**University of British Columbia**

**English 301-Technical Communications**

**Professor: Erika Paterson**

**Assignment 3-2 Formal Report**

**‘Reduction of aerosol bacteria in clinical dental hygiene practice’**

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**To: Dr. B. Miller DDS, and Ms. J. Olmstead (dental practice manager)**

**Richmond Dental Clinic, Calgary AB**

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**I. Abstract**

(to be completed)

**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 bacteria1. 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 environment1. These micro-organisms could potentially cause cross-infections, jeopardizing the health of patients and dental professionals1. 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 treatments2. 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. Chlorhexidine (CHX) is considered the gold standard oral rinse in controlling microbial spread by oral aerosols1. This is due to its broad antibacterial spectrum and substantivity of 8 to 12 hours1. Since microorganisms can survive in aerosols for hours, this is an effective method of reducing harmful bacteria1. An alternative oral antiseptic that is used and is an excellent pre-procedural rinse is Listerine2. The essential oils contained in Listerine, menthol, eucalyptus, and thymol, have been shown to effectively reduce intra-oral bacteria2. Clinical studies have found that using an essential oil antiseptic mouth-rinse for 30 seconds produced a 94.1% reduction in bacteria during ultrasonic scaling3.

**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 handpieces2. 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 emitted2. 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. 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 1. 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 2. 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 3. 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 4. 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**

(to be presented and completed)

**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, 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 exposure1.

**Recommendations**

(To be completed)

**V. Literature Cited**

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<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.**