TRANSLATIONAL RESEARCH

Translating research into better dental care practices

BACKGROUND

The Institutes of Medicine (IOM) has reported that there are significant gaps in the quality of health care provided in the United States. Problems occur in overuse, underuse, and misuse of practices or treatments. These are seen as components of the Know-Do Gap, which refers to the difference between the evidence we know and the practice patterns we follow. Ideally, practice patterns should be consistent with evidence. Know-Do Gaps can result from a number of factors and can be addressed in a number of ways. The process involves translational research.

FACTORS CONTRIBUTING TO THE KNOW-DO GAP

Seven stages have been identified for the translation of evidence into routine clinical practice, and the process can break down at any of these points (Figure 1). Adding to these factors is the fact that the medical and dental sciences are experiencing an era of rapid advances. These advances are accompanied by increased complexity in delivering care. With the number of patients continuing to grow, the health care system and health care providers in particular are increasingly being burdened by trying to stay current. For most busy clinicians, the effort has become infeasible. In response to this need, the evidence-based health care method has embraced the development of secondary data analysis methods (systematic reviews) and "just-in-time" approaches to accessing high-quality evidence resources at the point of care.

Systematic reviews summarize the available evidence on important topics so that clinicians can quickly see what is known about a specific clinical area. These reviews not only follow a rigorous and transparent scientific method to identify, evaluate, and synthesize the relevant literature, but they also reduce the need for clinicians to find and read extensive scientific literature, provide an assessment of the strengths and weaknesses of the evidence, and summarize their findings to offer conclusions. These reviews are highly efficient methods for evaluating clinical interventions.

The "just-in-time" attitude to information seeking involves clinicians with training in evidence-based practice addressing clinical questions that pop up during routine patient care. These individuals must efficiently seek out high-quality evidence to guide their clinical decisions.

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Although both systematic reviews and "just-in-time" approaches can contribute to better clinical care, it can be challenging to translate scientific information into clinical practice. Translational research is the study of how to apply scientific research to improve human health and well-being. Basic science information is transferred into knowledge that is useable clinically.

Translational research occurs in 5 domains: Discovery, Theory, Bench Research, Clinical Research, Practice, and Policy, or stages T0 through T4. T3 research is focused on translating evidence into clinical practice, making it most relevant to evidence-based dentistry and medicine. Clinical practice guidelines are a good example of what comes out of this research. In addition, implementation science fits within the T3 domain.

Clinical Practice Guidelines

Clinical practice guidelines are systematically developed statements that help guide practitioners and patients to make good decisions about health care for their specific clinical situation. These guidelines are developed through a standardized process and use evidence obtained through systematic reviews. They state practical recommendations for how to proceed in a clinical setting and can reduce variations in practice, promote effective interventions, reduce the use of ineffective treatments, and improve health outcomes for individual patients as well as populations. As a result of having clinicians follow practice guidelines, patients receive evidence-based care.

Problems arise because clinical practice guidelines are not universally adopted, so clinical practices do not always change. Barriers to their adoption include changes in the current practice model, actions by colleagues, trust in the validity or currency of the evidence, unclear or contradictory information, personal experience, and financial constraints. Peer influence is strongly biased in any attempt to change behaviors. To translate the science into practice patterns requires targeted and strategic methods to change behaviors and attitudes.

Implementation Science

Both dissemination and implementation are involved in implementation science. Dissemination uses specific tactics to increase the awareness about scientific evidence, and implementation develops and evaluates specific strategies to change provider behavior in line with the evidence. As a result, an evidence-based treatment becomes the norm and is sustainable. When these 2 steps are combined, practitioners become aware of evidence and use it to improve practice through changes at individual, organizational, and policy levels. Implementation science is designed to develop permanent sustained improvements in practice patterns by removing barriers to

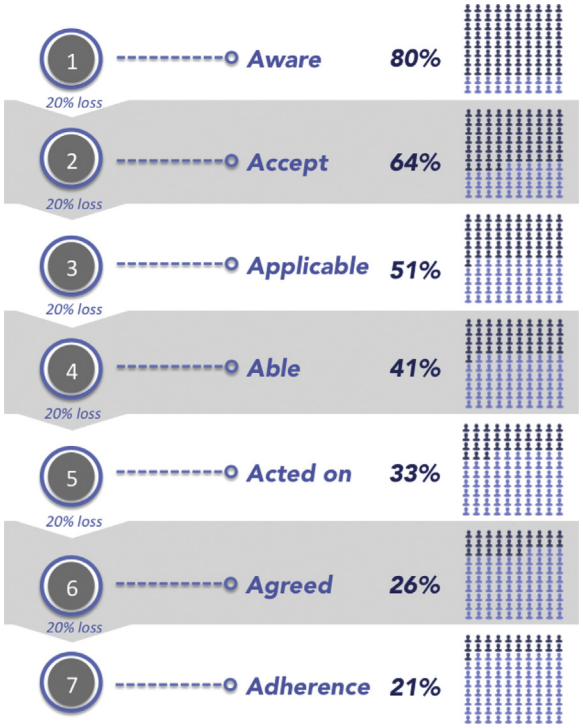

Figure 1. Pathway from research to practice. At each step, approximately 20% of scientific evidence "leaks" and fails to proceed to the next step. This results in only 21% of scientific evidence being incorporated into patient care. (Adapted from Glasziou P, Haynes B. The paths from research to improved health outcomes. ACP J Club 2005;142(2):a8-10; with permission.) (Courtesy of Frantsve-Hawley J, Rindal DB: Translational research: Bringing science to the provider through guideline implementation. *Dent Clin N Am* 63:129-144, 2019.)

adopting the new methods and ultimately by changing the culture of care delivery.

Changes in practice patterns depend on changes in provider behavior. The first step is therefore assessing the attitudes of clinical and administrative personnel toward the perceived need for change and evaluating whether the staff is aware that there might be a need to change their approaches. This assessment helps to guide the choice of implementation strategy and the identification of structural barriers to change and facilitators of change.

Change requires interventions that challenge the stability of the system in place. Among the areas where interventions may be needed are financial disincentives, time constraints, patient expectations, social norms, perceived standard of practice, potential for liability or tort claims, the influence of key opinion leaders, the knowledge and skill levels of the staff, and level of confidence in making changes. The identification of barriers and facilitators to change must encompass the provider, clinic, and health care system levels.

When the goal is to implement clinical practice guidelines, it's important to understand how to make the changes routine and sustainable elements in the specific practice setting. Basing implementation strategies on behavior change theory is associated with better results in adopting guidelines, but complete adoption can still be sabotaged by elements related to the specific guideline or factors unique to a practice setting.

Among the tools used to implement guideline adoption are algorithms, guidelines summaries, clinical decision-making tools or clinical decision support, patient communication tools, and evaluation guidance measures. The clinical decision support (CDS) in the electronic health record may improve the implementation of scientific evidence into clinical practice by providing needed information to the clinician at the point of care in a way that fits into the clinical workflow.

APPLICATIONS TO DENTISTRY

Specific challenges that face those who want to implement clinical practice guidelines in dentistry include the fact that most dental care is still delivered in small private offices. Thus there is a lack of external oversight of the care delivery or clinical decisions that a dentist makes. In addition, a lack of standardization of the data entered into the electronic medical record makes it difficult to measure actual practice changes. The inability to link treatment to need compromises the ability to monitor the appropriateness of clinical practice. Because most dentists do not think of their patients as a population, their practice patterns measures and patient outcomes are not

Clinical Significance

The development of evidence-based guidelines is critical in bridging the gap between research findings and improved practice patterns. Targeted strategies for implementation should be developed to minimize the gap between knowing and doing and to facilitate the translation of evidence into better patient care. Knowing what barriers and facilitators are in place is one important step toward improving dental care delivery, but these components will differ depending on the specific practice that is involved. Making progress in reducing the Know-Do Gap will require a robust implementation strategy.

considered in the context of their total patient population in most cases.

The National Institute for Dental and Craniofacial Research (NIDCR) supports the use of implementation science as a priority in their efforts to create new knowledge around oral health and develop and test implementation strategies that move research findings into practice patterns. The institute has taken steps to determine when clinical practices are ready to be scaled up or de-implemented, to identify potential strategies for practice change, and to assess the existing infrastructure to support implementation research. The traditional reliance on continuing education training as the only strategy for implementing clinical practice guidelines has proved to be ineffective. Instead, systemic, multicomponent strategies need to be developed to address all the contexts in which dental care is delivered.

Frantsve-Hawley J, Rindal DB: Translational research: Bringing science to the provider through guideline implementation. *Dent Clin N Am* 63:129-144, 2019

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TRENDS

Current considerations in dental practice

BACKGROUND

Managing a practice and treating patients can take up most of the dentist's time, but it's also important to keep up with the latest trends among dental peers. Surveys of the readers of *Inside Dentistry* and other sources yielded data on the most recent trends in terms of the clinical care delivered, purchasing patterns, and business aspects of dental practices in the United States.

CLINICAL CARE

The most significant clinical trend is the movement of general practitioners toward performing work traditionally referred to specialists. About 21% of the dentists surveyed place more than 5 implant restorations per month, 57% do some endodontic procedures, and 49% perform gingivectomies or gingivoplasties. Dentists have more tools available so they can keep these procedures in house. Specialists will always be needed to address the complex cases, but minor orthodontics or uncomplicated implant placement can be done by dentists who have the training and the digital technology available to provide excellent care in these areas.

Patient demand is the determining factor for what procedures are being performed in most dental practices. About 66% of the dentists surveyed place 10 or more crowns a month. Elective dentistry usually involves cosmetic procedures. Patients often do the research online before they select a dentist for these procedures, choosing a practitioner who seems to have the skill and experience to deliver what they want.

Tooth bleaching continues to be popular, with about 87% of dentists offering some sort of tooth bleaching services. All the methods work; the patient's lifestyle determines which will work best for him or her.

More chair time is spent delivering implant restorations because of the new options available. Of surveyed dentists, about 67% place cement-retained restorations, 61% screw-retained restorations, 42% overdentures, and 18% all-on-4 cases. Cement-retained restorations are losing their appeal, which should reduce the cases of peri-implantitis. New implant components, including angle-correction abutments and angle-corrected implants, increase the usefulness of screw-retained restorations, which offer better biological results, although care is needed when designing the occlusion.

Other treatments made more viable by advances in technology include the ability to offer treatment for sleep-disordered breathing. Both sleep apnea treatment and laser dentistry can be areas where dentists can deliver care, but proper education and training, along with collaboration with medical practitioners, will be required.

PURCHASING PATTERNS

When a dentist decides to purchase new equipment or products, most dentists consider information from clinical research, peer-reviewed journals, and the recommendations of key opinion leaders, as well as other sources. The primary sources trusted by dentists are dental publications and colleagues. Highly disposable products may be purchased based on price, but if something will be going into the patient's mouth or has a clinical application,