**Report on the Feasibility of Incorporating the HuFriedy Airflow Tooth Polishing System to the Current Stain Removal Armamentarium**

**Prepared For**

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**Formal Report Draft**

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**Abstract**

\*to be completed before final due date\*

# **Introduction**

Extrinsic tooth stains are the unwanted result of consuming coffee, tea, red wine and blueberries as well as smoking cigars, cigarettes and hookah. Dental patients are concerned with the esthetic outcome of the professional tooth cleaning and that includes the efficient removal of stain. Stain removal by the dental hygienist should be effective, should not cause damage to the tooth surface or increase dentinal hypersensitivity and stain should be adequately removed.

## Definition of coronal polishing, description and background

Selective coronal polishing is a routine dental hygiene procedure performed after periodontal debridement. (Jones) The purpose of dental polishing is to create a smooth surface that is more resistant to stain and plaque biofilm adherence. (Jones) Evidence based practice suggests that the dentition selected for polishing and the prophy grit be selected on a case by case basis. There is evidence to suggest that tooth polishing can lead to dentinal hypersensitivity especially for patients with gingival recession. (Jones) Evidence further suggests that air-polishing may achieve better stain removal without the negative outcome of sensitivity. and of dental polishing be dental hygiene .

## Purpose of the report - to assess benefits of AirFlow

The dental hygiene practice currently uses prophy paste and the rubber cup polishing technique to remove dental stains. Ultrasonic and manual scalers are also used to remove dental stain. However, when the stains are heavy or covering more than 30% of the tooth surface, removing the stain is very labor intensive. The AirFlow by HiFriedy is an air polishing technique designed to remove these tenacious dental stains with the added benefit of not causing dentinal hypersensitivity. The purpose of this report is to evaluate the feasibility of incorporating air polishing into the dental hygiene practice at Laurelwood Family Dentistry.

## Intended audience – Dr. Heather Stone DDS

This repost is prepared for Dr Heather Stone Dentist and owner of Laurelwood Family Dentistry

## Method of inquiry

### Primary research - surveys,

**Method of Primary Research**

Eight dental hygienists  from the Laurelewood Family Dentistry practice, in the region of Waterloo, Ontario responded to a short online survey designed to analyze the current method of selective coronal polishing being employed for stain removal. Additionally, attempting to determine the incidence of patient’s self-reports of dissatisfaction with the effectiveness of stain removal and the occurrence of dentinal hypersensitivity  after selective coronal polishing with prophy paste and rubber cup polishing technique.  An analysis of potential costs and revenue was performed to determine the feasibility of implementing the HuFriedy AirFlow system.

**Method of Secondary research** - A search of the UBC library databases of peer reviewed journal articles published within the last 10 years using the key words air polishing, dental polishing, prophylaxis, dentinal hypersensitivity, plaque biofilm and glycine powder was performed.

## Limitations of the study

Limitations of the study include a small sample size and the possibility of self-report bias from those that completed the survey. The secondary research was often funded by HuFriedy making the studies susceptible to ??

## Working Definitions used in this Report

## Dental Stain

The accumulation of discolorations on the surface of the teeth from the consumption of tea, coffee, red wine, blueberries and high iron content in drinking water.

## Stain Removal

This is the mechanical removal of extrinsic dental stains resulting from exposure to coffee, tea, red wine, blueberries, high iron content in drinking water,

## Coronal Polishing

The mechanical removal of extrinsic dental stain using a slow speed hand piece with a latch shank rubber cup polisher and prophylaxis paste

## Dentinal Hypersensitivity

The unusual sensitivity of the teeth to temperature changes and certain foods such as those high in acid or sugar. Gingival recession may increase the incidence of dentinal hypersensitivity since the cementum covering the root surface has tiny microscopic openings called tubules that can transmit sensation to the nerve of the tooth resulting in hypersensitivity.

## Scope of this research

To assess the feasibility of incorporating the Air-Flow air polisher into the recare appointment, I plan to pursue the following areas of inquiry:

1. The clinicians’ experiences with the current system of stain removal regarding efficiency and tooth sensitivity.
2. Evaluation of the Air-Flow as an effective alternative to the traditional stain removal techniques.
3. The contraindications for using Air-Flow.
4. The indications for air-polishing Implants
5. The initial investment of the Hu-Friedy Air-Flow polishing system

## Conclusions of my inquiry

# \*data analysis has not been completed at this time\*

# **Collected data**

## Current method of selective coronal polishing used by clinicians

## Definitions

## Findings

## Interpretation of findings

1. Reports of dentinal hypersensitivity after coronal polishing with prophy paste
	* Definitions
	* Findings
	* Interpretation of findings
2. Effectiveness of stain removal with prophy paste and cup polishing
	* Definitions
	* Findings
	* Interpretation of findings

The most popular grit size for dental polishing is course. Course polish may lead to more stain buildup since it creates micro abrasion to the surface of the tooth that holds more stain and becomes more difficult to clean.

1. Effectiveness of AirFlow tooth polishing for:
	* Stain removal
	* dentinal hypersensitivity
	* Definitions
	* Findings
	* Interpretation of findings

# Table 1: Comparison of air polishing powders

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **sodium bicarbonate**  | **aluminum tri hydroxide**  | **Calcium carbonate (Pearls)**  | **glycine**  |
| **Physical**  | sharp angular ‘hard particles’ salt crystal substance Biocompatible salty taste covered by various flavourings  | rounded ‘very hard particles’ sodium free similar to antacid tablets feeling of sand when sprayed onto teeth  | spherical shape ‘soft particles’ sodium free no salty taste food grade approved carbonate  | • small angular particles• Water soluble amino acid glycine • sodium free• no salty taste, comfortable• Water rinse feeling  |
| **name/ Company**  | • all  | • Jet-fresh / dentsply cavitron  | • germiphene (Pixipearls)  | • ems, 3m esPe, acteon  | • soft / ems • (larger particles)  |
| **Where**  | • supragingival only  | • supragingival only  | • supragingival only  | • subgingival  | • supragingival only  |
| **Which surfaces**  | • enamel • some restorative materials  | • enamel only  | enamel limited use on root surfaces most restoratives materials except gold implantscrowns except zircon ceramics  | • all surfaces  | • enamel• root surfaces • restorative materials  |
| **used for**  | • heavy stain removal • (effective, like a sand blaster)  | • stain removal  | heavy to light stain removal effective biofilm removal safer than sodium biocabonate  | • subgingival Biofilm removal  | • light stain removal  |
| **do not use**  | subgingival implants root surfaces veneers ceramics Patient with restricted sodium diets  | subgingival implants root surfaces veneers ceramics restorative materials (will pit and matt)  | • subgingival  | • not for stain removal  | • subgingival  |
| **treatment**  | technique sensitive, 110° away from gingival margins must polish manually with prophy cup and paste after usage  | technique sensitive, 110° away from gingival margins must polish manually with prophy cup and paste after usage  | technique, 60–90° towards tooth Better suction angle easier to apply no clogging recommend manual polish after usage  | technique, 45° direction into tissue easier suction no manual polishing necessary  | technique 60–90° toward surface area light manual polishing recommended  |

1. Costs associated with prophy paste/polishing cup set up
	* Initial cash investment for equipment purchases
	* Consumables - ongoing expenses
	* Cost per patient after initial equipment investment/setup

Table 2. Expenses for prophy paste and rubber cup polishing

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Quantity  | Price per  | Extended price |
| Slow speed hand pieces  | 15 | 175.00 | 2625.00 |
| Prophylaxis paste | 6 | 58.00 | 348.00 |
| Latch shank Rubber Cups  | 6 boxes of 144 | 97.00 | 582.00 |
|  |  |  | 3555.00 |

1. Cost associated with AirFlow
	* Initial cash investments for equipment purchase
	* Consumables – ongoing expenses
	* Cost per patient after initial equipment investment/setup
	* Oral Healthcare Provider training

Table 3. Initial financial investment for air polishing system

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Quantity  | Price per  | Extended price |
| Airpolisher  | 1 | 3775.00 | 3775.00 |
| Air polishing tips  | Pack of 100 | 97.00 | 582.00 |
| Glycine powder | 1 | 228.00 | 348.00 |
| Titanium dioxide powder | 1 | 187.00 | 582.00 |
| Bicarbonate of Soda  | 1 | 168.00 |  |
|  |  |  |  |

Conclusion

Summary

## Summary of findings

Selective coronal polishing using prophy paste and rubber cup

AirFLow provides the option of using a less abrasive air polishing system to remove tenacious extrinsic stains, followed by the glycine powder air polishing to reduce dentinal hypersensitivity. The air polisher is versatile since it can be filled with bicarbonate of soda to remove heavy extrinsic stain for individuals not on a sodium restricted diet, titanium dioxide for individuals on a sodium restricted diet, and glycine powder for individuals suffering from dentinal hypersensitivity, The additional benefits of air polishing include supragingival plaque biofilm removal, subgingival plaque biofilm removal up to 10mm pocket depth, safety for plaque biofilm removal from implants., will not cause damage or scratching to implants.

## Overall interpretation of findings

The preliminary inquiry identified the absence of an effective tool for removing extrinsic dental stain. This is especially evident for the patient population that have heavy and/or tenacious stains from coffee, tea and tobacco. Moreover, patients with gingival recession, deep pits and grooves

Therefore augmenting the current stain removal techniques to improve extrinsic stain removal from the tooth surfaces to improve patient satisfaction is required. The HuFriedy AirFlow air polishing system has been evaluated based on the outcomes supported by the data analysis of the research findings.

These are the areas

* Appointment time allocation
* Supporting
* outcomes of the research

Recommendations

* Incorporating air polishing into the dental hygiene visit for clients with moderate to heavy stain will decrease the appointment time making more efficient use of time.
* Using of the air-polishing technique on individuals with gingival recession and moderate to heavy extrinsic has demonstrated less dentinal hypersensitivity when compared to rubber cup polishing. Therefore air polishing is recommended for these clients,
* There is substantive evidence to support the efficacy of plaque biofilm removal from the implant surfaces. This is the preferred method of periodontal debridement for implants and has been shown to reduce the incidence and severity of peri-implant mucositis.

**Appendix**

# Please consider the following recommendations for incorporating the HuFriedy AirFlow air polishing system into the recare appointment:

1. Allocating adequate time in the appointment for implementing HFAF
2. Determining contraindications for use of the HFAF
3. Identifying patients who prefer not to have this method of SCP
4. Identifying preferences of the patients
5. Obtaining informed verbal consent to proceed with HFAF
6. Billing for one unit of SCP instead of a half unit to increase rev

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