

Now that makes sense!
Creating a healthy sustainable
environment



Desiccation Therapy – The new frontier in managing
dysbiotic periodontal microbes

Speaker - Anne Guignon, RDH, MPH, CSP is receiving an
honarium from the Utah Dental Association for this
presentation. Additional support provided by: Young
Innovations, Curaden USA, PerioProtect, and BioGaia.

Image Authenticity: Images used in this presentation
have not been altered from their original state. Images
that have been altered for education purposes will be
fully explained and disclosed to the audience during the
presentation.

Complex patients – complex solutions



When faced with this.....



Or this.....



Or this.....



Or this.....



Key concepts:

Customized care strategy

Focus on diagnostic needs

benefit plan is secondary

The Schedule!

Time	Patient	Procedure
7 AM	Petrified Penelope	Exam, X-rays
8 AM	Barrel-chested Bob	Exam, X-rays
9 AM	Big-bosomed Bertha	Exam, X-rays
10 AM	Mrs. Don't-Put-Me-Back-Too-Far	Exam, X-rays
11 AM	Sensitive Sarah	Exam, X-rays
Lunch		
1 PM	George the Gagger	Exam, X-rays
2 PM	Anxious Andy	Exam, X-rays
3 PM	Little Johnny Jump Up and his Mom, Patti Protective	Exam, X-rays

Our "WHY":
Meet people where they are

Respect their concerns



- stick with the facts
- don't try and convert
- look for alternatives

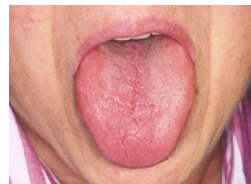


- look past legacy options
- reinforce natural physiology
- consider options
- **support homeostasis**

There is just so much to know!



Dry mouth – prevalence



- 30% population
- more women

Thomson WM, Lawrence HB, et al. The impact of xerostomia on oral health-related quality of life among younger adults. *Health Qual Life Outcomes*. 2006 Nov 8;4:86.
And S, Vellappally S, Hashem M, et al. Xerostomia in geriatric patients: a burgeoning global concern. *J Investig Clin Dent*. 2014 Sep 1.
Mandel ID. The functions of saliva. *J Dent Res*. 1987 Feb;66 Supp No:623.

- disruptive breathing
- dry climates / AC / heat
- OSA - CPAP therapy
- salivary gland pathology
- hormone imbalances
- laxative/diuretic abuse
- medications - over 700
- sodium intake
- nursing / pregnancy
- dehydration
- cancer therapy
- coughing / COPD
- cognitive impairment
- radiation treatment
- chronic renal failure
- autoimmune disorders
- eating disorders
- HIV - hepatitis C

Insufficient saliva




- increased acidogenic microbes
- aciduric microbes thrive
- decreased buffering capacity
- sticky plaque biofilm

Saliva and the Control of its Secretion. Sillberg (ed.), *Dysphagia, Medical Radiology Diagnostic Imaging*, Springer-Verlag Berlin Heidelberg 2012.
Graham I, Mount WH. (2005). Preservation and restoration of tooth structure. 2nd Edition. Queensland, Australia: Knowledge Books and Software.



Detection strategies

- Salivary pH / buffering capacity
- Salivary flow rates
- Beverage pH
- Blue Check Caries detection
- Lumaticare Caries detection rinse
- AI




Critical pH

- critical pH – is a dynamic number
- dependent - salivary calcium and phosphorus
- average resting salivary pH 6.4 – 7.2


Mount GI and Howe WL. Preservation and restoration of tooth structure. Knowledge basis and software. 2nd Edition. 2005.
 Stevens C. What is the critical pH and why does tooth dissolve in acid? J Can Dent Assoc 2003; 149(11):124-4.
 Stenley GK. The effect of saliva on dental caries. JADA 2008 May; 139:155-175.
 Lussi A, Schuster N, et al. Dental erosion: an overview with emphasis on chemical and histopathological aspects. Caries Res 2013;45 Suppl 1:2-12.

Healthy salivary pH



- resting - pH 6.8 - 7.2
- favors homeostasis
- supports remineralization
- suppresses pathogens

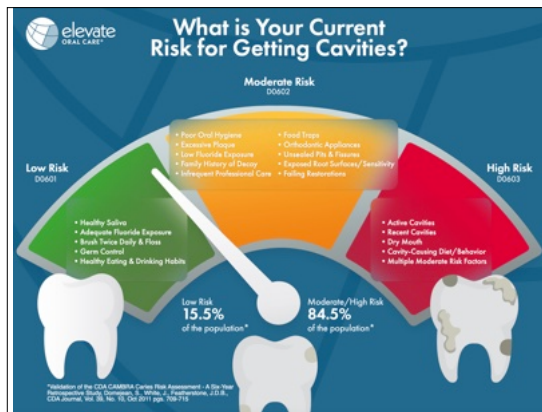

Smalley JM, Vignoli A. Dry mouth. The radiologist's guide. Wiley, Blackwell. May 2010.
 Lussi A, Schuster N, Rahmetovska E, Giese C. Dental erosion: an overview with emphasis on chemical and histopathological aspects. Caries Res 2013;45.



When do teeth melt???

- root structure - pH 6.7
- enamel - between pH 5 and 5.5
- fluorapatite - pH 4.5

Mount GI and Howe WL. Preservation and restoration of tooth structure. Knowledge basis and software. 2nd Edition. 2005.
 Stenley GK. The effect of saliva on dental caries. JADA 2008 May; 139:155-175.
 Lussi A, Schuster N, et al. Dental erosion: an overview with emphasis on chemical and histopathological aspects. Caries Res 2013;45 Suppl 1:2-12.
 Heppner-Brenner PM, Driessens FC, Bongersma JM. The mineral solubility of human tooth roots. Arch Oral Biol 1987;32:1319-1322.


Problem saliva?

Identifying risks


© 2024

Baseline data

- snapshot in time
- data can change



first thing in the morning

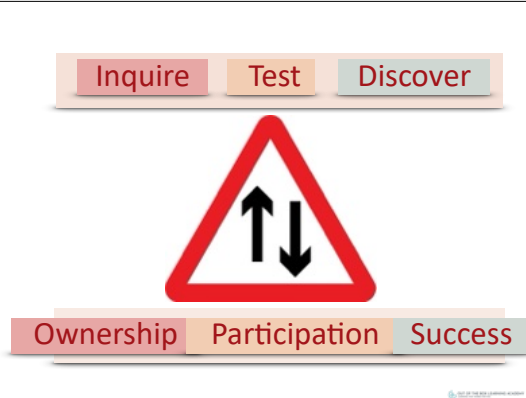


later in the day

pH testing

- wet strip with saliva
- match to grid on bottle
- take a "saliva selfie"

© 2024




Inquire **Test** **Discover**

Ownership **Participation** **Success**


© 2024

home testing



- frequency
- results
- text reminder
- reward

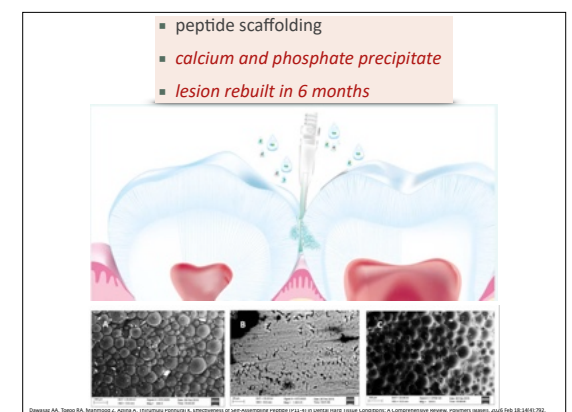
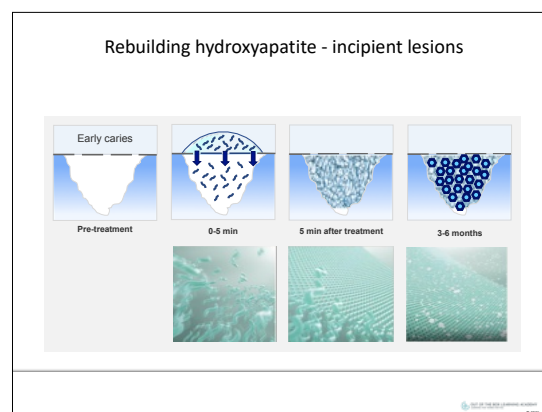
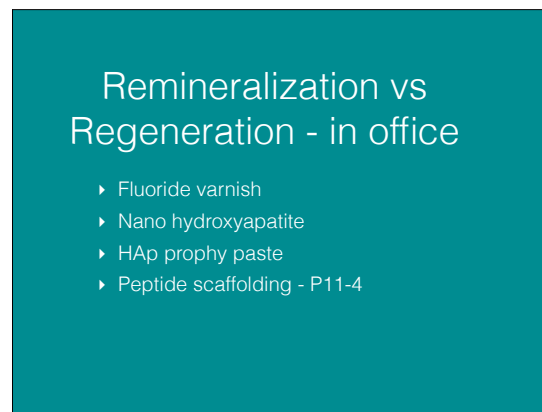
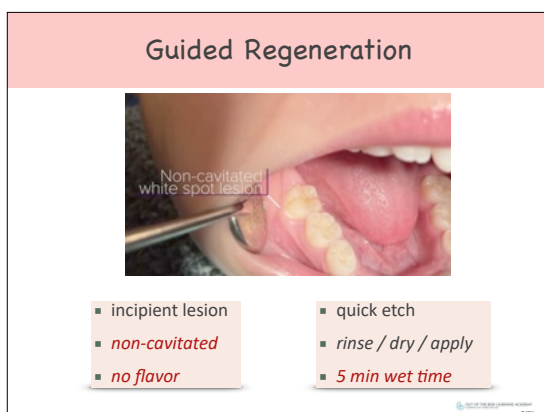
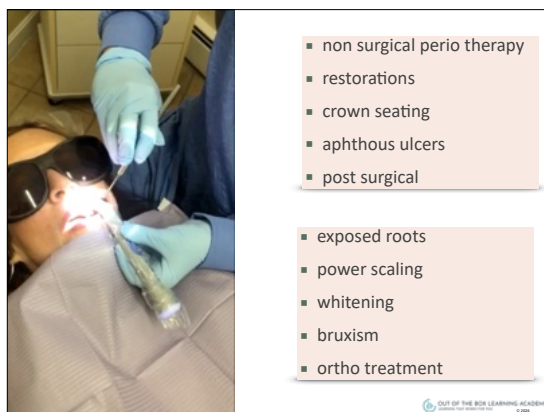
© 2024



Details, details.....

- salivary pH testing
- taste dry mouth products
- balance oral pH to 7

© 2024



Stopping microbial activity - in office

- ▶ SDF and SF
- ▶ Povi-One plus fluoride varnish
- ▶ Chlorhexidine thymol varnish
- ▶ Pappacarie Duo - dentin caries removal
- ▶ Laser bacterial reduction
- ▶ Desiccation therapy
- ▶ Liquid probiotic placement

Non Fluoride Treatment



Silver diamine fluoride

- ▶ natural antibacterial
- ▶ hypersensitivity relief
- ▶ carious dentin lesion turns black
- ▶ no anesthesia



Chemomechanical Caries Removal

- enzyme based - papain
- introduced in 2003 in Brazil
- FDA cleared - 2026



- decreased pain perception
- reduced fear / anxiety
- no aerosol generation
- no noise
- no anesthesia
- split mouth design
- 25 children age 5-9
- 50 primary molars
- CMCr - no pain - 92%
- 100% liked treatment
- reacts-infected dentin
- breaks down denatured protein
- improves bond strength

Almeida SO, Oliveira DD, Oliveira OD, Oliveira MD. Comparative evaluation of the clinical effectiveness of chemomechanical caries removal and conventional mechanical caries removal methods in treatment of carious primary molars - a randomized controlled clinical study. BMC Oral Health. 2024 Feb 15;24(1):20. doi: 10.1186/s12937-023-00558-1.

- frequency - caries risk
- mild - none
- moderate - 6x / year
- high/extreme - monthly

- antiseptic
- interferes with glycan production
- reduces microbe adhesion
- unit dose

- 8 drops povidone iodine
- saturate side of swab
- no re-dipping



Iodine use in caries prevention and management. Jeremy Horst Keeper, DDS, PhD. youtube.com/watch?v=vPhKD1wG388&t=8s

Chlorhexidine/Thymol Varnish – Cervitec Plus



- seals exposed dentin tubules
- treat susceptible areas
- active - 3 months
- 1% chlorhexidine + 1% thymol
- no chlorhexidine side effects

Chemomechanical Caries Removal



- slow speed bur vs enzyme gel
- gel application - 30 - 60 sec
- spoon excavator - hand burs
- until gel is clear - dentin is shiny
- glass ionomer restoration



Dentinal hypersensitivity / Erosion - home care

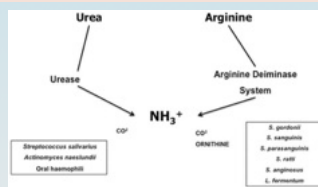
- Arginine bicarbonate calcium carbonate chews
- Arginine paste
- Calcium phosphate gel or strips
- Nano hydroxyapatite toothpaste
- 5000 ppm toothpaste

NEWS FLASH

Prebiotics.....
stimulate growth or activity
of certain healthy bacteria

Koopen JE, Hoogenkamp MA, Buijs MJ, Brandt BW, Keijser BJ, Crielaard W, Ten Cate JA, Zaura E. Changes in the oral ecosystem induced by the use of 8% arginine toothpaste. Arch Oral Biol. 2017 Jun;73:79-87.
RPA, Krombeek JA, Bollen CMB, et al. Prebiotics: why definitions matter. Current opinion in biotechnology. 2016;37:1-7.

Salivary arginine - mode of action



- Urea** - few bacteria
- ★ saliva & crevicular fluid
 - ★ broken down by urea
 - ★ byproduct-ammonia
- Arginine** - many bacteria
- ★ low in saliva/abundant in peptides
 - ★ ADS - 3 enzyme system
 - ★ byproduct - ammonia
 - ★ action produces ATP

Burns RA, Dong L, Min LJ, et al. Progress Disrupting the Oral Microbiome in Caries and Health. *Advances in Dental Research*. 2012;24(2):77-85.



Biochemistry

- ammonia production
- raises the pH
- sucrose metabolism decreases

Microbes

- shift in salivary microbiome
- increase healthy commensals
- 4 weeks

Neoclements MM, Brownworth C, et al. The effect of arginine on oral biofilm communities. *Mol Oral Microbiol*. 2014 Feb;29(2):65-54.

Huang X, Schaller ME, Burns RA, Neoclements MM. Characterization of the arginine-modifiable protease virgins into pH homeostasis in human and biofilms. *Caries Res*. 2013;46(2):169-76.

Zhu B, Maclean LC, Kitten T, Xu H. Streptococcus sanguinis biofilm formation & interaction with oral pathogens. *Future Microbiol*. 2018 Jun 1;13(6):853-862.

© 2018 The Author(s). Published by John Wiley & Sons Ltd



EPS Impact

- interferes - EPS formation
- reduces biofilm thickness
- reduces EPS matrix density

Future thoughts

- caries risk assessment
- prebiotic - ADS strains
- fluoride combinations

Neoclements MM. Potential Uses of Arginine in Dentistry. *Adv Dent Res*. 2018 Feb;29(2):98-103.

Neoclements MM, Brownworth C, Huang X, et al. Arginine Modulation in Supragingival Oral Biofilms as a Potential Predictor of Caries Risk. *ISDR Clin Trans Res*. 2019;14(4):282-290.

March PS. In Salivary and in Health: What Does the Oral Microbiome Mean to Us? An Ecological Perspective. *Adv Dent Res*. 2018 Feb;29(2):60-65.

Huang X, Dong L, Schaller ME, Burns RA, Liu C, Zhou X, Cheng L, Ten Cate JM. Effect of arginine on the growth and biofilm formation of oral bacteria. *Arch Oral Biol*. 2017 Oct;82:276-282.

© 2018 The Author(s). Published by John Wiley & Sons Ltd



- calcium and phosphate
- fluoride free
- cleared for hypersensitivity
- plugs open tubules

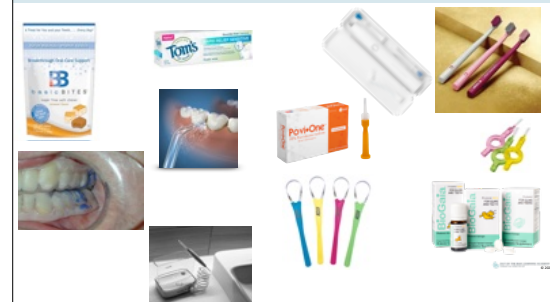
Johnson JC, Pridgen TJ, Peres R, Minerva J, Morgan P, et al. Evaluation of a novel water-releasing oral care. *Adv Dent Res*. 2018 Feb;29(2):60-65.

© 2018 The Author(s). Published by John Wiley & Sons Ltd

Perio biofilm management and disruption - home

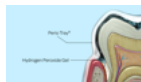
- ▶ Tray therapy
- ▶ Water flossing
- ▶ Improved manual brushes / interprox devices
- ▶ Advanced and speciality power brushes
- ▶ Probiotics
- ▶ Iodine application
- ▶ Arginine bicarbonate

Daily biofilm destruction



Prescription trays - hydrogen peroxide gel therapy

- antiseptic
- debridement
- reduces inflammation



- trays create hydraulic seal
- eliminates dilution
- up to 9mm

- 10 min therapeutic
- 15 min full O₂ release

Problem: "Therapeutic delivery of H₂O₂ to prevent periodontal disease required mechanical access to subgingival pockets."



- disruption - 29% more effective than string
- irrigation + brushing - more effective - all surfaces

Abdulkader A, Alkhatib A, Alkhatib A, Alkhatib A. Comparison between water flosser and regular floss in the efficacy of plaque removal in patients after single visit. *Stomatol*. 2018;14(2):274-278.

Chen JH, Chen JH, Chen JH. Evaluation of the plaque removal efficacy of a water flosser compared to string floss in adults after a single visit. *J Clin Dent*. 2018;23(2):17-22.

Wang Y, Li H, Wang Y, Li H. Effect of water flosser on plaque removal in patients with periodontitis. *J Clin Dent*. 2018;23(2):17-22.

© 2018 The Author(s). Published by John Wiley & Sons Ltd



Probiotics are live microorganisms that, when administered in adequate amounts, confer a health benefit on the host.....

Importance of strain specificity

Indication	<i>L. reuteri</i> ATCC PTA 5289 <i>L. reuteri</i> DSM 17938	Streptococcus sobrinus K12 Streptococcus sobrinus K12 Streptococcus sobrinus JH-565
Gingivitis*	HIGH EFFECT	Not studied
Periodontitis*	HIGH EFFECT	NO EFFECT
Implantitis*	HIGH EFFECT	Not studied
Caries*	MODERATE	MODERATE
Halitosis*	LOW	Not studied

L. reuteri Prodentis – human-derived probiotic strain

Isolated from the breastmilk of a lactating woman from a rural, non-Westernized area of the Andes mountains

Isolated from the saliva of a Japanese woman with excellent oral health despite poor oral hygiene

246 Clinical Trials | 20,345 Individuals | 11 International Clinical Guidelines

54 studies in 6,814 subjects | 24 studies in 2,719 subjects | 42 studies in 4,512 subjects | 136 studies in 6,290 subjects

INFANTS (0-12 mos) | TODDLERS (13-36 mos) | CHILDREN (37-18 yrs) | ADULTS (19-99 yrs)

■ Maintenance

■ Gingivitis, peri-implant mucositis, caries

■ Non-surgical perio - adjunct

Traditional nylon brush

Curaprox Velvet 12,460 brush

12440 FILAMENTS MADE OF CUREN®
EACH 0.08 MILLIMETER IN DIAMETER

The new gold standard

Polyester filaments

- flex not bend
- dry quickly
- retard bacterial growth

Design

- easy to grasp handle
- angled head

HYDROSONIC PRO

Hydrosonic Pro -

Ultra small tear drop head

won't brush | coordination issues | caring for another

Maintaining a neutral pH

- Xylitol
- Arginine
- Remin Gel
- Rx - Aquoral / pilocarpine AllDay toothpaste

Know your products

What's the point?

Mouth feel | Antimicrobial | Balanced pH | Hydration | Lubrication | Electrolyte balance | Mucosal protection | Prebiotic | Remineralization | Salivary stimulation

candies | lozenges | lollipops | sprays | pastes | rinses | gels | granulate

Taste and see.....why not?

- flavors
- textures
- foaming
- SLS / fluoride




Taste and see.....

- arginine bicarbonate
- bring pH to 7
- promotes homeostasis

- 44% xylitol
- 5000 ppm fluoride
- no SLS
- pH 7

super saturated 44% xylitol
muco-adhesive complex
more viscous

- viscous / protective film
- lubricates / hydrates




- Salagen - pilocarpine
- Evaxac - cevimeline



pleasanthillsapothecary.com

Rinses

Lozenges

Disks

Sprays

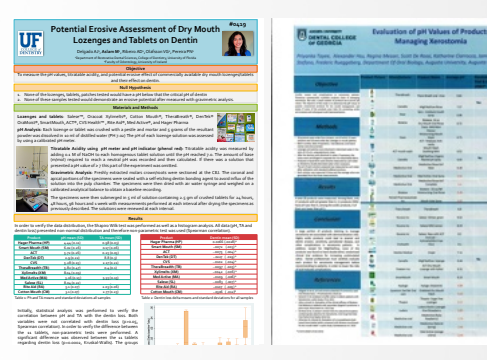
Gels

Pastes

pH levels of common dry mouth products					
Rinses	Lozenges + Disks	Sprays			
TheraBreath [®]	9.2	AlkaMints [®]	8.04	CTZ Spray [®]	9.1
Perio Listerine [®]	8.2	Saliva [®]	8.32	All Day Spray [®]	7
MightyFlow [®]	7.31	Candy Highliner Mints [®]	7	Spray Rinse Spray [®]	6.98
Smart Mouth [®]	7.33	Lozings [®]	7	MightyFlowing Spray [®]	6.43
Closey [®]	7.3	MightyFlow [®]	6.84	Biotin Moisturizing Spray [®]	6.11
GUM Hyalite Rinse [®]	7	Acid Dry Mouth [®]	6.35	Mint Spray [®]	6
Perio H2 Extreme Dry Rinse [®]	7	Smart Mouth [®]	6.15	BM Moisturizing Spray [®]	6
Biotin Dry Mouth [®]	6.72	MintLozenges [®]	5.2	AlkaMint Spray [®]	6
Art Total Care Anticavity [®]	6.52	CTZ Lozenges [®]	5.18	MouthKiss Spray [®]	5.92
TheraBreath [®]	6.3	TheraBreath [®]	5.82	Biotin Dry Mouth Spray [®]	4
MouthKiss Soft Base [®]	6.18	Art Lozenges [®]	5.72	Lozings [®]	4
Hyalite [®]	6	Hyalite [®]	4.84	Mouth Kiss Spray [®]	3.02
Oral Care Mouth Rinse [®]	6	Hager Pharma [®]	4.84	Gels and Pastes	
Mouth Rinse [®]	6	OralBite Patch [®]	3.54	AlkaMint [®]	7.4
Smart Mouth Dry Mouth [®]	6	Thera's Super Rinse [®]	3.17	GC Dry Mouth Gel [®]	7
MouthKiss Soft 2 Rinse Complete [®]	5.4	Citrus Mouth [®]	3.1	OralGel [®]	7.11
Biotin PPM Oral Complete [®]	5.39	MouthKiss [®]	2.43	GUM Hyalite Gel [®]	6.8
OralCare Rinse [®]	4.8	OralBite [®]	2.73	Biotin Dry Mouth Gel [®]	6.8
		Lozings [®]	2.53		

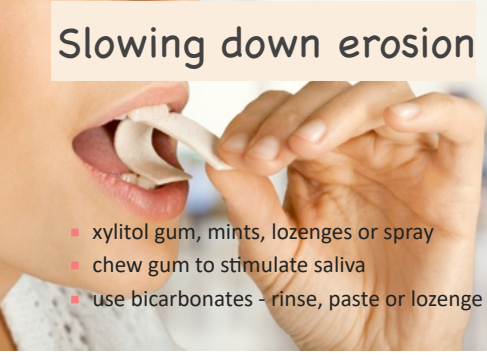
Potential Erosive Assessment of Dry Mouth Lozenges and Tablets on Dentin

Evaluation of pH Values of Products Managing Xerostomia




Slowing down erosion

- xylitol gum, mints, lozenges or spray
- chew gum to stimulate saliva
- use bicarbonates - rinse, paste or lozenge



Slowing down erosion

- brush before morning juices, etc.
- rinse with water - reduces titratable acidity, not pH
- soft bristle brushes / low abrasion paste



Cheese and chocolate

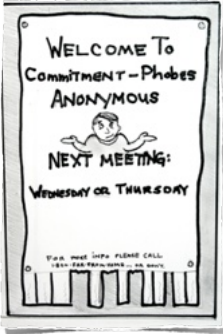


Conversation starters!

oral health to general health



- get the facts
- coaching not scolding
- positive energy
- legitimate spin

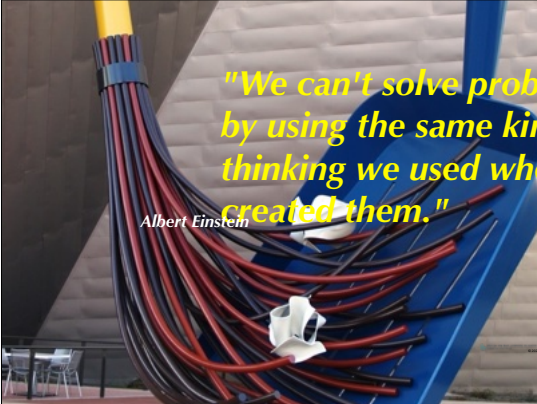


Begin Anywhere!

"A plan in your head isn't worth the paper that it's written on."

Yogi Berra



© 2014 THE NEW LEARNING ACADEMY



"We can't solve problems by using the same kind of thinking we used when we created them."

Albert Einstein

UTAH DENTAL ASSOCIATION
2026 CONVENTION



anne@anneguignon.com

© 2014 THE NEW LEARNING ACADEMY