Upsetting the Underworld of Biofilm with Guided Biofilm Therapy

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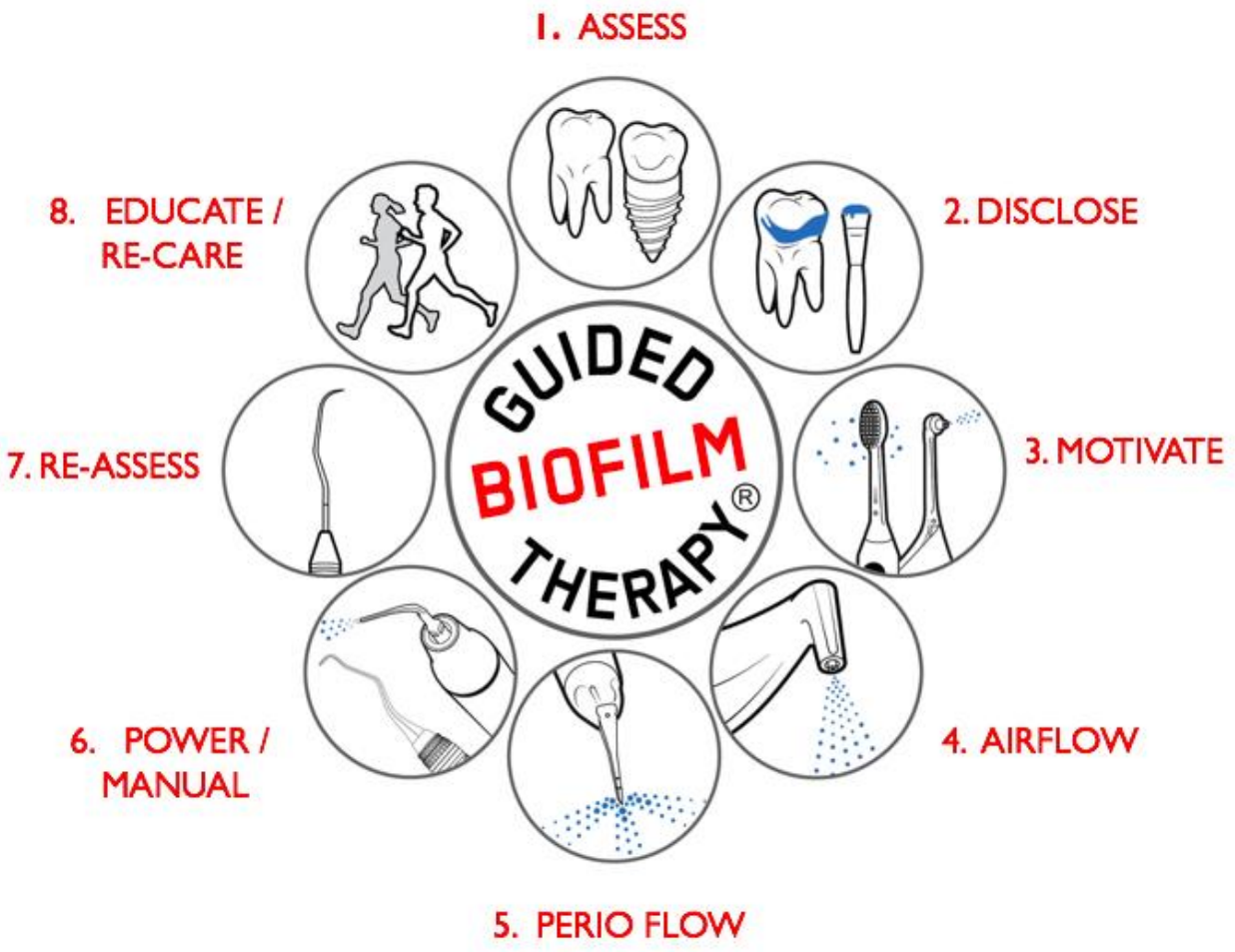
Guided Biofilm Therapy – the intentional removal of supra and subgingival biofilm with Air Flow technology and low-abrasive powder *prior to power and/or hand instrumentation* for the benefits of efficiency, comfort, accessibility, preservation of tooth surfaces, restorative materials and periodontal tissues.



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Keystone pathogens evade the host response & orchestrate a shift in the balance of the biofilm (dysbiosis)

Biofilm dysbiosis promotes the growth of inflammatory pathogens, synergy of the microbiota & an abundant release of pro-inflammatory cytokines

Increase in cytokines essentially becomes "metastatic inflammation". An intervention to remove disease promoting biofilm is required to drive down inflammation. *Periodontology 2000, 2015*

Bacterial burden correlates with CIMT. As subgingival bacterial burden increases, so did the carotid intima-media thickness. *Circulation 2015*

Improvement in clinical and periodontal status is related to a decrease in CIMT. *Journal of the American Heart Association 2013*

Aa, P gingivalis, F nucleatum periodontal pathogens positively associated with various cancers. *PLOS Pathogens 2014, Infectious Agents & Cancer 2016*

Identification of periodontal pathogens with salivary diagnostics:
OralDNAlabs.com, OraVital.com, Hain-diagnostics.com

Tri-plaque ID gel – GC America

PlaqueHD – disclosing toothpaste

Probiora Pro – repopulating oral cavity with beneficial bacteria

Moh's Hardness Scale: 1 to 6 with 1 being the softest

- Talc 1
- Glycine Powder 2 (25 Microns)
- Erythritol PLUS Powder 2 – 2.5 (14 Microns)
- Dentin 2 – 2.5
- Sodium Bicarbonate Powder 2.5-3 (65-120 Microns
- Sodium Bicarbonate HFEMS Classic Comfort 2.5 – 3 (40 Microns)
- Calcium Carbonate Powder 3 (40 Microns)
- Aluminum Trihydroxide Powder 4 (80 Microns)
- Enamel 4-5
- Calcium Sodium Phosphosilicate Powder (Sylc) 6 (50 Microns)
- Pumice 6-7 (81 – 120 Microns)

Low-abrasive powders:
Hu-Friedy - PERIO powder – Glycine 25microns & PLUS powder – Erythritol 14 microns
Clinpro – Glycine powder
Acteon – Glycine powder

Clinical Evidence Guide – www.Hu-Friedy.com/biofilm / www.Hu-Friedy.com/powerrequest

PAIR & SHARE: A Paradigm Shift In Mechanical Biofilm Management? Subgingival Air Polishing: A New Way to Improve Mechanical Biofilm Management in the Dental Practice *Quintessence International 2013*

For exposed roots, cleaning with sodium bicarbonate powder cannot be recommended. Less abrasive glycine powder however, demonstrated non-critical substance loss of the tooth surface. *Journal of Periodontology 2014*

SPT should favor minimally invasive and patient-friendly procedures for biofilm management. The patient perception was the primary outcome parameter in this review. The data from four studies are consistent and report a low experience of discomfort and a minor potential for harm for air polishing devices using glycine powder. *International Journal of Dental Hygiene 2016*

EO displayed no detectable detrimental effects on human gingival and PDL fibroblasts, whereas CHX reduced both cell migration and long-term survival. *Journal of Periodontology 2013*

Erythritol PLUS powder: 58% smaller particle size than glycine / 37% harder

Air Flow® PLUS powder cleaned more deeply without any damage to the enamel compared to polishing pastes which were found to abrade the enamel surface, flatten enamel rods and deposit debris in the microstructures. *Journal of Clinical Dentistry 2016*

How is erythritol anti-cariogenic? (*Food Science & Biotechnology 2014)*

Inhibits growth of _____

Reduces adhesion of_____

Anti-biofilm Activity of PLUS powder (*Journal of Oral Pathology & Medicine 2016)*

Inhibitory effect_____

Reduced_____

Reduced_____

Abrasion on tooth surfaces might become substantial over time when the cumulative effects of repeated instrumentation in SPT are considered. *Journal of Periodontology 2007*

Dimensions of Dental Hygiene 2019: Air Polishing as An Adjunctive Therapy:

1.
2.
3.
4.
5.

PAIR & SHARE: Subgingival polishing with erythritol during periodontal maintenance. *Journal of Clinical Periodontology 2014*

Potential Contraindications (Use clinical judgment)

Respiratory conditions

Communicable conditions

Undergoing chemotherapy

Pregnant (Perio Flow nozzle)

Known allergies

Low-abrasive Air Polishing devices: Hu-Friedy/EMS, Acteon, Coltene

Subgingival Air Polishing Method in Shallow Pockets:

Direct tip toward gingival margin / 3-5 mm from the tooth

Continuous movement – sweeping; not pumping

Subgingival Air Polishing Method in Deeper Pockets (PERIO FLOW nozzle)

Vertical movement – slowly up & down

5 second application per deep pocket

Potential Causes of Titanium Particle and Ion Release in Implant Dentistry: A Systematic Review. *International Journal of Molecular Sciences 2018*

Wear, corrosion & titanium oxide can be influenced by saliva, chemicals & bacteria

Use non-fluoridated & non-acidic rinses & gels for daily care

Ultrasonic instruments can damage the surface & cause chemical changes

Greatest decontamination with air polishing achieved in deeper pockets with moderate air pressure, tip movement vertically, & increased water flow

Laser decontamination w/Diode: low power (1W) in a pulsed mode & short exposures did not damage surface

Non-negotiables for every visit: _____,_____,_____

HVE solutions:

Nu-bird HVE Mirror – www.nu-bird.com

Ivory Re-leaf – www.kulzerus.com

Mr. Thirsty – www.zirc.com

Isovac – www.zyris.com

Purevac HVE system – www.dentsply.com

Sensitivity Solutions:

Tom's Rapid Relief with arginine & calcium carbonate

Shield Force Plus – desensitizer & dentin protection

ROI: Magical Minutes - What would you do with 10 extra minutes?

1.

2.

3.

Tips for Ease of GBT:

Inform the patient of the benefits

Select HVE system you prefer

Protect you and your patient

Provide desensitizer, as indicated

Begin on occlusal surfaces first

A paradigm shift in mechanical biofilm management? Subgingival air polishing: A new way to improve mechanical biofilm management in the dental practice. Quintessence International. 2013. Bastendorf KD, Becker C, Bush B, Einwag J, Lanoway C, Platzer U, Schmage P, Schoeneich B, Walter C, Wennström JL, Flemmig TF, Sculean A.

Review of current literature during a consensus conference with experts and researchers held during the Europerio 7 Congress in Vienna in 2012.

Findings:

- Air polishing devices have shown to be efficient in removing both sub and supragingival biofilm and stains.
- The new generation of powders and devices with subgingival nozzles provide better access to subgingival and interdental areas.
- In shallow pockets up to 4mm and in deeper pockets ≥ 5mm, air-polishing removed biofilm significantly more efficiently than hand curettes.
- Full-mouth glycine powder air-polishing results in a significantly decreased load of P gingivalis in the oral cavity.
- Subgingival biofilm removal with air-polishing is considerably faster than hand instrumentation or ultrasonics.
- Glycine-based air polishing is perceived as more comfortable by the patients than hand instrumentation or ultrasonics.
- Subgingival air-polishing with glycine-based powder is safe if used as per recommendation.

Clinical Take-Away Messages:

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2.

Subgingival polishing with erythritol during periodontal maintenance. Randomized clinical trial of 12 months. Journal of Clinical Periodontology 2014. Moene, MN, Cancela JA, Mombelli A.

ABSTRACT

Objective: To evaluate repeated subgingival air polishing in residual pockets with a new erythritol powder containing 0.3% chlorhexidine.

Methods and Materials:

Randomized clinical trial of 12 months with a two-arm parallel design
50 PM patients were evaluated at 3-month intervals.
At 0, 3, 6, and 9 months all probing depths measuring >4mm were subject to subgingival air-polishing (test group) or ultrasonic debridement (control group)
Primary end-point was presence/absence of pocket depth of >4mm at the end of 12 months.

Results:

6918 total sites were monitored at baseline and 457 had PD >4mm (5 – 9mm)
The number of PD >4mm per subject, PD and bleeding on probing were significantly lower at month 12.
Differences between test and control were not significant.
Significant difference in favor of air polishing for the perception of pain/discomfort.
Differences between six tested microorganisms between baseline and month 12 were not significant.
At month 12, test sites were less frequently positive for Aggregatibacter actinomycetemcomitans compared to controls.

Conclusions:

Repeated subgingival air polishing reduced the number of pockets >4mm similar to ultrasonic debridement. It was safe and induced less pain.

Clinical Take-Away Messages:

1.

2.