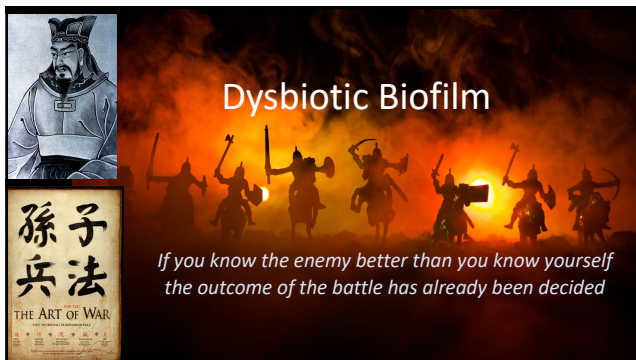




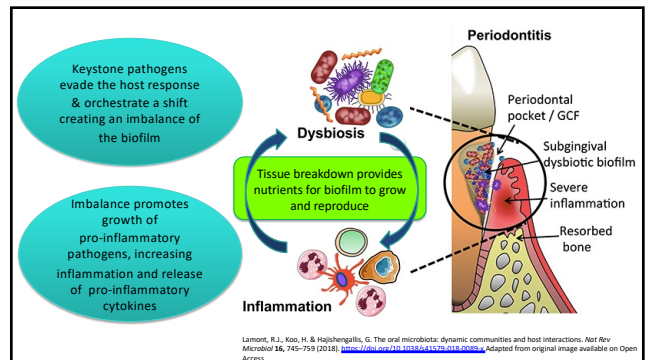
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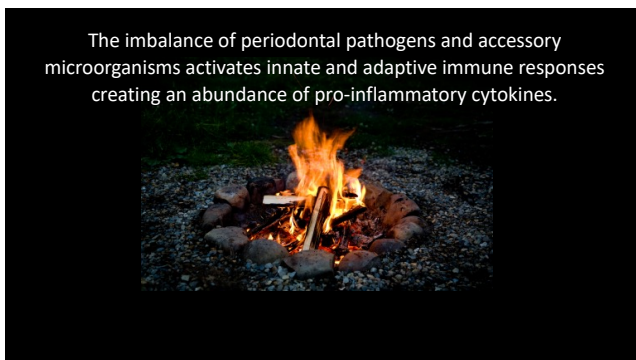
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Molecular aspects of the pathogenesis of periodontitis
 Josefa Minis & Ian Chaves

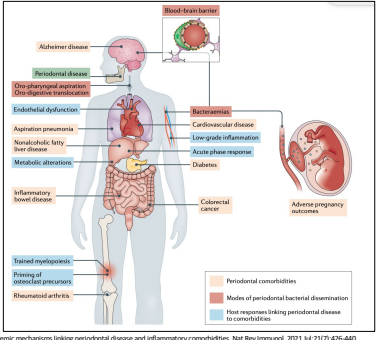
Increase in cytokines essentially becomes "metastatic inflammation"

Intervention to remove disease-promoting biofilm is required to drive down inflammation

Periodontology 2000, 2015

7


PD has a Direct (bacteremias) & Indirect (increase in inflammatory burden & pro-inflammatory cytokines) Influence on Systemic Health



Hajishengallis G, Chavakis T. Local and systemic mechanisms linking periodontal disease and inflammatory comorbidities. Nat Rev Immunol. 2021 Jul;21(7):428-440. doi: 10.1038/s41577-020-00488-6. Epub 2021 Jan 28. PMID: 33510490; PMCID: PMC7811884

8

www.perio.org



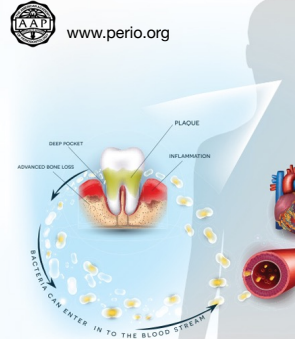
...research suggest that periodontal disease may contribute to the progression of other diseases.

...bacteria associated with periodontal disease can be aspirated into the lungs and contribute to respiratory diseases such as pneumonia.

...inflammation caused by periodontal disease may be responsible for the increased risk of heart disease.

9

www.perio.org



...the relationship between diabetes and periodontal disease goes both ways...

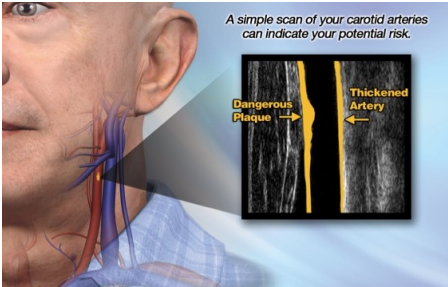
Researchers found that men with gum disease were 49% more likely to develop kidney cancer, 54% more likely to develop pancreatic cancer...

Gum disease bacteria may be able to travel to the brain and contribute to the development of Alzheimer's disease.

10

Carotid Intima-Media Thickness Test (CIMT)

A simple scan of your carotid arteries can indicate your potential risk.



11

NIH Public Access
 Author Manuscript
 Published in final edited form as:
 Circulation. 2003 February 9; 111(5): 576. doi:10.1161/01.CIR.0000154382.37101.15.

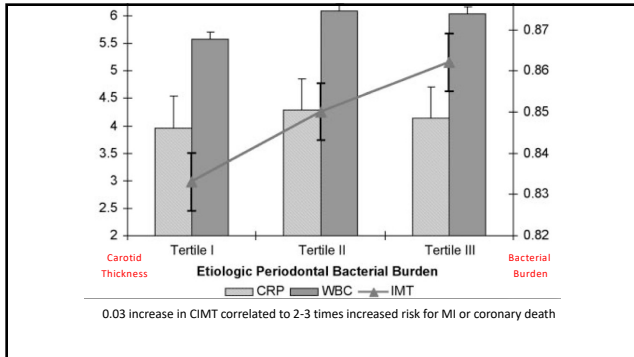
Periodontal Microbiota and Carotid Intima-Media Thickness: The Oral Infections and Vascular Disease Epidemiology Study (INVEST)

Moïse Desvarieux, MD, PhD, Ryan T. Demmer, MPH, Tatjana Rundek, MD, PhD, Bernadette Boden-Albala, DrPH, David R. Jacobs Jr, PhD, Ralph L. Sacco, MD, MS, and Panos N. Papapanou, DDS, PhD

From the Division of Epidemiology (M.D., R.T.D., D.R.J.), School of Public Health, and Department of Medicine (P.D.), Medical School, University of Minnesota, Minneapolis, Minn; Departments of Neurology (T.R., B.B.-A., R.L.S.), Columbia University College of Physicians and Surgeons and Sociomedical Sciences (B.B.-A.) and Epidemiology (M.D., R.L.S.), Mailman School of Public Health, Columbia University, New York, NY; and Division of Periodontics (P.N.P.), Columbia University School of Dental and Oral Surgery, New York, NY.

Conclusions—Our data provide evidence of a direct relationship between periodontal microbiology and subclinical atherosclerosis. This relationship exists independent of C-reactive protein.

12



13

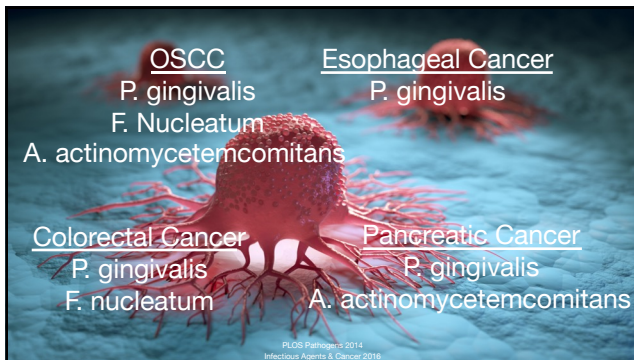
420 patients/3-year follow-up

5008 subgingival samples

DNA of 11 periodontal pathogens

RESULTS: CIMT progressed in a direct and dose responsive manner to bacterial burden

14



15

More studies are needed to elucidate mechanisms whereby periodontal pathogens or ensuing inflammation cause or contribute to systemic disease. Nonetheless, **it is already clear that management of periodontal disease and proper oral care can positively effect MORBIDITY, MORTALITY and HEALTH CARE COSTS associated with non-oral systemic diseases**

Journal of Periodontology 2010

16

A Crisis of Disease...

17

Periodontal - July 2011

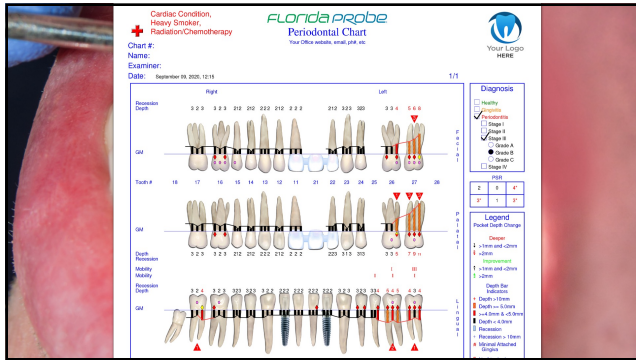
Comprehensive Periodontal Therapy: A Statement by the American Academy of Periodontology*

Patients should receive a comprehensive periodontal evaluation and their risk factors should be identified at least on an annual basis.

It is essential to determine the periodontal diagnosis and prognosis of the dentition and/or the suitability of dental implants. Patients should receive a comprehensive periodontal evaluation and their risk factors should be identified at least on an annual basis. Such an evaluation includes discussion with the patient regarding his/her chief complaint, medical and dental history review, clinical examination, and radiographic analysis. Microbiologic, genetic, biochemical, or other diagnostic tests may also be useful, on an individual basis, for assessing the periodontal status of selected individuals or sites. The following procedures should be included in a comprehensive periodontal evaluation:

1. Extra- and intraoral examination to detect non-periodontal oral diseases or conditions.

18



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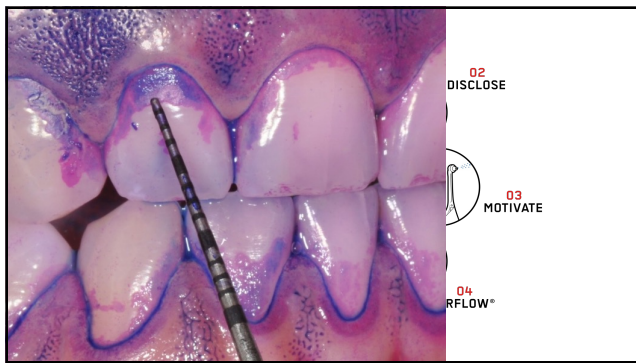
Minimally-invasive/Protective

Effortless *Efficient* *Effective*

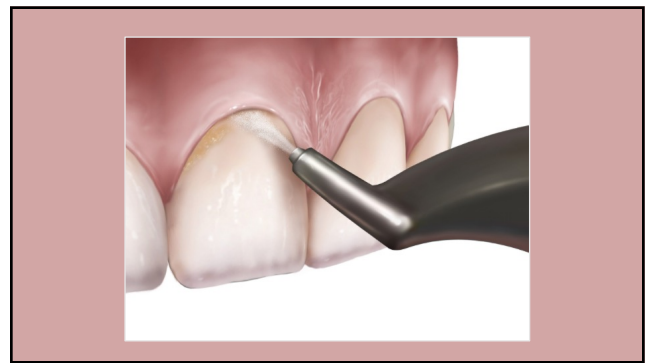
Safe *Comfortable* *Ergonomic*

imagine

20



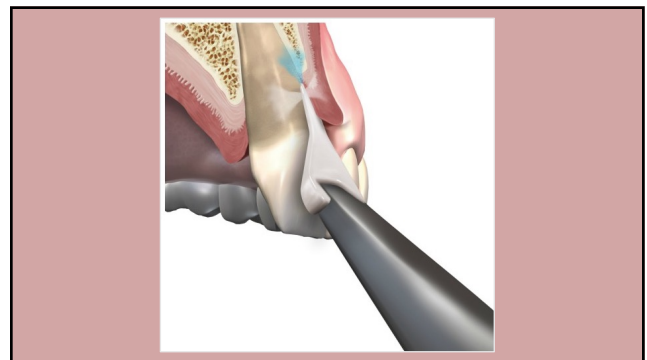
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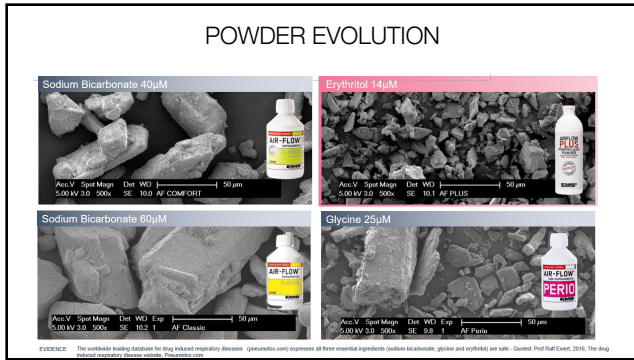
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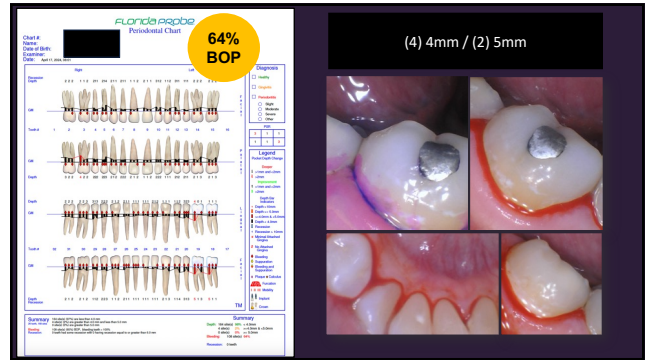
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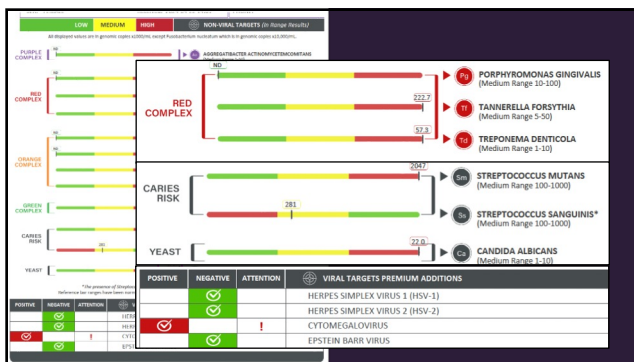
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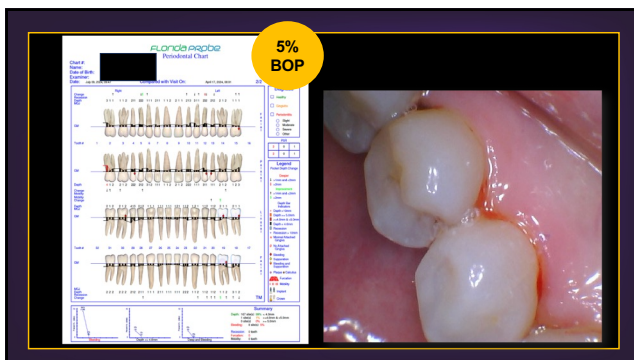
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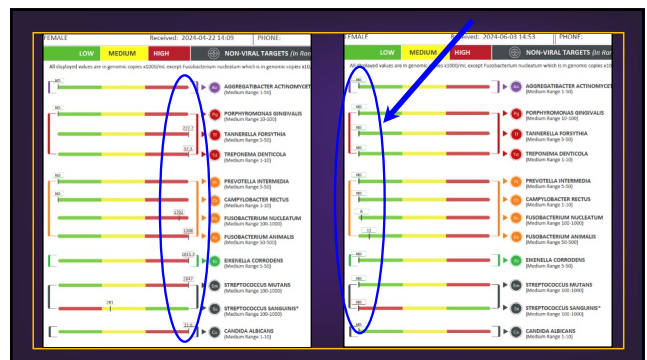
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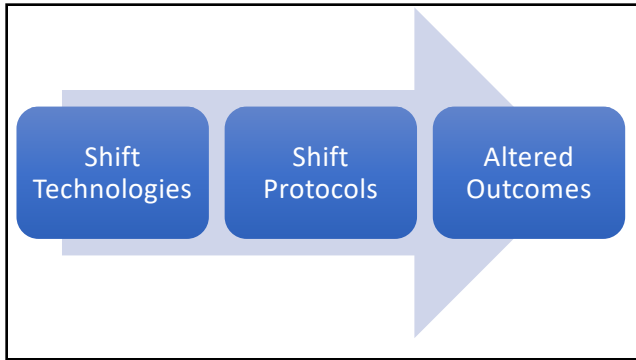
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31

AIRFLOW® Prophylaxis Master

Heated water for patient comfort

Best feature for harder deposits or stains

Piezon handpiece LED light

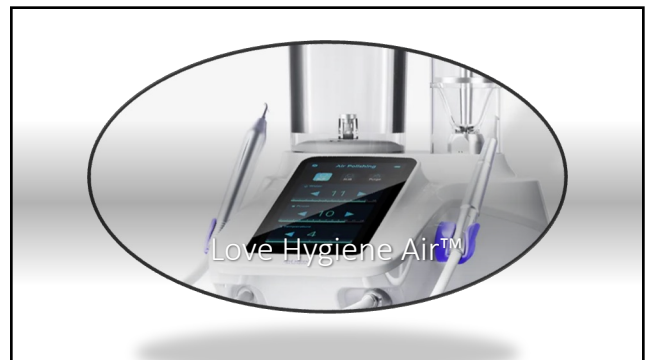
Lightweight & ergonomic design

Clinical Evidence

32



33



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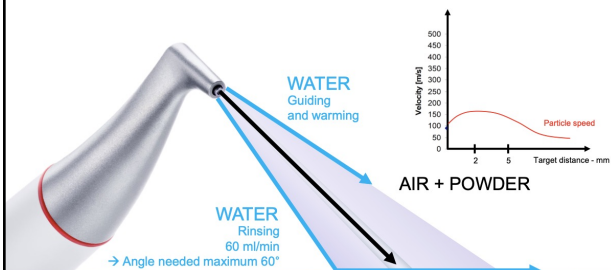
36

How many of you experience muco-skeletal pain regularly?
 What are optimal ergonomics worth to you?



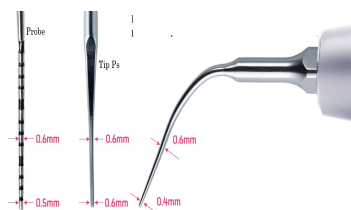
37

Water ~100% / Erythritol PLUS powder ~30%



38

PIEZON PS Dynamic Power & Optimal Accessibility



39

Why Remove Biofilm First?



40

Subgingival Debridement Efficacy of Glycine Powder Air

Thomas F. Flemmig,^{1*} Marc Hetzel,² Heinz Torner,³ and Gregor Petersilka^{1*}

Periodontol - June 2007

SPT.⁷ It also indicates that the requirements for subgingival instrumentation in initial and supportive periodontal therapy are distinct with respect to abrasiveness. In initial therapy, highly abrasive instruments such as curets or sonic or ultrasonic scalers are needed for the ablation of hard and tenacious subgingival calculus. In SPT, the abrasiveness of the instrumentation method used should ideally be just high enough for biofilm removal, but low enough to mitigate any deleterious effects to the tooth surfaces and adjacent soft tissues. Abrasion on tooth surfaces might become substantial over time when the cumulative effects of repeated instrumentation in SPT are considered.^{8,9}

With the goal of establishing an efficient and safe technique for subgingival biofilm removal in SPT, a low-abrasive glycine powder[®] was developed for use in commercially available injection abrasive water jets, also known as air polishing devices. Compared to so-



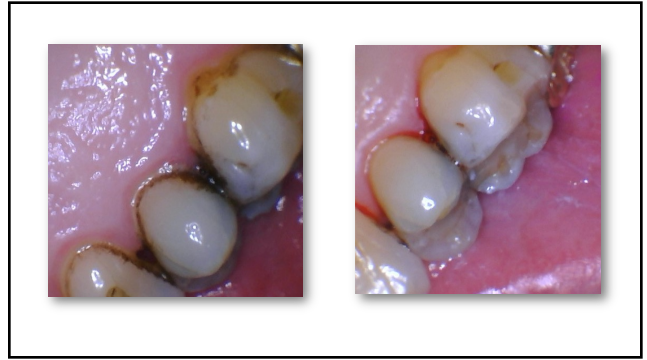
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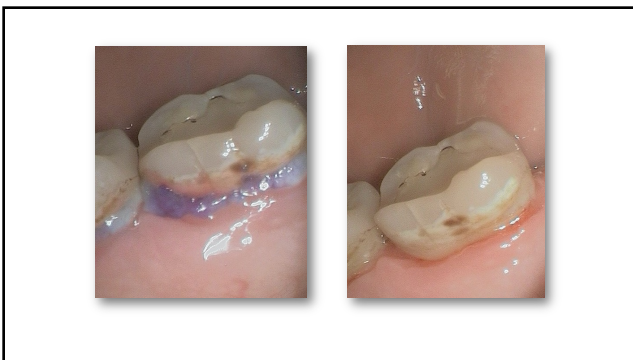
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50

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

51

microorganisms
 MDPI

Review
Novel Approach to Dental Biofilm Management through Guided Biofilm Therapy (GBT): A Review

“It is beneficial in removing the biofilm around the tooth and implant structures, resulting in better or comparable clinical outcomes than SRP. These results were substantiated with the reduction in the microbial load as well as the reduction in the inflammatory cytokines.”

Shrivastava D, Natoli V, Srivastava KC, Alzoubi IA, Nagy AI, Henza MO, Al-Johani K, Alam MK, Khurshid Z. Novel Approach to Dental Biofilm Management through Guided Biofilm Therapy (GBT): A Review. *Microorganisms*. 2021 Sep 16;9(9):1966. doi: 10.3390/microorganisms9091966. PMID: 34570863; PMCID: PMC8468826.

52

Biofilm Removal and Antimicrobial Activity of Two Different Air-Polishing Powders: An In Vitro Study
 Dragoi L, Del Fabbro M, Bortolin M, Vassena C, De Vecchi E, Taschieri S. *Biofilm removal and antimicrobial activity of two different air polishing powders: an in vitro study*. *Journal of Periodontology*. 2014;Nov;85(11):e363-9

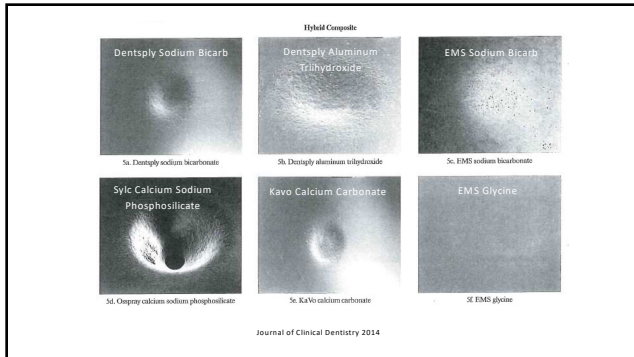
Erythritol PLUS powder is a valuable alternative to glycine

53

Three-Dimensional Defect Evaluation of Air Polishing on Extracted Human Roots
 Salmann P, Rosny V, Schmalz PR, Attin T, Naqvi F. *Three dimensional defect Evaluation of air polishing on extracted human roots*. *Journal of Periodontology* 2014;85:1107-1114

5 seconds sodium bicarb, considerable surface defects
 10 seconds of glycine, no defects
 “For exposed roots, sodium bicarbonate cannot be recommended”

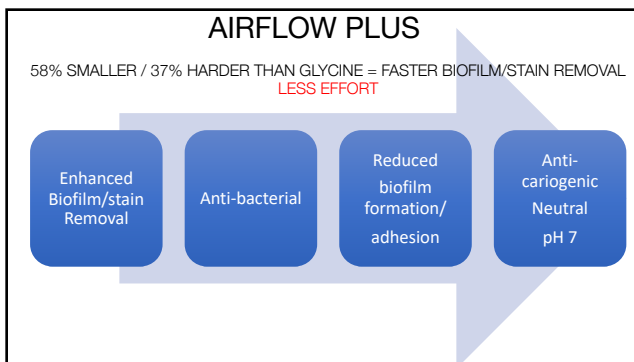
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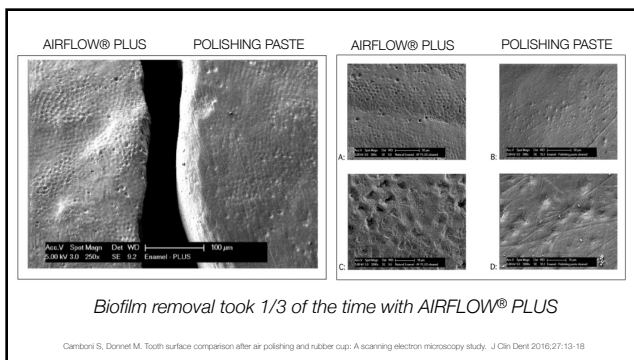
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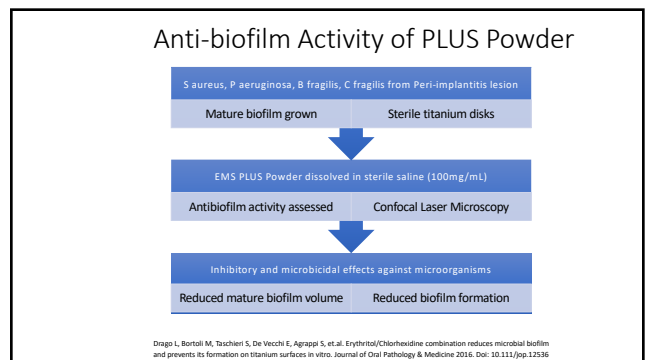
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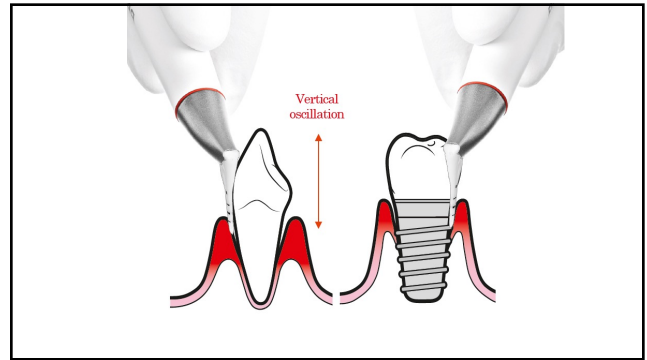
How is erythritol anticariogenic?

INHIBITS the growth of S mutans

Reduces ADHESION of S mutans on Smooth surfaces

Park YH, Jeong SS, Zeng J, et al. Anti-cariogenic effects of erythritol on growth and adhesion of Streptococcus mutans. Food Science and Biotechnology 2014;vol. 23, no.3, 1187-1191

61



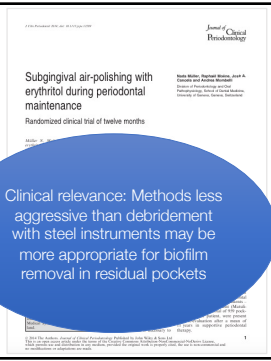
62

With SPT, do you need to scale every tooth, every pocket?



63

2014 / 457 sites >4mm
Baseline, 3, 6, 9,12 months
229 Air Polishing w/ Erythritol
228 Ultrasonic Debridement



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

Clinical relevance: Methods less aggressive than debridement with steel instruments may be more appropriate for biofilm removal in residual pockets

64

2021 12-Month Split Mouth Comparison of Curette/Ultrasonic Debridement Versus Erythritol Air Polishing (Furcations)

Both treatments achieved clinical improvements at 12-months

Erythritol air polishing was superior in terms of patient comfort

“Erythritol air polishing might be considered an alternative to conventional debridement when considering faster biofilm removal and less loss of tooth substance”

Lee H, Muscatello T, Burnes D, et al. A 12-month randomized controlled trial comparing erythritol air-polishing versus curette/ultrasonic debridement for furcations in supportive periodontal therapy. BMC Oral Health 21: 38 (2021). <https://doi.org/10.1186/s12903-021-01367-3>

65

2020 Air Polishing in Subgingival Root Debridement During Supportive Periodontal Care: A Review

“Subgingival air-polishing, specifically with glycine or erythritol powders, is **more acceptable by patients** since this **causes less gingival irritation and a lower perception of pain** during treatment.”

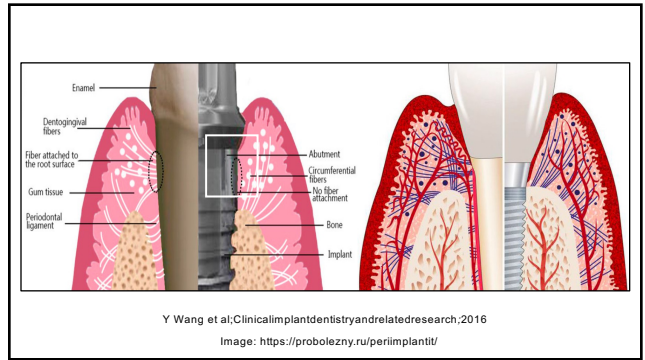
“Air-polishing is therefore a more attractive treatment modality to patients.”

Jenaphan K, Hill RE, Gillem D (2020) Air Polishing in Subgingival Root Debridement during Supportive Periodontal Care: A Review. J Clin Periodontol Res 2: 1-12. DOI: 10.29671/j.cpr.1112.1001113

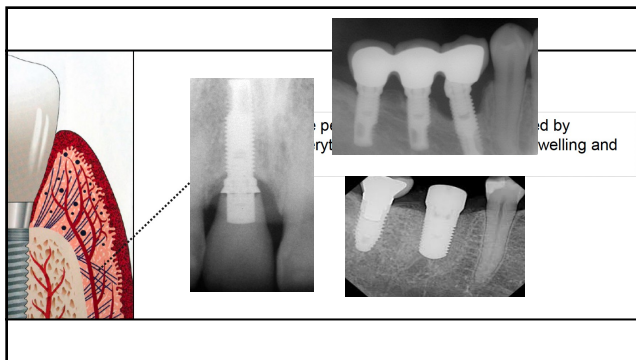
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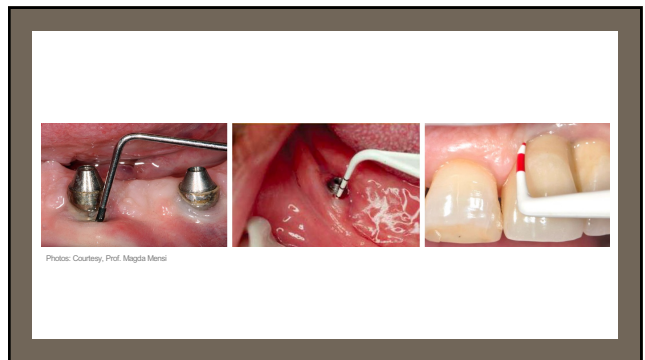
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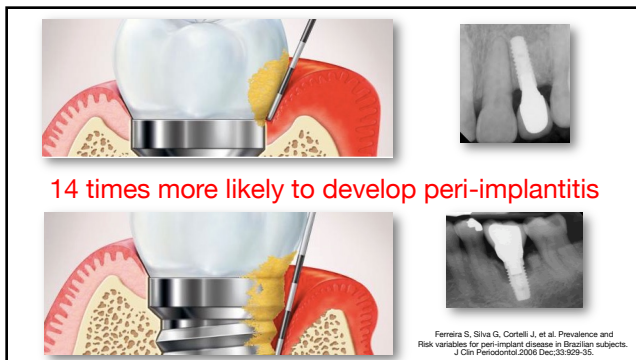
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72

International Journal of Evidence-Based Practice for the Dental Hygienist

Air-polishing debridement with glycine powder provides more effective removal of peri-implant biofilm and a greater improvement in bleeding, pocket depth, and plaque index with sustained improvement for 6 months when compared to manual treatment + CHX

2016

73

Peri-Implant Disease Prevalence 2017

218 Patients

21-26 Years Follow-up

54% Peri-implant Mucositis

22.1% Peri-implantitis

Robert S. Lindahl G. Persson G.R. Occurrence of cases with peri-implant mucositis or peri-implantitis in a 21 – 26 years follow-up study. Journal of Clinical Periodontology, 2017. <https://doi.org/10.1111/jcpe.12764>. Accessed March 15, 2022.

74

Epidemiology & Risk Factors – Review 2018

57 Studies

5 years

9% Peri-implantitis prevalence with regular prophylaxis

18.8% Peri-implantitis prevalence without regular prophylaxis

Dreyer H, Grönbæk J, Tades C, Eberhard J, Schwelz A, Tokkonen SE, et al. Epidemiology and risk factors of peri-implantitis: A systematic review. 2018. <https://doi.org/10.1111/jcpe.12764>. Accessed March 11, 2021.

75

10-Year Retrospective Study 2020

242 implants

77.6% Mucositis

16.3% Peri-implantitis

Blümel A, Tokkon SE, Sauer D, Körner G. Survival and success of implants in a private dental practice: a 10-year retrospective study. BMC Oral Health. 2020;20(1):92.

76

Airflow® for initial nonsurgical treatment of peri-implantitis: A systematic review and meta-analysis

1st systematic review to evaluate Airflow® in non-surgical treatment of peri-implantitis in terms of clinical outcomes

336 studies reviewed / 5 RCT studies in systematic review / 288 dental implants assessed / low bias

Airflow® and mechanical debridement have comparable short-term clinical and radiographic outcomes

CLINICAL RELEVANCE

This systematic review and meta-analysis restates that AIR-FLOW® significantly reduces BOP and lowers peri-implant mucosal recession

With respect to patient satisfaction, AIR-FLOW® was perceived to be most favored

Alteh MA, Almatrooshi A, Shah M, Hanonawi H, Tawee-Smith A, Alzubeidi NM. Airflow for initial nonsurgical treatment of peri-implantitis: A systematic review and meta-analysis. Clin Implant Dent Relat Res. 2022 Apr;24(2):198-210. doi: 10.1111/cid.13079. Epub 2022 Feb 18. PMID: 3516396.

77

Erythritol and glycine powders had **no significant changes** with respect to surface roughness

Sodium bicarbonate powder caused **the most alterations** to the implant surfaces.

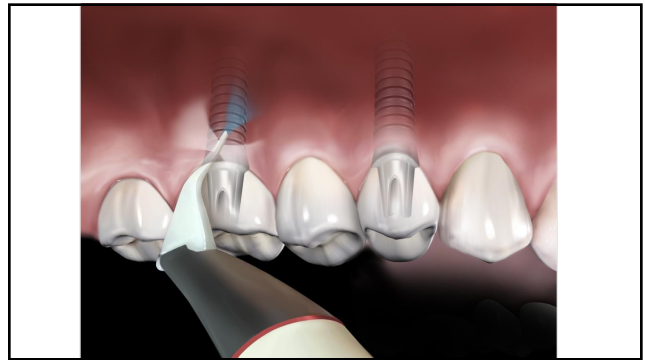
Matsubara VH, Leong BW, Leong MJL, Lawrence Z, Becker T, Quaranta A. Cleaning potential of different air abrasive powders and their impact on implant surface roughness. Clin Implant Dent Relat Res. 2020;22:98-104 <https://doi.org/10.1111/cid.12875>

78



Photos, Courtesy Prof. Magda Menini, Dr. Jacques Hassid

79



80

Randomized, controlled, split-mouth clinical study:
TREATING PERI-IMPLANTITIS


10 pts. Moderate. contralateral peri-implantitis

PerioFlow PLUS 7 sec. per site / Unlimited time w/ Teflon currettes & EMS PEEK tip

3 mo. Modified Gingival Index (MGI) reduced both groups

Treatment time: 3.25 min. PerioFlow PLUS / 13.50 min. Mechanical instrumentation

Nasri L, Minasi G, Ripoli R. Treatment of peri-implantitis using an air polishing device with erythrol powder or mechanical debridement: a randomized, controlled Split mouth clinical study. Clinical Oral Implants Research 2014




81



What would you do with 10 extra minutes?

82

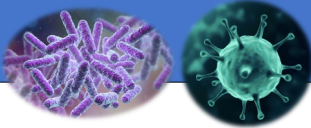
World-wide use of AGD in Dentistry



Disease transmission documented: miniscule

83

90-98% REDUCTION with HVE

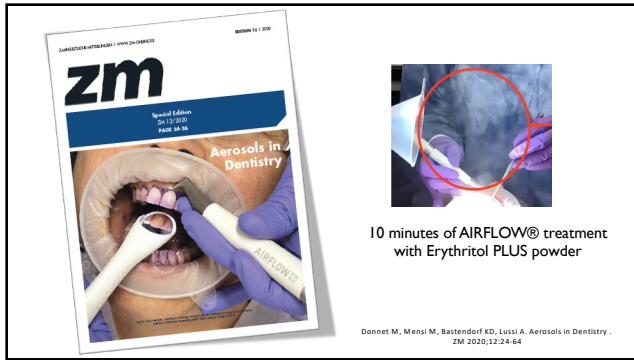


Harrel SK, Barnes JB, Rivera-Hidalgo F. Reduction of aerosols produced by ultrasonic scalers. *J Periodontol.* 1996;67:28-32. (In vitro)

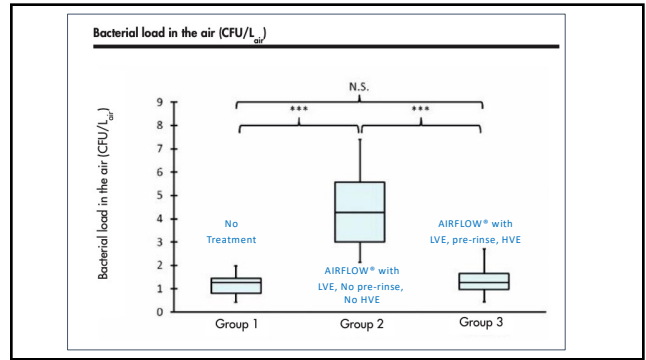
Jacks ME. A laboratory comparison of evacuation devices on aerosol reduction. *J Dent Hyg.* 2002;76:202-206. (In vitro)

Klyn SL, Cummings DE, Richardson BW, Davis RD. Reduction of bacteria-containing spray produced during ultrasonic scaling. *Gen Dent.* 2001;49(6):648-652. (In vivo)

84



85



86

“Reducing the risk of airborne contamination from ultrasonic scaling procedures could be achieved by using HVE, but using SE alone is not recommended.”

Srivastava T, Kuralibhat V, Sanjivji M, Wajayman AS. The Efficacy of High-Volume Evacuators and Extracanal Vacuum Aspirators in Reducing Aerosol and Droplet in Ultrasonic Scaling Procedures during the COVID-19 Pandemic. Eur J Dent. 2022 Jun 11. doi: 10.1055/s-001-1739448. Epub ahead of print. PMID: 35162518.

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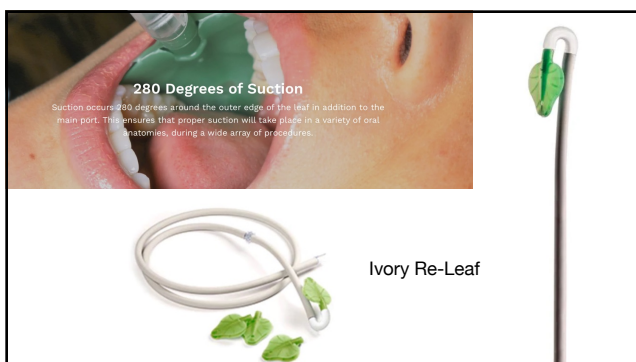
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International Association for Dental Research
FOR IMMEDIATE RELEASE
May 12, 2021

AADR*
American Association of Dental Research
CONTACT:
Erica Butler
+1 703 279 8084
mash@iadr.org

Sources of SARS-CoV-2 and Other Microorganisms in Dental Aerosols

Alexandria, Va., USA — COVID-19 was declared a global pandemic in March 2020 and given an incomplete understanding of the transmission of SARS-CoV-2 at that time, the American Dental Association recommended that dental offices refrain from providing non-emergency services. As a result, 19,200 dentists in the United States closed their doors to patients. The study "Sources of SARS-CoV-2 and Other Microorganisms in Dental Aerosols," published in the Journal of Dental Research (JDR), sought to inform infection control science by identifying the source of bacteria and viruses in aerosol-generating dentistry.

Researchers at The College of Virginia University College of Dentistry, Division of Periodontology, Columbus, USA, traced the source of microorganisms in aerosols generated during treatment of 28 patients undergoing ultrasonic scaling, implant assistance or restorative procedures by combining reverse transcription-PCR, DNA microarray and quantitative SARS-CoV-2 and 16S sequencing to characterize the entire microbiome. In a fine-scale examination and source-tracking, thirty minutes following the procedure, samples were collected from the operator and assistant's face shield, the patient's chest and an area 6.4 m from the site of operation.

The results show that it is possible to trace the source of contamination through DNA microarray analysis and that infection control measures such as pre-operative disinfection and accurate high-volume room air exchange are effective. The authors conclude that the risk for transmission of SARS-CoV-2 and other respiratory pathogens from aerosolized saliva in dental operations is moderately low and that current infection control practices are adequate robust to protect personnel and patients alike.

"Understanding the sources of microbial load in aerosols is important, not only for infection control in dental operations during the COVID pandemic, but also to inform best practices in aerosol reduction, mitigation and abatement in the long term," said JDR Editor-in-Chief Nicholas Mikulec, Newcastle University, England. "While further studies are needed with larger sample sizes, this study sets the stage for future work on risk of microbial transmission in oral health care settings."

Analyzed aerosolized DNA microbiota from 28 patients undergoing ultrasonic instrumentation, implant surgery, or restorative procedures

Saliva did not significantly contribute to contamination as pre-procedural rinses and HVE were utilized

Major source of DNA contaminant in aerosols came from the dental irrigants

Authors conclude that risk of transmission of SARS-CoV-2 from aerosolized saliva is moderately low

Meethil AP, Sarawati S, Chaudhary PP, Dabdouh SM, and Kumar PS. Sources of SARS-CoV-2 and other microorganisms in dental aerosols. Journal of Dental Research 2021; <https://doi.org/10.1177/00220439211015646>
Accessed May 14, 2021

94

QuickPass®

www.proedge dental.com

3 Steps to Safe Water
Protecting Your Patients & Practice

The latest evidence-based research shows that daily effective water disinfection is a high-priority goal. ProEdge's QuickPass® provides three steps to help you achieve this goal in compliance with CDC Guidelines and ensure your patients and practice are safe.

ONE: SHOCK FIRST

Other microbes as well as bacteria, including your dental unit waterline, are required for many water treatment processes to be effective. Shocking waterlines is a critical step to ensure your water is safe for your patients and practice. ProEdge's QuickPass® provides a shock treatment that is safe for your patients and practice.

Two: DAILY TREATMENT

Daily, or continuous, waterline treatments are essential to maintain a continuous level of disinfection in your waterlines. ProEdge's QuickPass® provides a daily treatment that is safe for your patients and practice.

THREE: TEST QUARTERLY

Quarterly water testing of your waterlines is the only way to ensure the treatment is working. ProEdge's QuickPass® provides a water testing kit that is safe for your patients and practice.

How To Use Daily Treatment:

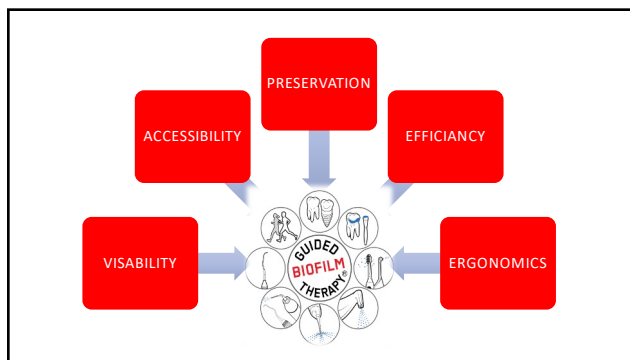
1. Turn on your waterline treatment.
2. Let your waterline treatment run for 20-30 minutes.
3. Turn off your waterline treatment.

How often should I test?

1. Test your waterline every quarter.
2. Use a quality water testing kit.
3. Test your waterline after completing any remedial action to confirm it is effective.

Questions?
800.643.3243
www.ProEdgeDental.com

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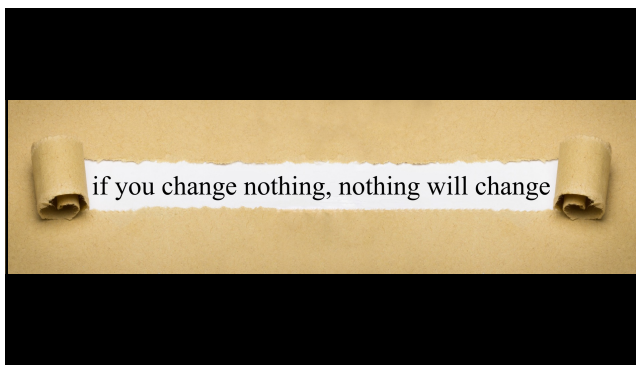
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