

would obtain the process skills to continue such critical self-evaluation when in practice.

### Patient care quality

Gone are the days when education came first and patient care second. The outcome of education must be the same as practice — quality care. An early mentor gave me a principle for professional life as a dentist-educator that has been a wonderful tool: good care is good teaching. If we do not monitor the quality of patient care in our programs, we are not providing good education. All of our training programs use patients as a laboratory and must have a component of quality care assessment. If we revise our standards for postdoctoral education and do not mandate that programs 1) teach residents to conduct quality assurance and 2) demonstrate quality assurance in patient care, we have failed.

### Accreditation

Outcomes are required for accreditation under existing standards, but the application of an outcomes standard has been uncomfortable for many because we are used to assessing the steps of education rather than the educational product. It would be as if General Motors tested its brakes, engines and transmissions, but never its assembled cars. Few educators realize the power of outcomes in accreditation, which has traditionally been a process vested in the opinion of “experts” whose own programs may leave much to be desired! A program armed with solid outcomes data on the various aspects of postdoctoral training is in a dominant position. With standards that permit and encourage development of strongly associated goals and outcomes, programs have an upper hand if they develop and maintain outcomes data.

### Outcomes at Ohio State/Columbus Children’s Hospital

The table portrays some of the past and current uses of outcomes at our institution. Some are measures of patient care and teaching, while others look at research and more globally at the product of the educational process. Hospital affiliation encourages collection of outcomes data both because of the quality assurance tradition and culture, and also now because managed care has forced

TABLE. OUTCOME MEASURES USED FOR POSTDOCTORAL TRAINING

#### Quality Assurance of Sedation

Using AAPD or other guidelines, faculty can evaluate clinical performance of residents

Faculty can use sedation QA to test whether students have met outcomes for proficiency in sedation

Students early in the program can conduct QA, learn a life-long process, learn about sedations they will eventually do, and measure quality of care for the program

#### Chart Review

This can be used to measure quality of care, chart completion skills and types/numbers of procedures done

#### Cases Completed/ Procedures Performed

Provides information on program operation and resident performance

Has fiscal as well as educational component

#### Revenue Generated

Residents can assess productivity and measure change over time

Faculty can use this fiscal outcome to do program evaluation and planning

#### Patient Satisfaction

This outcome can help in assessment of behavioral goals

#### Master Degrees Produced

#### AAPD Graduate Student Research Awards Obtained

#### IADR/AADR Resident Abstracts Accepted

These research outcomes can help evaluate and document program research goal attainment

efficiencies in operations and demanded justification for treatment. Outcomes can be academic (grades), fiscal (revenue generated), clinical (treatment success), practice administration (appointments kept), or process (patient satisfaction). Ideally, programs should tie outcomes directly to the educational program goals and to training guidelines, standards of care, and quality assurance criteria.

Dr. Casamassimo is Professor and Chair, Section of Pediatric Dentistry, The Ohio State University College of Dentistry, and Chief of Dentistry, Columbus Children’s Hospital, Columbus, Ohio.

## Pediatric dental care: state of the art versus state of the science

James J. Crall, DDS, ScD

The demand for accountability on the part of health care providers continues to increase. Patients, purchasers of health care benefits, third-party payers, and the public at large expect a much greater degree of accountability from the health care system today than at any time in the past. And there is little reason to believe that this demand for accountability will diminish.

Organizations representing groups of health care professionals initially responded to this call for accountability by developing policy statements that reflect consensus about the “state of the art”, or level of development of practices for dealing with specific conditions at a particular point in time, in their respective clinical disciplines. Examples in the field of pediatric dentistry include the Oral Health Policies,

Guidelines, and Quality Assurance Criteria, which have been developed and published by the American Academy of Pediatric Dentistry (AAPD).<sup>1</sup> However as purchasers and users of health care services have become more sophisticated, so too have demands for scientifically valid data concerning the appropriateness, effectiveness, and cost-effectiveness of clinical practices, or the "state of the science".

In light of these emerging trends, this paper provides a commentary on the importance of developing policy statements for pediatric dentistry that are based on valid scientific evidence, especially in the area of outcomes assessments. Attention also is directed at the critical role of the academic community in this enterprise and the importance of a collaborative effort on the part of the academic and practicing communities within the specialty to satisfy demands for this information.

### **Growing emphasis on outcomes assessment**

As noted above, parties interested in purchasing and utilizing health care services increasingly expect to base their decisions on scientifically valid empirical information, ideally on data concerning assessments of outcomes of care. At a basic level, outcomes refer to measurable results of treatment. "Outcomes assessment" refers to a process of collecting and analyzing data to determine whether a specific procedure or treatment regimen produces desired results. In addition to traditional clinical criteria, contemporary outcomes assessments frequently include aspects such as patient satisfaction, function, esthetics, and reduced risk of subsequent disease. Increasingly, the question of whether limited resources are being used in a cost-effective manner is being linked to outcomes assessments.

The growing emphasis on outcomes assessment underscores the importance of moving from policies based on consensus statements describing common processes of care — in other words, the normative data or "the state of the art" — to policies that reflect scientifically valid outcomes data, or the "state of the science". Others have pointed out that the historic justifications for clinical practices such as the adage that "it works in my hands" or an undocumented "sense" that a particular treatment is best for a given situation or patient, no longer suffice to convince third-parties that a particular procedure or pattern of care is indicated and worthy of reimbursement.<sup>2</sup>

### **Why should the AAPD be concerned about this issue?**

It is incumbent on professional organizations to seek to strengthen the scientific basis of the clinical disciplines they represent. Accordingly, the AAPD has several important reasons for maintaining a leadership role in the development of practice policies concerning oral health services for infants, children, and adolescents. The first motivation is the desire to continually

provide optimal oral health care for pediatric patients. In addition to this responsibility to the public, there are issues of credibility within the dental profession, within the academic community in the areas of education and research, with external organizations such as purchasers, third-party payers, other health care professionals, and with the public. In an era where information and data have become the basis for authority and credibility, outcomes assessment must be seen as a professional responsibility.

Professional organizations that are unwilling or unable to accept this responsibility are likely to experience erosion of their credibility. Examples of ongoing challenges to professional credibility in the field of pediatric dentistry include topics as fundamental as behavior management approaches such as use of restraints, guidelines for sedation, and indications for general anesthesia, diagnostic and prevention protocols such as frequency of fluoride applications and indications for sealants, and the appropriateness of restorative procedures such as indications for the use of stainless steel crowns.

### **Complementary roles of academic programs and practitioners**

Critical literature reviews exist for many areas of clinical practice such as treatment of traumatic injuries and evaluations of pulpal treatments, and occasionally contain useful information regarding clinical outcomes. Those examples notwithstanding, substantive scientific evidence regarding the outcomes and cost-effectiveness of many common procedures used in pediatric dentistry generally is lacking. Academic programs have an important role to play in extending this body of knowledge since evaluating the adequacy of existing clinical studies and policies is an inherent function of academic programs. Academic programs also generally have considerable access to literature sources.

As noted above, credibility in the emerging environment will demand a more active role in collecting data concerning a broader range of outcomes than typically have been included in prior research endeavors. And it is in that regard that academic programs and practitioners have an opportunity to collaborate in a manner that can advance both the state of the science and the state of the art of pediatric dentistry.

One approach for collecting the types of outcomes data that are in increasing demand involves the establishment of practice-based networks.<sup>3</sup> In essence, practice-based networks are groups of practices devoted principally to the care of patients, but also affiliated with each other or academic enterprises for the purpose of investigating local clinical practice issues. These networks, which have been operated in the medical sector, including pediatrics practices, for decades, provide an excellent opportunity for partnerships. In these networks, the traditional strengths of academic programs — expertise in research design, data collection, and

data analysis — are combined with that of the practicing community, access to large numbers of patients being treated under “real world” conditions.<sup>4</sup>

### **The responsibility, the opportunity, and the challenge**

The hallmark of any health care profession is the pursuit of excellence. Inherent in that ideal is the process of measuring results using the best science available and continually striving to advance the state of clinical practice. Outcomes assessment has become an important tool in that process and thus should be viewed as a fundamental responsibility of our specialty. Active participation in outcomes assessments not only provides the opportunity to evaluate and improve clinical practices, but also can facilitate assessment and improvement of nonclinical factors, such as patient compliance and health plan design, which can

have a significant impact on health. Our challenge is to find a way to utilize the resources of both our academic and practicing communities in a collaborative manner to support our joint professional goals. Practice-based networks represent a promising approach toward that end.

Dr. Crall is Head of the Department of Pediatric Dentistry and Associate Dean for Program Evaluation and Planning, University of Connecticut School of Dental Medicine.

1. American Academy of Pediatric Dentistry. Reference Manual, 1995–96. *Pediatr Dent* 17(Spec Issue), 1996.
2. Davis MJ: Outcomes and accountability: can dentistry prove the benefits of care? *NY State Dent J* :42–5, 1996.
3. Green LA, Wood M, Becker L, et al: The Ambulatory Sentinel Practice Network: purposes, methods, and policies. *J Fam Prac* 18:275–80, 1984.
4. Starfield B: A research agenda. IN: Primary care: concept, evaluation, and policy. New York: Oxford University Press, 1992:236–48.

---

## **“Scientific Inquiry”—A new course in evidence-based practice**

**Burton L. Edelstein, DDS MPH**

**A**s editor of the *Journal of Dental Research*, Colin Dawes asks, “Should dentists be doing what dentists do?” The answer, of course, depends upon evidence that what we do is beneficial. If basic science knowledge, theory, or chair-side experience points the way to a therapy, and if clinical research substantiates the utility of that therapy when measured in health outcomes, then evidence supports the clinician. After all, patients and dentists alike seek to maximize their interaction by doing what is best in terms of health and satisfaction at an appropriate expenditure of time and money.

What is the status of evidence-based practice in dentistry? Health services researcher Jim Bader reviewed variability in dentists’ clinical decision-making and summarized the current status with the observation, “Information which a lay observer might assume to be the very bedrock of the dental profession all too often resembles quicksand.”<sup>1</sup>

While dentistry, as a healing profession, is internally obligated to assure that its treatments are valid, external “drivers” of health system change, particularly third-party payers, increasingly require health care professionals to substantiate the value of their treatments. This is the status of our profession as its newest students join our ranks. This status, coupled with a commitment to teaching students how to become lifelong learners, promoted the development of “Scientific Inquiry”, a Harvard School of Dental Medicine course in evidence-based practice for first-year students.

The overarching course goal is to teach a systematic, methodological approach to evaluation of dental knowledge that seeks rationality, objectivity, and validity. The course prepares students for careers in den-

tistry that incorporate self examination and continuous professional development for the advancement of patient care.

“Scientific Inquiry” seeks to help students:

1. Understand the dual bases of dentistry: the art, or clinical experience base, and the science, or evidence base
2. Learn how to raise and formulate research questions that can validate or challenge clinical standards
3. Develop facility at using the scientific literature to evaluate existing knowledge
4. Understand the nature of associations (causality, bias, confounding and chance), and
5. Recognize common approaches to dental research as well as clinical reporting.

The course is divided into sections on clinical decision theory, scientific sources of information for clinicians, causality, ethics in research and practice, and clinical guidelines. Students complete two library projects involving extensive literature manipulation and interpretation to investigate the evidence behind common clinical practices.

“Scientific Inquiry” seeks to raise student awareness that the highest standards of professional practice arise from the most critical evaluation of what we clinicians do each day at the chair. By better understanding the evidence base of our professional ministrations and by learning to use evaluative skills to constantly assess that base, we encourage today’s students to become tomorrow’s thoughtful clinicians. We also recognize that the more our clinical treatments are evidence-based, the more we will be able to meet the challenges of health system change with information to substantiate the value of our work.