AN IMPROVED METHOD TO INCREASE COMPLIANCE WITH DENTAL HYGIENE TECHNIQUES IN CHILDREN

By

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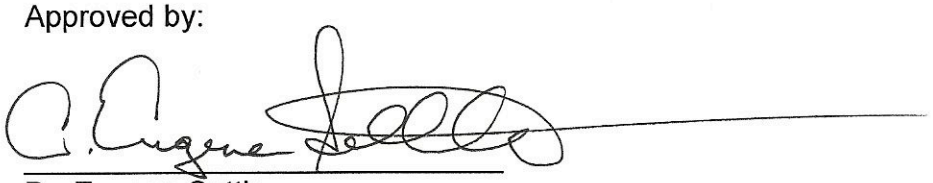

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STATEMENT BY AUTHOR

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Abstract

We investigated the improvement in test scores among elementary school children utilizing a pre-test/post-test approach. Our results show that average test scores improved from pre-tests/post-test approach. Our results show that average test scores improved from pre-tests to post-tests for all students. Although the females scored higher on the pre-test, there was no statistically significant difference between boys' improvement and girls' improvement. In addition, we obtained photographic visual evidence from students. It shows that, for a majority of the children, plaque amount did not decrease after being educated with the oral health curriculum.

Statement of Purpose

Tooth decay is one of the most chronic childhood diseases in the U.S. It has been estimated that in the state of Arizona alone, 75 percent of 3rd graders experience signs of caries (treated or untreated tooth decay (Oral Health Resources). Early Childhood Caries (ECC) is three times more prevalent than obesity and five times more prevalent than asthma (Wagner). In addition, students from lower socioeconomically families are at greater risk for dental caries. Furthermore, caries is affecting low-income and non-white families at higher rates (Wagner). Such reasons for this type of outcome may range from the fact that lower socioeconomically families' insurances may not cover all dental related appointments or to the idea of oral hygiene being portrayed as an inconvenience or lower on their priority list. Despite the fact that caries can be easily evaded through basic oral hygiene practices, such measures are typically disregarded until the need for invasive dental procedures is evident. Further intervention can take place through proper nutritional intake as well as use of fluoridated water(Wagner).

As a result, an oral health education curriculum was produced to not only address the pervasiveness of caries in younger children, but to instill proper oral hygiene techniques in hopes to combat this epidemic. I acknowledge the fact that it is best to address proper oral hygiene at the earliest age possible to ensure a longer lasting set of healthy teeth. As a result, the best suggested way to interact and target young children at once is through the school system. Thus two years ago, Abraham Itty created an oral health education program using the American Dental Association (ADA) curriculum as a basis for the program. With the assistance and collaboration of Zarah Ahmed (former University of Arizona student), we revised and planned purposefully Itty's curriculum including more interactive activities, as well as monthly visits reviewing oral health care knowledge with the students, for three consecutive months; hence, creating an overall enriching experience for the visual and kinesthetic learners. Working with a young age group entails a whole new endeavor in terms of introducing new material, as in a typical college style power-point lecture may not do justice. Thus revamping the curriculum was critical so that it was apt to the student needs and not simply us, the researchers. Making the material more student-friendly are attempts to encourage the students to take action into their own hands so they can see the relevance of oral hygiene. The objective of our program is to not only increase oral health care competence, but as well as to decrease overall plaque levels through the practice of proper brushing and flossing techniques in addition to the importance of a balanced nutritional diet. Through knowledge of proper oral care, students will make an initiative to take responsibility of their own well-being. Ultimately, we hope to create and/or set a precedent for a sustainable oral health care program which can be easily implemented in elementary schools throughout the nation which will effectively increase awareness all the while improve oral hygiene.

Statement of Relevance

The notion that the mouth is simply an extension of the human body is becoming more apparent through the constant advancements in research. In the realms of dental care, preventing tooth decay can be not only cost beneficial, but improve one's overall health. Brushing and flossing has shown to prevent heart disease, diabetes and dementia. Children who are uninsured have less accessibility to the basic essentials of health care. This includes immunizations, periodic medical and dental services, and prescription medications. Two-thirds of middle class families with access to employer-based coverage said their child remained uninsured because they could not afford the health plan. (How The Patient Protection and Affordable Care Act Helps Children) For the greater majority of the population, preventative care should be actively pursued in order to obviate otherwise more costly procedures in the future if not treated properly. Thus I think it is important to emphasize to parents and especially pregnant mothers prior to conception, how rewarding, both financially and emotionally, it can be to have strong healthy oral habits to avoid a more detrimental state of caries. What once seemed inevitable, like caries, can now be considered a controllable factor through mere self-improvement.

Not only are brushing and flossing emphasized within the program, but additionally the importance of proper nutrition. The significance of proper nutrition reflects beyond oral care and into a child's overall wellbeing. With student's nutrition compromised, their attentiveness in school is jeopardized as well. I find that educating students about healthy nutrition has multiple benefits, both for the shortcomings and for the long-run. For example, more immediate implications of how important having a healthy diet can be based on the number of cavities present as a child or an individual's physique as a young adult. More long-term benefits may include a greater resistance to chronic diseases like diabetes or heart failure. I am not saying that

students should completely abandon the idea of candy or any sweets; however, if they recognize important facts such as hard candy is worse to intake than a chocolate bar then perhaps by next Halloween they may reconsider before grabbing a Jolly Rancher over a Snicker's bar. Furthermore, since we all know how irresistible birthday cakes can be for children, another important fact to teach them is not only what type is best to eat but also when it would be the most appropriate time to eat desserts, which is right after a main meal course due to the saliva action already in progress. This allows for better digestion of the sweets. Lastly, the formation of cavity is introduced to the students to help them be more precautious. How quickly cavities form is dependent on three main factors. First the kind of food one eats such as sugars or starch. Next, how long the food maintains contact with the teeth. When sugar makes contact with the teeth, the bacteria, specifically the streptococcus mutans, begins to metabolize the carbohydrates. Sugars such as fructose, lactose, sugars and starches are fermented creating an acidic environment for the teeth. Eventually the acid corrodes the enamel causing the formation of dental caries. Such cariogenic species secrete pyruvate and lactic acid as a byproduct. Sticky foods that remain on the surface of the teeth cause greater erosion due to prolonged exposure to acid. Lastly, the frequency that food makes contact with the teeth also determines the amount of acid that is created. Every time sugar is exposed the enamel; the mouth pH drops to about 3.0 to 4.0. It takes approximately 20 to 30 minutes for saliva to buffer and neutralize the acid to normal range. Soon demineralization occurs, creating white spots throughout the surface of the teeth. Darker browner spots indicate a more advance stage for the caries disease. (Whitney)

Methodology

An experimental study to assess students' knowledge and retention of oral health care was determined before and after the teachings of our curriculum. Thus a pre-test was administered by

the teacher and an identical post-test was administered later by us. Evaluation of knowledge was determined through their pre- and post-test scores which consisted of 11 multiple choice questions. Additionally, a superficial method to visually determine the plaque levels on the facial portion of the teeth was incorporated into the curriculum. Thus not only did we have statistical data, but we provided a visual result section which illustrates the application of the knowledge retained from the curriculum.

a. Integration of curriculum

Modifications and expansion of the pre-existing curriculum were made following the ADA protocol. Shortly after, the school nurses at local elementary schools were contacted. A presentation was made in front of the Sunnyside school district nurses' meeting in order to exemplify the objective of the curriculum, and the advantageous outcome we seek to ensure. Not only will students be exposed to the knowledge of oral health care, but they will also have the opportunity to meet local college students who attend University of Arizona. Allowing elementary students to interact with college educators encourages a positive reinforcement of education that can further inspire these students to one day attend college. A photograph consent form was created asking permission to take visual pictures of the child's teeth periodically throughout the semester. In addition to the photograph release form, parents were notified in a parent letter that their child is part of a study and their identities will remain anonymous. Next a limited number of college students were selected from the pre-dental society and were trained to be instructors. Topics that were taught to the children were value and durability of teeth, how cavities and plaque forms, proper brushing and flossing techniques, significance of good nutrition, regular dentist visits, and extra protection for your teeth. Each instructor is delegated to teach two sections each. Since there are six sections to teach, a total of three instructors are

needed. Poster boards and interactive demonstrations are encouraged to be created beforehand. Next a dentist is needed in order to apply the florescent gel on the children's teeth. Lastly, one assistant will need to help the dentist in keeping the children lined up in numerical order, take pictures, and adjust the blue light.

b. Protocol of Classroom teaching

Students will be administered a pre-test at the very beginning of the program. As the students are taking the test, they will all be given two toothbrushes, one for school and a second one for home, a container of floss, tooth paste, and a popsicle stick with an assigned number and letter thereby designating them to a group and team member. Afterwards there will be an introduction about oral health care, and the instructors that will be teaching the curriculum. The class will be split in four groups and will rotate through stations with different instructors. When they reach the station with the dentist, they will be photographed. Next, students have a predetermined partner in which they will cross examine their plaque levels. Following the cross-examination, students will be asked to brush off the remaining florescent dye. An instructor will be there at all times to supervise and make sure everyone is brushing correctly, while students are asked to monitor their partner's brushing techniques. After all the rotations are completed, students will be administered the post-test. Lastly the students will be enticed to continue brushing and flossing through the disclosure of the incentives. The boy and girl with the most improvements will receive an electrical toothbrush. The students will be informed that we will return to monitor their improvement but we will not provide the students with the exact date as to when. By this I mean that students are aware that we will be returning, but there is still an element of surprise because the visit will still be considered unannounced. At least twenty days will be given

between each visit for three months. Each subsequent visit students will be reminded the process for proper brushing and flossing and will be photographed again.

c. Improvements

Improvements were made from the previous teaching methodology due to the plaque levels not decreasing significantly after the completion of the education curriculum. Students will be paired in order to create a buddy system. After the students have taken their photograph, the students will be asked to evaluate their buddy's plaque level. This added positive peer pressure will motivate students to improve their own oral hygiene habits. I personally feel that having this buddy system encourages students to take care of their own teeth better. Being able to evaluate someone else's teeth also provides more exposure to what plaque build-up looks like. As a result, individuals can be more cautious of their own mouth. An additional instructor will be needed to monitor the students brushing techniques when removing the florescent gel. A toothbrushing log was created for the students' parents in order for them to be actively involved in strengthening their child's oral hygiene. The toothbrushing log asked parents to initial the paper if their child brushed once in the morning and once at night. I believe that parent involvement was initially undermined in our previous attempts, thus this time hopefully with the additional support from parents there will better results. The students were also encouraged to improve their brushing and flossing by offering silly bands to the team of students that had the most improvement.

Hypotheses:

We predicted an increase in performance on students' post-test results indicating retention of the curricular knowledge in comparison to their pre-test scores.

Null Hypothesis H_0: $\mu=0$ (No difference)

Alternative Hypothesis: H_A: $\mu > 0$ (Significant difference)

We also predicted that females would retain more knowledge than males. Gender Difference Hypotheses:

H_0: $\mu 1 = \mu 2$ $\mu 1$= average test scores of male

H_A: $\mu 1 \neq \mu 2$ $\mu 2$= average test scores of females

Data

Retention of knowledge was assessed through pre-test and post-test examination. The pre- and post test consisted of eleven questions spanning the major topics discussed within the curriculum. A matched t-test was employed in order to determine statistical significance. In addition, fluctuations in plaque levels were analyzed visually. In most cases, it was evident whether the student had increased or decreased levels of plaque. **Study Sample:**

Fourth grade students from Erikson Elementary were chosen to be part of the study. The particular class that was evaluated had diverse ethnic backgrounds such as Caucasians, African-Americans, and Hispanics. The families that attend Erikson elementary are predominately from lower to middle socioeconomic class. The students who were not present for all three school visits were disregarded for the data study.

Results:

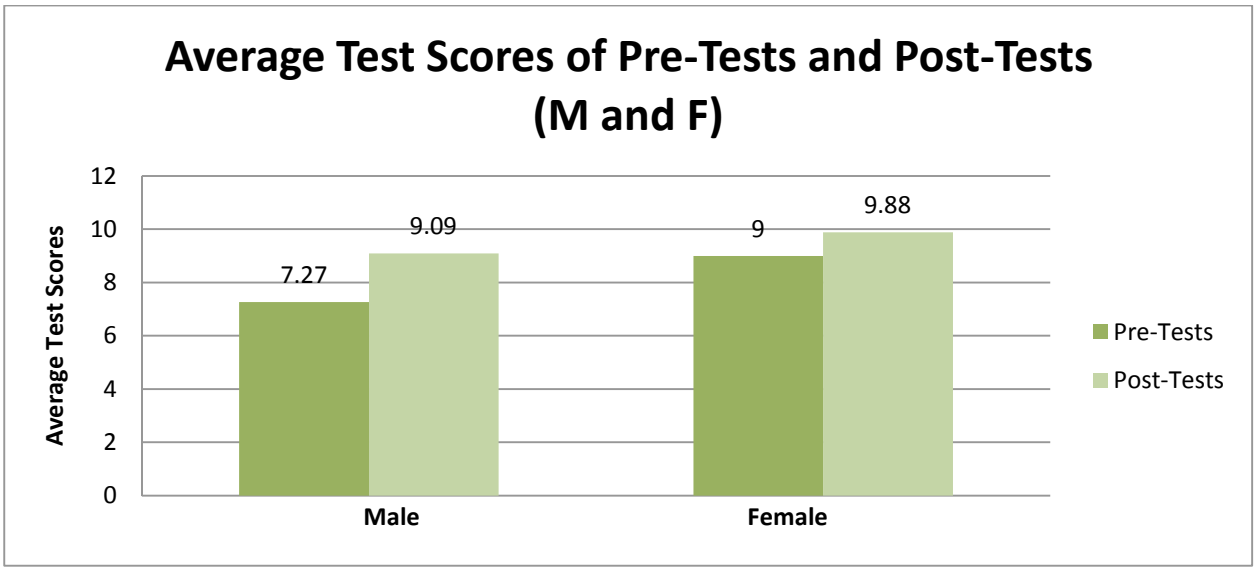

Figure 1: The males pre-test score averaged 7,27, while the female pre-test score averaged 9.00. The male post-test score averaged 9.09, and the female post- test score was 9.88. There was no significant difference in the improvement of retention between genders. ($p \geq .05$)

The data indicates that there is an increase in retention of knowledge for the 4th grade students in Erikson Elementary (See Figure 1). The males pre-test score averaged 7,27, while the female pre-test score averaged 9.00. The male post-test score averaged 9.09, and the female post-test score was 9.88. Overall, the class improved 1.4 questions. The males improved by 1.82 questions while the females improved by 0.88 questions. The total p-value was 0.00345. The males' p-value was 0.030817 and the girls p-value is 0.009207. All of the aforementioned p-values were significant being <0.05.

Figure 2A

Figure 2B

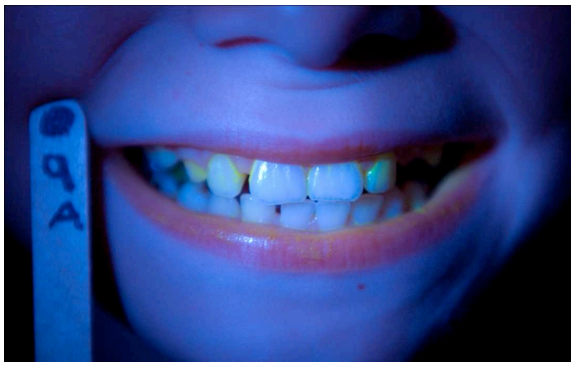

Figure 2C

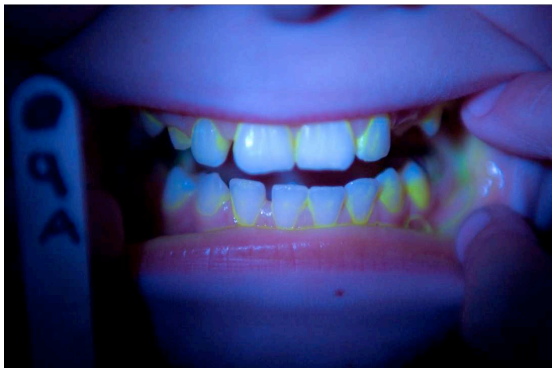

Figure 2D

As for the visual data, despite the students' improvements in learning the material, in terms of applying their knowledge there was no visible decrease in plaque amount. The images indicate that in a majority of the students the plaque content had increased as measured by the florescent dye. Initially, the students' are photographed without the florescent dye (Figure 2A). Figure 2B indicates their initial levels of plaque. This particular student had virtually no plaque to begin with. Figure 2C is the next month's visual assessment. The student seems to have plaque buildup in their right lateral incisor and canine. Unfortunately, this result indicates increase in plaque levels. Lastly Figure 2D is the last months visual assessment. The student has additional plaque from the previous month in both upper and lower regions. Also the student has further plaque buildup between the teeth. Increase in plaque seemed to be the most prevalent case amongst students in this study sample.

Figure 3A

Figure 3B

Figure 3C

Figure 3D

Some students had no plaque throughout the duration of the program (See Figure 3A-3D). Ideally, we would like all of our students to have shown results like this.

Figure 4A

Figure 4B

Figure 4C

Figure 4D

Next there were some students who had improved after completing the program. In figure 4B the student showed heavy signs of plaque in the central and lateral incisors. In the next month there was plaque in-between the child's mouth, however the density of the plaque and overall plaque had decreased. In the last month the student showed no signs of plaque, and had decreased their overall plaque level since the initial assessment (See figure 4D).

Conclusion:

Students showed an increase in their post-test scores indicating retention of curricular information. However, in terms of practical application, our results were not as promising. Most of the students had actually increased in overall plaque from the first visit. Nevertheless, there were some students who had very little or no plaque at all initially, and remained plaque free throughout the duration of the program. Rather than demonstrating a definitive solution, several questions were raised. One reason for this outcome may be the lack of repetition of material by more authoritative figures such as parents and teachers. Many young children need to be repeatedly told the importance of keeping their teeth clean before this behavior is habitual and implemented in their daily routine. In our previous research, the idea of lack of repetition was

one of the problems that were addressed. In order to resolve this issue, a toothbrushing log was implemented asking parents to actively participate in improving their children's oral health care. Unfortunately I was a little disappointed to find out that only a few of the parents had actively participated. Therefore the efficacy of the toothbrushing log was inconclusive. Due to the fact that our program was taught in a lower socioeconomic area, there could be a lack of parent involvement for several reasons. Similar to the positive correlation in parent involvement in education, if parents actively participate in creating healthy habits for their children, then the children are more inclined to have healthy oral care habits. One possible reason is that the parents themselves do not know the importance of oral care, and therefore neglect emphasizing this to their children. Therefore, in the future, instructors can create a workshop meant for parents to educate them first before teaching their children and how they can improve their child's overall wellbeing. I feel this will be a great opportunity for parents to see the relevance of oral hygiene. If they can witness how beneficial proper oral hygiene can be, then perhaps they will be more pro-active in their children's lives.

Despite the fact that the results of the project seemed inconclusive for practical purposes, both students and teachers were very receptive to our teaching methodology and curriculum. In fact, several teachers had approached us and asked us to teach in their classroom. In addition, Students had approached the instructors on numerous occasions explaining how they have not only changed their own brushing techniques but had influenced their friends and family. I personally witnessed many of the students' desire to make changes in their oral care after they had seen their plaque levels in the blue light. The added peer pressure seemed to further reinforce proper brushing techniques. At times some students felt embarrassed to show their teeth to their partners because of the high levels of plaque in their mouth This illustrates how students are

motivated when they are compared to their peers. Although it was not our intention to embarrass the children, they nevertheless comprehended the idea that they have to change their oral care habits. In addition, when instructors had revisited the students in the second and third months, students seem to recall proper brushing and flossing techniques.

X. **Acknowledgements**

I would like to thank the Pre-Dental Society and the instructors, namely Kristy Rogan, Sahil Arora, Dina Tan, Julius Hindy, and Harlean Ahuja. Each of these instructors have a genuine passion beyond dentistry and into the realms of public health. This idea can be exemplified by Julius's statement, "I'm so excited to teach these kids, I can barley sleep." This sort of enthusiasm gives me a sense of pride to witness firsthand my own peers who wish to make a difference in the world and help change the common perception of dentistry. Although I will be graduating, there are students who wish to modify the curriculum, in hopes to reach conclusive results. I would also like to thank Zarah Ahmed for assisting my efforts throughout the program. Next I would like to thank Abraham Itty for inspiring me to reach my potential, and for exposing me to oral health education. His work is a reflection of my research. I would also like to thank Southern Arizona Dental Society, especially Sue Smedley and Dr. Tung Bui. Both Sue and Dr. Bui were integral parts of the success of our program. Lastly I would like to thank my mentor Dr. Settle for all of his support inside and outside the classroom. His encouragement in my capabilities has propelled me to reach beyond my own perceivable abilities as a college student.

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UofA Oral Health Educational Curriculum (4th)

Purpose

- Test the knowledge of 4th students before and after education curriculum via written exam.
- Instill in students a sense of competence and responsibility for keeping their mouth clean and healthy.
- Visually observe and document physical images of student recording their progress monthly.

Fundamental Message

- Your teeth are valuable
- Developing simple habits to improve your oral health and more so your overall health can ensure that your teeth last a lifetime

Expected Outcome

Upon completion of this presentation, students should be aware of the following facets of oral healthcare:

- Basic Tooth Anatomy
- Impact of Cavities and Plaque
- Proper Brushing and Flossing Techniques
- Significance of good nutrition
- Importance of visiting your dentist regularly
- Awareness for additional protection of teeth i.e. mouth guards and dental sealants
- Recognizing behaviors that can be detrimental to their teeth.

Section 1: General Introduction

1) **Introduce Presenting Members**
   a) Your Names, where you're from, and why you're here
   b) Ask: How many times do you brush your teeth each day? [Get responses]

2) **Question:** What is value
   a) Discuss with students what makes something valuable. [Write down responses pertaining to teeth]
      i) Can't be replaced
      ii) Good quality
      iii) Lasts a long time
      iv) Looks nice
   b) What about your teeth? Are they valuable? [Opinions]
   c) What can your teeth help us do?
      i) Chew food
      ii) Talk

iii) Give us beautiful and healthy Smiles

- Split into four groups: Make sure everyone has a name tag and a specific number.
- Group 1: Section 2-3
- Group 2: Section 4-5
- Group 3: Section 6-7
- Group 4: Section 8

Section 2: Your Teeth are Valuable and Durable

*Materials Needed: white board with markers

1) Teeth are Precious

a) Teeth help us not only eat but also talk and give us healthy and beautiful smiles

Ex. People who lose their teeth have difficulty enunciating words. The voices of kids that lose their front two teeth sound differently.

b) Ask: How many sets of teeth do we get in our lifetime?[Get responses]

i) First set: Baby Teeth (20)
ii) Second Set: Permanent Teeth (32)

c) Ask: Why don't we have one set of teeth that last us our entire lifetime? [Get responses] As you grow older you need bigger teeth that can generate more force to chew more food

d) If you lose a permanent tooth another tooth will not replace it; permanent teeth are supposed to last you your entire lifetime

e) Question: In 60 year period, how many times do you think you chew with your teeth? [Answer: 33 million; get 3 answers and reward closest answer with sugar free candy]

***2*) Lets look at what each of these durable teeth are composed of: Tooth Anatomy**

- Ask: How many layers do your teeth have? [Get opinions. Answer=3]
  Draw layers of tooth on whiteboard:

a) Enamel:

i) Outside layer
ii) Hard protective covering
iii) The hardest substance in our body, even harder than bone

b) Dentin

i) Underneath the enamel

ii) Makes up the largest part of a tooth

iii) Hard, but not as hard as enamel

c) Pulp:

i) The inside layer

ii) The live part of the tooth

iii) Has blood vessels and nerves

- Portray on your diagram the idea that there are thousands of germs in your mouth whose goal is to eat away at the layers of your tooth until they get to the pulp; this leads to PAIN

Section 3: Cavities and Plaque

*Materials Needed: cavities and plaque poster board, whiteboard and markers

1) Intro

a.) Ask: "What happens if we don't take care of our teeth?" [Wait until some answers 'cavities']
b.) The formation of cavities is not instantaneous but rather forms through a gradual process

2) Plaque

a) Ask: "Have you ever woken up in the morning after not brushing the night before? What is the fuzzy substance that you feel on your teeth?" Explain that the yellow and white, gritty substance is called plaque and it forms in your mouth all night when you sleep.

b) Plaque is a sticky, clear film that is forming on your teeth all the time. Plaque contains germs, and sometimes, it cannot be easily detected by the naked eye.

c) Eating and drinking sugary food causes sugars and plaque to mix together to make an acid. The acid attacks your teeth to cause decay. [Write on the following equation on the whiteboard bacteria + sugar = plaque acid] This acid then attacks your enamel [draw arrow from acid to the enamel that was drawn on the board from Section 2]

d) Then have a discussion about acids with the students and have them name as many acids as they can [soda, orange juice etc]. Explain that the more exposure your teeth have to acid, the more cavities there will be.

3) Cavities

a) Ask: "What is a cavity?" Explain to them that it is a little hole in a tooth and can lead to pain, tooth loss, and infection. Cavities are a sign that your tooth is decaying.
b) Point to the visual of the cavity on the poster board. Explain that this huge cavity first started with the formation and accumulation of plaque. Then over time the small tiny hole formed from the acid got bigger and bigger because it was not properly taken care of.
c) Then ask the students what happens when something decays so that they can relate the idea of decay to everyday objects. When things decay they lose strength and fall apart.

d) What are some ways we can make sure that acid doesn't lead to tooth decay [get responses; brushing with toothpaste, flossing, eating healthy food, going to dentist, fluoride,]. Now we're going to talk about some of these ways.

Section 4: Brushing and Flossing

*Materials Needed: typodont, toothbrush, dental floss, hard boiled egg soaked in Coke, water

1) **Basic brushing techniques**
   - **a.** How often should you brush your teeth? [Get Responses. Ideally, we should try to brush after every meal]. This prevents the sugar from combining to the plaque to create acid. If you can not brush your teeth after every meal, at least try rinse your mouth.
   - **b.** What do you put on your toothbrush? Why do you use tooth paste?
     - i. Tooth Paste has FLUORIDE. Fluoride prevents tooth decay and makes teeth more resistant towards cavities as well as making the enamel stronger. Other sources of fluoride include some drinking water (tap water), or fluoride mouth rinses.
     - ii. Always spit out all the toothpaste and rinse with water.

Demonstration of Brushing with Typodont:

1. Place the toothbrush at a 45-degree angle to the gums
2. It is important to brush every tooth (especially the back teeth) and all the sides of these teeth: outer surfaces, inside surfaces, and chewing surfaces
   a. Allude back to disclosing tablet experiment and how most plaque is seen on the chewing surfaces of the back teeth on the inside surfaces
3. Ask: Where else in our mouth should we brush besides our teeth?
   a. It is important to brush your tongue to remove the bacteria on your tongue; this helps your breath smell better and reduces the amount of germs.
   b. Roof of your mouth
   c. Gum line
4. It is still possible to get cavities even if you brush your teeth and mouth properly. Ask: Why is that? [Get Responses]. Cavities can form between your teeth because the bristles of your brush are too large to clean the areas in between you teeth.

2) **Flossing Techniques:**
   - **a.** Flossing is the best way to prevent cavities from forming between your teeth. Flossing is just as important as brushing because it keeps your teeth AND gums healthy.
   - **b.** You should floss your teeth very gently *once a day*

Demonstration of Flossing on Typodont:

1. Use a piece of floss about 12 inches long
2. Gently guide the floss between the teeth. When it reaches the gum line, curve the floss into a C-shape and move the floss gently up and down the side of the entire tooth. Repeat for both sides of each tooth.

3. If your gums bleed, it may be a sign that your gums are weak and you need to floss more to keep your gums healthy

ACTIVITY: Hard boil an egg. Then soak the egg overnight in Coca Cola. The eggs should appear brown in color. Explain to the students that egg shell represents your tooth and the brown color represents what happens if you expose your tooth to acidic substances like soda or allow plaque to grow for extended periods of time. Then use a brush and water to brush the outside of the egg. The egg should turn from brown to white. Explain to them that when we brush our teeth we are essentially brushing away the plaque and acidic substances so that are teeth can remain clean and healthy! Fluoride washes the areas weakened by acid. Pass the egg around the class.

Section 5: Significance of Good Nutrition

*Materials Needed: Nutrition Poster Board, sugar jar, measuring teaspoon, clear cup, empty 12oz soda, empty 20oz soda bottle

1) **Good Nutrition**
   - **a.** "It is great to remove the germs on our teeth by brushing and flossing, but it's EVEN BETTER to prevent these germs from getting there in the first place!" One of the best ways to limit the amount of germs from getting on our teeth is to reduce the amount of sugary foods we eat.
   - **b.** How quickly cavities develop depend on 3 factors that you can easily control
     - **i.** The kind of food (sugary or starchy)
     - **ii.** The number of times that the food makes contact with the teeth
     - **iii.** How long the food remains in contact with teeth
   - c. Food composition and texture plays a vital role in the production of acid.
     - i. Starchy foods like cookies, donuts, and sweet cereal are bad for your teeth because they tend to stick to your teeth.
     - ii. But the WORST food for your mouth is hard candy (suckers and breath mints) because it remains in contact with your teeth for a long period of time and is also very sugary; thus it has the potential for more acid to be produced.
   - d. If you do eat sugary and starchy foods always eat them with a meal. When you eat a meal your mouth generates a lot of saliva, which contain lysozymes that destroy bacteria. This will wash away food neutralizing the acid.

2) **Snacks**
   - **a.** Sometimes we need to eat between meals. During these situations it is best to select nutritious foods like [point to posterboard] fruit, vegetables, and yogurt. Save the sugary snacks for a meal!

ACTIVITY: Have a jar of sugar, a teaspoon and an empty clear cup ready for use. Ask children how much sugar is in a can of soda and hold up an empty soda can. Have students come up and physically put the number of teaspoons of sugar they think are in a 12oz soda can into

the clear cup. Once a few students have guessed, show them that the answer is actually ten teaspoons of sugar! Display the cup with 10 teaspoons of sugar. Now ask how much sugar they think is in a 20 ounce bottle of soda and show them an empty 20 ounce bottle. Have students come up and estimate the number of teaspoons into a clear cup again. Tell them that the answer is 17 teaspoons of sugar. Display a jar with 17 teaspoons of sugar in it. Pass the cup of sugar around the class. Now ask if anyone could imagine eating this much plain sugar at one time.

b. Great alternatives to soda are water and milk

3) Chewing Gum:

a. Ask: Is chewing gum good for your teeth? [Get Opinions]

b. As long as the gum is sugar free, it is alright to chew gum. Not in school though. Chewing gum actually helps your mouth generate more saliva, which can then destroy bacteria.

Section 6: Visiting Your Dentist Regularly

*Materials Needed: Fillings Posterboard

1) Overview:

a. So far we have talked about the three important ways you can care for your teeth, gums and mouth. Ask: Who can name all three? (Brushing, flossing,fluoride, and eating nutritious foods) but we forgot one more very important thing we should all do to keep our teeth and gums healthy. Who can tell me what it is? [Answer: visiting the dentist]

2) Dental Appointments

ACTIVITY: Ask a student to volunteer to act as a dentist dressing them up in a white lab coat (giving student's ownership). Ask the student for his/her last name and refer to him/her as Doctor. Ask the following questions to the dentist.

a) Ask Dentist: How many times a year would you want to see your patients?
b) Ask students: How many times a year should you go to the dentist? [Answer: Twice a year or as often as recommended]
    i) Once a cavity forms it can only be repaired by a dentist, it does not heal by itself.
c) A few things you can expect to be done when you go to the dentist:
    i) Examination of your teeth and mouth to see if they are properly being cared for.
    ii) X-Rays (have dentist take out x-ray image from pocket of the coat)
        (1) Helps dentist locate cavities that are not visible to the naked eye
    iii) Removal of Tartar
        (1) When plaque gets hard it becomes Tartar. This can only be removed by a dental hygienist.

Section 7: Extra Protection for teeth

*Materials Needed: Whiteboard and Fillings

1) **Overview:**
   a. In addition to keeping your teeth clean, eating nutritious foods and visiting your dentist regularly, there are several other ways you can help your teeth last a lifetime. Does anyone know what dental sealants are? [Some children may have already had sealants applied to their teeth and may be able to explain the process to the class.]
2) **Dental Sealants and Fluoride Varnish**
   a. After your permanent molars have come in- your dentist/hygienist/assistant can coat them with a special dental plastic that seals out decay.
      i) Applying sealants and varnish is quick, easy and painless.
      ii) Sealants can last for several years.
   b. Ask: How many of you have had sealants applied to your permanent teeth?
      i) Sealants are additional protection from decay that many of your parents didn't have.
      ii) When your parents were children, getting cavities was much more common than it is today.

   C Fillings

      ii. Removes decay and prevents cavity from penetrating deeper into the tooth. [Point to the poster board and explain the 3 types of fillings]

   d. Dental Sealants (not always applied)

      iii. Provide extra protection for your teeth that seals out decay

   e. This doesn't mean you should stop caring for your teeth. Sealants are added protection.
   f. Fluoride strengthen teeth, through toothpaste and some rinsing**. Swish and spit at school- now a new way to brush the fluoride on trays/foam at dental office?**
   g. Show a picture of a dental sealant being applied to a tooth.

ACTIVITY: Place a Tums tablet in three paper cups. Cover one tablet with water, cover the next tablet with vinegar cover, the last other tablet with vinegar and wrap it with plastic and seal it with transparent tape. Wait five minutes and pour off the liquid. Unwrap the plastic from the Tubs tablet. The plastic has protected the "tooth" from the acid.

3) **Mouthguards**
   a. There is something else you can do to protect your teeth, but this is used to protect your teeth from getting broken or knocked out.
      i) Ask: Does anyone know what I'm thinking of? Hint: You use it for active sports like football.
   b. A mouthguard is a piece of soft, molded plastic that covers your upper teeth. Your dentist can make one that fits your teeth exactly or you can buy an unshaped mouthguard at the store that can be softened in boiling water and then shaped to fit over your teeth.
   c. Ask: why is it so important to use a mouthguard?

i) Because if you lose your permanent teeth, new ones will not grow in to replace them. Do you know anyone who has had teeth knocked out during sports? Will those teeth ever grow back?

ii) Let's list all the sports and activities that we can think of where your teeth and mouth might be injured.

d. Mouthguards protect teeth from injury and should be used during all active sports.

4) Behaviors that can hurt teeth

a. Sometimes not doing certain things is just as important as the positive things you do. Avoiding bad habits and unhealthy activities is important too. Can anyone name something you might do that would injure your teeth or the health of your mouth? [Write on White Board]

b. Chewing on hard objects such as on ice cubes, pencils and pens, nails, or even hard candy can chip or crack your teeth.

c. Tobacco: There is another bad habit that is very dangerous, not only for your teeth, but for your mouth and entire body; using tobacco products. Smoking and chewing tobacco is bad for your total health.

i.) Tobacco products can stain your teeth and cause gum disease and tooth loss.

ii.) Never starting is your best defense against all the health problems related to tobacco.

Section 8: Data Analysis

1) Pictures:

a. Take a before picture of the students.

b. Apply disclosing solution to all students.

i. The students will form two lines and await to take a picture

ii. Once first in line, we will apply the florescent light and take a snapshot of the child's teeth (no flash)

iii. Students will return back and asses their partner's teeth using the mirror and florescent light.

c. Students will then brush their teeth to remove disclosing solution.

d. If there is free time, students will fill out the cross word puzzles.

Post Oral Health Test

Name:_____ **Gender**:___ **Grade**:____ **School:**_____
Date:_____ **Teacher**:_____

1. How often should you brush your teeth?
    a. After every meal
    b. Once a day
    c. Only when my mouth feels dirty
    d. Once every two days

2. There is a very important ingredient in most toothpastes that helps your teeth. What is it?
    a. Bleach
    b. Baking soda
    c. Soap
    d. Fluoride

3. What is a cavity?
    a. a chipped tooth that can lead to a lot of pain
    b. germs on your gums that make your mouth bleed
    c. a little hole in a tooth that can lead to pain, tooth loss, or an infection
    d. germs on your tongue that can make your teeth decay

4. Which statement is true about flossing?
    a. Flossing is not good for me because it makes my gums bleed
    b. Flossing is not important because it does not help clean your teeth
    c. Flossing is optional. I don't have to floss if I don't want to
    d. Flossing is important because it keeps my teeth and gums healthy

5. What causes cavities?
    a. Brushing your teeth
    b. Using a toothpick instead of dental floss
    c. Eating sugary foods like candy bars and brownies
    d. Biting your nails

6. At least how many times a year should you go to the dentist?
    a. Every Month
    b. Only when you have pain
    c. Once a year
    d. Twice a year

Post Oral Health Test

7. When eating sugary snacks like cookies, soda, and candy, the best way to protect your teeth is to:
    a. Eat or drink the sugary foods with a meal
    b. Eat or drink the sugary foods in the morning
    c. Drink as much soda as you want but don't eat candy
    d. Eat or drink the sugary foods by themselves and not with other food

8. In order to remove the germs in your mouth that **give you bad breath** it is best to brush your
    a. Gums
    b. Tongue
    c. Teeth
    d. Top of your mouth

9. Plaque mixing with _____ makes Acid. Acid then attacks your teeth causing _____.
    a. Sugar; Cavities
    b. Water; Bad Breath
    c. Fluoride; Cavities
    d. Saliva; Sore Throat

10. How many sets of teeth do people get in a life time?
    a. Three Sets—your baby teeth, your permanent teeth, and your super permanent teeth
    b. Two Sets—your baby teeth and your permanent teeth
    c. One set—the teeth that you are born with are the teeth that last your entire life
    d. None of the Above

11. Which of the following foods would be the worst for your teeth
    a. Chocolate Chip Cookies
    b. Orange Juice
    c. Brownies
    d. Hard Candy

Please Turn in this Test to Your Teacher


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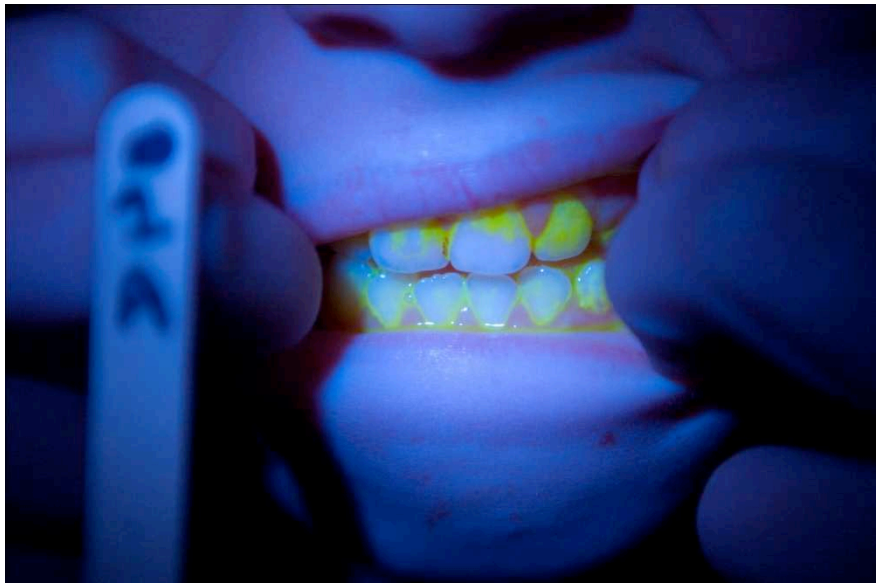
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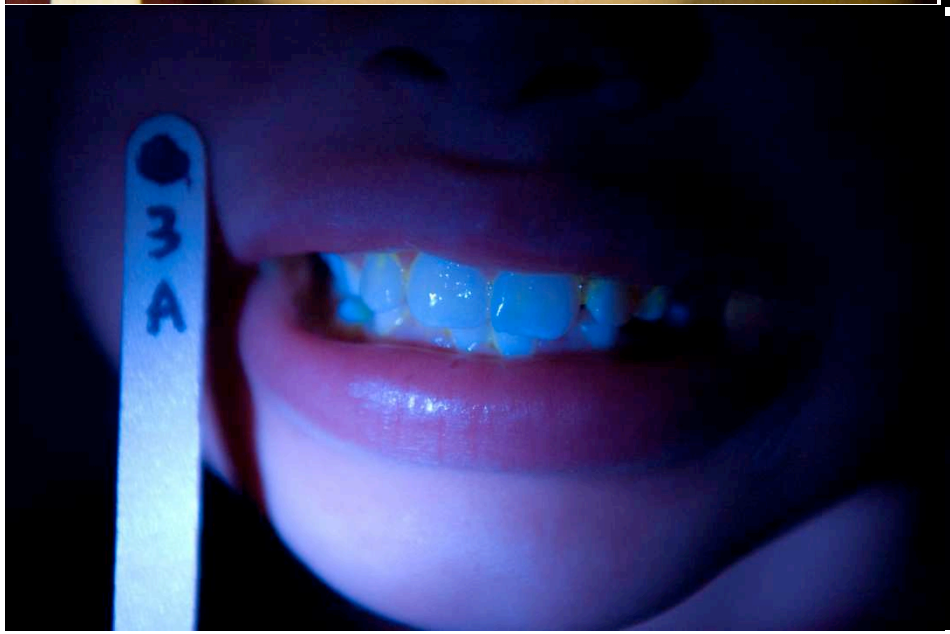
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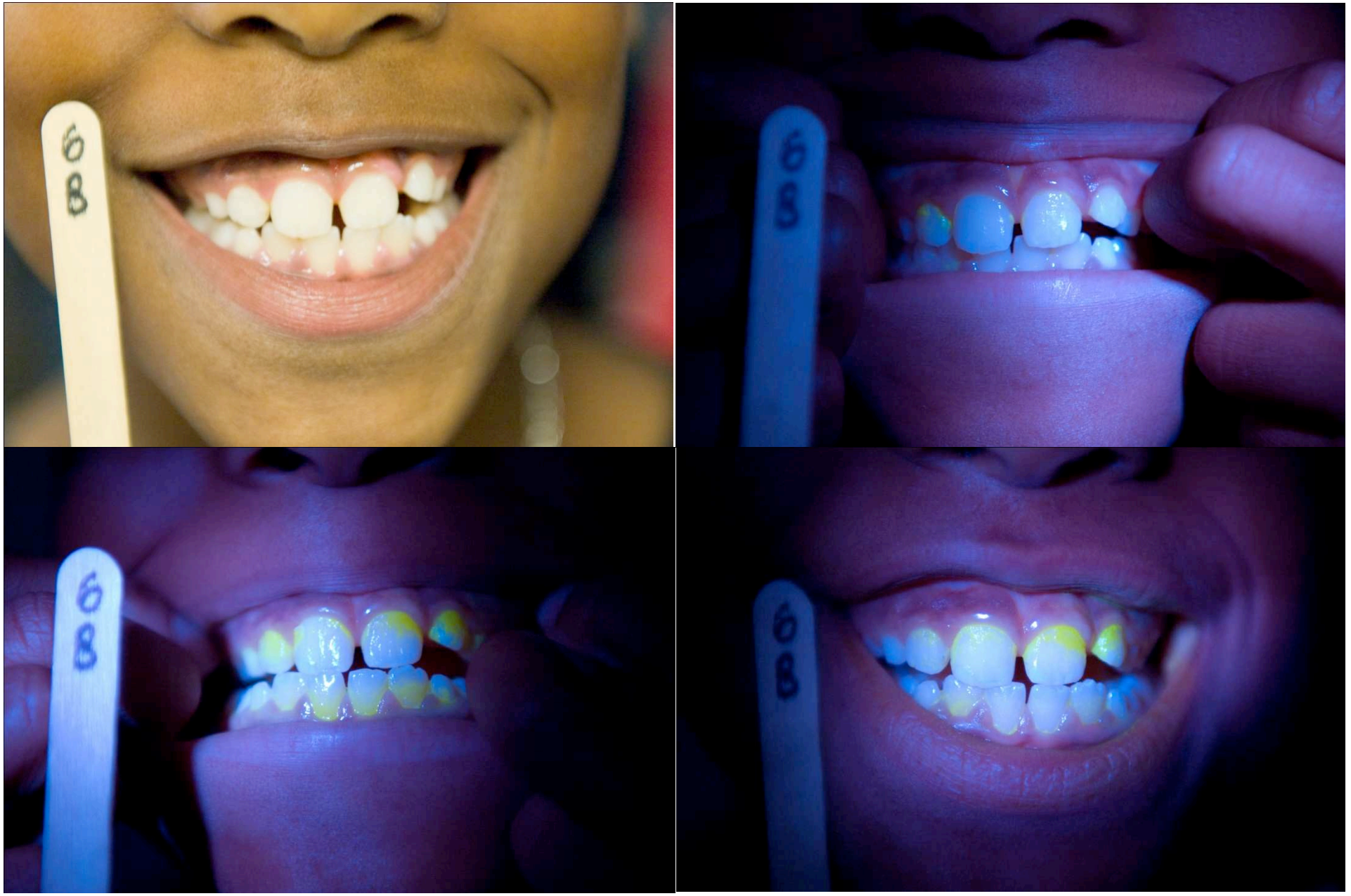
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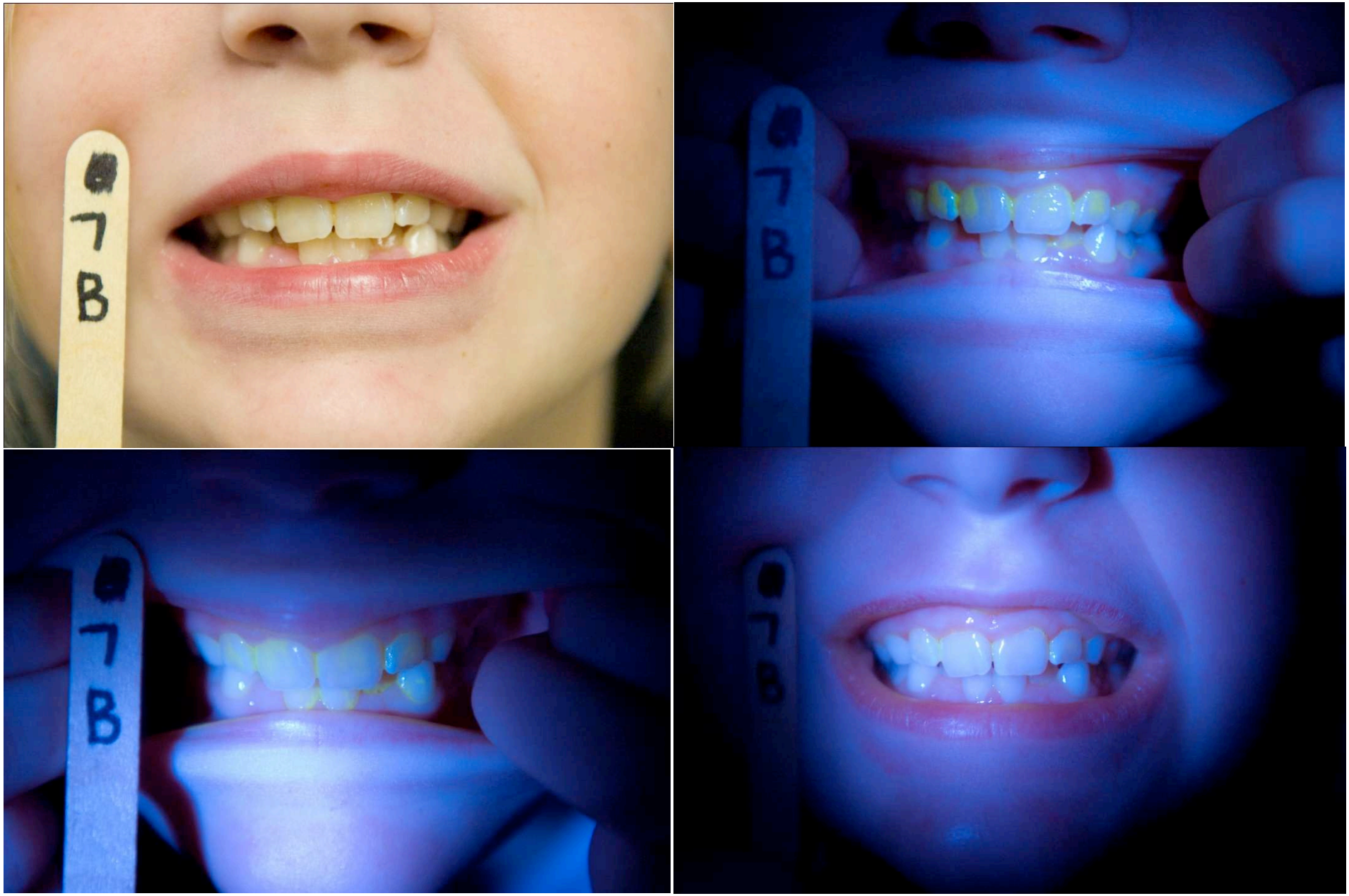
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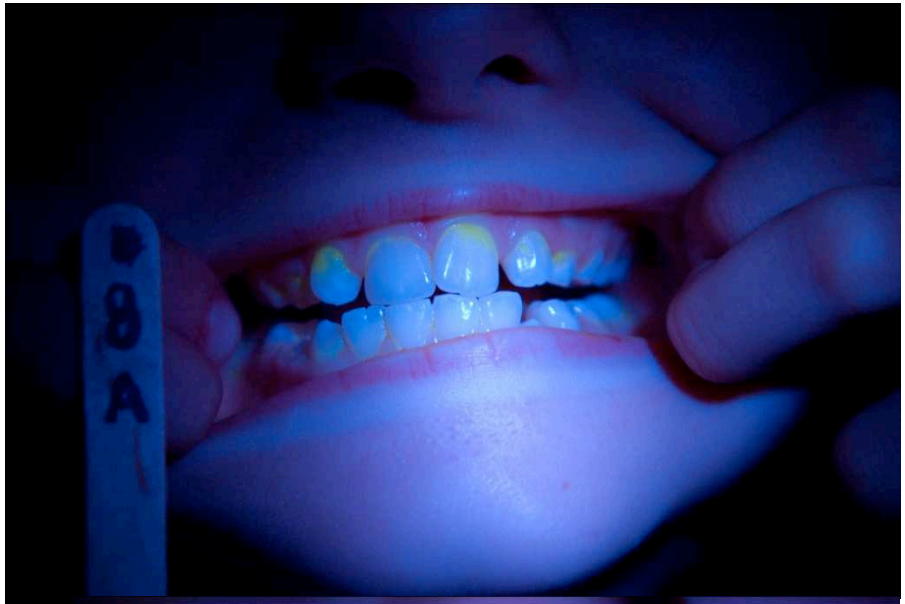
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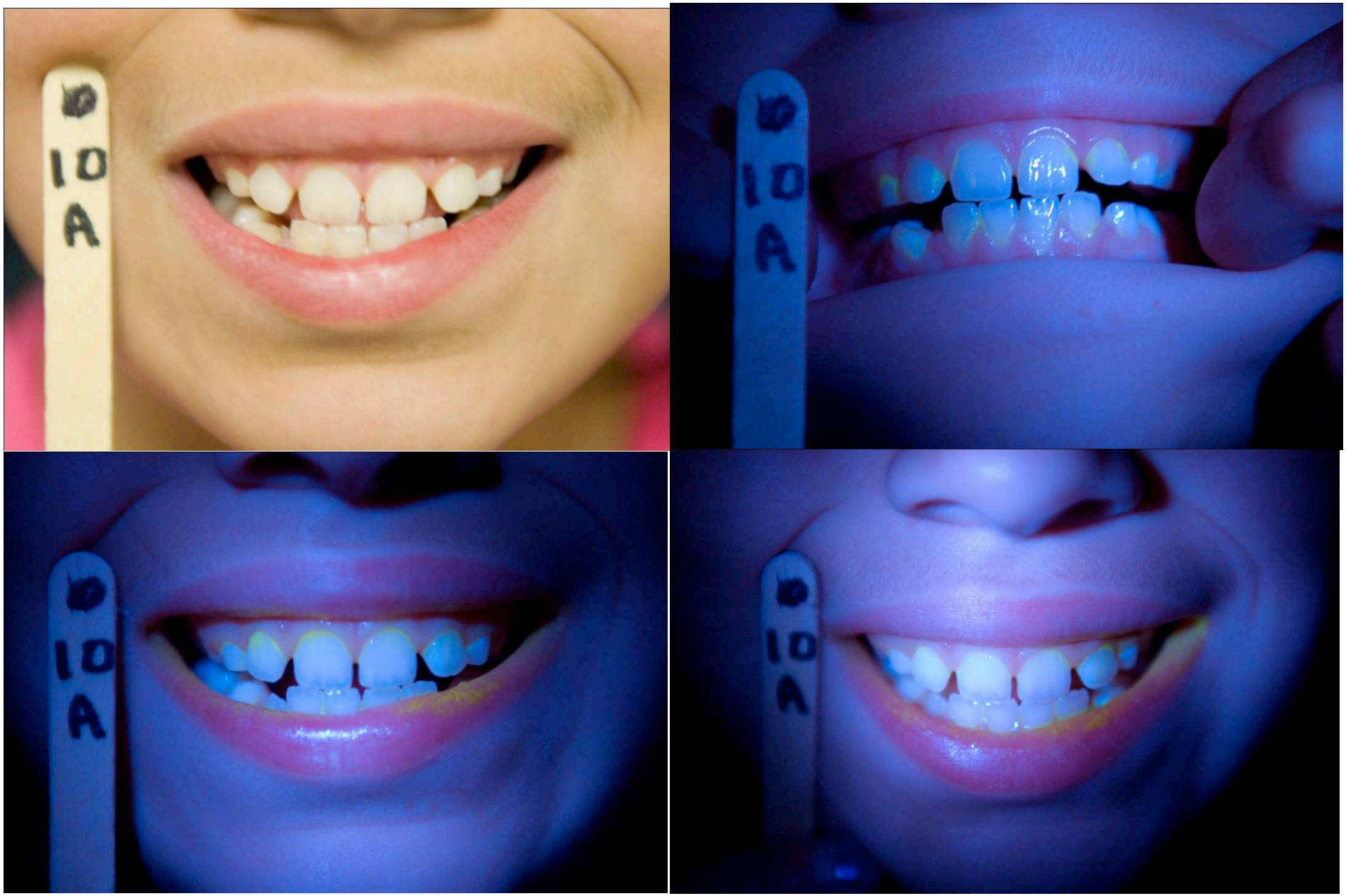
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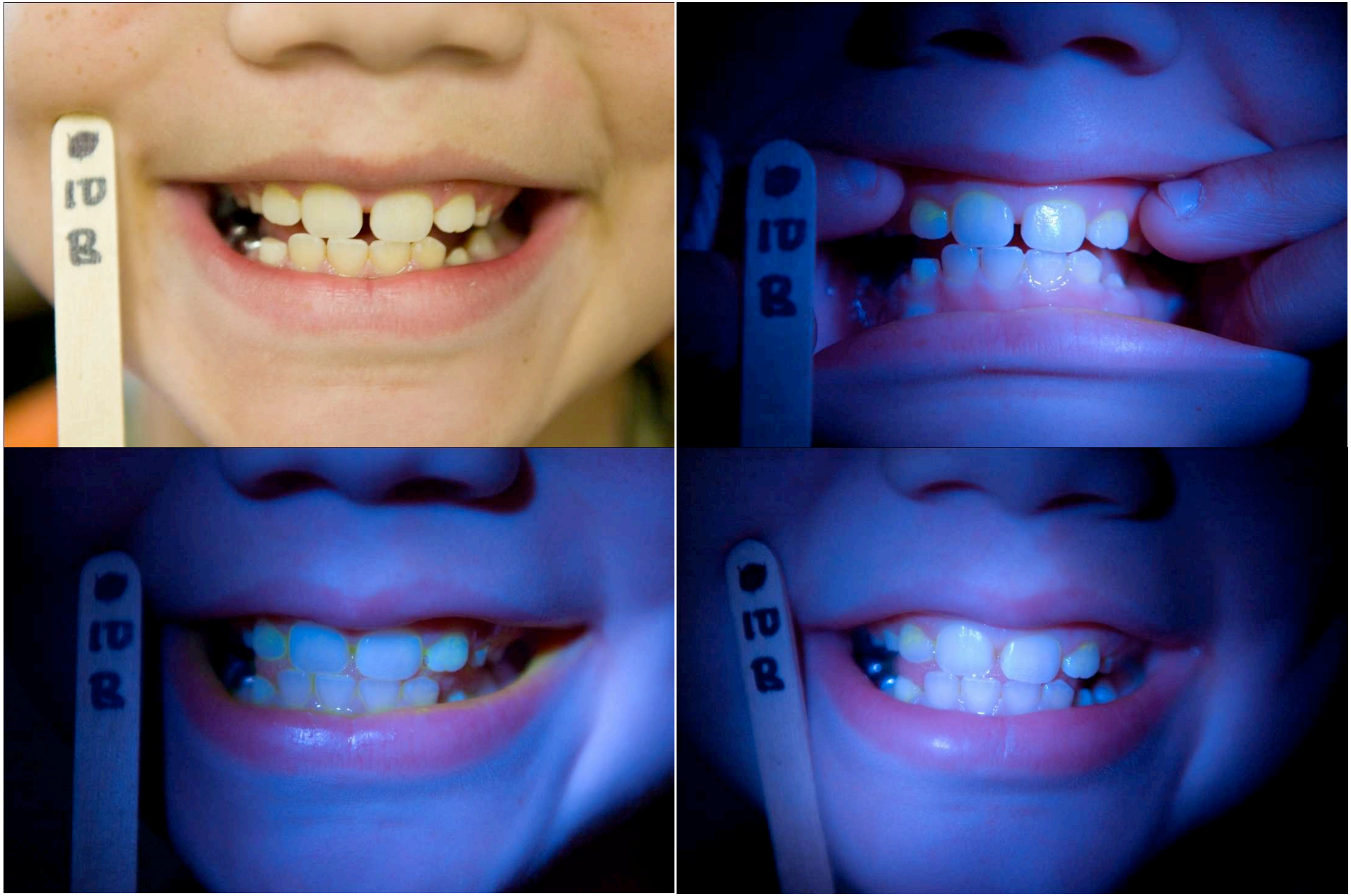

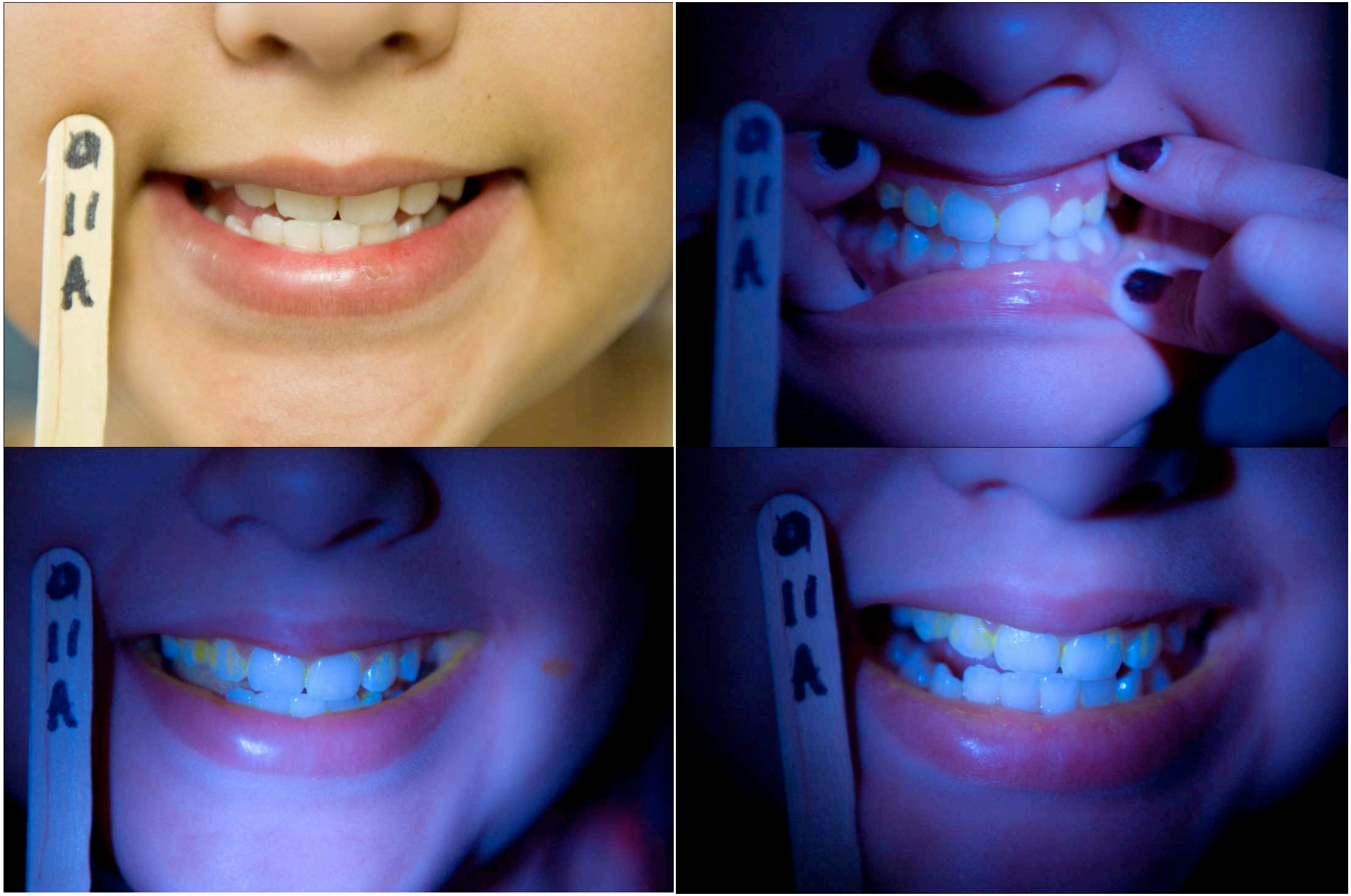


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