

University of British Columbia
English 301-Technical Communications
Professor: Dr. Erika Paterson
Assignment 3-2 Formal Report

‘REDUCTION OF AEROSOL BACTERIA IN DENTAL HYGIENE PRACTICE’

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I. Abstract

Objective: Dental health professionals work collaboratively to research and implement standards of practice protocols for the benefit of dental staff, and of the clients served. This presentation is related to evidence-based practice standards that could greatly benefit the dental team in their efforts to reduce aerosol bacteria in the working environment of the dental office.

Approach: This presentation followed the scientific research model, and aimed to collect data from the participants (being the dental hygiene team). The participants were provided with a survey questionnaire to respond to questions related to their daily dental hygiene practice, and the recent implementation of using an antibacterial pre-rinse proposed by management.

Findings: The research conducted for this presentation’s goal was to inform management about the participants’ perception to using the pre-rinse protocol. It also aimed to collect data regarding the dental hygienists’ daily practice and inclusion of the pre-rinse or not. This research concluded that the team was aware of the benefits of including a pre-rinse to daily practice, and the reasoning behind the clinician’s implementation of the pre-rinse protocol or not.

Outcomes: The presentation to management concluded that the majority of the dental team was implementing the pre-rinse protocol. The team found this to be a beneficial addition to daily practice, and recognized the potential health benefits for all.

II. Introduction

Problem

Infection control is an imperative part of working in the dental health care field. Health care providers working in dental offices are often presented with the task of finding ways to reduce the bacterial load exposure in order to protect themselves as well as the rest of the dental team. Oral antiseptic and anti-bacterial mouth-rinses have been shown to be highly effective at reducing aerosol bacteria (Retamal-Valdes et al). The use of certain equipment in the dental office, such as, ultrasonic devices and dental handpieces, may spread aerosols and splatters containing microorganisms into the working environment (Retamal-Valdes et al). These microorganisms could potentially cause cross-infections, jeopardizing the health of patients and dental professionals (Retamal-Valdes et al).

When a pre-procedural rinse is administered to the patient prior to ultrasonic scaling the intra-oral bacteria emitted via aerosols can be significantly reduced. Dental Hygienists are not routinely administering a pre-procedural oral antiseptic rinse prior to ultrasonic scaling at Richmond Dental Clinic. This is a potential infection control hazard for the clinician, which could also affect the team as a whole. Dental hygienists are constantly exposed to viruses transmitted via aerosols, such as the cold and flu virus.

For the purpose of this research paper, I am interested in researching some of the practices currently in place, as well as the dental hygienists' perception to the newly implemented pre-rinse protocol at Richmond Dental. For this report, I will be conducting research in my place of work. Currently, I am practicing dental hygiene at Richmond Dental Clinic in Calgary, AB. This will be the location of my study. The scope of this research is to report to management the

findings of my research based on the anonymous questionnaire responses of the dental hygiene team participants.

Intervention

The dental hygienist has a major role in the prevention of aerosol bacteria. The importance of implementing preventative methods in daily practice can greatly reduce harmful microorganisms in the dental working environment. Recently, the dental hygiene team was informed by management at the last staff meeting, that using a pre-procedure rinse could be beneficial in the reduction/control of aerosol bacteria. In the efforts to inform the team regarding the implementation of this new protocol, there was a lunch and learn conducted by the sterilization and infection control procedures educational company, Germiphene.

After the presentation the team agreed that implementing a protocol for administering an oral antiseptic rinse, such as Listerine, prior to ultrasonic scaling for every patient would be beneficial. This was a very informative presentation; I became aware of the short cuts that we sometimes take throughout our daily practice. I found it extremely important to make the necessary changes in the operatories to begin implementing the oral antiseptic pre-rinse. As an office, we have modified our working space, and have placed bottles of Listerine with pumps by the sink. This is to help remind the team that the pre-procedure rinse is one of the first steps prior to commencing ultrasonic scaling.

Generally, I am interested in finding out if dental hygienists are giving patients a pre-rinse before every appointment. Also, to determine their personal background knowledge and, perceived benefits of implementing a pre-procedural rinse. As well as, determining what could help the dental hygiene team follow-through with the pre-rinse protocol.

Comparison of Administering a Pre-Procedural Rinse or Not

Reports show that microbial aerosol peak concentrations in dental treatment rooms were associated with dental hygiene scaling procedures, by as much as 47% compared to other dental treatments (Suresh-Rani). Different procedures, materials and antimicrobial agents have been introduced into the market to help minimize microbes and bacteria in the dental office.

Procedures such as, immunization of dental staff, surface disinfectants, sterilization of instruments, use of personal protective equipment and pre-procedural mouthwashes (Walsh Lawrence J.).

Chlorhexidine (CHX) is considered the gold standard oral rinse in controlling microbial spread by oral aerosols (Retamal-Valdes et al). This is due to its broad antibacterial spectrum and substantivity of 8 to 12 hours (Retamal-Valdes et al). Since microorganisms can survive in aerosols for hours, this is an effective method of reducing harmful bacteria (Retamal-Valdes et al). An alternative oral antiseptic that is used and is an excellent pre-procedural rinse is Listerine (Suresh-Rani). The essential oils contained in Listerine, menthol, eucalyptus, and thymol, have been shown to effectively reduce intra-oral bacteria (Suresh-Rani). Clinical studies have found that using an essential oil antiseptic mouth-rinse for 30 seconds produced a 94.1% reduction in bacteria during ultrasonic scaling (Walsh Lawrence J.).



Figure 1. Peridex Chlorhexedine Gluconate (Patterson Dental.com)



Figure 2. Listerine Mouthwash (Patterson Dental.com)

Proposed Outcomes

As primary health care professionals, we are trained to inspect our work environment and to be aware of the potential hazards that we are constantly exposed to. For example, contamination with communicable diseases and viruses; such as, cold and flu viruses, and the bacteria that harbour in the oral cavity. Although there is no evidence of hepatitis B or human immunodeficiency virus (HIV) transmission through inhaling aerosols, it is likely that aerosol spray might contain hepatitis B, hepatitis C, herpes simplex (HSV), or HIV viruses when the blood is aerosolized and incorporated into the aerosol of the water in the ultrasonic scalers and handpieces (Suresh-Rani). Furthermore, inhalation is the major transmission route of viruses, such as, measles, mumps, respiratory viruses, and influenza virus; all of these viruses might also be present in the aerosols emitted (Suresh-Rani). The proposed outcomes to administering an antiseptic pre-rinse are to reduce these harmful microbes, to diminish viruses in the aerosols emitted while working, with the main goal to keep the clinician and team healthy.

Research Methods

Research was conducted using a survey method, providing the participants with an ethical introduction to the questionnaire. It was reiterated to the participants that their participation in the research was voluntary and anonymous. I provided a short survey that took no longer than 5 minutes to complete. I have also observed the participants on a casual basis, to determine the effectiveness of the implementation of the pre-rinse protocol. The audience to whom I presented the research findings to was the dentist, Dr. B. Miller, and office manager, Ms. J. Olmstead.

III. Data Collection

Survey Questionnaire for Participants

(Refer to Appendix A)

Researcher Observations

During the past few weeks, I have been interested in observing the participants of my research. The implementation of the antiseptic pre-rinse is well under way, with the team following instructions as per Germiphene and office management. I have also been able to keep track by noticing the amount of Listerine bottles that we are having to order on a more regular basis, which has increased since last month's order from one box to two boxes of 4 1-Litre bottles in each. This has been a factor that proves that we are using this product more frequently than before. It should also be noted that there was a cold virus outbreak in the office. Most of the team

was affected, through casual conversation reports by six out of ten team members who fell ill at some point this cold and flu season. The virus travelled quickly, and none of the team members were incapacitated for very long.

Participants' Perception

Based on the participants' responses to the survey questionnaire, I have determined the reasoning behind the regular administration of an antiseptic pre-rinse. The majority of responses were related to time management, participants felt that administering the pre-rinse wasn't possible due to the time constraints of daily practice. Forgetting to implement the pre-rinse was the second most popular comment. Interestingly enough, some respondents thought it didn't make much a difference to give a pre-rinse; despite the presented instructional evidence. A point that was also made was that the pre-rinse wasn't administered because of the lack of a recycling program to go along with using plastic cups for the delivery of this treatment was perceived as being wasteful.

Results Comparison

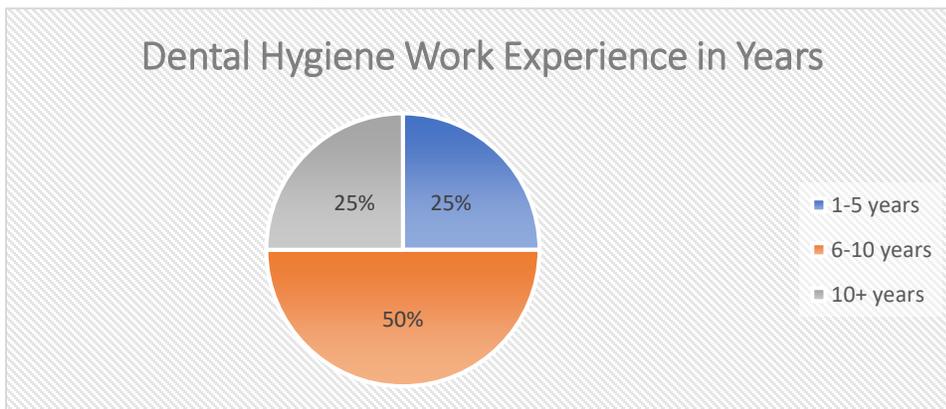


Figure 3. Years of Work as a Registered Dental Hygienist

The majority of dental hygienists working at Richmond Dental have been working in the dental field for approximately 6-10 years.

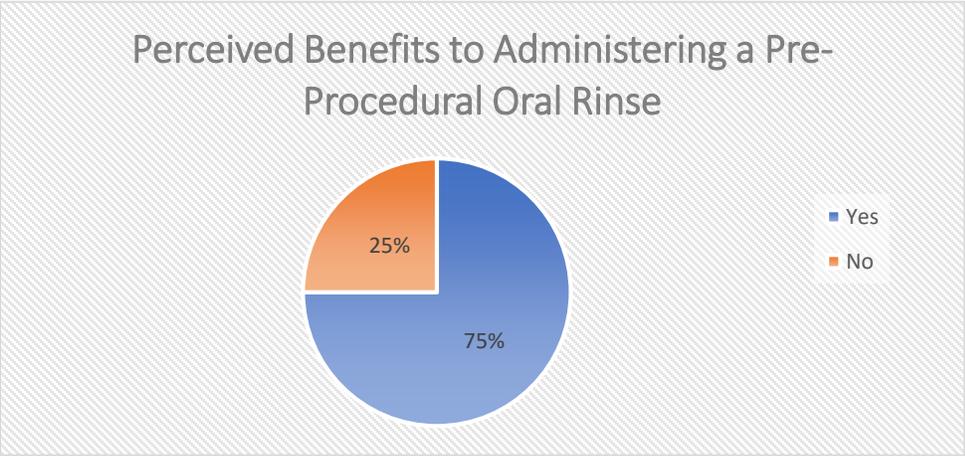


Figure 4. Dental Hygienists’ Perceptions to the Administering of a Pre-Rinse
 An average of 75% of dental hygienists at Richmond Dental are aware of the benefits of administering a pre-procedural antibacterial rinse.

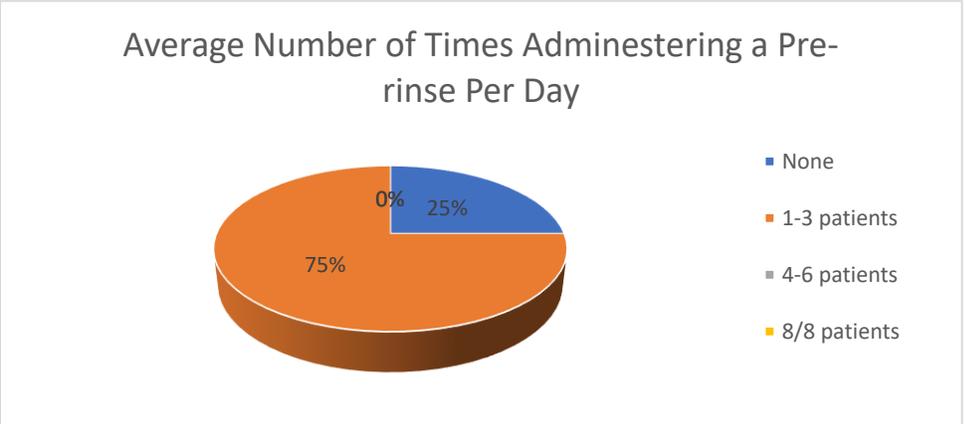


Figure 5. Dental Hygienist Number of Times Per Day Administering a Pre-Rinse
 Approximately three out of eight patients are receiving a pre-procedural rinse, based on an average number of eight patients seen per day. This translates to 75% of hygienists only administering the pre-rinse to less than half of the patients seen per day.

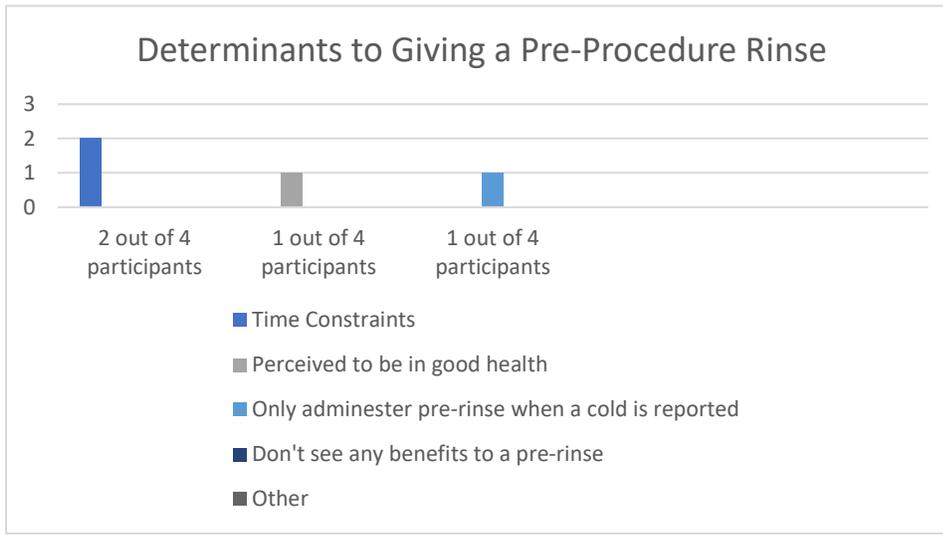


Figure 6. Dental Hygienists’ Perceived Determinants to Giving a Pre-Rinse

Half of the participants perceived time to be the number one factor in administering the pre-rinse. Another interesting fact was that the dental hygienists’ perception of the patient to be in good or ill health played a major role in their decision to administer the antibacterial pre-rinse.

Presentation of Research Results

I met with Dr. B. Miller and Ms. J. Olmstead on December 16, 2019, to present the results of this report. Beginning with the recent presentation conducted by Germiphene in our office, which was very educational, and effective to inform the team of the evidence available related to this subject. It was a positive method of involving the team in a discussion of standards of practice and brought awareness to the subject of aerosol bacteria in our work environment. I was interested in researching what the team thought regarding this new implementation sought after by management. After delivering the methods of data collection, and advising them of the anonymous nature of the survey as per the ethical methods of research for English 301.

I proceeded to discussing the results, which demonstrate that 75% of participants are aware and fully educated on the benefits of administering a pre-procedural antiseptic rinse prior to ultrasonic scaling. It was determined that the majority of hygienists are administering the pre-rinse to less than half of patients seen per day. These numbers don't add up based on the notion of the benefits of the pre-rinse. That is why the determinants preventing more hygienists to comply with the pre-rinse protocol was so important to be investigated. The greatest determinant to the pre-rinse was time constraints, and basically not used to the pre-rinse protocol since it is a fairly new addition to the standard of practice routine in our office.

Overall, the presentation of these findings went well, management was pleased with the newly gathered information. I also presented management with recommendations that could help to implement this protocol, (see recommendations). Now management can move forward with making the necessary changes to help the team thrive with this infection control policy.

Recommendations

1. Changes that could be made to help re-enforce the pre-rinse protocol could be to place the Listerine bottle with a pump for ease of access by the sink in the operatory. That way the first thing that you notice when you walk in is the pre-rinse. As soon as the patient sits down giving them the pre-rinse before starting with any of the assessment inquiry.
2. Having the infection control officer of the team conduct frequent check-ins with the team on the implementation of this protocol. Reviewing the areas where changes could be made to the process of care to make it easier to include in the daily practice routine. Continued use of the preferred mouthwash, which at the moment is Listerine Zero alcohol-free rinse.

3. Getting the team to open up about any concerns they have related to this protocol, or any recommendations that they could present at the next staff meeting. Possibly discussing a recycling and eco-friendly alternative to the plastic cups currently being used. Following up with everyone to see how it's going, and if they have any thoughts to contribute about this new change in the office. Maybe any patient feedback about having the pre-rinse prior to dental hygiene.

IV. Conclusion

Summary of Research

The results of this research must be used for increasing awareness and quantifying the risk of staff and patient exposure to aerosolised microbial pathogens at Richmond Dental Clinic, which must be controlled by efficient preventive measures. Dental hygienists are not routinely administering a pre-procedural antiseptic rinse prior to ultrasonic scaling. The implementation of a Listerine mouth-rinse prior to dental hygiene for every patient, could greatly reduce the aerosol bacteria contamination hazard for dental hygienists. With cold and flu season around the corner, and strains getting stronger every year, it is imperative that the dental hygiene team becomes aware of this knowledge. After assessing the dental hygienists personal perceived factors to implementing this protocol, we now have an idea of the changes that could be made to the protocol. Studies demonstrate that clinicians are the ones who benefit the most from giving a pre-procedural rinse, since this can greatly reduce the intra-oral bacterial load in patients; thereby, reducing the aerosol bacteria exposure (Retamal-Valdes et al).

V. Literature Cited

RETAMAL-VALDES, Belén et al. *Effectiveness Of A Pre-Procedural Mouthwash In Reducing Bacteria In Dental Aerosols: Randomized Clinical Trial*. 2017. [cited 2019 NOV. 26]. Available from: <http://dx.doi.org/10.1590/1807-3107bor-2017.vol31.0021>.

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WALSH LAURENCE J. *Pre-procedural mouthrinsing: beyond bacterial control, having your patient rinse before a procedure is healthier for all*. 2007 [cited 2019 NOV. 26]. Available from: https://www.researchgate.net/profile/Laurence_Walsh/publication/43480408_Pre-procedural_mouthrinsing_beyond_bacterial_control/links/02bfe51115c7cf304b000000

VI. Appendices

Appendix A. Survey Questionnaire

Using an Antibacterial Pre-rinse in Dental Hygiene

I am an undergraduate student at UBC currently enrolled in English 301-technical communications. The purpose of this survey is to collect data, in order to compose a formal report regarding the use of an antibacterial rinse in dental hygiene practice. The formal report will be presented to Dr. B. Miller, and Ms. J. Olmstead, to report on the findings of this survey. My research aims to provide feedback from the dental hygiene team as it pertains to their use or not of a pre-procedure rinse, as well as the hygienists' perception to the pre-rinse protocol. This is a short multiple-choice questions survey, and should take no longer than five minutes. Your responses are voluntary and anonymous. Thank you for your participation in this survey.

1. How many years have you been working as a dental hygienist?

- a. 1-5
- b. 6-10
- c. 10+

2. Are you aware of any benefits to administering a pre-procedural oral rinse?

- a. yes
- b. no

3. On average, how many times per day are you giving a pre-procedural rinse to patients (out of an average of 8 patients per day)?

- a. none
- b. 1-3
- c. 4-6 patients per day
- d. 8/8 patients per day

4. What are the determinants preventing you from giving a pre-rinse?

- a. time constraints
- b. patient is perceived to be in good health

- c. I only give a pre-rinse when a patient-reports having a cold
- d. I am unaware of any benefits of giving a pre-rinse to patients
- e. other

5. Please provide feedback on your participation in giving the pre-procedure rinse, and/or suggestions for the dental hygiene team.
