

# GUIDED BIOFILM THERAPY



## CLINICAL EVIDENCE

### 01 ASSESS

Anamnesis: review the case history<sup>1</sup> of your patient and raise awareness on caries promoting and reducing factors<sup>2</sup>.  
Pre-rinse with BacterX<sup>®</sup> Pro<sup>3</sup>.  
After patient and clinician preparation<sup>4</sup>, perform the periodontal probing and screening<sup>5</sup>.

### 02 DISCLOSE

Apply disclosing solution<sup>6,7</sup>, then rinse with water.

### 03 MOTIVATE

Show your patient the disclosed biofilm<sup>6,7</sup> and re-educate them on oral hygiene<sup>6</sup>.  
EMS recommends Philips Sonicare<sup>8,9</sup>.

### 04 AIRFLOW<sup>®</sup>

Remove stains<sup>10</sup>, biofilm<sup>11,12</sup> and young calculus supra and subgingivally up to 4mm on natural teeth<sup>13</sup>, implants<sup>14</sup>, restorations, orthodontic brackets<sup>13</sup>, dentine<sup>15</sup> and soft tissues<sup>16,17,18</sup>.

### 05 PERIOFLOW<sup>®</sup>

Remove biofilm in periodontal pockets and implants from 4mm to 9 mm<sup>11,17,18,19</sup>.

### 06 PIEZON<sup>®</sup>

Remove calculus<sup>20,21</sup> on natural teeth up to 10 mm<sup>22,23</sup> with PS instrument NO PAIN<sup>\*24</sup> and on implants with PI instrument.

### 07 CHECK

Check for any remaining biofilm, stains and calculus. Diagnose caries<sup>2</sup> and other dental hard tissue defects, protect with fluoride<sup>25</sup> and inform the patient on post treatment recommendations<sup>26</sup>.

### 08 RECALL

Schedule next recall appointment adapting recall frequency to individual risk assessment<sup>27,28</sup>.



\* NO PAIN applies when used in accordance with EMS instructions and/or training by the Swiss Dental Academy

## 1 ADHA – Standards for clinical dental hygiene practice (page 6)

*American Dental Hygienists' Association, adopted March 2008, revised 2016 / Stainbach P, Smith M, Burch S.*

"A health history assessment includes multiple data points that are collected through a written document and an 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)." [Link](#)

## 2 WHITE PAPER ON DENTAL CARIES PREVENTION AND MANAGEMENT: A summary of the current evidence and the key issues in controlling this preventable disease (pages 23-25)

*FDI World Dental Federation 2016 / Pitts N, Zero D.*

Risk assessment must be considered as an essential component in the clinical decision-making process in dental practice to determine the appropriate level of patient care. [Link](#)

## 3 REDUCTION OF SALIVARY BACTERIA BY PRE-PROCEDURAL RINSES WITH CHLORHEXIDINE 0.12%

*Journal of Periodontology 1991, 62(11) / Veksler AE, Kayrouz GA, Newman MG.*

Pre-procedural rinsing with CHX has a profound and sustained effect on the aerobic and facultative flora of the oral cavity, which may contribute to a variety of clinical benefits. Pre-procedural rinsing may also be of value in protecting patients and dental professionals during dental manipulations. [Link](#)

## 4 AEROSOL, A HEALTH HAZARD DURING ULTRASONIC SCALING: A clinico-microbiological study

*Indian Journal of Dental Research 2016, 27(2) / Singh A, Shiva Manjunath RG, Singla D, Bhattacharya HS, Sarkar A, Chandra N.*

The aerosols and splatters produced during dental procedures have the potential to spread infection to dental personnel. Therefore, proper precautions should be taken to minimize the risk of infection to the operator. [Link](#)

## 5 ADHA – Standards for clinical dental hygiene practice (page 7)

*American Dental Hygienists' Association, adopted March 2008, revised 2016 / Stainbach P, Smith M, Burch S.*

A comprehensive periodontal examination is part of clinical assessment. [Link](#)

## 6 EFFECT OF VISUAL METHOD VS PLAQUE DISCLOSURE IN ENHANCING ORAL HYGIENE IN ADOLESCENTS AND YOUNG ADULTS: a single-blind randomized controlled trial

*American Journal of Orthodontics and Dentofacial Orthopedics 2014, 145(3) / Peng Y, Wu R, Qu W, Wu W, Chen J, Fang J, Chen Y, Farella M, Mei L.*

The use of images showing the severe consequences of biofilm accumulation enhanced the oral hygiene of patients treated with fixed appliances. [Link](#)

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

*European Journal of Paediatric Dentistry 2010, 11(1) / Botti RH, Bossù M, Zallocco N, Vestri A, Polimeni A.*

Disclosing agent is a must before cleaning pits and fissures. Air polishers ensure complete removal of plaque from the tooth before placing a sealing material. [Link](#)

## 8 IN VITRO TOOTH CLEANING EFFICACY OF ELECTRIC TOOTHBRUSHES AROUND BRACKETS.

*European Journal of Orthodontics 2010, 32(5) / Schätzle M, Sener B, Schmidlin PR, Imfeld T, Attin T. [Link](#)*

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

*The Journal of Clinical Dentistry 2017 Mar;28(1 Spec No A):A1-6 / Delaurenti M, Ward M, Souza S, Jenkins W, Putt MS, Milleman KR, Milleman JL. [Link](#)*

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

*European Journal of Dental Education 2017 Jul-Sep;11(3):370-375 / Shukla HR, Mathur A, Shetty N, Makhijani B, Manohar B.*

The 40 µm sodium bicarbonate powder removed dental stains as efficiently as the 65-µm powder. Powder handling and patient acceptance were comparable between grain sizes of 65 and 40 µm. [Link](#)

## 11 CLINICAL OUTCOMES FOLLOWING SUBGINGIVAL APPLICATION OF A NOVEL ERYTHRITOL POWDER BY MEANS OF AIR POLISHING IN SUPPORTIVE PERIODONTAL THERAPY:

*a randomized, controlled clinical study*  
*Quintessence International 2013 Nov-Dec;44(10):753-61 / Hägi TT, Hofmänner P, Salvi GE, Ramseier CA, Sculean A.*

The new erythritol powder applied with an air-polishing device can be considered a promising modality for repeated instrumentation of residual pockets during supportive periodontal therapy. [Link](#)

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

*Journal of Periodontology 2014, Nov;85(11) / Drago L, Del Fabbro M, Bortolin M, Vassena C, De Vecchi E, Taschieri S.*

Biofilm removal with air polishing could be achieved with the combination of erythritol and chlorhexidine as it seems to be a good alternative to the traditional glycine treatment. [Link](#)

## 13 AIR POLISHING: A REVIEW OF CURRENT LITERATURE

*The Journal of Dental Hygiene 2013, 87(4) / Graumann SJ, Sensat ML, Stoltenberg JL.*

The effect of air-powder polishing on hard and soft tissues, restorative materials, sealants, orthodontic appliances and implants, as well as health risks and contraindications to air polishing are discussed. [Link](#)

## 14 A NEW MULTIPLE ANTI-INFECTIVE NON-SURGICAL THERAPY IN THE TREATMENT OF PERI-IMPLANTITIS: A CASE SERIES

*Minerva Stomatologica 2017, 66(6) / Mensi M, Scotti E, Calza S, Pilloni A, Grusovin MG, Mongardini C.*

Within the limits of this study, the MAINST protocol showed improvement of clinical parameters for the treatment of peri-implantitis, which were maintained for up to 12 months. [Link](#)

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

*PLoS One 2015 Jun 29;10(6):e0131056 / Hägi TT, Klemensberger S, Bereiter R, Nietzsche S, Cosgarea R, Flury S, Lussi A, Sculean A, Eick S.*

Compared to hand instrumentation the application of ultrasonication and of air-polishing with erythritol prevents from substance-loss and results in a smooth surface with nearly no residual biofilm that promotes the reattachment of periodontal ligament fibroblasts. [Link](#)

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

*The Journal of Clinical Dentistry 2014, 25(4) / Barnes CM, Covey D, Watanabe H, Smetich B, Schulte JR, Chen H.*

Air polishing powders compatible with enamel are EMS Glycine and EMS Sodium Bicarbonate powders. [Link](#)

## 17 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, 44(7) / Sculean A, Bastendorf KD, Becker C, Bush B, Einwag J, Lanoway C, Platzer U, Schmage P, Schoeneich B, Walter C, Wennström JL, Flemmig TF.*

Subgingival air-polishing with Glycine powder is efficient, fast, comfortable and safe. [Link](#)

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

*Journal of Periodontology 2012 Apr;83(4):444-52 / Flemmig TF, Arushanov D, Daubert D, Rothen M, Mueller G, Leroux BG.*

The results indicate that supragingivally applied glycine powder air polishing is more efficacious in removing subgingival biofilm in moderate-to-deep periodontal pockets than scaling and root planing. Furthermore, full-mouth glycine powder air polishing may result in a beneficial shift of the oral microbiota and appears to be well tolerated. [Link](#)

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

*Journal of Clinical Periodontology 2014, 41(9) / Müller N, Moëne R, Cancela JA, Mombelli A.*

Repeated subgingival air-polishing reduced the number of pockets >4 mm similar to ultrasonic debridement. It was safe and induced less pain. [Link](#)

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

*Journal of Clinical Periodontology 2008, 35(1) / Barendregt DS, Van der Velden U, Timmerman MF, Van der Weijden F.*

In untreated periodontitis patients, the Ultrasonic Tip penetrated the pocket deeper than the pressure-controlled probe and the Gracey Curette. [Link](#)

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

*Journal of Clinical Periodontology 2011 Sep;38(9):820-7 / Wennström JL, Dahlén G, Ramberg P.*

This short-term study revealed no pertinent differences in clinical or microbiological outcomes between subgingival air polishing and ultrasonic debridement of moderate deep pockets in supportive periodontal therapy patients. [Link](#)

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

*European Journal of Orthodontics 1999, 21 / Ramaglia L.*

In orthodontic patients, use of air polishing is a lot more safer, efficient and effective to remove stains and dental plaque in comparison to rubber up and pumice. [Link](#)

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

*Journal of Orofacial Orthopedics 2009, 70 / Benedict W, Shervin V, Dieter D.*

AIRFLOW® is unproblematic due to minimal increase in friction. Use of Glycine and Sodium Bicarbonate powders is suitable on metal and ceramic brackets. When plastic brackets are used, Glycine is recommended due to its lower abrasiveness. Sodium bicarbonate causes greater roughness and subsequent plaque accumulation. [Link](#)

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

*Clinical Oral Investigations 2017, 21(5) / Müller S, Huber H, Goebel G, Wimmer G, Kapferer-Seebacher I.*

Both ultrasonic devices showed very small pain intensities during debridement of highly hypersensitive teeth and can therefore be recommended for supportive periodontal therapy. [Link](#)

## 25 FDI - Promoting Oral Health Through Fluoride

*FDI World Dental Federation, revised August 2017 [Link](#)*

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

*Caries Research 2006, 40(3) / Wetton S, Hughes J, West N, Addy M.*

Salivary pellicle offered proportionately greater protection to enamel than dentine. Cautiously extrapolating these in vitro data suggests that pellicle should offer erosion protection to individuals who imbibe acidic drinks at frequencies of 1 h or less. [Link](#)

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

*American Dental Hygienists' Association / Brida AS, Daubert DM, Garcia LT, Kosinsky TF, Nenn CA, Olsen JA, Platt JA, Wingrove SS, Chandler ND, Curtis DA*

Baseline for recall regimen, professional maintenance regimen and at-home maintenance regimen for patients with tooth- and implant-borne removable and fixed restorations. [Link](#)

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

*National Collaborating Centre for Acute Care. 2004 Oct. A Azaripour et al*  
Guideline to select the appropriate recall interval for an individual patient. [Link](#)