

The impact of the Affordable Care Act on provision of endodontic services within a dental school setting in Oregon

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Abstract

Objectives: In January 2014 implementation of the Medicaid expansion of the Affordable Care Act (EACA) in Oregon increased the number of children and adults qualifying for the Oregon Health Plan (OHP). Simultaneously, dental care benefits for adult Medicaid members were restored in Oregon after a period of noncoverage. This study evaluated the impact of these changes on the receipt of endodontic services in the Graduate Endodontic Clinic (GEC) at Oregon Health & Science University.

Methods: A retrospective electronic health records (EHRs) database review was conducted from July 2010 through June 2017, a seven-year period covering 3.5 years before (pre-EACA) and 3.5 years after (post-EACA) implementation of EACA. The number of completed anterior, premolar and molar non-surgical root canal therapies (NS-RCT) was retrieved from de-identified EHRs by targeting dental codes. Pre- and post-EACA frequencies were compared and analyzed by patient age [<21 years (children) versus adults], payer mix [OHP versus non-Medicaid (self-pay and private insurance)], and tooth type (anterior, premolar and molar) using Chi-square tests ($P < 0.05$).

Results: The number of procedures provided for patients covered by OHP post-EACA compared to pre-EACA was increased by 363 percent. There was an 18 percent decline in NS-RCT provided for non-OHP patients ($P < 0.0001$). Post-EACA increases in frequency applied to anterior, premolar, and molar NS-RCT ($P < 0.0001$), with the greatest increase in frequency post-EACA occurring for premolar NS-RCT procedures (666 percent).

Conclusions: By eliminating barriers to care greater numbers of vulnerable people in Oregon sought and received endodontic services at the GEC.

Introduction

In recent years, there has been an increased focus on oral health in the United States. A significant milestone occurred with the release of the Surgeon-General's oral health report in 2000 (1). In this report, the Surgeon General declared that oral health is "essential" to the well-being of all Americans. In 2010, the U.S. Department of Health and Human Services launched the Oral Health Initiative (2), which aimed to improve the coordination among existing health-care agencies and to overcome the barriers that prevent the most vulnerable populations from receiving dental care.

Since the 1990's, Oregon has provided dental benefits for Medicaid children and adult members as part of the Oregon Health Plan (OHP) (3). Children and adults have had different experiences within the Medicaid OHP program, with children being continuously covered while adults vacillated between availability and non-availability of coverage. In January 2014, implementation of the Medicaid expansion of the Affordable Care Act in Oregon (EACA) increased the number of adults and children qualifying for the Oregon Health Plan (OHP) (4). Following implementation of EACA, OHP benefits became available to adults who earn up to 138 percent of the federal poverty

level (FPL) and children age 20 or less whose family earns up to 300 percent of the FPL (Figure 1). At the same time, Oregon chose to restore the adult dental care benefits simultaneously with the Medicaid expansion. In 2016 more than 1 million people were covered under OHP for dental services in Oregon (5), a substantial increase from the approximately 600,000 people covered prior to the Medicaid expansion. OHP has 2 enrollment options (a) *OHP Plus* provides coverage for qualified children ages 0–20 [includes anterior, premolar and molar non-surgical root canal therapy (NS-RCT)] and adults ages 21–64 (includes anterior and premolar and excludes molar NS-RCT) and (b) *OHP Plus Supplemental* provides coverage for pregnant adults age 21 and over with covered benefits equivalent to those of *OHP Plus* ages 0–20 excluding 2nd molars.

The Oregon Health & Science University (OHSU) Graduate Endodontic Clinic (GEC) is a referral-based clinic that provides a broad range of endodontics services. Electronic records are required to maintain Medicaid and Medicare reimbursement rates in accordance with the American Recovery and Reinvestment Act of 2009 (6). Since 2010 electronic records for patients seen in the GEC have been maintained using axiUm dental software (Exan, Henry Schein Company, Coquitlam, BC). The patient pool includes those enrolled in Medicaid dental benefits plans, patients covered by private insurance plans and those who self-pay. The GEC accepts multiple insurance plans and offers services at reduced fees when compared to those published by the American Dental Association (7). It is reasonable to assume that the 2014 OHP changes have drawn more members with OHP dental benefits to the GEC as their covered benefits have expanded and their out-of-pocket expenses have decreased.

Removing barriers to care is a crucial step when attempting to provide care to the underserved (8). One would expect that increased Medicaid coverage would

correspond to an increase in underserved people seeking endodontic care. If there were no increase, this would suggest the existence of additional barriers to care that need to be identified and removed to improve access to care at the GEC. The aim of this study was to evaluate the impact of the 2014 OHP dental benefits changes on the receipt of endodontic services (nonsurgical root canal therapy) provided in the GEC at OHSU by conducting a patient electronic health record (EHR) database review. The study sought to compare the patient payer mix before and after the 2014 Oregon dental benefits changes and to evaluate the effect of age (children age 20 or less and adults age 21 or greater) on services provided.

Methods

This study was reviewed and declared exempt by the OHSU Institutional Review Board (IRB#00016958). A retrospective EHR database review was conducted of endodontic services provided to Oregon residents attending the GEC from July 2010 through June 2017; a seven-year period covered 3.5 years either side of implementation of EACA: pre-EACA (July 2010 to December 2013) and post-EACA (January 2014 to June 2017). Data for patients with benefits provided via *OHP Plus* and *OHP Supplemental* (Figure 1) were pooled, because there were no substantive differences between the two groups with regard to covered benefits under the two plans and NS-RCT.

The number of anterior, premolar, and molar NS-RCTs completed in the GEC was retrieved from de-identified EHR in axiUm by targeting dental codes: D3310 (RCT – anterior), D3320 (RCT – bicuspid), and D3330 (RCT – molar). Pre- and post-EACA numbers overall, and for each treatment code, were compared. Data were further analyzed by patient age [children (age 20 or less) versus adults (age 21 or greater)] and payer mix [OHP versus

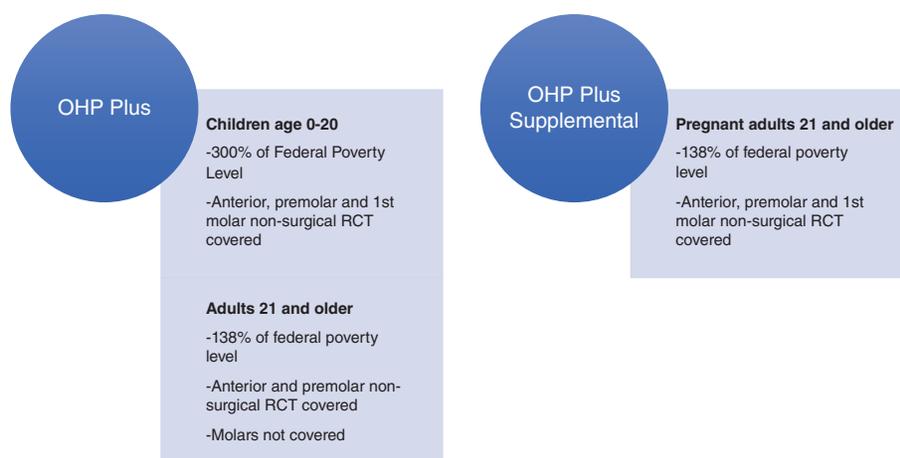


Figure 1 Oregon health plan (OHP) options and relevant coverage for endodontic services.

non-OHP (self-pay and private insurance)]. Chi-square tests were used with significance set at $P < 0.05$.

Results

Table 1 shows the overall number of NS-RCT completed in the GEC over the study period. NS-RCT procedures completed in the GEC increased by 28 percent from 1,184 during pre-EACA to 1,518 post-EACA. The frequency of NS-RCT procedures provided for anterior, premolar, and molar teeth was significantly higher in post-compared to pre-EACA periods ($P = 0.005$) (Table 1).

There was a significant increase in the number of procedures provided for patients covered by OHP post-EACA ($n = 674$) compared to pre-EACA ($n = 152$) (363 percent increase), and a decline (18 percent) in NS-RCT provided for non-OHP patients ($n = 1,032$ pre-EACA versus $n = 844$ post-EACA; $P < 0.0001$). Further analyses revealed that post-EACA increases in frequency applied to anterior, premolar, and molar NS-RCT (each $P < 0.0001$), with the greatest increase in frequency post-EACA occurring for premolar NS-RCT procedures ($n = 24$ pre-EACA versus $n = 183$ post-EACA; $P < 0.0001$) representing a 666 percent increase (Table 1).

Table 2 shows analyses of the frequencies of NS-RCT completed for adults and children. The number of adults and children whose NS-RCT was covered by OHP increased significantly in the post-EACA period (both $P < 0.0001$). This was particularly evident for adults covered by OHP ($n = 34$ pre-EACA versus $n = 464$ post-EACA; $P < 0.0001$) representing a 1,265 percent increase

post-EACA, while the non-OHP adult and child patient pools declined. Further analyses showed highly significant increases in adult NS-RCT post-EACA for each tooth type (including molar NS-RCT that is not covered under the OHP-Plus plan for adults) (Figure 1). In children, the provision of NS-RCT was also significantly greater during the post-EACA compared to pre-EACA period for anterior ($P = 0.04$), premolar ($P = 0.02$), and molar ($P = 0.003$) teeth (Table 2).

Discussion

This is the first study to look at the impact of the 2014 Medicaid OHP changes on endodontic services in Oregon. Since 2014, patients with OHP dental benefits have represented an increasing proportion of the patients receiving NS-RCT in the GEC.

The decline in NS-RCT for non-OHP patients suggest that patients may have chosen other treatment options that appealed to the non-OHP patient. This population may have had discretionary dollars to spend on costlier treatment options such as dental implants. The upswing in the economic environment in the United States after 2014 may have allowed non-OHP patients to seek endodontic care in the dental community outside of the GEC where costs may have been higher but were now deemed affordable.

Dental providers' referral practices may also have contributed to the decline in NS-RCT for non-OHP patients and the increase in the OHP populations seeking services at the GEC. Dental providers of services for OHP

Table 1 Overall Frequencies of NS-RCT Completed in the GEC

	Pre-EACA <i>n</i> (%)	Post-EACA <i>n</i> (%)	ΔPost-EACA <i>n</i>	Pre-EACA (%)	<i>P</i> *
<i>All procedures</i>	1,184 (100)	1,518 (100)	334	(28)	
<i>Tooth type</i>					
Anterior	195 (16)	309 (20)	114	(58)	
Premolar	246 (21)	345 (23)	99	(40)	
Molar	743 (63)	864 (57)	121	(16)	0.005
<i>Payer mix</i>					
OHP	152 (13)	674 (44)	552	(363)	
Non-OHP	1,032 (87)	844 (56)	-188	(-18)	<0.0001
<i>Tooth type and payer mix</i>					
<i>Anterior RCT</i>					
OHP	43 (22)	189 (61)	146	(339)	
Non-OHP	152 (78)	120 (39)	-32	(-21)	<0.0001
<i>Premolar RCT</i>					
OHP	24 (10)	183 (53)	160	(666)	
Non-OHP	222 (90)	162 (47)	-60	(-27)	<0.0001
<i>Molar RCT</i>					
OHP	85 (11)	302 (35)	217	(255)	
Non-OHP	658 (89)	562 (65)	-96	(-15)	< 0.0001

* Chi-square.

Table 2 NS-RCT Completed Pre- and Post-EACA by Age Group, Payer Mix, and Tooth Type

	Pre-EACA <i>n</i> (%)	Post-EACA <i>n</i> (%)	Δ Post-EACA <i>n</i>	Pre-EACA (%)	<i>P</i> *
<i>Age group and payer mix</i>					
Adults					
OHP	34 (4)	464 (38)	430	(1265)	
Non-OHP	926 (96)	755 (62)	-171	(-18)	<0.0001
Children					
OHP	118 (53)	210 (70)	92	(78)	
Non-OHP	106 (47)	89 (30)	-17	(-16)	<0.0001
<i>Adult, tooth type and payer mix</i>					
Anterior					
OHP	13 (9)	137 (57)	124	(954)	
Non-OHP	131 (91)	105 (43)	-26	(-20)	<0.0001
Premolar					
OHP	14 (6)	163 (51)	149	(1064)	
Non-OHP	212 (94)	158 (49)	-54	(-25)	<0.0001
Molar					
OHP	7 (1)	164 (25)	157	(2242)	
Non-OHP	583 (99)	492 (75)	-91	(-15)	<0.0001
<i>Children, tooth type, and payer mix</i>					
Anterior					
OHP	30 (59)	52 (78)	22	(73)	
Non-OHP	21 (41)	15 (22)	-6	(-29)	0.04
Premolar					
OHP	10 (50)	20 (83)	10	(100)	
Non-OHP	10 (50)	4(17)	-6	(-60)	0.02
Molar					
OHP	78 (51)	138 (66)	60	(77)	
Non-OHP	75 (49)	70 (34)	-5	(-7)	0.003

* Chi-square.

members often do not limit their practice to only OHP members. Often their practice comprises OHP, private insurance, and self-pay. As the economy improves and non-OHP patients have discretionary dollars for dental services, there is an increase in the demand for services by non-OHP patients. Rightly or wrongly, the dental provider often chooses to provide services for the non-OHP member and opts to refer the OHP portion of the practice to endodontic specialists within a dental school setting.

The overall increase in treatment post-EACA suggests increased access to care for patients who are near the poverty level. Interestingly, there was an increase in the number of molar RCT for OHP patients in the GEC, which suggests that removing the cost of the initial examination may remove an important barrier for many vulnerable people. In other words, it may be the case that people are able to afford the cost of the molar NS-RCT, but not the cost for both the exam and NS-RCT. It could also be speculated that the dental health education received during the initial exam may help the patient understand the value of keeping their teeth rather than undergoing extractions.

Sharing of the cost of endodontic services between the patient and OHP may also have removed the barrier for

molar RCT. The simultaneous restoration of dental care benefits for adult Medicaid members in Oregon after a period of noncoverage resulted in OHP again funding endodontic treatment for anterior and premolars. Prior to this, adults near the poverty level would have been paying out of pocket for all endodontic services.

The provision of molar NS-RCT significantly increased for children with Medicaid post-ACA. This treatment was covered before the 2014 changes, and there is no hard evidence for why this increase occurred. It is worth pointing out that the post-EACA increase of around 400,000 Medicaid members had wide-ranging implications for the entire dental care system outside the GEC (which in Oregon is a mainly managed care system funded through capitated contracts). Anecdotally, dental care organizations observed that the comprehensive dental coverage for the adult (parent) population had the additional effect of raising awareness of oral health and dental care which meant that parents increasingly expressed a demand for dental care both for themselves and for their children. In spite of the longstanding eligibility for dental care for OHP children, only <50 percent had traditionally obtained dental care. Thus, there was still under the existing Medicaid

system enormous potential for improving the dental care for children. Currently, the federal government protects dental benefits for children, which with the introduction of the ACA in 2010, required insurance packages to include dental care for children (9). Medicaid has minimum requirements regarding the care the child should receive. These include emergency care, restorative treatment, medically necessary treatment, and maintenance of the child's dental health. Under OHP, this coverage extends to members 20 years of age and younger. In contrast, the federal government does not require dental coverage for adults with Medicaid (10). Each state in the United States is given the option to provide access to dental care as they choose. While nearly all states, as well as Washington D.C., provide some form of dental care for adults who qualify for Medicaid, at the time of writing there are currently only 27 states that provide restorative and endodontic dental coverage for adults (8). As one of these states, Oregon has been at the forefront of including adult dental care as part of its Medicaid benefits (3).

Although increasing access to care is important, an important factor to consider is whether or not the fees associated with Medicaid reimbursement are sustainable for the provider. OHP's reimbursements for NS-RCT are well below market level (6,11) and lower than fees charged in the GEC. For example, the reimbursement rate for D3330 is \$212.77 USD from OHP, compared to the \$650.00 USD fee at the GEC, which is already substantially lower than the market rate (7). This has the potential to induce financial strain and sheds light on the importance of not only providing access to care for OHP members but also insuring a sustainable business model for clinics that may not have access to funding beyond reimbursements. Dental schools and community health centers may have access to government funding and donations to supplement their patient care revenue, but it may not be feasible for private practitioners to provide care to Medicaid members. Indeed, it has been shown that increasing Medicaid fees to be more in line with private practice fees has a significantly positive impact on the utilization of available dental care (12).

State-funded dental care is available in several countries. For example, Sweden provides some form of dental care for all of its citizens (13). Children and young adults up to age 21 receive all dental care for free, mostly in public dental clinics. Adults aged 22 years and above receive subsidized dental care through the government health insurance system. The individual receives annual vouchers to cover the cost of an exam and cleaning; the care can be sought either in a public dental clinic or at a private dental practitioner, who is contracted with the health insurance. For further treatment, the patient pays the first 320 Euros out of pocket. Then the government health insurance will

subsidize 40 percent of treatment costs up to 1,590 Euros and 85 percent for anything above 1,590 Euros. This is funded through federal and state taxes. Medical and dental care account for 9 percent of Sweden's GDP (14). Finland has a similar dental care program to Sweden's (15). In contrast, other countries that provide health care through similar government health insurance systems may exclude dental benefits. In Canada, a country with otherwise universal health care through the Canada Health Act, dental care is not included and 95 percent of oral health-care services are provided by private dental practitioners with patients paying out of pocket (16).

It should be noted that the capacity to provide endodontic services to all who requested them, as well as marketing strategies, remained unchanged throughout the study period. It is also important to point out limitations of the study. Several variables might have contributed to the increased number of NS-RCT completed post-EACA. The US economic crisis starting in 2008 may have created financial hardship preventing people from seeking dental care during the pre-EACA period. Also, improved efficiency protocols coincidentally introduced into the GEC post-EACA resulted in the capacity to see a larger number of patients per clinic session, which is reflected in the increase seen for "All Procedures" (Table 1). As well, information about from which pre-EACA group the patients with Medicaid post-EACA came was not available; it would be encouraging if they were members that previously did not have access to care. Additionally, the present data were generated in a dental school setting in Portland, Oregon. Whether the state of Oregon has adequate capacity to provide needed endodontic services for its Medicaid members is unclear. For example, there are no data on the impact of transportation challenges, and alternate options, for Medicaid members in Oregon who reside too far away from the dental school for that to be an appropriate source of specialty endodontic care. Furthermore, unless reimbursement rates increase, the reimbursement for Oregon Medicaid covered endodontic procedures may not be financially sustainable in the non-dental school setting. Future studies providing more complete information on these important matters could be used to inform state and dental school policies, as well as help non-school sources which might be willing to participate in the provision of endodontic care for Medicaid members to better understand their potential market.

In conclusion, this study found that the EACA and restoration of adult dental benefits for Medicaid members initiative introduced in Oregon in 2014 had a highly significant impact on the provision of NS-RCT in the GEC. There were significant increases in the provision of endodontic treatment at OHSU's GEC for both children and adults with OHP dental benefits coverage post-EACA. The data support the premise that by eliminating the main financial

barrier to care greater numbers of vulnerable people in Oregon sought and received endodontic services at the GEC, even when Medicaid did not cover all of these services.

Acknowledgments

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Conflict of Interest

The authors deny any conflicts of interest.

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