



*Improving Oral Health Through Measurement*

## **Testing DQA Adult Dental Quality Measures**

**FINAL REPORT: DECEMBER 2016**

**Dental Quality Alliance**

**2016 DQA©**

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## Purpose

The purpose of this report is to summarize the goals, methodology, high-level results, and key outcomes of the validation testing conducted for adult oral health performance measures developed by the Dental Quality Alliance (DQA). Detailed testing results are on file with the DQA.

## Background

In 2013, the DQA Adult Measures Workgroup proposed a set of Adult Dental Measures that could be calculated using administrative data. The workgroup identified measure concepts and developed draft specifications for these proposed measures. The concepts identified were designed for use at the program and plan levels. In 2015, the DQA Measures Development and Maintenance Committee (MDMC) began the process of testing these measures for feasibility, reliability, and validity. [Table 1](#) indicates the three measures that are being validated.

Table 1. DQA Adult Dental Measures Evaluated

<b>Periodontal Evaluation in Adults with Periodontitis</b>
<b>Ongoing Care in Adults with Periodontitis</b>
<b>Topical Fluoride for Adults at Elevated Caries Risk</b>

The DQA entered into a service agreement with the University of Washington/Marquette University to test these measures. Marquette University secured support from Delta Dental of Wisconsin and the Wisconsin Department of Health Services which provided Wisconsin Delta Dental and Wisconsin Medicaid data, respectively, for measure testing. The University of Washington secured support from the Washington State Department of Social and Health Services, which provided Washington Medicaid data for measure testing. The DQA provided funding for this project by securing a grant from the ADA Foundation to support part of this project.

The service agreement identified specific areas of focus for testing. The first focused on testing that would allow the MDMC to finalize the denominator criteria for each measure, including: (1) determining the enrollment requirements to be applied (for each of the three measures); (2) determining the appropriate age inclusion criteria; (3) evaluating methodologies for identifying adults with a history of periodontal disease (for the two periodontal measures); and (4) evaluating methodologies for identifying adults at elevated caries risk (for the topical fluoride measure). The second focused on measure numerator criteria, including (1) which services and the minimum number of visits that should be included in the periodontal ongoing care measure and (2) the minimum number of fluoride applications for the topical fluoride measure. After making denominator and numerator determinations, testing focused on producing the measure rates for the measures as specified to identify meaningful performance gaps. Measure critical data element validity was established through comparison of administrative claims data with dental record reviews.

All data sources and testing methodologies were approved by the University of Washington Institutional Review Board, the Washington State Institutional Review Board, and the Marquette University Institutional Review Board.

## Executive Summary of Measures Based on Testing Results

Measure	Questions addressed	Decisions based on testing data				
<b>Periodontal Evaluation in Adults with Periodontitis</b>	<ul style="list-style-type: none"> <li>Given the lack of diagnostic codes in claims databases, which procedure codes can be used as markers for periodontitis [not limited to “active” disease or recent treatment]?</li> <li>Medicaid programs may only cover scaling and root planning; how does this impact the ability to identify periodontitis?</li> <li>Should D4910 be included to identify patients with periodontitis?</li> <li>What age range should the measure cover?</li> <li>What should the enrollment interval be (90 days, 180 days, 12 months?)</li> </ul>	<p>Percentage of enrolled adults age 30 years and older with periodontitis who received a comprehensive or periodic oral evaluation or a comprehensive periodontal evaluation within the reporting year.</p> <table border="1"> <tr> <td>NUM</td> <td>D0180 OR D0120 OR D0150 In the reporting year</td> </tr> <tr> <td>DEN</td> <td>D4240 OR D4241 OR D4260 OR D4261 OR D4341 OR D4342 OR D4910 in any of the 3 prior years</td> </tr> </table> <ul style="list-style-type: none"> <li>Include adults age 30 years and older</li> <li>Required enrollment of at least 180 continuous days in the reporting year</li> </ul>	NUM	D0180 OR D0120 OR D0150 In the reporting year	DEN	D4240 OR D4241 OR D4260 OR D4261 OR D4341 OR D4342 OR D4910 in any of the 3 prior years
NUM	D0180 OR D0120 OR D0150 In the reporting year					
DEN	D4240 OR D4241 OR D4260 OR D4261 OR D4341 OR D4342 OR D4910 in any of the 3 prior years					
<b>Ongoing Care in Adults with Periodontitis</b>	<ul style="list-style-type: none"> <li>Given the lack of diagnostic codes in claims databases, which procedure codes can be used as markers for periodontitis [not limited to “active” disease or recent treatment]?</li> <li>Medicaid programs may only cover scaling and root planning; how does this impact the ability to identify periodontitis?</li> <li>Should D4910 be included to identify patients with periodontitis?</li> <li>What age range should the measure cover?</li> <li>What procedure codes define “ongoing care”? Should ongoing scaling and root planning be included in the numerator?</li> <li>At least how many times ongoing care should be provided in the reporting year?</li> </ul>	<p>Percentage of enrolled adults age 30 years and older with periodontitis who received ongoing periodontal care at least 2 times within the reporting year.</p> <table border="1"> <tr> <td>NUM</td> <td>D1110 OR D4910 OR D4341 OR D4342 At least 2 times in the reporting year</td> </tr> <tr> <td>DEN</td> <td>D4240 OR D4241 OR D4260 OR D4261 OR D4341 OR D4342 OR D4910 in the 3 prior years</td> </tr> </table> <ul style="list-style-type: none"> <li>Include adults age 30 years and older</li> <li>Required enrollment of at least 12 months in the reporting year allowing a single gap of no more than 31 days</li> </ul>	NUM	D1110 OR D4910 OR D4341 OR D4342 At least 2 times in the reporting year	DEN	D4240 OR D4241 OR D4260 OR D4261 OR D4341 OR D4342 OR D4910 in the 3 prior years
NUM	D1110 OR D4910 OR D4341 OR D4342 At least 2 times in the reporting year					
DEN	D4240 OR D4241 OR D4260 OR D4261 OR D4341 OR D4342 OR D4910 in the 3 prior years					
<b>Topical Fluoride Application for Adults at Elevated Caries Risk</b>	<ul style="list-style-type: none"> <li>How do we define elevated risk? Do we include extractions in the list of codes for elevated risk?</li> <li>Should extent of treatment (i.e. number of restorations/treatment codes) be a factor when classifying an individual as being at elevated risk?</li> <li>At least how many times topical fluoride should be provided in the reporting year?</li> </ul>	<p>Percentage of enrolled adults age 18 years and older who are at “elevated” caries risk (i.e., “moderate” or “high”) who received at least two topical fluoride applications within the reporting year.</p> <table border="1"> <tr> <td>NUM</td> <td>D1206 or D1208 at least 2 times in the reporting year</td> </tr> <tr> <td>DEN</td> <td>[Restorations and endo treatment (exclude extractions): at least 3 codes in the reporting year or in the three prior years] OR [D0602 or D0603 in the reporting year]</td> </tr> </table> <ul style="list-style-type: none"> <li>Required enrollment of at least 12 months in the reporting year, allowing a single gap of no more than 31 days</li> </ul>	NUM	D1206 or D1208 at least 2 times in the reporting year	DEN	[Restorations and endo treatment (exclude extractions): at least 3 codes in the reporting year or in the three prior years] OR [D0602 or D0603 in the reporting year]
NUM	D1206 or D1208 at least 2 times in the reporting year					
DEN	[Restorations and endo treatment (exclude extractions): at least 3 codes in the reporting year or in the three prior years] OR [D0602 or D0603 in the reporting year]					

## Data Sources and Time Frame

Administrative enrollment and claims data (paid and unpaid claims) from the following programs were used for testing:

- Wisconsin Delta Dental (WI DD),
- Wisconsin Medicaid (WI MD), and
- Washington Medicaid (WA MD).

For Wisconsin Delta Dental and Medicaid, data from calendar years (CY) 2011 to CY 2014 were used. Corresponding data for Washington Medicaid were not available because adult dental benefits were eliminated in Washington in 2011; therefore, data from CY 2007 to CY 2010 were used for testing purposes.

[Table 2](#) summarizes the main characteristics of each of the data sources used for measure testing. [Table 3](#) summarizes the population characteristics for these three data sources.

Table 2. Summary of Data Sources, Delivery System Models, and Provider Reimbursement

	Wisconsin Delta Dental CY 2014	Wisconsin Medicaid CY 2014	Washington Medicaid CY 2010
<b>Age Range</b>	>=18 years	>=18 years	>=18 years
<b># Unique Enrollees, &gt;=18 Years CY2014</b>	822,470	922,474	687,952
<b>Dental Delivery Models</b>	FFS	FFS	FFS
<b>Payment from Program to Dental Provider</b>	FFS based on fee schedule	FFS based on fee schedule	FFS based on fee schedule

Table 3: Population Characteristics

	WI Delta Dental, CY 2014		WI Medicaid, CY 2014		WA Medicaid, CY 2010	
	#	Column %	#	Column %	#	Column %
<b>Total Number of Patients &gt;=18 Years, enrolled at least one month</b>	820723	100.00%	922474	100.00%	687952	100.00%
<b>Age Group Distribution (years)</b>						
18	9073	1.11%	26834	2.91%	37320	5.42%
19-20	29856	3.64%	44365	4.81%	56425	8.20%
21-24	63992	7.80%	84158	9.12%	83044	12.07%
25-34	138224	16.84%	215439	23.35%	170265	24.75%
35-44	154814	18.86%	149698	16.23%	97541	14.18%
45-54	192318	23.43%	124296	13.47%	84047	12.22%
55-64	177349	21.61%	93902	10.18%	60955	8.86%
65-74	45748	5.57%	80608	8.74%	45821	6.66%
75-84	7480	0.91%	56908	6.17%	31772	4.62%
85+	1869	0.23%	46266	5.02%	20762	3.02%
<b>Sex</b>						
Female	424927	51.77%	569435	61.73%	460570	66.95%
Male	372903	45.44%	353038	38.27%	227367	33.05%
Unknown	22893	2.79%	1	0.00%	15	0.00%
<b>Race and Ethnicity</b>						
Non-Hispanic White	N/A	N/A	580297	62.91%	422676	61.44%
Non-Hispanic Black	N/A	N/A	141673	15.36%	46432	6.75%
Hispanic	N/A	N/A	57069	6.19%	18406	2.68%
Other and Unknown	N/A	N/A	143435	15.55%	200438	29.14%

## Methodology

The testing methodology included:

- Refining the specifications by using administrative claims and enrollment data to evaluate numerator/denominator definitions and measure calculation logic.
- Establishing critical data element validity by using dental records to examine the agreement between claims data and dental records and evaluate concordance by calculating sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and the Kappa statistic.
- Identifying meaningful performance gaps by evaluating statistically significant and practically meaningful differences in measure scores between programs and by age, race, and location (i.e. urban vs. rural).

### Critical data element validation

Critical data element validation evaluates the correctness of the data elements required to calculate the measure against an authoritative source. Critical data element validation focused on the administrative procedure codes used in the measures for a random sample of patients drawn using a random uniform distribution. Record reviews were conducted for each of the three programs: WI Delta Dental, WI Medicaid, and WA Medicaid. The sample requirements were: (1) enrolled in the program with at least one claim during the reporting year, (2) patient at Marquette University for the WI Delta Dental and WI Medicaid samples and patient at the University of Washington for the WA Medicaid sample during the four-year period used for testing in each program. The codes were validated by comparing the procedure codes in the administrative claims data to procedures documented in the patient dental record. The record reviewers followed a review protocol and used the same extraction form. Record review results were provided to the statistical programmer who compared the abstraction results to procedure codes in the claims data for the same patient and date of service. Simple agreement and the kappa statistic were calculated. The kappa statistic takes into account agreement observed by chance and provides a more conservative estimate of agreement. A kappa statistic value of 0 reflects the amount of agreement that would be expected to be observed by chance. A kappa statistic value of 1 indicates perfect agreement. Guidance on interpreting the kappa statistic is: 0.01-0.20 (slight agreement); 0.21-0.40 (fair agreement); 0.41-0.60 (moderate agreement); 0.61-0.80 (substantial agreement); 0.81-0.99 (almost perfect agreement).<sup>1</sup>

### Evaluation of measure score ability to identify variations in performance

The measure scores were calculated using the final measure specifications and reported with their 95% confidence intervals, standard deviations, and standard error. Comparison of the 95% confidence intervals and chi-square tests were used to evaluate whether the measures detected variations in performance between programs and between population sub-groups (e.g., variations by age, race, and geographic location) within a program.

### Evaluation of measure score face validity

Face validity was assessed throughout the measure development and testing process. In November 2016, an Interim Report that included the detailed measure specifications and described the measures, testing process, and preliminary results was sent to a broad range of stakeholders, including representatives of federal agencies, dental professionals/professional associations, state Medicaid and CHIP programs, and community health centers. Each comment received was carefully reviewed and addressed by the MDMC, which entailed additional sensitivity testing and refinement of the measure specifications. Based on the comprehensive testing results, the three measures were approved by the DQA membership at its December 16, 2016 meeting.

The approval process entailed a formal face validity assessment at the December 16, 2016, Dental Alliance Quality meeting. A final presentation of the final and fully specified measures, testing methodology, and results was made to the DQA membership expert group. The presentation addressed the NQF criteria for scientific acceptability of measures.

<sup>1</sup> Landis JR, Koch GG. An application of hierarchical kappa-type statistics in the assessment of majority agreement among multiple observers. *Biometrics* 1977;33(2):363-74.



Using the NQF criteria, the 30 representatives of the DQA membership who attended the face-to-face meeting voted by secret ballot on criteria addressing each measure’s importance, feasibility, reliability, validity, and usability as well as overall approval of the measure. Specifically each individual voted on

1. the level of confidence for each criterion using the categories of
  - **High:** Based on the information submitted, there is high confidence (or certainty) that the criterion is met;
  - **Moderate:** Based on the information submitted, there is moderate confidence (or certainty) that the criterion is met;
  - **Low:** Based on the information submitted, there is low confidence (or certainty) that the criterion is met; or
  - **Insufficient:** There is insufficient information submitted to evaluate whether the criterion is met (e.g., blank, incomplete, or not relevant, responsive, or specific to the particular question).

and
2. an overall open vote of whether to (a) approve or (b) disapprove the measure as specified.

## RESULTS: Critical Data Elements Frequency Evaluation

One of the first steps in verifying implementation feasibility was to confirm the presence and completeness of the data elements needed to calculate the measures. The MDMC identified which data elements were “critical” for calculating each measure and which elements were needed for the proposed stratifications. The critical data elements for the three measures include: (1) member ID (to link between claims and enrollment data), (2) date of birth, (3) enrollment indicator, (4) date of service, and (5) dental procedure codes (CDT codes). The research team calculated for each of the three data sources the percentage of missing and invalid data for each data element for all four years of the time frames specified for testing (2011–2014 for the Wisconsin Delta Dental and Medicaid programs and 2007–2010 for Washington Medicaid). Critical data elements had missing/invalid rates of <1% with the exception of dental procedure codes for Washington Medicaid. These rates are consistent with guidance from the Centers for Medicare and Medicaid services regarding acceptable error rates.<sup>2</sup> The rates for missing and invalid data are presented in [Table 4](#). In Washington Medicaid, there were approximately 12% of procedure codes accounted for by the CMS Healthcare Common Procedure Coding System (HCPCS) code T1015: “Clinic visit/encounter, all-inclusive.” This code is commonly used by Federally Qualified Health Centers and similar entities that bill on an encounter basis. Therefore, the code itself is valid, but it does not allow for identification of specific dental services and was flagged as a result. Further investigation found that more than 99% of these codes were accompanied by CDT procedure codes for the same patient on the same date of service, alleviating concerns that dental services for these patients would not be captured.

Table 4a: Critical Data Elements—Rates of Missing and Invalid Data, (CY 2014, WI DD)

	Data Source	# Total Counts (Enrollees in Enrollment Database; Claims in Encounter Database)	# Missing (i.e., data element is not filled for that record)	% Missing	# Invalid (i.e., data element is filled but with an invalid value)	% Invalid	# Missing OR Invalid	% Missing or Invalid
<b>Critical Elements</b>								
<b>Member ID</b>	Enrollment Database	823,671	0	0.00%	0	0.00%	0	0.00%
<b>Member ID</b>	Claims/Encounter Database	3,655,074	0	0.00%	0	0.00%	0	0.00%
<b>Date of Birth</b>	Enrollment Database	823,671	0	0.00%	0	0.00%	0	0.00%
<b>Monthly enrollment indicator</b>	Enrollment Database	823,671	0	0.00%	0	0.00%	0	0.00%

<sup>2</sup> Centers for Medicare & Medicaid Services. Medicaid and CHIP Statistical Information System (MSIS) File Specifications and Data Dictionary. 2010; <https://www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/MSIS>.

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Dental Procedure Codes - CDT	Claims/Encounter Database	3,655,074	0	0.00%	5	0.00%	5	0.00%
Date of Service	Claims/Encounter Database	3,655,074	0	0.00%	0	0.00%	0	0.00%

Table 4b: Critical Data Elements—Rates of Missing and Invalid Data, (CY 2014, WI MD)

Variable Name	Data Source	# Total Counts (Enrollees in Enrollment Database; Claims in Encounter Database)	# Missing (i.e., data element is not filled for that record)	% Missing	# Invalid (i.e., data element is filled but with an invalid value)	% Invalid	# Missing OR Invalid	% Missing or Invalid
<b>Critical Elements</b>								
Member ID	Enrollment Database	1,495,631	0	0.00%	0	0.00%	0	0.00%
Member ID	Claims/Encounter Database	2,550,346	0	0.00%	0	0.00%	0	0.00%
Date of Birth	Enrollment Database	1,495,631	0	0.00%	0	0.00%	0	0.00%
Monthly enrollment indicator	Enrollment Database	1,495,631	0	0.00%	0	0.00%	0	0.00%
Dental Procedure Codes - CDT	Claims/Encounter Database	2,550,346	0	0.00%	0	0.00%	0	0.00%
Date of Service	Claims/Encounter Database	2,550,346	0	0.00%	0	0.00%	0	0.00%

Table 4c: Critical Data Elements—Rates of Missing and Invalid Data, (CY 2010, WA MD)

Variable Name	Data Source	# Total Counts (Enrollees in Enrollment Database; Claims in Encounter Database)	# Missing (i.e., data element is not filled for that record)	% Missing	# Invalid (i.e., data element is filled but with an invalid value)	% Invalid	# Missing OR Invalid	% Missing or Invalid
<b>Critical Elements</b>								
Member ID	Enrollment Database	688,045	0	0.00%	0	0.00%	0	0.00%
Member ID	Claims/Encounter Database	1,478,763	0	0.00%	0	0.00%	0	0.00%
Date of Birth	Enrollment Database	688,045	0	0.00%	0	0.00%	0	0.00%
Monthly enrollment indicator	Enrollment Database	688,045	0	0.00%	0	0.00%	0	0.00%
Dental Procedure Codes - CDT	Claims/Encounter Database	1,478,763	1,806	0.12%	178,557*	12.07%*	180,363*	12.20%*
Date of Service	Claims/Encounter Database	1,478,763	0	0.00%	0	0.00%	0	0.00%

\*Note: The "invalid" dental procedure codes were virtually all (99.9%) CMS Healthcare Common Procedure Coding System (HCPCS) code T1015: "Clinic visit/encounter, all-inclusive." This is code is commonly used by Federally Qualified Health Centers and similar entities that bill on an encounter basis. Therefore, the code itself is valid, but it does not allow for identification of specific dental services. More than 99% of these codes were accompanied by CDT codes for the same patients on the same date of service, alleviating concerns that dental services provided to these patients would not be captured.

## PERIODONTAL MEASURES

Periodontal follow-up is critical in patients following treatment for active periodontal disease. Although evidence-based guidelines or systematic reviews do not exist on this topic, multiple independent studies have shown that a periodontal maintenance program following active periodontal therapy is effective and reduces tooth loss and recurrence of disease in compliant patients.<sup>3,4,5</sup> The periodontal maintenance programs studied included updates of medical and dental histories, periodontal examinations, debridement, prophylaxis, and fluoride application as well as oral hygiene instructions and repeated scaling and root planing for sites indicating disease activity. A Position Paper from the American Academy of Periodontology (AAP) includes several citations to support their recommendation that “successful long-term control of periodontal disease and implant complications depends upon active periodontal maintenance care and appropriate additional therapy, if indicated.”<sup>6</sup>

Based on this evidence, the DQA developed and tested two performance measures applicable to patients with periodontitis:

- Periodontal Evaluation in Adults with Periodontitis
- Ongoing Care in Adults with Periodontitis

**Intended Use and Measure Type.** During the development and testing process, the MDMC discussed the intended use for each measure and the appropriate measure type classification. The MDMC determined that Ongoing Care in Adults with Periodontitis is intended for use in accountability applications as a process of care quality measure. A process of care quality measure is a “health care-related activity performed for, on behalf of, or by a patient. Process measures are supported by evidence that the clinical process—that is the focus of the measure—has led to improved outcomes.”<sup>7</sup> The MDMC did not feel that the current evidence base was sufficient to similarly support Periodontal Evaluation in Adults with Periodontitis as a process of care quality measure. However, it did feel that this measure is an important indication of whether adults with periodontitis are continuing to be seen for care and provides useful contextual information for interpreting the Ongoing Care measure. Consequently, it determined that Periodontal Evaluation is appropriately classified as a utilization of services measure, which is a “related health care delivery measures” that “can assess encounters, tests, or interventions that are not supported by evidence for the appropriateness of service for the specified individuals.”<sup>7</sup>

## RESULTS: Denominator Definition – History of Periodontal Disease to Identify Periodontitis

Initial data analysis to derive the denominator definition for periodontitis was conducted with Wisconsin Delta Dental data, a commercial plan that has extensive periodontal service coverage for adults.

### [Identifying patients with a history of treatment for periodontal disease](#)

To establish the set of CDT treatment codes that can be used to positively identify a group of patients who have periodontitis based on submitted claims data, the MDMC reviewed all codes within the “D4xxx” category of the CDT Codes and, through expert opinion, identified a preliminary set of “core” codes for consideration—i.e., those codes most likely to be indicative of a history of periodontal disease.

<sup>3</sup> Costa FO, Lages EJ, Cota LO, Lorentz TC, Soares RV, Cortelli JR. Tooth loss in individuals under periodontal maintenance therapy: 5-year prospective study. *J Periodontol Res.* 2014 Feb;49(1):121-8. doi: 10.1111/jre.12087. Epub 2013 May 7.

<sup>4</sup> Costa FO, Cota LO, Lages EJ, Lima Oliveira AP, Cortelli SC, Cortelli JR, Lorentz TC, Costa JE. Periodontal risk assessment model in a sample of regular and irregular compliers under maintenance therapy: a 3-year prospective study. *J Periodontol.* 2012 Mar;83(3):292-300. doi: 10.1902/jop.2011.110187. Epub 2011 Jun 21.

<sup>5</sup> Ng MC, Ong MM, Lim LP, Koh CG, Chan YH. Tooth loss in compliant and non-compliant periodontally treated patients: 7 years after active periodontal therapy. *J Clin Periodontol.* 2011 May;38(5):499-508. doi: 10.1111/j.1600-051X.2011.01708.x. Epub 2011 Feb 22.

<sup>6</sup> Cohen RE; Research, Science and Therapy Committee, American Academy of Periodontology. Position paper: Periodontal Maintenance. *J Periodontol.* 2003 Sep;74(9):1395-401.

<sup>7</sup> National Quality Measures Clearinghouse. Varieties of Measures in NQMC: Measures of Quality and Measures Related to Quality. 2014; <http://www.qualitymeasures.ahrq.gov/tutorial/varieties.aspx>. Accessed November 18, 2016.

- Codeset A – core set: CDT Codes D4240, D4241, D4260, D4261, D4341, D4342, D4381

Next, the MDMC identified a set of “additional” codes that may be indicative of a history of periodontal disease.

- Codeset B – additional set: CDT Codes D4210, D4211, D4212, D4245, D4249, D4263, D4264, D4265, D4266, D4267, D4268, D4270, D4273, D4275, D4276, D4277, D4278

The MDMC examined the number of all enrolled adults who had each of the proposed set of “core” codes ([Table 5](#)) within a three-year period. After reviewing this frequency analysis, the MDMC initially confirmed the candidate set of “core” codes (Codeset A).

Table 5: Adults with each code in the initial proposed “core set” by age strata for a 3 year period (2011 – 2013), WI DD

	18-20 (N=38,976)		21-24 (N=64,166)		25-34 (N=138,722)		35-44 (N=155,111)		45-54 (N=192,642)		55-64 (N=177,598)		65-74 (N=45,880)		75-84 (N=7,499)		85+ (N= ,876)		Overall (N=822,470)	
<b>D4240</b>	1	0.003%	0	0.000%	1	0.001%	3	0.002%	24	0.012%	30	0.017%	10	0.022%	0	0.000%	0	0.000%	69	0.008%
<b>D4241</b>	2	0.005%	6	0.009%	13	0.009%	23	0.015%	54	0.028%	118	0.066%	52	0.113%	4	0.053%	0	0.000%	272	0.033%
<b>D4260</b>	2	0.005%	4	0.006%	28	0.020%	104	0.067%	280	0.145%	407	0.229%	114	0.248%	15	0.200%	0	0.000%	954	0.116%
<b>D4261</b>	2	0.005%	4	0.006%	39	0.028%	145	0.093%	431	0.224%	761	0.428%	278	0.606%	45	0.600%	4	0.213%	1709	0.208%
<b>D4341</b>	21	0.054%	193	0.301%	1887	1.360%	3009	1.940%	4482	2.327%	4462	2.512%	1070	2.332%	127	1.694%	19	1.013%	15270	1.857%
<b>D4342</b>	8	0.021%	115	0.179%	1046	0.754%	1922	1.239%	3382	1.756%	4468	2.516%	1414	3.082%	227	3.027%	33	1.759%	12615	1.534%
<b>D4381</b>	5	0.013%	49	0.076%	441	0.318%	1030	0.664%	2249	1.167%	3488	1.964%	1175	2.561%	197	2.627%	27	1.439%	8661	1.053%

Note: The same adult could be represented in more than one procedure code, but is not counted more than once for a specific procedure code.

To make the final determination on whether to include or exclude the “additional” set of codes (Codeset B), the MDMC determined the number of unduplicated individuals who may be excluded were these additional codes not used to define the denominator population (Figure 1).

Figure 1: Individuals with codes from Codeset B without Codes from Codeset A.

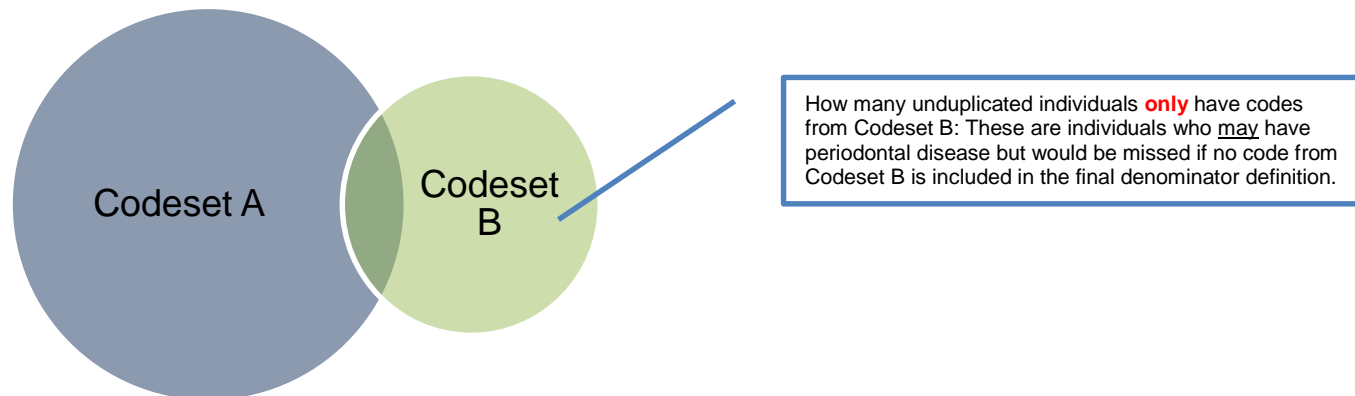


Table 6 presents the number of unduplicated individuals with any code from Codeset A, any code from Codeset B, and individuals with a code from Codeset from B **without** any codes from Codeset A.

Table 6: Adults identified by each Codeset by Age Strata for a 3 year period (2011 – 2013), WI DD

	18-20 (N= 38,976 )	21-24 (N= 64,166)	25-34 (N= 138,722)	35-44 (N= 155,111)	45-54 (N= 192,642)	55-64 (N= 177,598)	65-74 (N= 45,880)	75-84 (N= 7,499)	85+ (N= 1,876)	Overall (N=822,470)
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
<b>Any Codeset A</b>	37 (0.1%)	320 (0.5%)	2883 (2.1%)	5041 (3.2%)	8359 (4.3%)	10334 (5.8%)	3037 (6.6%)	443 (5.9%)	64 (3.4%)	30518 (3.7%)
<b>Any Codeset B</b>	62 (0.2%)	250 (0.4%)	599 (0.4%)	1003 (0.6%)	1839 (1.0%)	2417 (1.4%)	766 (1.7%)	114 (1.5%)	21 (1.1%)	7071 (0.9%)
<b>Any Codeset B Given No Codeset A Codes</b>	58 (0.1%)	243 (0.4%)	554 (0.4%)	860 (0.6%)	1495 (0.8%)	1831 (1.0%)	573 (1.2%)	88 (1.2%)	17 (1.0%)	5719 (0.7%)

Based on these data and expert opinion on which treatment codes were more likely indicative of a history of periodontitis, the MDMC was in favor of only including codes from the core set, Codeset A. Further, of the codes included in Codeset A, upon further discussion, the MDMC determined that D4381 (localized delivery of antimicrobial agents) was not unambiguously indicative of history of periodontitis and excluded D4381 from the core set.

The MDMC finalized the following set of six CDT treatment codes to reliably identify patients with a history of active treatment for periodontitis (Table 7). The MDMC acknowledges that some patients with periodontitis may be excluded due to lack of diagnoses in claims data.

Table 7: CDT Treatment Codes Indicating a History of Periodontal Disease

Code	Description
D4240	Gingival flap (4 or more teeth/quad)
D4241	Gingival flap (1-3 teeth/quad)
D4260	Osseous surgery (4 or more teeth/quad)
D4261	Osseous surgery (1-3 teeth/quad)
D4341	Scaling and root planing (4 or more teeth/quad)
D4342	Scaling and root planing (1-3 teeth/quad)

Impact of ONLY including D4341 and D4342 to identify history of periodontal disease

Next, the MDMC considered whether individuals with periodontitis could be identified by ONLY including D4341 and D4342 instead of all 6 treatment codes in Codeset A, given that some Medicaid programs may only cover D4341/D4342. Table 8 presents data on the denominator impact for the periodontal measures when using the complete set of 6 core treatment codes for WI DD versus using only D4341 and D4342. The two Medicaid programs were not included in this comparison because the other four services were not covered.

Table 8. Adults with a history of periodontal disease (measured using the complete list of six CDT codes from Table 9) versus measured only using D4341/D4342 by age group and enrollment period, WI DD

	Members Enrolled ≥ 180 Days Continuously in 2014		Members Enrolled 11-12 Months Continuously in 2014	
	Core Code Set	Only 4341/4342	Core Code Set	Only 4341/4342
<b>Overall</b>	<b>25622</b>	<b>23666</b>	<b>24117</b>	<b>22270</b>
<b>18</b>	0	0	0	0
<b>19-20</b>	31	24	30	23
<b>21-24</b>	279	268	262	252
<b>25-34</b>	2553	2505	2289	2244
<b>35-44</b>	4453	4275	4162	3993
<b>45-54</b>	7179	6673	6821	6341
<b>55-64</b>	8394	7533	8034	7212
<b>65-74</b>	2337	2038	2134	1864

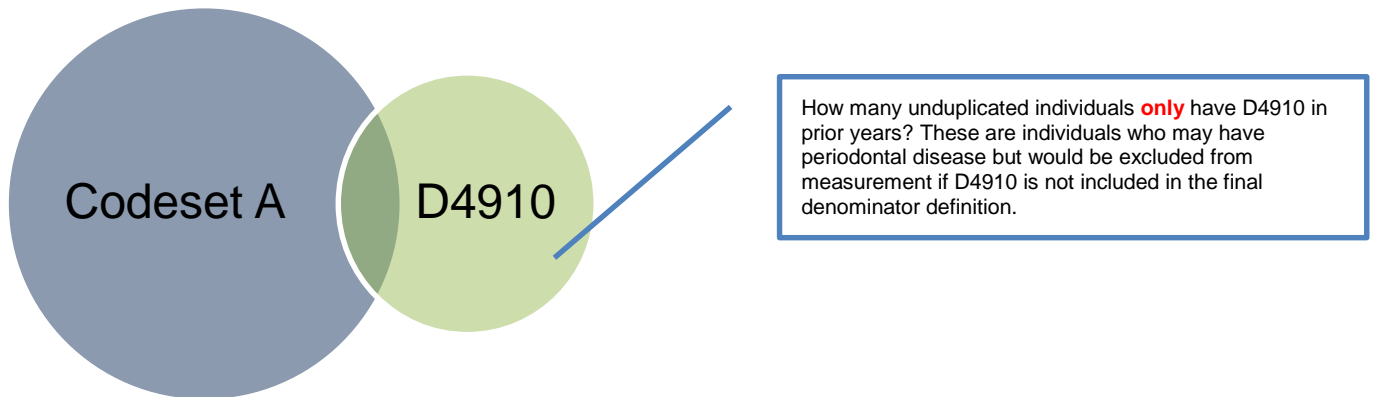
75-84	348	306	339	299
85+	48	44	46	42

Based on these data, the MDMC noted that there was not a substantial impact from dropping the other four codes in Codeset A; however, the MDMC believes that the comprehensive list of core codes increases face validity of the measure specification to identify patients with periodontitis. **It is important to note that although Medicaid programs may not cover the additional codes, these data confirm that most patients who receive soft tissue (D4240 or D4241) and osseous surgery (D4260 or D4261) also receive D4341 and D4342 during a three- year time frame. Medicaid programs choosing to implement this measure that do not reimburse all six services will be able to reliably implement these measures.** It is also important to note that this sampling methodology to identify the denominator population is not meant to identify the universe of patients with periodontitis but simply seeks to identify a reliable sample for measurement.

Impact of D4910 in prior years to identify history of periodontitis

In addition to the CDT treatment codes identified above, the MDMC considered whether to include D4910 (periodontal maintenance)—a service typically provided to individuals who have undergone active treatment for periodontal disease and are now on maintenance therapy. The MDMC evaluated the impact of including the periodontal maintenance code (D4910) in the denominator. [Table 9](#) presents the frequency of occurrence of D4910 with and without other codes in Codeset A ([Figure 2](#)). The number of adults included in the denominator without D4910 is indicated in blue font in the table, and the number in red font indicates the additional number of adults who would be included with D4910.

**Figure 2: Individuals with D4910 without other six core codes from Codeset A.**



**Table 9a. Adults with D4910 versus any code from Codeset A: (CY 2011–2013, WI DD).**

	Overall	No Code from Code Set A - No	Any Code from Code Set A - Yes
Population TOTAL	820,723	793,735	26,988
D4910 - No	776,842	760,339	16,503
D4910 - Yes	43,881	33,396	10,485

**Table 9b. Adults with D4910 versus any code from Codeset A: (CY 2011–2013, WI MD).**

	Overall	No Code from Code Set A - No	Any Code from Code Set A - Yes
Population TOTAL	922,474	910,373	12,101
D4910 - No	916,594	905,908	10,686
D4910 - Yes	5,880	4,465	1,415

**Table 9c. Adults with D4910 versus any code from Codeset A: (CY 2007–2009, WA MD).**

	Overall	No Code from Code Set A - No	Any Code from Code Set A - Yes
Population TOTAL	687,952	644,139	43,813
D4910 - No	678,610	636,495	42,115
D4910 - Yes	9,342	7,644	1,698

Based on the MDMC expert opinion that individuals with D4910 are likely to have a history of periodontitis and these data that demonstrate that a significant proportion of the population has ONLY D4910 in the three years prior to the

measurement year, the MDMC included D4910 **in addition to** the set of CDT treatment codes identified in [Table 7](#) to identify adults with a history of periodontitis. If a Medicaid program does not cover D4910 and the patient requires limited scaling, dentists in the Medicaid program typically use the D4341 and D4342 codes and these individuals will be captured in the denominator. Those patients in a Medicaid program that does not cover D4910 who (1) have not had active therapy in the last 3 years AND (2) received only D1110 as ongoing care may not be captured in the denominator. In such instances, the measure denominator may include fewer individuals with a history of periodontitis; however, the MDMC believes there will be sufficient sample sizes at the program/plan level to avoid compromising measure score validity.

## RESULTS: Denominator Definition: Age Range

Based on epidemiologic data on prevalence rates of periodontal disease<sup>8</sup> and stakeholder feedback during the public comment period, the MDMC determined that the lower age bound for the measure would be 30 years.

## RESULTS: Numerator Definition – Periodontal Evaluation

The MDMC determined that the codes to identify periodontal evaluation did not require further validation. D0120, D0150 OR D0180 will be used to identify periodontal evaluation.

## RESULTS: Numerator Definition – Services to Identify “Ongoing” Care

Conceptually the MDMC believes that patients with a history of periodontitis may receive ongoing care as either D1110 OR D4910 OR D4341/D4342 depending on the patients’ clinical condition.

To validate the services that could be used as markers for ongoing care, the MDMC compared three combinations of codes: 1) periodontal maintenance only; or 2) periodontal maintenance OR a dental prophylaxis or 3) periodontal maintenance OR a dental prophylaxis OR scaling and root planning. The MDMC also analyzed the independent impact of D4341/D4342.

[Table 10](#) summarizes the percentage of adults with a history of periodontal disease (measured using the complete list of six CDT codes from [Table 7](#) for the denominator) by age group who received ongoing periodontal care in the reporting year using each of the three approaches described above.

[Note: For this data run, D4910 in the last 3 years was not included in the denominator.]

Table 10a. Adults who received ongoing periodontal care in the reporting year (CY 2014, WI DD)

	Den	ONLY D4341 or D4342 and No D4910 or D1110	%	D4910/D1110/D4341/4342	%	D4910/D1110	%	D4910 only	%
<b>Overall</b>	50733	432	0.85%	40929	80.68%	40497	79.82%	31866	62.81%
<b>18</b>	0	0	--	0	--	0	--	0	--
<b>19-20</b>	32	1	3.13%	20	62.50%	19	59.38%	7	21.88%
<b>21-24</b>	312	3	0.96%	176	56.41%	173	55.45%	82	26.28%
<b>25-34</b>	3051	45	1.47%	2098	68.76%	2053	67.29%	1428	46.80%
<b>35-44</b>	6963	91	1.31%	5106	73.33%	5015	72.02%	3753	53.90%
<b>45-54</b>	13763	134	0.97%	10783	78.35%	10649	77.37%	8402	61.05%
<b>55-64</b>	19420	130	0.67%	16467	84.79%	16337	84.12%	13208	68.01%
<b>65-74</b>	5975	26	0.44%	5225	87.45%	5199	87.01%	4179	69.94%
<b>75-84</b>	1071	2	0.19%	938	87.58%	936	87.39%	727	67.88%
<b>85+</b>	146	0	0.00%	116	79.45%	116	79.45%	80	54.79%

<sup>8</sup> Eke PI1, Dye BA, et al. Update on Prevalence of Periodontitis in Adults in the United States: NHANES 2009 to 2012. J Periodontol. 2015 May;86(5):611-22. doi: 10.1902/jop.2015.140520. Epub 2015 Feb 17.



Table 10b. Adults who received ongoing periodontal care in the reporting year (CY 2014, WI MD)

	Den	ONLY D4341 or D4342 and No D4910 or D1110	%	D4910/D1110/ D4341/4342	%	D4910/ D1110	%	D4910 only	%
<b>Overall</b>	10884	207	1.90%	4452	40.90%	4245	39.00%	1925	17.69%
<b>18</b>	12	0	0.00%	6	50.00%	6	50.00%	1	8.33%
<b>19-20</b>	24	0	0.00%	6	25.00%	6	25.00%	0	0.00%
<b>21-24</b>	192	3	1.56%	50	26.04%	47	24.48%	11	5.73%
<b>25-34</b>	2057	31	1.51%	616	29.95%	585	28.44%	246	11.96%
<b>35-44</b>	3008	59	1.96%	1103	36.67%	1044	34.71%	472	15.69%
<b>45-54</b>	2845	58	2.04%	1260	44.29%	1202	42.25%	568	19.96%
<b>55-64</b>	1939	47	2.42%	964	49.72%	917	47.29%	421	21.71%
<b>65-74</b>	633	7	1.11%	347	54.82%	340	53.71%	157	24.80%
<b>75-84</b>	150	2	1.33%	84	56.00%	82	54.67%	43	28.67%
<b>85+</b>	24	0	0.00%	16	66.67%	16	66.67%	6	25.00%

Table 10c. Adults who received ongoing periodontal care in the reporting year (CY 2010), WA MD

	Den	ONLY D4341 or D4342 and No D4910 or D1110	%	D4910/D1110/ D4341/4342	%	D4910/ D1110	%	D4910 only	%
<b>Overall</b>	35103	2818	8.03%	12621	35.95%	9803	27.93%	5041	14.36%
<b>18</b>	0	0	--	0	--	0	--	0	--
<b>19-20</b>	187	13	6.95%	63	33.69%	50	26.74%	19	10.16%
<b>21-24</b>	2265	161	7.11%	672	29.67%	511	22.56%	239	10.55%
<b>25-34</b>	8876	726	8.18%	2904	32.72%	2178	24.54%	1020	11.49%
<b>35-44</b>	6692	548	8.19%	2396	35.80%	1848	27.62%	898	13.42%
<b>45-54</b>	6608	561	8.49%	2457	37.18%	1896	28.69%	1041	15.75%
<b>55-64</b>	4568	375	8.21%	1818	39.80%	1443	31.59%	786	17.21%
<b>65-74</b>	3182	258	8.11%	1293	40.63%	1035	32.53%	569	17.88%
<b>75-84</b>	1892	145	7.66%	725	38.32%	580	30.66%	317	16.75%
<b>85+</b>	833	31	3.72%	293	35.17%	262	31.45%	152	18.25%

The following paragraphs describe MDMC determinations in defining “ongoing care”.

[Inclusion of D4910 to identify ongoing care](#)

Periodontal maintenance (D4910) is, by definition, ongoing care for patients with a history of periodontal disease. MDMC included D4910 as a marker of ongoing care.

[Inclusion of D1110 in addition to D4910 to identify ongoing care](#)

The data in the tables above demonstrate a significant impact of D1110 on the number of individuals included. Further, conceptually, MDMC determined that depending on the clinical condition of the patient, D1110 may be provided as ongoing care for patients with a history of periodontitis. Based on these considerations, the MDMC determined to include D1110 in the numerator definition.

[Inclusion of D4341 and D4342 in addition to D4910 and D1110 to identify ongoing care](#)

Periodontal maintenance (D4910) as a procedure includes “site specific scaling and root planing.” Anecdotally, in some Medicaid programs that do not cover D4910 or have frequency limitations, providers use D4341/D4342 to document limited scaling and root planing in patients being maintained following comprehensive periodontal therapy. Inclusion of D4341/D4342 did not substantially increase the numerator values in the WI DD and WI Medicaid programs. However, there was a pronounced increase in the numerator for WA Medicaid. Based on these considerations, the MDMC was in favor of including D4341/D4342 in the definition of ongoing care to include patients being cared for through the provision of limited scaling and root planing to address recurrent disease.

Exclusion of D4240, D4241, D4260, and D4261 to identify ongoing care

The MDMC also considered whether to include codes for flap or osseous surgery in the numerator to identify ongoing care. Generally, the majority of patients receiving maintenance following active treatment are not expected to require advanced treatments such as flap or osseous surgery to address recurrent disease as ongoing care. [Table 11](#) presents the data used to inform this decision by assessing the frequency with which a patient with a history of periodontitis received flap or osseous surgery as one or both visits during the reporting year. (As described below, the measure requires two ongoing care visits during the reporting year.) These data are presented only for WI Delta Dental because there were no occurrences of flap or osseous surgery in the Medicaid populations. Within the commercial population, only 0.2% of adults with periodontitis would be excluded from the numerator due to exclusion of these codes when they account for one of the two visits. Further, there were only 10 instances (0.02%) where individuals ONLY received flap or osseous surgery in BOTH visits during the measurement year. Thus, inclusion of these additional codes would not impact the measure score. Given these data and the concern that advanced treatment should not be expected in the majority of patients being maintained, the MDMC was not in favor of including these codes to represent ongoing care.

Table 11. Adults Who Received D4240/D4241/D4260/D4261 as One or Both Visits to Qualify for the Numerator, (CY 2014, WI DD)

	Den	At Least 1 Visit with Flap/Osseous Surgery(D4240/D4241/D4260/D4261) AND only 1 other Visit with D1110/D4910/D4342/D4342	%	At Least Two visits with Flap/Osseous Surgery (D4240/D4241/D4260/D4261) and NO Visits with D1110/D4910/D4342/D4342	%
<b>Overall</b>	50733	95	0.19%	10	0.02%
<b>18</b>	0	0	--	0	--
<b>19-20</b>	32	0	0.00%	0	0.00%
<b>21-24</b>	312	1	0.32%	0	0.00%
<b>25-34</b>	3051	4	0.13%	0	0.00%
<b>35-44</b>	6963	14	0.20%	1	0.01%
<b>45-54</b>	13763	26	0.19%	4	0.03%
<b>55-64</b>	19420	40	0.21%	5	0.03%
<b>65-74</b>	5975	9	0.15%	0	0.00%
<b>75-84</b>	1071	1	0.09%	0	0.00%
<b>85+</b>	146	0	0.00%	0	0.00%

**RESULTS: Numerator Definition – Frequency of Periodontal Services for Ongoing Care**

The Position Paper from the AAP suggests that for individuals with history of periodontitis, periodontal maintenance services should be performed at least four times per year with 3 months interval between each service for a decreased likelihood of disease progression.<sup>9</sup> To that end, MDMC looked at the frequency of periodontal ongoing care services for those individuals enrolled for at least 11 months with periodontitis (six codes). [Table 12](#) presents the data from this analysis. [Note: This data run included D4910 in the denominator]. This analysis helped the MDMC assess performance gaps.

Based on the AAP recommendations and the significant performance gap even at 2 visits in a commercially-insured population, the MDMC determined that as a measure of quality, a requirement of “at least 2 visits” is appropriate.

9 Cohen RE; Research, Science and Therapy Committee, American Academy of Periodontology. Position paper: Periodontal Maintenance. J Periodontol. 2003 Sep;74(9):1395-401.

Table 12a: Periodontal Ongoing Care (D4910, 4341, 4342 or D1110) in 2014: Enrolled At Least 11 months with History of Periodontitis in 2011-2013, WI DD

	Den	Any visit	Rate	Exactly 1 visit	Rate	Exactly 2 visits	Rate	Exactly 3 visits	Rate	4 or more visits	Rate
<b>Overall</b>	49479	40125	81.10%	7683	15.53%	15601	31.53%	11732	23.71%	5109	10.33%
<b>30-34</b>	2141	1490	69.59%	398	18.59%	653	30.50%	322	15.04%	117	5.46%
<b>35-44</b>	6963	5106	73.33%	1296	18.61%	2087	29.97%	1247	17.91%	476	6.84%
<b>45-54</b>	13763	10783	78.35%	2246	16.32%	4201	30.52%	3087	22.43%	1249	9.08%
<b>55-64</b>	19420	16467	84.79%	2818	14.51%	6242	32.14%	5050	26.00%	2357	12.14%
<b>65-74</b>	5975	5225	87.45%	749	12.54%	1982	33.17%	1720	28.79%	774	12.95%
<b>75-84</b>	1071	938	87.58%	156	14.57%	381	35.57%	274	25.58%	127	11.86%
<b>85+</b>	146	116	79.45%	20	13.70%	55	37.67%	32	21.92%	9	6.16%

In summary:

- 81.1% received at least one ongoing care visit
- 65.6% received at least two ongoing care visits
- 34.0% received at least three ongoing care visits
- 10.3% received at least four ongoing care visits

Table 12b: Periodontal Ongoing Care (D4910, 4341, 4342 or D1110) in 2014: Enrolled At Least 11 months with History of Periodontitis in 2011-2013, WI MD

	Den	Any visit	Rate	Exactly 1 visit	Rate	Exactly 2 visits	Rate	Exactly 3 visits	Rate	4 or more visits	Rate
<b>Overall</b>	9942	4195	42.19%	2451	24.65%	1417	14.25%	244	2.45%	83	0.83%
<b>30-34</b>	1343	421	31.35%	276	20.55%	126	9.38%	16	1.19%	3	0.22%
<b>35-44</b>	3008	1103	36.67%	706	23.47%	339	11.27%	38	1.26%	20	0.66%
<b>45-54</b>	2845	1260	44.29%	741	26.05%	411	14.45%	90	3.16%	18	0.63%
<b>55-64</b>	1939	964	49.72%	494	25.48%	370	19.08%	70	3.61%	30	1.55%
<b>65-74</b>	633	347	54.82%	180	28.44%	133	21.01%	25	3.95%	9	1.42%
<b>75-84</b>	150	84	56.00%	41	27.33%	35	23.33%	5	3.33%	3	2.00%
<b>85+</b>	24	16	66.67%	13	54.17%	3	12.50%	0	0.00%	0	0.00%

In summary:

- 42.2% received at least one ongoing care visit
- 17.5% received at least two ongoing care visits
- 3.3% received at least three ongoing care visits
- 0.8% received at least four ongoing care visits

Table 12c: Periodontal Ongoing Care (D4910, 4341, 4342 or D1110) in 2010: Enrolled At Least 11 months with History of Periodontitis in 2007-2009, WA MD

	Den	Any visit	Rate	Exactly 1 visit	Rate	Exactly 2 visits	Rate	Exactly 3 visits	Rate	4 or more visits	Rate
<b>Overall</b>	27966	10394	37.17%	7650	27.35%	1795	6.42%	744	2.66%	205	0.73%
<b>30-34</b>	4191	1412	33.69%	1094	26.10%	214	5.11%	83	1.98%	21	0.50%
<b>35-44</b>	6692	2396	35.80%	1782	26.63%	376	5.62%	201	3.00%	37	0.55%
<b>45-54</b>	6608	2457	37.18%	1678	25.39%	486	7.35%	222	3.36%	71	1.07%
<b>55-64</b>	4568	1818	39.80%	1255	27.47%	376	8.23%	142	3.11%	45	0.99%
<b>65-74</b>	3182	1293	40.63%	998	31.36%	212	6.66%	62	1.95%	21	0.66%
<b>75-84</b>	1892	725	38.32%	594	31.40%	98	5.18%	25	1.32%	8	0.42%
<b>85+</b>	833	293	35.17%	249	29.89%	33	3.96%	9	1.08%	2	0.24%

In summary:

- 37.2% received at least one ongoing care visit
- 9.8% received at least two ongoing care visits
- 3.4% received at least three ongoing care visits
- 0.7% received at least four ongoing care visits

## RESULTS: Denominator Definition – Enrollment Interval for Periodontal Evaluation Measure

Four approaches to defining enrollment were evaluated: (1) members enrolled for at least 30 continuous days; (2) members enrolled for at least 90 continuous days; (3) members enrolled for at least 180 continuous days; and (4) members enrolled for 12 months continuously during the calendar year allowing a single gap of no more than 31 days.

Table 13 presents data on the number of adults aged 18 years and older eligible for inclusion under each enrollment definition in each of the three programs.

Table 13. Adults ages 18 and older eligible for inclusion under each enrollment definition.

	WI Delta Dental, CY 2014			WI Medicaid, CY 2014			WA Medicaid, CY2010		
	Number of Members >=18, 2014	Members >=18 with Any CDT Code	% of Enrolled	Number of Members >=18, 2014	Members >=18 with Any CDT Code	% of Enrolled	Number of Members >=18, 2010	Members >=18 with Any CDT Code	% of Enrolled
<b>Enrolled at least 30 days continuously</b>	820,723	655,852	79.91%	922,474	165,917	17.99%	687,952	164,948	23.98%
<b>Enrolled at least 90 days continuously</b>	803,426 (97%)	648,211	80.68%	842,666 (91%)	164,415	19.51%	624,208 (91%)	161,649	25.90%
<b>Enrolled at least 180 days continuously</b>	766,659 (93%)	621,849	81.11%	710,082 (77%)	152,593	21.49%	515,365 (75%)	147,074	28.54%
<b>Enrolled 11-12 months</b>	689,785 (84%)	558,087	80.91%	511,438 (55%)	122,175	23.89%	360,907 (52%)	115,073	31.88%

Based on these data and to achieve consistency with the pediatric oral evaluation measure, the MDMC Committee was in favor of using a **180-day continuous enrollment requirement** in the denominator for the periodontal evaluation measure.

## RESULTS: Denominator Definition – Time Frame to Identify History of Periodontitis

The measure specifications allow for identification of a history of periodontitis by using available claims for 3 prior years; however, they do not require enrollment in those prior years. The MDMC evaluated the effect of using different time frames for the “look back” period to identify a history of periodontitis. Table 14 presents these data. [Note: Lower age bound used for this analysis was 35 years.]

Table 14a. Periodontal Evaluation: Comparison of 1, 2, and 3 Year Look-Back Periods to Identify History of Periodontitis, Adults 35 Years and Older

	Periodontal Evaluation								
	History Determined Using 3 Prior Years			History Determined Using 2 Prior Years			History Determined Using 1 Prior Year		
	Den	Num	Rate	Den	Num	Rate	Den	Num	Rate
<b>WI Delta Dental</b>	50035	37132	74.21%	45072	34379	76.28%	38268	30582	79.92%
<b>WI Medicaid</b>	9661	3871	40.07%	6927	3056	44.12%	4093	1976	48.28%
<b>WA Medicaid</b>	26532	9908	37.34%	21198	8217	38.76%	14121	5663	40.10%

Table 14b. Periodontal Ongoing Care: Comparison of 1, 2, and 3 Year Look-Back Periods to Identify History of Periodontitis, Adults 35 Years and Older

	Periodontal Ongoing Care								
	History Determined Using 3 Prior Years			History Determined Using 2 Prior Years			History Determined Using 1 Prior Year		
	Den	Num	Rate	Den	Num	Rate	Den	Num	Rate
<b>WI Delta Dental</b>	47338	31350	66.23%	42673	29591	69.34%	36260	27077	74.67%

<b>WI Medicaid</b>	8599	1599	18.60%	6214	1391	22.38%	3709	1018	27.45%
<b>WA Medicaid</b>	23775	2426	10.20%	18984	2054	10.82%	12602	1506	11.95%

Having fewer prior years of data decreases the denominator. The measure scores for the three programs were higher with a shorter look-back period, indicating poorer performance as more time elapses from active treatment. Because patients with periodontitis require ongoing evaluation and care, the MDMC selected the 3-year time frame for identifying a history of periodontitis.

## RESULTS: Data Element Validation for Periodontal Measures

To evaluate data element validity (i.e., to answer the question whether the data reported in the claims match up with those in the dental record), the research team conducted reviews of dental records for all data sources to validate individual dental procedure codes as well as broader care domains. The periodontal sample included 82 enrollees in WI Delta Dental (the full population of those qualifying for denominator inclusion), 325 enrollees in WI Medicaid, and 188 in Washington Medicaid for a total of 595 records reviewed. All dental procedure codes for these patients in 2014 were compared between the administrative claims data and the dental records: 2,717 for WI Delta Dental and 8,910 for WI Medicaid. There was agreement between the claims data and dental records for 87% of procedures in WI Medicaid, 92% of procedures in WI Delta Dental, and 91% of procedures in WA Medicaid. **Validation of the specific codes used in the periodontal measures demonstrated greater than 99% agreement in both WI Delta Dental and WI Medicaid.** Kappa statistic values ranged from 0.80–1.00 indicating “substantial” or “almost perfect” agreement. These data are presented in [Table 15](#).

Table 15: Data Element Concordance: Periodontal Measures

Procedures	WI Delta Dental		WI Medicaid		WA Medicaid	
	Percent Agreement	Kappa Statistic	Percent Agreement	Kappa Statistic	Percent Agreement	Kappa Statistic
D0120	99.7%	0.99	99.4%	0.96	99.6%	0.96
D0150	99.9%	0.98	99.5%	0.99	99.7%	0.94
D0180	100.0%	1.00	100.0%	N/A*	99.4%	0.97
D1110	99.9%	1.00	99.0%	0.91	99.5%	0.97
D4240	100.0%	N/A*	100.0%	N/A*	100.0%	N/A*
D4241	99.9%	0.80	100.0%	N/A*	100.0%	N/A*
D4260	100.0%	1.00	100.0%	N/A*	100.0%	N/A*
D4261	100.0%	1.00	100.0%	N/A*	100.0%	N/A*
D4341	99.9%	0.99	99.5%	0.94	99.7%	0.96
D4342	100.0%	1.00	99.1%	0.93	100.0%	1.00
D4910	99.7%	0.99	99.2%	0.94	99.8%	0.96

\*N/A: Insufficient data to calculate

## RESULTS: Measure Scores for Periodontal Evaluation using Finalized Measure Specifications

Overall rates: [between program comparisons](#)

Measure scores ranged from 35.9% of WA Medicaid enrollees with periodontitis who had an evaluation to 73.8% of WI Delta Dental enrollees ([Table 16](#)). The non-overlapping 95% confidence intervals between the programs indicate that the between-program differences were statistically significant at the 0.05 level.

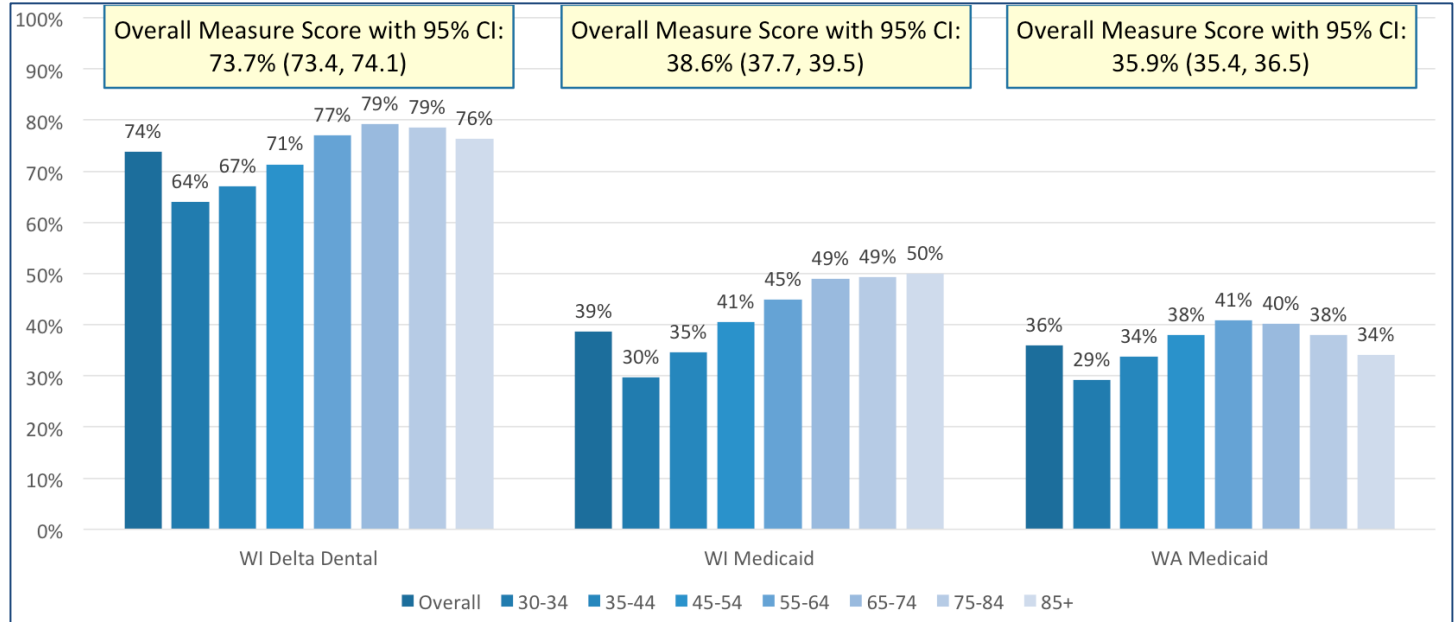
Table 16: Periodontal Evaluation Measure Scores by Program

Program	Den	Num	%	95% Confidence Interval
WI Delta Dental	52,383	38,634	73.75%	(73.37%, 74.13%)
WI Medicaid	11,235	4,338	38.61%	(37.71%, 39.52%)
WA Medicaid	32,063	11,518	35.92%	(35.40%, 36.45%)

[Rates reported by age strata](#)

Figure 3 depicts the measure scores stratified by age group. There was statistically significant variation in receipt of topical fluoride between age strata. In addition, there were statistically significant differences by race/ethnicity and the enrollee’s geographic location (urban versus rural); these additional stratification results are on file with the DQA.

Figure 3: Periodontal Evaluation Measure Scores by Age Strata



## RESULTS: Face Validity of Periodontal Evaluation Measure Scores using Finalized Measure Specifications

The results of the face validity assessment demonstrate that the expert group had confidence in the measure’s importance, feasibility, reliability, validity and usability as a utilization of services measure, the voting members of the DQA voted to approve the measure as specified based on the testing results. Thus, the measure score has strong face validity.

## RESULTS: Measure Scores for Periodontal Ongoing Care using Finalized Measure Specifications

[Overall rates: between program comparisons](#)

Measure scores ranged from 9.8% of WA Medicaid enrollees with periodontitis who received at least 2 ongoing care services to 65.6% of WI Delta Dental enrollees (Table 17). Even in the highest performing program, two-thirds of enrollees did not receive at least two ongoing care visits. The non-overlapping 95% confidence intervals between the programs indicate that the between-program differences were statistically significant at the 0.05 level.

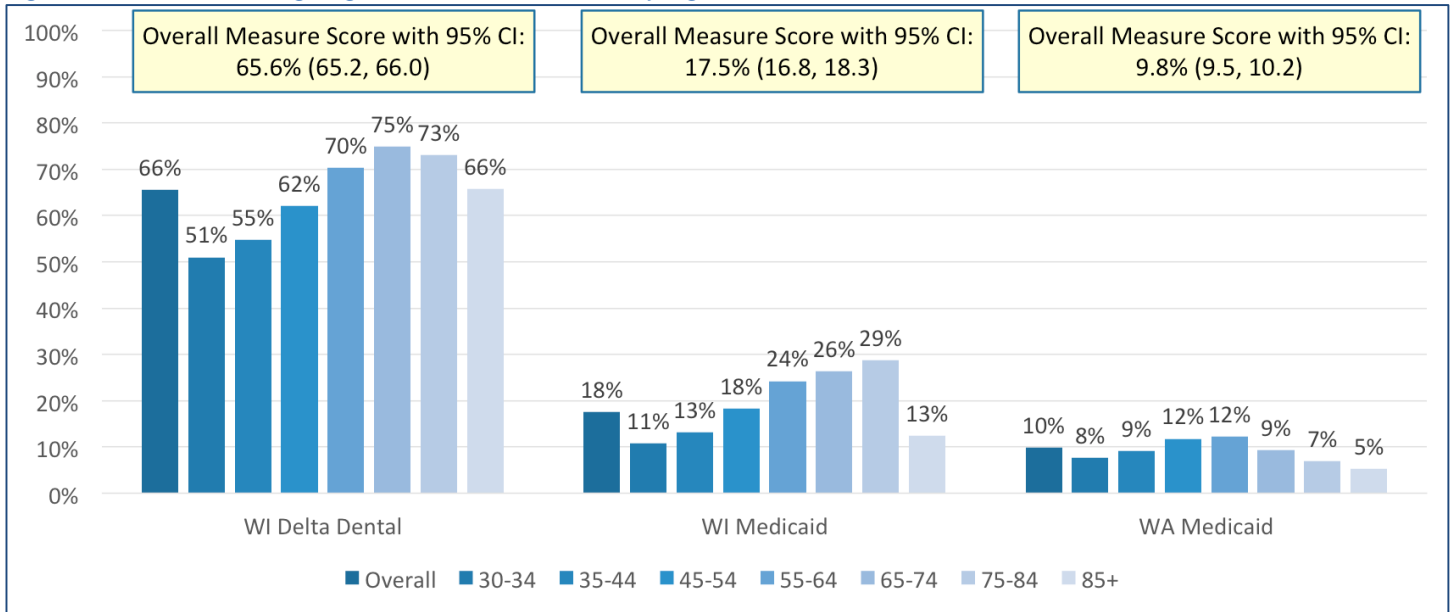
Table 17: Periodontal Ongoing Care Measure Scores by Program

Program	Den	Num	%	95% Confidence Interval
WI Delta Dental	49,479	32,442	65.57%	(65.15%, 65.99%)
WI Medicaid	9,942	1,744	17.54%	(16.80%, 18.30)
WA Medicaid	27,966	2,744	9.81%	(9.47%, 10.17%)

Rates reported by age strata

Figure 4 depicts the measure scores stratified by age group. There was variation in receipt of ongoing care services between age strata. In addition, there were statistically significant differences by race/ethnicity and the enrollee's geographic location (urban versus rural); these additional stratification results are on file with the DQA.

Figure 4: Periodontal Ongoing Care Measure Scores by Age Strata



## RESULTS: Face Validity of Periodontal Ongoing Care Measure Scores using Finalized Measure Specifications

The results of the face validity assessment demonstrate that the expert group had confidence in the measure's importance, feasibility, reliability, validity and usability as a process of care quality measure, the voting members of the DQA voted to approve the measure as specified based on the testing results. Thus, the measure score has strong face validity.

## TOPICAL FLUORIDE FOR ADULTS AT “ELEVATED CARIES RISK”

Although frequently not covered for adults, American Dental Association Evidence-Based guidelines suggests that professionally applied fluoride varnish every three to four months is effective in preventing caries in high risk adults.<sup>10</sup> Studies published following publication of this systematic review further support this preventive approach.<sup>11, 12</sup>

Based on this evidence, the DQA developed and tested one performance measure applicable to patients with elevated risk for caries as a process of care quality measure:

- Topical Fluoride Application for Patients at Elevated Risk for Caries

Decisions for the topical fluoride measure specifications were based largely on testing with Medicaid data due to low coverage among the commercial plans included in the testing. **For the purposes of implementation, existence of a validated quality measure should trigger program officials to consider expanding benefits to support services that are the focus of the measure to provide high quality oral health care for their beneficiaries.**

### RESULTS: Denominator Definition – Identify Adults at “Elevated Caries Risk”

The measure specifications will include D0602 and D0603 to identify individuals at elevated risk for caries. However, the MDMC noted that these caries risk codes are not yet fully documented and transmitted into claims databases. To identify an alternate mechanism to identify individuals at elevated risk, the MDMC noted that past history of caries remains the most valid predictor for future lesions. The MDMC reviewed all relevant restorative, endodontic and extraction codes that may indicate past treatment for caries. The set of restorative and endodontic CDT codes indicative of elevated caries risk is included in [Table 18](#).

Table 18. CDT Codes Indicating History of Elevated Caries Risk

D1354	D2393	D2620	D2712	D2790	D3222
D2140	D2394	D2630	D2720	D2791	D3310
D2150	D2410	D2642	D2721	D2792	D3320
D2160	D2420	D2643	D2722	D2794	D3330
D2161	D2430	D2644	D2740	D2799	
D2330	D2510	D2650	D2750	D2931	
D2331	D2520	D2651	D2751	D2932	
D2332	D2530	D2652	D2752	D2933	
D2335	D2542	D2662	D2780	D3110	
D2390	D2543	D2663	D2781	D3120	
D2391	D2544	D2664	D2782	D3220	
D2392	D2610	D2710	D2783	D3221	

#### Exclusion of Extraction Codes – D7140, D7210, D7250

Initial analysis of the WI Medicaid administrative claims ([Table 19](#)) indicated that about 75% of adults identified as at "elevated risk" had restorations; about 49% had extractions and about 10% had endodontic procedures. Of the total population included in the sample, 21% had ONLY extractions and no restorations and no endodontic procedures. Similarly, analysis of the WI Delta Dental administrative claims indicate that about 90% of adult identified as at “elevated risk” had restorations; about 21% had extractions and about 16% had endodontic procedures. Of the total population included in the sample, only about 7% had ONLY extractions and no restorations and no endodontic procedures.

<sup>10</sup> Weyant, Robert J. et al. Topical fluoride for caries prevention. The Journal of the American Dental Association 2013, Volume 144 , Issue 11 , 1279 - 1291

<sup>11</sup> Zero DT, Brennan MT, et al. Clinical practice guidelines for oral management of Sjögren disease: Dental caries prevention. J Am Dent Assoc. 2016 Apr;147(4):295-305. doi: 10.1016/j.adaj.2015.11.008. Epub 2016 Jan 5.

<sup>12</sup> Gibson G, Jurasic MM, et al. Longitudinal outcomes of using a fluoride performance measure for adults at high risk of experiencing caries. J Am Dent Assoc. 2014 May;145(5):443-51. doi: 10.14219/jada.2013.53.



Table 19: Individuals with elevated caries risk in 2011-2014 or have any extraction code (2011- 2014)

Any Restorations?	Any Extractions?	Any Endodontics?	WI Medicaid		WI Delta Dental	
			N	%	N	%
Yes	No	No	167,507	44.7%	347,519	65.3%
Yes	No	Yes	17,445	4.7%	60,867	11.4%
Yes	Yes	No	84,469	22.5%	51,719	9.7%
Yes	Yes	Yes	15,342	4.1%	18,946	3.6%
No	No	Yes	2,609	0.7%	4,862	0.9%
No	Yes	Yes	2,130	0.6%	1,452	0.3%
No	Yes	No	79,571	21.2%	35,421	6.7%

The MDMC evaluated reasons for extractions and noted that in adults, extractions often may not be related to diagnoses that are consistent with caries-related lesions. For example, extractions can be prompted by trauma and periodontal diseases, leading to concerns about validity of including extraction codes given the lack of diagnostic codes in the claims system. These determinations were supported by dental record reviews documenting the reasons for extractions (data on file with the DQA). To that end, the MDMC decided not to include extraction codes in the “elevated caries risk” code set.

Extent of treatment as a consideration for determining caries risk

Next the MDMC evaluated whether a single occurrence of any one of these codes would place the individual in the high risk category (Table 20). [Note: These analyses were run without tooth restriction for identification of elevated caries risk.]

Table 20a: Individuals identified as at elevated risk based on the number of risk code occurrences – Number and as Percent of All Enrolled 11-12 Months (CY 2014 WI DD)

Age	At least one elevated risk code in reporting year or prior three years	At least two elevated risk code in reporting year or prior three years	At least three elevated risk code in reporting year or prior three years
<b>Overall</b>	433,743 (63%)	325,216 (47%)	234,992 (34%)
<b>18-20</b>	12,099 (35%)	7,718 (23%)	4,847 (14%)
<b>21-24</b>	27,225 (51%)	19,598 (37%)	13,937 (26%)
<b>25-34</b>	59,401 (58%)	44,610 (43%)	32,742 (32%)
<b>35-44</b>	79,067 (61%)	58,017 (45%)	41,323 (32%)
<b>45-54</b>	110,442 (66%)	81,985 (49%)	58,322 (35%)
<b>55-64</b>	112,114 (72%)	86,851 (56%)	63,831 (41%)
<b>65-74</b>	27,499 (74%)	21,804 (59%)	16,444 (44%)
<b>75-84</b>	4,790 (73%)	3,761 (57%)	2,865 (43%)
<b>85+</b>	1,106 (68%)	872 (53%)	681 (42%)

Table 20b: Individuals identified as at elevated risk based on the number of risk code occurrences – Number and as Percent of All Enrolled 11-12 Months (CY 2014 WI MD)

Age	At least one elevated risk code in reporting year or prior three years	At least two elevated risk code in reporting year or prior three years	At least three elevated risk code in reporting year or prior three years
<b>Overall</b>	111,079 (22%)	89,072 (17%)	70,207 (14%)
<b>18-20</b>	10,969 (31%)	8,788 (25%)	6,840 (20%)
<b>21-24</b>	7,298 (19%)	5,813 (15%)	4,509 (12%)
<b>25-34</b>	30,028 (29%)	24,772 (24%)	19,974 (19%)
<b>35-44</b>	24,109 (32%)	19,243 (25%)	15,338 (20%)
<b>45-54</b>	18,224 (29%)	14,417 (23%)	11,353 (18%)
<b>55-64</b>	12,347 (24%)	9,736 (19%)	7,592 (15%)
<b>65-74</b>	4,781 (8%)	3,683 (6%)	2,786 (5%)
<b>75-84</b>	2,037 (4%)	1,521 (3%)	1,142 (2%)
<b>85+</b>	1,286 (4%)	919 (3%)	673 (2%)

Table 20c: Individuals identified as at elevated risk based on the number of risk code occurrences – Number and as Percent of All Enrolled 11-12 Months (CY 2010 WA MD)

Age	At least one elevated risk code in reporting year or prior three years	At least two elevated risk code in reporting year or prior three years	At least three elevated risk code in reporting year or prior three years
<b>Overall</b>	97,116 (27%)	78,117 (22%)	60,728 (17%)
<b>18-20</b>	5,673 (24%)	4,159 (18%)	2,967 (13%)
<b>21-24</b>	11,175 (30%)	8,996 (24%)	6,927 (19%)
<b>25-34</b>	27,993 (36%)	23,023 (29%)	18,323 (23%)
<b>35-44</b>	16,935 (33%)	13,706 (27%)	10,672 (21%)
<b>45-54</b>	14,465 (27%)	11,608 (21%)	9,060 (17%)
<b>55-64</b>	9,625 (22%)	7,673 (18%)	5,923 (14%)
<b>65-74</b>	6,145 (18%)	4,942 (14%)	3,797 (11%)
<b>75-84</b>	3,721 (15%)	2,967 (12%)	2,278 (9%)
<b>85+</b>	1,384 (10%)	1,043 (7%)	781 (6%)

Restorative treatments in adults occur more frequently for reasons unrelated to caries compared with restorative treatments in children. Absence of diagnostic codes in the claims data limits the ability to assess reasons for restorative treatment. Limited quality of documentation within the charts further limits the information that can be gleaned from chart reviews. Because of these considerations, the MDMC was in favor of a more conservative approach for defining the adult population that is at elevated risk for caries.

Based on expert opinion, the MDMC decided to require at least 3 instances of any of the risk codes to identify an individual as being at elevated caries risk for denominator inclusion. Note that this sampling methodology does not seek to identify ALL individuals at elevated caries risk but simply seeks to identify a suitable sample for measurement purposes by focusing on those who are most likely to be at elevated caries risk.

## RESULTS: Numerator Definition – Topical Fluoride Use

The MDMC determined that the codes to identify topical fluoride did not require further validation. D1206 and D1208 are used to identify topical fluoride.

## RESULTS: Numerator Definition – Frequency of Topical Fluoride

American Dental Association Evidence-Based guidelines suggests that professionally applied fluoride varnish every three to four months is effective in preventing caries in high risk adults.<sup>13</sup> The MDMC examined the frequency of topical fluoride for those individuals enrolled for at least 11 months who were at elevated caries risk. [Table 21](#) presents the data from this analysis. This analysis helped the MDMC assess performance gaps. [[Note: These analyses were run without tooth restriction for identification of elevated caries risk.]

13 Weyant, Robert J. et al. Topical fluoride for caries prevention. The Journal of the American Dental Association , Volume 144 , Issue 11 , 1279 - 1291

Table 21a: Fluoride Services in 2014: Enrolled At Least 11 months with Elevated Caries Risk (at least 3 risk codes in CY 2011-2014) in WI DD

	Den	Any visit	Rate	Exactly 1 visit	Rate	Exactly 2 visits	Rate	Exactly 3 visits	Rate	4 or more visits	Rate
<b>Overall</b>	235000	15983	6.80%	9727	4.14%	5585	2.38%	485	0.21%	186	0.08%
<b>18</b>	585	126	21.54%	107	18.29%	18	3.08%	1	0.17%	0	0.00%
<b>19-20</b>	4264	563	13.20%	421	9.87%	132	3.10%	8	0.19%	2	0.05%
<b>21-24</b>	13937	1062	7.62%	761	5.46%	285	2.04%	12	0.09%	4	0.03%
<b>25-34</b>	32744	2496	7.62%	1665	5.08%	795	2.43%	27	0.08%	9	0.03%
<b>35-44</b>	41325	2826	6.84%	1708	4.13%	1043	2.52%	52	0.13%	23	0.06%
<b>45-54</b>	58323	3565	6.11%	2129	3.65%	1272	2.18%	120	0.21%	44	0.08%
<b>55-64</b>	63832	4017	6.29%	2232	3.50%	1526	2.39%	182	0.29%	77	0.12%
<b>65-74</b>	16444	1076	6.54%	567	3.45%	421	2.56%	64	0.39%	24	0.15%
<b>75-84</b>	2865	208	7.26%	108	3.77%	79	2.76%	18	0.63%	3	0.10%
<b>85+</b>	681	44	6.46%	29	4.26%	14	2.06%	1	0.15%	0	0.00%

In summary:

- 6.8% received at least one fluoride visit
- 2.7% received at least two fluoride visits
- 0.3% received at least three fluoride visits
- 0.1% received at least four fluoride visits

Table 21b: Fluoride Services in 2014: Enrolled At Least 11 months with Elevated Caries Risk (at least 3 risk codes in CY 2011-2014) in WI MD

	Den	Any visit	Rate	Exactly 1 visit	Rate	Exactly 2 visits	Rate	Exactly 3 visits	Rate	4 or more visits	Rate
<b>Overall</b>	70207	12305	17.53%	9377	13.36%	2364	3.37%	430	0.61%	134	0.19%
<b>18</b>	3835	1524	39.74%	1103	28.76%	381	9.93%	22	0.57%	18	0.47%
<b>19-20</b>	3005	751	24.99%	572	19.03%	155	5.16%	18	0.60%	6	0.20%
<b>21-24</b>	4509	769	17.05%	629	13.95%	113	2.51%	20	0.44%	7	0.16%
<b>25-34</b>	19974	2902	14.53%	2470	12.37%	366	1.83%	51	0.26%	15	0.08%
<b>35-44</b>	15338	2230	14.54%	1783	11.62%	370	2.41%	62	0.40%	15	0.10%
<b>45-54</b>	11353	1906	16.79%	1377	12.13%	412	3.63%	94	0.83%	23	0.20%
<b>55-64</b>	7592	1324	17.44%	905	11.92%	308	4.06%	83	1.09%	28	0.37%
<b>65-74</b>	2786	499	17.91%	309	11.09%	132	4.74%	45	1.62%	13	0.47%
<b>75-84</b>	1142	245	21.45%	134	11.73%	84	7.36%	23	2.01%	4	0.35%
<b>85+</b>	673	155	23.03%	95	14.12%	43	6.39%	12	1.78%	5	0.74%

In summary:

- 17.5% received at least one fluoride visit
- 4.2% received at least two fluoride visits
- 0.8% received at least three fluoride visits
- 0.2% received at least four fluoride visits

Table 21c: Fluoride Services in 2014: Enrolled At Least 11 months with Elevated Caries Risk (at least 3 risk codes in CY 2007-20110) in WA MD

	Den	Any visit	Rate	Exactly 1 visit	Rate	Exactly 2 visits	Rate	Exactly 3 visits	Rate	4 or more visits	Rate
<b>Overall</b>	60728	13296	21.89%	11443	18.84%	1400	2.31%	409	0.67%	44	0.07%
<b>18</b>	406	277	68.23%	192	47.29%	80	19.70%	5	1.23%	0	0.00%
<b>19-20</b>	2561	1165	45.49%	837	32.68%	282	11.01%	35	1.37%	11	0.43%
<b>21-24</b>	6927	1663	24.01%	1483	21.41%	142	2.05%	33	0.48%	5	0.07%
<b>25-34</b>	18323	4063	22.17%	3662	19.99%	301	1.64%	93	0.51%	7	0.04%
<b>35-44</b>	10672	2260	21.18%	1991	18.66%	185	1.73%	78	0.73%	6	0.06%
<b>45-54</b>	9060	1784	19.69%	1497	16.52%	195	2.15%	86	0.95%	6	0.07%
<b>55-64</b>	5923	1034	17.46%	869	14.67%	114	1.92%	45	0.76%	6	0.10%
<b>65-74</b>	3797	613	16.14%	539	14.20%	50	1.32%	21	0.55%	3	0.08%
<b>75-84</b>	2278	295	12.95%	261	11.46%	31	1.36%	3	0.13%	0	0.00%
<b>85+</b>	781	142	18.18%	112	14.34%	20	2.56%	10	1.28%	0	0.00%

In summary:

- 21.9% received at least one fluoride visit
- 3.1% received at least two fluoride visits
- 0.8% received at least three fluoride visits
- 0.1% received at least four fluoride visits

Based on the guideline recommendations and the noted performance gaps, the MDMC determined that as a measure of quality, a requirement of “at least 2 visits” would be appropriate.

## RESULTS: Denominator Definition – Time Frame to Identify Elevated Caries Risk

The measure specifications allow for identification of elevated caries risk by including available claims from 3 prior years as well as the reporting year; however, they do not require enrollment in those 3 prior years. The MDMC evaluated the effect of using different time frames for the “look back” period to identify elevated caries risk. [Table 22](#) presents these data. The measure scores for the three programs were higher with a shorter look-back period, indicating poorer performance as more time elapses from caries treatment. [Note: These analyses were run without tooth restriction for identification of elevated caries risk.]

Table 22. Topical Fluoride: Comparison of 0, 1, 2, and 3 Year Look-Back Periods to Identify Elevated Caries Risk

	Caries Risk Determined Using Reporting Year & 3 Prior Years			Caries Risk Determined Using Reporting Year & 2 Prior Years			Caries Risk Determined Using Reporting Year & 1 Prior Year			Caries Risk Determined Using Reporting Year Only		
	Den	Num	Rate	Den	Num	Rate	Den	Num	Rate	Den	Num	Rate
<b>WI Delta Dental</b>	235000	6268	2.67%	193296	5375	2.78%	137400	4042	2.94%	66838	2038	3.05%
<b>WI Medicaid</b>	70207	2928	4.17%	56010	2519	4.50%	39438	1948	4.94%	20888	1211	5.80%
<b>WA Medicaid</b>	60728	1853	3.05%	52718	1636	3.10%	41667	1388	3.33%	23918	966	4.04%

Previous caries experience is an important predictor of future caries risk, and ongoing evidence-based prevention can help mitigate that risk. Because patients with elevated risk require ongoing preventive care, the MDMC selected the 3-year time frame for identifying people at elevated risk.

## RESULTS: Data Element Validation for Topical Fluoride Measure

To evaluate data element validity (i.e., to answer the question whether the data reported in the claims match up with those in the dental record), the research team conducted reviews of dental records for all data sources to validate individual dental procedure codes as well as broader care domains.

The fluoride sample included 292 enrollees in WI Delta Dental, 365 enrollees in WI Medicaid, and 244 enrollees in WA Medicaid for a total of 901 records reviewed. **Validation of the specific codes used in the fluoride measure demonstrated agreement of 87.1%-100%.** The kappa statistic for identifying caries risk overall was 1.0. The kappa statistic for identifying topical fluoride application was 0.92 in WI Delta Dental, 0.86 in WI Medicaid, and 0.96 in WA Medicaid, signifying “almost perfect” agreement. These data are presented in [Table 23](#).

Table 23: Data Element Concordance: Fluoride Measure

Procedures	WI Delta Dental		WI Medicaid		WA Medicaid	
	Percent Agreement	Kappa Statistic	Percent Agreement	Kappa Statistic	Percent Agreement	Kappa Statistic
<b>Caries Risk Code Groups</b>						
Any Caries Risk Codes Excluding Extractions	100.0%	1.00	100.0%	1.00	100.0%	1.00
<b>Fluoride Codes</b>						
Any Fluoride	99.9%	0.92	99.7%	0.86	99.0%	0.96
D1204	99.9%	1.00	99.9%	0.88	99.0%	0.96
D1206	99.9%	0.92	99.8%	0.80	99.9%	0.82
D1208	100.0%	N/A*	99.9%	0.96	N/A*	N/A*

\*N/A: Insufficient data to calculate

## RESULTS: Topical Fluoride Measure Scores using Finalized Measure Specifications

### [Overall rates: between program comparisons](#)

Measure scores ranged from 2.7% of WI Delta Dental enrollees at elevated caries risk who received at least two topical fluoride applications to 4.2% of WI Medicaid enrollees ([Table 24](#)). The overall low measure scores indicate a considerable performance gap. The non-overlapping 95% confidence intervals between the programs indicate that the between-program differences were statistically significant at the 0.05 level. [Note: These analyses were run without tooth restriction for identification of elevated caries risk.]

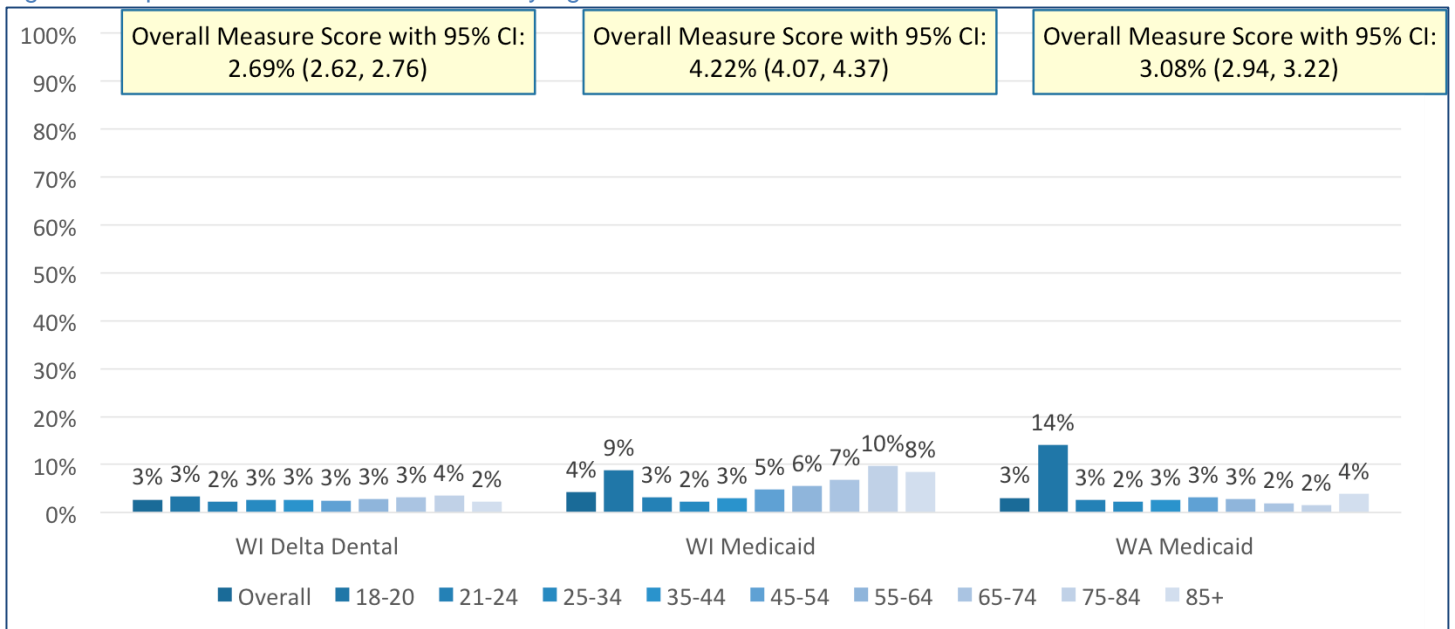
Table 24: Topical Fluoride Measure Scores by Program

Program	Den	Num	%	95% Confidence Interval
WI Delta Dental	219,578	5,903	2.69%	(2.62%, 2.76%)
WI Medicaid	68,634	2,897	4.22%	(4.07%, 4.37%)
WA Medicaid	60,090	1,848	3.08%	(2.94%, 3.22%)

### [Rates reported by age strata](#)

[Figure 5](#) depicts the measure scores stratified by age group. There was variation in receipt of topical fluoride between age strata. In addition, there were statistically significant differences by race/ethnicity and the enrollee’s geographic location (urban versus rural); these additional stratification results are on file with the DQA.

Figure 5: Topical Fluoride Measure Scores by Age Strata



## RESULTS: Face Validity of Topical Fluoride Measure Scores using Finalized Measure Specifications

The results of the face validity assessment demonstrate that the expert group had confidence in the measure’s importance, feasibility, reliability, validity and usability as a process of care quality measure, the voting members of the DQA voted to approve the measure as specified based on the testing results. Thus, the measure score has strong face validity.

### Summary

At its December 16, 2016 meeting, after presentation and discussion of the testing results and final measure scores, the DQA membership approved Periodontal Evaluation in Adults with Periodontitis as a utilization measure, and it approved Ongoing Care in Adults with Periodontitis and Topical Fluoride for Adults with Elevated Caries Risk as process of care quality measures.

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### Program Data for Testing

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- Wisconsin Medicaid
- Wisconsin Delta Dental
- Washington Medicaid

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