Dry Brush Inside Bottom Teeth First
page 1

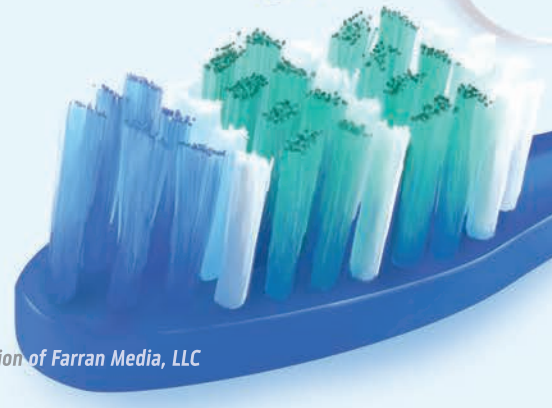
Perio Reports Vol. 25 No. 11
page 2

hygienetown

November 2013

with **Perio Reports** by Trisha E. O'Hehir, RDH, MS

Is the Standard Prevention Message Working?



A Division of Farran Media, LLC

Dry Brush Inside Bottom Teeth First

by Trisha E. O'Hehir, RDH, MS
Hygienetown Editorial Director

Dentists and hygienists provide careful toothbrushing instructions, but something gets in the way of effective brushing at home. In the office, toothbrushing instructions are always done with a dry toothbrush, without toothpaste. At home, on goes not the pea size drop of toothpaste, but instead that of a Dairy Queen swirl. Toothpaste creates so many bubbles which makes patients lean over the sink, drool and daydream while brushing. What seems like three minutes is really closer to 30 seconds, not enough time to effectively remove plaque from all surfaces of all the teeth. The flavoring and wetting agents in the toothpaste actually numb the tongue, tricking people into thinking their teeth are clean long before removing all the plaque.

For these reasons, brushing first without toothpaste will actually result in longer brushing time and more effective plaque removal. Research published in *JADA* in 1998 confirms this. Patients instructed to dry brush their teeth, beginning on the inside of the bottom teeth first and brushing until the teeth felt and tasted clean throughout before adding toothpaste showed significant benefit after six months. This resulted in a 63 percent reduction in lingual calculus and a 55 percent reduction in lingual bleeding. Despite the many benefits of toothpaste ingredients, toothpaste actually gets in the way of effective plaque removal. What is your observation about patient effectiveness with toothbrushing?

The brushing, flossing and fluoride routine remains the standard preventive message, but recent systematic reviews show it isn't working as well as one would expect. This begs the question, "Is the standard prevention message working?" ■

Inside This Issue

NHANES Report on the Prevalence of Perio in Adults

The National Health and Nutrition Examination Survey (NHANES) is a large-scale study first completed in 1960-1962 and repeated several times since then, with the most recent report covering 2009 and 2010. One area of investigation within this large scale study is the prevalence and incidence of periodontal disease in adults. In past surveys, only partial-mouth probings were done. This is the first to report six probing sites per tooth for all teeth in the mouth.

Dental hygienists working in mobile clinics examined 3,743 patients across 50 states and the District of Columbia. This sample represents 137.1 million civilian, non-institutionalized American adults.

Definitions of periodontitis for this study included severe with two or more interproximal sites with 6mm or more of attachment loss (AL) and one or more sites with 5mm or more of probing depth (PD), moderate was two or more interproximal sites with 4mm or more of AL and two or more sites with 5mm or more of PD, and mild was two or more interproximal sites with 3mm or more of AL and two or more sites with 4mm or more of probing depth.

The prevalence of periodontitis in this group was 47.2 percent representing 64.7 million people. Reports for disease severity were: 8.7 percent with mild, 30 percent with moderate and 8.5 percent with severe. In adults 64 years or older the prevalence of periodontitis was 70.1 percent. Periodontitis was highest in men and Mexican Americans.

Clinical Implications: Periodontitis remains a significant public health problem, especially among the aging population. ■

Eke, P., Dye, B., Wei, L., Thornton-Evans, G., Genco, R.: The Prevalence of Periodontitis in the United States: 2009 and 2010. J Dent Res 91(10): 914-920, 2012.

Perio Reports Vol. 25, No. 11

Perio Reports provides easy-to-read research summaries on topics of specific interest to clinicians. Perio Reports research summaries will be included in each issue to keep you on the cutting edge of dental hygiene science.

www.hygienetown.com

Periodontal Disease Significantly Underestimated

Past NHANES studies suggested a decline in periodontitis based on partial-mouth probings. Previous partial-mouth probings presented biased data that did not accurately represent the extent of periodontal disease in this country.

In past studies, only two random quadrants were evaluated and only two sites per tooth measured: mesial-buccal and mid-buccal. In one of the studies they used three sites, including the distal-buccal site. This data led to a prevalence rate for periodontitis of 19.5 percent with two sites per tooth or 27.1 percent with three sites per tooth compared to the 2009-2010 figure of 47.2 percent, based on full-mouth data.

Prior to the current study results, a decrease was reported over a 15-year period. Attachment levels of 6mm or more were reported to drop from 8.4 percent to 5.3 percent. Compare the 5.3 percent reported in 1999-2004 to the current level of 25.5 percent reported for attachment loss of 6mm more and the bias of partial-mouth probing in previous study results is clear. Had the latest data been collected with partial probings, there would have been nearly a five-fold underestimation of periodontal disease prevalence.

Socio-demographic patterns remain the same from past to current NHANES findings. Periodontitis is more prevalent in men, smokers, people below the poverty line and those with the lowest education. Mexican Americans are now more affected than Non-Hispanic Blacks.

Clinical Implications: Periodontitis has been underestimated by 50 percent with new figures suggesting that nearly 50 percent of the population has some periodontal disease and 70 percent of those over 65 years of age are affected. ■

Papapanou, P.: The Prevalence of Periodontitis in the US: Forget What You Were Told. J Dent Res 91(10): 907-908, 2012.

continued on page 3

 continued from page 2

Manual Toothbrushing Removes Less than 50 Percent of Plaque

Toothbrushing is generally accepted as the most common practice to reduce oral plaque biofilm. Despite the introduction of a variety of toothbrush designs and bristle configurations, no one toothbrush design has been found to be superior for plaque removal. Personal preference for one brush over another is how people decide which brush to use. Enthusiastic brushing is not however synonymous with effective plaque removal. Most people are able to remove approximately 50 percent of plaque with a one-minute brushing. This means people are generally not very good toothbrushers and live their lives with considerable plaque on their teeth. A systematic review was needed to determine the effectiveness of manual toothbrushing.

Researchers at University of Amsterdam in the Netherlands evaluated all available studies to determine the effect of manual toothbrushing on plaque removal. A total of 59 papers with 212 brushing experiments were evaluated. A total of 10,806 subjects participated in these studies. The outcome analyzed from each of these studies was the percentage of reduction in plaque from before to after the brushing exercise.

Overall, the manual toothbrush provides a 42 percent reduction in plaque scores. The reduction is 30 percent when the Quigley and Hein plaque index is used and 50 percent when the Navy plaque index is used. Sub-analysis revealed that various bristle designs reduced plaque scores 24 to 61 percent. Toothbrushing time also impacted plaque removal. For studies brushing for one minute, the mean plaque reduction was 27 percent and increased to 41 percent with two minutes of brushing.

Clinical Implications: Toothbrushing doesn't remove as much plaque as you might expect. ■

Slot, D., Wiggelinkhuizen, L., Rosema, N., Van der Weijden, G.: The Efficacy of Manual Toothbrush Following a Brushing Exercise: A Systematic Review. Int J Dent Hygiene 10: 187-197, 2012.

Dry Brushing Mandibular Lingual Surfaces First

Standard toothbrushing instructions focus on bristle placement and toothbrush movement, not where to start brushing. Mandibular lingual surfaces have the highest levels of both calculus and gingivitis, but this area is often the last to be brushed, if at all. Many clinicians followed their common sense instincts and recommended that patients brush mandibular lingual surfaces first. Individuals reported success with this approach, but no research was available to confirm these findings.

To test this theory, 29 dental hygienists were invited to participate in a pilot study to measure the effects of lingual brushing first on calculus and bleeding. They invited patients with heavy lingual calculus to participate in the study. Since all were busy clinicians, data collection was limited to mandibular lingual surfaces, measuring calculus and bleeding upon probing. A total of 126 patients participated in the study. Dental hygienists instructed the patients to begin brushing on the lingual surfaces of the mandibular arch. They were told to brush dry, no water and no toothpaste. They followed their regular brushing technique, brushing until all the teeth in the mouth felt clean and tasted clean. At that point, they rinsed their toothbrush, added toothpaste and brushed again to deliver the toothpaste to the tooth surfaces. They were seen again at six months.

Analysis of the data revealed a 55 percent reduction in bleeding on the mandibular lingual surfaces and a 58 percent reduction in calculus. When analyzing data from just the mandibular anterior teeth, the reduction in calculus was 63 percent. Patients reported brushing longer and more evenly throughout their mouths.

Clinical Implications: Teach patients to dry brush mandibular lingual surfaces first to achieve longer time brushing and more thorough plaque removal. ■

O'Hehir, T., Suvan, J.: Dry Brushing Lingual Surfaces First. JADA 129:614, 1998.

Dental Floss Provides No Benefit over Toothbrushing Alone

Dental flossing is encouraged and recommended daily by dentists and dental hygienists. Dental professionals believe, based on common sense, that dental floss is effective. However, the research doesn't bear this out. Some studies show no benefit when flossing is added to toothbrushing.

Researchers at the University of Applied Sciences in Amsterdam, the Netherlands, performed a Cochrane Review to see how brushing alone compared to brushing and flossing. Of the 187 studies they evaluated, 11 met the criteria for inclusion in the review process. They were controlled, clinical trials lasting at least four weeks on subjects 18 years of age and older. Many of the studies showed no benefit from flossing on either plaque levels or gingivitis. The data from these studies was extracted and evaluated by way of a meta-analysis to determine the effect of daily dental floss use on plaque and gingivitis levels.

While individual studies may show some benefit when flossing is used without toothbrushing, this systematic review of dental floss research showed no beneficial effect when dental flossing was added to toothbrushing. Two of the studies included involved dental students with more than average knowledge of proper brushing and flossing technique. However, even with that advantage over the general population, no benefit from flossing was demonstrated. Dental floss is no longer the first choice for interdental control of plaque and gingivitis.

Clinical Implications: Clinicians must decide on an individual basis what the best interdental tool is for each patient. The scientific evidence does not support recommending dental floss to every patient. ■

Berchier, C., Slot, D., Haps, S., Van der Weijden, G.: The Efficacy of Dental Floss in Addition to a Toothbrush on Plaque and Parameters of Gingival Inflammation: A Systematic Review. Int J Dent Hygiene 6: 265-279, 2008.

Fluoride Toothpaste Reduces Caries 23 Percent

Fluoride toothpastes have been used since the 1950s in the United States and are widely used and recommended today. A review of the randomized, controlled trials comparing toothpastes of varying fluoride concentrations was undertaken as a Cochrane Review. The studies reviewed were published between 1955 and 2009 in the U.S. and the U.K. The minimum study length was 12 months and the longest study was seven years. Analysis focused on the data closest to the three-year mark. Study participants were children up to the age of 16.

A total of 75 papers covering 83 independent trials were included in the review. Fluoride concentrations of 440/500/550ppm showed no beneficial effect when compared to a placebo toothpaste for caries reduction. Toothpastes with fluoride concentrations of 1000/1055/1100/1250ppm demonstrated a 23 percent effect when compared to a placebo. Higher concentrations proved greater benefit. This figure is called the "prevented fraction" and is calculated by taking into account the effect of both the test and placebo group averages for caries reduction. This figure is considered a more accurate representation of the preventive effect of the fluoridated toothpastes.

Analysis was also done on the potential for dental fluorosis in children under the age of six years when any topical fluoride was used. No significant association was found between the frequency of brushing with fluoride toothpaste or the fluoride concentration on dental fluorosis.

Clinical Implications: Fluoride toothpaste has the potential to provide a caries reduction benefit of 23 percent. Additional approaches and interventions are needed to achieve 100 percent caries prevention. ■

Wong, M., Clarkson, J., Glenny, A., Lo, E., Marinho, V., Tsang, B., Walsh, T., Worthington, H.: Cochrane Reviews on the Benefits/Risks of Fluoride Toothpastes. J Dent Res 90(5):573-579, 2011.

Is the Standard Prevention Message Work

by Trisha E. O'Hehir, RDH, MS

Are brushing, flossing and fluoride really preventing dental disease? The evidence suggests that both caries and periodontal disease are completely preventable but despite that fact, these diseases are on the rise. Why isn't the general public capable of preventing dental disease? More importantly, are they even getting the message that dental disease is preventable?

The general public actually thinks tooth decay and gum disease are inevitable. Their parents had cavities and they are convinced they will too. Bleeding gums? Some report to you that their whole family has bleeding gums, yet they aren't concerned about it. To them, it's normal.

Consumers believe you just can't do anything about dental disease. To them, it's inevitable.

In many cases, it does seem inevitable. Despite the best efforts of the dental and dental hygiene professions, dental caries is still the most common childhood disease in the United States today and periodontal disease is still a serious problem.

According to the National Institute of Health (NIH), caries rates declined in the early 1970s, but recent studies show an increase in dental caries. The Centers for Disease Control and Prevention (CDC) reported on data collected between 1988 and 1994 that 24 percent of children two to five years of age had caries in their primary teeth. CDC data reported in 2007 shows that rate had increased to 28 percent. In adults the current data indicate that 92 percent of adults 20 to 64 years of age have experienced dental caries in permanent teeth. In the 1970s it was reported than 50 percent of children up to age 17 were caries free; that's no longer the case.

A 2010 press release from the American Academy of Periodontology reported that partial-mouth probing in epidemiology studies was compared to full-mouth probing and revealed a significant underestimation of periodontal disease – an underestimation of 50 percent! In the study published in the *Journal of Dental Research* in 2012, new estimates for periodontal disease are much higher than previously reported by NIH. New figures indicate 47 percent of adults 30 years of age and older have at least one tooth with periodontitis. For those 65 and older, the figure is 64 percent. Why isn't modern day prevention working?

There are several aspects contributing to the current situation: education, practice and tradition. Dental and dental hygiene education focus primarily on the treatment of disease, not prevention, so the focus of most research is also on treatment of disease with new technology, materials and approaches in the restorative arena. Dental education focuses on the diagnosis and treatment of dental disease. The four years of dental school generally include a single, one-credit course on prevention. There are bits and pieces of the prevention message sprinkled throughout the curriculum, but grades depend on finding and treating the destruction caused by disease, with little time left for preventing it.

Dental hygiene education places more emphasis on prevention, but the grades and eventually the state board examinations focus on calculus removal. Even dental hygiene education rewards treatment rather than prevention. Clinicians get the message early in their careers that treatment is more valuable to a dental practice than prevention.

In clinical practice, little value is placed on prevention as those procedures are often provided at no charge or simply included with the routine prophylaxis visit. No charge means no value in the minds of the consumer. The value of prevention doesn't translate into actual financial charges for basic preventive information. Educating patients and coaching them on the best ways to prevent caries and periodontal disease are services given away. Time spent providing services at no charge also means a negative impact on the bottom line of the practice. Since prevention is so low on the productivity scale, few clinicians are willing to expend the energy to reflect on the effectiveness of the standard prevention message and implement change where needed. The standard prevention message of brushing, flossing and fluoride has become an established tradition that is no longer questioned. For many decades it has been the message of the ADA. The advice pages on the ADA website for every age group encourage toothbrushing with a fluoride toothpaste and flossing. Two of the highlighted messages on the website are: "Flossing once a day can keep the drill away" and the toothbrushing message "two minutes twice a day." Brushing, flossing and fluoride are still the message despite scientific evidence showing disappointing results from toothbrushing, dental floss and fluoride toothpaste.

Toothbrushing

In a recent systematic review of manual toothbrushing studies published in the *International Journal of Dental Hygiene,* it was shown that most people can't even remove half the plaque on their teeth with toothbrushing. Researchers reviewed 59 papers with 212 brushing tests involving 10,806 participants to answer the question, "Do we have scientific evidence showing that toothbrushing is effective?" The average amount of plaque removed from pre- to post-testing was 42 percent. Subjects were

continued on page 7

ing?

 continued from page 6

most often given one minute to brush and told to brush as usual. In a few studies, they were instructed to follow the Modified Bass toothbrushing technique. When separating the data based on the amount of time allowed to brush their teeth, those brushing for one minute only removed 27 percent of the plaque compared to those brushing for two minutes who removed an average of 41 percent of the plaque.

As a clinician, it is assumed that with proper instructions people will actually remove 100 percent of the visible plaque on their teeth. The goal is 100 percent removal, but if not that, at least 85 percent. The evidence that people are only removing 42 percent of the plaque on their teeth is disturbing, but certainly explains why dental disease is still a significant problem. Couple this with information that people rarely brush more than 30 seconds, equating to 27 percent plaque removal and we have a recipe for oral health failure.

Dental Floss

Toothbrushing is the most common approach to mechanical plaque removal despite the fact that caries and periodontal disease are more likely to occur between the teeth than on facial or lingual surfaces.

Dental floss is the first choice for interdental cleaning touted by dentists and hygienists alike. Dental education stresses dental floss for interdental cleaning with such rigor. Many dentists and hygienists continue to recommend dental floss despite noncompliance and scientific evidence showing that few people actually floss daily and that dental floss in the hands of the public does not provide the anticipated bacterial biofilm removal.

A systematic review published in the *Journal of Dental Research* in 2006 evaluated professional and personal flossing. When daily flossing was performed by an oral health professional, the risk for caries in deciduous teeth was reduced 40 percent. In studies where the subjects reported they performed daily flossing, there was no beneficial effect and no reduction in the risk for caries.

Another systematic review published in 2009 in the *International Journal of Dental Hygiene* posed the question, "Does flossing plus toothbrushing provide benefit over toothbrushing alone for plaque removal and reduction in gingivitis?" The conclusion was no, flossing does not provide a significant benefit over brushing alone. All the more reason to consider alternatives to dental floss.

Based on these findings, the routine instruction of dental floss use is not supported by scientific evidence. It's better to determine on an individual basis the best approach for cleaning interdental spaces and what alternative to dental floss will work best for each patient. Many different interdental cleaning devices are available that are both effective and easier to use than dental floss, for example sticks, picks and water irrigation. Picking the right interdental cleaning aid depends on the size and shape of the area, morphology of interdental tooth surfaces, dexterity of the patient and willingness to comply with the recommended product. Even if dental floss was effective, which it isn't, compliance is reported to be 13 percent of adults according to a study published in the *Journal of Periodontology* in 1996 and a Gallop Poll conducted in 1999. The other 87 percent floss infrequently or not at all. It's time for alternatives.

Fluoride

Fluoride toothpaste is the third common recommendation. Toothpaste companies realize that people are not brushing effectively, so their solution is fluoridated toothpaste to deliver a chemical for caries prevention. Toothpaste advertising has been so successful, people now believe the toothpaste is more important than toothbrushing. Based on the current low levels of plaque removal with toothbrushing, that might be true, but fluoride in toothpaste is not achieving the goal of disease prevention either. A recent *Cochrane Review* evaluated 79 clinical trials evaluating the effect of fluoridated toothpaste in 73,000 children up to age 16. With the U.S. standard 1,000ppm fluoride concentration, the preventive effect was 23 percent. With higher concentrations of prescription fluoride from 2,400ppm to 2,800ppm the preventive benefit increased to 36 percent.

These current findings are quite different from the fluoride toothpaste ads of the 1950s and1960s with children holding a note from the dentist and saying "Look Mom, no cavities." When introduced, it was anticipated that fluoride added to toothpaste would eliminate tooth decay completely, but the evidence proves otherwise.

Summary

With toothbrushing only removing 42 percent of plaque, flossing not adding any benefit while 87 percent don't floss regularly anyway and fluoride toothpaste reducing caries by only 24 percent, it's time for a new science-based prevention message that provides better results. Sticking with this message might be comfortable, but it isn't effectively preventing dental disease. Take a look at your patients and see if the standard prevention message is as ineffective as the research suggests. How healthy are your patients when measuring plaque, gingivitis, bleeding and caries?

Cleaning between the teeth is the most important area to focus on as this is the area at greatest risk for caries and periodontal disease. Knowing that, what is your message to patients about preventing caries and periodontal disease between the teeth? More flossing isn't the answer. We know that won't work. Brushing doesn't reach between the teeth, so that doesn't help. What will your message be?

"Brush, floss and fluoride" has been the message for decades, but it isn't effectively preventing dental disease. It's time for a new message – what will it be? Share your suggestions for a new prevention message in the comments section associated with this article on both Dentaltown.com and Hygienetown.com. ■

To comment on this article, visit Dentaltown.com/magazine.aspx.

Spry
DENTAL DEFENSE SYSTEM®

MADE SIMPLE MADE SWEET

SPRY® DENTAL DEFENSE SYSTEM

You've been telling your patients to "brush and floss" since their very first visits—yet dental caries rates continue to climb. Perhaps there is something missing from your message that can help reverse this trend.

Clinical and laboratory studies have consistently proven the impressive oral health benefits of an all-natural sugar-replacement and dental aid, Xylitol.

Spry products from Xlear Inc., *The Xylitol Experts*, combine the natural benefits of xylitol with delicious natural flavors to create an extraordinary *Dental Defense System®*—a full line of xylitol-rich dental care products from toothpaste and tooth gels to oral rinse, chewing gums, mints and even dental floss.

Now you can offer your patients an easy-to-use way of getting extra help in their oral care programs—anytime throughout the day and in ways that easily fit into their lifestyles.

Sweetened with 100% XYLITOL!

XLEAR
THE XYLITOL EXPERTS

THE MAKERS OF

Spry | SparX | XyloSweet

Available at your local fine health food store or ask your local retailer to carry Xlear.
Call or visit us at: 1.877.599.5327 www.xlear.com

Premier®
Resin Handle Ultrasonic Inserts

Choose from Universal, Triple Bend or the Thin-tip designs. Premier inserts are made in the U.S.A. with 100 years experience and are compatible with most magnetostrictive hand pieces.

Satisfaction guaranteed!

Big Easy® inserts with cushioned ergonomic grips are also available from Premier® Dental Products Company.

$66 Each
Net price after 2+1 offer

INTRODUCTORY SPECIAL!

2+1 FREE!*

Purchase any two resin handle inserts for $99* each, get one **FREE!**

Contact your dealer for more information!

Premier® Dental Products Company
888-670-6100 • www.premusa.com

*Suggested U.S. retail price. **Forward a copy of your dealer invoice indicating purchases and desired resin handle insert(s) free good to: Premier Redemption Center, Box 640, Plymouth Meeting, PA 19462-0640: Fax 888-627-6160: E-mail: Redemption@PremUSA.com. Valid in the U.S. and Canada only; cannot be combined with other offers. Limited quantities available. Offer valid from 11/1/2013 through 12/31/2013. Redeem by 1/15/14. Big Easy U.S. patent number D428,652.

THINK ABOUT IT.

Why do you *really* use fluoride varnish?

To protect your patients' teeth!

Independent studies show Enamel Pro® Varnish delivers more enamel fluoride uptake and greater fluoride release than 3M Vanish[1,2]

Indications for use:

- Enamel Pro® Varnish is a fluoride containing preparation for the treatment of dentinal hypersensitivity, and for the reduction of post operative sensitivity.
- Enamel Pro Varnish offers a nice esthetic appearance, is patient pleasing and has studies which support fluoride uptake, fluoride release and diminished hydraulic conductance.[1,2,3]

Premier® Dental Products Company
888-670-6100 • www.premusa.com

1-3 Full data available. / 3M Vanish is not a trademark of Premier Dental.