

## INVITED PAPER

# Potential to improve oral health care through evidence, protocols, and payment models

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## Abstract

Evidence-based health care aims to utilize the best available evidence from scientific methods and apply this evidence to clinical and public health practice. Evidence of the benefits and risks of treatment is derived from randomized controlled clinical trials, systematic reviews, and expert panels. Evidence-based clinical parameters and guidelines should foster the best health outcomes for individuals or populations at reduced costs. By incorporating evidence-based guidelines into payment models, the payers – private or public – have the capacity to improve oral health care and ultimately oral health outcomes. This paper uses examples from pediatric dentistry to show how adoption of caries risk factors, clinical management protocols, and a reimbursement system based on evidence-based guidelines may allow for better quality of care to more individuals and at a lower cost.

## Evidence-based health care

The concept of using evidence to guide clinical decision making was first introduced by Gordon Guyatt and the Evidence-Based Medicine Working Group at McMaster University in Ontario, Canada, in the 1990s. They established a new paradigm for medical education designed to incorporate current research into education and practice to enable practitioners to provide the best care for their patients (1). Evidence-based health care utilizes a systematic process to critically appraise the health-related scientific evidence for validity and then apply the evidence to patient care while considering patients' preferences, values, and circumstances. More recently the concept of a "learning health care system" has evolved whereby new knowledge is so embedded into the core of the health care practice that it leads to continual improvement in care (2). This paper explores ways that evidence can foster disease prevention and improve access to quality dental care while reducing costs.

However, to the practicing health professional and to policy makers, evidence-based dentistry can be perplexing as well as difficult to implement. Certainly, practitioners share

the goals of providing the best quality and cost-effective care for patients and populations using best available evidence. However, there are challenging obstacles in implementing evidence-based care including: providers lack of training in evaluating and implementing scientific findings into clinical practice; hard to find, confusing, contradictory, clinical science; as well as the difficulty of implementing quality care when payment models are not aligned with evidence-based knowledge.

The optimum evidence for efficacy of a therapy is the randomized, controlled clinical trial. Besides such clinical trials, publication of systematic reviews produces substantial evidence for clinical practice. Systematic reviews use methods to minimize biases and critically appraise a body of studies. These reviews in dentistry are readily available through many sources, including the Cochrane Collaboration (3), the Center for Evidence-Based Dentistry (4) and the American Dental Association's (ADA's) Center for Evidence-Based Dentistry (5). In the past few years the ADA has published valuable evidence-based reviews on topics such as topical fluorides, pit-and-fissure sealants, and fluoride supplements.

**Table 1** Caries Risk Factors for 0- to 5-Year Olds (Adapted from American Academy of Pediatric Dentistry) (20)

Clinical findings
Child has more than one carious lesion.
Child has active white spot lesions or enamel defects.
Child has elevated mutans streptococci.
Child has plaque on teeth.
Social findings
Mother/primary caregiver has untreated caries or tooth loss.
Parent/caregiver has low socioeconomic status.
Child has >3 between meal sugar-containing snack/drinks per day.
Child put to bed with a bottle of a drink containing sugar.
Child has special health care needs.
Child is a recent immigrant.

## Risk assessment

Risk assessment procedures currently used in medical practice may have sufficient evidence to accurately quantitate disease susceptibility of a person and allow for evidence-based preventive, diagnostic, and treatment measures (6). Even though dental risk assessment procedures currently lack sufficient data to quantitate a patient's disease susceptibility, it still can foster the treatment of the disease process, rather than the outcome of the disease. Furthermore, caries risk assessment promotes preventive and restorative treatment tailored for the individual patient and aids in anticipation of caries progression or stabilization.

Caries risk indicators may examine factors that cause the disease directly or that can be useful in predicting it. Clinical dental factors in children, such as presence of previous caries or white spot lesions are strongly associated

with caries development (7). In preschool children, the presence of plaque (8) and mutans streptococci levels (9) are valuable clinical findings for estimating caries risk. Additionally, social factors such as parents with untreated carious lesions or tooth loss (10,11), low socioeconomic status (12), high frequency sugar consumption (10,13), and recent immigration (14) are important considerations (Table 1).

## Clinical management protocols

Clinical management protocols provide standardized care regarding diagnosis, prevention, and treatment of a disease, and are frequently used in medicine to improve quality of care. They are based on evidence from the current literature, the judgment of expert panels, and the clinical experience of practitioners. Caries management protocols are dependent on a specific patient's risk levels (10). Table 2 presents a caries management protocol that is based on results of clinical trials, systematic reviews, and expert panel recommendations (15-20). Similar protocols have demonstrated better clinical outcomes and more cost-effective caries treatment for preschool children (21). Additionally, clinical protocols have the potential to standardize decision making and treatment strategies (22-24) and foster appropriate levels and preventive care and restorative procedures. The basis for these protocols includes identification of an individual's risk for caries, early detection of non-cavitated lesions, and "active surveillance" to apply appropriate preventive measures and to monitor disease arrestment/progression.

**Table 2** Caries Management Protocol for 0- to 5-Year Olds (Adapted from American Academy of Pediatric Dentistry) (20)

Risk Category	Diagnostics	Fluoride	Sealants	Diet	Restorative
Low risk	Recall every 6-12 months Radiographs 12-24 months Baseline MS*	Twice daily brushing with F toothpaste†	No	No	Surveillance¶
	Recall every 6 months	Twice daily brushing with F toothpaste			Active surveillance of incipient smooth surface lesions§
Moderate risk	Radiographs 6-12 months Baseline MS	Fluoride supplements‡ Professional topical every 6 months	Yes	Counseling	Restoration of cavitated or enlarging lesions
	Recall every 3 months	Twice daily brushing with F toothpaste			Active surveillance of incipient smooth surface lesions
High risk	Radiographs, 6 months Baseline and follow up MS	Fluoride supplements Professional topical every 3 months	Yes	Counseling	Restoration of cavitated or enlarging lesions

\* Salivary mutans streptococci bacterial levels.

† Parental supervision of a "smear or pea size" amount of toothpaste.

‡ Need to consider fluoride levels in drinking water.

¶ Surveillance = periodic monitoring for signs of caries progression.

§ Active surveillance = careful monitoring of caries progression and prevention program.

MS, mutans streptococci; F, fluoride.

## Payment models

The payment models for provider reimbursement have been slow to adapt to advances in science, including caries risk assessment and clinical protocols. Barriers to change include purchasers of insurance programs, providers, and patients – all of whom may base their health care beliefs and desires on factors other than current evidence.

Additionally, the primary reimbursement method in dentistry remains a basic fee-for-service model that rewards reparative treatment, instead of treatment of the disease process. This fee-for-service model does little to incentivize evidence-based care, treatment of underlying disease process, or high-quality care. The fee-for-service also is reported to be inefficient and does not reduce unnecessary treatment (25). An example of the inconsistency of fee-for-service with evidence-based dentistry is the professional topical fluoride procedure. There is significant data showing that individuals at high caries risk greatly benefit from professional fluoride treatment being performed more frequently than every 6 months, while those at low risk have little benefit from such treatment (26). However, topical fluoride schedules in the fee-for-service model generally only allowed at 6-months interval treatment for all patients. This schedule for professional topical fluoride also may influence the scheduling of other procedures, such as periodic recall appointments and prophylaxis, regardless of risk level.

There have been some trials in the medical arena with the aim of improving the quality of care and enhancing efficiency (25,27). Pay for performance models encourage adoption of evidence-based medical practice by aligning financial reward with improved outcomes. However, these models has not been widely adopted because of the challenges associated with measuring quality of care, practitioners avoiding high-risk patients, and the belief that performance-based payments ultimately would affect fee schedule increases (28).

A payment model linked with evidence-based care should improve the oral health of the population and reduce the cost of care (29). In order to affect government policy regarding oral health care, oral health advocacy organizations petitioned the Department of Health and Human Services in 2011 to adopt evidence- and risk-based treatment protocols as part of the structure of the pediatric dental benefit of the Affordable Care Act. However, this panel did not propose a specific insurance model that could be used to facilitate evidence- and risk-based oral health care (30).

Any dental reimbursement system that aims to improve performance needs to take full advantage of the prevailing dental financing systems, and should not deviate too radically from, or be significantly more complicated than existing payment models. Incentives to improve care can be implemented into the current fee-for-service structure by instruct-

ing and encouraging providers to adopt a more disease-based treatment approach. If a dental reimbursement system is perceived by the dental providers as adding value for their services, not increasing the administrative burden and making them feel that they are performing more beneficial services, it would be anticipated that not only the quality of care but access to care would improve.

Perhaps an “incentive modified” fee-for-service model may require dental providers to qualify for enhanced fees by improving their understanding of evidence- and risk-based care through some form of educational program. Once qualified, financial incentives would encourage providers to align their patient care with established treatment protocols. For example, care for children at higher risk for early childhood caries could include the increased use of professional topical fluoride treatment and diet counseling (Table 2). Participating insurance companies could use diagnostic codes (30) or follow provider performance measures to ensure that risk-based protocols are being followed. The additional costs for preventive procedures would be offset by savings from the prevention of disease and the need for advanced dental procedures (21).

Besides an incentive fee-for-service model potentially improving health outcomes and reducing costs, another important added benefit would be the dissemination of more science-based oral health care information to current and future providers. Certainly, the incentives that would be offered by the reimbursement plans to provider groups and to dental schools would stimulate health care providers’ knowledge of the evidence-based health care and treatment protocols. Thus the adoption of an improved performance model would not only encourage the practice but also the understanding of evidence-based dentistry.

## Conclusion

Incorporating evidence-based clinical protocols and guidelines can optimize oral health care. Through the implementation of incentives for evidence-based care, the insurance industry and government agencies can optimize the reimbursement system to encourage practitioners to provide better quality of care to more patients at a lower cost. Changing the payment model also will foster the increased education in, and practice of evidence-based care to new and experienced practitioners.

## Conflict of interest

The author declares no conflict of interest.

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