

## eHealth Records to Improve Dental Care for Patients with Chronic Illnesses

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**Summary:** An electronic dental record (EDR) integrated with an electronic medical record (EMR) and personal health record (PHR) provides a unique opportunity to improve the dental care of patients with chronic conditions by alerting them to special care requirements and alerting dentists at the point-of-care. Furthermore, the integration of an EMR, PHR, and EDR into an integrated electronic health record (EHR) system improves health information exchange, communication, and cost effectiveness of care, particularly for patients with chronic illnesses.

This project involved a randomized clinical trial to evaluate the effectiveness of simple reminders in an integrated EHR to improve the quality and safety of dental care for patients with chronic illnesses. The study involved 102 dentists from 15 dental clinics within HealthPartners, a large integrated health system in Minnesota that consists of a dental group, a medical group, a hospital system, a health plan, and a dental plan. The patients in the study population had special dental care needs as a result of four chronic conditions: diabetes mellitus, congestive heart failure, chronic obstructive pulmonary disease, and xerostomia (dry mouth) caused by medications or related conditions. The interventions were designed to address how and to whom special dental care needs are communicated. The impact of two clinical decision support (CDS) approaches was compared with a usual-care control group. Dental providers were randomly assigned to one of the intervention groups or the control group. The interventions were: 1) a reminder to the patient delivered by a PHR e-mail or, if e-mail was not available, over the phone by the dental clinic staff or by postal mail; or 2) a point-of-care reminder to the dentist through the EDR.

This study demonstrated that utilization of clinical guidelines for medically compromised patients can be improved with CDS using electronic dental records with provider and patient activation strategies. The clinical implication is that, as our population ages, dentists must adapt care for medically compromised patients to maintain their safety and quality of services.

### Specific Aims:

- Determine the effectiveness of integrated EMR-based interventions toward changing dentist and patient behavior. **(Achieved)**
- Determine the impact of an integrated EMR-based intervention upon the use of emergency and or restorative dental care. **(Achieved)**
- Produce and distribute a generalizable, replicable model of evidence-based care recommendations for implementing an integrated health information technology system for diabetes and other chronic illness

management within dental care practices throughout the United States. **(Achieved)**

**2011 Activities:** The focus of activity was on completing data analysis and writing up the study findings and a final report. The third manuscript to result from this project, [Electronic Health Records Improve the Use of Clinical Care Guidelines for Medically Complex Patients](#), was published as the cover story in the October 2011 issue of the *Journal of the American Dental Association*. Two additional manuscripts, “eHealth Records Improve Quality of Care for Medically Complex Patients” and “The Impact of eHealth Records on Adverse Events in Medically Complex Patients,” were submitted to journals for consideration. Two grant applications were also submitted to the Agency for Healthcare Quality as an extension of this grant.

Due to challenges with data collection, particularly in accessing data from the EDR earlier in the project, a 12-month no-cost extension was necessary to complete the project, which ended in September 2011. As last self-reported in the AHRQ Research Reporting System, project progress was on track and project budget spending was on target.

**Impact and Findings:** Participants in both the provider and patient activation groups increased use of the system during the first 6 months to access the guidelines for all patients. They also improved the accuracy of documenting medical history and use of preventive care as recommended in the guidelines. The intervention did not have an impact on patient complications (which were relatively low) between groups. Provider activation was more effective in promoting access to the guidelines than was patient activation. However, providers did not sustain their high level of use of the system.

In general, the principal findings of the study include:

1. The development and implementation of evidence-based guidelines improved safety and quality of dental care in patients with medical conditions.
2. Reminder alerts to both dentists and patients increased utilization of care guidelines by 440 percent and 221 percent, respectively, from baseline, while the control group had no increase.
3. Both provider and patient alerts had a generalizable, sustainable effect of increasing the providers reference care guidelines for all patients compared with usual care.
4. Automated provider alerts in the EDR were more effective at encouraging the use of care guidelines than personalized alerts sent to patients.
5. The CDS triggered a response by about 79 percent of all dental providers, leaving only 21 percent nonresponsive to the system.
6. There was a clear trend toward increasing the frequency of correcting errors in medical history reconciliation by dental providers as triggered by the CDS.
7. The CDS increased the use of preventive dental encounters from pre- to post-intervention periods per patient, as suggested by the guidelines.
8. The CDS did not reduce the number of dental or medical complications per patient per year.

This study demonstrates that CDS that alerts providers through EDRs or alerts patients through PHRs can improve dental providers’ review of clinical care guidelines for patients with medically complex conditions, improve medication reconciliation, and improve preventive care. However, dental providers’ use of the CDS system declined after the first 6 months despite the continued use of alerts. This suggests that dentists and hygienists either did not feel the need to continue reviewing the clinical care guidelines or the alerts became less effective. Future research is needed to determine which additional CDS components will increase the

percentage of dental providers who use it and to improve transferability and scalability of a system to more dental providers while maintaining high acceptability.

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**Target Population:** Adults, Chronic Care\*, Chronic Obstructive Pulmonary Disease, Congestive Heart Failure, Diabetes, Other Conditions: Xerostomia

**Strategic Goal:** Develop and disseminate health IT evidence and evidence-based tools to improve health care decisionmaking through the use of integrated data and knowledge management.

**Business Goal:** Implementation and Use

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*\* This target population is one of AHRQ's priority populations.*