

AIR POLISHING: TAKE CONTROL OF THE “MESS”

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RDH Under One Roof
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10:30 a.m. – 12:30 p.m.

PRE AND POST TEST

1. Air polishers can safely and efficiently be used for each of the following EXCEPT one. Which one is the EXCEPTION?
 - a. implant maintenance
 - b. sealant and bonding preparation
 - c. disruption of subgingival biofilms
 - d. stain removal on composite resin restorations
 - e. plaque removal around orthodontic bands and brackets

2. Air polishers use which ONE of the following to achieve stain removal?
 - a. moderate speed
 - b. constant friction
 - c. appropriate water
 - d. lateral pressure

3. Air polishers use a specially processed agent to remove extrinsic stains. The agent is more abrasive than traditional rubber cup and polishing paste.
 - a. both statements are TRUE
 - b. both statements are FALSE
 - c. the first statement is TRUE, the second is FALSE
 - d. the first statement is FALSE, the second is TRUE

4. The correct air polishing instrumentation angulations are 60 degrees for anterior teeth; 80 degrees posterior; and 90 degrees for occlusal surfaces. Which ONE of the following statements explains why using various angulations is recommended when removing stain from a tooth?
 - a. reduces splatter
 - b. results in decreased abrasion
 - c. increases efficiency to remove stain
 - d. lessens the incidence of carpal tunnel syndrome

5. Each of the following instrumentation techniques are indicated when using an air polisher EXCEPT one. Which one is the EXCEPTION?
 - a. Polish only 1 to 2 teeth at a time for 1 to 2 seconds
 - b. Rinse slurry often to increase patient comfort
 - c. Position the nozzle tip 3mm – 4mm from the tooth
 - d. Retract the patient’s lips and cheeks to enhance visibility

AIR POLISHING: CONTROL THE “MESS”

CYNTHIA FONG, RDH, MS

It's a fact that air polishing has tremendous value to remove extrinsic stain and disrupt biofilm. It's a fact that air polishing has been available for nearly fifty years. And it's a fact that most dental hygienists think air polishing is messy. If the problem of “mess” can be addressed, then dental hygienists may be willing to incorporate air polishing in clinical practice. Essentially, the answer lies in the application of proper clinical techniques, which will enable clinicians to manage air polishing aerosols and embrace the technology. This course will begin with a discussion to compare air polishers to traditional rubber cup polishing. Followed by detailed instrumentation strategies to overcome the mess associated with air polishing, including information to determine the appropriate air polishing agent to meet the individual needs of the patient.

At the completion of the lecture, the participant will be able to:

- Compare and contrast the rationale for use of air polishers versus rubber cup polishing
- Discuss the efficacy and safety of using air polishers in clinical practice
- Distinguish between the various air polishing agents and its application based on the patient's oral conditions
- Describe the proper air polishing clinical techniques to manage aerosols and ensure patient comfort and safety

1. DEFINITIONS

- Polishing
 - achieves a smooth, mirror like enamel or material surface that reflects light and is characterized as having a high luster
 - accomplished with a fine grit abrasive agent so that the surface scratches are smaller than the wavelength of visible light (0.5µm)
 - coronal polishing: removal of plaque and extrinsic stain
- Therapeutic polishing
 - polishing of the root surfaces that are exposed during surgery to reduce endotoxin and microflora on the cementum
 - therapeutic polishing may also use agents for the purposes of remineralization, hypersensitivity and inhibiting dental caries
- Cleansing
 - removes plaque biofilm and extrinsic stain from tooth surfaces after scaling
 - accomplished by using a cup/bristle brush on a prophylaxis angle attached to a low-speed handpiece or an air powder system
 - cleansing can also be accomplished by the patient with a toothbrush, dentifrice and interdental cleaning devices
- Selective Polishing
 - optional and site specific
 - **cleansing and polishing procedures are only provided when justified by tooth surfaces that have visible stains after scaling and oral debridement are complete**
 - newly erupted teeth, crowns, and composite restorations are usually avoided to prevent damage to restored and natural teeth
 - stain removal is essentially done for aesthetic and not for health-based reasons

Darby M. An Evidence-Based Approach to Cleansing and Polishing Teeth. Oral Systemic Healthcare 2012.

2. COMMON DENTAL STAINS

Exogenous Extrinsic Stains (occurs after tooth eruption)

- | | |
|--------|---|
| Yellow | Most common
Causes: food pigments
Removal: polishing, toothbrush |
| Brown | Second most common
Causes: food, beverages, tobacco, CHX, poor oral hygiene
Removal: mechanical instrumentation; polishing |
| Black | continuous fine black line follows gingival crest
Causes: attachment to the tooth by pellicle-like structure
Removal: mechanical instrumentation; polishing |
| Orange | Rarely seen
Causes: antibiotic use altering normal flora allowing chromogenic bacterial growth
Removal: mechanical instrumentation |

Exogenous Intrinsic Stains (occurs during tooth development)

- Pulpal trauma/pulpal necrosis
Appearance: light yellow brown, slate grey, reddish brown, dark brown; bluish-black, orange, or greenish tinge
- Fluorosis
Appearance: Depends on severity - white or brown spots; milky opalescence; pitting; mottling
- Tetracycline
Appearance: Mild – light yellow, brown or grey stains restricted to incisal surface
Moderate – deeper staining ranging from deep yellow to grey or brown with no banding
Severe - dark brown, dark grey, purple stains with banding

3. CONTRAINDICATIONS FOR USING TRADITIONAL RUBBER CUP AND POLISHING PASTE

1. Absence of extrinsic stains
2. Acute gingival and periodontal infection
3. Esthetic restorations
4. Allergy to paste ingredients
5. Dental caries
6. Decalcification
7. Enamel hypoplasia
8. Exposed dentin or cementum
9. Hypomineralization
10. Newly erupted teeth
11. Patients with respiratory problems
12. Recessions
13. Tooth sensitivity
14. Xerostomia

J Indian Soc Periodontol. 2015 Jul-Aug;19(4):375–380. Tooth polishing: The current status
Madhuri Alankar Sawai, Ashu Bhardwaj, Zeba Jafri, Nishat Sultan, Anika Daing.

4. **TRADITIONAL RUBBER CUP AND POLISHING PASTE – FACTORS CONTRIBUTING TO ABRASION**

- a. Type and amount of agent used (particle shape and size)
- b. Speed: rotations per minute (rpm) of the rubber cup polisher
- c. Rubber cup-to-tooth pressure or load
- d. Time spent polishing each stained area

Christensen RP, Bangerter VW. Determination of rpm, time, and load used in oral prophylaxis polishing in vivo. *J Dent Res*. 1984;63:1376-1382.

5. **ADVANCE STAIN REMOVAL ALTERNATIVES**

Dental Microabrasion: To remove persistent intrinsic or fluorosis stains by removing a thin layer of tooth enamel with a mixture of acid and abrasives. Reduced the appearance of intrinsic stains without damaging tooth structure.

World J Clin Cases. 2015 Jan 16;3(1):34–41. Enamel microabrasion: An overview of clinical and scientific considerations. Núbia Inocencya Pavesi Pini, Daniel Sundfeld-Neto, Flavio Henrique Baggio Aguiar, Renato Herman Sundfeld, Luis Roberto Marcondes Martins, José Roberto Lovadino, Débora Alves Nunes Leite Lima.

6. **AIR POLISHING**

Definition

A stain removal system that uses a combination of compressed air, water and typically a specially processed sodium bicarbonate; and is used as an **alternative to traditional polishing**. A hand piece and unit designed for air polishing that propels expels an air-slurry mixture, which serves as the abrasive. The abrasive particles start out as relatively large granules, but as they combine with water, they soften and dissolve, becoming smaller and smaller.

Advantages

Air polishers have been proven to remove extrinsic stains more rapidly and thoroughly than scalers, abrasives in rubber cups, strips, etc., without significant changes in surface appearance of enamel or dentin. In comparison to traditional polishing methods, air polishing is:

- more efficient
- less abrasive
- more cost effective
- more versatile
- environmentally friendly

Disadvantages

- dispersed aerosols
- incorrect use can traumatize soft tissue
- highly polished restorations will result in a matte finish

7. **EXPANDED AIR POLISHING CLINICAL APPLICATIONS**

- removal of plaque and soft debris
- polishing for orthodontic patients
- before placement of sealants and bonding
- implant maintenance
- prior to use of caries-detection devices (DIAGNOdent)

8. AIR POLISHING AGENTS

- Sodium Bicarbonate
- Aluminum Trihydroxide
- Calcium sodium phosphosilicate
- Calcium Carbonate
- Glycine Erythritol

9. MEDICAL CONSIDERATIONS

- Systemic steroid therapy
- Patients taking diuretics
- Compromised respiratory conditions
- Communicable diseases
- Sodium restricted diets
- Hypertensive patients
- Chronic end-stage kidney disease

10. DENTAL CONSIDERATIONS

- Amalgam
- Gold
- Composite resins
- Exposed root surfaces
- Implants

11. CLINICAL PREPARATION

- Unit
 - Adjust power indicator
 - Adjust water/powder ration
 - Foot control
 - Air nozzle
- Patient
 - Patient positioned at a 45-degree angle
 - Head turned toward operator
 - Direct vision and external fulcrums
 - Position high volume evacuator and/or saliva ejector
 - Place mouthwash-soaked 2 x 2 gauze square/cotton roll on the floor of the mouth

12. INSTRUMENTATION

- Use thumb and forefinger to grasp the patient's lip and/or cheek to form a cup
- Use hand to contain aerosols
- Nozzle tip 3 to 4 mm from the tooth
- Directed at the middle to incisal third of the tooth
- Constant circular motion
- Polish 1 to 2 teeth for 1 to 2 seconds
- Rinse excess slurry often

13. ANGULATION

- Anterior: 60 degree angulation
- Posterior: 80 degree angulation
- Occlusal: 90 degree angulation

14. SUBGINGIVAL AIR POLISHING

- Purpose: to remove subgingival biofilm and clean root surfaces
- Agents: Glycine powder air polishing (GPAP)
Erythritol
- Clinical Technique:
 - Use specially designed nozzle that possesses multiple openings; are thin and tapered
 - Properly position high volume evacuation
 - Gently insert nozzle subgingivally until resistance is felt; slightly withdraw the nozzle to allow for at least a 3mm distance from the base of the pocket to the tip of the nozzle
 - Activate the air polisher and instrument the entire subgingival root surface using a circular motion for 5 seconds per surface.

15. EQUIPMENT MAINTENANCE

- End of Day
 - Empty powder chamber at the end of the day
 - Store powder in a cup that has a tightly secured cap
 - Flush system and use high volume evacuator to remove any residual powder
 - Secure powder chamber cap on the unit
- Start of Day
 - Fluff powder before re-filling powder chamber
 - Ensure that excessive powder does not fill the air flow tube