# Action Research Project:

Will My Patients' Oral Hygiene Compliance Increase

If I Demonstrate Dry Brushing?

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#### Abstract

As a dental hygienist working in two, rural community dental clinics, I often see plaque in my patients' mouths. Plaque retained on teeth and oral surfaces is a risk factor for dental disease and many patients present with active caries, gingivitis, and or periodontal disease. Part of my personal vision for patients is the reduction of dental disease by empowering patients to make choices towards health. I work consistently to educate my patients about disease and health, providing them with instruction in plaque removal via dry brushing.

In November and December of 2015, I carried out an action research project with the purpose of evaluating whether my demonstrating dry brushing would increase patient compliance. I asked: "Will my patients' oral hygiene compliance increase if I demonstrate dry brushing?"

I taught patients to detect plaque on their teeth and demonstrated how to remove it using a dry toothbrush. I asked patients to practice daily dry brushing for plaque removal and surveyed eight patients at follow-up dental hygiene appointments. All eight were practicing dry brushing daily. Patients demonstrate personally valuing dry brushing by recommending the practice to their family members and friends.

# Background

A dental hygienist for more than twenty years, I currently work for North East Washington Health Programs (NEWHP) in two community dental clinics. The clinics are Federally Qualified Health Centers (FQHC), and provide services at no or reduced patient cost under government programs (Medicaid and others), for fee (paid by cash or private insurance), or under an income-based sliding-fee scale for those who qualify. NEWHP is a non-profit organization having both medical and dental clinics serving three rural Washington counties: Ferry, Pend Oreille, and Stevens. Approximately 19 to 22% of the 64,300 people living in these counties live in poverty. (1)

Many of my patients present with plaque and active dental disease, including caries and or periodontal disease. Frequently they have had either no professional care for years or only emergency care, often extractions, and express a desire to get on a program of routine care and completion of treatment for their dental disease(s). Often times they are embarrassed or ashamed of their oral condition. Some struggle even to brush daily, perhaps due to having never made it a habit or priority, or because of pain, or not having a toothbrush. Some have had very negative dental experiences and are anxious about receiving dental care. Because of these issues, I have worked to create an atmosphere of trust and mutual respect, and effective, easy to implement, low-cost home care regimens.

To me, empowering patients to invest in their own health means teaching them about their current oral health status using a patient's own mouth, a hand mirror, intraoral photographs, radiographic images, etcetera. This is showing WHAT IS. Next, I explain and demonstrate what CAN BE (health). For example, if a patient has healthy areas as well as diseased areas, I show both and then teach the patient HOW to achieve oral health. Because patients are individuals and vary in their aptitudes, interests, desires, and commitments to health, patient education and inspiration must be patient specific.

As a dental hygiene student, I was blessed to have several patients with advanced periodontal disease and very limited incomes who were willing to "do anything" oral hygiene-wise to keep their teeth. I recall scaling one woman's very mobile teeth. I would hold each tooth in place with my finger while carefully scaling each one. I was so concerned a tooth (or all of them) might fall out while I was scaling, one night before clinic I dreamed all her teeth fell out while I was working to clean them. None did. My instructors worked very closely with me to create a homecare regimen that would maximize the patient's opportunities for health. The woman dry brushed and rubber tipped, she flossed and brushed interdentally. Her daily activity revolved around caring for her teeth. Her tissue tone and color improved. Her teeth lost their mobilities. She returned to periodontal health. Years later I saw her, not as a patient, just in passing. She stopped me and thanked me for all I had done to help her keep her teeth and said she still had all of them.

My experience with this patient has inspired me for nearly 25 years. We worked together to resolve and remove her disease. I did things only I could do, calculus and biofilm removal, and she did things only she could do, keeping appointments and daily plaque removal; together we achieved health.

Today, as I work with patients who have not had professional dental care in years, often decades, I thank them for the opportunity we have to work together and I explain there are things only I can do and things only they can do and together we can make a tremendous difference toward health. I do my best to treat everyone with kindness and respect and to make an environment of mutual understanding and trust, opening the way for the exchange of ideas and creating opportunities for learning while also exploring what the patient wants to gain from our interaction. Bolton says, "People can only learn when they are confident, respected and valued, and to an extent control the process of learning."

I believe in educating people about what is (in their oral health) and then empowering and guiding them to make choices and changes necessary to create or maintain health. The work completed by providers in the dental office makes a difference for oral health, but I believe the patient and his or her daily choices make the biggest differences.

While patients and I CAN work together for health, not all patients are cooperative. There are many things I do not know and much I have yet to learn about battling disease and creating health. Some patients do not want to invest in their oral health. Some are unwilling to make the needed changes in their

current habits and lifestyles. Finances and resources to pay for care are often lacking. I have had that life experience, that of having a dental or other health need and very limited or no resources with which to pay for care. Sometimes that is a very challenging place to be! But having had that experience enables me to connect with patients who are going through such difficulty. This challenge inspires me to continue to strive to create low cost solutions for patients and to encourage them to do what they can to promote health for themselves and their families and friends.

I have a curious mind and have long participated in reflective practice looking to be a better person and dental health care provider. Reflective Practice involves reflecting on actions, ideas, and feelings, and writing about them. (2, p 15) Reflective practice helps me to improve my interactions with others, my dental hygiene work, and to clarify my thoughts and actions.

#### Introduction

Many of my patients present with active dental disease, including caries and periodontal disease, often have not had dental care other than emergency treatment (often extractions) in years or decades, and are very independent in their thinking and living. I wanted to have a project that would benefit patients right away and make a tangible difference for oral health.

Two of the purposes of action research are to improve learning and to improve practice. (3, p51) My initial thoughts for action research were to investigate the difference asking permission to educate patients could make in patient compliance to recommended oral self-care regimens. I worked with patients, practicing techniques and ideas presented in <a href="Health Behavior Change">Health Behavior Change</a> in the Dental Practice. (4) Patients responded positively to my asking permission to share oral findings with them. I recognized if I asked permission from patients to share my discoveries in their mouths, I had to tell them about the plaque I saw clinging to their teeth and other oral tissues. I wanted to do this in a way that would not come across as judgmental and as though I was talking down to the patient. I sought a way of promoting self-discovery.

As I practiced my ideas with patients, I realized framing the study and investigating the impact of asking permission before educating on compliance could be quite complex and may not lead to immediate, tangible benefit to the patient and his or her health. After experimenting with this idea on a small scale, I decided against it as a study subject though I continue to ask permission in practice.

While I thought about the study question, I continued to interact with patients, working to educate them and remove biofilm, stain, and calculus.

It was during a discussion with classmates and faculty at O'Hehir
University this past summer I was reminded of dry brushing and the profound
effects the practice can have on oral health. Trisha O'Hehir kindly sent a copy of
her terrific book, The Toothpaste Secret. (5) After reading the book and trying dry

brushing myself (again, I had practiced it in years past but had not done so regularly in recent times). Because plaque is a primary risk factor for dental disease, (6) I realized dry brushing could really benefit my patients and could be used to encourage self-discovery and evaluation.

I began suggesting they add dry brushing to their home care practice. I tried various ways of presenting the idea but initially was disappointed, as patients did not seem interested in adding to their oral health care routines.

Knowing that dry brushing can make a dramatic difference in health (8) and a sense of having a fresh, clean mouth, (6) I did not give up, but kept developing and trying new ways of motivating patients to try dry brushing.

If I have not brushed my teeth for a period of time, I can feel plaque on my teeth. Plaque is associated with dental disease, (6,7, 8, 9) and the formation of calculus. (11) I know when I dry brush, my teeth feel smooth and clean. Trisha O'Hehir mentioned in our class discussion that if plaque is removed completely, calculus should not re-form. I figured since most patients don't particularly like scaling, I thought they would be glad to know another reason to remove plaque. But, the idea of removing plaque and the reality of removing plaque are often far apart. Many people do not know how, have the skill or dexterity, or have some other impedance to plaque removal. (6,12) My long experience as a dental hygienist has taught me people often benefit from hands on instruction, so I began demonstrating dry brushing for plaque removal in my patients' own mouths. Because I continued to believe in the value of dry brushing and was experiencing results in my own mouth, I wondered, *if I demonstrate dry brushing*,

will my patients' oral hygiene compliance increase? This became my study question.

The word, "compliance," sometimes has a negative connotation as it is at times used in a context with force being applied to the subject. It is not in my nature to *force* anyone to do anything. Rather, I think of compliance as "the degree to which an individual adheres to the advice provided by health care professionals." (10, p 27) As a patient, I seek health advice from those who know more than I do. I do not take this as a negative, but am grateful for their expertise. I want to be healthy and I do try to adhere to the advice my providers give, though at times I find I need additional training or help to implement what my provider wants me to do. As a health care provider myself, I seek to help my patients towards health. Sometimes that means I have to motivate a patient to want to be healthy, to do the work it takes to become healthy from a diseased state, and to desire and accept education to implement health promoting activities, in this case plaque removal via dry brushing.

# Methodology

I began to integrate dry brushing into my patient care routine, checking teeth for plaque and other deposits and talking with the patient about what I was seeing and feeling with the explorer. When I encountered visible plaque, if I had not already asked the patient about his or her current self care practices and what care had been done most recently and when, I asked. "Would you tell me, please, about what you currently do to care for your teeth?" or "When did you last

... brush, floss, etc." I do my best to use non-judgmental language, both by word and phrase choice and body language, so as to help the patient feel at ease and to feel he or she can be honest with me about their habits and choices. Many times I have seen what were to me copious amounts of plaque, and had patients say they brushed immediately prior to their appointment! Rather than say anything about what I see, I stop, and reach for a toothbrush.

While I am opening the toothbrush, I ask the patient to feel his or her teeth with their tongue. I ask, "How do they feel? Smooth? Rough? Fuzzy? How would you describe it?" If they say "smooth, " but I can see plaque, I ask if I may show them something. So far they have always said yes. I use the newly opened toothbrush to brush the lingual surfaces of the lower left quadrant. I then ask if he or she can feel a difference between the lingual surfaces of the left where I just brushed, and the right where I have not brushed. Most people can feel a difference and report the left feels smoother.

Some people seem to never have felt their teeth with their tongues before I ask and require a bit of coaching to feel along the gum line, and sometimes anywhere on the tooth surface. For those who cannot feel any differences even in areas right next to each other, one brushed and the other heavy with plaque, I show them with a hand mirror. Of course, some cannot see the plaque, either. If I have time or think it will be a worthwhile investment in the patient's education, I use disclosing solution to show the areas of plaque accumulation.

Coaching the patient on becoming plaque aware is an important part of dry brushing and practicing it in such a way as to be effective. The patient

benefits most when he or she can see or feel that the oral hygiene work they are doing provides a tangible difference or benefit. I encourage patients to evaluate their plaque levels after and during dry brushing by checking for plaque using their tongues and or using a mirror.

After I dry brush on the left side, I ask the patient to dry brush the right and coach them on brushing technique. When it comes to tooth brushing for plaque removal, technique matters. (13)

I have found that when patients feel their teeth are cleaner following dry brushing, they often ask why no one ever told them about dry brushing before.

Some lament that they could have prevented dental disease if they had only known about and practiced dry brushing beginning a long time ago.

I encouraged and taught dry brushing for several months before my action research data-gathering period, November 16 – December 5, 2015. The data-gathering period began after obtaining permission from my employer to do the study and closed on a Friday early in December to allow time for data analysis and paper writing. I had in mind to follow-up with patients I had seen or was seeing for multiple appointments (scaling and root planing or debridement) as they would have been educated in dry brushing and had opportunity to implement dry brushing, or not. I thought patients would likely give me more information if I were able to talk with them about their experiences. Sadly, few of my multi-appointment patients returned to me during my data-gathering period. I wanted to give patients an opportunity to try the dry brushing on their own and then ask them how it went. I did not want to ask them to do it in anticipation of

being involved in a study, but rather to offer an attractive, meaningful option and see if they would on their own do the work necessary to receive the benefit.

It was interesting to discover that though few of the patients I saw during the study period were returning for an appointment that was part of a series, I did sometimes see patients who were returning for an annual or semi-annual hygiene appointment. Many of these I either noticed in the chart notes I had talked with them about dry brushing at a 6 months or more ago appointment or the patient mentioned I had talked with them about it before, sometimes more than a year before.

#### Gathering and interpreting data and generating evidence

Before beginning the formal project, I obtained permission from my employer to do the study in the clinics. I submitted a written introduction to the study and all forms that were to be used. The practice in which I work is owned by a non-profit organization and the introduction and forms were submitted to senior management officers with final approval being affirmed by the Dental Director, Dr. Todd Garcia. Patients read and signed participation consent forms prior to filling out surveys.

I gathered evidence by demonstrating dry brushing and its effects with patients and encouraging them to add dry brushing to their current oral hygiene routines and recording notes about our discussions and demonstrations of dry brushing in the patient charts. During a designated study period, November 16 – December 5, 2015, I asked returning patients who had experienced my dry

brushing demonstration and talk, to complete questionnaires regarding their dry brushing habits. Eight patients returned questionnaires. Their responses have been collated onto a single form included in the attached appendix.

Looking back, I could have selected a broader range of responses by contacting patients who had already been exposed to my dry brushing demonstration and had been instructed in the techniques involved. I did not do this for several reasons including that I had hoped to talk face to face with patients about their experiences with dry brushing rather than sending them written materials or talking over the telephone. In my experience, people typically respond much more succinctly, if at all, to written materials or phone calls. Even so, I did choose to have patients complete a written questionnaire. If I were to do a study again, I might have a form I fill out regarding patient's expressed responses rather than asking them to fill it out. Another reason is that I wanted to see if their teeth were looking cleaner and if there were changes in the gingiva. I could have added these categories to the questionnaire or a different form I could have created to track responses.

Still, my initial question when considering a study question was about patient compliance. Perhaps my question would better have been worded something like, "How will demonstrating dry brushing influence patient compliance?" rather than, "If I demonstrate dry brushing, will my patients' oral hygiene compliance increase?" McNiff and Whitehead caution against questionnaires (3, p 142) but because my question was, "will ... compliance

increase?" I thought a written questionnaire appropriate for gathering and collating patient responses.

# Main Findings / Results

Of the eight patients surveyed, eight dry brush their teeth at least once per day. Half have noticed a reduction or an end to bleeding on brushing or flossing, three have noticed some reduction or are unsure, and one has not noticed a reduction in bleeding. Half feel their teeth are cleaner, two mentioned the convenience of dry brushing, and one is not sure yet whether dry brushing has made a difference for him or her. Eight of eight recommend dry brushing to their friends or family. That study participants would recommend dry brushing to friends and family demonstrates patients perceive value in dry brushing.

I did not track the interval between the initial exposure to a dry brushing demonstration and follow-up appointment, but now think I should have. I do know the longest interval between visits was in excess of twelve months. One of the study participants began dry brushing daily following his dental hygiene appointment with me in fall of 2014 during which I introduced dry brushing. He currently dry brushes once daily and says his calculus "no longer bridges".

In the periods before and after the time I designated as the study period, many times patients have opened up to me about their experiences with dry brushing. Some describe it as life changing. Others have built their schedules around caring for their teeth and taken ribbing from their family members. One

woman, recently widowed, wanted to quit smoking but needed guidance in making the commitment to do it and steps she could take to help her quit. I demonstrated dry brushing and suggested she brush her teeth when she wanted a cigarette. Several weeks passed between her appointments. When she returned she thanked me for teaching her dry brushing and said when she wanted to smoke, she brushed her teeth instead. By doing this, she had cut back significantly on the number of cigarettes she was smoking each day. And her teeth were looking better and feeling cleaner besides. Sadly, she did not return during the designated study period. Other patients have reported seldom brushing their teeth before learning about dry brushing but now brush daily, saying it is so convenient to brush since they do not have to use toothpaste. Others with significant decay sometimes find it more comfortable to brush without toothpaste and report brushing more frequently and or longer each time they brush.

One Friday recently I saw a patient who needed dental clearance prior to a joint replacement. It had been many years since he'd had any professional dental hygiene care. He presented with localized areas of heavy plaque, moderate to very heavy supragingival calculus, generalized moderate subgingival calculus, and generalized gingival erythema and edema. Because of the calculus and plaque, the dentist was unable to complete his exam and release him for surgery. I was needed in another operatory to give anesthesia and gave the patient a brief introduction to plaque awareness (feeling and recognizing plaque on his teeth), I demonstrated dry brushing in one quadrant,

and instructed him to brush the others while I stepped out for a moment. When I returned, he was happily brushing his teeth and expressed amazement at how different they felt. I perio charted and performed a gross debridement; he was then scheduled back for needed scaling and root planing. He returned the following Wednesday. He was very glad to see me and told me how well the dry brushing was going. Immediately after his last visit, he had gone straight to the store to purchase the toothbrush I suggested and was dry brushing his teeth 3-4 times per day. Because he had been brushing and cleaning between his teeth well, he presented with very little plaque. His gingiva was pink except in areas of remaining moderate subgingival calculus. He was like a new man. Excited for the changes in his mouth, we talked about how clean and already looking healthy his mouth was. He told me no one had ever shown him how to brush and that his last dental hygiene appointment, if he'd ever had one, was when he was in the military in 1971 or 72. I am happy to say that with the changes in his homecare, he has been cleared for surgery, and plans to return for completion of his dental treatment plan.

Many patients have told me dry brushing has been very valuable to them and they intend to continue it for life.

#### Methods Summary:

- Demonstrate effect of dry brushing
- Coach on checking for plaque
- Coach on brushing technique
- Coach on frequency and duration of dry brushing
- Follow up at future appointment

### **Business Aspects**

What price can be put on patient satisfaction? My patients who have adopted dry brushing and see and feel the differences in their oral health express gratitude and satisfaction with their dental care. They value the care I have given them. I always make it a point to thank them for being proactive and taking steps to improve their health. This is empowering to them and they grow in confidence in themselves. These patients keep more appointments, are more likely to comply, and have less anxiety and pain. (10, p 28) They also refer family and friends for care.

Because health is gained, patient care needs change. Patients may not need to be seen as frequently for prophylaxis or periodontal maintenance. Their out-of-pocket costs and time invested in dental appointments may be lessened.

When there is less calculus, there is less physical work for the dental hygienist. This may result in reduced risk of occupational injury or being able to see more patients in a day or freeing the dental hygienist to perform other duties; preventive, restorative or anesthesia functions, possibly boosting office production.

When the periodontal foundation is healthy and any decay has been addressed, patients are often interested in cosmetic dentistry. This may result in increased production and satisfaction for the patient and the dental team.

Seeing patients comply with oral hygiene recommendations and watching

them become healthier is inspiring for the dental team. Our satisfaction is increased, as is our willingness and confidence to step out of our comfort zones to address areas in which a patient may need help or coaching toward health. The patient is more likely to listen if he or she has trust in us already. For example, perhaps a patient is a tobacco user and previously not ready to quit, but experiences success with dry brushing and becomes ready to make a commitment to quitting. In this case, increases in health and reduction in health care and employment costs may result. The patient may contribute more to his or her work and society at large. Currently, medical noncompliance is estimated to cost \$300 billion per year. (10, p 27)

#### Conclusion

I will continue to demonstrate and teach dry brushing to my patients. Not all will choose to dry brush, but those who do are likely to experience an increase in health and self-confidence. For me, the most profound impact dry brushing has had is the tremendous satisfaction and inspiration I experience as I watch people improve their health. I have witnessed people who are suffering and discouraged when they begin their dental treatment blossom and grow as they travel through to the completion of treatment. It is hope inspired by change the patient chooses, by the patient doing the work needed to improve his or her health. This work may be keeping appointments, cleaning their teeth, quitting

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smoking, changing to a healthier diet, or any manner of other things. I have

witnessed personal transformation of my patients many times.

Even so, there are times I do become discouraged and stressed about my

work as a dental hygienist. There are time and production pressures; patient

challenges, and other frustrations. But all those difficulties pale when a patient

shows success in choosing health. With Vincent Van Gogh, I say, "I am seeking.

I am striving. I am in it with all my heart."

Word count: 4627

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# **Appendix**

# Questions and collated responses from action research project questionnaires

 Can you see or feel (with your tongue) plaque on your teeth prior to brushing? YES / NO / UNCERTAIN

7 yes, 1 no

2. How often do you dry brush your teeth?

8 daily at least once, 3 twice at least, one always at least once, trying for twice

3. Can you feel a difference on the surfaces of your teeth and along the gum line when you dry brush? YES / NO / UNCERTAIN

8 yes

4. Have you experienced bleeding when brushing or flossing? YES / NO

4 YES, 3 NO, 1 said "haven't noticed"

- 5. If you dry brush, have you experienced a reduction or end to bleeding on brushing or flossing? YES / NO
  - 2 "YES"
  - 1 "YES" and "reduction in bleeding when flossing"
  - 1 "some"
  - 1 "not sure, think so",
  - 1 "haven't noticed",
  - 1 "N/A" (she has not experienced bleeding when brushing or flossing)
  - 1 "no"

6. What difference has dry brushing made for you?

"I've noticed even after sleeping all night my teeth feel cleaner in the morning than before. No more bleeding when flossing."

"its more convenient to brush throughout the day"

"It's easier and more convenient"

(calculus) "stopped bridging"

"It seems to help reduce the plaque problem"

"My teeth feel cleaner - noticeably"

"cleaner mouth"

"not sure yet"

7. Would you recommend daily dry brushing to your friends or family? Why or why not?

"Yes, very effective and economical"

"Yes! My teeth feel cleaner and it is so simple everyone can do it!"

"Yes."

"I have"

"Yes. Seems to help"

"Yes, absolutely – because you can literally feel the difference on your teeth."

"I do"

"Yes. I think it is good for my gums"

8. Has learning about and practicing dry brushing influenced or changed your use of toothpaste? How?

"Yes, only use it sometimes now"

"Yes! I usually dry brush and the(n) use toothpaste after. Sometimes I skip it all together now."

"I use less, still use some at end of day, before bed."

"I use much less overall and use less when I do"

"Yes, sometimes if I feel I have limited time, I skip the toothpaste and dry brush"

"I 've gone from using toothpaste 2-3x daily to occasional use.

# 9. Any other thoughts or comments?

"Thanks for teaching me about dry brushing. Why isn't this more commonly taught?"

"Nope! I love how freaking convenient dry brushing is brush anywhere not as much need to spit no toothpaste"

"I think this is a good idea."

"good luck ©"

"Having been employed in the dental field for literally decades – dry brushing has been a real eye opener – much less abrasive than using toothpaste multiple times daily."

"no"

"Not at this time"