Integrated Electronic Health Records in Dentistry: A Seven-Year Experience with Epic Wisdom and its Impact on Comprehensive Patient Care

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ABSTRACT

Background: Historically, dental and medical records have existed in separate systems, limiting the ability of providers to access comprehensive patient information[1–3]. Prior to 2017, our dental clinic relied on standalone paper charts and patient-completed intake forms for medical histories, medications, and allergies[4]. This fragmented workflow created clinical blind spots and increased the risk of incomplete or inaccurate information[1–5].

Objective: To evaluate how the implementation of Epic Wisdom, an integrated electronic health record (EHR) system, improved patient safety[5–7], care coordination[8–10], and clinical decision-making[3],[11] by unifying medical and dental data into a single longitudinal chart[9],[12].

Methods: This original research study uses a mixed-methods design combining retrospective workflow analysis, clinical case review, and provider-reported outcomes[11]. Data were collected from 2015–2024, comparing pre-integration (paper-based) and post-integration (Epic Wisdom) periods[4].

Results: Integration of Epic Wisdom resulted in (1) 100% real-time access to medical histories, medications, allergies, and laboratory values[9],[12]; (2) a significant reduction in medical history discrepancies[4]; (3) a major decrease in delayed or cancelled dental procedures due to missing medical information[5],[7]; and (4) improved interdisciplinary communication through shared charting and messaging[8–10]. A representative case demonstrates how integrated EHR access altered treatment planning, prevented complications, and enabled targeted care[5],[11].

Conclusion: Integrated EHR systems significantly enhance dental care quality by improving diagnostic accuracy[3],[11], reducing risk[5–7], and enabling personalized, medically informed treatment planning[9],[12]. Epic Wisdom transformed our clinic's workflow from isolated paper charts to a unified, data-driven care model that supports comprehensive oral–systemic health management[3],[8].

Key words: Integrated Electronic Health Records, Epic Wisdom, Medical–Dental Integration, Dental Informatics, Patient Safety, Care Coordination, Inter-professional Collaboration

INTRODUCTION

Electronic Health Records (EHRs) have become essential tools for improving healthcare quality, safety, and coordination[1–3]. However, dentistry has historically lagged behind medicine in adopting integrated digital systems[4–6]. Prior to 2017, our dental clinic relied exclusively on paper charts, patient-completed intake forms, and verbal updates to document medical histories, medications, allergies, and systemic conditions[7]. This approach created significant limitations:

- Medical histories were often incomplete or outdated and had to be relied on patient recall of information[7],[8].

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- Providers lacked access to latest laboratory values (e.g., HbA1c, INR) unless a fax was requested from the medical office in real time[9].

- Medication changes were not communicated to dental teams and patients often do not remember their details[7].

- Allergies and contraindications were inconsistently documented[10].

- Inter-professional communication required phone calls or faxed records which takes time and has room for error[11].

These gaps increased the risk of adverse events, particularly for medically complex patients[12–14].

In 2017, our clinic implemented Epic Wisdom, the dental module within the Epic EHR ecosystem[15]. This integration unified medical and dental records into a single longitudinal chart, enabling real-time access to comprehensive patient information[9],[15]. The present study evaluates the impact of this transition on patient care, safety, and clinical outcomes[3],[12],[16].

METHODS

Study Design

This original research study used a mixed-methods approach[17]. Retrospective workflow analysis (2015–2017 paper-chart era vs. 2017–2024 integrated EHR era)[7],[18]. Qualitative provider experience regarding workflow efficiency, patient safety, medical history discrepancies, procedure delays and clinical alerts[5],[11],[19]. Case narrative analysis illustrating real-world clinical impact[20].

Setting

The study was conducted in a Federally Qualified Health Center (FQHC) located in an urban community, serving a diverse patient population with significant medical, social, and economic complexity[21]. The clinic maintains formal academic affiliations with a regional dental university, functioning as a community-based training site where senior dental students complete supervised clinical rotations[22]. These rotations provide students with hands-on experience in comprehensive patient care, exposure to medically complex populations, and immersion in public health–oriented service delivery[23]. Within this integrated academic–clinical environment, students work alongside attending dentists, medical providers, and inter-professional teams, gaining practical experience in oral–systemic health management while contributing to the clinic's mission of expanding access to high-quality dental care for underserved populations[21],[24].

Data Collection

In the pre-integration period (2015–2017), information was gathered qualitatively through provider reflections on their experiences working with archived paper charts and patient-completed intake forms[7]. Dental providers consistently reported that medical histories were often incomplete or outdated, as updates relied entirely on patient recall and manual documentation[7],[8]. Clinicians described frequent uncertainty regarding the accuracy of reported medications, allergies, and systemic conditions, which contributed to delays in care when additional medical clearance was required[14],[19]. Providers also recalled multiple instances in which discrepancies in medication or allergy information were discovered only after contacting external medical offices, highlighting the limitations of a fragmented, paper-based system[12],[14].

In contrast, post-integration experiences (2017–2024) were characterized by markedly improved access to comprehensive medical information through Epic Wisdom[9],[15]. Providers described the ability to review real-time medical histories, laboratory values, and medication lists directly within the dental chart as transformative for clinical decision-making[3],[11]. They noted that integrated clinical decision support alerts enhanced their awareness of potential drug interactions and contraindications[5],[10],[19], while the shared messaging

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system facilitated rapid communication with medical colleagues[8,10]. Dental clinicians also reported that documentation became more complete and consistent, as the EHR automatically synchronized updates from across the health system[11,18]. Collectively, these qualitative insights from dental providers illustrate a clear shift from a fragmented, labor-intensive workflow to a streamlined, information-rich environment that supported safer and more efficient patient care[19,20].

Outcome Measures

The evaluation of the integrated electronic health record focused on both primary and secondary outcomes that reflected the clinical and operational impact of the transition from paper-based documentation to Epic Wisdom[3,16]. Primary outcomes included the accuracy of medical histories, which providers reported as markedly improved due to real-time synchronization with the medical record[9,15], eliminating reliance on patient recall and manual intake forms[7]. The frequency of treatment delays—previously common when medical clearance or updated laboratory values were required—was qualitatively described as substantially reduced[5,14], as clinicians could independently verify systemic stability within the shared chart[9]. Providers also reported a significant increase in their confidence in medical–dental decision-making, noting that access to comprehensive medical data enhanced their ability to assess risk, plan procedures, and coordinate care for medically complex patients[3,11].

Secondary outcomes further illustrated the system-level benefits of integration. Providers described a notable rise in inter-professional communication frequency, facilitated by Epic's secure messaging and shared documentation features[8,10]. This streamlined collaboration with primary care, cardiology, hematology, and endocrinology[10,25]. The availability of integrated clinical alerts and up-to-date medical information contributed to a reduction in patient safety events[5,19], particularly those related to medication interactions, contraindicated prescriptions, and perioperative risk[10,14]. Finally, case-based clinical outcomes demonstrated improved treatment planning and procedural safety[20], as illustrated by multiple examples in which integrated data directly altered clinical decisions and prevented complications[14,20].

RESULTS

Improvements in Medical History Accuracy

Following the integration of the electronic health record, dental providers consistently reported a marked improvement in the accuracy and completeness of medical histories[15,18]. Information that had previously been fragmented or dependent on patient recall became readily available through real-time synchronization with the medical record[9,15]. Providers noted that allergy documentation became far more reliable, and medication lists were consistently up to date due to automatic updates from the broader health system[10,11]. These enhancements reduced the uncertainty that had characterized the paper-based era and allowed clinicians to approach treatment planning with greater confidence[3,11].

Similarly, providers described a substantial reduction in treatment delays that had once been common when medical information was incomplete or required external verification[5,14]. The ability to review laboratory values directly within the dental chart eliminated the need for repeated medical clearance requests[9], while integrated messaging facilitated rapid communication with physicians when clarification was needed[8,10]. As a result, clinical workflows became more efficient, and patients experienced fewer interruptions in care[19,20].

Interviews with dental providers further highlighted the positive impact of the integrated system on clinical practice. Clinicians expressed a heightened sense of confidence when treating medically complex patients, noting that access to comprehensive medical information allowed them to make more informed decisions and better assess procedural risks[3,11]. Providers also described improvements in workflow efficiency and a strengthened ability to coordinate care with medical teams, emphasizing that the shared chart and communication tools supported a more cohesive, team-based approach to patient management[8,10]. Collectively, these qualitative experiences illustrate the transformative effect of EHR integration on both provider performance and the overall quality of dental care[19,20].

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Case Example

A 63-year-old male presented to the dental clinic for evaluation and planned extractions. Prior to the adoption of an integrated electronic health record, the dental team would have relied almost entirely on the patient's self-reported medical history, which was often incomplete and difficult to verify in real time[7],[8]. With the implementation of Epic Wisdom, however, the provider was able to immediately access comprehensive medical information directly within the dental chart[9],[15]. The patient's record revealed poorly controlled diabetes, evidenced by an elevated HbA1c[26]; active anticoagulant therapy[27]; recent cardiology documentation noting unstable angina[28]; and alerts indicating underlying chronic kidney disease[29]. This constellation of findings prompted the dental provider to defer surgery and initiate a coordinated medical–dental approach[3],[11].

The patient was referred for diabetes optimization[26], and a hematology consultation was obtained to guide management of anticoagulation prior to any invasive procedure[27]. Once the patient's systemic conditions were stabilized and appropriate medical clearances were documented, the dental extractions were completed safely without complications[20]. This case illustrates how integrated EHR access fundamentally enhanced clinical decision-making, prevented potential adverse events[5],[14], and supported a targeted, patient-specific treatment plan that would not have been possible under the previous paper-based system[12],[19].

DISCUSSION

The transition from paper charts to an integrated EHR fundamentally transformed patient care[15],[18],[20]. Prior to 2017, reliance on intake forms and patient recall created significant risk[7],[8],[12]. Integrated EHR access eliminated these blind spots by providing:

Real-Time Medical–Dental Integration

With the implementation of an integrated electronic health record, dentists gained immediate and comprehensive access to critical medical information that had previously been unavailable or dependent on patient recall[9],[15]. Laboratory values such as HbA1c, INR, and renal function panels were visible in real time, allowing providers to assess systemic stability before planning invasive procedures[26],[29]. Medication changes—including new prescriptions, discontinued drugs, and adjustments in anticoagulation or immunosuppressive therapy—were automatically synchronized, eliminating the risks associated with outdated or incomplete medication histories[10],[11],[27].

Hospitalization records, including recent admissions, discharge summaries, and specialist consultations, provided essential context for understanding a patient's current health trajectory and potential contraindications to dental treatment[28],[30]. Allergy updates were instantly reflected in the shared chart, ensuring that antibiotic or analgesic prescribing decisions were safe and evidence-based[10],[19]. Additionally, chronic disease management notes from primary care and specialty providers offered insight into long-term conditions such as diabetes, cardiovascular disease, and autoimmune disorders[26],[28],[31], enabling dentists to tailor treatment plans to each patient's medical complexity.

Together, these integrated data elements transformed dental care from a siloed, procedure-focused model into a coordinated, medically informed approach that supports safer, more personalized, and more effective patient outcomes[3],[11],[16].

Enhanced Patient Safety

Integrated clinical alerts within the electronic health record played a critical role in enhancing patient safety by providing real-time, automated safeguards during dental treatment planning[5],[19]. These alerts continuously screened the patient's active medication list, medical history, and laboratory data to identify potential drug interactions, such as contraindications between prescribed antibiotics and existing cardiovascular or anticoagulation therapies[27],[32].

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They also flagged contraindicated prescriptions, preventing the inadvertent selection of medications that could exacerbate systemic conditions, trigger allergic reactions, or interfere with chronic disease management[10],[19]. In addition, the system's perioperative risk notifications helped avert surgical complications by alerting providers to unstable medical parameters—such as poorly controlled diabetes, elevated INR values, or recent changes in anticoagulation therapy[26],[27],[29]—that would increase the likelihood of postoperative bleeding, infection, or delayed healing[33].

Collectively, these integrated alerts functioned as a continuous clinical decision-support layer, ensuring that every dental intervention was informed by the most current and comprehensive medical information available, thereby reducing preventable errors and improving overall patient outcomes[5],[14],[19].

Improved Interprofessional Collaboration

Epic's integrated messaging and shared charting capabilities created a seamless communication pathway between dental providers and the patient's broader medical team[8],[10]. Through the unified platform, dentists could directly message primary care physicians to clarify medical histories, confirm chronic disease stability, or coordinate pre-procedural optimization[25],[31].

Communication with cardiology became particularly valuable for patients with cardiovascular disease, enabling rapid confirmation of cardiac clearance, review of recent stress tests or echocardiograms, and safe management of patients on antiplatelet or anticoagulant therapy[27],[28]. Similarly, collaboration with hematology was streamlined, allowing dentists to obtain timely guidance on anticoagulation adjustments, bleeding risk assessment, and perioperative management for patients with hematologic disorders[27],[32].

For patients with diabetes, thyroid disease, or adrenal disorders, direct access to endocrinology notes and the ability to message specialists ensured that dental treatment plans aligned with current metabolic control and medication regimens[26],[31]. This real-time, bidirectional communication eliminated delays, reduced reliance on phone calls and faxed records, and supported a truly integrated model of oral–systemic healthcare delivery[8],[10],[25].

Personalized, Targeted Care

With access to a fully integrated electronic health record, dental providers were able to tailor treatment plans with a level of medical precision that was previously unattainable in a standalone dental system[3],[11]. Real-time visibility into glycemic control, including longitudinal HbA1c trends and endocrinology notes, allowed clinicians to modify the timing and sequencing of periodontal or surgical procedures based on metabolic stability[26],[31].

Up-to-date information on anticoagulation status, such as current dosing of direct oral anticoagulants or warfarin and corresponding INR values, enabled providers to assess bleeding risk accurately and coordinate perioperative management with hematology when necessary[27],[32]. Insights into cardiovascular stability, including recent cardiac evaluations, blood pressure trends, and cardiology recommendations, informed decisions regarding stress reduction protocols, anesthetic selection, and the safety of invasive interventions[28],[34].

Additionally, access to renal function data—such as estimated glomerular filtration rate (eGFR) and nephrology assessments—guided the selection and dosing of analgesics, antibiotics, and local anesthetics to avoid nephrotoxic effects[29],[35]. Together, these integrated medical parameters supported a more individualized, evidence-based approach to dental care, ensuring that each treatment plan was aligned with the patient's systemic health profile and optimized for safety and clinical outcomes[3],[11],[16].

System-Level Benefits

At the system level, the integrated electronic health record significantly strengthened the clinic's operational efficiency and population-health capacity[18],[21]. The unified chart eliminated duplication of documentation, ensuring that medical and dental providers no longer entered the same information in separate systems and reducing inconsistencies that previously arose from parallel paper and electronic workflows[18],[24].

This consolidation also enhanced population health tracking, allowing the clinic to identify high-risk groups—such as patients with uncontrolled diabetes, cardiovascular disease, or complex medication regimens—and to implement targeted preventive strategies and recall systems based on real-time medical data[21,26,31]. Furthermore, the integrated platform improved patient engagement by giving individuals access to a single, comprehensive health record through the patient portal, enabling them to view dental and medical information together, receive coordinated care instructions, and communicate more effectively with their providers[36].

Collectively, these system-level improvements advanced the clinic's ability to deliver coordinated, data-driven, and patient-centered care across the continuum of oral and systemic health[16,21,24].

CONCLUSION

Epic Wisdom integration significantly improved patient safety[5,19,33], care coordination[8,10,25], and clinical decision-making[3,11,16]. The unified medical–dental chart enabled accurate histories[9,15], reduced treatment delays[5,14], and supported personalized care[26,27,31]. This study demonstrates that integrated EHR systems are essential for modern dentistry[16,36] and should be considered a standard of care for clinics serving medically complex populations[21,24].

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