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CareQuest Institute for Oral Health

CareQuest Institute Summary:

The Association Between Periodontal Treatment and Decreased Diabetes Mellitus-Related Treatment Costs

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Executive Summary

- Of all the associations between oral health status and chronic systemic diseases, the link between diabetes mellites (DM) and periodontal disease (PD) is the most consistently identified.
- For patients with DM, periodontal treatment is linked with lower total health care costs compared to those who did not undergo periodontal treatment.
- Periodontal disease is more common among individuals living below the federal poverty level (65.4%), thus improving adult dental Medicaid benefits could ultimately contribute to the advancement of health equity.

Treatment for Periodontal Disease Is Linked to Lower Diabetes-Related Health Care Costs

In the research paper, "Periodontal Treatment Associated with Decreased Diabetes-Mellitus-Related Treatment Costs: An Analysis of Dental and Medical Claims Data," Madhuli Thakkar-Samtani et al. explore the relationship between periodontal disease treatment and DM health care costs in commercial insurance and Medicaid claims data. IBM MarketScan commercial insurance and Medicaid databases, including overall outpatient, inpatient, and drug costs for patients with DM, were utilized to conduct this study. Generalized linear modeling reveals the associations between overall health care costs per patient in 2019 and the use of periodontal services between 2017 and 2018. Findings reveal that for commercial insurance enrollees, periodontal treatment was associated with reductions of overall health care costs by 12% in comparison to people with no periodontal treatment. Among Medicaid enrollees, periodontal treatment was associated with a 14% decrease in costs in comparison with patients with DM who did not receive periodontal treatment. There were no significant differences in inpatient costs for commercial insurance enrollees or in drug costs for Medicaid beneficiaries. Expansion of Medicaid benefits to include comprehensive periodontal treatment could potentially contribute to the reduction of health care costs for DM patients.

What Is Diabetes Mellitus (DM)?

DM includes a heterogeneous group of metabolic disorders with a variety of causes, but all are characterized by hyperglycemia (high glucose blood sugar).[1] The two main types of DM are Type 1 DM, an autoimmune disease that prevents the pancreas from making insulin due to the destruction of insulin-producing cells; and Type 2 DM, a condition that results from insulin resistance and relative beta-cell failure, where the body cannot produce enough insulin or use it properly. Consistently high glucose levels can lead to increased inflammation as well as other changes over time and contribute to serious health complications such as kidney disease, cardiovascular disease, lower extremity amputations, and retinopathy leading to blindness.[2] According to the Centers for Disease Control and Prevention (CDC), in 2021, about 38.4 million people of all ages, or 11.6% of the United States (US) population, had diabetes.[3]

What Is Periodontal Disease (PD)?

PD is a microbially initiated chronic inflammatory disease, in which dysregulated immune-inflammatory processes destroy host tissue.[4, 5] The early stage of PD, known as gingivitis, is caused by plaque and tartar buildup on the teeth and gingiva, which results in swelling and oftentimes bleeding. Left untreated, gingivitis can lead to periodontitis, where the gums can pull away from the tooth and loss of bone. Periodontitis results in the destruction of the periodontal ligament and ultimately tooth loss.[4] Periodontal disease affects people worldwide, with approximately 40% to 60% of adults in the US having moderate periodontal disease.[4–10] Periodontal disease is more common in men than women. It is also more common in those living below the federal poverty line, those with less than a high school education, and current smokers.[4] In the US, it was estimated that in 2018 PD led to $3.5 billion in direct costs and $150.7 billion in indirect costs associated with PD-related edentulism.[11]

The Bidirectional Relationship Between Diabetes Mellitus and Periodontal Disease

Periodontal Treatment Results in Lower HBa1C Levels/ Better Glycemic Control

Of all the associations between oral health status and chronic systemic diseases, the link between DM and PD is the most consistently identified.[12] Randomized controlled trials show that periodontal treatment results in reduced HBA1c (glycated hemoglobin) levels.[5, 13–14] Additionally, periodontal treatment improves patients' glycemic control as it decreases bacterial burden and reduces inflammation, allowing restoration of insulin sensitivity over time and improved metabolic control.[15]

Studies Show Lower DM-Related Health Care Costs After Periodontal Treatment

For patients with DM, periodontal treatment is linked with lower total health care costs compared with patients with DM who did not undergo periodontal treatment. Patients who received a new diagnosis of DM, and also received periodontal treatment, showed significant reduction in total health care costs — costs related to inpatient care, DM-related drug costs, and other drug costs — in comparison with those who did not receive periodontal treatment.[16] A cost-effectiveness simulation analysis estimates that providing nonsurgical periodontal treatment to patients with Type 2 DM (T2DM) would produce a total net per-capita savings of $5,904, as well as reduce T2DM-related tooth loss, microvascular diseases, and cardiovascular disease.[17]

Lower DM-Related Health Care Costs After Periodontal Treatment in Medicaid and Commercially Insured Adults

A study examining the effect of periodontal treatment on DM-related treatment costs utilized deidentified Medicaid and commercial insurance administrative claims data from IBM MarketScan Research Databases from 2013 through 2019.[18] The Medicaid and commercial insurance data sets contain information on integrated enrollment and medical (outpatient, inpatient), drug, and dental claims from 13 deidentified states, as well as from select insurance plans in all 50 states.

In 2019, a total of 390,783 adults in the Medicaid claims data received a diagnosis of DM (8.33% of the 4,667,230 total Medicaid enrollees in the sample) and 280,700 adults in the commercial insurance cohort received a diagnosis of DM (7% of the 3,988,099 total commercial insurance enrollees in the sample). In the Medicaid cohort, 4.2% of patients with DM used periodontal services within the past two years, in comparison with 14.9% of commercially insured patients who had DM.

For Medicaid enrollees, findings reveal a 14% decrease in average overall health care costs among those with DM who had periodontal treatment in 2017 through 2018 compared with patients with DM who did not receive periodontal treatment during the same period ($14,796 vs. $17,181). In the commercial insurance claims database, periodontal treatment is associated with a 12% reduction in health care costs compared with no periodontal treatment ($13,915 vs. $15,739). Therefore, the relationship between overall health care costs and periodontal treatment is more pronounced among Medicaid enrollees than among those with commercial insurance.

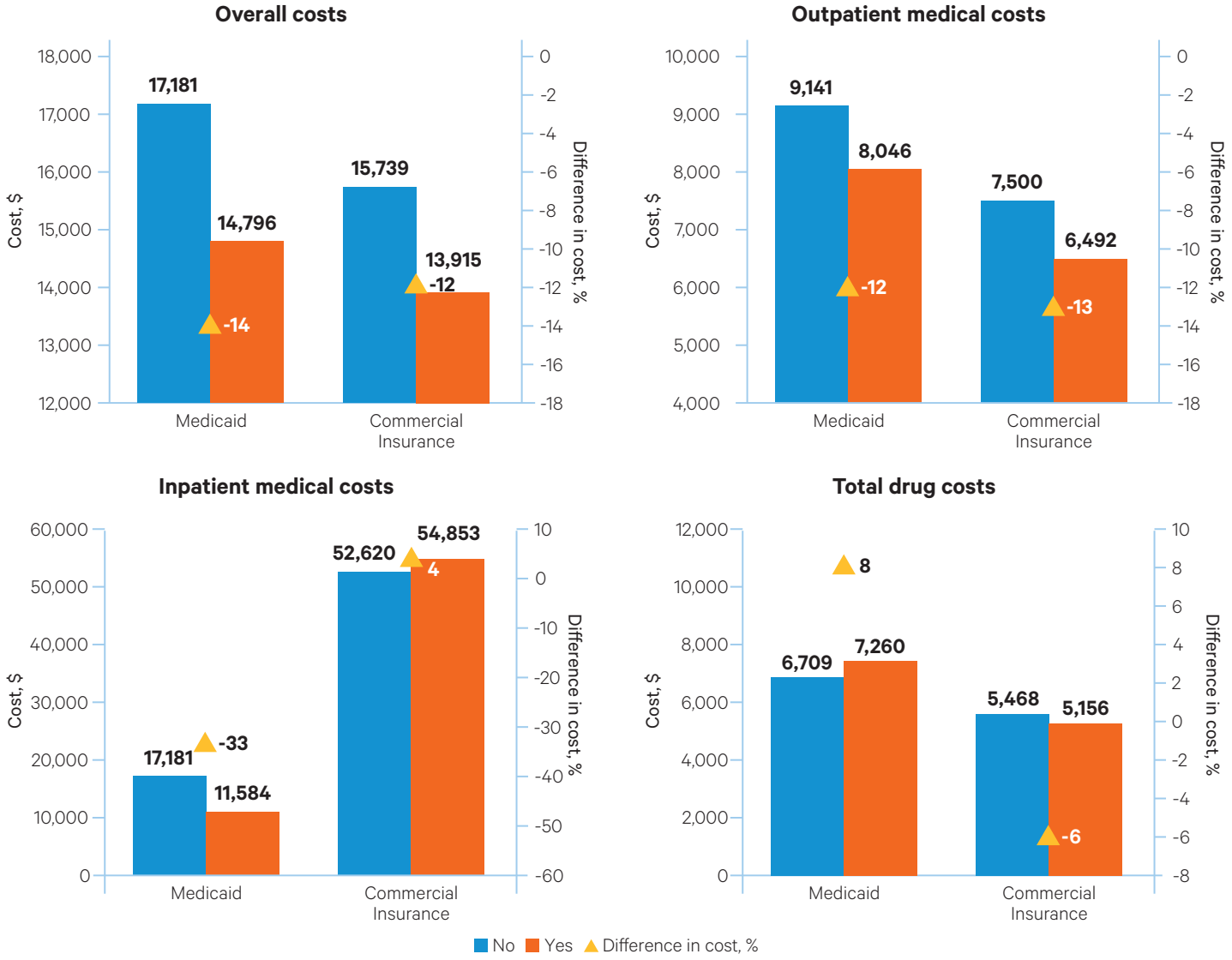
For outpatient medical costs, periodontal treatment was associated with a 12% reduction in costs in the Medicaid cohort ($8,046 vs. $9,141) and a 13% reduction in costs in the commercial insurance cohort ($6,492 vs. $7,500). A significant decrease in inpatient costs (-33%) was seen with periodontal treatment for Medicaid enrollees ($11,584 vs. $17,181), and a small, nonsignificant increase in inpatient costs (4%) was found for commercial insurance enrollees who received periodontal treatment ($54,853 vs. $52,620).

As for drug costs, periodontal treatment was associated with a small and nonsignificant (8%) increase in costs in the Medicaid cohort ($7,260 vs. $6,709) and a 6% decrease in the commercial insurance cohort ($5,156 vs. $5,468).

Implications for Medicaid Dental Coverage

Overall findings illustrate the importance of maintaining a healthy mouth as part of a DM management program. Periodontal treatment has a significant association with reductions in overall health care costs for patients with DM in both Medicaid and commercial insurance claims data, with a more pronounced difference for Medicaid enrollees (-14% vs. -12%). Additionally, an increase in the number of periodontal treatments was associated with additional cost savings. Many state Medicaid programs do not cover periodontal treatment for adult populations.[19] According to the study's findings, the average annual per-person cost for periodontal treatment was $316 for Medicaid enrollees and $408 for individuals with commercial insurance. However, the average annual per-person cost of outpatient health care for those without periodontal treatment was about $4,600 more for Medicaid beneficiaries and $3,200 more for commercial insurance than for those who received periodontal treatment. The reduction in health care costs associated with periodontal treatment for DM patients, both for commercially insured and Medicaid enrollees, suggests the potential for cost savings for the US health care system. In particular, the expansion of Medicaid benefits to include comprehensive periodontal treatment could help achieve this goal. As periodontal disease disproportionately affects 65.4% of individuals living below the federal poverty level, the improvement of Medicaid dental benefits could ultimately contribute to the reduction of oral health disparities and the advancement of oral health equity.[4]

Past use of periodontal services and insurance type



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