Ultimate Guide to Achieving Periodontal Health
Secrets to Patient Compliance

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Liz Graham Presents *** Trisha O’Hehir

Objectives
1. Understand complex ecosystem of biofilm
2. Describe infection and inflammation
3. Recognize role of sugar in inflammation
4. Interpret Common Cause Theory
5. Understand how xylitol changes biofilm
6. Compare interdental tools for biofilm control
7. Apply health behavior change techniques
8. Understand protocol for GBT

NEW VISION

What would it look like if all your patients effectively removed or prevented bacterial biofilm everyday.

No pockets, no bleeding, no caries!
Happier, healthier, more confident patients.

DH school and board exams: the vision is calculus removal

...with grades based on competencies

grasp, fulcrum, insertion, activation...

No requirement that patients achieve health

Not based on health outcomes!

Take out a piece of paper

Is dental disease preventable?

Periodontal Health Index (PHI)

With the PHI, you can calculate your success rate
**Periodontal Health Index (PHI)**

Simple number - like blood pressure

- **Number of pockets**
- number of bleeding points

Goal: 0/0

Ideal is 0/0

24/38 - means more than just a few 4s and bleeding in the posterior

Worst possible score - 168/168

Perio scores are often 25/100 to 85/140

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Patient played tennis with a dentist friend

3/5 is his current score
86/122 was his baseline

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How successful is your treatment?

My guess was 85%

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What is your success rate with periodontal therapy?

30 patients
1,916 pockets — 139 pockets
139 divided by 1,916 = .07
1.0 minus .07 = 93% of pockets eliminated

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**Periodontal Health Index (PHI)**

With the PHI, you can calculate your success rate
The Bola Story...
Daniel Brownwood
Tina Long, RDH

Cleaning Teeth

Probing underestimates disease levels
Patient Scenario

- Two years since last DH visit
- Scheduled for a “cleaning”
- You review medical history
- Not much suprag. calculus
- Probing looks fine
- Begin instrumentation and find 4-5mm interproximal sites

What Happened?

Probing: Line angle vs interproximal

New, Mature, Acid Producing Biofilm

GC America Tri Plaque ID Gel

Pink is new plaque
Light blue is acid plaque
Blue is old plaque

GC America Tri Plaque ID Gel

New, Mature, Acid Producing Biofilm
Biofilm - it's a complex ecosystem worthy of our respect.

Too bad plaque biofilm isn't green!

What do your teeth feel like when you wake up?

Does it feels like the teeth are wearing?

Does it feels like the army marching through?

Does it feels like the bottom of a bird?
Or does it feel just plain fuzzy!

Quorum sensing

Biofilm Formation

fimbria

fibrills

Biofilm Formation

fimbria

fibrills

Quorum sensing

Attachment 1
Growth 2
Detachment 3

Cell-Cell Communication
1/3 bacteria
2/3 slime - to absorb water and trap particles

Biofilm grows in a fluid environment:
saliva and crevicular fluid

Bacterial toxic waste *subgingivally* includes endotoxins that penetrate pocket walls and trigger the immune response destroying tissue and bone

Biofilm - it's a complex ecosystem worthy of our respect

Would you agree?
Pathogenesis

Infection & inflammation

• outer epithelium
• rete pegs
• junctional epithelium
• connective tissue
• capillaries
• bone

Bacterial endotoxin and antigen

Permeation Agents VSCs
Volatile
Sulfur
Compounds

hydrogen sulfide
and
methal mercaptan

Translate cell biology into cartoons

Vasodilation

Endotoxins also trigger a cascade of immune responses to protect the body from bacteria and viruses

Signals alert the immune system

Mast cells around the blood vessels release histamine, causing vasodilation

PMNs are sent to the area
Endothelial cells separate to allow PMNs to exit the blood vessel.

PMNs release chemical machetes

MMP
prostaglandin (pre-term birth)
interleukin
collagenase

Breakdown of the active transport system

PMNs release chemical machetes

In aggressive cases, the PMNs are over active and produce more than the normal amount of destructive chemicals

Breakdown of GAGS Glue glycosaminoglycans

Breakdown of active the transport system

Krebs Cycle

ATPs

With oxygen - 24-28 ATP molecules from one molecule of glucose converted to pyruvate, plus the 4 molecules from glycolysis.

Mitochondria

Not just one mitochondria per cell, but as many as 2,000 in each liver cell.
Mitochondria

- Uses sugar and oxygen to generate energy for the cell
- Energy stored as chemical bonds
- With too much "sugar" there is an increase in oxidative stress which leads to inflammation

Mitochondria

Goal is equilibrium

- Oxidation - giving away an electron
- Reduction - gaining an electron

REDOX reactions

Generate unstable free radicals = ROS
ROS will strip electrons from other molecules
Leaving more unstable free radicals = domino effect

Mitochondria

Goal is equilibrium

With adequate oxygen and good nutrition, the antioxidant defenses will control free radicals the keep ROS within the cells where they were produced.

When free radicals and ROS exit the cell = inflammation

Mitochondria

Goal is equilibrium

Too much refined carbohydrate = mitochondrial dysfunction

- Oxidative stress
- DNA alternations in the mitochondria
- Reduced numbers of mitochondria

Oxygen debt

No oxygen - 4 molecules of ATP from each glucose molecule in glycolysis
Limited ATPs of energy requires a big decision.

Immature epithelial cells
granulation tissue

Infection and Inflammation
- pocket epithelium
- scar formation in connective tissue
- bone loss
- small band of connective tissue attachment
- capillary formation
WARNING
Biofilm outside the body

Medicine Learns from Dental Hygiene

Non Healing Chronic Wound
After treatment with Xylitol and Lactoferrin

photos courtesy of Dr. Randall Wolcott

Biofilm causes ear infections
Inflammation closes the eustation tube.

Look at your Toes
Squirt your Nose

XLEAR NASAL SPRAY
Nathan, please tell us why you have three nasal sprays?

There is an oral-systemic connection with chronic periodontitis

The Common Cause: Sugar

The pathogenesis of heart disease

- Leading cause of death in the Western world
- Atherosclerosis - plaque on vessel walls
- Becomes fibrous, obstructs blood flow
- Plaque surface ruptures, allowing leakage
- Leakage is thrombus, blocks there or travels to other blood vessels and blocks
The pathogenesis of heart disease

- A person gets fat - eating sugar and flour
- Their cells become inflamed
- Inflammation causes insulin resistance
- Body has to make more insulin
- Eventually the pancreas stops making insulin and diabetes follows

*Thomas Van Dyke, Scientific American, 2016*

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The pathogenesis of diabetes

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**The Metabolic Syndrome**

- Heart Disease
- Lipid Problems
- Hypertension
- Type 2 Diabetes
- Dementia
- Cancer
- Polycystic Ovarian Syndrome
- Non-Alcoholic Fatty Liver Disease

Dr. Robert Lustig - the connection is sugar

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**SUGAR**

How many of you see patients like this, who also have good oral hygiene?

Sugar is the reason gums bleed

In humans, add two sugary drinks per day and increase pocket depth by 0.4mm


Sugar = carbohydrate

Nearly every packaged food contains sugar

- sucrose
- high fructose corn syrup
- dextrose
- honey
- maple syrup

61 Names for Sugar

- Agave nectar
- Barbados sugar
- Barley malt
- Barley malt syrup
- Beet sugar
- Brown sugar
- Buttered syrup
- Cane juice
- Cane juice crystals
- Cane sugar
- Caramel
- Carob syrup
- Castor sugar
- Coconut palm sugar
- Coconut sugar
- Confectioner’s sugar
- Corn sweetener
- Corn syrup
- Corn syrup solids
- Date sugar
- Dehydrated cane juice
- Demerara sugar
- Dextrin
- Dextrose
- Evaporated cane juice
- Free-flowing brown sugars
- Fructose
- Fruit juice
- Fruit juice concentrate
- Glucose
- Glucose solids
- Golden sugar
- Golden syrup
- Grape sugar
- HFCS (High-Fructose Corn Syrup)
- Honey
- Icing sugar
- Invert sugar
- Malt syrup
- Maltodextrin
- Maltitol
- Maple syrup
- Molasses
- Muscovado
- Palm sugar
- Panocha
- Powdered sugar
- Raw sugar
- Refiner's syrup
- Rice syrup
- Saccharose
- Sorghum Syrup
- Sucrose
- Sugar (granulated)
- Sweet Sorghum
- Syrup
- Treacle
- Turbinado sugar
- Yellow sugar

Topically, sugar feeds acid producing bacteria leading to caries
Topically, sugar also feeds subgingival bacteria through wicking - triggering periodontal disease.

New evidence shows that sugar comes out in the gingival crevicular fluid.

Systemically, sugar impacts inflammation - leading to gingival bleeding.

Excessive consumption of fermentable carbohydrates led first to dental diseases and then systemic diseases. Dental disease is the alarm bell for systemic disease.

1950-1960

The Common Cause Theory

Dental disease is the alarm bell for systemic disease.

1950-1960

The Common Cause Theory

Two researchers - Cleave and Yudkin
**The Common Cause Theory**

"My research on coronary heart disease has convinced me beyond doubt that *sugar* plays a considerable part in this terrifying modern epidemic." 1972

John Yudkin  
(1910-1995)

**The Common Cause Theory**

“If from an evolutionary point of view, the refined carbohydrates... are always the foods most likely to be at fault (for the diseases of civilization), and not the fats.” 1975

Thomas Cleave  
(1906-1983)

They considered refined carbohydrates (white flour and sugar) to be the most transformed or refined food, and therefore the most dangerous.

**The Common Cause Theory**

flour and sugar cause both dental diseases and systemic diseases

**The opposing theory**

Fat was the culprit
Ancel Keys, 1904-2004

He was a scientist, studied business, political science, zoology and oceanography.

He researched starvation, created K-rations.

Ancel Keys was charismatic, popular and had a big following.

He was so popular at the time that he was featured on the cover of Time Magazine.

Saturated fat makes you fat and caused heart disease

He postulated that fats caused systemic disease, thus advocating a diet high in fruits, veggies and fermentable carbohydrates instead.

Based on the Low Fat Diet

- No more steak, bacon, butter, eggs or cheese

- Take fat out of processed food and add sugar

Ancel Keys, 1904-2004

He was a scientist, who studied business, political science, zoology and oceanography. He researched starvation, created K-rations for the military and with his wife, popularized the Mediterranean Diet.
Standard American Diet (SAD)

Increased risk of cancer, heart disease, stroke, intestinal disorders – just about any illness – the standard American Diet has them all.

Ancel Keys studied 6 countries

Data was collected from 22 countries!

He selected data from only 6 countries showing a linear relationship.

Not only did Ancel Keys cheat on the research, he was a bully!

He bullied other professionals.

The Common Cause Theory

"My research on coronary heart disease has convinced me beyond doubt that sugar plays a considerable part in this terrifying modern epidemic."

Yudkin, 1972 (1910-1995)
Ancel Keys destroyed the careers of both Cleave and Yudkin

The evidence for sucrose as the “greatest killer” in Western societies is “utter nonsense” and “would never pass an acceptable term paper in an undergraduate course in home economics.”

Ancel Keys, 1975

Saturated fat made you fat and caused heart disease

Dental disease was simply a necessary side effect for the greater good of preventing heart disease by decreasing fats and increasing sugars.

Ancel Keys, 1975

Saturated fat made you fat and caused heart disease

Dental disease considered a local infection to be treated/prevented with fluoride, OHI, restorations, sealants, etc.

The Caries Research Foundation (CRF)
Sugar Industry
Dental Association

It’s not about reducing sugar in the diet - all about improving oral hygiene!

National Institute for Dental Research

1971 National Caries Program - eradicate caries within a decade

Sugar industry documents from 1959-71 adopted strategies to deflect attention away from sugar

Funded studies on enzymes to break up plaque and a vaccine with questionable potential

National Institute for Dental Research

78% of sugar industry submissions were incorporated into the NIDR call for research applications

Research harmful to the sugar industry was omitted

Opportunity missed to develop scientific strategies to reduce sugar consumption
From then on, research conclusions focused on brushing, flossing, fluoride and restorative dentistry - not on sugar!

In 2009, Cristin Kearns, DDS uncovered sugar industry papers from the 1950s-1980s

Big Sugar worked to influence journalists, scientists, regulator and clinicians

She gave up dentistry to become an investigative journalist, historian and health researcher at UCSF.

1967, three Harvard Medical School researchers were paid ($50,000.00) by the sugar industry to write literature reviews that focused on fat as the cause of heart disease rather than sugar. Published in the NEJM.

Humans do not need sugar
No physical need to consume sugar

Stanton Glantz, a professor of medicine at U.C.S.F., author of the 2016 JAMA Internal Medicine article that documented sugar industry efforts to minimize the link between sugar and heart disease.

2009 - Stone Age Diet - Switzerland

- 10 subjects in a controlled Stone Age environment
- Provided a small supply of whole grain barley, wheat and spelt, some salt, herbs, honey, milk and meat from domestic goats and hens.
- Not enough food for the 4 week study
- They foraged for berries, edible plants and fishing

2009 - Stone Age Diet

- No oral hygiene products or tools
- Stone Age clothes, tools and huts
- Filmed for a TV special
- Sports medicine physicians monitored
- Dental examinations before and after
2009 - Stone Age Diet

- Plaque increased, as expected
- Surprised by reduction in gingivitis & probing depths
- Bleeding upon probing reduced from 35% to 13%
- Bacteria changed to a balance favoring health rather than disease

Oral hygiene became necessary when the Western Diet of refined carbohydrates was introduced.

Hunter/Gatherers did not feed their oral bacteria, no oral hygiene needed

Dr. Weston Price

1930s traveled the world to discover how nutrition impacted dental caries

1939 published his book: Nutrition and Physical Degeneration

Western diet led to oral/systemic disease

Dr. Weston Price

After Parents Adopted a Western Diet
Pottenger’s Cats
A Study of Nutrition-Cooked vs Raw Meat

First generation - end of life, lazy with degenerative diseases

Second generation - degenerative diseases by mid-life, loosing coordination

Third generation - degenerative diseases early in life, born blind, weak, shorter lifespan, fewer offspring

All died out by fourth generation

Pottenger’s Cats
Milk: raw, pasteurized, evaporated or sweetened condensed

Cats on raw milk did better than the others that showed degeneration similar to the meat study

Conclusion: missing protein necessary for growth and development of healthy cats

Topical and Systemic Effects

People don’t know how much sugar they eat

XYLITOL - THE GOOD SUGAR

How many sweets are in the break room at your office?
… we need an alternative to sugar for the occasional sweet.

Xylitol the good sugar
Best alternative

- Looks and tastes like “sugar”
- Broad category: carbohydrate
- Narrow category: polyol
- 2.4 calories per gram
- 40% fewer calories than other carbohydrates

Alternatives to sugar you will like

- Xylitol - 5 carbon polyol
- Erythritol - 4 carbon polyol
- Stevia - extracted from stevia leaves

Artificial Sweeteners to Avoid

- Acesulfame potassium (Ace-K)
- Aspartame
- Saccharin
- Sucralose (Splenda)

Biggest Game Changer in DH?

Reduces plaque biofilm by 50%!
- Doesn’t feed bacteria
- Reduces acid production
- No insulin needed
- Enhances remineralization
**Xylitol the good sugar**

- Discovered in 1891 by German & French chemists
- Benefits remained dormant for several decades
- Xylitol production began at the Finnish Sugar Co, Ltd.
- 1960 for diabetics, 1970 for caries prevention

**Crystaline carbohydrate**
- Found in tree bark, plants, fruits and vegetables
- The body makes 5-10 grams of xylitol every day

**Most common source today is corn cobs and corn stalks**
- They contain no corn

**Side Effects**
- dangerous for dogs
  - drop in blood sugar
  - liver damage

Never give your pets:
- chocolate, coffee, caffeine
- alcohol
- avocado
- macadamia nuts
- grapes and raisins
- yeast dough
- raw or undercooked meat, eggs
- onions, garlic and chives
- milk

**Under nourished dogs are at greatest risk**
- Xylitol triggers release of insulin in dogs
- Remedy: give them sugar
- Take them to the vet - the vet will give IV glucose

**Side Effects**
- gastric upset when eaten in large amounts too quickly
Xylitol the good sugar

• **Side Effects**
  -digested as a fiber
  -pulls water out of tissue cells, thus diarrhea

• **Glycemic level of 7**

<table>
<thead>
<tr>
<th>Sugar</th>
<th>GI Value</th>
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<tbody>
<tr>
<td>Glucose</td>
<td>100</td>
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<tr>
<td>Table sugar</td>
<td>68</td>
</tr>
<tr>
<td>Honey</td>
<td>55</td>
</tr>
<tr>
<td>Fructose</td>
<td>19</td>
</tr>
<tr>
<td>Xylitol</td>
<td>7</td>
</tr>
</tbody>
</table>


Xylitol the good sugar

• **How it works**
  -5 carbon, not 6 carbon like sorbitol, mannitol, maltitol
  -Passes through bacterial membrane; not metabolized
  -Bacteria uses energy to pump the xylitol molecule out

Xylitol the good sugar

• **Does not raise insulin levels**
• **Does not use insulin for metabolism**
• **Safe for diabetics**

Xylitol the good sugar

• **How it works**
  -Bacteria like acid environment
  -When bacteria cannot make acids
    -cannot stick to each other or the teeth
    -bacterial communication disturbed
    -biofilm structure is compromised
  -Bacteria slide down the digestive & nasal tracks

Xylitol prevents biofilm formation

Metabolism and Communication
**Xylitol dissolves established biofilm**

**Metabolism and Communication**

**Addiction to Pharmaceutical Nasal Spray**

- Nasacort
- Afrin
- Zicam
- Fionase
- Rhinocort
- Simply Saline
- NeilMed

**Side effects of oxymetazoline hydrochloride**

- blurred vision
- fast, irregular or pounding heartbeat
- headache, dizziness, drowsiness or lightheadedness
- high blood pressure
- increase in runny or stuffy nose
- nervousness
- trembling

**Xylitol - research in Finland**

- 1970 xylitol containing caramels, sweet rolls and beverages reduced 4-day plaque mass by 50%
- 1972 similar results after a 5-day study, dental students, no oral hygiene - **SIMILAR RESULTS**

**Xylitol - research in Finland**

- Two-year meal replacement study - 85% reduction in caries
  - Difficult study to undertake and monitor

  **Three test groups:**
  - Xylitol
  - Fructose
  - Sucrose

  **Turku Sugar Studies**

**Xylitol - research in Finland**

- One-year chewing gum study 6.7 grams vs 67 grams resulted in 85% reduction in caries incidence compared to sucrose group

6.7 grams 67 grams
How Xylitol Fights Tooth Decay

Inhibits Plaque Accumulation and Cariogenic Bacteria

- Two-week study
- S mutans digest sorbitol
- Gum chewed 5/day
- Gums:
  - 100% xylitol
  - xylitol/sorbitol
  - 100% sorbitol

![Change in plaque weight(%)]

Hungarian Study of 1981-1984

- 3 year study
- 690 Hungarian students
- Test groups:
  - Control - fluoridated toothpaste
  - Fluoride in milk
  - Xylitol 20 grams/daily in candy spread out during the day

Belize City Xylitol Chewing Gum Study 1989-1994

- Belize study conducted by the U of Michigan
- 1277 students divided into 4 groups
- 40 month study
- 100% xylitol gum - dramatic decrease in tooth decay

Mäkinen, K., J Dent Res, 1995

What's the difference between a train and a teacher?

Teacher says "spit out your gum"

while a train says "CHEW CHEW!"

Hungarian Study of 1981-1984

10.0
7.5
5.0
2.5
2.0
0.0
DMFS Caries Increment

Control
Fluoride
Xylitol

Fluoride Caries Increment

How Xylitol Fights Tooth Decay

Belize City Xylitol Chewing Gum Study 1989-1994

- Five years later, follow-up study by University of Washington
- 70% reduction in tooth decay - xylitol
- Xylitol changes oral micro-flora

Belize City Xylitol Chewing Gum Study 1989-1994

1989-1994

Belize study conducted by the U of Michigan

1277 students divided into 4 groups

40 month study

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Teacher says "spit out your gum"

while a train says "CHEW CHEW!"
How much? How often?
Frequency of xylitol use is important

- Two-year study in Finland
- 172 students
- Best - three times daily
- Better - Strive for Five

How Xylitol Fights Tooth Decay

Tooth Eruption
Opportunity to establish long-term protection

- Xylitol enhances early mineralization
- Xylitol inhibits initial colonization by S. mutans

Xylitol and the Mother-Child Relationship
Mother chews xylitol for child’s first two years

- Avoid Strep mutans until age two = less decay
- Harmless, non-acidogenic bacteria will colonize
- Harder for the Strep mutans to get a foot-hold

Preventing The Vertical Transmission of the Streptococcus mutans Bacteria

Xylitol Superior to Fluoride Varnish & CHX Varnish

- Two year study
- 169 new mothers
- Varnishes at 6, 12, & 18 months
- Xylitol used 3-5 times a day
- Children: no varnish, no xylitol

Xylitol use by mothers has long-term benefits

Child’s first dental visit

Benefits of xylitol
- Reduces bacterial plaque 50%
- Reduces caries from 60% to 85%
- Elevates pH - saliva remineralizes enamel
- Prevents acid production by bacteria
- Promotes mineralization and remineralization
- Prevents ear infections, allergies and asthma
- Promotes healing of open wounds

My Big Fat Greek Wedding

Put some Windex on it!

CloSYS
As effective as CHX
- no stain
- no taste alteration

CloSYS - chlorine dioxide
- Penetrates and dissipates biofilms that harbor oral pathogens
- Inhibits re-growth of bacteria for 36 hours
Kills 99% of Streptococci in 10 seconds
Kills 99% of perio pathogens in 10 seconds

CloSYS - chlorine dioxide

ADA Seal: Safe and Effective for eliminating bad breath
CloSYS - Reasons for Use

- Sensitivity
- Dry Mouth
- Fresh Breath
- Perio Health

CloSYS - chlorine dioxide

CloSYS is less toxic than CHX to human gingival cells.

When used as a lavage in ultrasonic scaling, CloSYS safely reduced the exposure to microbial aerosols by 60%.

CloSYS - Available Here:

- Amazon.com
- Walmart
- CVS Health
- Walgreens
- Safeway
- Kroger
- Meijer
- Albertsons
- H-E-B
- Kinney Drugs
- Pharmaca
- Face Values

INTERDENTAL CLEANERS

More effective interdental options

- Interdental brushes of various sizes
- Interdental picks and sticks
- Oral irrigation
US Department of Health and Human Services
Removed flossing as a recommended practice after being questioned by the Associated Press regarding the lack of scientific research supporting floss to prevent periodontal disease and caries. 2016

Are brushing and flossing working for your patients?
Time to “Toss the Floss”

Harvard Health Publications
HARVARD MEDICAL SCHOOL
Trusted advice for a healthier life

Tossing flossing?
Robert H. Shmerling, MD
Editor, Harvard Health Publications

Archie Cochrane, MD

Flossing for the management of periodontal diseases and dental caries in adults
Dario Sambunjak, Jason W Nickerson, Tina Poklepovic, Trevor M Johnson, Pauline Imai, Peter Tugwell, Helen V Worthington
First published: 7 December 2011

Twelve studies show flossing in addition to toothbrushing reduces gingivitis compared to toothbrushing alone.

Weak, unreliable evidence from 10 studies that flossing plus toothbrushing shows a small reduction in plaque at 1 and 3 months.
No studies reported the effectiveness of flossing plus toothbrushing for preventing dental caries in adults as studies were not long enough.

- 8% reduction in gingivitis with floss
- Insufficient evidence to claim plaque reduction
- In another review study -
  - 40% reduction in caries risk for kids 4 to 13 years with professional flossing on school days
    - (why not 100%)

Feeling Guilty About Not Flossing? Maybe There’s No Need

Haven’t flossed lately? Don’t feel too bad: Evidence for the benefits of flossing is ‘weak, very unreliable’

Associated Press

Guilty No More: Flossing Doesn’t Work
An AP investigation finds weak evidence that flossing helps.

WILL GREENBERG
2016

This is why flossing doesn’t work…
This is why flossing doesn’t work…

Flossing is difficult
- Flossing removes only 18-35% of interproximal plaque (Ong, 1990, J of CP)
- Only 13% of adults and 6% of kids floss daily
- No benefit over brushing alone

Flossing Compliance is Poor
- 18 out of 258 reported daily flossing - 7%
- Any gains seen at 2 weeks - lost at 4 weeks
- Instruction alone doesn’t work

CONCLUSIONS
While flossing with any type of floss is substantiated within this literature as an effective method of interproximal plaque removal, for some clients and/or for certain oral sites, other methods of interdental cleansing are warranted.

Flossing will not prevent caries at the contact area. The caries begins just below the contact - not at the contact.

Biofilm forms below the contact
Concavities are Difficult to Reach

Heather - can you give us some tips on sizing a patient?

BREAKOUT SESSION
Straight better on lingual than tampered design

Offer Alternatives

- Interdental brushes, picks, sticks, etc
- Water Flossing
- Cut out added sugars
- Xylitol to replace sugar
- Dry Toothbrushing and various toothbrushes

Oral Irrigation
Cutler et al, 2000 - Study Design

52 subjects with 4 - 7 mm pockets and BOP randomized into 3 groups
A: Cessation of ROH - 14 days
B: No modification of ROH - 14 days
C: Water irrigation plus ROH - 14 days

Outcome measures:
PI, GI, PPD, CAL, BOP
Cutler et al, 2000 - Results

“The addition of oral irrigation with water to the subjects' routine oral hygiene (ROH) for 14 days resulted in a significant reduction in PPD, BOP, GI, and PI at interproximal sites with mild to moderate (4 - 7 mm) periodontal disease”

Sonic-Fusion

Dental Floss

If patients are flossing effectively, support them and encourage them to continue.

Those who do no interdental cleaning, offer two alternatives to floss and let them choose which one they want to use.
Offer Alternatives

- Interdental brushes, picks, sticks, etc
- Water Flossing
- Cut out added sugars
- Xylitol to replace sugar
- Dry Toothbrushing and various toothbrushes

Recognize the limitation of oral hygiene lectures

Does Education Work?

38 million still smoke
18% of men and 14% of women

Recognize the limitation of oral hygiene lectures

This is our first instinct - what we were taught in school
Education is often one-sided

Giving information vs raising awareness

The “Righting Reflex”

Patients tend to push back

Clinician wants to fix the patient

Traditionally, we blame the patient for poor oral hygiene.

Research shows people only remove 42% of plaque with a manual toothbrush and 46% with a power toothbrush.

Patients actually think they removed all the plaque from their teeth before coming to see you. They really do!

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Post-op</th>
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<tbody>
<tr>
<td>buccal</td>
<td>30%</td>
<td>15%</td>
</tr>
<tr>
<td>lingual</td>
<td>40%</td>
<td>20%</td>
</tr>
<tr>
<td>interproximal</td>
<td>80%</td>
<td>40%</td>
</tr>
</tbody>
</table>

50% plaque reduction

J Perio, DeVore, C. et al, Plaque Score Changes Based Primarily on Patient Performance at Specific Time Intervals

Do your patients ever blame genetics?

Steps needed to engage the patient in planning for change

1. Shift from educator to advocate
2. Take the patient’s side - blame someone else
3. Solve a problem for the patient

Toothbrushing and flossing instructions have been going on for over 100 years. Is it working?
Shift from educator to advocate
Take the side of the patient - avoid being the adversary
avoid simply educating

Take the patient’s side
To avoid blaming the patient — find someone or something else to blame.

Blame the toothpaste

Reasons why dry brushing works
Most people brush with their eyes closed DROOLING and DAY DREAMING
30 seconds seems like 3 minutes
#1 People brush longer without toothpaste
Toothpaste makes so many bubbles, you can’t see what you’re doing.

#2 People brush more evenly around the mouth

Toothpaste flavor and wetting agents numb your tongue so your teeth feel clean when they really aren’t.

#3 People have a way to measure plaque removal with the tongue

Steps needed to engage the patient in planning for change

1. Shift from educator to advocate
2. Take the patient’s side - blame someone else
3. **Solve a problem for the patient**

Solve a problem for the patient

Do you like when I scrape off the buildup behind your lower front teeth?

Brushing times 38 to 60 seconds

- Erratic pattern of brushing
  - ✓ Returning several times to starting place
- Rarely brushing lingual surfaces
  - ✓ If so - only 10% of time spent on linguals

MacGregor, Rugg-Gunn JPR 1979 14:225-230
Dry Brush Inside First

✓ Reduced lingual calculus 63%
✓ Reduced lingual bleeding 55%

O’Hehir, Suvan, JADA 1998 129:614

My brother-in-law, Billy — my sister Peggy

Blame the toothpaste - not the patient

Toothpaste is the reason for 30 second brushing and lingual calculus

Recognize the limitation of oral hygiene lectures

Education

The Goal: Behavior Change

Change is difficult

Ask any married couple
Change is difficult

I want others to change,
but I don’t want to change!

I want my patients to change,
but I don’t want to change!

Change is difficult

It happens outside your operatory

Limits to education alone

Roll with resistance

Start with this assumption:
the patient did the best they could!

Continuing to educate patients the
same way and expecting different
results is the

**definition of insanity!**

If *we* want different results,
*we* have to change.

First Change: Skip the lecture
Skip the Lecture!
The brush and floss message isn’t getting through to all our patients!

Ask permission to educate

• Action Research - 10 patients asked
• 7 said NO
• 3 said “…only if you want to…”

Objectives
1. Understand why education is not enough
2. Describe steps in planning for change
3. Compare approaches to behavior change
4. Use open-ended questions to begin conversation
5. Observe changes in patient commitment

MASLOW’S金字塔

- Self-actualization: achieving one’s full potential including creative activities
- Esteem needs: prestige and feeling of accomplishment
- Belongingness and love needs: intimate relationships, friends
- Safety needs: security, safety
- Physiological needs: food, water, warmth, rest

Alderfer
Herzberg
Maslow
McClelland

Growth
Motivators
Self-Actualization
Esteem
Achievement
Power
Affiliation
Hygiene Factors
Safety
Physiological
Relatedness
Existence
Intrinsic Motivation
Extrinsic Motivation
Basic needs
Psychological needs
“You can’t instill motivation to change into someone else.”

Stephen Rollnick
Change comes from within

Some behavior changes are yes or no fastening your seat-belt

Oral Health Behaviors depend on quality not quantity not all flossing is effective not all brushing is effective more of the same isn’t always better

Trisha’s Theory of Change

1. Skip patient education
2. Keep your info a secret
3. Solve a problem for the patient
NEW VISION COACHING

NEW VISION
for Oral Health Promotion

Oral Health Coaching

TYPES OF RESEARCH

Quantitative - lot of statistics, graphs, etc
Qualitative - feeling, opinions, interviews

External - Avoid Bias
Internal - Include Bias

Action Research

Action Research Question Development
changing something you are doing with patients to achieve better oral health.

Identify a problem with patient oral health
What are 3 potential causes of this problem?
What are 3 potential solutions to this problem?

Pick one solution you think will improve oral health.

Action Research Question:
If I do this (the change you want to make), oral health as measured by this (how will you measure change), will improve.
Action Research Question:

If I introduce an alternative to flossing, patient behavior will change and interdental bleeding will be reduced.

ACTION RESEARCH

• Examples of OHU studies on interproximal cleaning

Is it...

• important – will it make a difference
• manageable – not adding a lot of work for you
• contextual – easily fits into your schedule
• focused – not a PhD project
• opened-ended – not a yes/no question
• reflective – looking at the patient’s response and also how the research impacts you

You are already doing Action Research

Is it...

• important – will it make a difference
• manageable – not adding a lot of work for you
• contextual – easily fits into your schedule
• focused – not a PhD project
• opened-ended – not a yes/no question
• reflective – looking at the patient’s response and also how the research impacts you

NEW VISION

Are you willing to accept this new vision - focused on health outcomes!
If we want different results, we have to change.

First Change: Skip OHI
Second Change: Open-ended questions

Patients don’t care how much you know until they know how much you care!

Open ended questions get a conversation going.

Caring enough to ask, shows empathy.

Motivational Interviewing
one tool for behavior change

OARS
- Open ended questions
- Affirm the patient
- Reflective listening
- Summarize the plan

Open ended questions get a conversation going.

Open-ended question the answers to which you do not know.

Do you floss?
Not open-ended and you know the answer.
Open ended questions get a conversation going.

What do you use to clean between your teeth?

Follow-up: **Tell me more about...**

Open ended questions get a conversation going.

On a scale of 1 to 10 How healthy is your mouth?

Open Ended Questions

What do you use to clean between your teeth?

Motivational Interviewing

- Opened ended questions
- Affirm the patient
- Reflective listening
- Summarize the plan

Partner up with a colleague in a breakout room
Try this open-ended question with your partner.

On a scale of 1 to 10
How healthy is your mouth?

Try this open-ended question with your partner.

On a scale of 1 to 10
How healthy is your mouth?
If you could change anything about your mouth, what would it be?

Try this open-ended question with your partner.

On a scale of 1 to 10
How healthy is your mouth?
If you could change anything about your mouth, what would it be?
Tell me more about...

Motivational Interviewing

OARS

Opened ended questions
Affirm the patient
Reflective listening
Summarize the plan

The Plan

- Offer alternatives to floss
- Offer secrets to solve problems
- Help the patient to make their plan
Motivational Interviewing

**OARS**
- Open ended questions
- Affirm the patient
- Reflective listening
- Summarize the plan

Open Ended Questions

Tell me what you like to eat for breakfast?

Tell me about your favorite snacks?

Tell me about your favorite drinks?

Open Ended Questions

Tell me what you like to eat for breakfast?

Tell me about your favorite snacks?

On a scale of 1 to 10

...how healthy is your diet?

...how healthy is your mouth?

Conversations with patients about sugar

Be brave - ask a question and see what you learn!
Conversations with patients about sugar

**Action Research Projects**

- Benefits of reducing fermentable carbohydrates
  - Reduced plaque biofilm formation
  - Reduced acid production by bacteria
  - Stronger blood vessels and capillaries
  - Better general health
  - Weight loss

Help the patient make the plan
Which of these two interdental cleaners do you think you would be most likely to use?
When in the day do you think you are most likely to use it?

Recommended Reading...

- Asking open-ended questions
- Actively listening to the patient’s needs
- Giving instructions to patients

Traditions you may want to avoid
- Asking closed questions
- Giving instructions to patients

Changes you may want to try
- Asking open-ended questions
- Actively listening to the patient’s needs

EMS - GUIDED BIOFILM THERAPY
Guided Biofilm Therapy (GBT)

AirFlow with Glycine/Erythritol

Removal of supragingival biofilm

80% less abrasive, safe & comfortable
Powder gently enters the sulcus
Cleans up to 4mm
Makes calculus visible

Scientific evidence shows it is safe, effective and 3 times faster than rubber cup polishing

How will erythritol powder be used?

Air Flow first to remove biofilm - then easier to remove calculus

Despite the evidence, DH schools still favor rubber cup polishing

PerioFlow

Reaches 9mm
Safe on root surfaces
Effective biofilm removal
Imagine the 11/12 Gracey Instruments designed to reach interproximal areas

Problem
blade too big for subgingival space
off-set blade harms tissue

Standard
Mini design

Need for the O’Hehir Curettes
Radical Change in Instrument Design
The O’Hehir Curettes

Experience Comfort, Quality & Durability!
Welcome to PDT’s Latest Innovation... The Jack B. Nimble™ Scaler
The Jack B. Nimble™ is a small, contra-angled scaler with a continuous curved blade. The blade is structured so increased surface of the cutting edge comes in direct contact with the tooth surface when scaling. The Jack B. Nimble™ is the perfect instrument for situations that are difficult to access with a straight-shank sickle or larger universal instrument. Jack B. Nimble™, Jack be quick.

Susan Wingrove, RDH, BS
Titanium Implant Instruments

Have a Heart and give back!

- PDT will accept old, used instruments regardless of the manufacturer
- For any 12 instruments, PDT will send FREE stainless steel curette or scaler.
- PDT craftspeople recondition the instruments and donate to over 400 dental missions throughout the world!

PDT Queen of Hearts
“I help people change behaviors to achieve optimal oral health.”
MicroClear breaks up biofilm buildup in waterline tubing reducing harmful aerosols.

Easy to use - MicroClear is non-toxic and designed to remain in the waterline overnight without the need to air or water purge at the end of the day. MicroClear does not require mixing and comes with a calibrated pump to reduce waste and save time.

- Powerful Antimicrobial formula
- Non-staining, Non-Corrosive on equipment
- pH balanced completely safe if ingested
- Does not alter water taste or odor
- Calibrated pump for easy usage
- Maintains less than 10 cfu/mL (ADA standard <200cfu/mL)
- EPA Registration #87117-1

To order, or for more information, just call your dental supplier, or call us.

Now you can have the industries best for less
and it could be the most cost efficient procedure performed in your office this year.
SPLATTER MATTERS.

Why Pre-Rinse:
During any dental procedure patient splatter will happen. Reducing the harmful bacteria in dental aerosol reduces the chance for cross-infection to patients & staff. Antimicrobial pre-rinsing should be part of every dental office PPE protocol.

- Naturally activated by saliva
- Breaks up harmful biofilm
- Destroys microbes & toxins
- Gentle Un-flavored formula

To order, or for more information, just call your dental supplier, or call us.

CloSYS Pre-Treatment Rinse in Chair Side bottle & pump: CloSYS Ultra-Sensitive Unflavored Pre-Rinse is a simple and effective pre-treatment rinse perfect for all your patients thanks to Cloralstan®, a powerful but gentle, patented ingredient that... kills 99.9% of harmful bacteria in 10 seconds.
Evidence-based protocols for biofilm management on teeth, soft tissues and implants.
1. MAKE BIOFILM VISIBLE
2. AIRFLOW® FIRST
3. PS INSTRUMENT FOR REMAINING CALCULUS
4. LESS POWER AND HAND INSTRUMENTS
5. NO MORE RUBBER CUPS, NO MORE PASTE
GBT - THE NEW AND MODERN WAY

ONLY THE VERY BEST FOR MY PATIENTS
ONLY THE SWISS ORIGINALS

“I FEEL GOOD”
GBT SAVES TEETH, IMPLANTS

22 APPLICATIONS OF GBT

* Approved for 5 mm in the U.S. - 9 mm in Canada
AND MUCH MORE

GUIDED BIOFILM THERAPY®

AROUND BRACKETS
ON PRIMARY TEETH
TONGUE AND PALATE
INTERDENTAL
IN PITS AND FISSURES
BEFORE COMPOSITE RESTORATIONS
BEFORE BLEACHING
ON RESTORATIONS
ON RESTORATIONS

GBT SAVES TEETH, IMPLANTS AND MUCH MORE
08 RECALL
HEALTHY PATIENT = HAPPY PATIENT
- Schedule recall frequency according to risk assessment
- Ask your patient if he or she liked the treatment

07 CHECK
MAKE YOUR PATIENT SMILE
- Do a final check for remaining biofilm
- Ensure calculus is fully removed
  - Accurately diagnose caries
  - Protect with fluoride

06 PIEZON® PS
REMOVE REMAINING CALCULUS
- Use the minimally invasive EMS PIEZON® PS Instrument supra- and subgingivally up to 10 mm
- Clean > 10 mm pockets with mini curette
- Use EMS PIEZON® PI Instrument around implants up to 3 mm subgingivally and on restorations

05 PERIOFLOW®
REMOVE BIOFILM IN >4 TO 9 MM POCKETS*
- Use AIRFLOW® PLUS Powder on natural teeth in deep pockets and root furcations and on implants
- Use new and slimmer PERIOFLOW® Nozzle

* Approved for 5 mm in the U.S. - 9 mm in Canada
01 ASSESS
PROBE AND SCREEN EVERY CLINICAL CASE
► Healthy teeth, caries, gingivitis, periodontitis
► Healthy implants, mucositis, peri-implantitis
► Start by rinsing with BacterX® Pro mouthwash

02 DISCLOSE
MAKE BIOFILM VISIBLE
► Highlight to patients the disclosed biofilm and their problematic areas with EMS Biofilm Discloser
► The color will guide biofilm removal
► Once biofilm is removed, calculus is easier to detect

03 MOTIVATE
RAISE AWARENESS AND TEACH
► Emphasize prevention
► Instruct your patients in oral hygiene
► EMS recommends Philips Sonicare toothbrushes, interdental brushes and Airfloss Ultra

04 AIRFLOW®
REMOVE BIOFILM, STAINS AND EARLY CALCULUS
► Use AIRFLOW® for natural teeth, restorations and implants
► Remove biofilm supra- and subgingivally up to 4 mm using AIRFLOW® PLUS 14μm Powder
► Also remove biofilm from gingiva, tongue and palate
► Remove remaining stains on enamel using AIRFLOW® CLASSIC Comfort Powder
THE AIM OF GBT IS

GINGIVITIS
EMS Biofilm Discloser visibly reveals the presence of early and mature biofilm. The sulcus area (gingival margin) shows mature biofilm due to an inappropriate brushing technique leaving biofilm untouched.

In this case, GBT was limited to AIRFLOW® PLUS Powder up to 3mm. Some bleeding from the gingival margin (red line) indicates low-grade gingivitis. GBT fosters the patient’s motivation to use correct tooth brushing techniques.

- GBT prevents and treats gingivitis

CARIES DETECTION
Accurate caries detection requires clean teeth. Here, the EMS Biofilm Discloser shows the presence of biofilm, interdentally as well as at the gingival margin. Finally, GBT reveals interdental caries at an advanced stage.

- GBT helps detect caries with precision.
- No more biofilm: No more caries.

IMPLANTS
In this sequence of peri-implantitis, AIRFLOW® removes supra- and subgingival biofilm up to 4mm. The EMS Biofilm Discloser helps to minimize treatment time. PERIOFLOW® removes biofilm in peri-implant pockets up to 9mm*. Finally, the PIEZON® PI Instrument removes the remaining calculus around the implant.

- GBT contributes to the treatment of peri-implantitis in a minimally invasive way.

* Approved for 5 mm in the U.S. - 9 mm in Canada
TO ELIMINATE ALL BIOFILM ON TEETH, IMPLANTS AND SOFT TISSUES.
**CHILDREN**

In this case, using a 2-tone disclosing agent visibly reveals cariogenic biofilm and helps motivate the young patient. Children love AIRFLOW® – it is “cool” and they lose the fear of the treatment.

- The pain-free GBT method motivates children and helps prevent caries.

**ORTHODONTICS**

Orthodontic appliances are a challenge for patients and professionals performing biofilm management. Using a 3-tone disclosing agent reveals cariogenic biofilm (pH < 4,5) in areas difficult to access during home care and helps to motivate the young patient. AIRFLOW® PLUS Powder during GBT reveals demineralized white spots which were impossible to identify before.

- GBT prevents caries during orthodontic treatment.
- GBT maintains orthodontic appliances.

**EXPOSED DENTINE**

Biofilm and calculus removal on exposed dentine surfaces is usually critical in terms of patient comfort (dentine hypersensitivity) and risk of over instrumentation. The disclosed biofilm helps to minimize AIRFLOW® treatment and to save time. No more color (of the disclosing agent) - no more biofilm. AIRFLOW® PLUS Powder and PIEZON® NO PAIN with PS Instrument are the best assurance for high quality and painfree treatments.

- GBT preserves exposed dentine preventing sensitivity.

**STAINS AND CALCULUS**

AIRFLOW® removes stains and facilitates further calculus removal with PIEZON® PS Instrument, minimizing power instrumentation.

- GBT will make your patient smile again.
MORE CASES

Photos: Courtesy, Dr. Gleb Aseev

Photos: Courtesy, Prof. Magda Mensi
Why GBT Is the... 

- Dental biofilm is the main etiological factor for caries, periodontitis and peri-implant infections. Periodontitis may increase the risk of systemic diseases, such as cardiovascular and respiratory disorders, arthritis or diabetes.

- Regular oral hygiene, combined with professional measures, keeps biofilm under control – for a better oral and systemic health. Axelsson and Lindhe pioneered preventive dentistry in the 1970’s with studies and clinical protocols based on prophylaxis in “recall hours”.¹⁻²

- GBT follows the recommendations on Professional Mechanical Plaque Removal (PMPR) and Oral Hygiene Instructions (OHI) for Home Care issued by the European Federation of Periodontology (EFP).³⁻⁵.

- “Periodontal Health for a Better Life!”

Professional Tooth Cleaning Can Be a Painful Experience

Patients Do Not Like It and Often Stay Away From Recalls

This shows that dental biofilm is not always visible.

1. Removing calculus with hand instruments can often be painful for the patients. Dental surfaces and implants often will be scratched.

2. Polishing with rotary rubber cups and brushes is time-consuming and often messy. With many areas not reachable, the gingiva will be affected mechanically. Dental hygienists and assistants know that traditional cleaning may be a painful experience. For this reason, patient compliance is not often very high. Now, almost fifty years later, it is time for change.

GBT IS THE NEW AND PATIENT ORIENTED CONCEPT

1. Before removal, biofilm is always disclosed with a dye solution. Biofilm and early calculus are easily removed with AIRFLOW® and PERIOFLOW® – supra- and subgingivally.

2. If needed, this is followed by debridement with PIEZON® PS NO PAIN piezoceramic instruments.

3. Guided Biofilm Therapy means that the clinician is guided by the disclosed biofilm during tooth cleaning procedures.

4. Guided Biofilm Therapy is truly minimally invasive and reduces the need for hand and sonic/ultrasonic instrumentation. It is safe, effective and gentle to teeth and soft tissues, implants and restorations.

5. GBT is very comfortable for patients and practitioners. It is efficient and timesaving.

This also valid for primary caries and perio prevention in children and teenagers.

6. GBT is part of a comprehensive preventive concept – to preserve your patients’ oral health – and to make the patients feel good.

7. Since 1982 EMS has provided dental practices all over the world with AIRFLOW® air polishing and PIEZON® PS NO PAIN piezoceramic scaling technology.

8. In 2012 EMS added the high-tech erythritol-based AIRFLOW® PLUS Powder with a particle size of only 14 μm.

9. Guided Biofilm Therapy is based on clinically proven technologies invented by EMS. It was developed in cooperation with highly respected and experienced periodontologists, caries specialists and dental hygienists.

10. GBT is a systematic, predictable, risk-oriented and user-friendly treatment for all age groups and each individual patient.


1. WHY MAKE BIOFILM VISIBLE?

- With GBT we intend to eliminate all the biofilm, including areas which are difficult to access.
- If biofilm is made visible, it is removed much faster with GBT.
- What you see is what you remove. Color removal = Biofilm removal. Also on soft tissues.
- The users of hand instruments, rubber cups and “polishing” paste do not like to disclose biofilm as they would need much more time to finish the treatment.
- The German Stiftung Warentest reported that the conventional prophylaxis only removes 50% of Biofilm in the difficult to access areas.
- Colored teeth and gums will also help motivate the patient to improve their homecare – OHI.

2. WHY AIRFLOW® FIRST?

- AIRFLOW® removes biofilm, stains and colorations first as well as the thin layers of early forming calculus. Now you will see the remaining calculus better and it will be easier to eliminate it with the PIEZON® NO PAIN PS Instrument.
- With GBT the removal of calculus in supra- and subgingival areas is easier, faster and truly minimal invasive.
- This pain free and comfortable GBT treatment method, if done correctly by trained GBT dental professionals will help create happy and loyal patients for your recall practice.
- AIRFLOW® = CASH FLOW.
3. WHY ONLY THE PS INSTRUMENT?

- The PIEZON® PS (Perio Slim) Instrument is slim and smooth like a probe. It is gum-friendly, minimally invasive, maximally preventive and preserves the epithelium due to its absolute linear movements.
- By using only one instrument to do 95% of the work, things will be easier. For the 5% that remain we recommend our new curved PIEZON® PSL and PSR (Perio Slim Left and Right) Instruments. The PIEZON® PS Instrument gives the clinician a good haptic and secure feeling when working subgingival.
- The treatment with the PS instrument is Pain Free if used the correct way.
- A Pain Free and pleasant treatment is the dream of every patient. This is the key for patient loyalty and satisfaction.
- The cost of a PS instrument is only 5 cents per treatment and per patient! It is absolute nonsense to buy copy or “compatible” tips.
- If EMS handpieces get damaged (e.g. the thread) with a “compatible“ tip you will lose your EMS warranty.
- The PIEZON® PS Instrument, the PIEZON® Handpiece and the PIEZON® NO PAIN electronic module were made/matched for each other. This Trilogy works in harmony.

4. WHY NO MORE „POLISHING“ PASTE?

- The enamel prisms of the natural tooth enamel are easily recognizable. The photo shows the remnants of the bacteria killed off with sodium hypochlorite.1
- The vital enamel prisms have been „polished“ away. Pastes have caused scratches. Biofilm has spread into natural crevices.
- Overall abrasive pastes cause a loss of valuable enamel. No improvement of the dental surface.1
- The biofilm has been removed with AIRFLOW®. The surface is clean down to the pores. No abrasion. The enamel prisms remain intact and the surface is perfectly smooth. The tongue no longer feels any roughness - no need to „polish“ with abrasive paste. Save enamel and treatment time.1

ONE POWDER ONLY

FOR 90% OF ALL CASES

OPTIMAL COMFORT
MINIMALLY INVASIVE
MAXIMALLY PREVENTIVE

TEETH
- Primary and permanent teeth
- Interdental spaces
- Crowded teeth
- Exposed dentine
- Pits and fissures
- Demineralized enamel

CARIES MANAGEMENT
- Before caries detection
- Before sealing
- Before fluoridation

SOFT TISSUES
- Sulcus
- Shallow pockets up to 4mm
- Deep pockets >4 to 9mm*
- Tongue and palate

ORTHODONTICS
- Orthodontic brackets
- Patients with Invisalign

AESTHETIC DENTISTRY
- Crowns and veneers
- Before placing restorations
- Before bleaching

IMPLANTS
- Peri-implant sulcus
- Deep peri-implant pockets

* Approved for 5 mm in the U.S. - 9 mm in Canada
ONE INSTRUMENT ONLY
FOR 95% OF ALL CASES

OPTIMAL COMFORT
MINIMALLY INVASIVE
MAXIMALLY PREVENTIVE

SUPRAGINGIVAL
- Primary and permanent teeth
- Best interproximal access
- Crowded teeth
- Exposed dentine

SUBGINGIVAL
- Sulcular deposits
- Preserves the epithelium
- Pockets up to 10mm

ORTHODONTICS
- Around orthodontic brackets

1 Clinical Research Associates, Newsletter.

1 GOOD DESIGN®, one of the most important design awards in the world from the Chicago Athenaeum Museum of Architecture and Design.
The Swiss-Made AIRFLOW® Prophylaxis Master was developed at the EMS Research Centre with more than 100,000 hours of technical and clinical testing in collaboration with leading dental professionals worldwide.
AIRFLOW® REMOVES BIOFILM, STAINS & EARLY CALCULUS. CLEANS AND POLISHES AT THE SAME TIME.

- After the use of AIRFLOW® no extra polishing with rubber cups/paste is necessary any more.
- Dental practices using AIRFLOW® and GBT have more and happier recall patients.
- Professional prophylaxis is becoming an important economic factor.\(^1\)

AIRFLOW® removes biofilm and early calculus in all these situations. It also cleans the gingival or peri-implant sulcus to a depth of 4mm.\(^2-4\) At the same time AIRFLOW® is fast, efficient and comfortable for the patient. Fine tune the air pressure/power for all clinical situations.

THE MULTITASKER

ABOVE CEMENTO-ENAMEL JUNCTION

SUBGINGIVAL

AROUND BRACKETS

EXPOSED DENTINE

TONGUE AND PALATE

ON PRIMARY TEETH

INTERDENTAL

IN PITS AND FISSURES

BEFORE COMPOSITE RESTORATIONS

BEFORE BLEACHING

ON RESTORATIONS

AROUND IMPLANTS

4MM


OBERHALB SCHMELZ-ZEMENT-GRENZE

SUBGINGIVAL

BIS 4 MM

SUBGINGIVAL BIS 4 MM

UM IMPLANTATE AIRFLOW® PLUS

BEVOR AIRFLOW® NACH AIRFLOW®

ABRASIV? VON WEGEN!

21
Objective: The purpose of this study was to investigate the effects of each of the commercially available air polishing powders on the surface characterization of human enamel, hybrid composite, and glass ionomer using a highly standardized protocol. The air polishing powders utilized in the study included aluminum trihydroxide, calcium carbonate, calcium sodium phosphosilicate, glycine, and sodium bicarbonate.

Based on the results of this study, the air polishing powders that are compatible with use on hybrid composite and glass ionomer cements are EMS glycine and EMS sodium bicarbonate. The air polishing powders that are compatible for use on enamel include EMS glycine, Dentsply sodium bicarbonate, and EMS sodium bicarbonate. In the study a particle size of 65μm of the EMS powder was used. Since 2013, EMS has reduced the particle size of its Comfort sodium bicarbonate Powder to only 40μm.

“The results of this research indicate that there are air polishing powders that are significantly less abrasive than others, even with similar ingredients, specifically sodium bicarbonate.”

Please read the full study, just download the QR code below.

Today, EMS offers an even better erythritol based prophylaxis powder, which enables supra- and subgingival treatment with superior comfort and efficiency than glycine powder.

EFFECT OF 5 SEC AIR POLISHING ON HUMAN ENAMEL

EFFECT OF 5 SEC AIR POLISHING ON GLASS IONOMER

2. For AIRFLOW® PLUS Powder, complimentary tests have been submitted to the J Clin Dent (Barnes CM, et al.).
With 2 chemical laboratories in Germany and Switzerland, EMS is the only company producing its own powder. With 35 years of clinical research and testing, many scientific studies and millions of patients treated, EMS recommends the following 2 powders for all clinical cases.

### RECOMMENDED

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<th>Name</th>
<th>Plus</th>
<th>Classic</th>
<th>Classic</th>
<th>Soft</th>
<th>Perio</th>
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<td>-8.1</td>
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- **Stains and early calculus**
- **Enamel**
- **Enamel white spots**
- **Pits and fissures**
- **Dentine**
- **Gingiva**
- **Tongue and palate**
- **Hybrid composite**
- **Glass ionomer**
- **...and peri-implant tissues**
- **Brackets and appliances**

### OTHER EMS POWDERS

<table>
<thead>
<tr>
<th>Name</th>
<th>Plus</th>
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<tr>
<td>Particle size</td>
<td>~14μm</td>
<td>~40μm</td>
<td>~65μm</td>
<td>~65μm</td>
<td>~25μm</td>
</tr>
<tr>
<td>pH</td>
<td>-7</td>
<td>-8.1</td>
<td>-8.1</td>
<td>-6</td>
<td>-6</td>
</tr>
</tbody>
</table>

- **Stains and early calculus**
- **Enamel**
- **Enamel white spots**
- **Pits and fissures**
- **Dentine**
- **Gingiva**
- **Tongue and palate**
- **Hybrid composite**
- **Glass ionomer**
- **...and peri-implant tissues**
- **Brackets and appliances**

Beware of so-called „EMS compatible“ powders in the market, which can damage oral tissues and the device. See here a nozzle completely damaged by such aggressive powders.

- Use only EMS powders with your EMS devices.
- The use of not authorized powders by EMS will result in a loss of warranty.
NEW PERIOFLOW® NOZZLE

Subgingival biofilm removal (debridement) in >4 to 9 mm* periodontal¹ and peri-implant² pockets
Initial and follow-up (SPT) periodontal therapy³
Prevention of mucositis / peri-implantitis⁴
Initial and follow-up treatment of mucositis / peri-implantitis⁵

³ Approved for 5 mm in the U.S. - 9 mm in Canada
NEW PERIOFLOW® NOZZLE
EMS invested in research on safety matters before it decided to offer the subgingival PERIOFLOW® application.
EMS’ main concern was to limit risks of emphysema.
In 2019 at IDS, EMS will offer for sale the third generation new PERIOFLOW® exchangeable nozzle - slimmer, safer and easier to use.

The new PERIOFLOW® Nozzles are thinner and more flexible and able to adapt to the topography of periodontal/peri-implant pockets. A pressure release groove limits pressure in periodontal/peri-implant pockets.

PERIOFLOW® APPLICATIONS

PERIODONTAL POCKETS
PERI-IMPLANT POCKETS
ROOT FURCATION

* Approved for 5 mm in the U.S. - 9 mm in Canada
AFTER USING AIRFLOW®, REMOVE REMAINING SUPRA- AND SUBGINGIVAL CALCULUS WITH THE PIEZON® NO PAIN¹ PS INSTRUMENT.

- Linear movement of the PS Instrument = no damage to tooth surfaces and soft tissues. Minimally invasive with regard to root cementum. Dynamic power setting.
- “EMS PS (Perio Slim) Instrument delivers the best interproximal and subgingival access.”²
- Patients will be surprised as the treatment with the PIEZON® PS Instrument will be entirely Pain Free when used in the correct way by Dental Professionals.

1. NO PAIN: when used in accordance with EMS instructions and/or the training by the Swiss Dental Academy.
95% OF ALL CASES

CALCULUS REMOVAL WITH EMS PIEZON® PS INSTRUMENT

PHOTOS: COURTESY, PROF. MAGDA MENSI

AFTER AIRFLOW®

AFTER PIEZON®

95% OF ALL CASES

EMS PS PERIO SLIM INSTRUMENT
IS INDICATED FOR 95% OF ALL CASES.

PS - THE ONE AND ONLY

ON PRIMARY TEETH

SUPRA & SUBGINGIVAL

10MM
The following dental surfaces are most at risk for caries\textsuperscript{1,2}:
1 - Occlusal.
2 - Approximal.
3 - Cervical areas.

In these areas:
- GBT helps effectively remove the biofilm and prevent caries in a minimally invasive way.

At an early stage of demineralization, caries is often hard to detect even with X-rays. Biofilm and calculus may conceal them. The International Caries Detection and Assessment System - ICDAS (2011) underscores the importance of „clean and dry“ surfaces for accurate detection.

1 OCCLUSAL

2 APPROXIMAL

3 CERVICAL
The width of occlusal fissures of cavities is often less than 100μm. This is less than toothbrush bristles and any hand instrument.

**Disclosing + AIRFLOW® sequence supporting early caries treatment:**
- After an initial biofilm disclosure, the fissure is cleaned with AIRFLOW® PLUS 14μm Powder.
- If needed, enlarge the fissure with 40μm CLASSIC Comfort Powder and polish with PLUS Powder.
- Burs can be used selectively in addition to AIRFLOW® if the lesion is still present.
- Clean with AIRFLOW® erythritol prior to sealing enables optimal adhesion.
GBT IS COOL...*

“I do not want to do without Airflow technology or air-polishing in my everyday work. Gentle on substance, clean, pleasant for patients and quicker, particularly in the interdental spaces. The results are accordingly good. Less inflammation, and the tooth necks are no longer sensitive after treatment.”

PETRA NATTER, DENTAL HYGIENIST

“With the EMS devices, we can very much to simplify the procedure protocol of our “prophylaxis sessions”, to make it more gentle on substance and more patient-friendly (less pain). After more than 3 years, prophylaxis has become a technically and economically very important part of our dental practice thanks also to the scientific and technical competence (e.g. NO PAIN with PS tip, PLUS Powder) of EMS.”

DR. NADINE STRAFELA-BASTENDORF, DENTIST

“I’m so happy with GBT, I could not accept any other tooth cleaning method anymore. Due to GBT I see my dentist regularly and gladly for my prophylaxis. And each time I leave the office I’m happy with my clean and brilliant white smile! To me prophylaxis with GBT has become a great experience and I dearly recommend it!”

SABINE PAVICIC, PATIENT

“Due to the small particle size of the product, especially the Plus powder, there is practically no traumatic gingivitis anymore...We were able to increase turnover in the area of prophylaxis by approx. 50 percent from 2015 to 2016, which is surely also due to the now much more pleasant treatment. The reactions were positive without exception.”

DIRK PALME, DENTIST

“Patients started to book in particularly with me. They thought I was more gentle than the other hygienists and their mouths were feeling better than ever. The bosses had also noticed a seemingly higher standard of treatment being delivered with lower bleeding scores and cleaner mouths coming from my surgery. They thought it was me. They thought I was more skilled. A better motivator. An exceptional communicator. It wasn’t me. It was the AIRFLOW®.”

FAYE DONALD, BEST UK DENTAL HYGIENIST 2014 AND 2017

“With the EMS devices, we can motivate our patients in terms of prophylaxis. Through a pleasant feeling in the mouth – WELLNESS factor. Removal of stains – BEAUTY factor. 100% plaque removal – HEALTH factor.”

MICHAELA GRUL
PATIENTS AND USERS ARE FANS

“AIRFLOW® IS COOL - SUPER COOL.”

MORRIS MEYER (9 YEARS)
01 ASSESS
Anamnesis: review the case history of your patient and raise awareness of caries promoting and reducing factors.
Pre-rinse with BacterX® Pro.
After patient and clinician preparation, perform the periodontal probing and screening.

02 DISCLOSE
Apply disclosing solution, then rinse with water.

03 MOTIVATE
Show your patients the disclosed biofilm and provide appropriate oral hygiene instruction.
EMS recommends Philips Sonicare.

04 AIRFLOW®
Remove stains, biofilm and early calculus supra- and subgingivally up to 4mm on natural teeth, implants, restorations, orthodontic brackets, dentine and soft tissues.

05 PERIOFLOW®
Remove biofilm in 4-9 mm periodontal and peri-implant pockets.

06 PIEZON®
Remove calculus on natural teeth up to 10 mm subgingivally with PS Instrument NO PAIN and on implants up to 3 mm subgingivally with PI Instrument.

07 CHECK
Check for any remaining biofilm, stains and calculus. Diagnose caries and other dental hard-tissue defects, protect with fluoride and inform the patient on personal preventive measures.

08 RECALL
Schedule next recall appointment adapting recall frequency to individual risk.

* Approved for 5 mm in the U.S. - 9 mm in Canada
1 A NEW MULTIPLE ANTI-INFECTIVE NON-SURGICAL THERAPY IN THE TREATMENT OF PERIODONTAL DISEASES: A CLINICAL STUDY

2 SHORT-TERM CLINICAL OUTCOMES FOLLOWING AIR POLISHING OF ERYTHRITOL POWDERS ON ENAMEL AND SELECTED ESTHETIC RESTORATIVE MATERIALS

3 A NEW PARADIGM SHIFT IN MECHANICAL BIOFILM MANAGEMENT? SUBGINGIVAL AIR POLISHING IN MODERATE-TO-DEEP PERIODONTAL POCKETS

4 AEROSOL, A HEALTH HAZARD DURING ULTRASONIC SCALING: A clinico-scientific review

5 THE EFFECT OF USE OF A SONIC POWER TOOTHBRUSH AND A MANUAL TOOTHBRUSH IN COMPARISON WITH ULTRASONIC INSTRUMENTATION DURING MAINTENANCE

6 EFFECTIVENESS OF PLAQUE INDICATORS AND AIR POLISHING FOR THE SEALING OF PITS AND FISSURES

7 GUIDELINE TO SELECT THE APPROPRIATE RECALL INTERVAL FOR AN INDIVIDUAL PATIENT

8 DEVELOPMENT AND VALIDATION OF A ELITE BIOMATERIAL FOR GUM REJUVENATION

9 THE EFFECT OF USING A SONIC POWER TOOTHBRUSH AND A MANUAL TOOTHBRUSH CONTROL ON PLAQUE AND GINGIVITIS

10 CLINICAL COMPARISON OF THE STAIN REMOVAL EFFICACY OF TWO AIR POLISHING POWDERS

11 DISCUSSION ON THE CURRENT PRACTICE OF AIR POLISHING WITHIN KEY CLINICAL DENTISTRY SETTINGS

12 BIOFILM REMOVAL AND ANTIMICROBIAL ACTIVITY OF TWO DIFFERENT AIR- POLISHING POWDERS: AN IN VITRO STUDY

13 AIR POLISHING: A REVIEW OF CURRENT LITERATURE

14 A NEW MULTI-PURPOSE NON-SURGICAL TREATMENT IN THE TREATMENT OF PERI-IMPLANTITIS: A CASE SERIES

15 A BIOFILM POCKET MODEL TO EVALUATE DIFFERENT NON-SURGICAL PERIODONTAL TREATMENT MODALITIES IN TERMS OF BIOFILM REMOVAL AND INFECTION CONTROL, SURFACE ALTERATIONS AND ATTACHMENT OF PERIODONTAL LIGAMENT FIBROBLASTS

16 IN VITRO COMPARISON OF THE EFFECTS OF VARIOUS AIR POLISHING POWDERS ON ENAMEL AND SELECTED ESTHETIC RESTORATIVE MATERIALS

17 A PARADIGM SHIFT IN MECHANICAL BIOFILM MANAGEMENT? SUBGINGIVAL AIR POLISHING: A new way to improve mechanical biofilm management in the dental practice

18 RANDOMIZED CONTROLLED TRIAL ASSESSING EFFICACY AND SAFETY OF GLYCINE POWDER AIR POLISHING IN MODERATE-TO-DEEP PERIODONTAL POCKETS

19 SUBGINGIVAL AIR-POLISHING WITH ERYTHRITOL DURING PERIODONTAL MAINTENANCE: RANDOMIZED clinical trial of twelve months

20 PENETRATION DEPTHS WITH AN ULTRASONIC MINI INSERT COMPARED WITH A CONVENTIONAL CURETTE IN PATIENTS WITH PERIODONTITIS AND IN PERIODONTAL MAINTENANCE

21 SUBGINGIVAL DEBRIDEMENT OF PERIODONTAL POCKETS BY AIR POLISHING IN COMPARISON WITH ULTRASONIC INSTRUMENTATION DURING MAINTENANCE THERAPY

22 A CLINICAL COMPARISON OF THE EFFICACY AND EFFICIENCY OF TWO PROFESSIONAL PROPHYLAXIS PROCEDURES IN ORTHODONTIC PATIENTS

23 IN VITRO STUDY OF SURFACE CHANGES IN FIXED ORTHODONTIC APPLIANCES FOLLOWING AIR POLISHING WITH CLINPRO™ PROPHEY AND AIRFLOW®

24 PAIN PERCEPTION DURING DEBRIDEMENT OF HYPERSENSITIVE TEETH ELICITED BY TWO ULTRASONIC SCALERS

25 FDI - PROMOTING ORAL HEALTH THROUGH FLUORIDE

26 EXPOSURE TIME OF ENAMEL AND DENTINE TO SALIVA FOR PROTECTION AGAINST EROSION: A study in vitro

27 ADHA - Clinical Practice Guidelines for Recall and Maintenance of Patients with Tooth-Borne and Implant-Borne Dental Restorations

28 DENTAL RECALL: recall interval between routine dental examinations – appendix G

"A health history assessment includes multiple data points that are collected through a written document or oral interview. The process helps build a rapport with the patient, and verifies key elements of the health status. Information is collected and discussed in a location that ensures patient privacy and complies with the Health Insurance Portability and Accountability Act (HIPAA)."
For more than 35 years EMS has developed high-end technologies and protocols in conjunction with the world’s most advanced clinicians, enabling the patients to enjoy natural teeth and implants for much longer.

„Primum non nocere“ * and minimal invasiveness are not only a must, they are our way of life.