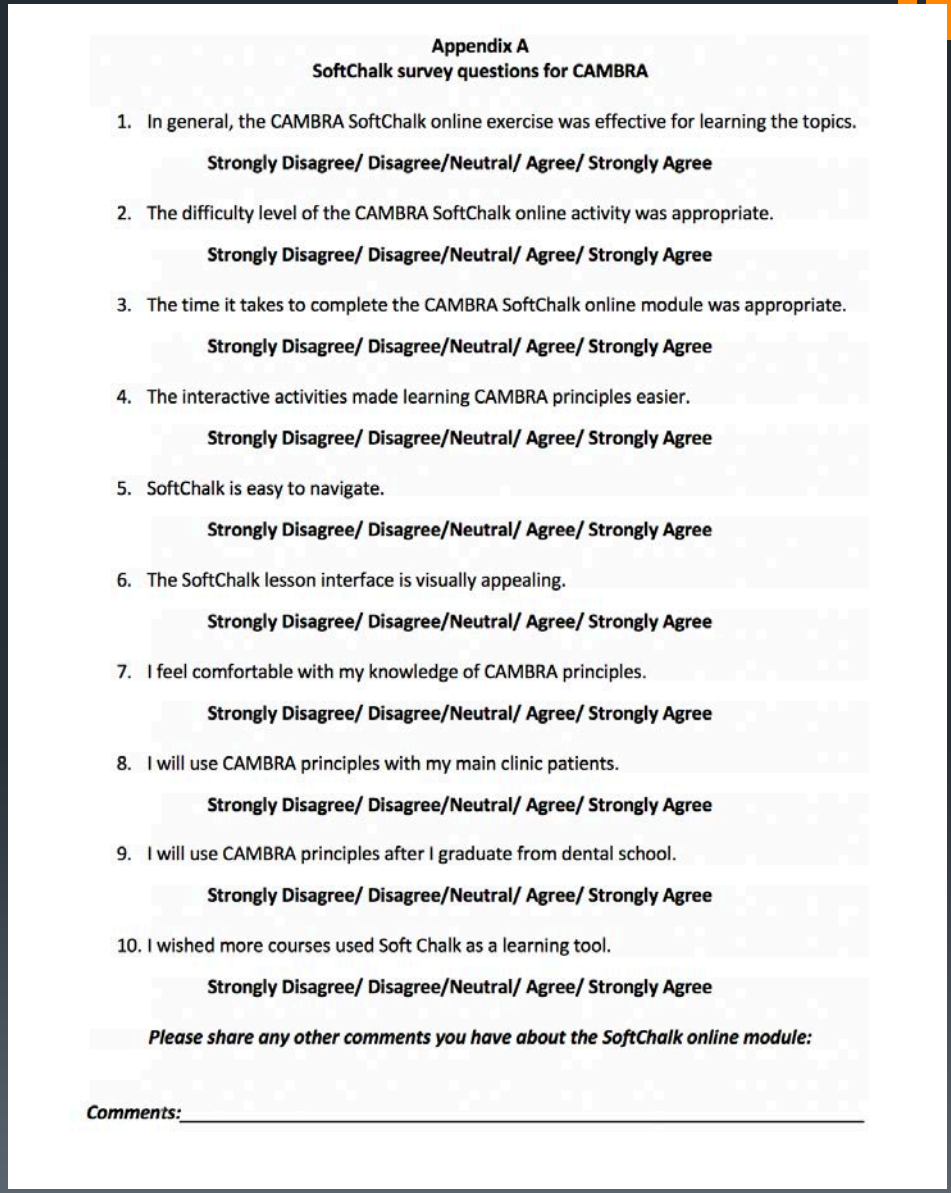
Ali MF, Askary G, Mehdi H, Khan A, Kaukab H, Qamar R. To assess students' perception about Kahoot! as an innovative learning tool in oral pathology- a qualitative study. J Pak Med Assoc. 2021 Oct;71(10):2426-2428.

Outcomes

Participants:
Third year dental students; voluntary and anonymous

DDS 2023 = 148
IDS 2023 = 26

60 surveys



Appendix A
SoftChalk survey questions for CAMBRA

1. In general, the CAMBRA SoftChalk online exercise was effective for learning the topics.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

2. The difficulty level of the CAMBRA SoftChalk online activity was appropriate.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

3. The time it takes to complete the CAMBRA SoftChalk online module was appropriate.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

4. The interactive activities made learning CAMBRA principles easier.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

5. SoftChalk is easy to navigate.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

6. The SoftChalk lesson interface is visually appealing.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

7. I feel comfortable with my knowledge of CAMBRA principles.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

8. I will use CAMBRA principles with my main clinic patients.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

9. I will use CAMBRA principles after I graduate from dental school.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

10. I wished more courses used Soft Chalk as a learning tool.

    Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

Please share any other comments you have about the SoftChalk online module:

Comments:_____

Results

✓ Survey results: SoftChalk well accepted by students. Most students agreed that SoftChalk was effective for learning CAMBRA

✓ Most requested that the module incorporate more clinical cases in order to reinforce learning.

✓ Most individuals desired more of their courses utilize SoftChalk as a learning tool.

SoftChalk survey questions for CAMBRA

1. In general, the CAMBRA SoftChalk online exercise was effective for learning the topics.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

2. The difficulty level of the CAMBRA SoftChalk online activity was appropriate.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

3. The time it takes to complete the CAMBRA SoftChalk online module was appropriate.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

4. The interactive activities made learning CAMBRA principles easier.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

5. SoftChalk is easy to navigate.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

6. The SoftChalk lesson interface is visually appealing.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

7. I feel comfortable with my knowledge of CAMBRA principles.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

8. I will use CAMBRA principles with my main clinic patients.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

9. I will use CAMBRA principles after I graduate from dental school.

   Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

10. I wished more courses used Soft Chalk as a learning tool.

    Strongly Disagree/ Disagree/Neutral/ Agree/ Strongly Agree

Comments: This was really useful to help reinforce the learning from reading the PPTX. Thank you!

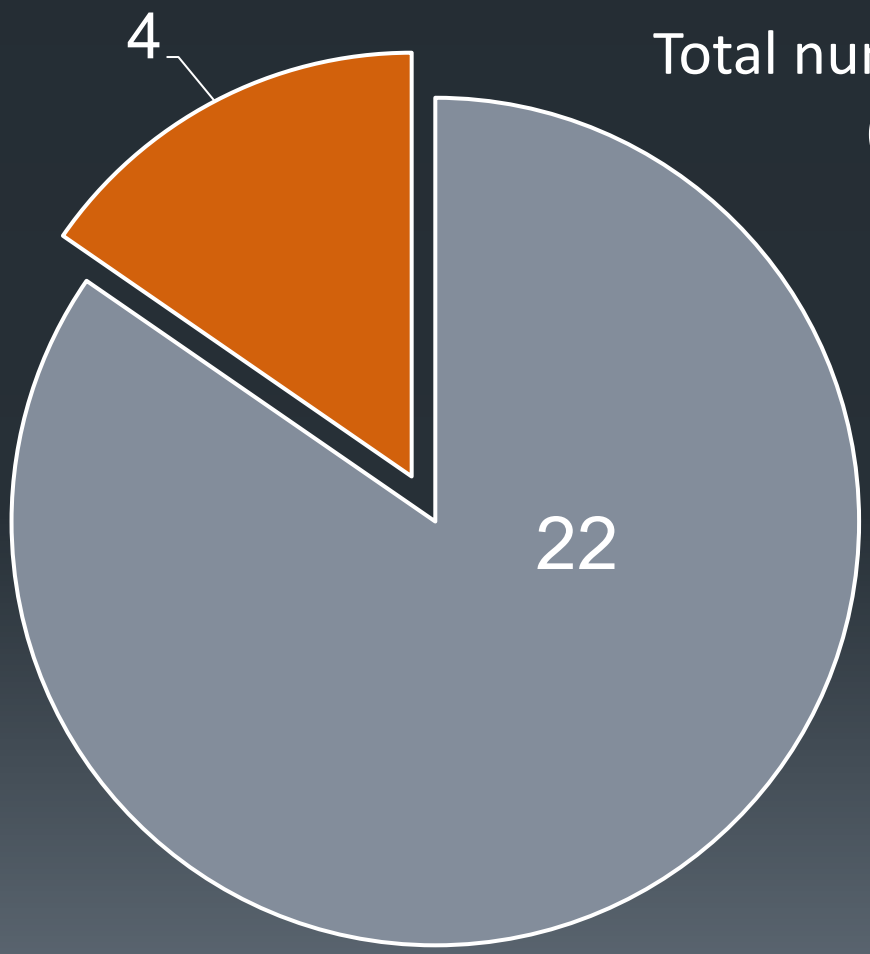
Survey Questions

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
In general, the CAMBRA SoftChalk online exercises were effective for learning the topics.	0	1	2	9	48
The difficulty level of the CAMBRA SoftChalk online activity was appropriate	0	2	1	21	36
The time it takes to complete the CAMBRA SoftChalk online module was appropriate.	0	1	1	20	38
The interactive activities made learning CAMBRA principles easier	0	0	0	16	44
SoftChalk is easy to navigate	1	0	4	8	47

Survey Questions

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The SoftChalk lesson interface is visually appealing	1	0	5	21	33
I feel comfortable with my knowledge of CAMBRA principles	0	0	2	19	39
I will use CAMBRA principles with my main clinic patients	0	0	2	12	46
I will use CAMBRA principles after I graduate from dental school	1	0	1	14	44
I wish more courses used SoftChalk as learning tool	0	1	4	25	30

Written comments



Total number of comments
(N = 26)

Commendations: 22
Suggestions: 4

Comments

- *"This was very useful to help reinforce the learning from reading the PowerPoint"*

- *"Even though I was taught CAMBRA in my first year, SoftChalk exercises allowed me to understand the principles"*

- *"The explanations are excellent for learning why the correct answers are right"*

- *"I loved the SoftChalk exercises, wished we had more practice questions focusing on different scenarios"*

Comments

- *"SoftChalk is a useful way to prepare for any rotation- students tend not to look at Powerpoints. This specific SoftChalk was almost too simple"*

- *"An effective learning resource"*

- *"Have never presented CAMBRA products in main clinic other than SDF and topical fluoride…"*
  but now I'm a CAMBRA believer"

Suggestions

- *"I wish we had more modules on the SoftChalk CAMBRA. It was very helpful"*
- *"Would love a matching exercise for the CTX products"*
- *"SoftChalk module could be a bit longer! One more case would be beneficial"*
- *"Could be slightly more challenging" Overall was fun and helpful*

Generation Z

”Generation Z students… tend to raise questions online, see a lecture as “*come and entertain me*” and does not like waiting for a response but demand instant information and communication”

Cilliers, E. J. (2017). THE CHALLENGE OF TEACHING GENERATION Z. *PEOPLE: International Journal of Social Sciences*, *3*(1), 188–198.

What we need to do

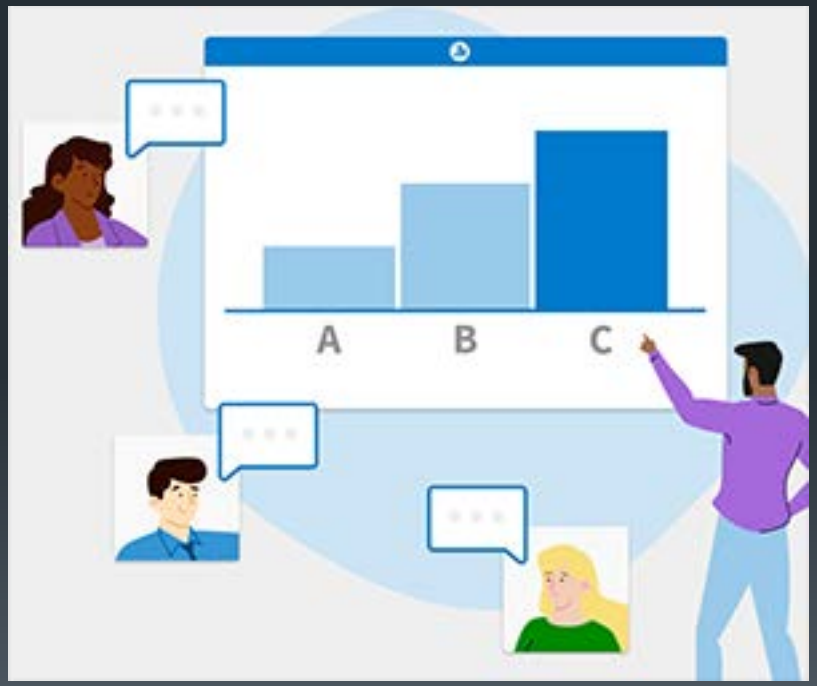
- Incorporate technology, social media and social networking into teaching and learning

- Introduce more visual-teaching methods and interesting, quick-result participatory methods.

"Creative classroom setup"

Cilliers, E. J. (2017). THE CHALLENGE OF TEACHING GENERATION Z. *PEOPLE: International Journal of Social Sciences*, *3*(1), 188–198.

Poll Everywhere

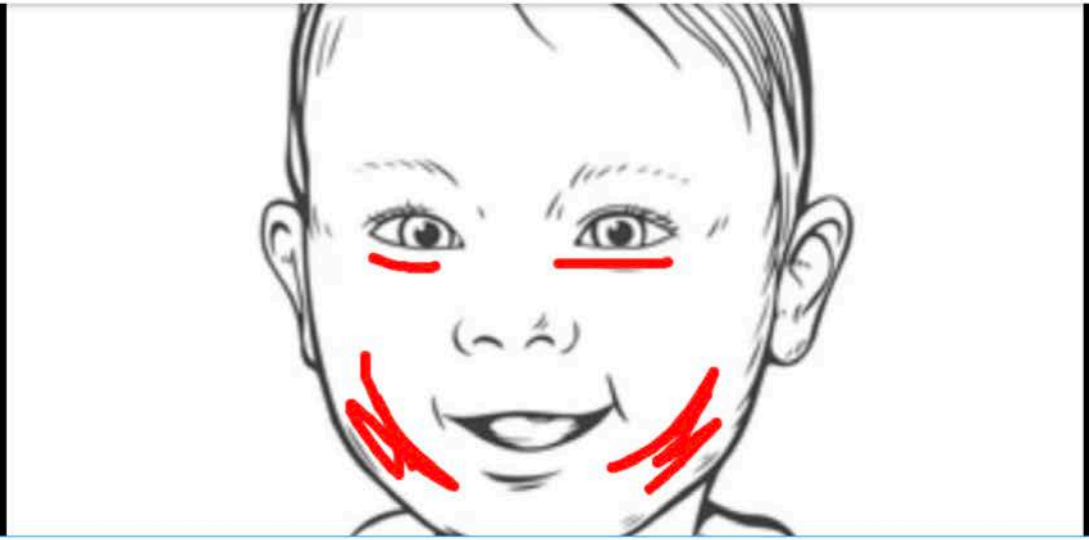


nearpod

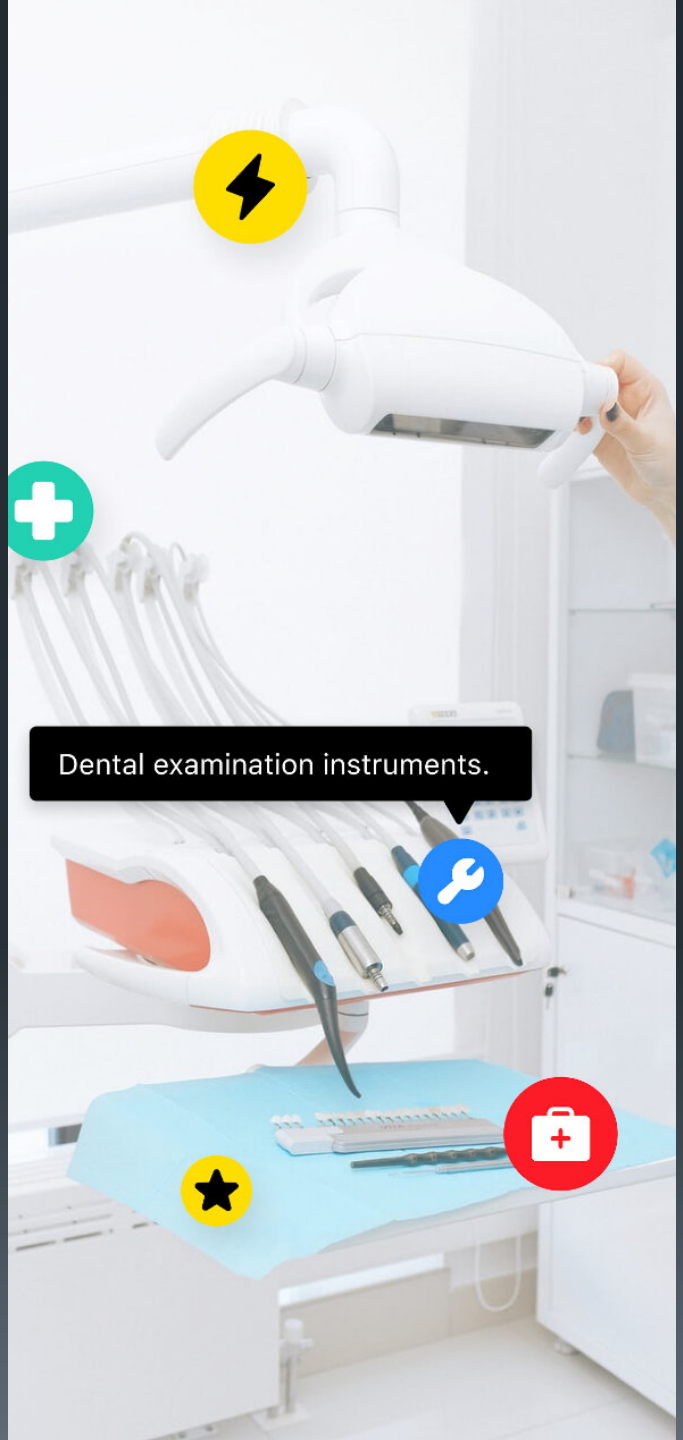
nearpod Menu CODE: D4T5X Student Teacher

On the child's face, indicate where extraoral swelling occurs in which you must immediately hospitalize a child due to life-threatening conditions.

Instructions

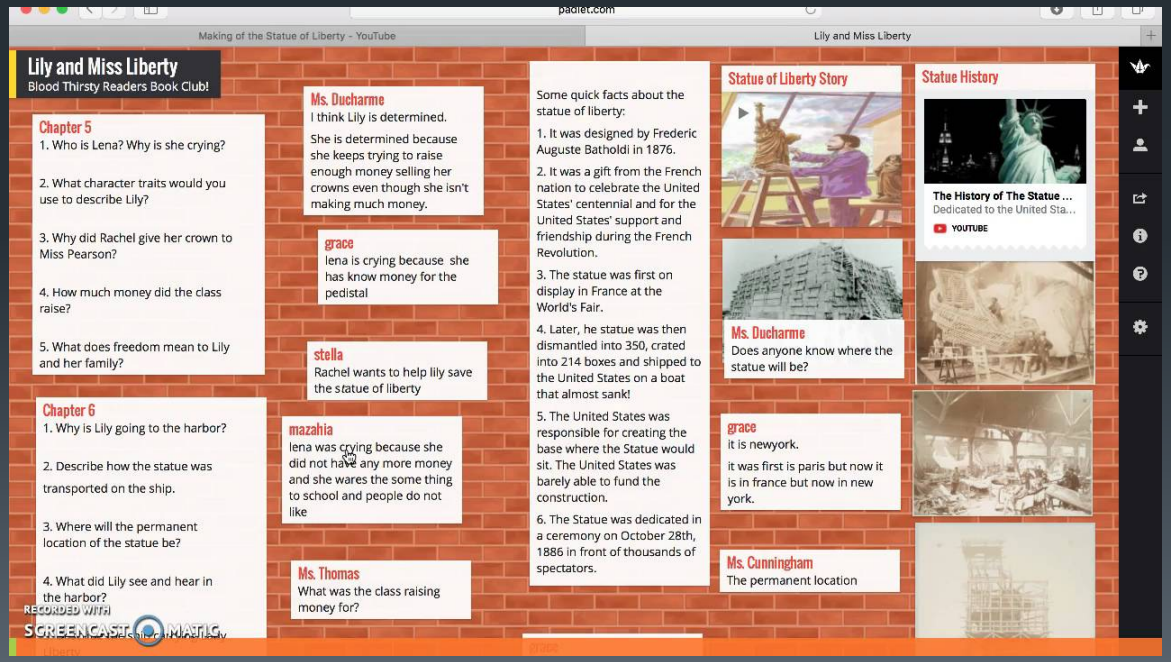


Submit



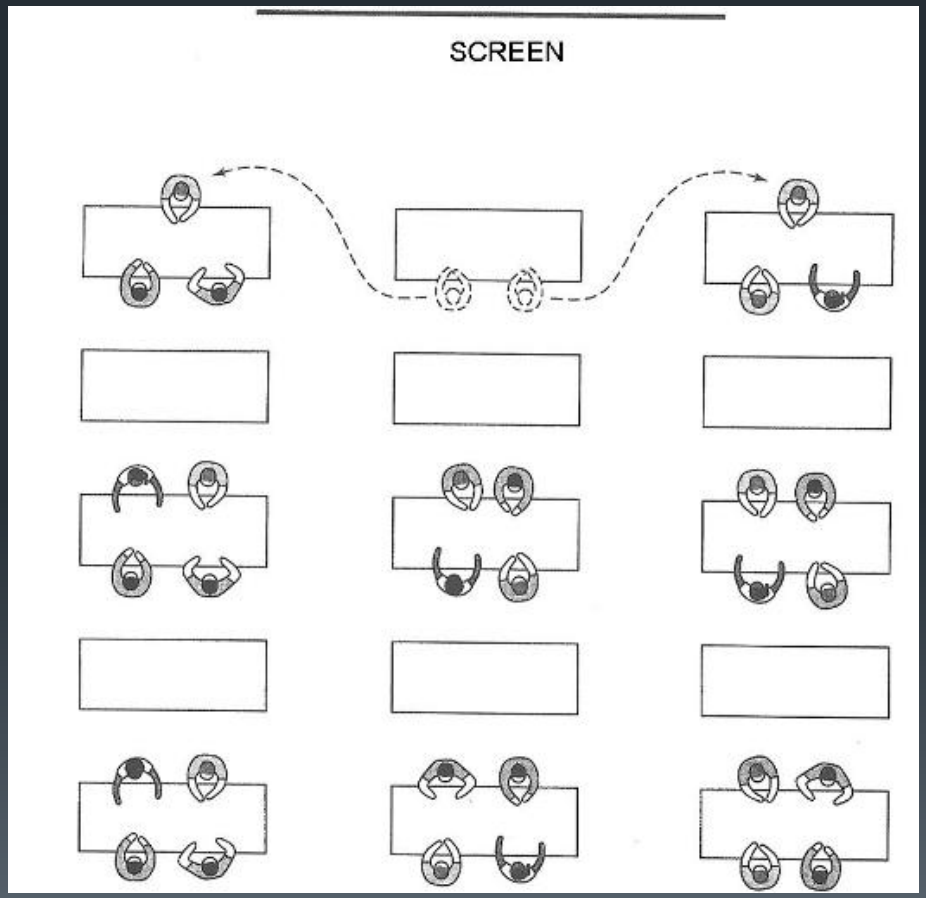
thinglink.

padlet


padlet.com
Making of the Statue of Liberty - YouTube
Lily and Miss Liberty
Lily and Miss Liberty
Blood Thirsty Readers Book Club!
Chapter 5
1. Who is Lena? Why is she crying?
2. What character traits would you use to describe Lily?
3. Why did Rachel give her crown to Miss Pearson?
4. How much money did the class raise?
5. What does freedom mean to Lily and her family?
Chapter 6
1. Why is Lily going to the harbor?
2. Describe how the statue was transported on the ship.
3. Where will the permanent location of the statue be?
4. What did Lily see and hear in the harbor?
Ms. Ducharme
I think Lily is determined.
She is determined because she keeps trying to raise enough money selling her crowns even though she isn't making much money.
grace
lena is crying because she has know money for the pedistal
stella
Rachel wants to help lily save the statue of liberty
mazahia
lena was crying because she did not have any more money and she wares the some thing to school and people do not like
Ms. Thomas
What was the class raising money for?
Some quick facts about the statue of liberty:
1. It was designed by Frederic Auguste Batholdi in 1876.
2. It was a gift from the French nation to celebrate the United States' centennial and for the United States' support and friendship during the French Revolution.
3. The statue was first on display in France at the World's Fair.
4. Later, he statue was then dismantled into 350, crated into 214 boxes and shipped to the United States on a boat that almost sank!
5. The United States was responsible for creating the base where the Statue would sit. The United States was barely able to fund the construction.
6. The Statue was dedicated in a ceremony on October 28th, 1886 in front of thousands of spectators.
Statue of Liberty Story
Statue History
The History of The Statue ...
Dedicated to the United Sta...
YOUTUBE
Ms. Ducharme
Does anyone know where the statue will be?
grace
it is newyork.
it was first is paris but now it is in france but now in new york.
Ms. Cunningham
The permanent location
RECORDED WITH SCREENCAST-O-MATIC

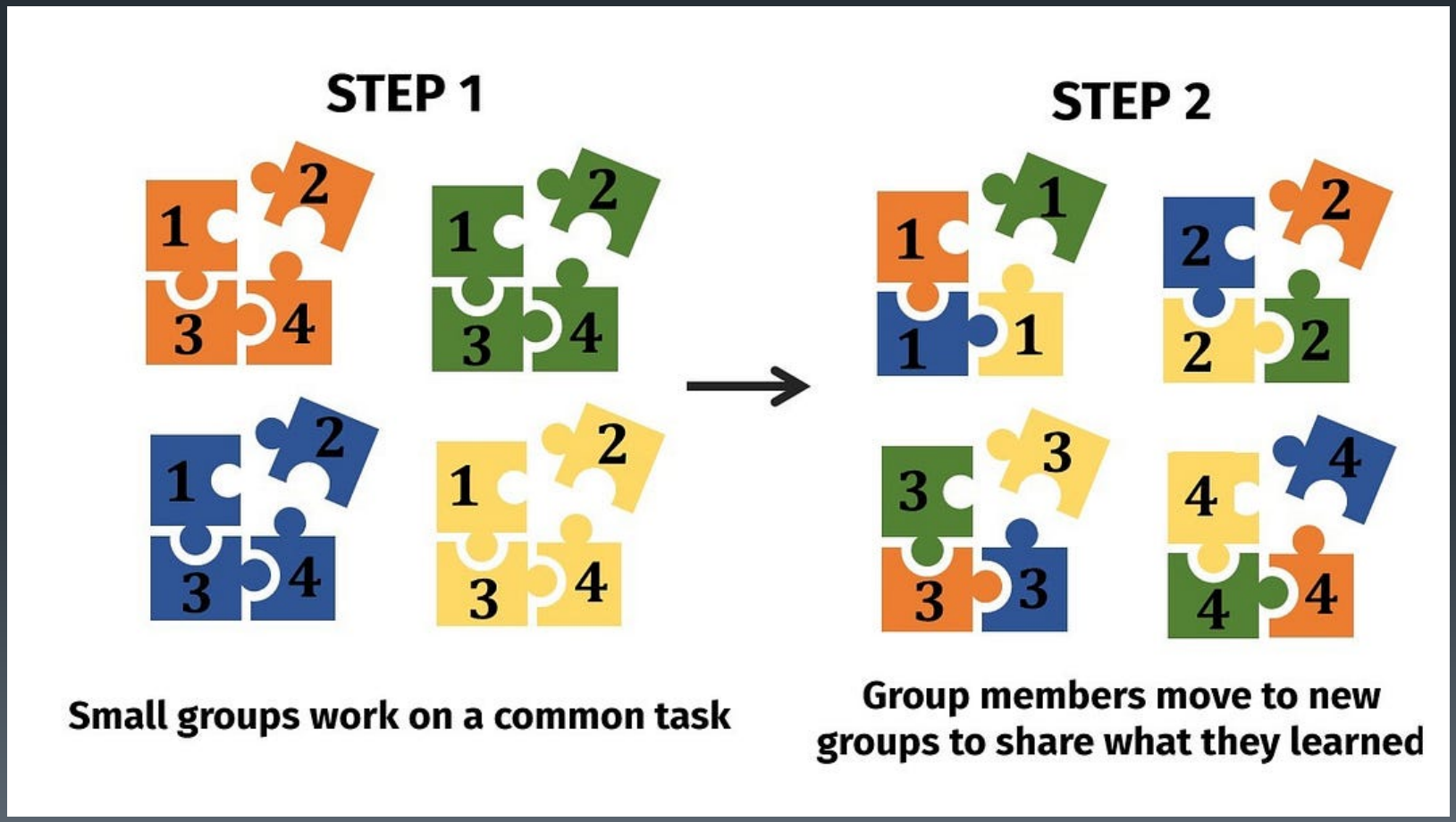
Non-tech Techniques

“Buzz groups”



Non-tech Techniques

"Jigsaw activity"



Non-tech Techniques

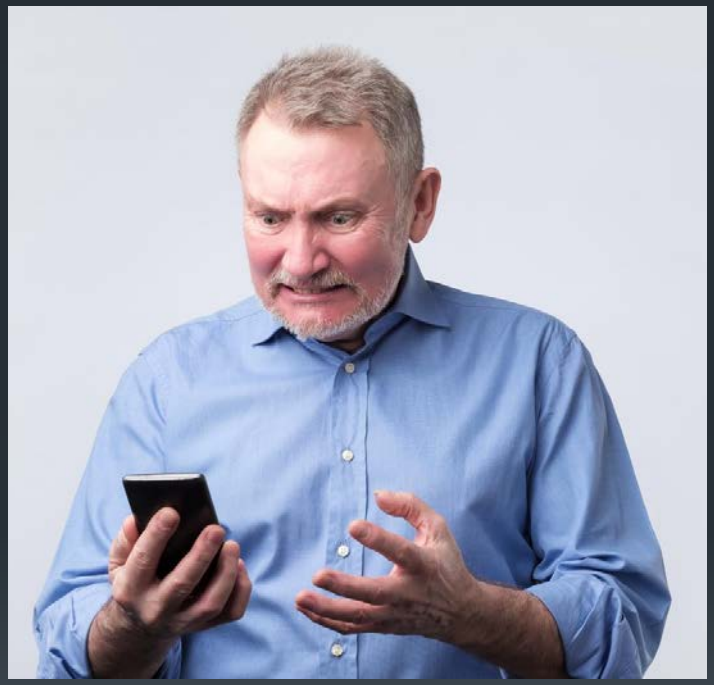
Engaging students in the back

“Seasoned” Generation?

• Older adults: positive views about technology and open to using helpful devices in their daily lives

• Stereotypes suggest that older adults (65 years of age or older) are unable, unwilling, or afraid to use technology

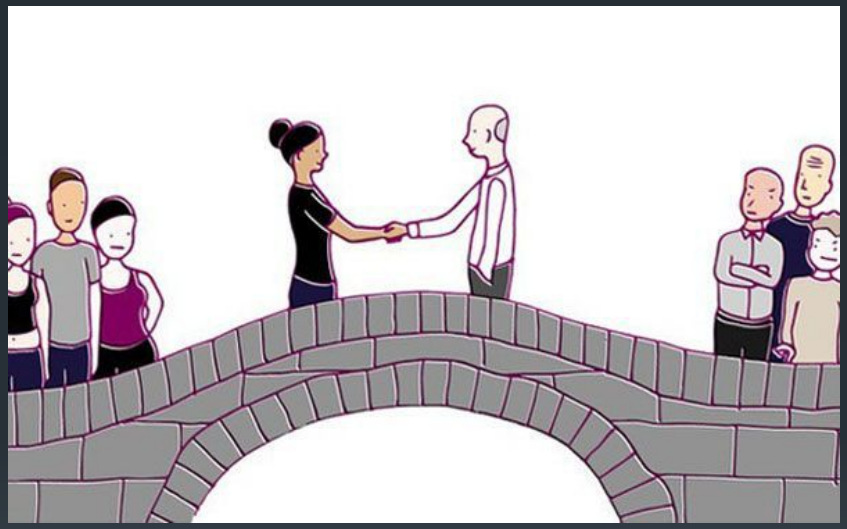
• Two personal barriers to technology adoption: low self-efficacy regarding computer use and high anxiety for computer use



Mitzner TL, Boron JB, Fausset CB, Adams AE, Charness N, Czaja SJ, Dijkstra K, Fisk AD, Rogers WA, Sharit J. Older Adults Talk Technology: Technology Usage and Attitudes. Comput Human Behav. 2010 Nov 1;26(6):1710-1721.

Solutions

- Hold technology workshops regularly
- Pair young and "seasoned" faculty members
- Inclusive culture***



Ultimate Goal

Thank you!

Are you likely to implement any of these tools in your teaching approach?

msuh@pacific.edu

tverceles@pacific.edu