

Innovative Models of Dental Care Delivery and Coverage

Patient-Centric Dental Benefits Based on Digital Oral Health Risk Assessment



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KEYWORDS

- Dental care • Dental benefits • Preventive • Risk-based care
- Risk-assessment technology • Cloud-based technology • Patient-centered care
- Evidence-based

KEY POINTS

- The purpose of innovative models is to align the interests and activities of all stakeholders to provide quality oral health care.
- Quality oral health care is defined and measured by clinical and patient-centric outcomes.
- The models' primary focus of oral health care is to sustain wellness by prevention in contrast to disease-necessitated repair.
- A key element is digital risk and severity assessment, which allow for objective precise measurement of oral health status and outcomes.
- Risk assessment expands on traditional diagnosis and repair by including risk as a modifier of treatment and as a determinant of preventive services.

DENTAL BENEFITS, EVIDENCE-BASED DENTISTRY, AND HEALTH CARE QUALITY

According to data from the Centers for Medicare and Medicaid Services, an estimated \$117.5 billion or \$366 per person was spent on dental services in 2015 by individuals, private insurers, and government payers.¹ There is, however, little objective evidence

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to show that these expenditures resulted in improvements in the oral health of individuals or populations receiving these dental services.²

Innovative models of dental care delivery and coverage are being developed to align the interests and activities of patients, purchasers, payers, and providers to provide quality oral health care as defined by the Institute of Medicine, which the authors paraphrase as *“the degree to which (oral) health services increase the likelihood of a patient’s desired outcome and is consistent with current professional knowledge.”*³ These models expand on the traditional disease, diagnosis, and repair approach by emphasizing the value of risk prediction and prevention. Hence, the models’ primary focus of dental care is to sustain wellness by prevention in contrast to disease-necessitated repair.

Innovative models of dental care delivery and coverage are being developed as a response to the need for evidence-based practice models that use dental quality measures to help dental professionals achieve outcomes desired by their patients.³⁻⁵ Traditional dental quality measures have assessed the process of care, such as access, safety, conformity with guidelines, and technical standards of care, and patient satisfaction with the care experience. Outcomes follow the process of care. Accordingly, the new models incorporate outcomes composed of clinical outcomes and outcomes from the patient’s perspective, such as quality-of-life measures and patient-reported outcomes.

The process of dental care, illustrated in Fig. 1, ends with outcomes, which are the foundational measure of dental care quality.^{3,6-8} The value proposition for oral health services can be defined as outcomes relative to costs.⁶ Although outcomes themselves have no associated cost, cost affects outcomes by its influence on access to care, the selection and delivery of services, and patient satisfaction with the care experience. Patient satisfaction can also exert a powerful force on outcomes and quality. Elements affecting patient satisfaction with care include the physical environment, dentist-patient-staff interactions, and the patient’s perceived value of objective treatment outcomes.⁹ Therefore, cost reduction or increase without consideration of outcomes may adversely affect the value proposition of health care services.

To achieve the best outcomes, new oral health care models will require the use of information technology that aligns the interests of purchasers, patients, third-party

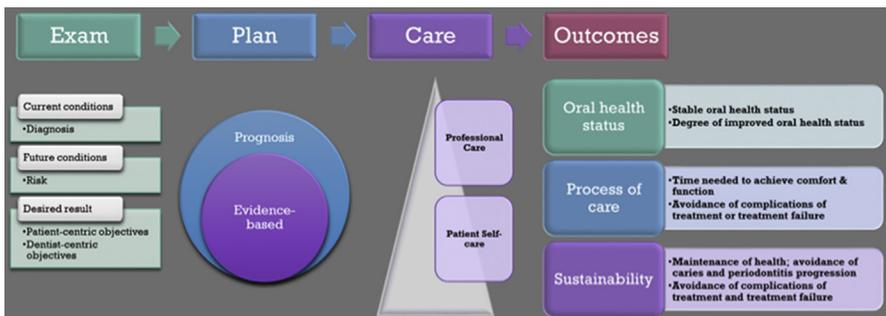


Fig. 1. Outcomes are the results of a dental process that begins with an examination of the patient, development of a treatment plan, and care. The examination includes an assessment of current conditions, future conditions, and desired results of care. Evidence-based and prognostic information is used along with the examination assessment to plan treatment. The results of care include outcomes about oral health status, the care process, and status during a follow-on period.

payers, and providers. Using objective measures of disease severity and risk, third-party payers can create plan designs that encourage provider performance congruent with recommended best clinical practices. These systems must also provide accessible resources to help patients make educated health care decisions.

Among the challenges the profession faces in transitioning from procedure-based payment to a system that rewards better outcomes is that third-party payers do not typically require submission of diagnostic codes or other information describing the clinical condition of the patient. The available information is a record of financial transactions between the provider and the payer for services rendered resulting in an estimate of value, cost-benefit, and quality based on claims data. Without objective descriptions of clinical findings or a diagnosis, these estimates provide, at best, an imprecise surrogate measure for the patient's true oral health status and outcomes of care. The lack of objective clinical findings limits the capacity to analyze the effects of oral health care and impedes the development of ways to improve outcomes and value-based reimbursement systems.^{5,6,8}

Several investigators have identified the need for information systems that use objective clinical information provided by the patient or entered by the provider at chairside to measure an individual's current oral health status and estimate risk for future disease.^{7,10-12} A standardized set of oral health risk and disease severity scores can provide clinical decision support for diagnosis and treatment planning by the provider; focused engagement of patients to motivate behavioral change; and evidence-based preventive care benefit determinations from third-party payers based on individual risk for oral disease.

Current evidence-based guidelines from both the American Dental Association and the American Association of Pediatric Dentistry base both the intensity and the frequency for preventive services on the individual patient's risk for dental caries. These guidelines recommend that children at greater risk for dental caries receive up to 4 fluoride treatments per year and that fluoride treatment is most likely beneficial for adults at greater risk as well.^{13,14} Caries risk assessment tools that are available to assist clinicians in evidence-based treatment planning include Caries Management by Risk Assessment or CAMBRA,¹⁵ Caries Risk Assessment,¹⁶ and Caries Assessment Test.¹⁴

Data systems that allow a dental provider to accurately convey objective clinical information about a patient to the dental insurer for automated predetermination of evidence-based benefits and to the patient for oral health counseling can be an important step in creating a more patient-centric and evidence-based dental care model. The American Dental Association Standards Committee for Dental Informatics has anticipated the need for voluntary consensus in the development of these technologies and recently published a standard describing the essential characteristics of digital oral health risk assessment resources.¹⁷

A CLOUD-BASED SYSTEM FOR A RISK-BASED MODEL OF DENTAL BENEFITS AND CARE

In 2010, a regional dental insurance carrier operating in Maine, New Hampshire, and Vermont (Northeast Delta Dental, Concord, NH, USA) began a novel collaboration with a health care technology company specializing in digital oral health risk and disease severity measurement (PreViser Corporation, Concord, NH, USA and Mount Vernon, Washington, USA) to pilot a patient-centric dental plan design whereby patients would have access to evidence-based benefits matched to their individual needs based on submission of a standardized assessment of disease severity and risk. The plan design became known as Health through Oral Wellness or HOW.

PreViser had previously developed a clinical risk assessment resource called the Oral Health Information Suite or OHIS, which provides scientifically validated measures for periodontal disease risk, severity, and stability,^{18–20} which was in use by dentists in the United States, the United Kingdom, and Japan. Other measures of OHIS that supported the initiative included a caries risk assessment score adapted from the CAMBRA analogue risk assessment tool,¹⁵ a restorative needs score, and an oral cancer risk score.

Embedded algorithms in PreViser's cloud computing service use standardized information about the patient to create objective and repeatable measures describing the patient's current oral health status and risk for future disease. Oral Health Risk and Severity Reports generated by the OHIS and downloaded at chairside, use color-coded numerical scores to help the patient understand their current oral health status and risk for future disease along with evidence-based preventive care and treatment recommendations.

Aggregated risk and severity data from the OHIS can also be used to create population oral health profiles and potentially to define clinically derived outcome measures. When compared with claims data, these clinical measures can identify gaps in care that can be addressed through patient-centric and evidence-based plan designs, patient engagement, provider education, and value-based reimbursement to achieve better clinical outcomes.

In a 2-year pilot program with 2 employer groups, the dental insurer developed a plan design that provided suites of enhanced preventive dental benefits based on evidence-based guidelines for preventive care from dental professional organizations, including the American Dental Association, the American Academy of Pediatric Dentistry, and the American Academy of Periodontology. Initially, both analogue and PreViser digital risk assessments were accepted by the insurer for making benefit determinations. It became soon apparent, however, that analogue assessments were administratively unscalable. To operationalize an evidence-based plan design across the company's book of business, a single, standardized, digital risk assessment tool set became an essential requirement.

USE OF AN INFORMATION SYSTEM TO IMPROVE HEALTH CARE QUALITY

To operationalize the HOW program, PreViser and Northeast Delta Dental began a collaboration to build a secure cloud-based platform that came to be called the Population Oral Health Manager (POHM). The features of the POHM, shown diagrammatically in [Fig. 2](#), include a HIPAA compliant cloud computing services and data storage hub that contains encrypted OHIS-generated patient data. These data are then accessible through a data hub that resides behind the dental insurer firewall using a decryption key known only to the patient's provider, dental insurer, or other HIPAA authorized user.

The data hub can access or share data with the provider's electronic health record and the dental insurer's claims payment system for automated benefit determination. The POHM Platform also includes a digital messaging center that provides automated messaging to engage patients based on user-defined characteristics.

In addition to scores, the reports provide actionable information regarding evidence-based preventive care or treatment recommendations to restore health and/or prevent disease. The risk and severity scores can be correlated with current diagnostic criteria to provide diagnostic decision support for the provider.

By transmitting oral health data scores directly to the patient's dental insurer to automatically trigger a predetermination of the evidence-based benefits, the need for administrative or consultant review is avoided, making the transaction virtually

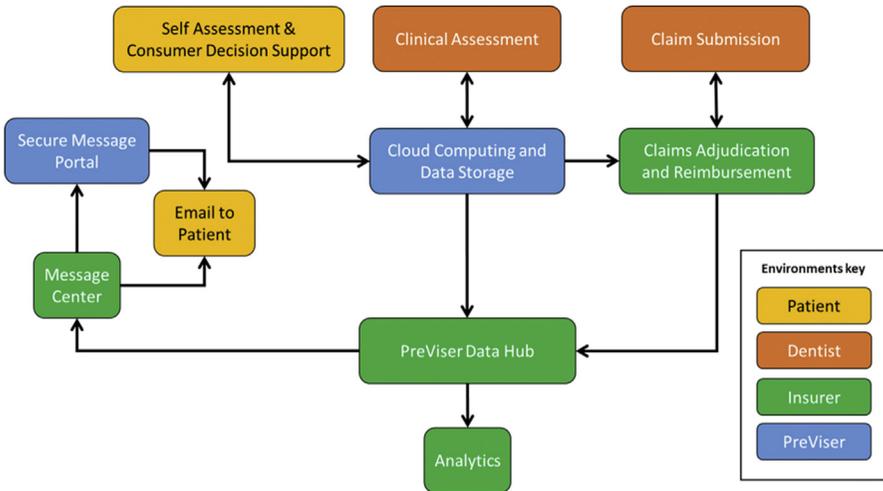


Fig. 2. Core components of the POHM include cloud computing services, data storage hub, and message center. Embedded algorithms in the cloud computing service return a description of the patient’s current oral health status and risk for future disease. An insurer using information in the data storage hub adjudicates claims, analyzes care, and sends health care messages of particular importance to a specific patient.

instantaneous, which results in savings in administrative costs for both the benefit plan and the provider.

In contrast to plan designs that provide additional cleanings or other benefits based on medical diagnoses such as diabetes or pregnancy, risk-based benefit programs like HOW focus on primary prevention of oral disease and do not require the patient to be diagnosed with a systemic comorbidity to obtain evidence-based dental benefits.

The HOW plan was made available to all of the dental insurer’s employer groups in January 2015, and by June 2017, more than 99% of the insurer’s employer groups adopted the new plan design. The program could not succeed without adequate clinician participation. Fortunately, provider acceptance has exceeded expectations, with more than 86% of plan participating and nonparticipating licensed dentists in the insurer’s coverage area of Maine, New Hampshire, and Vermont accepting free licenses to use the OHIS clinical tool. These dentists have submitted more than 76,000 risk assessments as of June 2017. Although it is too early at this time to assess the impact of the new plan design on outcomes or quality measures, a nonscientific survey of dentists found high levels of user satisfaction with the program. There has been no increase in premium costs or administrative expense for employers attributable to the program.

WHY SCORES MATTER

Numerical scores are integral to evidence-based and patient-centric care and benefit models. PreViser’s information system provides objective and repeatable measures describing a patient’s oral health status and its change over time. Some elements of the scoring system have been scientifically validated, whereas others are still based predominantly on expert opinion. Standardized assessment measures, however, provide the only way to establish a basis for quality assessment, economic analysis, and patient-centered care.^{2,3,6,8,21}

Scores can be used to describe current conditions or to predict the likelihood a condition will occur or worsen in the future (ie, disease risk assessment). In addition to

scores that measure a patient's condition over time or describe treatment outcomes, scores that describe the patient's satisfaction with their oral health and treatment received are also important (eg, oral health–related quality of life, patient-reported outcomes). Patient activation measures can be developed to measure a patient's level of understanding of their oral health status and their ability and willingness to participate in self-care activities to improve health outcomes.

Implementation of dental diagnostic codes will be an important advance that will drive improvements in oral health care quality. Objective, clinically based, risk, severity, and stability scores can enhance the accuracy of diagnosis and provide additional granularity to reveal changes in oral health over time within a diagnostic classification. For example, the OHIS periodontal health module describes periodontal status by applying weighted values for pocket depth, supporting bone and bleeding on probing, using a computerized algorithm. A numerical scale from 1 (representing gingival health) to 100 (representing severe periodontitis in all dentate sextants) describes the extent of disease severity within each diagnostic class. For each diagnostic descriptor, other than “health,” there are multiple scores for gingivitis, mild periodontitis, moderate periodontitis, and severe periodontitis. Each score accurately and precisely describes a current condition, which means the outcomes of improvement and deterioration are captured with greater granularity than is possible with purely descriptive diagnostic nomenclature or codes.

SUMMARY

The use of digital risk-assessment technology offers a promising new approach for models of dental care and benefits that has value for patients, purchasers, payers, and providers. The dental benefit provider uses risk assessment scores to automatically predetermine evidence-based preventive benefits for patients at greater risk for oral disease. This, in turn, reduces barriers to case acceptance and patient compliance that occur when coverage for evidence-based services is denied based on age or frequency limitations. Although it is too early in the program to demonstrate improvement in outcomes, purchaser, provider, and patient acceptance has been very favorable with no significant increase in costs to purchasers.

Digital risk and severity assessment allows for more objective and granular measurement of oral health status for individuals and populations than claims data or diagnostic codes alone. Digital risk assessment resources like the OHIS and POHM may help bridge the divide between the current fee-for-service model with payment based primarily on actuarial rather than clinical measures and truly value-based reimbursement models based on achieving objectively measured clinical outcomes.

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