

# Dental Health: Updates and concerns

Stanford Down Syndrome Conference  
November 1, 2024

Allen Wong, DDS, EdD, DABSCD

Professor Emeritus, University of the Pacific Arthur A. Dugoni School of Dentistry  
Kramer Davis Health-Nashville, Dental Department Head



# Disclosures

- No Financial disclosures for this presentation
- Colgate: product expert consultant for IDD populations
- unpaid consultant for ComfortSoft retractor
- Dedicated to my greatest instructors... my patients, residents, students and faculty

(some slides modified from past residents Drs Mali McGuire and Sierra Lee)



# My Journey...

## From Recovery to Discovery

Prevention focus

Special Olympics to Special Care

COVID to Health equity

Operator to Intervenor to Advocate





# My Beginnings.... My journey ...the road less traveled

Graduated from Dental School 1986 (special needs rotation in senior externship)  
Advanced General Dentistry Residency  
Teaching predoctoral ER/OS (postdoctoral AEGD program, OMFS restore)  
Hospital Dentistry (Highland Hospital/ Special Healthcare needs program)  
Director AEGD Program Pacific Dugoni (postdoctoral residency)  
Special Olympics.....local volunteer to Global Clinical Advisor...ret.  
Special Care Dentistry Association (AAHD Fellowship, Diplomate ABS CD)  
American Academy of Developmental Medicine and Dentistry (AADMD Past president)  
International Association Disability and Oral Health (iADH) Chair Advisory  
Special Care Dentistry Association (SCDA) President  
Santa Fe Group Fellow (Intellectual and Developmental Disability)  
Kramer Davis Health-Nashville (Transdisciplinary Clinic) Dental Department Head

FACD, FICD, FPFA, FAAHD, FADI, FiADH, FAADD, FNAP



# Common Clinical Features & Physical Signs Down Syndrome

---

- \*Decreased muscle tone at birth
- \*Excess skin at the nape of the neck
- \*Wide, short hands with short fingers
- \*Atlanto-Axial instability
- \*Upward angulation of eyes
- \*Flat nose and face
- \*Thin upper lip
- \*Shorten neck
- \*Small ears
- \*Opened mouth
- \*protruding tongue

# Health Challenges & Medical Conditions

## 01 Intellectual Disability

- Listen to patient and caregivers
- Verify your understanding
  - > Prepare for success
  - > Use appropriate terminology

## 02 Behavior management

- Schedule /Telehealth?
- Reduce unnecessary stimuli > Plan a step-by-step evaluation...
- immobilization techniques
- Behaviorist (BCBA)
- Anxiolytics?

03

## Cardiac conditions

mitral valve prolapse occurs in more than half of all adults with this developmental disability.

04

## Compromised immune system

Frequent oral and systemic infections and a high incidence of periodontal disease

- Aphthous ulcers, oral Candida infections, and acute necrotizing ulcerative gingivitis
- Chronic respiratory infections contribute to mouth breathing, xerostomia, and fissured lips and tongue

- Consult with patient's physician regarding systemic health especially diabetes/ sleep apnea/ early onset dementia
- > Consult for the need for antibiotic prophylaxis

Assure proper oral care with support team>  
Treat Periodontal (gum) concerns aggressively.

- Talk to patients and their caregivers about preventing oral infections with regular dental appointments
- > Stress the importance of using fluoride to prevent dental caries associated with xerostomia.
- > Use lip balm during treatment to ease the strain on your patient's lips.

## 05 Hypotonia

imbalance of forces on the teeth  
contributes open bite  
-muscles controlling facial  
expression and mastication are  
affected, problems with chewing,  
swallowing, drooling, and speaking

## 06 Seizures

can usually be controlled  
with anticonvulsant  
medications.

Patients may chip teeth or  
bite the tongue or cheeks

- > Maintain a clear path for movement throughout the treatment setting.
- > Determine the best position for your patient in the dental chair and the safest way to move his or her body, especially support the head and neck.

- Consult your patient's physician. Record information in the chart about the frequency of seizures and the medications used to control them.
- > Assure medications have been taken as directed.
- Avoid "triggers" of seizures
- > Stay with your patient, turn patient to one side, and monitor the airway to reduce the risk of aspiration



## 07 Hearing loss/ impairment

may further complicate communication

## 08 Visual impairments

strabismus (crossed or misaligned eyes), glaucoma, and cataracts.

> Patients who wear aides may want to adjust their hearing aids or turn them off, since the sound of some instruments may cause auditory discomfort.

> Visual feedback is helpful. Maintain eye contact with your patient. Before talking, eliminate background noise

> Use your patients' other senses to connect with them, establish trust, and make treatment a better experience.

> Tactile feedback, such as a warm handshake, can make your patients feel comfortable.

> Face your patients when you speak and keep them apprised of each upcoming step, Smile!

Use Video clips and multimedia

# Effects of down syndrome in dental health

## Periodontal disease

---

- Most significant oral health problem in people with Down syndrome
  - Children experience rapid, destructive periodontal disease
    - Consequently, large numbers of them lose their permanent anterior teeth in their early teens
    - Contributing factors:
      - poor oral hygiene
      - Malocclusion
      - Bruxism
      - conical-shaped tooth roots
      - abnormal host response because of a compromised immune system.
- > Some patients benefit from the daily use of an antimicrobial agent such as chlorhexidine. (spray/tooth brush)
  - > If use of particular medications has led to gingival hyperplasia, emphasize the importance of daily oral hygiene and frequent professional cleanings
  - > Encourage independence in daily oral hygiene.
  - > Some people with Down syndrome can brush and floss independently, but many need help. Talk to their caregivers about daily oral hygiene.

# Effects of down syndrome in dental health

## Dental caries (cavities)

---

- Children and young adults who have Down syndrome have fewer caries than people without this developmental disability.
    - Several associated oral conditions:
      - delayed eruption of primary and permanent teeth
      - missing permanent teeth
      - small-sized teeth with wider spaces between them  
→ which make it easier to remove plaque.
      - The diets of many children with Down syndrome are closely supervised to prevent obesity  
→ this helps reduce consumption of cariogenic foods and beverages.
  - By contrast, some adults with Down syndrome are at an increased risk of caries
    - Xerostomia (dry mouth) and cariogenic food choices
    - hypotonia contributes to chewing problems
    - inefficient natural cleansing action
- > Advise patients taking medicines that cause xerostomia to drink water often. Suggest taking sugar-free medicines if available and rinsing with water after dosing.
  - > Recommend preventive measures such as topical fluoride and sealants. Suggest fluoride toothpaste, gel, or rinse, depending on your patient's needs and abilities.
  - > Emphasize noncariogenic foods and beverages as snacks. Advise caregivers to avoid using sweets as incentives or rewards.

# Effects of down syndrome in dental health

## Malocclusion

---

- Found in most people with Down syndrome
    - Due to delayed eruption of permanent teeth & underdevelopment of the maxilla
  - A smaller maxilla contributes to an open bite
    - → to poor positioning of teeth
    - → increasing the likelihood of periodontal disease and dental caries.
- Orthodontics should be carefully considered in people with Down syndrome.
  - > In and of itself, Down syndrome is not a barrier to orthodontic care. The ability of the patient or caregiver to maintain good daily oral hygiene is critical to the feasibility and success of treatment.

# Effects of down syndrome in dental health

## Tooth anomalies

- **Congenitally missing teeth**

- Third molars, laterals, and mandibular second bicuspid are the most common missing teeth.

- **Delayed eruption of teeth,**

- Primary teeth may not appear until age 2, with complete dentition delayed until age 4 or 5. Primary teeth are then retained in some children until they are 14 or 15.

- **Irregularities in tooth formation**

- such as **microdontia** and **malformed teeth**

- Crowns tend to be smaller, and roots are often small and conical

> Examine a child by his or her first birthday and regularly thereafter to help identify unusual tooth formation and patterns of eruption.

➤ Consider using a panoramic radiograph to determine whether teeth are congenitally missing.

➤ > Maintain primary teeth as long as possible. Consider space maintainers for missing teeth



# Effects of down syndrome in dental health

## TRAUMA and INJURY

---

- TRAUMA and INJURY to the mouth from falls or accidents occur in people with Down syndrome
- Physical abuse often presents as oral trauma. Abuse is reported more frequently in people with developmental disabilities
  - > Suggest a tooth-saving kit for group homes.
  - > Emphasize to caregivers that traumas require immediate professional attention and explain the procedures to follow if a permanent tooth is knocked out.
  - instruct caregivers to locate any missing pieces of a fractured tooth, and explain that radiographs of the patient's chest may be necessary to determine whether any fragments have been aspirated.
  - Avulsed (teeth knocked out) if not put back within 20 minutes may not survive

# References

Debord, Jessica. <https://www.ndss.org/resources/dental-issues-syndrome>

Fenton SJ, Perlman S, Turner H (eds.). Oral Health for People with Special Needs: Guidelines for Comprehensive Care. River Edge, NJ: Exceptional Parent, Psy-Ed Corp., 2003.

Roizen NJ. Down Syndrome. In Batshaw ML, Pellegrino L, Roizen NJ (eds.). Children With Disabilities (6th ed.). Baltimore, MD: Paul H. Brookes Publishing Co., 2007.

Weddell JA, Sanders BJ, Jones JE. Dental problems of children with disabilities. In McDonald RE, Avery DR, Dean JA. Dentistry for the Child and Adolescent (8th ed.). St. Louis, MO: Mosby, 2004. pp. 524–556.

# Prevention Paradigm Shift



-Treating Dental Caries and Periodontal Disease as a “disease”

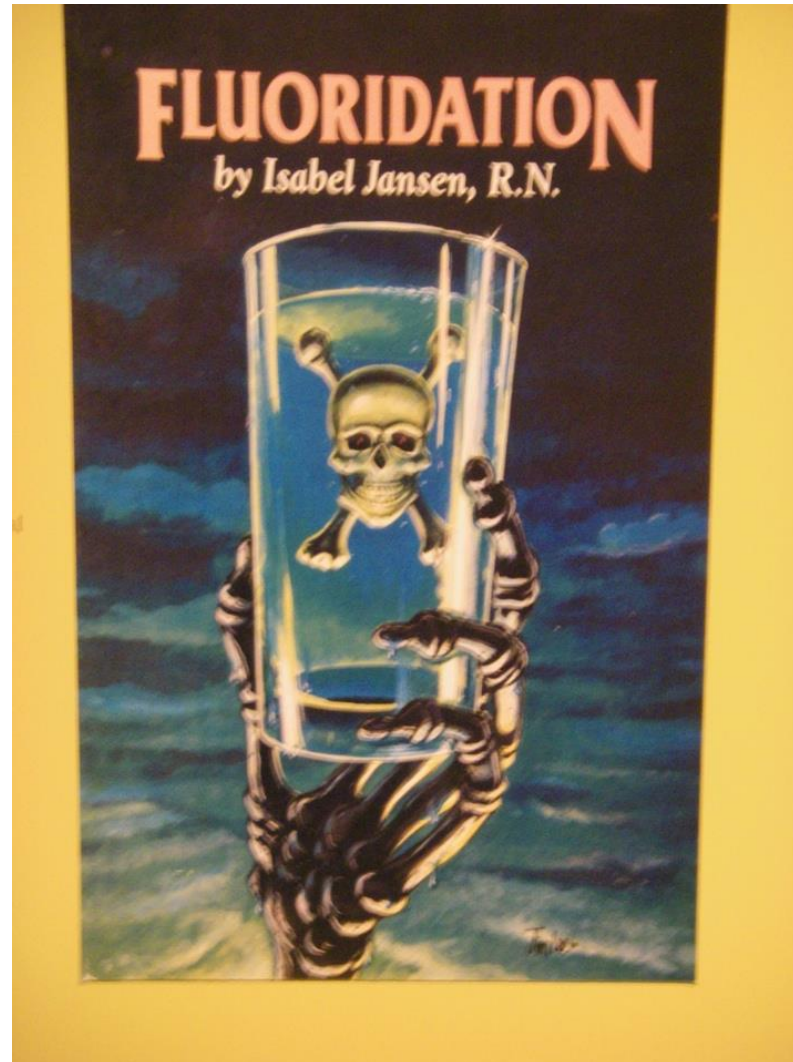
-Reducing etiological Risks!

-New Science

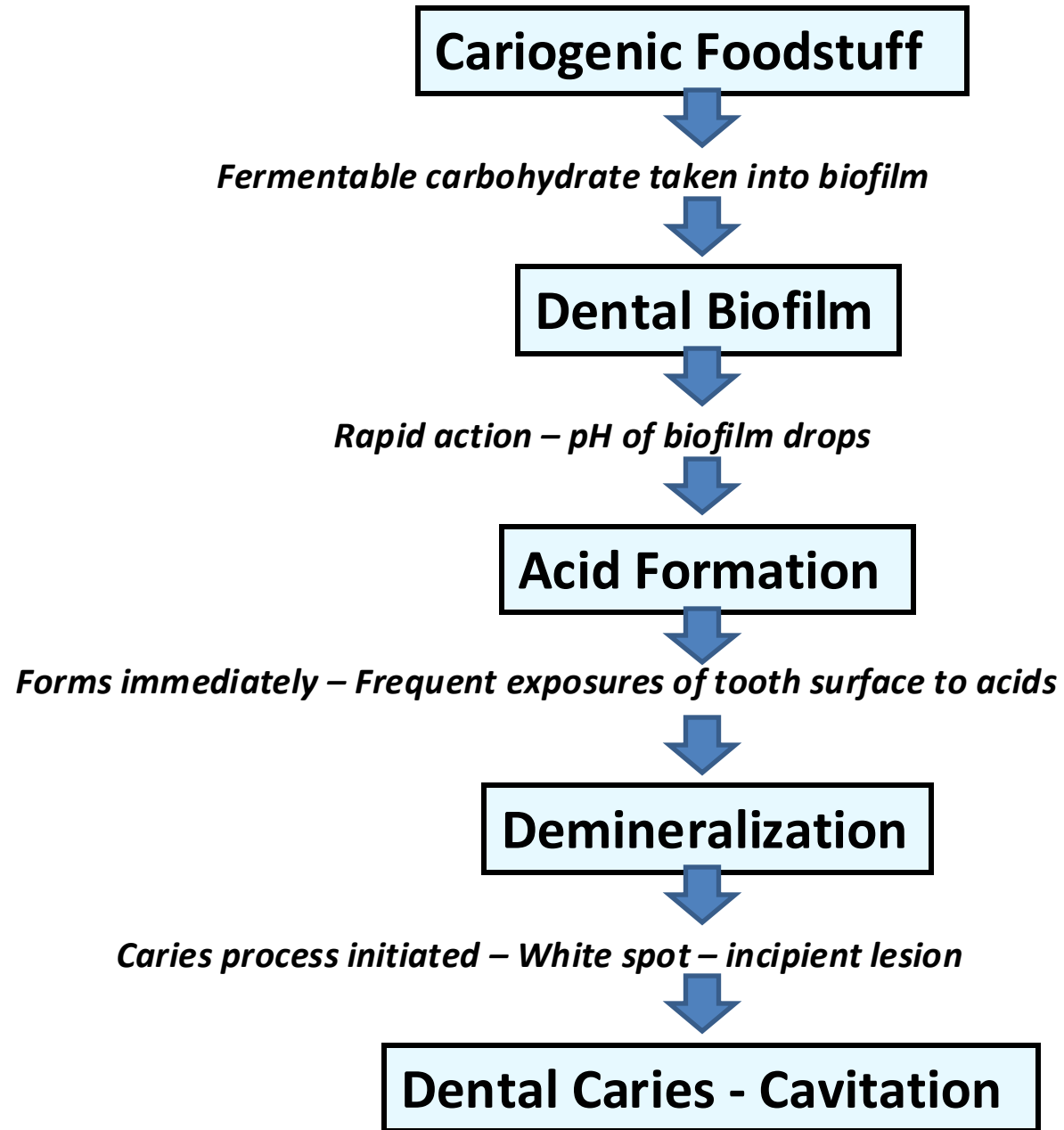
- Silver diamine fluoride
- Caries risk protocols
- ATP monitoring
- Saliva testing (pH and Buffering capacity)
- Oral Genomic test



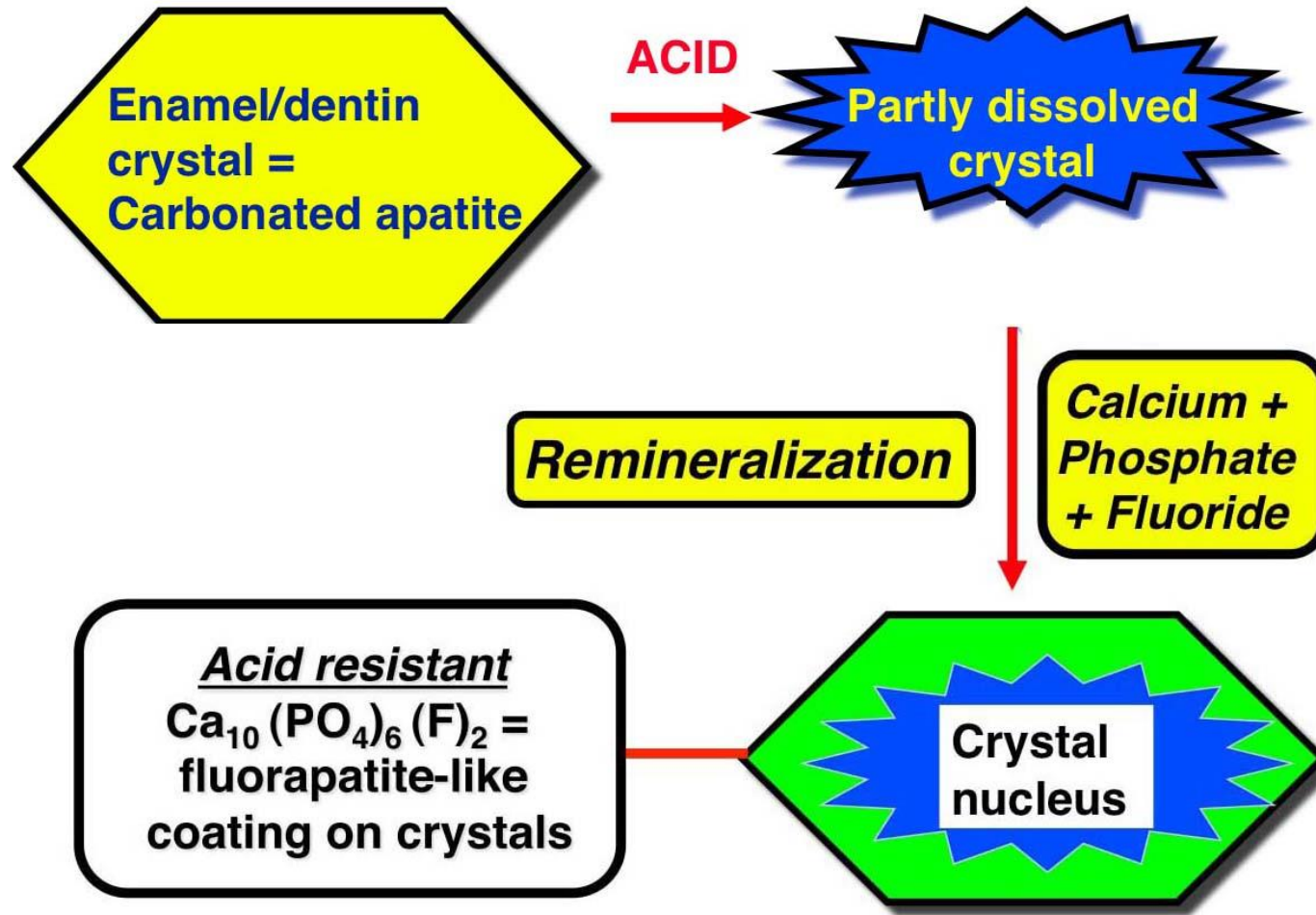
# Products







# Demin /Remin



Courtesy of Dr. John Featherstone

# So what's causing this pandemic?

?

## Pattern Recognition

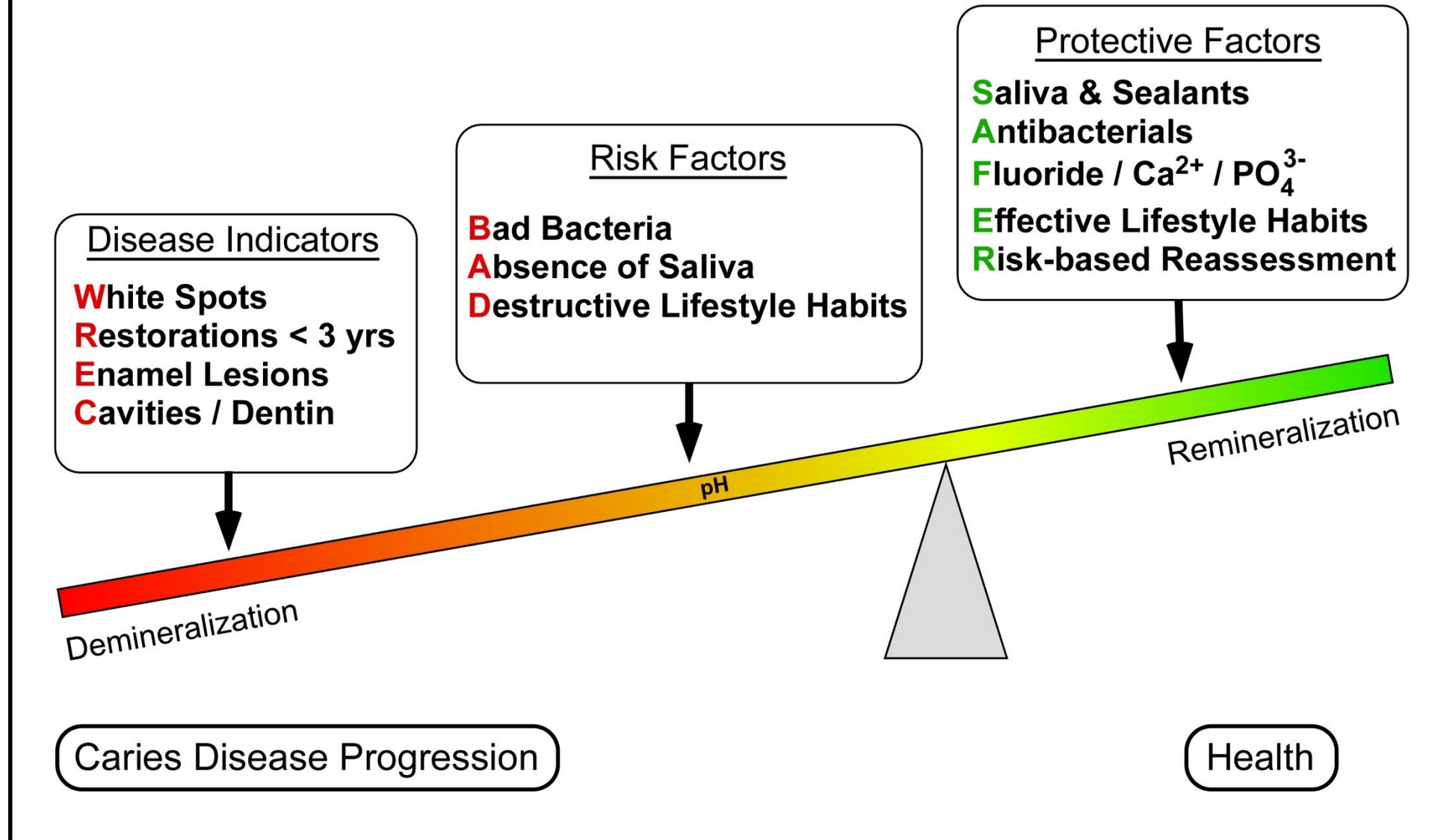
Dr. Kim Kutsch

# American Academy Developmental Medicine and Dentistry

## Generic and Trade Name Medication Dental Watch List

					Risk for Stomatitis			Risk for Xerostomia		
					Risk for Reflux			Risk for Caries		
Abilify										
Acamprosate										
Accutane										
AetiQ										
Adalat										
Advair										
Aldomet										
Alendronate										
Alfuzosin										
Aliskiren										
Alprazolam										
Amitriptyline										
Anafranil										
Antivert										
Aripiprazole										
Asacol										
Aspirin										
Atarax										
Atomoxetine										
Atrovent										
Azulfidine										
Baclofen										
Biaxin										
Budesonide										
Buprenex										
Buprenorphine										
Bupropion										
Byetta										
Campral										
Carbamazepine										
Carbidopa										
Cardura										
Celexa										
Cetirizine										
Chantix										
Chlorpromazine										
Cholestyramine										
Cialis										
Citalopram										
Clarithromycin										
Claritin										
Clomipramine										
Clonidine										
Clozapine										
Clozaril										
Cognex										
Combivir										
Copegus										
Cozaar										
Cyclobenzaprine										
Cymbalta										
Cyproheptadine										
Cytotec										
Darifenacin										
Diffunisal										
Ditropan										
Dolobid										
Doxazosin										
Doxepin										
Duloxetine										
Duragesic										
Elavil										
Enblex										
Enalapril										
Exenatide										
Famotidine										
Feldene										
Felodipine										
Fentanyl										
Fentanyl (transmucosal)										
Flexeril										
Flonase										
Flovent										
Fluoxetine										
Fluticasone										
Fluvoxamine										
Fosamax										
Fosinopril										
Gabapentin										
Gemfibrozil										
Granisetron										
Guanfacine										
Haldol										
Haloperidol										
Hydroxychloroquine										
Hydroxyzine										
Hyoscyamine										
Ibuprofen										
Imipramine										
Imitrex										
Immodium										
Inderal										
Indocin										
Indomethacin										
INH										
Insulin										
Itraconazole										
Ketorolac										
Kytril										
Lamivudine										
Lansoprazole										
Levalbuterol										
Levbid										
Levocarnitine										
Levocetirizine										
Levodopa										
Lexapro										
Lioresal										
Lisdexamfetamine										
Lisinopril										
Lithium										
Locholest										
Loperamide										
Lopid										
Lopressor										
Loratadine										
Losartan										
Luvox										
Meclizine										
Mesalamine										
Methotrexate										
Methyldopa										
Metoprolol										
Midazolam										
Midodrine										
Mirtazapine										
Misoprostol										
Monopril										
Naproxen										
Neurontin										
Nexium										
Nifedipine										
Nitro-Bid										
Nitro-Dur										
Nitroglycerin										
Nitrostat										
Nortriptyline										
Oxybutynin										
Pamelor										
Pentasa										
Pepcid										
Periactin										
Piroxicam										
Plaquenil										
Plendil										
Prevacid										
Prevalite										
Prinivil										
ProAmatine										
Procardia										
Propranolol										
Prozac										
Pulmicort										
Questran										
Rebetol										
Remeron										
Rhinocort										
Ribavirin										
Risperdal										
Risperidone										
Sinequan										
Sporanox										
Strattera										
Subutex										
Sulfamethoxazole										
Sulfasalazine										
Sulfatrim										
Sumatriptan										
Tacrine										
Tadalafil										
Tegretol										
Tektura										
Tenex										
Thorazine										
Tofranil										
Toprol										
Toradol										
Trexall										
UroXatral										
Varenicline										
Vasotec										
Versed										
Vistaril										
Vyvanse										
Wellbutrin										
Xanax										
Xopenex										
Xyzal										
Zestril										
Zidovudine										
Zonalon										
Zyban										

# The Caries Balance / Imbalance





# Remineralization

## 5 factors

- Salivary pH
- Fluoride
- Biofilm Control
- Calcium
- Phosphate

ATP Test: Bioluminescence technology  
Measure activity of dental plaque...



# Caries Risk Assessment

## Caries Susceptibility Test

**ATP + luciferin + O<sub>2</sub>**

**Mg<sup>+2</sup>**

**luciferase**

**AMP + oxyluciferin + PPi + CO<sub>2</sub> + Light (560 nm)**



# Oral Genome Test (saliva)

## Point-of-Care Biometrics Testing Device:

For piloting, we utilize the [Oral Genome™ Biometrics Testing Kit](#) for salivary collection and testing. The device, coupled with an mHealth app, provides quick results and personalized health recommendations. Tests cover salivary biomarkers, pH, buffering capacity, Porphyromonas gingivalis, proteins, MMP-8, glucose, and nitric oxide.

The mHealth app, powered by [Harmony Health Foundation](#), also incorporates the ADA Caries Risk and ADA Diabetes Risk Assessment Questionnaires.

### Key Features:

- Simplified data interpretation with user-friendly interface.
- Personalized treatment recommendations based on algorithms.
- AI-enabled photography
- Cost-effective and accessible technology
- Focus on empowering informed decisions and improving oral health practices.



## How We Do It

Patient completes Biometrics Assessment



# PREVENTION ACADEMY

## *Virtual “Casual” Lecture & Q&A*

- Casual virtual setting to allow better accessibility
- Residents presented short fun facts and helpful hints with opportunities for Q&As
- Interviewed athletes about their experiences with dental visits
- Asked athletes for feedback

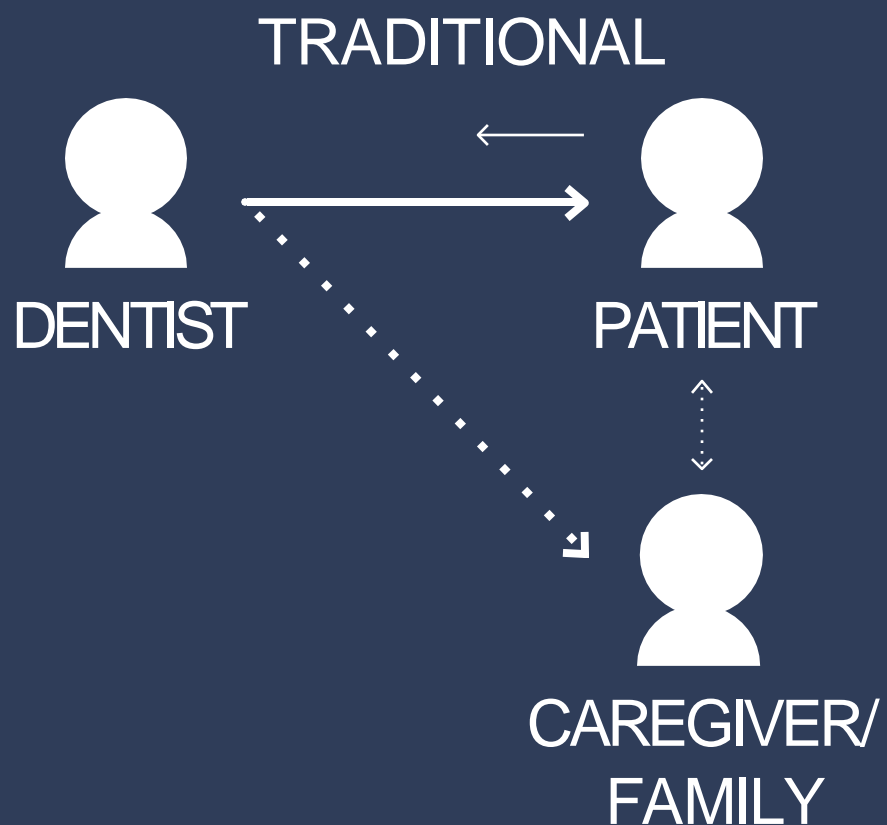


Credit: Aileen Wong



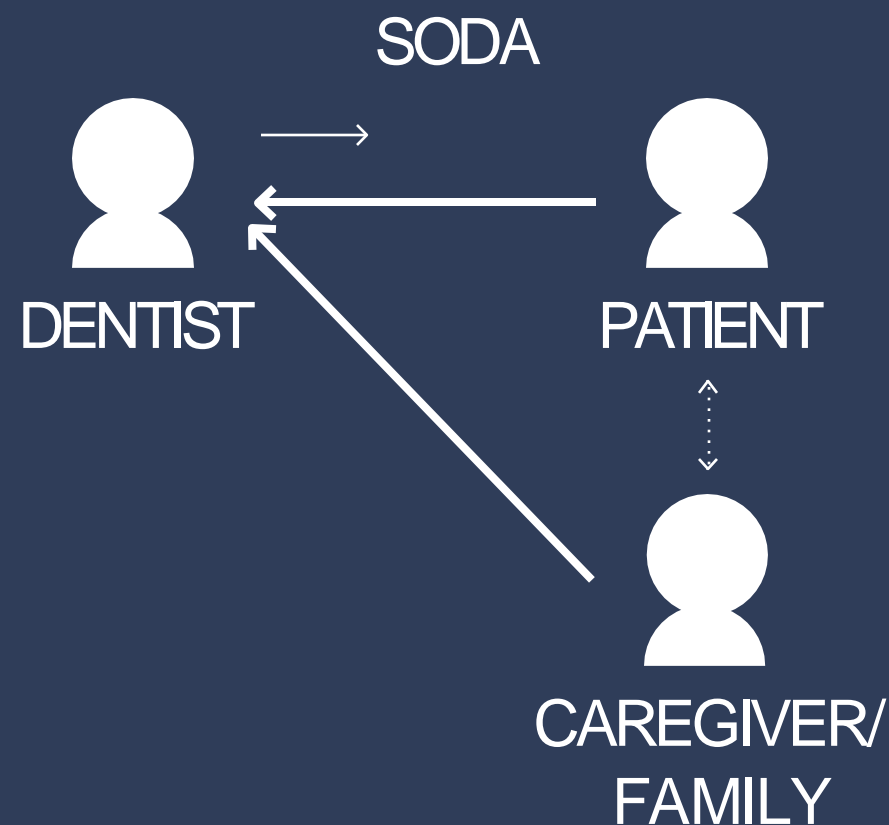
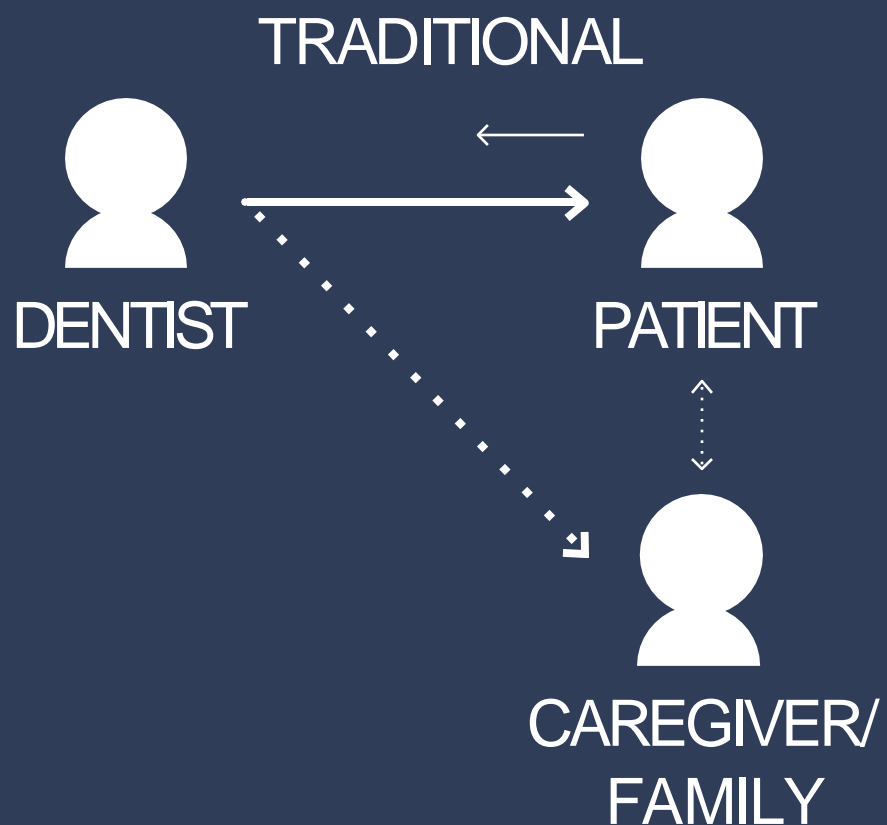
# TWO WAY COMMUNICATION

*Learning from Special Olympic Self-Advocates*



# TWO WAY COMMUNICATION

*Learning from Special Olympic Self-Advocates*



# SCHEDULE SAMPLE

17

MINI LECTURE - ENTIRE GROUP - Room 136AB  
9:30-10:00 AM

## SCRIPTING

BREAKOUT GROUPS  
Room 136AB  
10:00-10:30 AM



## SIMULATION

BREAKOUT GROUPS  
Special Care Clinic (2nd Floor)  
10:45-11:30 AM



# MINI LECTURE SAMPLE TOPICS

## Medical Immobilization/Protective Stabilization (MIPS)

- May be necessary for longer or more complex procedures
- Used to protect you as the patient and us as your dentist
- May include
  - Cushions you lie on to help you feel more comfortable
  - Cushions that wrap around you like a hug to keep you very still for the procedure



# MINI LECTURE SAMPLE TOPICS

---

## Fillings

- Surgical method of treating cavities
- Involves
  - Numbing the tooth that has the cavity
  - Using special equipment that may make high pitched sounds or cause vibration
  - Cleaning the tooth out
  - Filling the tooth up with a tooth colored filling
  - Polishing the tooth so it feels comfortable to bite on
  - Flossing in between the teeth to make sure everything fits well
- May be numb after the procedure



# SMALL GROUP INTERVIEW

*Team Collaboration to Determine Best Way to Treat the IDD Population*

- Resident, dental student grouped with self-advocate and their support group
  - > Positive/negative experiences
  - > Physical accessibility tips
  - > Behavioral guidance tips
  - > Communication tips
- Direct feedback from self-advocate and support group



Credit: Allen Wong



# SMALL GROUP SIMULATION

## *Desensitizing Beyond the Dental Chair*

- Resident, dental student grouped with self-advocate and their support group
- Stations with hands-on material and limited armamentarium
  - > Alginate impressions
  - > Prophylaxis set-up
  - > XCP and lead apron
  - > MIPS rainbow wrap
- Direct feedback from self-advocate and support group



Credit: Allen Wong

# ONE-ON-ONE HYGIENE MENTORSHIP

## *Desensitizing & Building Healthy Habits*

- Resident paired with self-advocate and their support group
- Conversations about what is working and what is not working at home with hygiene care
- Provide personalized tips to make homecare more effective, efficient and fun
- Direct feedback from self-advocate and support group



Credit: Allen Wong

LET ME ~~WIN~~, <sup>↪</sup> TREAT  
BUT IF I CANNOT ~~WIN~~, <sup>↪</sup> TREAT  
LET ME BE BRAVE IN THE ATTEMPT

FUTURE

# *Applications*

---

- Academia
- Private Practice



Credit: Allen Wong

# ACADEMIA

- Two way desensitization
- Standardized patient model
- Person/patient centered curriculum





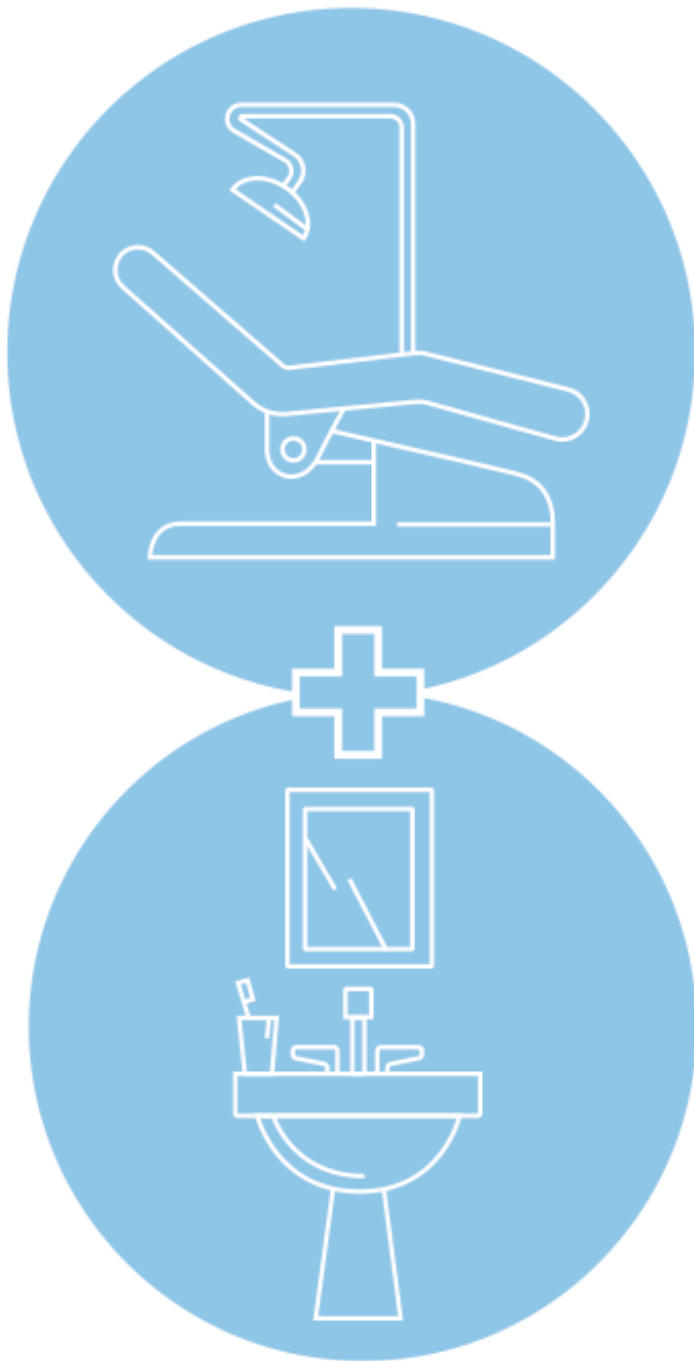
Credit: John Draper

# PRIVATE PRACTICE

- Outreach opportunity
- Practice builder
- Enacting culture change
- Increased access to care



**LET ME WIN,  
BUT IF I CANNOT WIN,  
LET ME BE BRAVE IN THE ATTEMPT**



# ComfortSoft

Connected health from office to home

First universal soft tissue retractor for any procedure.

Specially designed for IDD patients and caregivers.

Dual purpose soft retractor to be used chairside and then given to patient to use at home.

Access, Comfort, Visibility, Control for patients.

Giving CARE, SAFETY and PIECE OF MIND to caregivers globally.

[www.armor-dental.com](http://www.armor-dental.com)





[www.armor-dental.com](http://www.armor-dental.com) Cherie@armor-dental.com



[www.armor-dental.com](http://www.armor-dental.com)

# Other Tools for Success

## Powered Toothbrushes

Sonicare

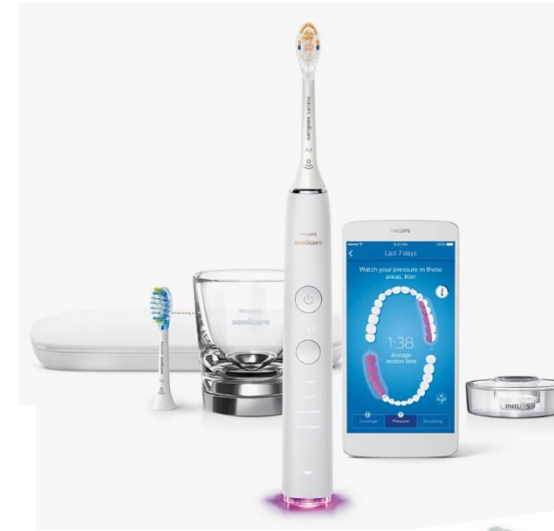
Oral B

Battery

Multiheaded

HUM (Colgate)

Wearable AI tech



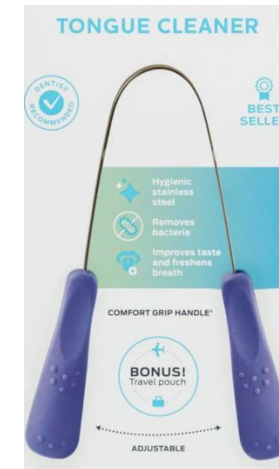
# Other tools

Floss Holders

Floss Piks

Water pik

Tongue scrapers





# Access to Care....Help is on the Way...

- -American Academy of Developmental Medicine and Dentistry (AADMD) and National Council on Disability (NCD) partnered to have the American Dental Association add “disability” into code of ethics (previously overlooked)
- -ADA Commission on Dental Accreditation (CODA) finally added an Educational Standard for ALL dental schools that all graduates MUST be able to assess and manage those with IDD/disabilities
- (stay tuned)



## PREDOCTORAL

**2-23** Graduates **must** be competent in providing oral health care within the scope of general dentistry to patients in all stages of life.

**2-25** Graduates **must** be competent in **assessing ( and managing ) the treatment needs** of patients with special needs.

# Problem with adding Standards to impacted studies?

- What is going to be taught?
- We don't have room in the Curriculum as is?
- Who is going to teach it if we don't have faculty?
- Where are we going to teach clinical care?



## NICHE Dental Overview

AADMD received a two-year funding grant to develop and **design an evidence-based, interdisciplinary oral health curriculum for people with Intellectual & Developmental Disabilities (IDD)**. This curriculum provides education on the dental and medical disparities of people with IDD, resources and training **to be used in dental and allied health educational institutions**. This project was initiated by the passing of the 2019 CODA Standard 2-25 requiring dental students to receive education on how to serve people with disabilities. The curriculum will be piloted with more than 20 dental schools across the nation, with the goal of it becoming a toolkit for dental schools to use in their lectures and syllabus. To date, 93 authors have contributed to this project and 44 chapters have been drafted, designed, and a PPT developed for each.

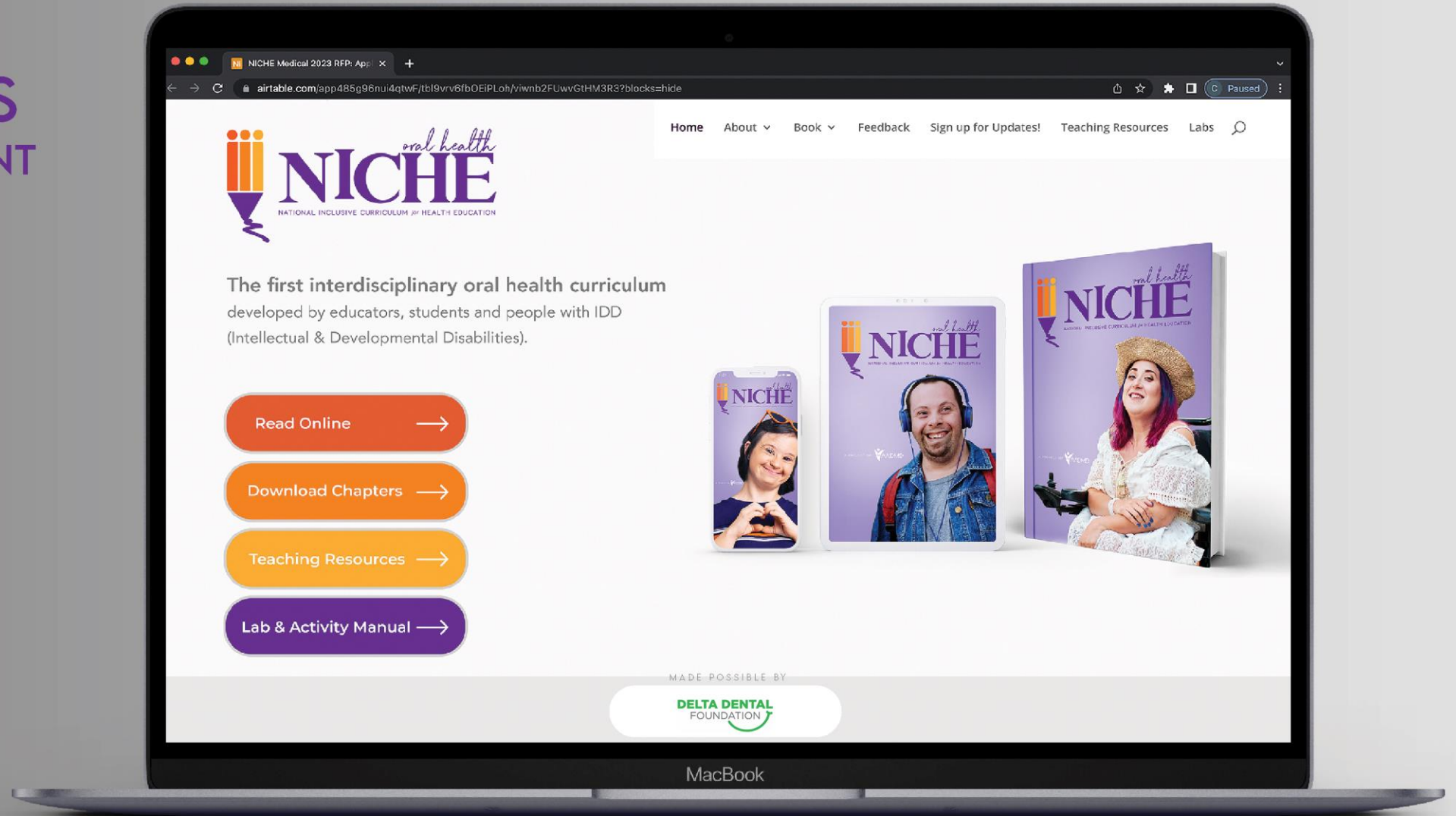
**93**  
Authors

**22**  
Dental  
Schools

Piloted with  
**400+**  
students

**44**  
Chapters

# MATERIALS IN DEVELOPMENT





# PILOT IMPLEMENTATION

UTHealth Houston piloted the curriculum in four courses and two electives. The courses included Ethics, Clinical Applications 1, Clinical Applications II (case studies), second-year clinic with behavior lectures with a total of 420 students. Two interdisciplinary electives were offered utilizing the curriculum chapters during the development in this project for 32 students that included dental, nursing and dental hygiene students.

A group of students in blue scrubs are seated around a table, looking at a laptop. A man in a dark shirt is standing and gesturing while speaking. A presentation screen in the background shows text about dental care and health disparities.

NICHE Pilot Elective

NICHE Pilot Elective

A large group of students and staff are posing for a group photo in front of a table covered with a white cloth. The table has a logo for the University of Texas School of Dentistry.

Wellness Health Event

2  
Interdisciplinary  
Elective  
Courses

3  
Clinical  
Courses

Piloted with  
**452**  
students

1  
Ethics  
Course

A group of students and staff are participating in a wellness event. A student is sitting in a chair, and a staff member is standing next to them. A table with various items is in the background.

Wellness Health Event

A group of students and staff are posing for a group photo. A student is wearing a blue and yellow costume. A sign in the background says "Smile".

Wellness Health Event



# Resources:



HELEN: Journal of Human Exceptionality [Helenjournal.org](http://Helenjournal.org)



American Academy of Developmental Medicine and Dentistry (AADMD) [aadmd.org](http://aadmd.org)



Special Care Dentistry Association (SCDA) [scaonline.org](http://scaonline.org)



International Association for Disability and Oral Health (iADH) [iadh.org](http://iadh.org)



Special Olympics International Special Smiles <https://resources.specialolympics.org/health/special-smiles>