Effects of Cuts in Medicaid on Dental-Related Visits and Costs at a Safety-Net Hospital

We used data from Boston Medical Center, Massachusetts, to determine whether dental-related emergency department (ED) visits and costs increased when Medicaid coverage for adult dental care was reduced in July 2010. In this retrospective study of existing data, we examined the safety-net hospital's dental-related ED visits and costs for 3 years before and 2 years after Massachusetts Health Care Reform. Dental-related ED visits increased 2% the first and 14% the second year after Medicaid cuts. Percentage increases were highest among older adults, minorities, and persons receiving charity care, Medicaid, and Medicare. (*Am J Public Health.* 2014; 104:e13–e16. doi:10.2105/AJPH.2014.301903)

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EMERGENCY DEPARTMENT (ED) visits in the United States rose by 32% from 1993 to 2006.[1] In the 2010 National Hospital Ambulatory Medical Care Survey,[2] there were 42.8 ED visits for every 100 people. Almost one third, 31.4%, of the 2010 ED visits were by people dependent on Medicaid or State Children's Health Insurance Program,[2] 17.7% were by people with Medicare, and 16.6% were uninsured.[2]

Cohen et al.[3] examined ED use for the treatment of dental problems at the University of Maryland Medical System in 1995. They analyzed dental-related ED use before and after a change in coverage status for poor adults took place (in an attempt to reduce costs, in February 1993, the state of Maryland eliminated Medicaid reimbursement for dental care). After the policy change, the rate of dental visits to the ED by Medicaid recipients increased by 21.8%. Because definitive treatment is not provided in the ED, use of EDs for dental care and associated costs may be repeated because patients are forced to return for treatment of the unresolved condition. The magnitude of this problem is unknown.

Lewis et al.[4] reported that patients in the United States made about 3 million ED visits for complaints of tooth pain or tooth injury during the 4-year period from 1997 to 2000. Similarly, in a national study based on the National Ambulatory Medical Care Survey, Wall[5] found that dental-related ED visits increased from 1.15% to 1.87% between 1997–1998 and 2007–2008. In New Hampshire, overall ED use has been increasing among all age, racial, and ethnic groups. Between 2001 and 2007, Anderson et al.[6] found a 14% increase in total ED visits overall and a 47% increase in the visits associated with the nontraumatic dental conditions. Thus, use of EDs for dental care points to an inappropriate use of resources and lack of continuity of dental care.

Lowe et al.[7] evaluated the effect of the Oregon Health Plan changes on ED use in a representative sample of Oregon EDs before and after the Oregon Health Plan cutbacks in February and March 2003. Multivariate analyses showed that the March 2003 policy change was followed by a 20% (95% confidence interval [CI] = 13%, 28%) increase in the number of uninsured ED visits per month, after they adjusted for seasonal variation and for a secular trend showing an additional increase of 7% per year (95% CI = 4%, 10%).

The Massachusetts Medicaid program (MassHealth) reduced its dental coverage for adults in July 2010. The purpose of this study was to analyze the rate of adults (aged 21 years or older) who used the ED at an urban safety-net hospital, Boston Medical Center (BMC) in Massachusetts, for dental problems 3 years before and 2 years after Massachusetts Health Care Reform (July 1, 2007–June 30, 2012).

METHODS

BMC is a large urban teaching hospital serving the Boston metropolitan area. In this retrospective study of ED visits from BMC's ED database, we obtained data from the BMC data warehouse for analyses to test the hypothesis that there was no significant difference in the rate of people visiting EDs for dental services before and after MassHealth reform.

Outcomes Measured

The primary outcome was the annual use of EDs for dental services at BMC by persons aged 21 years or older 3 years before and 2 years after Massachusetts Health Care Reform (July 1, 2007, to June 30, 2012). A secondary outcome was the cost per visit per year for dental-related ED visits.

Inclusion Criteria

Specifically, we identified patients with the following specific *International Classification of Diseases, Ninth Revision* (*ICD-9*),[8] codes: periapical abscess: 522.5; periodontitis chronic: 523.42; impacted tooth disturbances in eruption: 520.6; abscess, cellulitis, infection, face: 682.0; abscess, neck: 682.1; exostosis mandibular/maxillary: 526.81; alveolitis of the jaw, dry socket: 526.5; periapical abscess with sinus tract: 522.7; dental caries: 521.00; cracked tooth: 521.81; pain, face, facial: 784.0; sinusitis: 473.0; candidiasis of mouth/thrush: 112.0; osteomyelitis, acute, jaw: 730.28; osteomyelitis, jaw, chronic: 730.18; osteomyelitis/inflammatory conditions of jaw: 526.4; osteomyelitis/

osteoradionecrosis, head/jaw: 730.09; and acquired tooth loss: 525.10. We also included diseases of the dental hard tissues of teeth (521.0–521.9), pulp and periapical tissues (522.0–522.9), gingival and periodontal diseases (523.0–523.9), retained dental roots (525.3), unspecified disorder of the teeth and supporting structures (525.9), internal structures of mouth, broken tooth (873.63), and the ED visits for nontraumatic dental conditions used in New Hampshire, including conditions starting with 521, 522, 523, 525, and 528.

Analyses

We calculated total ED dental users and groups by age, sex, race/ethnicity, and diagnostic code grouping and rates of use per 1000 BMC emergency department visits per year, 3 years before and 2 years after Massachusetts Health Care Reform. We compared the mean dental ED users per year in the 3 years before July 1, 2010, and the ensuing 2 years, as well as costs of care per visit.

RESULTS

ED visits for dental reasons at BMC increased by 2% in 2010 to 2011 and by 14% in 2011 to 2012 (Table 1). Over the same period, dental visits per 1000 ED visits increased from 53.52 in 2007 to 2010, to 55.5 in 2010 to 2011, and to 61.84 in 2011 to 2012, increases of 1% and 16%, respectively. By age group, the greatest increases were in the persons 55 to 64 years, who showed an increase of 50% in 2011 to 2012, followed by 65 years and older, with a 45% increase and 45 to 54 years, with a 24% increase. The greatest increases by race/ethnicity were in Black patients, with a 5% increase in 2010 to 2011 and a 19% increase in 2011 to 2012, followed by Hispanic patients, with a slight decrease of 3% in 2010 to 2011 but a 12% increase in 2011 to 2012. Examination of visits by insurance showed a 38% increase in charity care in 2011 to 2012, followed by a 13% increase in Medicare and a 10% increase in Medicaid/MassHealth. By *ICD-9* codes, the greatest increases were in caries-related pathologies with a 77% increase, followed by a 47% increase in soft tissue pathologies, a 26% increase in headaches related to other dental pathologies, and a 20% increase in other tooth-related problems.

The mean costs per patient per visit and changes in 2010 to 2012 are shown in Table 2. Overall, mean cost per patient increased 7% in 2010 to 2011 and 27% in 2011 to 2012. By insurance, this increase was greatest for charity with an increase of 35%, followed by a 33% increase in private, a 31% increase in Medicare, and a 20% increase in Medicaid/MassHealth. By *ICD-9* codes, the greatest increase was in other tooth-related problems with an increase of 97%, followed by soft tissue pathologies with a 46% increase. Total hospital costs for dental-related problems in the ED increased 8% in 2010 to 2011 (from $8.4 to $9.1 million) and 44% in 2011 to 2012 (from $8.4 to $12.1 million).

TABLE 1—Number of Visits to Boston Medical Center Emergency Department for Dental Reasons, by Year: Boston, MA, 2007–2012

Variable	Mean 2007, 2008, 2009	2010	% Change From 2007, 2008, 2009	2011	% Change From 2007, 2008, 2009
Total	5546	5637	+2	6317	+14
Female	2892	3033	+5	3322	+15
Male	2654	2604	–2	2995	+13
Age group, y					
21–34	2410	2484	+3	2496	+4
35–44	1252	1161	–7	1291	+3
45–54	1052	1074	+2	1299	+24
55–64	487	547	+12	729	+50
≥ 65	346	371	+7	502	+45
Race/ethnicity					
Black	2905	3054	+5	3457	+19
Hispanic	1068	1039	–3	1197	+12
Other	431	444	+3	432	0
White	1142	1100	–4	1231	+8
Insurance					
Charity	627	753	+20	865	+38
Commercial/private	929	896	–4	896	–4
Medicaid/Masshealth	2649	2592	–2	2909	+10
Medicare	830	751	–9	938	+13
Missing	537	578	+8	645	+20
Other	75	67	–10	64	–14
Diagnosis group					
Broken tooth	132	111	–16	148	+12
Caries	203	245	+21	360	+77
Cellulitis/osteomyelitis	379	315	–17	332	–12
Headache	2465	2707	+10	3097	+26
Other inflammation/infection	158	151	–5	149	–6
Other tooth-related problems	74	60	–19	89	+20
Periodontal disorders	1675	1570	–6	1605	–4
Pulpal pathology	632	601	–5	666	+5
Soft tissue pathologies	87	76	–12	127	+47

TABLE 2—Cost per Visit, by Year, for Dental-Related Emergency Department Visits at Boston Medical Center: Boston, MA, 2007–2012

Variable	Mean 2007, 2008, 2009, $	2010, $	% Change From 2007, 2008, 2009	2011, $	% Change From 2007, 2008, 2009
Total	1514	1615	+7	1921	+27
Gender					
Female	1626	1696	+4	2002	+23
Male	1393	1519	+9	1831	+31
Age group, y					
21–34	1148	1219	+6	1360	+18
35–44	1460	1538	+5	1799	+23
45–54	1780	1869	+5	2159	+21
55–64	1993	2001	+0.4	2550	+28
≥ 65	2785	3197	+15	3496	+26
Race/ethnicity					
Black	1434	1545	+8	1741	+21
Hispanic	1572	1722	+10	2084	+33
Other	1494	1618	+8.5	1688	+13
White	1672	1705	+2	2350	+41
Insurance					
Charity	1145	1175	+3	1549	+35
Commercial/private	1716	1865	+9	2284	+33
Medicaid/Masshealth	1445	1499	+4	1739	+20
Medicare	2004	2116	+6	2626	+31
Missing	1182	1684	+42	1684	+42
Other	1477	1469	–0.5	2210	+50
Diagnosis group					
Broken tooth	1632	2218	+36	1844	+13
Caries	1107	1130	+2	1023	–8
Cellulitis/osteomyelitis	2055	2266	+10	2711	+32
Headache	2105	2161	+4	2712	+29
Other inflammation/infection	3396	3584	+6	3722	+10
Other tooth related problems	895	1824	+104	1766	+97
Periodontal disorders	590	627	+6	713	+21
Pulpal pathology	886	1002	+13	990	+12
Soft tissue pathology	1206	1804	+50	1759	+46
Total[a]	8 409 129	9 101 477	+8	12 137 027	+44

[a]Mean cost per patient * number of visits.

DISCUSSION

Dental-related ED visits in an urban safety-net hospital and the related costs of care rose significantly during the period analyzed when Medicaid funding for adult dental care was reduced. The greatest percentage increases in ED care were among older adults and persons receiving Medicare, Medicaid, and charity care. These results extend previous state and national findings[3–7,9–11]; taken together, they highlight the need for primary dental care among the poor, racial/ethnic minorities, and adults of all ages, especially older adults.

The findings of this study must be put into context because they took place during and following (2008–2010) the worst recession since the Great Depression.[12] Although we could not control for it, we cannot minimize the contribution of the economic climate to the policy change (the likely source of the original policy change) and the increases in ED use.

From the perspective of the state as a payer, there was an almost 50% cut in Medicaid spending for adults: from an annual statewide average of $139.4 million from July 1, 2007, to June 30, 2010, to $67.2 million from July 1, 2010, to June 30, 2012 (personal communication, Brent Martin, DDS, MBA, Massachusetts Dental Medicaid Program, January 10, 2014). The savings should be balanced against the human costs of receiving nondefinitive care in inappropriate settings.

This study found the largest increases in people with caries and soft tissue pathologies. These conditions are best treated in dental practices and community health centers. Importantly, individuals seeking dental treatment in EDs do not receive definitive treatment. Most dental treatments provided in the ED are transitory or palliative (temporary treatment, analgesics and antibiotics, or referral to a dental care provider) and have significant implications in terms of cost. If, for example, the $3.7-million increase in just 1 year (2012) could be provided to persons for primary care at $500 per year, 7456 persons could be seen in a private office or community health center rather than the 771 additional persons covered, almost a 10-fold difference. In 2012, Medicaid partially restored dental care coverage for adults in Massachusetts. Further research is needed to determine whether ED visits declined as a result.

In conclusion, ED care for dental problems increased at a major safety-net hospital (BMC) when Medicaid coverage for dental care for adults was reduced. The greatest percentage increases in ED care were among older adults and persons receiving charity care, Medicare, and Medicaid. The increased burden was measurable in terms of number of visits and costs of care. ■

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Contributors

M. Neely contributed to data analysis and interpretation and drafting of the brief. J. A. Jones and L. Santana Gutierrez contributed to the conceptualization and design of the study, submission to the institutional review board, data interpretation, and drafting of the brief. S. Rich contributed to data analysis and interpretation and critical review of the brief. P. Mehra contributed to the conceptualization and design of the study, data analysis, and critical review of the brief. All authors reviewed and approved the final brief.

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Human Participant Protection

This study was approved by the Boston University Medical Campus institutional review board (H-31524) on June 12, 2012. Amendments were approved on December 7, 2012, and April 23, 2013. A waiver of consent was obtained.

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