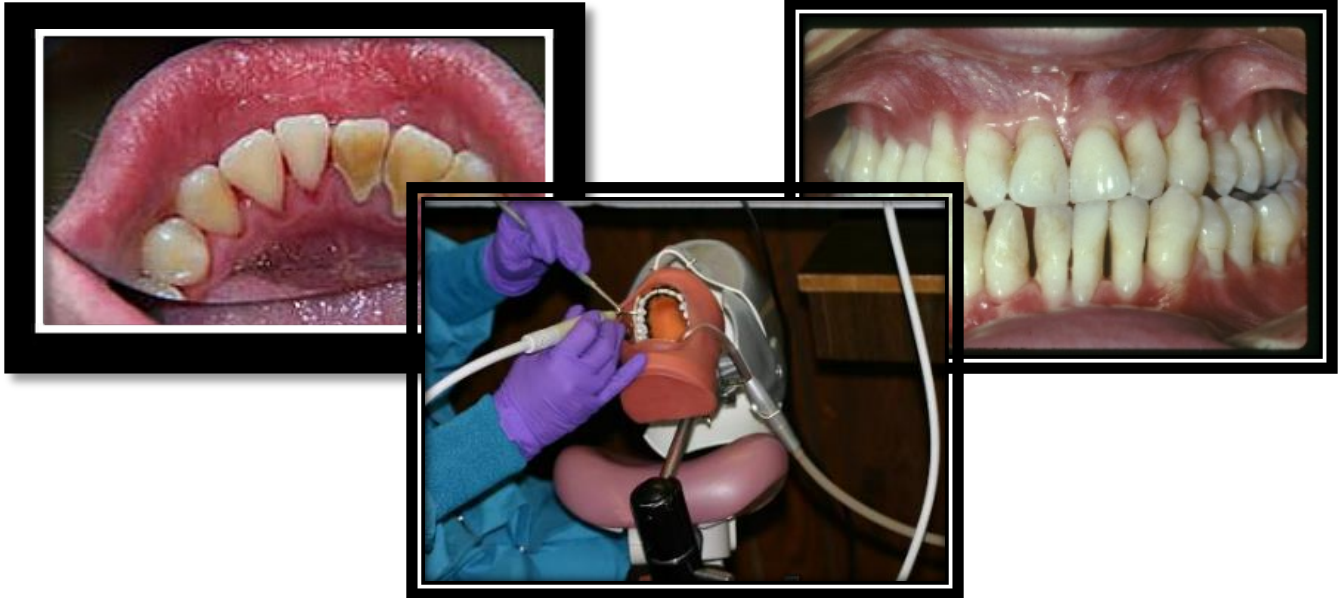


# Evaluating the Effectiveness of Periodontal Expanded Function Dental Assistants



**August 28, 2017**

**Indian Health Service Division of Oral Health**

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## Executive Summary

Oral health disparities in American Indian and Alaska Native people are well known and include caries experience, untreated decay, periodontal disease and missing teeth. Like all disparities in health, oral health disparities exist as a result of unequal distribution of social, economic, and environmental resources. Limited access to and availability of dental services are critical barriers that can limit a person's use of prevention and treatment. A national oral health workforce shortage exists. In contrast to typical medical practice structure, oral health care in the U.S. lacks a robust force of midlevel dental providers. That is, breaking away from the traditional triad of dentist, hygienist, and assistant, alternative dental workforce models can expand the dental workforce.

The Indian Health Service (IHS) has been a pioneer in the use of alternative dental workforce models, and as early as 1961, implemented the use of Expanded Function Dental Assistants. In the past decade, one specific alternative dental workforce model, the periodontal expanded function dental assistant (perio EFDA), has been in widespread use across IHS and tribal dental programs.

Beginning in late 2016 and ending in April 2017, the IHS Division of Oral Health collaborated with the Johns Hopkins University's Bloomberg School of Public Health to measure the effectiveness of multiple alternative dental workforce models, including perio EFDAs. Subsequently, from May to July 2017, the IHS Division of Oral Health conducted its own independent analysis of perio EFDAs, following up on the recommendations of the JHU study.

Overall, programs with periodontal expanded function dental assistants (EFDAs) 1. had significant increases in procedures normally considered within the scope of work of periodontal EFDAs: dental sealants, topical fluoride applications, dental prophylaxis cleanings, and periodontal gross debridements; 2. increased utilization of dental services by patients as measured by total services and services per patient visit, although results varied significantly from site to site; 3. showed an increase in periodontal procedures typically performed by dental hygienists and dentists, presumably because periodontal EFDAs were providing more basic services to allow more time for dental hygienists and dentists to perform these advanced services; 4. did not have positive changes in GPRA performance in the three GPRA dental indicators of access, the proportion of 2-15 year-olds receiving sealants, or the proportion of 1-15 year-olds receiving at least one application of topical fluoride; and 5. showed little overall improvement in terms of total patient visits, relative value units produced, or services provided per patient.

While there were multiple limiting factors, and while further study is needed to adequately isolate and evaluate programs with alternative dental workforce models, this study showed some positive impacts to access to care and clinical productivity of various alternative dental workforce models.

## Background

Traditionally, oral health services have been provided by a licensed dentist, a licensed or registered dental hygienist, and a dental assistant. The dentist, a graduate of a 3-5 year dental school, leads the dental team, diagnoses oral diseases, develops a treatment plan with the patient, and carries out that treatment with chairside assistance by a dental assistant. The dental hygienist, operating under the supervision of a dentist, provides oral hygiene instruction, preventive and periodontal care to the patient.

Alternative dental workforce models are any deviations from the above described traditional model and can be used to expand the workforce and increase access to oral health care with an overall goal of reducing disparities, and ultimately improving oral health outcomes. Models can include expanded function dental assistants (EFDAs), dental therapists, and others. The Indian Health Service (IHS) has been among the pioneers in alternative workforce models. In 1961, the IHS spearheaded the training and use of Expanded Function Dental Assistants, the first alternative workforce model used in the IHS. Decades later, in 2004, the Alaska Native Tribal Health Consortium, in collaboration with Alaska's Tribal Health Organizations, developed the Dental Health Aide Initiative.

Historically, access to dental care in IHS, tribal, and urban programs has been lower than the general U.S. population. An estimated 44.5% of persons aged 2 years and older had a dental visit in the past year in the United States,<sup>1</sup> while only 28.7% of American Indians and Alaska Natives (AIAN) accessed dental care in 2016.<sup>2</sup> This low access rate was despite the fewest number of dentist vacancies in the IHS in the past decade.

At the same time, the burden of dental disease in Indian Country continues to loom large. AIAN children under 5 years of age have more than double the caries (tooth decay) experience of U.S. Hispanic children, the next highest minority group, and almost four times as many teeth with caries experience than U.S. white children.<sup>3</sup> Among 6-9 year-old AIAN children, 83% have caries experience and 47% have untreated decay, compared to 45% and 17% in the general U.S. population, respectively.<sup>4</sup> Among adolescents, 80% of 13-15 year-old AIAN youth have caries experience compared to just 44% for the general U.S. population, and almost five times as many AIAN youth (53%) have untreated decay compared to the general U.S. population (11%).<sup>5</sup>

In adults, AIAN dental patients suffer disproportionately not only from untreated tooth decay, but they are more likely to suffer from periodontal disease and missing teeth. In AIAN adults 35-44 years of age, 65% suffer from untreated tooth decay, more than double the U.S. average of 25%, and that trend continues in the 65-75 year-old age group, with 45% of AIAN adults with untreated decay compared to just 15% for the general U.S. population. With regard to periodontal disease, 17% of AIAN adults over the age of 35 have severe periodontal disease compared to 10% for the U.S. overall, and because we know that periodontal disease can adversely affect glycemic control in adults with diabetes and lead to diabetes complications, addressing periodontal disease through every available means in IHS, Tribal, and Urban programs becomes of paramount importance. Moreover, periodontal disease and untreated tooth decay

lead to missing teeth which negatively impacts nutrition, and 83% of AIAN adult dental patients over the age of 40 years have missing teeth compared to 66% in the general U.S. population in the same age group.<sup>6</sup> These facts help make the case for the use of periodontal (and restorative) expanded function dental assistants (perio EFDAs).

Figure 1. Percent of Adults with Severe Periodontal Disease (>5.5mm, CPI=4), U.S. Overall (NHANES 2009-12) vs. AIAN Dental Patients (IHS 2015)<sup>6</sup>

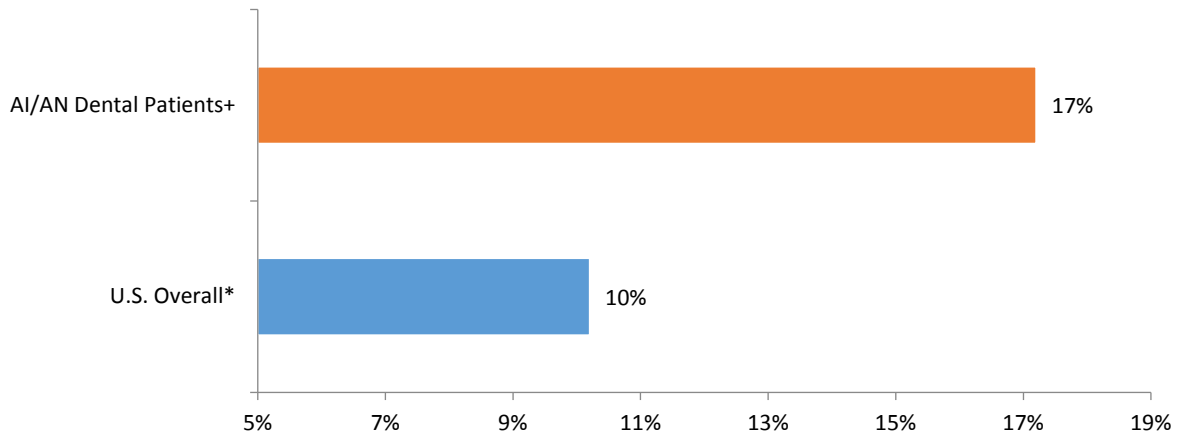
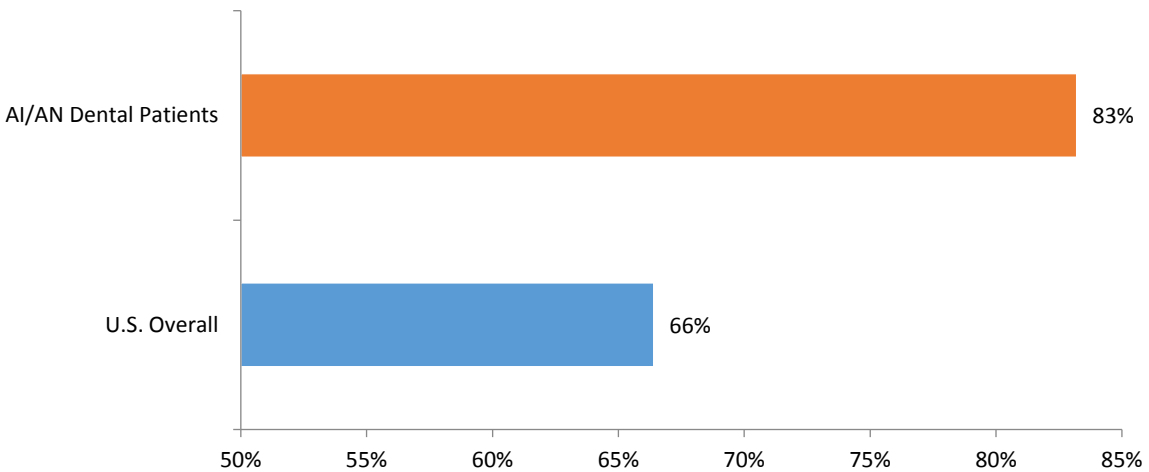


Figure 2. Percent of Adults 40-64 Years with One or More Missing Teeth, U.S. Overall (NHANES 2011-12) vs. AIAN Dental Patients (IHS 2015)<sup>6</sup>



## **Periodontal Expanded Function Dental Assistant**

### ***Definition/Scope of Practice***

One specific alternative dental workforce model, the periodontal expanded function dental assistant (perio EFDA), has been in widespread use across IHS and tribal dental programs for at least the past decade. The services that a perio EFDA can provide include:

1. Relating the community periodontal index, a periodontal screening performed by a dentist or dental hygienist, to the need for periodontal therapy;
2. Detecting diseased tissue and the presence of supra- and sub-gingival calculus;
3. Performing an ultrasonic scaling of teeth using ultrasonic equipment (such as a Cavitron), removing all visible plaque and calculus;
4. Providing oral hygiene education to patients, including recommending toothpastes, mouth rinses, and oral hygiene aids to the patient; and
5. Identifying patients at risk for further periodontal breakdown and ensuring those patients receive follow-up care from a dentist or dental hygienist.

In addition, perio EFDAs achieving an “advanced” certification also are able use hand instruments (scalers) to remove visible plaque and calculus. It should be noted that a perio EFDA does not diagnose periodontal disease, does not perform the specific procedure called scaling and root planing, and does not perform any type of periodontal surgery.

### ***Training and Certification***

The Indian Health Service offers a standardized continuing dental education curriculum for both the basic and advanced perio EFDA. Prior to either course, dental assistants must take a battery of online training modules design to assess basic knowledge of effective oral hygiene instructions and the use of antimicrobials in prevention of dental disease. Following successful completion of the online course, assistants must complete a one-week basic course; the one-week advanced course requires previous completion of the basic course. The course curriculum for the basic and advanced course is as follows:

- Monday PM: seminars on periodontics and hygiene
- Tuesday: seminar on ultrasonic instrumentation of teeth, then cleaning lab with typodonts rest of the day
- Wednesday AM: Students practice cleanings on each other
- Wednesday PM, Thursday, and Friday AM – Students clean teeth of patients

Following completion of the course, the dental assistant’s supervisor at their duty station serves as preceptor, and to become a certified perio EFDA, the dental assistant must successfully complete 20 post-course dental cleanings as graded by the preceptor using standardized grading criteria. Once the supervisor provides documentation that the assistant has completed this post-course requirement, he/she sends an e-mail to the IHS Continuing Dental Education Coordinator who certifies the assistant as a perio EFDA. Currently there is no recertification process in place, but dental supervisors are encouraged to conduct annual competency assessments on their perio EFDAs. In the past six years, the IHS has trained 251 perio EFDAs through 37 different courses.

Figure 3. Periodontal EFDA Training by Year, 2012-17

Fiscal Year	# of Courses	Basic Trained	Advanced Trained	Refresher Trained	Total Trained
2012	5	30	0	0	30
2013	5	20	0	0	20
2014	3	12	0	0	12
2015	5	30	6	0	36
2016	7	49	6	0	55
2017	15	75	13	10	98
<b>Totals</b>	<b>37</b>	<b>216</b>	<b>25</b>	<b>10</b>	<b>251</b>

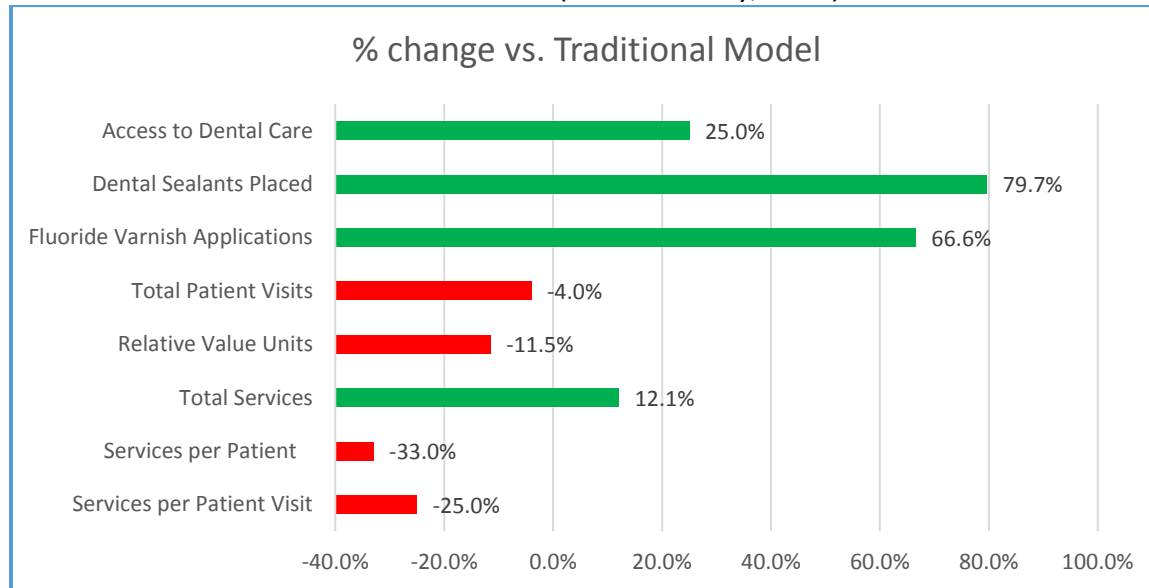
## Effectiveness of Periodontal Expanded Function Dental Assistants

### *Phase I Study: Johns Hopkins University, 2017*

Beginning in late 2016 and ending in April 2017, the Indian Health Service Division of Oral Health collaborated with the Johns Hopkins University’s Bloomberg School of Public Health to measure the effectiveness of multiple alternative dental workforce models, including perio EFDAs.<sup>7</sup> This study was very limited due to time constraints, financial resources, and the number of IHS, Tribal, and Urban dental programs studied. Limited data restricted a definitive conclusion regarding the impact of alternative dental workforce models on the selected indicators compared to the traditional dental workforce model, and the study concluded that “Further study is needed to adequately isolate and evaluate programs with alternative dental workforce models, but this study shows at least some positive impacts to access to care and clinical productivity of various alternative dental workforce models.”

This initial study showed some promising results for perio EFDAs, as shown in Figure 4 below. Eight different indicators were used to measure effectiveness. Perio EFDAs seemed to have the most impact on improving oral access to care, ranking fourth among the various alternative dental workforce models studied; on the provision of preventive dental sealants and topic fluoride applications, ranking third and second, respectively, among the various models studied; and on total services offered by a dental program. This makes sense, because even though their name indicates treatment of periodontal disease as the major component of their work, many perio EFDAs actually spend most of their time providing preventive services such as cleanings (prophylaxis or prophies), sealants, fluoride applications, and oral hygiene instructions. Green bars in the figure indicate an improvement in sites employing perio EFDAs, while red bars indicate a decline in sites employing perio EFDAs (compared to sites using only a traditional model).

Figure 4. Effectiveness of Perio EFDAs: Comparison of Sites Using Periodontal EFDAs vs. Traditional Dental Workforce Model Sites (JHU-IHS Study, 2017)<sup>7</sup>



**Phase 2 Study**

From May to July 2017, the IHS Division of Oral Health conducted its own independent analysis of perio EFDAs, following up on the recommendations of the JHU Phase I study.

Methodology. A total of 26 different IHS, Tribal, and Urban dental programs were identified based on having dental assistants certified as perio EFDAs between the time periods of July 2016 and November 2016. This period was chosen because the IHS felt like at least nine months of post-certification data (November 2016 – June 2017) was needed in order to validate any measurable effect of perio EFDAs in the dental programs. From these 26 identified programs, 18 programs expressed a willingness to share locally generated data with the IHS Division of Oral Health, a second inclusion criterion. From this group, programs were asked to self-identify as to whether or not they used periodontal EFDAs in that capacity and if so, what percentage of the time they were used as perio EFDAs (perio EFDAs are often used as chairside dental assistants for general dentistry procedures and even as restorative EFDAs at other times). This final inclusion criterion yielded 12 IHS, Tribal, and Urban dental programs, four times the number studied in the JHU study. Of these 12 programs, six were IHS-managed while six were tribally managed. Seven IHS Areas were represented by the 12 programs studied: Alaska Area, Albuquerque Area (three programs), Navajo Area, Oklahoma City Area (three programs), Phoenix Area (two programs), Portland Area, and Tucson Area.

Rather than comparing sites using perio EFDAs with “traditional dental workforce model sites,” this study compared the effectiveness of perio EFDAs by looking at data prior to EFDA certification and data post-certification using similar time frames. Data was obtained through three different sources. Data from the three Government Performance and Results Act (GPRA) indicators of access to dental care, the proportion of 2-15 year-olds receiving dental sealants, and the proportion of 1-15 year-olds receiving topical fluoride were obtained from local program

GPRA coordinators. Data for total patient visits, total relative value units, level II relative value units, total services, level II services, services per patient visit, and services per patient were obtained through seven different reports in the IHS National Dental Data Mart, an online database of unduplicated patient data extracted from the National Data Warehouse. Data for the number of dental sealants placed, fluoride applications, prophies, periodontal debridements, and periodontal scaling and root planing procedures were provided by the 12 participating sites based upon the time frame given by the project/study coordinator.

### Results/Conclusions

- **Overall, programs with periodontal expanded function dental assistants (EFDAs) had significant increases in procedures normally considered within the scope of work of periodontal EFDAs: dental sealants, topical fluoride applications, dental prophylaxis cleanings, and periodontal gross debridements.**

Based on the data analysis, the total EFDA-scope services (sealants, fluoride, prophies, debridements) increased by 25% when comparing the time period (minimum of 9 months) immediately following certification of one or more periodontal EFDAs to a similar time period prior to that certification, with a range of -3% to 289%. 10 of the 12 sites showed such an increase, while the two that had a decrease were minimal (-3%). For specific procedures, the number of dental sealants placed increased by 25% overall (range of -17% to 183%), with two-thirds of sites showing an increase; the number of topical fluoride applications increased by 32% overall (range of -19% to 385%), with two-thirds of sites showing an increase; the number of dental prophylactic cleanings increased by 15% overall (range of -37% to 191%), with three-fourths of sites showing an increase; and the number of periodontal gross debridements increased by 24% overall (range of -80% to 1915%), with only half of the sites showing an increase.

- **Overall, programs with periodontal EFDAs increased utilization of dental services by patients as measured by total services and services per patient visit, although results varied significantly from site to site.**

Based on the data obtained through the National Dental Data Mart (NDDM) for the 12 studied programs, the average number of services per patient visit provided after certification of periodontal EFDAs was 4.38, compared to 4.07 prior to certification, a 7% increase overall, with more than half of the sites showing an increase. Total services for the I/T/U programs increased by 5% overall (range of -25% to 131%), but with less than half reporting increased services. Similarly, level 2 services, the level for which most periodontal EFDA services would be classified, increased by 7% overall (range of -27% to 218%), but only four of the programs actually had an increase.

- **Programs with periodontal EFDAs showed an increase in periodontal procedures typically performed by dental hygienists and dentists, presumably because periodontal EFDAs were**

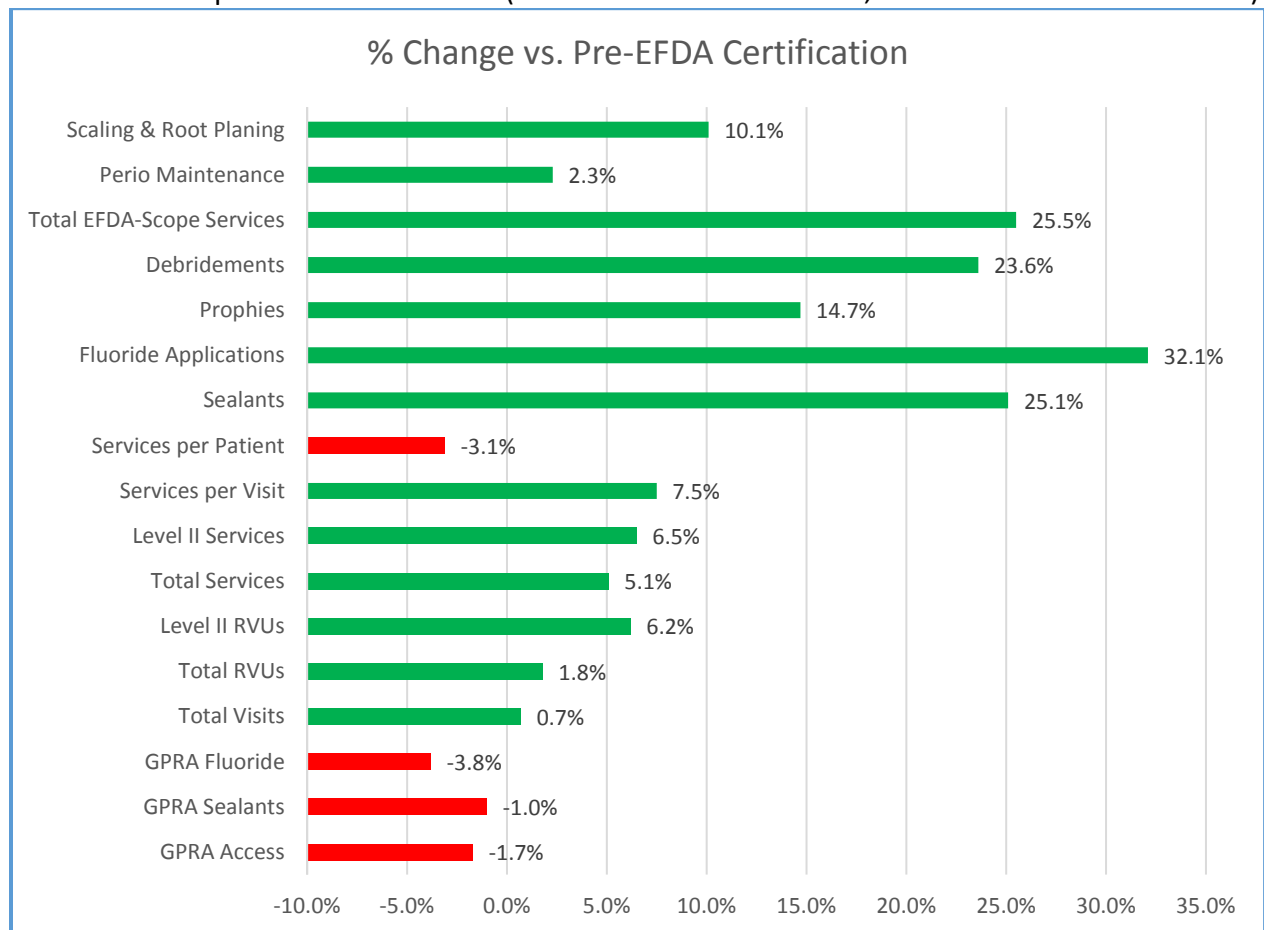


**providing more basic services to allow more time for dental hygienists and dentists to perform these advanced services.**

Based on the data obtained from the 12 I/T/U dental programs studied, programs reported a 2% increase in periodontal maintenance procedures (range of -55% to 256%), with over half of the sites reporting increases, and programs reported a 10% overall increase in periodontal scaling and root planing (SRP) procedures (range of -71% to 316%), with three-fourths of sites reporting such increases. Of the sites that reported increases in EFDA-related procedures, 80% of these sites also reported an increase in the dentist/dental hygienist-related procedures.

- **Overall, programs using periodontal EFDAs did not have positive changes in GPRA performance in the three GPRA dental indicators of access, the proportion of 2-15 year-olds receiving sealants, or the proportion of 1-15 year-olds receiving at least one application of topical fluoride. Similarly, programs using periodontal EFDAs showed little overall improvement in terms of total patient visits, relative value units produced, or services provided per patient.**

Figure 5. Effectiveness of Perio EFDAs: Comparison of Sites Using Periodontal EFDAs post-EFDA certification vs. pre-EFDA certification (minimum of 9 months data, maximum of 12 months data)



Limitations. This study, too, had limitations that could have affected the conclusions. First, one program in particular, the largest program studied, had more than five certified perio EFDAs and contributed heavily to some of the increases seen. Unlike the JHU study that attempted to weight each program based on services proportionate to the user population, this study did not make such an attempt. If that one program was excluded from the analysis, the results would have been diminished but still followed the same trends. For example, total EFDA services would have still have increased by 16.3% (vs. 25.5%), sealants would have increased by 19.8% (vs. 25.1%), fluoride applications would have increased by 16.6% (vs. 32.1%), prophies would have increased by 10.6% (vs. 14.7%), and periodontal debridements would have increased by 14.4% (vs. 23.6%). A second limitation is how clinics utilized perio EFDAs – some programs used perio EFDAs sparingly, reporting use less than 5% of the time, while others reported use as high as 50% of the time. This study did not take into account the percentage of time the perio EFDA was used in that capacity. A third limitation in the analysis of the programs was the effect of other staff on the results. Significant staffing changes, whether those involved dentists, dental hygienists, or other dental assistants, could and would significantly affect dental productivity indicators, and this was not taken into consideration in this study.

## **Recommendations/Future**

The IHS Division of Oral Health believes that alternative dental workforce models should be utilized to improve access to quality dental care in IHS, Tribal, and Urban dental programs. Periodontal EFDAs are well-trained to provide basic preventive and periodontal services. In programs where dental hygienists are able to meet the preventive and periodontal needs of the population, a perio EFDA can and should still be utilized to provide oral hygiene instructions to patients, provide child toothbrush prophies, and provide child and adult prophies as needed by the program. A perio EFDA can also help set up and maintain an evidence-based preventive and periodontal recall system for the program. In programs where dental hygienists are unable to meet the preventive and periodontal needs of the population, or in programs where there is no dental hygienist, a perio EFDA can be even more valuable in helping the dentist plan periodontal treatment, assisting in recording probing depths, providing periodontal gross debridements, offering customized oral hygiene instructions to patients, and preparing the patient for more extensive periodontal therapy by the dentist (or hygienist), in addition to the perio EFDA providing preventive services to include adult and child prophies and maintaining a preventive and periodontal recall system. How each program utilizes a perio EFDA will perhaps be unique to the needs of that particular program. The IHS Division of Oral Health recommends that perio EFDAs be assessed for competency on an annual basis, and such documentation be maintained in their clinic's personnel records.

This study was the first concerted effort to evaluate the effectiveness of perio EFDAs in IHS and Tribal dental programs. Further study is needed to address some of the limitations of this study. Additional study is also needed to evaluate other alternative dental workforce models in use in the IHS, with a priority being restorative EFDAs that are in widespread use currently in the IHS and Tribal programs.

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