

INSTRUCTIONAL PROGRAM ABOUT FLUORIDE VARNISH FOR DENTAL
PROFESSIONALS, PATIENTS, AND PARENTS

by

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Committee Approval

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Abstract

INSTRUCTIONAL PROGRAM ABOUT FLUORIDE VARNISH FOR DENTAL PROFESSIONALS, PATIENTS, AND PARENTS

A project will be presented to instruct dental professionals, dental patients, and parents about fluoride varnish to prevent dental caries. Dental caries is one of the most prevalent diseases among children and adults. Fluoride varnish is one effective way to prevent dental caries. The first section of this three part project will educate dental professionals about fluoride varnish. The dental professionals will learn about dental caries, caries incidence, caries risk factors, applying fluoride varnish, and talking with patients about fluoride. Next the project will illustrate a written information pamphlet for patients to read and take home. The pamphlet will cover information about caries and fluoride in laymen's terms. The last part of the project will outline a plan for an information table at a school. The information table will be manned by a dental professional and take place during parent teacher conferences. The dental professional will hand out the pamphlet created in section two and will be present to talk about fluoride varnish and answer questions.

CHAPTER 1

Introduction

This project will consist of three sections. The first section will be an instructional program for dental professionals. The program will be used as continuing education material. The program will cover the risk of cavities, preventing cavities with fluoride varnish, scripting for treatment planning with patients, application procedures, and benefits to dental offices and dental professionals. The second section of the project will include a brochure about fluoride for patients. The third section of the project will be a plan for an informational booth at a school during parent teacher conferences. The informational booth will include the same brochure used in the second section of the project. Information about contacting schools and obtaining permission will be provided.

Project Background

Tooth decay is one of the most prevalent diseases in the United States and is the most common preventable, chronic disease among children and adults (National Institute of Dental and Craniofacial Research [NIDCR], 2014). Fluoride is effective at preventing tooth decay and can be used systemically via fluoridated water or topically in the form of gels, pastes, varnishes, or rinses (Marinho, Worthington, Walsh, & Clarkson, 2013; McDonagh et al. 2000; Peterson & Lennon, 2004; Wong et al. 2010). Topical fluoride may be applied professionally or personally (Wong et al. 2010). However, professionally applied fluoride varnish is more effective at preventing tooth decay than personally applied topical fluoride (Marinho et al., 2013; Peterson and Lennon, 2004).

The writer of this project works in private practice as a dental hygienist. The dental office administration has requested that the writer create an instructional program

to teach the dental team about fluoride varnish. The incidence of untreated cavities in the US ranges from 14.5% to 69.7% (National Center for Health Statistics [NCHS], 2016). However, this dental office has a history of about 5% of patients receiving fluoride varnish. The dental office administration would like to raise the percent of patients receiving fluoride to reduce the risk of dental caries and increase the monetary production of the office. A dental team educated in the uses and benefits of fluoride varnish may be able to assess caries risk factors and communicate with patients.

This educational project will have three parts. The first part will be an educational program titled Fluoride Varnish Office Presentation. This presentation will be an instructional design for educating dental professionals regarding fluoride varnish. The second part of the project will be written literature that the dental team can give to patients. The project writer will provide a pamphlet handout with visuals and text for patients with information about fluoride varnish. The third part of the project will be a plan for implementing an informational table at an elementary school during parent teacher conferences. Each of the three prongs of the project will be designed for a different audience. The office presentation will target dental professionals. The pamphlet portion of the project will be to provide written information to dental patients. The third part of the project will target parents and children out in the community.

Project Significance

In the last few decades, efforts have been made to improve oral health and caries rates in the US and progress is starting to become evident (Mispireta, Fore, Piland, and Kelchner, 2014). In Idaho, progress has not been as steady due to challenges such as population distribution, geography and funding (Mispireta, et al., 2014). In Idaho in 2013,

62% of children aged 6-9 had a history of dental caries while the baseline of this measure in the US was 54% (Mispireta, et al., 2014). Between 2001 and 2013, in Idaho the incidence of untreated caries in children ages 6-9 improved from 27% to 21% (Mispireta, et al., 2014). In the US, between 2004 and 2010 the incidence of untreated caries in children ages 6-9 improved from 29% to 17% (Mispireta, et al., 2014). Improvement in the incidence of caries is needed in the US and Idaho because of the high physical and financial costs of caries to individuals and communities.

This project will help to guide dental professionals in their education of patients about the benefits of fluoride varnish. If dental professionals can educate patients about the benefits of fluoride varnish, more patients can accept fluoride varnish as a treatment. This project has the potential of reducing the risk of cavities and promoting health.

Definition of Terms

Decay. “The lay term for carious lesions in a tooth; decomposition of tooth structure.” (American Dental Association [ADA], 2015, “D”).

Dental assistant. One who assists the dentist during treatment of patients. Dental assistants also may take x-rays, perform patient education, and do other duties that are allowed by specific state regulations. Education can be on the job or certificate training program (ADA, 2015).

Dental caries. “...decomposition of tooth structure.” (ADA, 2015, “D”).

Dental Fluorosis. “Dental fluorosis is the appearance of faint white lines or streaks on the teeth that only occurs when younger children consume too much fluoride, from any source, over long periods when teeth are developing under the gums.” (ADA, 2016, “F”).

Dental Hygienist. One who removes deposits from all surfaces of teeth. Dental hygienists may also take x-rays, perform patient education, and do other duties that are allowed by specific state regulations. Education required is either associate or bachelor's degree (ADA, 2015).

Dental Professional. One who works as part of the dental team. A dentist, dental hygienist, or dental assistant (ADA, 2015).

Dentist. One who practices “the evaluation, diagnosis, prevention and/or treatment (nonsurgical, surgical or related procedures) of diseases, disorders and/or conditions of the oral cavity, maxillofacial area and/or the adjacent and associated structures and their impact on the human body...” (ADA, 2015, “D”).

Fluoride. A mineral that in the mouth can prevent the demineralization of tooth structure and aid in the remineralization of tooth structure (Collins, 2011; Pizzo, Piscopo, Pizzo, & Giuliana, 2007).

Professionally applied topical fluoride. Fluoride administered by a dentist, dental hygienist, or dental assistant through gels, foams, or varnishes (Wong et al., 2010).

Systemic fluoride. Fluoride that is ingested usually through community supplied water, salt or milk (Jones, Burt, Petersen, & Lennon, 2005; Wong et al., 2010). The mechanism of action for this type is to increase salivary fluoride concentration by being present in the bloodstream (Pizzo, et al. 2007).

Topical fluoride. Fluoride applied to the surface of the teeth through toothpastes, rinses, gels, and varnishes. The mechanism of action for this type of fluoride is a high concentration of fluoride penetrating into the tooth structure for a localized effect (Wong et al., 2010).

Responsibilities and Competencies for Health Education Specialists

This project satisfies many of the areas of responsibility and competencies for health education specialists as outlined by the National Commission for Health Education Credentialing (NCHEC). The NCHEC has established 7 areas of responsibility for health educators. Each area of responsibility has many competencies and sub-competencies that should be met in health education projects.

The first area of responsibility is “Assess needs, resources and capacity for health education/promotion.” Competency 1.1 in this area is “Plan assessment process for health education/promotion.” The writer of this project assessed the need for the project by gathering data from local and national health departments. The local health department was used to gather data so that the data would be relevant to the area in which the project will be implemented. Competency 1.2.3 in the first area of responsibilities is to “review related literature.” The second chapter of this project thoroughly reviews the literature related to the project. Competency 1.4.1 of this area states “identify and analyze factors that influence health behaviors.” The Behavior Change Theory was used in the planning of this project. The theory was used to guide the writing of this project and address specific factors that influence behavior change.

Area II of the responsibilities of health education deals with the planning of the actual health education and promotion actions. The writer of this project developed specific objectives, selected educational strategies, and tailored the education to the target populations. All of these steps in the project design meet competencies and sub-competencies of Area II.

The sixth area of health education responsibilities states “Serve as a health education/promotion resource person.” This project reviews the literature and teaches relevant health information in accordance with competency 6.1: “Obtain and disseminate health-related information.” The portion of this project devoted to teaching dental professionals satisfies competency 6.2: “Train others to use health education/promotion skills.”

Chapter 2

Literature Review

Introduction

This chapter reviews literature related to dental caries, topical fluoride, systemic fluoride, and risks of fluoride. The chapter will outline the risk for dental caries and the costs associated with caries and its treatment. The literature review will include research about the prevention of caries with the use of fluoride. The chapter will also review the literature involving perceptions of fluoride.

Dental Caries

Dental caries is the "...decomposition of tooth structure." (American Dental Association [ADA], 2015, "D"). Dental caries is the process by which minerals such as calcium and phosphate diffuse out of the tooth leaving a hole in the tooth structure (Collins, 2011; Barber & Wilkins 2002). Bacteria in the mouth produce an acidic environment which causes the enamel to be soluble (Barber & Wilkins, 2002). The most common caries causing bacteria in the mouth are *Streptococcus mutans* and *Lactobacilli* (Collins, 2012; Barber & Wilkins, 2002). These bacteria form a sticky plaque layer on the teeth and produce acids directly on the tooth surface (Barber & Wilkins, 2002). When the bacteria create an environment with a low enough pH and enough minerals are lost, a cavity is formed (Collins, 2012; Barber & Wilkins, 2002).

Incidence of Dental Caries

In 2012, untreated dental caries were present in 17.5% of children aged 5-17 years old and 59% of people aged 12-19 years old had tooth decay in their permanent teeth (Center for Disease Control and Prevention [CDC], 2014). Among people 12-19 years

old, 20% had untreated dental caries (CDC, 2014). Among adults age 20-64 years old, 92% had caries in permanent teeth and 26% had untreated tooth decay (CDC, 2014).

Race and economic factors affect the incidence of dental caries (National Center for Health Statistics [NCHS], 2016). In 2012, 14.5% of white children aged 5-19 years old had untreated dental caries while 23.2% of black or African American children in the same age group had untreated caries (NCHS, 2016). During the same year and in the same age group, 15.2% of Asian children and 22.2% of Hispanic or Latino children had untreated dental caries (NCHS, 2016). In the same age group and under the poverty level, 21.7% of white children and 29.2% of black or African American children had untreated caries (NCHS, 2016). Across all age groups in 2012, males had higher caries rates than females with ranges of 18.9%-31.7% and 16.1%-25.9% respectively (NCHS, 2016). In 2012 the highest incidence of untreated caries was 69.7% among black or African Americans under the poverty level and aged 45-64 years (NCHS, 2016).

In the state of Idaho in 2013, 62% of children aged 6-9 had a history of dental caries and 21% of children aged 6-9 had untreated dental caries (Mispireta, Fore, Piland, and Kelchne, 2014). In the State of Idaho in 2010, only 36.1% of the population was served by fluoridated community water (Mispireta, et al., 2014). In 2010, 74.6% of the US population was served by community water fluoridation (Mispireta et al., 2014). In the Panhandle region of Idaho in 2013, 15.6% of third graders had untreated dental caries (Idaho Department of Health and Welfare [IDHW], 2014). In the same region in 2013, 45.9% of third graders had a history of dental caries (IDHW, 2014). Generalizations are made based upon state, regional, and national figures.

Costs of Dental Caries

Costs to individuals and communities, because of dental caries, can be financial or manifested in disease, pain, and reduced quality of life (Marghalani, Alsahafi, & Alshouibi, 2014; Paula et al., 2015). In 2010, the cost of dental caries for 6.5 million people was \$1.04 billion (Marghalani et al., 2014). Dental caries can lead to a lower perceived quality of life (Paula, et al., 2015). People with dental caries can have a decrease in cognitive function, have reduced nutrition, and have lower levels of physical activity (Marghalani et al. 2014; Seirawan, Faust, & Mulligan, 2012).

Preventing Dental Caries

One effective way to prevent dental caries is through the use of fluoride in a topical or systemic form (Newbrun, 2010; Peterson & Lennon, 2004). The World Health Organization states that both topical and systemic fluorides reduce dental caries and it recommends that both be affordably available for public health (Petersen & Lennon, 2004). Professionally applied topical fluoride varnish is effective at preventing dental caries. The cost of one fluoride varnish application ranges from \$3.43 to \$3.83 (Hawkins et al., 2004). Fluoride varnish can reduce the number of caries in permanent teeth by 43% and can reduce the number of caries in primary teeth by 37% (Marinho, Worthington, Walsh, & Clarkson, 2013). For caries on the root surface of the tooth a 56-64% reduction is seen with fluoride varnish (Gluzman, Katz, Frey, & McGowan, 2013). In contrast, community water fluoridation can reduce dental caries by 15% (McDonagh et al., 2000). Over the counter fluoride treatments include toothpaste and mouth rinse and can reduce the prevalence of cavities by 23-26% (Pizzo, Piscopo, Pizzo, & Giuliana, 2007; Jones, Burt, Petersen, & Lennon, 2005).

Risks of Fluoride

The use of fluoride is a safe way to prevent dental caries (Demos, Kazda, Cicuttini, Sinclair, & Fairley, 2001; Marinho et al., 2013; McDonagh et al., 2000). However, one risk associated with the fluoride is the risk of dental fluorosis (McDonagh et al., 2000; Wong et al., 2010). Fluorosis can range in severity from mild discoloration of the tooth to pitting and breakdown of the enamel (CDC, 2015; Wong et al., 2010). Fluorosis occurs only to those age 8 and younger when a greater than recommended amount of fluoride is ingested (CDC, 2015). This is because fluorosis only happens during the formation of enamel while the teeth are still under the gums (CDC, 2015). The recommended dose for fluoride in water is .7mg/L and the greatest risk for fluorosis is seen at levels of 2mg/L or higher (CDC, 2015). The risk of fluorosis is usually less in areas where fluoride concentrations are adjusted in community water and may be greater in areas where fluoride is found naturally in the water (Peterson & Lennon, 2004). The relationship between topical fluoride and fluorosis is unknown. (Wong et al., 2010). The CDC recommends that fluoride toothpaste be avoided for children under two and that parents oversee that a pea-sized amount of fluoride toothpaste be used for children ages 2-6 (CDC, 2015). For professionally applied fluoride varnish, it is recommended to follow the manufacturer's guidelines and use a proper dental suction unit (Wong et al., 2010). No clear evidence of other adverse reactions is known with topical or systemic fluoride use (Demos et al., 2001; McDonagh et al., 2000).

Perceptions of Fluoride

There are varying public perceptions about water fluoridation and the reasons people support or oppose the idea are not well understood (Akers & Foley, 2012;

Armfield & Akers, 2010; Griffin, Shickle, & Moran, 2008). Public concern about fluoride safety and public pressure on administrators has led to fluoride being removed from water supplies in many communities (Demos et al., 2001). Community water fluoridation is often the subject of public argument about health and safety as physical health risks may be perceived to be associated with water fluoridation (Akers & Foley, 2012). These perceived risks include overdose, drug interaction, cancer, osteoporosis, bone fracture, and fluorosis (Griffin et al., 2008; Demos et al., 2001). Other negative perceptions about water fluoridation include that fluoride will make water impure, that fluoridation medicates the community without informed consent, that it is not the public responsibility to care for the dental health of others, and that the governing bodies cannot be trusted to make health decisions (Griffin et al., 2008).

Positive perceptions about fluoridation occur and people may feel the community is responsible to help less fortunate populations fight dental caries (Griffin et al., 2008). People who have been in areas with water fluoridation and have not seen any negative effects, are more likely to have positive perceptions regarding fluoridation (Griffin et al., 2008).

Conclusion

There is much literature available about fluoride and the prevention of cavities. Fluoride has been successfully used in topical and systemic forms. The only risk known to be associated with fluoride is dental fluorosis. This risk is known to be mitigated by using proper therapeutic dosages.

Chapter 3

Project Description

Introduction

This chapter will begin with the behavior change theory used in writing the project. The chapter will explain how the different parts of the behavior change theory were used and how the sections of the instructional program fit within the theory. The chapter will include a detailed description of the three parts of the instructional program. These three parts include the teaching practice, the patient pamphlets, and the information booth for elementary school parent teacher conferences. The description will include the planning and implementation processes to be used in the program. Thirdly, this chapter will describe the evaluation process for the project.

Behavior Change Theory

The program uses the Health Belief model. The Health Belief Model is one of the oldest behavior theories and consists of the following six components said to influence health behavior (Edberg, 2007).

- a. Perceived Susceptibility. The subject must first believe that he/she is at risk for a health problem.
- b. Perceived Severity. The person believes the consequences of the health problem are severe.
- c. Perceived Benefits. The person recognizes that the healthy action will prevent the health problem and do some good.
- d. Perceived Barriers. The person believes that the benefits outweigh the risks (or costs) of doing the healthy action. She/he decides it is worth it to overcome any barriers to action.
- e. Cues to Action. The subject is exposed to a stimulus that spurs him/her to action. Something in particular motivates the individual, e.g. an event, or a thought, or an advertisement.
- f. Self-Efficacy. The person believes that he/she will be able to complete the healthy action. The person needs to believe that he/she will be successful at the initial action.

After going through all of these steps, a person decides to start the action that leads to change in health behavior (Edberg, 2007).

The instructional program was designed to address all six of the constructs of the model. The first is perceived risk. The lecture will go over possible risk factors that are specifically applicable to the audience. The next component is perceived severity. The presentation will thoroughly go over the financial and physical costs of dental caries. The prevention of disease and the raised quality of life will explain the benefits of action. The perceived barriers and self-efficacy will be different for each individual. Cues to action could be the presentation itself, information in the pamphlets, or interaction with dental professionals.

Part 1. Teaching Practice for Dental Professionals

An educational program was designed to teach a dental team about the use of fluoride varnish. Fluoride varnish has been shown to be effective at preventing dental caries and can benefit both the dental patients and the dental office (Marinho, Worthington, Walsh, & Clarkson, 2013; Peterson & Lennon, 2004). In developing the instructional program, the writer followed a specific plan. First, the writer constructed the instructional objectives (Appendix A). Next, the designer created a lesson plan (Appendix B) and compiled instructional strategies and assessment tools. These important parts of the educational program will be combined with the content of the course and used by the presenter to prepare for the course.

Pre-instructional strategy. The pre-instructional strategy can serve multiple purposes. The subject matter is introduced and the instructor can gain the attention of the audience with a good pre-instructional strategy. The pre-instructional strategy in many

cases is the audience's first exposure to the subject matter (Morrison, Ross, Kalman, & Kemp, 2013). Four types of pre-instructional strategies are pretests, objectives, overviews, and advanced organizers (Morrison et al., 2013). Different pre-instructional strategies can be helpful with different instructional programs according to the program's content, goals, or audience (Morrison et al., 2013).

For the instructional program Fluoride Varnish Office Presentation, a pretest will be used as a pre-instructional strategy. A format titled Two Truths and a Lie will be implemented as the pretest (Appendix C, slides 2-4). The learners will be given three statements at a time. Two of the statements will be true and one statement will be false. The learners will be asked to decide which statement is false. The instructor will then give the correct answers and ask the students to think about their choices throughout the presentation. This pre-instructional strategy will be used to give the audience a preview to the presentation while keeping the pretest fun and stress free. A pretest is useful when the audience is comprised of skilled learners and has some previous knowledge of the subject matter (Morrison et al., 2013). Because the instructional program is written for dental professionals, a pretest was chosen as a good fit for the type of audience. Not only will the learners be skilled in dental presentations, but they will also be familiar with the content and vocabulary.

Active learning strategy. Active learning strategies are essential to effective instructional programs (Morrison et al., 2013). After the initial presentation of a program's subject matter, it is important that the learner generates connections between existing knowledge and new knowledge (Morrison et al., 2013). Active learning strategies are part of the generative strategy. Morrison et al. (2013) stated that active

learning strategies give the student a "...chance to relate the new information to existing information by generating new linkages" (p. 194). When the students are actively engaged in the instruction, they have a higher likelihood of converting the knowledge into personal skill (Rees & Goldsmith, 2009). Active participation can be incorporated in many different teaching styles and is very important to the learning process (Morrison et al., 2013).

For the Fluoride Varnish Office Presentation module, two active learning activities will be used. The first active learning strategy is a role playing exercise. The learners will be asked to practice treatment plan presentations with a partner. Each presenter will be asked to develop an evidence-based reason that their partner is being recommended fluoride varnish. The partners will then switch roles and practice again. During the role-play, the instructor will move from pair to pair and observe and provide feedback. The learners will be given a chance to ask questions and give comments about the exercise. The role-play activity will help achieve the course objectives #4 and #8 (Appendix A). The second active learning strategy is a hands-on practice of fluoride varnish application on each other. The participants will again be grouped in pairs for the exercise. The students will use proper infection control, mixing technique, dosing, and application procedures for a fluoride varnish application. The fluoride application activity will give the learners experience with fluoride varnish from an operator's and a patient's perspective. This activity will relate to the psychomotor skills of objective #9.

Media and print materials. Visual and auditory aids, whether in the form of electronic media or print materials, are important parts of effective instruction. Human communication has a symbolic component that is different than the communication

components of almost all other living things (Edberg, 2007). Due to the symbolic nature of our communication, human messages can be accurately portrayed in audio and visual media. Learners retain much more of what they hear and see than what they read (Edgar Dale 1969 as cited by Anderson, n.d.). For this reason, instructional designers can rely on media and print materials to enhance the text and lecture of a presentation.

The program Fluoride Varnish Office Presentation uses visual media and print materials in the form of a PowerPoint presentation (Appendix C). This interactive slide presentation was chosen for multiple reasons. The PowerPoint will give the students the opportunity to see and hear the material at the same time. Because the slides and handouts are intentionally left incomplete, the students will be instructed to fill in the blank areas during the presentation. This active writing, along with a role play section and fluoride application practice, will allow the students to participate in the instruction. Students will retain 70% of what they say and write and 90% of what they do (Edgar Dale 1969 as cited by Anderson, n.d.). This higher level of learning will also foster higher cognitive dimensions such as procedural and metacognitive knowledge (Wilson, 2006).

Implementation. The first step to implementing this instructional program is to acquire the audience. The program is written for a dental office or group of dental professionals. One way to acquire this type of audience is to contact a dentist or dental office administrator. After gaining an audience, the instructor should schedule the time and place for the event. It is important to schedule a time that is convenient to the office and the individual dental professionals.

This teaching practice is designed to be taught in a dental office or a meeting hall such as a convention center. The room for the presentation should be equipped with a projector or monitor visible to the attendees. The presentation includes a PowerPoint presentation to be played from the presenter's computer. The audio/video system of the venue should be tested for compatibility with the presenter's computer before the day of the presentation.

During the presentation the students will need the PowerPoint handouts. The handouts will be printed and supplied by the presenter. The handouts will be printed in landscape orientation with six slides per page. The instructor will also supply paper and pens for the pre-instructional strategy and the two evaluations.

When the students apply fluoride on each other, the instructor will supply masks, gloves, protective eyewear, paper towels, and the fluoride packets. The venue should supply garbage cans.

Evaluation. The evaluation for the teaching practice portion of this project will include a formative assessment and a summative assessment.

Formative assessment. Formative assessments can be very helpful for instructional designers and presenters. A formative assessment is a tool which allows the instructional designer to evaluate how effective the instruction is at an early point in the program (Morrison et al., 2013). The purpose of the formative assessment is to measure the effectiveness of the program's ability to reach the course objectives (Morrison et al. 2013). If the objectives are not being achieved, the instructional designer can rewrite portions of the program for subsequent presentations, or the instructor can make changes during the presentation. Classroom Assessment Techniques (CATs) are a group of

methods that can be used as formative assessments (Haugen, 2011). When used as formative assessments, CATs can improve student performance through improved program design and instruction (Haugen, 2011).

For the formative assessment of this program, a modification of the CAT titled “One-Minute Paper” will be used (Haugen, 2011). The students will be given a paper asking them to write one thing that they are most excited about learning from the presentation and one thing that is unclear after the instruction (Appendix D). One to two blank lines will be provided for the students’ answers. The instructor will compile a list of all of the students’ areas of excitement and explanations of all of the students’ unclear areas. This list will be given to the students at a later date.

Summative assessment. The summative assessment of an instructional program serves to evaluate how well the program has met the objectives (Morrison et al., 2013). The summative assessment is administered after the instruction has taken place and can be one of many different mechanisms. Student learning, initial investment, long term cost, attitude toward instruction, and continued benefit can all be measured by summative evaluations (Morrison et al., 2013). The information gained from the assessment can help the instructional designer anticipate the need for altering, continuing, or discontinuing the educational program.

For the summative assessment of the Fluoride Varnish Office Presentation, the instructor will use a case study (Appendix E). The students will be given a case study and the following prompt: “Given the case study, make fluoride treatment recommendations and defend recommended treatment options based on observed risk factors.” The prompt will then ask the students to include various specific points in their answers. The use of

the case study will allow the instructor to evaluate learning on multiple levels of cognitive dimension. The summative evaluation will relate to the objectives which have the highest level in the cognitive taxonomy. The instructional designer can then give feedback to the learners and provide additional instruction if needed.

Part 2. Patient Information Pamphlet

An information pamphlet was created for patients to be able to read and take with them. The pamphlet is a trifold color print (Appendix F). The information on the patient pamphlet is designed to give a short and easy to read synopsis of fluoride varnish. The pamphlet was written according to the health belief model. The writing will lead the readers through many of the six constructs of the theory. The beginning of the pamphlet addresses perceived risk and shows the readers many possible risk factors for tooth decay. The pamphlet also shows the benefits of fluoride and describes its efficacy rates. The readers will be able to form a judgment about the benefits of fluoride and overcome possible barriers. The section including the success rates of fluoride will help the readers perceive self-efficacy. Because topical fluoride is shown to be effective, the readers can believe that they will be successful in the action of preventing cavities. The back of the pamphlet includes the call to action requesting that the reader contact a dentist “today.”

An assessment questionnaire was written for the patient information pamphlet (Appendix G). This questionnaire will be available at the front desk of any dental office which distributes the pamphlet to patients. The pamphlet writer will receive the questionnaires and make any relevant changes to the pamphlet.

Part 3. Information Booth at Elementary School Parent Teacher Conferences

A booth will be set up at an elementary school to give information to people attending parent teacher conferences. The booth will be manned by a dental professional who can answer questions and pass out written information regarding fluoride varnish.

Receiving school permission. The booth organizer must first receive permission to hold an information booth on school grounds. The school administration should be contacted in person. For this booth, the principle and vice principle were contacted. The booth organizer verbally explained the booth and the information to be presented. At this time the principle granted permission for a single table booth to be present in the school lobby during the parent teacher conferences after school hours.

Booth layout. The booth for this project will be a single 6 foot table. The table will have a floor length table cloth and a chair for the presenter. The table will have a 3 foot Teddy bear with fake teeth and a 12 inch toothbrush. This large display Teddy bear and toothbrush will serve to capture the attention of people walking by. The table will also feature 3 pamphlet holders containing the fluoride information pamphlet from Appendix D. Having 3 pamphlet holders will make the table look more full and will allow multiple people to take pamphlets at the same time. The dental professional will provide a small waste basket for any incidental trash or damaged and unwanted pamphlets. The booth presenter will sit behind the table.

Booth setup. The booth will take approximately 10 minutes to set up and the presenter will require two trips from the car to bring the supplies. The presenter should arrive with enough time to set up the booth completely before the first parent teacher conference begins. The exact location of the table will be decided by the school

administration before the day of the conferences. No power supply or audio video equipment is needed for the table.

During the conferences. While the parent teacher conferences are underway, the dental professional will be present at the table to hand out pamphlets and answer any questions. The presenter will be able to use the information from the presentation Fluoride Varnish Office Presentation to answer any questions. The dental professional will not be able to diagnose disease or answer any questions about specific personal risk factors. If any visitors to the table ask such questions, the presenter should recommend that the visitor seek a formal dental examination.

Booth take down. After the conferences have concluded and there are no more visitors to the table, the dental professional will remove all materials and trash from the area. The presenter will require at least two trips the vehicle to remove the table and materials. The presenter will let the school office staff or administration know that he/she is leaving and thank them for the opportunity. Before the presenter leaves he/she will ask the school administration to fill out the evaluation form (Appendix H). The information from the evaluation form will help the presenter make any needed changes in the future.

Conclusion

The instructional design includes many steps and processes. It is important that the parts of the program are written ahead of time and are fit into a seamless presentation that smoothly transitions from one section to the next. This paper outlines the presentation planning and assessment planning parts of the educational program Fluoride

Varnish Office Presentation. Planning these steps ahead of time will help the presenter combine all of the parts of the program and be well prepared for a presentation.

This paper includes all of the material needed to present the in-office instruction for dental professionals. The paper also includes the written pamphlet to present to patients and a plan for the informative booth at an elementary school. With three distinct audiences, this program can reach many different people and inform them about dental caries and preventing them with fluoride varnish.

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Appendix A

Instructional Objectives Chart

Objective Statement	Domain	Domain Level	Cognitive Dimension
Define fluoride varnish.	Cognitive	Remember	Factual
List the ingredients of the fluoride varnish product used in our office.	Cognitive	Remember	Factual
Discuss the benefits of fluoride varnish according to standardized office scripting.	Cognitive	Understand	Conceptual
Given a case study, evaluate a patient's clinical oral conditions for risk factors outlined in this program.	Cognitive	Evaluate	Conceptual
Given a case study, defend recommended treatment options based on observed risk factors.	Cognitive	Evaluate	Metacognitive
Recall the percentages of untreated carries given in the presentation.	Cognitive	Remember	Factual
Explain the office goal of 15% fluoride varnish application.	Cognitive	Understand	Factual
Create a treatment presentation for fluoride varnish in the learner's own words using all seven aspects outlined in the course.	Cognitive	Create	Procedural
Demonstrate proper fluoride varnish application according to manufacturer's instructions.	Psychomotor	Articulation	N/A
Create a list of reasons why the learner would like to incorporate more fluoride varnish including benefits to the patient and the team.	Affective	Valuing	N/A

Appendix B

Lesson Plan

Teacher Activities	Purpose or Objectives	Sequence of Information Presented and Initial Presentation	Learner Activities, Generative Strategy, or Instructional Strategy From Chapter 9 in Morrison et al.	Time Frame in Minutes	Materials Needed: Print (handout), Media (Visual Aids, PPT), Technology, etc.
Pre-instructional Strategy: Pretest, teacher lead “Two Truths and a Lie” questions.	Purpose: Start the active learning process with the learners. Spark the audience’s interest.	Questions about: Acidic drinks comparison. Should everyone have fluoride? Other risk factors. Fluoride concentrations.	Learner Activity: Consider the questions and make notes about possible answers if wanted.	5 minutes	PPT and note paper and pen.
Instructional Strategy: Review carries risk and fluoride benefits and properties.	Objective: Be able to discuss carries risk factors and incidence. Be confident with fluoride definition, uses, and effectiveness.	Definition of dental carries, incidence of carries, risk factors of carries, risk factors in our specific patient base, what is fluoride, benefits of fluoride, effectiveness of fluoride, office goals.	Learner Activity: View PPT on carries and fluoride. Generative Strategy: integrate knowledge of carries risk with specific patient cases.	15-20 minutes	PPT and PPT outline handout.
Active Learning Strategy: Role play treatment presentation.	Objective: Create a treatment presentation.	Seven aspects of the treatment presentation, office scripting.	Learner Activity: Role play with one another. Generative Strategy: Organization. Learner organizes treatment presentation	15 minutes	PPT

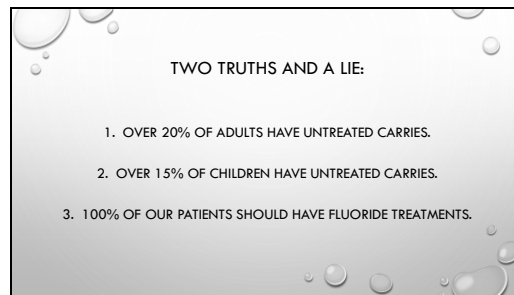
Active Learning Strategy: Practice opening, mixing, and painting fluoride varnish.	Objective: Demonstrate proper fluoride varnish application.	Opening package, mixing, applying on paper.	Learner Activity: psychomotor practice.	5 minutes	Fluoride varnish packets, PPE, Trash
Instructional Strategy: Review.	Purpose: Give the learners a review and a chance to ask questions.	Identical sequence to the presentation, give answers to the pretest.	Learner Activity: listen to the review. Ask questions if applicable.	10 minutes	PPT
Post-Instructional Strategy	Formative assessment for feedback	Classroom Assessment Technique (CAT): "One Minute Paper." Ask for most exciting and most unclear points	Learners give feedback on most exciting and unclear points. Two lines are provided for responses.	5 Minutes	Paper and pencil
	Summative assessment to evaluate whether students met the objectives	Summative Assessment: Case study.	Learners complete case study following prompt from the instructor.	5-10 Minutes	Paper and pencil

Appendix C

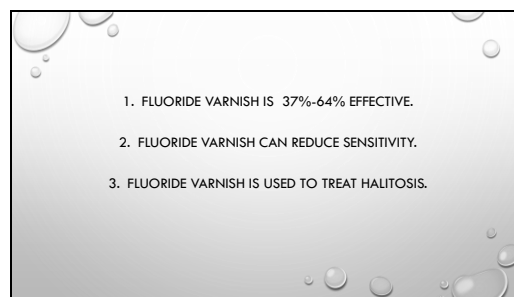
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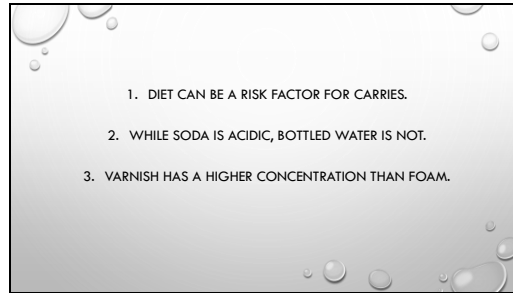
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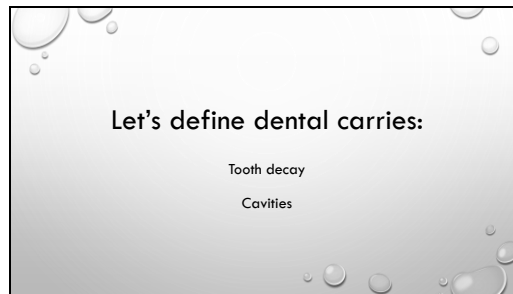
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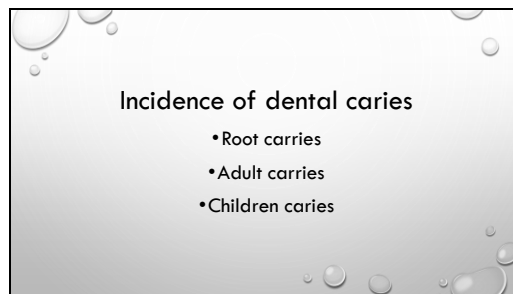
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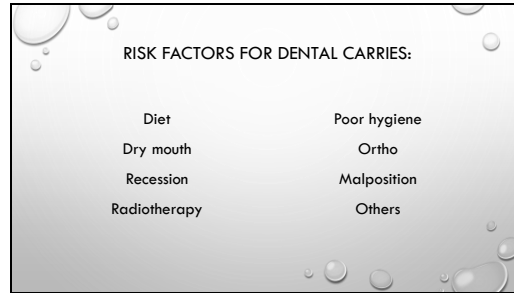
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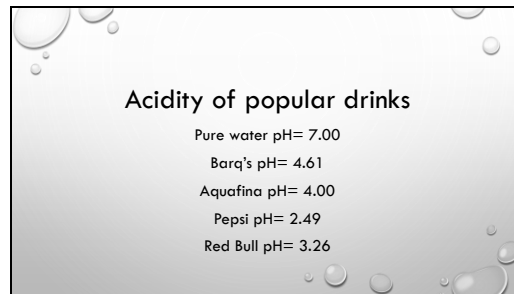
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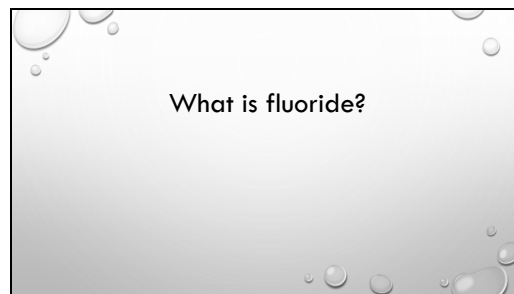
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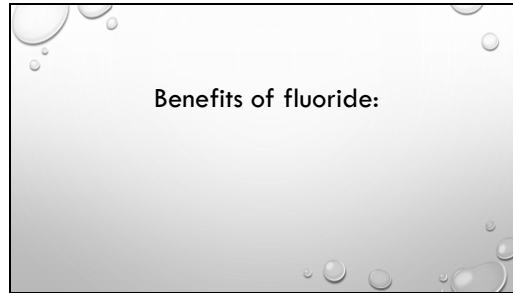
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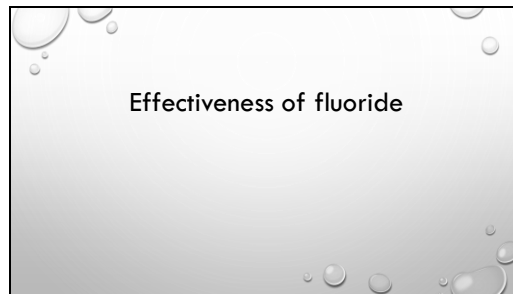
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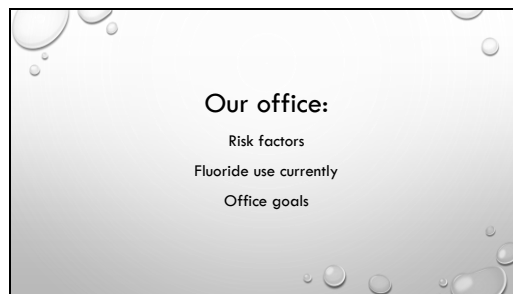
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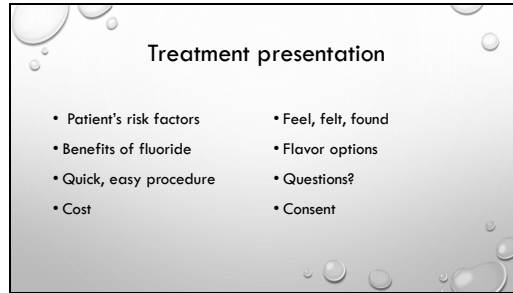
Slide 11



Slide 12



Slide 13



Treatment presentation

- Patient's risk factors
- Benefits of fluoride
- Quick, easy procedure
- Cost
- Feel, felt, found
- Flavor options
- Questions?
- Consent

This slide features a light gray background with a subtle gradient and decorative water droplets in the corners. The title 'Treatment presentation' is centered at the top. Below it, two columns of bullet points are listed, detailing various aspects of fluoride treatment from risk factors to patient consent.

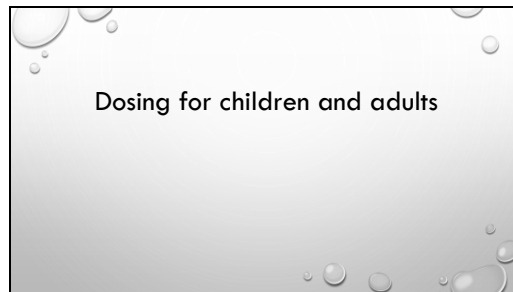
Slide 14



Role Play

This slide has a light gray background with a subtle gradient and decorative water droplets in the corners. The title 'Role Play' is centered in the middle of the slide.

Slide 15



Dosing for children and adults

This slide has a light gray background with a subtle gradient and decorative water droplets in the corners. The title 'Dosing for children and adults' is centered in the middle of the slide.

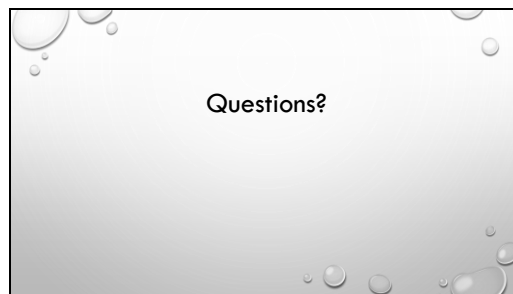
Slide 16



Slide 17



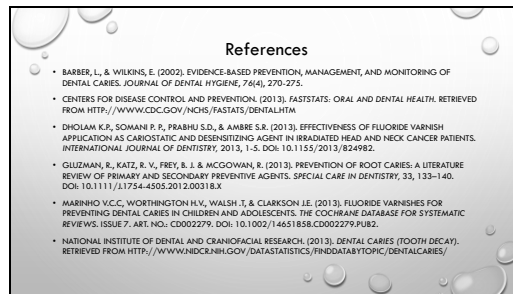
Slide 18



Slide 19



Slide 20



Appendix D

- 1. What is one thing that you are excited about learning from today's presentation?**
- 2. What is one thing that is unclear to you after today's presentation?**

Appendix E

Given the case study, make fluoride treatment recommendations and defend recommended treatment options based on observed risk factors.

Case study: You are conducting a routine hygiene appointment with a new patient. The patient has seen the dentist for a comprehensive exam and the dentist recommends a prophylaxis with a 6 month recare schedule. The doctor has treatment planned two occlusal restorations to be done at a later date. Review of the patient's health history reveals that the patients takes doxepin daily for depression. In interviewing the patient, you find that he has healthy eating habits and avoids almost all added sugars. The patient states that he brushes twice a day and flosses almost every day. Upon your initial evaluation, you find that the patient has excellent homecare and no active gingivitis or periodontitis.

Make sure to include type of fluoride and frequency recommended.

Appendix F



What is Fluoride?

Fluoride is a naturally occurring mineral ion.

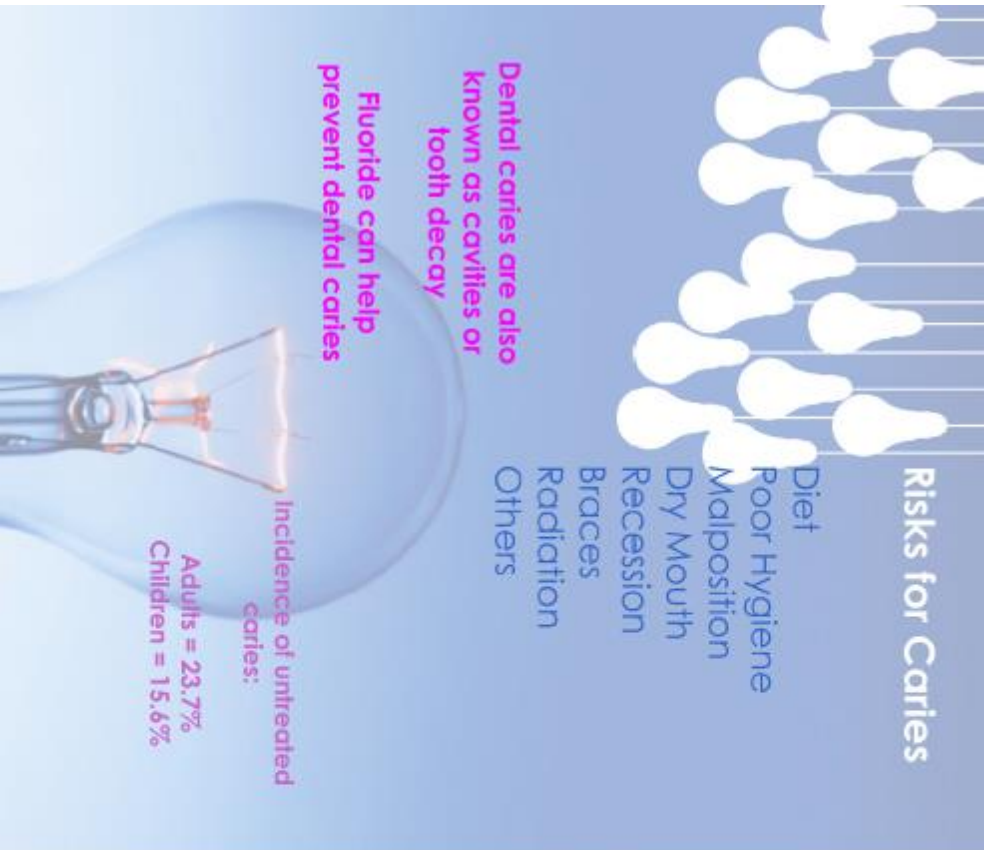
Fluoride is found in many natural water sources around the world.

Fluoride is concentrated and used in dentistry to prevent cavities

Topical Fluoride
A Bright Idea

Talk to a dentist today about the risks of dental caries and the benefits of topical fluoride

Tel 208 555 5555
Fax 208 555 5555
www.snyderhygienelips



*Centers for Disease Control and Prevention. (2013). FastStats: Oral and dental health. Retrieved from <http://www.cdc.gov/fastats/statistics/dental.htm>

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Appendix G

Please answer these questions regarding the pamphlet

“Topical Fluoride a bright Idea”

- 1. Was anything this pamphlet unclear? If yes, please list:**

- 2. What other information would you like to see in this pamphlet?**

- 3. Was the pamphlet visually pleasing?**

Appendix H

Evaluation for Fluoride Varnish Information Table

- 1. Was the presenter on time?**

- 2. Was the presenter professionally dressed?**

- 3. Was the information relevant and suited for the audience?**

Appendix I

Journal Ready Article**Fluoride Varnish: Educate Yourself to Educate
Others**

Dental caries is one of the most prevalent diseases in the US and is the most common preventable, chronic disease in children and adults.¹ Fluoride is effective at preventing caries and can be used systemically or applied topically in the form of gels, pastes, or varnishes.²⁻⁴ One of the most effective uses of fluoride is the professionally applied fluoride varnish. Fluoride varnish can reduce the incidence of caries by up to 64%.⁵

As dental hygienists we do much more than merely scrape teeth and pick plaque. We have the power to change people's lives in many ways. We often see patients for more time than their dentist and general doctor combined. We make lasting relationships with our patients and can build a foundation of trust with them. Because of this, we have a great opportunity to educate our patients and help them take ownership their health! The first step to educating our patients, is educating ourselves. The following sections outline a program used to educate dental professionals, patients, and community members. For access to any of the print materials or PowerPoint slides in electronic form, please contact the author.

An Educational Program about Fluoride Varnish

Educating Dental Professionals

Many dental offices conduct continuing education at the office or send team members to continuing education elsewhere. An instructional program was written to teach dental professionals about fluoride varnish and to teach them how to talk to patients about dental caries and fluoride varnish. The program can be conducted anywhere that there is space for the audience and access to a projector or monitor for audio visual aids.

The program is outlined on PowerPoint slides to be printed for the audience and displayed by the presenter. The PowerPoint slides are an important part of the teaching process. The use of audio visual aids can be very helpful in instruction and can help ensure that the learners will retain as much as possible.⁶ The presentation includes information about risk factors for cavities, effectiveness of fluoride, and applications procedures. The program also covers talking points for educating patients and presenting treatment plans.

The Science

Dental Caries

Dental caries is the process by which minerals such as calcium and phosphate diffuse out of the tooth leaving a hole in the tooth structure.⁷⁻⁸ Bacteria in the mouth produce an acidic environment which causes the tooth structure to become soluble. When the pH in the mouth becomes low enough, the tooth structure can become demineralized enough to create a hole in the tooth. This hole in the tooth structure is dental caries.⁷⁻⁸

Statistics

Dental caries is a very widespread disease that affects people of many age groups and socioeconomic groups. In 2012, untreated dental caries were present in 17.5% of children aged 5-17 years old and 59% of people aged 12-19 years old had tooth decay in their permanent teeth. Among people 12-19 years old, 20% have untreated dental caries. Among adults age 20-64 years old, 92% had caries in permanent teeth and 26% had untreated tooth decay.⁹

Risk Factors for Caries

Many habits and conditions can put people at higher risk for dental caries. Here are some of the most common risk factors. Many of you will see that almost all of your patients have one or more of these:

- a) Diet including high acid or carbohydrate consumption
- b) Dry mouth
- c) Recession
- d) Radiotherapy
- e) Poor oral hygiene
- f) Orthodontic appliances
- g) Malpositioned teeth⁸

If patients have any of these risk factors, they are good candidates for fluoride varnish treatment.⁸

How Fluoride works

Fluoride works by replacing mineral content in tooth structure and preventing minerals from leaving the tooth.⁷ Topical fluoride causes fluoride mineral globules to

form on the tooth structure at the microscopic level.⁷ When the tooth is exposed to acids, these globules prevent demineralization by releasing minerals and making the environment less acidic.⁷ This prevents minerals from being removed from the tooth structure and thus prevents dental caries.⁷

Risks of Using Fluoride

The use of fluoride is a safe way to prevent dental caries.^{2-3,10} However, one risk associated with the fluoride is the risk of dental fluorosis.³⁻⁴ Fluorosis can range in severity from mild discoloration of the tooth to pitting and breakdown of the enamel.^{4,11} Fluorosis occurs only to those age 8 and younger when a greater than recommended amount of fluoride is ingested.¹¹ This is because fluorosis only happens during the formation of enamel while the teeth are still under the gums.¹¹ The relationship between topical fluoride and fluorosis is unknown.⁴ The CDC recommends that fluoride toothpaste be avoided for children under two and that parents oversee that a pea-sized amount of fluoride toothpaste be used for children ages 2-6.¹¹ For professionally applied fluoride varnish, it is recommended to follow the manufacturer's guidelines and use a proper dental suction unit.⁴ No clear evidence of other adverse reactions is known with topical or systemic fluoride use.^{3,10}

A Pamphlet for Patients

It is helpful to have some written literature for patients to take home and read and share with family members. This pamphlet covers information about dental caries and fluoride varnish in laymen's terms. The pamphlet follows the constructs of the Health Belief Model. This model is a behavior change theory that states that there are six components that influence health behaviors.¹² The pamphlet covers many of these

components including perceived risk, benefits of fluoride, self-efficacy, and a call to action.

Topical Fluoride
A Bright Idea

Talk to a dentist today
about the risks of dental
caries and the benefits of
topical fluoride

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Fluoride is a naturally occurring mineral ion.
Fluoride is found in many natural water sources around the world.
Fluoride is concentrated and used in dentistry to prevent cavities



Information Table at a School

The information from the fluoride office presentation and the fluoride varnish pamphlet can be shared out in the community as well. A plan was written for an informational booth at an elementary school during parent teacher conferences. The information booth will be manned by a dental professional that has attended the

educational program about fluoride varnish. The information from the program can be used to answer questions and give information to booth visitors. First, the dental professional will contact the school and obtain permission to set up the booth. Then the school will set let the presenter know where the booth may be set up. The booth will consist of a 6-10 foot long table with a table skirt and a chair for the dental professional. The booth will be set up with three pamphlet holders to distribute the pamphlet seen above. This type of information booth can be adapted for many different locations in your community.

Author Bio

Joseph Snyder RDH is a practicing dental Hygienist in North Idaho. Joseph attended his undergraduate at Eastern Washington University and is currently pursuing a Master of Health Education degree at Idaho State University. Joseph has worked in private practice for 12 years.

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