Dentistry on the road(map)

Missing from the everyday dental practice equation has been a compilation of 'real-world' practice data that would help ground treatment decisions on a preponderance of unbiased, scientifically sound clinical evidence.

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Editor's note: In this guest editorial especially written for JADA, Dr. Tabak explores a recently launched clinical research initiative to study everyday problems confronting dental practitioners.

It is an everyday experience in dental practices across America: a middle-income patient with limited dental insurance presents complaining of discomfort in a premolar. An oral examination reveals that the tooth contains an old, two-surface amalgam restoration that has fractured. Replacing the restoration would provide a quick, viable and economical solution for the patient. After removing the old restoration, however, you note a hairline fracture near the mesial marginal ridge, and you may need to extend the cavity preparation. A composite might be a better choice for esthetic reasons. Then again, because the tooth may be at risk of developing further fractures, a more costly crown might be more appropriate and economical in the long run.

Which is the correct treatment choice? What are the relative benefits and risks of the three treatment alternatives? For decades,

EDITORIAL

dentists have worked their way through these everyday scenarios based on their clinical experience, relevant clinical information and weighing their patient's needs and preferences. Missing from the equation has been a compilation of "real-world" practice data that would help ground treatment decisions on a preponderance of unbiased, scientifically sound clinical evidence.

The National Institute of Dental and Craniofacial Research, or NIDCR, recently launched a new clinical research initiative to study everyday problems that confront dental practitioners. The initiative, called the Oral Health Practice-Based Research Networks, or PBRNs, will generate a tremendous amount of data comparing various oral health treatments, preventive regimens and dental materials. The PBRNs also will conduct anonymous chart reviews, as allowed by the Health Insurance Portability and Accountability Act of 1996, to provide data on disease and treatment trends and estimate the prevalence of less common oral conditions.

How will the PBRNs work? Each network will be a grass-roots effort involving 100 or more fellow practitioners—real-world dentists and dental hygienists—to join the clinical-trials network within at least a two-state geographic area, which must span two distinct population centers. This will allow networks to have a

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regional flavor and better capture the racial, ethnic and socioeconomic diversity among the patient populations that are seen. Once enrolled, practitioners will gain the opportunity to participate in and contribute data to the various clinical studies. The NIDCR foresees that each network will conduct approximately 16 to 22 clinical trials over the seven-year duration of the project, although the final number may vary from PBRN to PBRN. It should be noted that such a heavy volume will be possible because the clinical trials typically will be short-term, quick-turnaround investigations that yield large amounts of data.

Ideally, the NIDCR would like to support several PBRNs throughout the country. The final number of networks will be decided in the coming months based on the number of high-quality applications that are received.

What's in it for practitioners to participate in the network? First and foremost, the data generated will be extremely beneficial to the practice of dentistry and to patients. What's also particularly attractive about the network is that practitioners themselves will propose and prioritize which clinical trials to pursue. Here's how the process will work: five or six practitioners enrolled in the network also will serve on the PBRN executive committee, to which they will lend their experience and expertise to suggest possible future studies. Each proposal will be further evaluated by a protocol review committee on its scientific merits and feasibility. Proposals deemed to be meritorious will be launched only after independent review by appropriate committees to ensure patient safety and confidentiality. Another obvious benefit is that dentists and hygienists will have the opportunity to attend annual meetings of PBRN participants. This will allow them to exchange information with like-minded dental professionals, discuss needed clinical trials, and otherwise enhance their knowledge base. Moreover, in recognition of their essential contributions, practitioners will share authorship on the resulting = publications.

The PBRN will not cost participants significant time or money. The NIDCR recognizes that dentists and hygienists already have numerous responsibilities during the day, and the institute is taking every step to ensure that participation in the network does not add unduly to their already long days. If they or their staff members spend extra time performing study-related activities, such as patient recruitment and data management, compensation will be provided. Treatment costs, however, will not be reimbursed.

From the broader biomedical research perspective, a major impetus behind NIDCR's decision to pursue this initiative was the recent launch of the NIH Roadmap for Medical Research. "The Roadmap" is an NIH-wide endeavor that attempts to transform the nation's medical research capabilities and speed scientific discoveries from the bench to the bedside. (For those interested in learning more about the NIH Roadmap, which I recommend, please visit the following Web sites: "nihroadmap.nih.gov" or "www.nidcr.nih.gov/news/inside_scoop_roadmap.asp".)

In developing the NIH Roadmap, its organizers placed a high priority on integrating existing practice-based, clinical research networks under one organizational umbrella. This will allow the respective networks to function in a more collaborative and unified manner that better informs NIH on its research opportunities. That, in part, is why NIDCR took the lead in organizing the PBRN initiative. It ensures that when the integration and link up of existing medical-based systems has coalesced via the NIH Roadmap, dental professionals will have a viable network of their own whose voice will be actively engaged with their medical colleagues. In a future column, I will detail other features of the NIH Roadmap and how it will help catalyze advances in oral health.

The NIDCR has issued a Request for Applications (available at "www.nidcr.nih.gov/Funding/FundingAnnouncements/RequestForApps.htm"), and the first studies and data collection of a PBRN should get under way give soon. But NIDCR staff members remain mindful that this initiative will need more than high-quality grant applications. It will need the enthusiastic support and participation of dental practices throughout the country. It is my hope that dentists and hygienists will avail themselves of this unique opportunity that has so much to offer to patients, to dental practices and to dentistry as a whole. ■

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The author thanks Mr. Robert Kuska for his help in writing this column. Thanks also to Drs. Isabel Garcia, Bruce Pihlstrom and Henning Birkedal-Hansen for their comments.

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LETTERS

JADA welcomes letters from readers on topics of current interest in dentistry. The Journal reserves the right to edit all communications and requires that all letters be signed. The views expressed are those of the letter writer and do not necessarily reflect the opinion or official policy of the Association. Brevity is appreciated.

CONTINUING EDUCATION

I enthusiastically agree with Dr. Gordon Christensen's July JADA article, "Continuing Education: The Good, the Bad and the Ugly." As one who has been lecturing for 32 years and conducting hands-on courses for 15, I can attest to the profound value of hands-on courses in simulated clinical situations.

Not only does this enhance the education of the participants but, as Dr. Christensen so aptly pointed out, it enables the educator to evaluate the effectiveness of his or her teaching efforts.

From the hands-on course I conducted at the Academy of General Dentistry meeting in New York in July 1989 ("Creating the Super Smile With Porcelain Laminates: Success Without Stress") to the courses I presided over at the ADA 2003 annual session in New Orleans and the Greater New York Dental Meeting this past December, there are constant changes in the content of the lectures and audiovisuals, dictated not only by advances in dental materials and techniques, but also by observations of how aptly the participants can apply the information.

I would like to add one point: it is of great importance to quality continuing education for the participant to take the time to fill out the course evaluations afterward. This information, both positive and negative, is very vital to both the educator and the sponsoring institution to continually improve our dental continuing education.

Robert Weller, D.D.S.
Brooklyn, N.Y.

PRACTICAL INFORMATION

It was a refreshing breeze to read Dr. George A. Papazian's July JADA article, "Permanent Cementation of Crowns on Teeth With Minimal Tooth Structure." Too many times we pick up JADA and find it too technical and involved for practical use. This article had an everyday approach for us to try. It is in the tradition of early publications, such as Dental Cosmos and Dental Review, to bring everyday practical approaches to fellow dentists. My applause to The Journal and to Dr. Jeffcoat for bringing us articles of real use.

Samuel S. Wexler, D.D.S.
Richmond, Ill.

INSURANCE WOES

Ever since Dr. Jeffcoat became the JADA editor, I have always enjoyed reading her editorial views. But her July JADA editorial, "A Double-Edged Sword: Insurance A to Z," has me puzzled.

The article says, "We scheduled her for two surgical visits and contacted her insurance carrier for preauthorization, which was granted." Later, the insurance company changed its mind and denied payment.

What did Dr. Jeffcoat do wrong? It is a problem between the patient and the bogus insurance carrier. Why should Dr. Jeffcoat apologize?

Robert B. Stevenson, D.D.S., M.S.
Columbus, Ohio

COVERAGE DILEMMA

In response to Dr. Jeffcoat's dilemma regarding her periodontal patient in "A Double-Edged Sword: Insurance A to Z" (July JADA), I can only say that she did everything right, and the patient's insurance company did all it could to not pay her fee. Along the way, the carrier also undermined the patient's confidence in her care, skill and judgment by saying the treatment was not medically necessary—despite what the company "meant to say."

As she mentioned, it would be nice if we could explain to every patient how his or her insurance plan works. This is impossible. It is the job of the human resources department of every company to do this task. The company is providing the insurance; we are providing the care.

We in the trenches are fighting the war every day. Our leadership in organized dentistry should rise and lead the way, at a national level, to combat the abuse you encountered. The Aetna settlement was one small step in correcting years of past misdemeanors. The ADA has to make the next move to protect the membership from future ingresses to our profession.

Thomas J. Machnowski, D.D.S.
Secretary
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FLAWED SYSTEM

Allow me to add more insight to Dr. Jeffcoat's July editorial, "A

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Double-Edged Sword: Insurance A to Z."

First, it must be recognized that the vast majority of people are economically ignorant and politically naive. This is borne out by the fact that, with dental or medical insurance, most think that they are getting "something for nothing." Few realize they aren't or that it's a perk in lieu of pay.

Furthermore, the health provider becomes the vulnerable pawn in this insurance game of chess because, for the doctors, the issue is an esoteric one of "looking after my patient," irrespective of whether they will be paid. Whereas, with the other two stakeholders in this equation—the employer and insurance company—the question is one of maintaining profit margins. Thus, the quandary for the profession: serve the needs of the patients without regard to finances versus the antithesis, which is to serve the needs for finances without regard for the patients!

Sadly, this whole insurance mess never should have happened. The system of having an employer own one's dental, or even one's medical, insurance is bad government policy, stupid economic policy and very unfortunate for the employee. There is no more reason why one's boss should own one's dental or medical insurance than one's auto insurance.

In fact, "dental insurance" itself is an oxymoron. It defies the definition of insurance in that there is no catastrophic component. It is comparable to using insurance to pay monthly utility bills or for car tuneups.

And, incidentally, the reason why employer-based health insurance is so widespread is the discriminatory provision of federal tax law, which gives tax deductibility to company-owned health insurance, but denies tax deductibility to individually owned health insurance. The tax deductible feature is a powerful incentive in perpetuating a system that is basically wrong and grievously unfair!

Historically, the problem began during and shortly after World War II, when wage controls prevented employers from increasing pay to keep or attract employees. So they gave "fringe benefits." And politicians found it expedient to exempt these benefits from the heavy taxes on money income. From this has followed the grand illusion of something for nothing, which has created endless problems.

So we now have a system that can deny freedom of choice, in which there is compromised and lessened personal care, tons of fraud and where the windfalls go to the chief executive officers of the insurance companies.

And, interestingly, all those millions of dollars spent on premiums to insurers will not, in themselves, diagnose one problem, treat one patient or effect one cure. It's a terrible waste. But then, why would anyone expect otherwise when government intrudes into the marketplace and plays economic engineer and social planner, with a documented history of utter failure?

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IN VIVO VERSUS IN VITRO

In Dr. John H. Purk and colleagues' February JADA article, "In Vivo Versus in Vitro Microtensile Bond Strength of Axial Versus Gingival Cavity Preparation Walls in Class II Resin-Based Composite Restorations," an ingenious technique was used that allowed comparison of 125 microtensile testing of specimens bonded in vivo and in vitro from the axial and gingival walls of restorations. The results showed that the bonding in vivo was much weaker than that in vitro, and that the bonding to the gingival walls was weaker than to the axial walls of cavity preparations.

The discussion of the results focuses on several aspects affecting the wetness of the dentin, which, undoubtedly, will affect the results. Little attention is paid to the difference in structure of the dentin in the two locations, although the authors indicate that differences in the density of the tubules may be part of the explanation, especially because it affects the wetness of the dentin in vivo.

What about the difference in the branching of the tubules? Penetration and polymerization of the resin into the branches of the tubules clearly will affect the bond strength between the dentin and the resin, and this branching differs in the two locations studied. A relatively detailed description of the branching of dentinal tubules in human teeth can be found in the Archives of Oral Biology.[1]

It is quite possible that the differences in the bonding values between axial and gingival walls may be due to differences in the structure of the dentin in the two locations. I disagree with the authors when they suggest that less intertubular dentin at the gingival floor than on the axial wall may explain

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the reduced bond strength.

First of all, the dentin at the gingival floor is more superficial than that at the axial wall, as judged from Figure 1 in the article. Therefore, it has relatively more intertubular matrix than the dentin in the axial wall samples.

Second, since peripheral dentin has relatively few tubules, adhesive penetration into the tubules and their branches are less prominent than in axial dentin, and that may explain the reduced bond strength.

The authors refer to an unpublished scanning electron microscopy, or SEM, study of the dentin substrate (J. Purk, D.D.S., Ph.D., unpublished data, 2001). This approach may confirm that my suggestion is correct, provided the adhesive penetrates and polymerizes within the dentin tubules and their branches. I believe this explanation is more feasible than the difference in tubule direction, which has been shown to affect the bond strength at the dentin-resin interface, as suggested by the authors.

The characterization of the structure of dentin sample is an essential part of studies of the adhesive strength between resin and dentin. The authors must be complimented on adding the SEM component to the study. This approach should be a prerequisite for any study of the adhesive strengths between resin and dentin, because dentin is distinctly different in various locations within the tooth.

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1. Mjör IA, Nordahl I. The density and branching of dentinal tubules in human teeth. Arch Oral Biol 1996;41(5):401-12.

Author's response: We thank Professor Mjör for his thoughtful and insightful reading of our article, and for his plausible explanation in his letter. As correctly stated by Professor Mjör, when good penetration and wetting of the dentin by an adhesive into the branches of the tubules occurs, the bond strength between the dentin and the resin will be a good bond. Penetration of the bonding resin in our study into the gingival wall was impeded by wetness that was more prominent on the gingival versus the axial wall.

A follow-up fractographic scanning electron microscopy analysis, which measured the area of voids present on the gingival versus the axial wall under in vivo and in vitro conditions, found under in vivo conditions that 48.8 ± 29.2 percent of the area of the gingival wall compared with 13.6 ± 25.6 percent of the area of the axial wall contained voids, which were probably due to wetness. Under in vitro conditions 11.7 ± 17.6 percent of the gingival wall was found to have voids, compared with 0.0 ± 0.0 percent of the axial wall.

Clearly, penetration under in vivo conditions is more difficult than under in vitro conditions, and penetration at the gingival wall is more difficult than at the axial wall. This could be attributed to curing the material from the top of the matrix band, which is approximately 5.0 millimeters away from the gingival increment, resulting in an incomplete cure, although the cure at the axial wall at this distance did not seem to suffer. This also is seen clinically when practitioners remove failed composite resins in Class II restorations, when the gingival box increment seems to "fly" out so easily.

We would have to reduce the amount of voids at the gingival wall before we can conclude whether or not good adhesion can be attributed to the branches of the tubules, bonding to parallel or perpendicular dentin or for another unknown reason.

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KNOWLEDGE NEEDED

Dr. Jeffcoat's August editorial, "If We Don't Do It, Who Will? Dentistry Can't Shirk Medical Complexities," speaks to the growing population of elderly, physically disabled, mentally retarded, medically compromised and just plain scared individuals requiring dental care.

We humans like to do things that are comfortable and shy away from those that are uncomfortable or for which the outcome is unsure. Is it a lack of voluntary spirit, or a lack of knowledge, as Dr. Jeffcoat implies? I think the latter.

I am board-certified in intravenous sedation and anesthesia and have employed analgesics and tranquilizers in my general dental practice safely for 28 years. Knowledge of physical diagnosis, internal medicine, psychology and pharmacology are requisite to successfully treating these subpopulations.

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The four-year dental education provides a foundation. State and federal public health officials, hospitals and universities should be enlightened about meeting these needs, and initiate or expand hospital-based general practice dental residency postgraduate programs.

With the added knowledge and training, our voluntary spirit and a predictably successful outcome will better serve our community's dental health.

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