EMS CLINICAL EVIDENCE

→ AIR-FLOW®
ON NATURAL TEETH AND IMPLANTS

SCIENTIFIC LITERATURE IN PERIODONTOLOGY

EMS

LITERATURE ON ERYTHRITOL POWDERS

A. EFFECTS ON NATURAL TEETH

1. **The effects of erythritol air polishing powder on microbiologic and clinical outcomes during supportive periodontal therapy: Sixth-month results of a randomized controlled clinical trial**
   The subgingival use of erythritol air-polishing powder by means of an air-polishing device may be considered safe and may lead to comparable clinical and microbiologic outcomes to those obtained scaling and root planing.
   Tobi as T. Hägi, Petra Hofmänner, Sigrun Eick, Marcel Donnet, Giovanni E. Salvi, Anton Sculean, Christoph A. Ramseier, Quintessence Int, 2014, DOI: 10.3290/32817

2. **Tests of effectivity (abrasion) of Air-Flow® powder applications used on dental hard tissue surfaces**
   The study shows that there are hardly any changes in the surface of the dental enamel of the milk teeth after treatment with erythritol
   2015: CTA Anna Weber, Dr.rer.nat. Dipl.-Ing (FH) Susanne Reimann, Prof. Dr.rer.nat. Christoph Bourauel

3. **Subgingival air-polishing with erythritol during periodontal maintenance**
   Repeated subgingival air-polishing reduced the number of pockets >4 mm similar to ultrasonic debridement. It was safe and induced less pain.
   Division of oral Physiotherapy and Periodontology, school of Dental Medicine, University of Geneva, Switzerland
   J Clin Periodontol. 2014 Sep; 41(9): 883-9. doi: 10.1111/jcpe.12289. Epub 2014 Aug 7

4. **The Relative Effects of Root-Debridement on Biofilm-Removal and Hard-Substance-Alterations Using a New In-vitro Pocket Model**
   Air-polishing with erythritol resulted in almost no substance loss and a smooth surface and demonstrated excellent biofilm removal, thus representing a promising alternative to ultrasonication.
   Tobias T. Hägi, Sabrina Klemensberger, Riccarda Bereiter Raluca Cosgarea, Simon Flury, Adrian Lussi Anton Sculean and Sigrun Eick, Department of Periodontology, University Bern, Switzerland; University of Cluj-Napoca, Clui-Napoca, Romania Philips University, Marburg, Germany; Department of Preventive, Restorative and Pediatric Dentistry, University Bern, Switzerland

5. **Erythritol alters microstructure and metabolomic profiles of biofilm composed of Streptococcus gordonii and Porphyromonas gingivalis**
   Erythritol has inhibitory effects on dual species biofilm development via several pathways, including suppression of growth resulting from DNA and RNA depletion, attenuated extracellular matrix production, and alterations of dipeptide acquisition and amino acid metabolism.
   E. Hashino, M.Kuboniwa, S.A. Alghamdi, M.Yamaguchi, R. Yamamoto Molecular Oral Microbiology, 2013, 435-451

6. **Biofilm Removal and Antimicrobial Activity of Two Different Air-Polishing Powders: An In Vitro Study**
   Air-polishing with erythritol-chlorhexidine seems to be a viable alternative to the traditional glycine treatment for biofilm removal.
   2014: Lorenzo Drago, Massimo Del Fabbro, Monica Bortolin, Christian Vassena, Elena De Vecchi and Silvio Taschieri

B. EFFECTS ON IMPLANTS

7. **Treatment of peri-implantitis using an air polishing device with erythritol powder or mechanical debridement: a randomized, controlled split mouth clinical study**
   Air-polishing is safe, faster and a more practical option than using ultrasonics or hand instruments for non surgical treatment of peri-implantitis.
   L. Nastri, G. Miraldi R. Ripoli, Seconda Università degli Studi di Napoli, Naples, Italy Studio miraldi, Naples, Italy, Clin Oral Impl Res 25 (suppl 10), 2014

NEW LITERATURE ON GLYCINE POWDERS

A. EFFECTS ON NATURAL TEETH

1. Three-Dimensional Defect Evaluation of Air Polishing on Extracted Human Roots

In patients with exposed root surfaces, cleaning with bicarbonate powder cannot be recommended. Less abrasive glycine powder, however, demonstrated noncritical substance loss.

2014: Philipp Sahrmann, Valerie Ronay, Patrick R. Schmidlin, Thomas Attin, Frank Paqué

2. An In Vitro Comparison of the Effects of Various Air Polishing Powders on Enamel and Selected Esthetic Restorative Materials

EMS glycine and EMS sodium bicarbonate are compatible with use on hybrid composite, glass ionomer cements and enamel.

2015: Caren M. Barnes, David Covey, Hidehiko Watanabe, Bobby Simtich, Joel R. Schulte, Han Chen

3. A systematic review on the effects of air polishing devices on oral tissues

Air-polishing devices are applied in periodontally affected dentitions to remove supra and subgingival biofilm. Sodium bicarbonate powders should not be used in periodontally affected dentitions because of their considerable potential of harm to cementum, dentine and gingiva.

2014: J. Buhler, M. Amato, R. Weiger, C. Walter

4. Efficacy of glycine powder air polishing in comparison with sodium bicarbonate air polishing and ultrasonic scaling: a double-blind clinico-histopathologic study

GPAP is a more efficient for biofilm removal compared to SBAP and almost as effective as ultrasonic scaling during periodontal maintenance therapy. GPAP has a more docile effect on the soft tissues and causes less gingival erosion as compared to ultrasonic scaling.

C. J. Simon, P. Munivenkatappa Lakshmaiah, Venkatesh, R. Chickanna, Int Journal of dental hygiene, Article first published online: 26 Feb 2015, DOI: 10.1111/idh.12133

5. A systematic review on the patient perception of periodontal treatment using air polishing devices

Supra and subgingival air-polishing with glycine powders seems to be associated with least discomfort during non-surgical periodontal therapy

J. Buhler, M. Amato, R. Weiger, C. Walter, Int Journal of dental hygiene, Article first published online: 23 Jan 2015, DOI: 10.1111/idh.12119

B. EFFECTS ON IMPLANTS

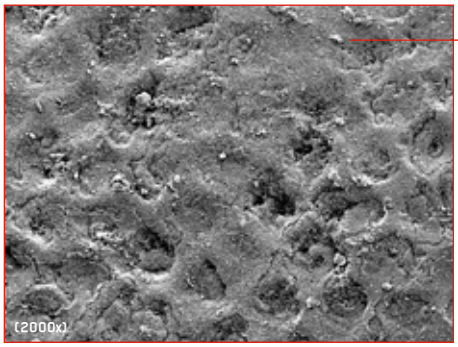
6. Treatment of peri-implant mucositis using a glycine powder air-polishing or ultrasonic device: a randomized clinical trial

Treatment with glycine powder air-polishing or an ultrasonic device is effective in non-surgical-treatment of peri-implant mucositis and can be used during implant maintenance

C. Riben-Grundstrom, O. Norderyd, U. André , S. Renvert, J Clin Periodontol 2015; 42: 462–469. doi: 10.1111/jcpe.12395

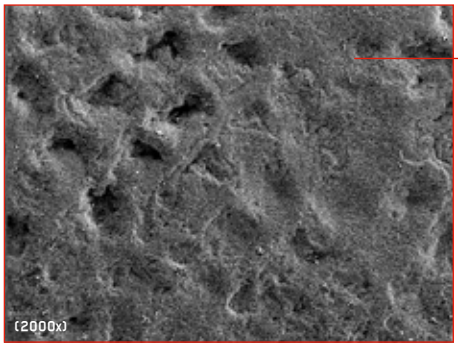
THE ELECTRON MICROSCOPE[1] PROVES BYE-BYE BIOFILM, BYE-BYE PASTE

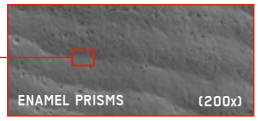
FIGURE A: NATURAL TOOTH ENAMEL WITH BIOFILM RESIDUALS[2]



- The enamel prisms of the natural tooth enamel are easily recognizable
- The photo shows the remnants of the bacteria killed off with sodium hypochlorite

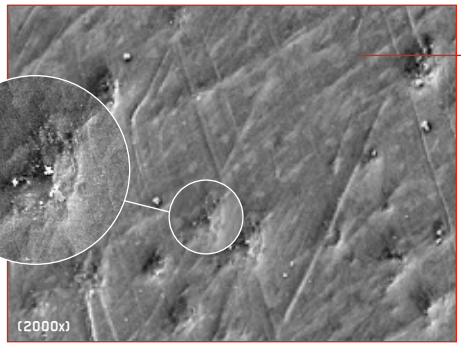
FIGURE B: TOOTH ENAMEL AFTER CLEANING WITH AIR-FLOW® PLUS POWDER

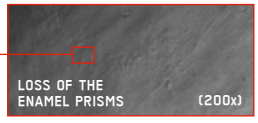




- The biofilm has been completely removed with AIR-FLOW® PLUS POWDER – the surface is clean down to the pores
- No abrasion – the natural enamel prisms remain intact
- The 200x enlargement shows the perfect smoothness of the clean tooth enamel; here the tongue can no longer feel any roughness, there is no further need for polishing (abrasive) – thus saving time

FIGURE C: TOOTH ENAMEL AFTER POLISHING WITH LOW-ABRASIVE POLISHING PASTE (RDA 27)





- The vital enamel prisms have been irretrievably polished away
- Pastes have caused scratches
- Biofilm has been spread into natural crevices
- Overall abrasive pastes cause loss of valuable enamel

[1] By cleaning the lab visualized; Stored for 2 months in 2% sodium hypochlorite and then cleaned for 10 minutes in an ultrasonic bath with 12% sodium hypochlorite

[2] SEM micrographs A, B, C : (SE, 5 kV, 2000x, Philips XL-30 SFEG, CIME - EPFL Lausanne); Sara Camboni, EPFL; Dr. Marcel Donnet, EMS; Publication in progress

ALL-IN-ONE N°1 PROPHYLAXIS

ORIGINAL METHOD

GUIDED BIOFILM THERAPY

EMS
ELECTRO MEDICAL SYSTEMS SA
Chemin de la Vuarpillière 31
CH-1260 Nyon

Tel. +41 22 99 44 700
Fax +41 22 99 44 701

BYEBYEBIOFILM.COM