Journal of the American College of Dentists



Journal of the American College of Dentists

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Mission

HE JOURNAL OF THE AMERICAN COLLEGE OF DENTISTS shall identify and place before the Fellows, the profession, and other parties of interest those issues that affect dentistry and oral health. All readers should be challenged by the Journal to remain informed, inquire actively, and participate in the formulation of public policy and personal leadership to advance the purposes and objectives of the College. The Journal is not a political vehicle and does not intentionally promote specific views at the expense of others. The views and opinions expressed herein do not necessarily represent those of the American College of Dentists or its Fellows.

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- A. To urge the extension and improvement of measures for the control and prevention of oral disorders;
- B. To encourage qualified persons to consider a career in dentistry so that dental health services will be available to all and to urge broad preparation for such a career at all educational levels;
- C. To encourage graduate studies and continuing educational efforts by dentists and auxiliaries;
- D. To encourage, stimulate and promote research;
- E. To improve the public understanding and appreciation of oral health service and its importance to the optimum health of the patient;
- F. To encourage the free exchange of ideas and experiences in the interest of better service to the patient;
- G. To cooperate with other groups for the advancement of interprofessional relationships in the interest of the public;
- H. To make visible to professional persons the extent of their responsibilities to the community as well as to the field of health service and to urge the acceptance of them;
- I. To encourage individuals to further these objectives, and to recognize meritorious achievements and the potentials for contributions to dental science, art, education, literature, human relations or other areas which contribute to human welfare—by conferring Fellowship in the College on those persons properly selected for such honor.

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Correspondence relating to the Journal should be addressed to the Editor: American College of Dentists 839 Quince Orchard Blvd., Suite J Gaithersburg, MD 20878-1614

The business office of the Journal of the American College of Dentists can be reached by:

Phone: (301) 977-3223 Fax: (301) 977-3330

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FROM THE EDITOR

The Big Placebo

have been studying the business side of contract research organizations, the firms that farm out clinical trials for drugs and other therapeutics. In 1998, this amounted to a \$2.2B industry. In terms of design and protocol, use of evidence, and protection of patients, it is also one of the most tightly regulated of industries and boasts high standards, broadly applied. One of these standards that has grown in importance concerns the handling of the placebo effect." This is the systematic improvement in some health or other desirable outcome that results from participation in a therapeutic or research activity but is not traceable to the therapeutic intervention. In the pharmaceuticals testing industry, a placebo effect can typically be found in 30% of the cases.

The two-group randomized controlled trial, RCT, that is taught in clinical trials courses and is held as the "gold standard" in peer-reviewed dental literature, is passé in the pharmaceutical industry. The standard there is to use three groups: one group has the active therapy, a second is a randomly controlled group receiving nothing, and the third receives an inert vehicle which mimics the participation of the active group but unknowingly receives no therapeutic agent or action. The difference between the placebo group and the control is called the placebo effect; the difference between the placebo group and the active experimental group is called the therapeutic effect.

The term "placebo" does not mean "to cure." Its Latin roots are in the words "to please" or "to palliate." In the interests of full disclosure and reader protection, this editorial is not about the placebo effect of pharmacal therapeutics; the big placebo is continuing dental education. I will argue the unusual position that dentists would prefer to receive placebos than give them.

Although placebos have been known and used for centuries, they were first studied in detail in the social sciences in America in the 1930s. turing facility called the Hawthorne Plant. The discovery, known as the Hawthorne Effect, was identified in the following manner. Engineers thought they had discovered that better lighting would increase productivity of the women working on a switch assembly line. They asked volunteers to participate in a "new program that would demonstrate the effectiveness of new principles of work designed, especially the beneficial effects of increased lighting." Several volunteers came forward. Perhaps to no one's surprise, productivity did go up in the new facility, which also featured careful and supportive supervision and ample publicity. Gradually, the superior performance of this experimental work setting diminished.

The term Hawthorne Effect has referred to a temporary enhancement of performance due in large part to increased attention and publicly announced expectations.

The research extended over approximately ten years and was led by Harvard professor Dr. Elton Mayo. These studies are best known for a phenomenon first identified in a Western Electric telephone manufac-

Mayo and his associates reasoned that the real operating factors in enhancing performance were expectations and attention. To test their theory, they asked volunteers to work in a new section of the plant to test the beneficial effects of reduced lighting on productivity. Their volunteers, supported by appropriate publicity and careful supervision, performed much as the first group had: initial high productivity with graduate return to baseline. Ever since, the term Hawthorne Effect has referred to a temporary enhancement of performance due in large part to increased attention and publicly announced expectations. Business has used this approach effectively since its discovery.

Renewed attention to the placebo effect occurred in the 1960s and 1970s, prompted this time by Harvard psychologist Robert Rosenthal. One of Rosenthal's first projects was to breed strains of mice for their aptitude for learning to run mazes in quick time. He reported on a genetic improvement program where rats with especially fast learning skills were bred with other rats who had similar aptitude and where rats who seemed to have no clue how to perform this task were bred with other "maze dull" peers. This breeding project was continued for a number of generations. When graduate students or doctoral research scientists used the rats from this breeding program, they always found that the "maze bright" rats substantially out-performed their dumber counterparts, often by large orders of magnitude. The only problem with this research was that the breeding program was a complete fantasy. Rosenthal always distributed rodents from his normal supply source in a strictly random fashion. Not only is the placebo effect substantive, it is also subtle. How, one wonders, did graduate students and scientists communicate their expectations to the rats that they were to learn quickly or slowly?

Not content to annoy his laboratory research colleagues, Rosenthal took his project to a public school system near San Francisco. On a preand post-school year basis, he administered a test said to be predictive of reports from their teachers that indicated significant improvement. What Rosenthal had not counted on, however, was the pre-to-post-year improvement on the test he had administered. The instrument was a standard IQ test. Although intelligence is still not well understood, it is commonly assumed that it is an inherently stable measure and not subject to modification by learning. The students who were randomly picked to experience growth in intellectual knowledge also gained in measured IQ.

This kind of research is no longer being conducted. The scientific com-

A s a broad generalization, and until we can get any evidence at all, it is probably fair to say that the placebo effect exists in continuing education.

potential academic blossoming. The elementary school children who scored high on this test were predicted to demonstrate grade-level spurts of intellectual development within a short period of time. Unbeknownst to the teachers, Rosenthal distributed fictitious scores at random. But as Rosenthal had predicted, students who were supposed to blossom academically did so, or at least they received grades and other munity reacted to this sort of finding as being threatening to their own work which is, after all, to show the effect of pre-determined scientific interventions which they are able to control. Their objections were clothed in ethical terms: is it ethical to mislead someone for their own benefit? In the scientific community, the answer is generally agreed to be "no." Professional educators have not been particularly impressed with the pla-

Editorial

cebo effect in education either. Even though an inexpensive means had been identified for statistically improving children's learning, this appeared dangerous. Because such improvements resulted in no budget increases and could not be controlled by professional educators, they were branded as unprofessional. A similar attitude is often found among mainline health professional with respect to alternative medicine.

What we have learned from several decades of research about placebos is not that they exist and not that they are bad, but that they work under certain circumstances and they produce surprising reactions especially in those who are involved in therapeutic interventions. To his amazement, Rosenthal found that those students who did grow intelthem. No one has yet been able to isolate a "placebo-prone" set of personality traits. There is some evidence that cultures as a whole differ in susceptibility to placebos, but that may have more to do with those who are around the person who receives the placebo than with the person himself or herself. Think of voodoo.

On the other hand, there are personality characteristics of the giver of the placebo that seems to make a difference. Care givers who are enthusiastic and believe that they are doing something of value are significantly more effective in producing the placebo effect than are care givers who are skeptical or thoughtless in this regard. The ritual and ceremony created by someone who intervenes also plays an important part in creating placebo. Finally, there is the issue of sup-

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lectually at a significant rate during the year but had predictive test scores that said they should not grow were picked out by the teachers. These students were often described as maladjusted, socially backwards, disruptive, and "over achievers." One interpretation of this finding is that teachers were confirming the labels placed on students by a random process; another alternative is that teachers were trying to compensate for a placebo effect that had not gone as they anticipated.

What we have learned about placebos is that they have little to do with the personality of those who receive port and contact. Those who intervene on a continuous basis and are perceived as providing long-term support produce placebo effects more readily and ones that last longer.

My friends who have looked at these matters tell me that the number one criterion for success on the dental CE circuit is ego. There is no question that continuing education devotes more attention and resources to rituals and amenities relative to content than does formal education, say in a graduate program. Finally, consider the relative zeal of participants in courses where brilliant lecture content is presented versus those in small programs with large, attentive staffs, versus those enrolled in "institutes" which feature long-term personal support.

Traditionally the effects of continuing education courses are discussed on four levels. At Level I, the concern is whether participants liked the course. Did they feel the presenter was authoritative, the material useful, and the Danish fresh enough. Level II is concerned with immediate postcourse measures of performance of the knowledge and skills presented. Sometimes, this includes pre- and post-course gains measures or even measures of retention several months following the course. Level III assesses the degree to which the knowledge and skills presented in a learning situation has been transferred and incorporated into one's practice. Level IV is the ultimate test: can any difference be detected in the health or quality of life of the patients one treats after continuing education?

The continuing education industry in dentistry—as in virtually all professions—is dominated by evaluation at Level I or no evaluation at all. Occasionally (as in journals), knowledge tests are given which might be called Level II, although the testing circumstances are completely unstandardized and the number of questions is so small that measures of their reliability and validity are almost impossible. By contrast, the justification for mandatory continuing education is always couched in the patient benefit language of Level IV.

Could it be that participation in a state dental association meeting, a weekend course, or even one of the large national conventions is an amalgam of formal and informal learning? Does anyone know the proportion of benefit these meetings provide that is the therapeutic effect measured by CERP numbers and the proportion that is placebo? There are some cynics who say it doesn't matter: "If we did not require attendance for certified units, professionals would miss the additional benefits of professional meetings or journal reading." There is a larger group of cynics who turn the argument the other diers of continuing education cried foul-"you misled the professionals"; the research community complained about the research design. After all, Dr. Fox had only shown what we knew all along, namely, that entertaining speakers will score high on Level I measures of whether partici-

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rection: "If we didn't have meetings in attractive places, hire big name headliners, and attend to the amenities, dentists would not get the benefit of formal educational programs." There's even a group of cynics who say the therapeutic and placebo benefits of continuing education are so thoroughly blended no one can tell the difference.

In 1965, researchers in the medical school at the University of Southern California decided to try an experiment to see how much of medical continuing education was steak and how much was sizzle. They hired a Hollywood actor and coached him in a topic on "mathematical game theory as applied to physician education." He knew no relevant science and had no practical experience in this area. But he certainly knew how to come across as credible. He was introduced in a normal continuing education course as Dr. Fox. Participants in his course rated the experience as valuable, credible, a useful learning experience, and overall as one of the best CE programs they had attended.

Reaction to publication of this paper was exactly as anticipated. Physicians generally were amused; presentpants enjoy the experience. So, the Dr. Fox team went to work again and prepared two video tapes covering the material which were judged to be identical in content, though one was presented by Dr. Fox and the other by a renowned practitioner in the field. In this case, participants in the course were measured on pre- and post-course evaluation of content only–Level II. Practitioners learned the most from Dr. Fox, and CE professionals thought they had been conned again.

As a broad generalization, and until we can get any evidence at all, it is probably fair to say that the placebo effect exists in continuing education. The masters on the circuit understand this and use it. Practitioners benefit from it. Researchers and scientifically-minded directors of CE programs denounce it. Dental politicians talk out of both sides of their mouths, claiming therapeutic benefit for what they know to be in significant part a placebo effect.

One's feeling about placebos may be heavily influenced by whether one is the agent or the recipient of the effect-the care provider to patients or the attendee at a CE program. Placebos may be seen as an annoying uncontrolled variation in science or as unreliable help for patients. But the mistrust of placebos in the professional community goes further. First, there is the embarrassing situation that placebos are more likely caused by the behavior of the professional than of the patient. But deeper than that is an image problem about how certain professionals offer help. For placebos to work, they require time and contact on the part of the care giver. This costs money and creates relationships.

While many professionals value their relationships with patients and count on them as part of their calling, others define their professional interventions as completely scientific (not dependent on the person rendering the care), deliverable in the shortest possible period of time, and under the control of the care giver and no one else. This is especially true of health professionals with a surgical leaning. Part of the professional tensions in dentistry as it faces managed care and competition from other types of health care providers such as plastic surgeons and hygienists stems from a confusion over whether the dental profession wants to control the interventions in their scientific and non-placebo sense or whether they want to control the relationship and its placebo consequences. There is likely a full range of styles and preferences within the profession over this issue. The only unethical position would be to publicly promote "relationships" and privately focus on "immaculate interventions."

TAUIO W MANDERS

David W. Chambers, EdM, MBA, PhD, FACD Editor

Report of the Woods Hole Group on the Changing Oral Health Care Environment

n September 1996, the Kellogg Foundation funded an application by Walter Guralnick for a grant L to study the delivery of dental care in today's changing health care environment and offer considered plans for the future of dental practice. A diverse, enthusiastic group of people with extensive experience in dentistry throughout the United States was convened. They were individuals with backgrounds in organized dentistry, dental education, dental public health, dental insurance, health care systems, and benefit management and were aggregated under the rubric, the Woods Hole Group.

During the past two years, the group met three times, listened to expert consultants, assessed the changes taking place in health care generally and dentistry specifically, and discussed the implications of these changes.

The Group's consensus, resulting from its deliberations, was that planning for dentistry's future may be articulated by three inter-related study subjects: dental education, achieving oral disease management through outcomes driven dental care, and the delivery of dental care. Working groups were organized to write the three individual but coordinated reports. They are presently offered for publication as the product of the Woods Hole Group's recommendations for dentistry's adaptation to the changing health care environment.

With publication of the final papers of the Woods Hole Group, I want to express mine, and the Group's appreciation to the Kellogg Foundation and its two Directors, Dr. Steven Uranga McKane and Dr. Robert A. DeVries who succeeded him, both of whom were always encouraging, supportive of our work, and helpful. The Group also expresses its thanks to Dr. Richard Niederman and Dr. Robert Compton for their help as consultants in various aspects of our deliberations.

Walter Guralnick, DMD

The following are members of the Woods Hole Group:

Howard L. Bailit, DMD, PhD, Professor and Chairman, Department of Behavioral Sciences and Community Health, Schools of Medicine and Dental Medicine, University of Connecticut

Terrence S. Batliner, DDS, MBA, Director, V.A. Rocky Mountain Network

John Brouder, MA, Assistant Dean for Clinical Affairs, Harvard School of Dental Medicine

David W. Chambers, EdM, MBA, PhD, FACD, Professor and Associate Dean for Academic Affairs, University of the Pacific, School of Dentistry

Gerald L. Cogan, DMD, Clinical Professor, Department of Health Dentistry, Oregon Health Sciences University Dental School

David DePorter, DDS, MS, MPH, DePorter Consulting Group

Chester W. Douglass, PhD, DMD, FACD, Professor and Chair, Department of Oral Health Policy and Epidemiology, Harvard School of Dental Medicine Walter Guralnick, DMD, Professor of Oral and Maxillofacial Surgery, Emeritus, Harvard School of Dental Medicine

William C. Hsiao, PhD, K. T. Li Professor of Economics, Harvard School of Public Health

Robert E. Hunter, DMD, FACD, President, Delta Dental Plan of Massachusetts

James E. Mulvihill, DMD, FACD, CEO, Juvenile Diabetes Foundation

Linda Niessen, DMD, MPH, MPP, FACD, Vice President, Clinical Affairs, Dentsply International; formerly Professor and Chair, Department of Public Health Sciences, Baylor College of Dentistry

Richard C. Oliver, DDS, MS, FACD, Dean Emeritus, Professor of Preventive Sciences, University of Minnesota, School of Dentistry

Richard Ryan, President and CEO, Dental Management Decisions

Jack Silversin, DMD, DrPH, President Amicus

Betty King Sutton, DMD, MPH, Chief, Individual Practitioner Services, North Carolina Department of Human Resources

Nancy Turnbull, MBA, Instructor in Health Care Management, Department of Health Policy and management, Harvard School of Public Health

Peter J. Veysey, Cigna Health Care, former Manager, Health and Welfare Plans, United Technologies Corporation

Delivering Dental Care

he Woods Hole Group was organized in 1996 out of concern for the inexorable changes rapidly taking place in health care in our country. Because medicine has been the primary focus of these changes, dentistry has felt that it is a privileged profession, insulated and protected from the way it provides care and is reimbursed for it. This sentiment is enjoyed and expressed by both its professional organizations and a majority of individual practitioners. This is probably illusory. The reality of health care suggests a somewhat different future.

Several examples strongly support the argument that the environment is changing. The first is the experience of Delta Dental of Massachusetts, which now markets a variety of policies in addition to its original indemnity program. There are two PPOs with discounted fees; and its fastest growing policy, capitation, is growing by 15% to 20% per month (Hunter, 1999). Of particular interest to its dentist providers is its profitability. Another example is the magnitude of growth of dental insurance in its brief thirty-year history. There are presently over 120 million people in the United States with dental insurance, and currently 95% of large employers (those with 5,000 to 10,000 employpurchase dental insurance ees) (Brouder, 1995). Finally, indemnity dental insurance is markedly decreasing as dental HMOs and PPOs increase. In 1990, there were 7.8 million HMO dental members; in 1997, the figure grew to 25 million (Brouder, 1995; Hunter, & Douglass, 1995; Moldover, 1996). These then are but a

few illustrations that support our conviction that dentistry must recognize its exposure to the tidal wave of "managed care."

The questions is "What should we (the profession) do about it?" In this report, we will describe three measures to be taken that we believe will preserve dentistry's favorable position even in the changing health care climate. The first important change will be from traditional solo to group practice. The second will be expansion of dentistry's admirable record in preventive care to "wellness" care. The third is the not-for-profit Dental Practice Management Company (DPMC). We will describe its importance in future dental practice. All these changes will require a paradigm shift from long-established practice habits to a new operating modus, but the benefits to be gained will make it worthwhile.

Group vs. Solo Practice

Recent ADA statistics on practice patterns, the increasing feminization of the profession, and the growth of the DPMC's suggest some directions. Will group practice replace solo practice? No, never. There will always be solo doctors particularly in niche markets (high-end restorative) and in rural areas. We believe, however, that in urban and suburban areas every solo dentist will be competing with at least one, and probably more than one group practice that will involve multiple specialists, extended hours, and insurance contracts. Do we think that DPMC organizations will control "everything?" No. But we suspect that, in every major metropolitan

area, there will be both a national dental company and several smaller local competitors organizing group dental practices. These group practices will have an organic life of their own, obviously less dependent on a single individual than today's solo practices. These group practices, whether owned by a public company, a local entrepreneur, or a few colleagues who have joined together, will compete with each other as much as with other local dentists. They may be viewed as favored providers of cost-conscious benefit managers of large employers.

What are the advantages of group practice (Mayes, 1996)? Some of the important benefits, as enunciated by one principal and co-founder of an established group practice include: quality control, collegiality, intellectual and professional benefits of collaboration in diagnosis and treatment planning, availability of specialist care, and financial gains that accrue from the ability to procure goods and services at favorable rates. In addition, dentistry has learned the advantages of hitech equipment in its practice. Newer devices such as digital radiography, lasers, and operating microscopes now used in endodontics are but some of the recent advances. The solo practitioner can seldom afford these expensive instruments. The group practice more readily absorbs these capital expenditures (Robinson, 1998).

Benefits to patients are as real as those of the dentist. There is the advantage of "one-stop shopping" where both primary and specialty care are available in the same venue. Standards of care, a foundation of quality of care, can be established by consensus of the professionals in the group and can help to establish a patient's feeling of trust (Bader, Shugars, Hayden, & White, 1996; Belkin, 1996).

In addition to advantages for both doctor and patient, there are significant administrative and financial gains to be enjoyed. Group practice is economically more efficient than solo practice. Major cost categories, i.e., professional compensation, staff payroll, laboratory, and supply costs can be better controlled. The manage-

These group practices will have an organic life of their own

ment of accounts receivable, an important determinant of cash flow, can be optimized. Patient recruitment can be maximized by virtue of the group's ability to absorb large numbers of patients, unlike solo practices. Large cohorts of patients with dental insurance can be directed to group practice because of the convenience of care, the assurance of quality of care, and, not inconsequentially, the potential for reduced cost. The acceptance of discounted fees is possible without loss of income by the group's practitioners for several reasons. The overhead of a well organized practice can be significantly less than the average 60% to 65% overhead associated with operating a solo practice. Secondly, groups can operate more than the average thirty-three hours per week that a solo practice cares for patients. An expensive facility need not be left unused for all the time of a solo practice by virtue of a group's ability to operate longer hours. And this can be accomplished without increasing each dentist's work hours since "shifts" can be equitably assigned. It is logical that better utilization of the facility both reduces operating cost and, at the same time, provides appointments for numbers of patients whose time for

care is limited by work or other obligations.

A further important advantage to a group practice is the ability of a group to continue operations during an individual dentist's vacation and/or professional meeting periods. Unlike the solo practice, which virtually shuts down for these important periods of a dentist's life and learning, the group can continue to function with little or no loss of income. Reduced cost of care is a potential product of group practice and is necessary for the continued success of dental practice. As fees escalate well beyond the consumer price index, dentistry becomes more vulnerable to oversight and control by forces outside of the profession.

In summary, the dominant practice model in the future will be the one that meets the needs of patients, dentists, corporate benefit managers, and dental plan administrators. Group practice fulfills more of those criteria than traditional solo practice. There are, moreover, other elements of the improved future dental environment.

The "Wellness" Model of Oral Health Care

Dental care has traditionally been delivered from a surgical repair model. There is a growing interest, however, in the medical as well as the surgical model. An accompanying paper describes this in detail so that we will now mention only a few salient points.

Over the last two decades, the insurance industry has noted an enormous reduction in the incidence of one and two surface fillings (Eklund, Pittman, & Smith, 1997). The insurance carriers are interested in this because they see it as a reduction in expense. Patients are excited by this indicator of the effectiveness of preventive care and its corollary, the saving of time, money, and discomfort. The "wellness" program is an extension of prevention based on advancements in knowledge gained particularly from present day sophisticated clinical research. The translation of laboratory findings to chair-side practice is one of the most exciting elements of today's dentistry (Benn, Clark, Dankel II, & Kostewicz, 1999; Anderson, Bales, & Omnell, 1993). But it does pose an interesting question. Will insurance carriers in the near future provide reimbursement for the component parts of the prevention program, such as periochips, laboratory analyses of caries and periodontal susceptibility, and more frequent therapies and/or different therapies for high-risk patients? As higher cost reparative procedures decrease and as demonstration projects validate the practicality of the concept and as patients come to appreciate its desirability and strongly advocate for it, we believe insurance companies will.

The changes in practice just described demand description of an optimal practice environment.

Managing Dental Care

The Dental Practice Management Company (DPMC) has become a visible entity in American dental care. These organizational entities have been set up to provide "professional" management of dental practices. They have taken two forms under the umbrella of the for-profit corporate structure. In one form, the corporation purchases the practice from the dentist and becomes the owner; and the dentist becomes the employee. In the less prevalent form, the dentist

There is a growing interest in the medical as well as the surgical model.

owners align themselves with a corporation and become essentially a franchise owner. They then must follow the DPMCs management policies and procedures.

DPMCs have acquired a negative image. One reason for this is the financial failure of several of these companies which had purchased numerous dental practices. These failures left the previous owners financially bereft and emotionally distressed. Dentistry's bitter taste is understandable, but the reason for it must be understood if the positive advantages of the Not-For-Profit Dental Practice Management concept are to be understood.

Most DPMCs were (and still are) investor-owned corporations with the singular purpose of providing a substantial profit for its stockholders (American Dental Association, 1999; Call, 1999). As dentistry became a \$50 billion per year industry, venture capitalists suddenly saw investment opportunities. Practices were bought at what appeared to be appealing sums to dentists, many of whom saw the sale as a retirement package. In the past, younger dentists were the ultimate purchasers of these practices. But times have changed! Few young, deeply indebted recent graduates can now afford to buy a practice (Douglass, & Carsos, 1998; Myers, & Zwemer, 1998). For the older dentists, the DPMCs buy out was appealing. For some who received cash, it was an opportunity to realize a substantial cash value for their practice. For most, however, the purchase was paid for with a percentage of cash and the bulk in stock. Bankruptcy of the DPMC left the seller in a financially compromised position and, subse-quently, entangled in complicated and expensive litigation to recapture his or her practice.

Many of these problems derived from the sad but predictable fact that investors (venture capitalists) were interested in a substantial and quick return on their money (Kassirer, 1997). They also gave the employee dentists little or nothing to say about management of the company and, of even greater importance, little or no control of their professional decision making and care. Considering these facts, even though a few successful for-profit DPMCs exist, the general condemnation of the system is understandable. There is, however, another DPMC model that could be both desirable and beneficial for dentistry: the Not-for-Profit Dental Management Company. We envision the notfor-profit DPMC as a corporation owned primarily by dentists. They would dominate the governance structure but hire professional managers to run the organization. This organization would own the practices.

We have described a number of advantages of group practice. If a group practice has excellent management added to its structure, optimal benefit can be achieved. For example, professional management relieves the dentist and hygienists from the added burden of administrative duties. It also allows dentists and hygienists time to devote energies and commitment to Beyond the advantages of sophisticated management, the DPMC has the resources to obtain and use the best of data collection and processing information systems. Not only is this important for optimal business efficiency, but it is also critical to accumulating clinical data for both current patient care and management.

The future ideal DPMC we have described will consist of multiple practice sites which can be linked and coordinated by a powerful information system. The not-for-profit DPMC, with its excellent data information system, will be able to accumulate meaningful clinical research information which can have important benefits for improved clinical practice without loss of income. A successful DPMC should be able to improve ac-

e envision the not-for-profit DPMC as a corporation owned primarily by dentists.

professional duties. They can do this wholeheartedly in the not-for-profit DPMC because they, the dentists, will have a major role in the governance of the organization that is free from stockholder pressure. Unlike the investor controlled DPMC, dentists will occupy the controlling portion of the Board of Directors of this organization.

At the recent National PPM (Physician Practice Management) Symposium, industry leaders expressed thoughts that are pertinent to our argument. According to one knowledgeable leader at the meeting, "...physician control is the key to the success of a PPM." He stated further, "...physicians are in a good position to reduce health care expenditures and improve quality. Managed care organizations and other payers recognize this; and they know that, with the proper management structure, PPMs can be a successful delivery mode" (Garbrech, 1998).

cess to care for some of the population that presently lacks it. The nature of the DPMC, with its highly efficient group practice, will allow it to absorb patients who are presently not accepted in many traditional solo practices. This is a social gain that the dental profession has long sought to add to its laudable public image.

Current best practices, standards, or guidelines are the responsibility of the professional staff who will enjoy autonomy, a critical element lacking in the corporate DPMC. This benefit, along with the availability of meaningful peer review and available specialty consultation and advice, will add to the pleasure of practice and enhancement of patient care.

The not-for-profit DPMC may not dominate dental practice in the near future, but its potential to benefit both the profession and its patients is worthy of trial. Some DPMCs should be established as a demonstration project so that the concept can be realistically judged. It is our hope and intention to do this and provide data for its evaluation.

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Achieving Oral Disease Management Through Outcomes Driven Dental Care

s patients, purchasers, and dental plans search for more cost effective dental care, dental researchers are making advances in technologies and therapies that can move the focus of care from treating the symptom through surgical interventions (e.g., tooth restorations, periodontal surgeries) to treating the result of disease through pharmacological based interventions. Some of these new technologies and therapies appear at the outset to be a potentially more cost-effective and cost-beneficial means of provide value in dental care.

The principal idea of evidence-based dental care is to provide dental services based on the evidence that supports its effectiveness in improving oral health outcomes (Sackett, Rosenberg, Gray, Hanes, & Richardson, 1996; Sackett, & Rosenberg, 1995; Evidence-Based Medicine Working Group, 1992). But in order to understand the reason and logic for providing dental services, the patient's diagnosis and risk to disease progression must be known.

Outcomes assessment depends on the ability to quantitate the success of an intervention in halting disease progression. This quantitation, however, depends on how disease progression and risk are initially measured or diagnosed. Evidence-based clinical care integrates the diagnosis and risk assessment with the best available evidence, good clinical judgement, and the patient's needs to achieve the best outcome. Thus, the key initial elements are the diagnostic codes and risk assessment that provide the status and likelihood of progression of the disease at the starting point of intervention. Diagnostic codes indicate why each treatment procedure is being used, facilitate evaluation of the success of therapy, as well as allow evaluation of alternative treatment from the same baseline point (Leake, 1997). This information is necessary in order to assess outcomes relative to different treatment modalities that might be considered. Diagnostic codes could also capture the active or inactive status of the disease. Clinicians may accurately diagnose a carious lesion but may misdiagnose it as active because an area of demineralization appears radiographically. If demineralization has not progressed for years, it is probably not an active area of disease and may never require treatment. Demineralization contained within the enamel will require a different therapy than demineralization that has progressed well into the dentin or that which has reached the pulpal tissue. Similar statements can be made about the early identification and treatment of periodontal disease. Examples of diagnostic conditions which would be included in a system of diagnostic codes are shown in Figure 1.

Recommendation #1

Diagnostic codes need to be developed for the clinical application of risk assessment and disease management in dentistry.

Disease management attempts to integrate all components of health care in order to develop a comprehensive, systematic approach to controlling a defined dental care condition. It includes attention to the entire life cycle of a disease within the context of a particular patient and uses a wide array of interventions and resources to promote continuous health improvement for that patient. It makes use of diagnostic codes, clinical protocols, standards of care, and outcome studies. It encourages cost-effective wellness programs, preventive therapy, and the medical management of disease over surgical management that are appropriate for each patient. Dentistry treats primarily two diseases-dental caries and periodontal disease. Both of these diseases have identified bacteria as significant causal factors and both diseases can be managed through early intervention with medical therapies that can arrest and reverse the disease process. The efficacy of existing and new disease management procedures need to be documented so that they can confidently be recommended for use. Hence the second recommendation.

Recommendation #2

Clinical trials and studies of insurance claims data and managed care encounter forms need to be conducted that relate alternative disease management therapies for specific diagnostic codes to oral health outcomes.

The present body of knowledge on risk assessment and disease manage-

Figure 1	Francias	of Dio	onostic	Codos
ingule i	. LAUITIPIES		griusiic	CODES

Gingivitis Periodontal

early

Pulpitis

moderate

advanced

refractory

Tooth Fracture

Coronal	tooth	caries	
active/no	ot active	e	
severity			
pit and f	issures		
smooth s	surface		
Root Co	aries		

active/not active severity

ment provides a wide array of diagnostic methods and risk factor information that would facilitate the incorporation of certain disease management procedures into dental practice at the present time. Disease management procedures have the potential to improve and maintain oral health status in the general practitioner's office at a lower cost over the long term. Lowering cost could greatly improve access to care to the 40% or more of the population who do not benefit from regular dental care. In order to evaluate disease management therapies, however, there is a need for studies that include cost-effectiveness and cost-benefit analyses of disease management procedures (Amundson, & Album, 1998). Before incorporating disease management into dental practice, it will be important to develop reimbursement mechanisms that work in favor of this more oral health oriented type of dental practice. Accordingly:

Recommendation #3

Dental insurance programs will need to establish benefit structures that provide financial incentives for improving oral health. With insurance reimbursement schemes that provide incentives for improved oral health outcomes, dental care practitioners would be more willing to deliver disease management services. At present, in the absence of such reimbursement, dentists are pri-

Disease

Because there are no clear examples at the present time of risk assessment based private dental practices, it is recommended that:

Recommendation #4

The dental profession should explore ways to develop the risk assessment disease management model of dental practice.

It would seem timely for dental education, research institutions, dental insurance carriers, dental practice management companies, and large employers to consider collaborative efforts toward the establishment, perhaps on a trial basis, of dental practices that focus on the improvement of oral health as the primary outcome objective. Such a demonstration project would provide valuable experience with patient acceptance, the cost-effectiveness of new diagnostics and therapies, and the overall financial viability of the practice. In order to ultimately be successful, the disease management model of dental practice will need to be implemented in the

O utcomes assessment depends on the ability to quantitate the success of an intervention in halting disease progression.

marily compensated to provide restorative and reparative dentistry once the disease process has progressed to a sufficiently destructive state. However, if benefit structures were at least expanded to include reimbursement for new methods of early diagnosis/ risk assessment and preventive therapies for incipient disease control, practitioners would be more likely to include such procedures into their dental practices. An alternative approach would be the use of a capitation reimbursement mechanism, where the provider is rewarded for maintaining the patients' oral health.

private for-profit sector. However, as a first step in developing prototype practices, it may be necessary for the non-profit sector to take the lead in developing the disease management model. Accordingly:

Recommendation #5

It is recommended that dental insurance carriers and purchasers of dental care explore the possibility of co-funding demonstration projects that implement evidence based risk assessment and disease management methods.

The development of an evidence based disease management dental prac-

tice within the non-profit environment would at least initially reduce the economic pressure for clinicians to treatment plan expensive, surgically-based therapies. With the incentive placed on health status outcomes, the incentives for patient care would be significantly altered. From those the brink of a breakthrough in being able to provide true oral health services to the public. However, our present reimbursement system is based on repair. In order to have the type of delivery system that will be needed for developing the new technologies, we must "skate to where the

The present body of knowledge on risk assessment and disease management provides a wide array of diagnostic methods and risk factor information.

demonstration projects, it might also be expected that measures like Health Plan Employer Data and Information Set (HEDIS) could be developed which would be applicable for evaluation of dental insurance plans throughout the dental care insurance market.

Another parallel development that is necessary in order to effectively establish the oral health outcomes model as an integrated component part of dental practice is the teaching of risk assessment and disease management in dental schools. Disease management is not currently included in any significant way in dental education.

Wayne Gretsky once said, "I skate to where the puck is going to be." With new diagnostic and early disease therapies, the dental profession is on puck is going to be;" i.e., we must create the various models of dental practices or practice networks that will be needed in order to implement and effectively use oral health oriented intervention methods. These demonstrations should come out of the dental profession. If we fail to do so, it is possible that forces outside the profession, such as venture capitalists, will seize the opportunity because they see the possibility of financial success from delivering oral health maintenance services to motivated middle income populations. If this occurs, the traditional patient care values of the dental profession will be seriously challenged.

The current President of the American Dental Association Dr. Tim Rose highlighted this issue in his first address: "Dentists must keep abreast of scientific developments and understand that outcomes of care will be the fundamental measurement to determine the quality of care."

"...require educators to recognize that dentistry is shifting from a repair-based profession to one that stresses and achieves wellness."

"...the products, materials, and techniques we use to treat patients (should be) supported by sound evidence-based science, not anecdotal information or untested techniques."

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Learning for Dentistry's Tomorrow– Dental Education

n Learning for Tomorrow, Alvin Toffler and his contributing authors agree that schools and universities are too past-andpresent-bound, that technological and social changes are outracing education, and that the concept of the future is closely bound to the motivation of the learner (Toffler, 1974). The same might be said of individuals and organizations in the health care system. To Toffler's "all education springs from some vision of the future" (Toffler, 1974, p. 3), might be added "together with an understanding of the past."

The purpose of this paper is not to identify every problem in dental education but rather to note a few important problems, make recommendations, and suggest that in changing times we must all be learners. Learning may be defined as useful changes in behavior resulting from reflecting on experience. There is much to reflect on as we look at the decade past and contemplate the new millennium and much to learn for and from all of us: students, faculties, practitioners, organized dentistry, state boards, public health officials, the public, dental insurers, and our medical colleagues. How can we become learners and learning organizations which can focus on the problems instead of protecting turf, libeling by label, with-holding "proprietary" information, ignoring experience, and repeating "it's always been done that way?" Can we learn that shared goals, shared information, shared analysis, and shared effort can solve problems?

The broadest way to state the major problem before us is that dentistry is not fulfilling the oral health needs of all Americans. Before we say "That's not our responsibility," remember that is what medicine said a decade ago and found itself on the outside looking in when health care reforms were being planned. Because oral health is essential for general health, we need to learn more about those whose oral health needs are unfulfilled. Some of the information we have recently learned includes the following:

- There has been marked decrease in tooth loss, dental caries, and advanced periodontitis in the U.S. population (Miller, Brunell, Carlos, et al, 1987).
- Only a portion of the population had extensive dental disease. These groups are more poorly educated, had lower incomes, and saw dentists much less frequently than those with better oral health.
- Early signs of dental disease have often gone unnoticed or have not been associated with the need to see a dentist even in people with extensive disease.
- Prevention works-including the use of fluorides and sealants, selfcare, more regular prophylaxes, and dental check-ups.
- Managed care is with us and growing.
- The computer, for instance, may be as important as the handpiece

with uses varying from treatment options to patient and health care professional communication to financial management.

• Technology, such as digital radiography and the laser, are profoundly influencing dental practice.

This information raises questions about how to address the unfulfilled dental needs in the population and challenges us to think anew about dental education and dental practice and who our patients will be in the future.

Recommendations

Dental Education: At least three major efforts have been made to take a fresh look at dental education in the 90s: the revision of accreditation standards focusing on the necessary competencies for graduates (American Dental Association, 1998), the Pew Foundation study of dentistry in the health care delivery system (Pew Health Professions Commission, 1993), and the Institute of Medicine study, Dental Education at the Crossroads: Challenges and Change (Field, 1995). They were comprehensive and have provided important guidance for dental education.

We add to the findings of these studies our recommendations with each preceded by an explanation.

Dental schools have always endeavored to teach the necessary knowledge and skills to enter practice as well as to develop judgement and values in students. They have had much greater success with the first two objectives than the last two. As Mager (1970) points out, "Most performance deficiencies are not training problems." The deficiencies are not related to knowledge or skills. In recent years, the necessity to develop lifelong learning skills, e.g., critical appraisal, analytical problem-solving, communication, and continual learning, have received special attention from health educators in their efforts to improve judgement and influence values in students. These efforts have included broadened student selection methods, the incorporation of problembased learning in the curriculum, risk-assessment in the clinics, and the recognition that competency based education and evaluation have different learning issues.

Educational methods and evaluations differ for different stages of competency. There has been an important shift from passive learning (lectures, demonstrations) to active learning in problem-based, self-directed small groups wherein simulations and ethical dilemmas are presented. Patient centered risk assessment and comprehensive care, delivered in practice groups, are the new teaching mode. Practice alternatives, business analyses, off-site clinics, and dental policy issues are part of the predoctoral curriculum. Twenty-five years of problem based learning (PBL) in medicine has demonstrated that PBL students not only do as well as traditional students in factual recall but also perform more effectively with their patients and are enthusiastic about their curriculum (Barrow, 1998). The same can be said for a PBL dental curriculum (Matlin, 1998).

Perhaps the most important lesson learned to facilitate the change to active learning in dental schools is reeducation of the faculty. Some still tend to teach as they were taught, tend to tell instead of listen, tend to check instead of teach, tend to be more interested in the fulfillment of requirements than the provision of needed care. Faculty development is Table 1. Learning issues, educational methods, and evaluation methods appropriate at various stages on the competency continuum

Stage of competency	Learning issues	Educational methods	Evaluation methods
Novice	Isolated facts performance	Lecturing, faculty control	Tests
Beginner	Some synthesis, integration, few choices	Seminars, labs, supervised work	Simulations
Competent	Independence, choice, self-control	Realistic work settings	Authentic evaluation (portfolios)
Proficient	ldentity, professional norms, context	Socialization, specialized training	Work-related markers
Expert	Internalized, patient-centered focus	Self-managed	Self-assessment

(From Chambers D. W., & Glassman, P. A primer on competency-based evaluation.)

a major challenge in many schools. The active learning changes are easier for students than for faculty. Therefore, we suggest the following: *Recommendation #1 Dental schools should accelerate curricular improvement by incorporating principles of problem-based learning already demonstrated by some dental*

schools. Both faculty and students require educational help as competencybased education is pursued.

Competency-based education and particularly evaluation is essential but difficult learning for dental school faculty. Table 1 illustrates the levels, competency learning issues, and evaluation methods in the competency continuum (Chambers & Glassman, 1997).

Since student learning differs in content and rate, clearly defined competencies with appropriate evaluation methods represent marked improvements over objective tests and the counting of clinical procedures. Again, however, competency-based education and evaluation requires extensive changes for the faculty. This educational effort competes with university expectations of higher research productivity from a faculty that already has far more student contact hours than any other faculty in the university. The tripartite mission of the university, education, research, and service sometimes seems a difficult burden, especially to full-time clinical faculty who interpret those responsibilities with different emphases.

At least half of our nation's dental schools have developed lists of competencies to be used for accreditation and education programs. But their lists require continuing evaluation and refinement as well as the development of assessment methods to be effective. This in turn requires ongoing faculty learning and commitment. The development of appropriate competencies is equally important for postgraduate programs.

Postdoctoral Education: What emerges from incorporating competency-based education and evaluation is clear recognition that, at best, schools produce competent graduates virtually all of whom could benefit from an additional year to "put it together" in a general practice residency or in specialty training. We support and reiterate the recommendation in the Strategic Plan for the Future of Dentistry (American Dental Association, 1983) for a mandatory year of post-doctoral training. That recommendation was recently endorsed again by the 1995 Institute of Medicine study of dental education, which also recommended that postdoctoral education positions with an emphasis on advanced general dentistry be available for all graduates within five vears (Field, 1995).

Recommendation #2

Local and regional dental educators, practitioners, hospitals, and public health officials should explore the creation of additional general practice residencies for dental school graduates to broaden their experience and help provide care for the underserved.

Student Debt: Both active learning and competency-based education are faculty intensive and can increase the costs of what is often already the most expensive education in the university. A year of post-doctoral education is at best a break-even year economically, with little chance to begin to pay off student loans. Therein lies an important part of the problem. Student debt continues to escalate and to affect choices in dentistry. "It is no secret that more than a few graduates are leaving dental school with debt in excess of \$15,000.00" Meskin wrote in his editorial in the April 1999 *Journal* of the American Dental Association. Repayment of debts of that level requires a very successful practice early in the young graduate's career. To repay a \$100,000 debt requires an annual income of \$178,000.

It is not clear whether high student debt and difficulty in obtaining loans is affecting the diversity of the applicant pool for dental schools, but it certainly limits the choices at graduation. For example, the new dentist who is heavily in debt cannot take on additional debt by buying a retiring

n changing times we must all be learners.

dentist's practice and often chooses to seek a salaried position. It would also be difficult for a student graduating with average or higher student debt to go into dental education without substantial other income. Dental schools are experiencing the reality of this as they have increased difficulty in recruiting faculty.

So is it possible for dental education to produce an entry-level dentist who is better prepared for the challenge of constant change in the profession? A mandatory post-doctoral residency could provide the opportunity for additional growth and experience and could play an important role in meeting the unfilled dental needs of the population. Can these changes be achieved for less cost? This is not solely a student, dental school, or university problem. The benefits of welltrained practitioners also accrue to the profession and the public. Isn't it time that all parties get together to address the problem? There is much to be learned by and from all of the organizations. We should explore possible solutions including reviving the idea

of an Educational Opportunity Bank (Meyers & Zweren, 1998; Zacharias 1967) as well as learning in community settings and selected private offices which could mitigate the problem and benefit students and the community.

Recommendation #3

The American Association of Dental Schools, the American Student Dental Association, the American Dental Association, the Bureau of Health Professions of HRSA, and other interested parties should convene an initial meeting to consider the broad ramifications of the high cost of dental education and escalating debt.

Evidence-Based Care: Evidencebased health care is being espoused as the new paradigm for the practice of both medicine and dentistry. As Guyatt (1994) has noted, evidencebased care is the outcome of the rapid expansion of clinical, behavioral, and health services research over the last thirty years and has the potential for transforming the education and practice of the next generation of clinicians. Dentists will face an exploding volume of literature, rapid introduction of new technologies, deepening concern about escalating health care costs, and increased attention to quality and outcomes of health care. Understanding the results of randomized clinical trials, meta-analysis, and cost-benefit studies can improve outcomes. Evidencebased health care will require new skills of the clinician, and dental faculties must be equipped to teach these skills. These include critical appraisal skills (Table 2) as well as increased sensitivity to patients' needs and an understanding of how clinician and patient behaviors affect the outcome of care (McCulloch, 1994).

Barriers to teaching evidencebased dental care include the fact that faculty with rudimentary critical appraisal skills may be threatened. In addition, for many clinical areas, high quality evidence on efficacy of particular approaches to care is lacking.

Woods Hole Group Report

These barriers can be reduced by focusing on areas in which there is good evidence available and by providing teaching workshops on critical appraisal. In addition to better preparation of students for practice, teaching evidence-based health care will help integrate the teaching and research missions of the faculty and may increase research productivity. Active learning strategies previously advocated provide an obvious fit but will require all in education and practice to be learners open to try, evaluate, and modify methods.

Recommendation #4

Evidence-based dental care holds the promise of improving clinical education and integrating research and practice. It should be introduced and gradually expanded in all dental schools.

Dental Health Policy: Problem-based learning can serve as an excellent vehicle for students to explore dental health policy issues such as access to care, the special needs of under-served populations, alternative practice arrangements, effects of reimbursement on care, cost-benefit analyses of treatment, and ethical dilemmas in health care. Only one out of five Medicaid eligible children currently receives even the preventive dental care to which they are entitled (Department of Health and Human Services, 1996). The elderly also must be able to access dental care. Will legislators link dental licensure to Medicaid participation? Our nation's academic health centers and dental schools, with their ability to study and embrace information, should be in the forefront of investigating the access crisis and other dental policy issues and teaching about them. Clinical rotation for students to provide care in community clinics reinforces the realities of dental health care policies and needs.

Recommendation #5

Dental schools should be active participants in addressing and defining dental policy issues, teaching about them, and contributing to their solutions. Table 2. Requirements for practice of evidence-based health care

Define the patient's problem Identify the information required to resolve the problem Conduct an efficient search of the literature Select the best of the relevant studies Apply rules of evidence to determine validity Extract clinical message and present to colleagues Apply to patient problem

Dental Licensure: The primary purpose of state health care licensing boards is to protect the public. Historically, this has been done by examining new graduates and others wishing to practice in the state to verify their knowledge and skills. Most health care licensing boards rely on the results of national examinations, simulations or credential review to issue licenses. Only dental boards continue to evaluate skill competency through the performance of a limited number of clinical procedures on patients. Most new graduates pass state board exams the first time. A few repeat a part of the exam a second time and then usually pass. First-time failure rates are higher in a few states, notably in California and Florida. However, there does not appear to be any evidence that dentists in those states have fewer malpractice or fraud problems because their state boards have been more "selective" through examinations.

There are many problems with state board examinations. The following are some:

• They are extremely costly (board exam fees, travel and housing, patient procurement costs, etc.) and time consuming, especially for new graduates, most of whom are already deeply in debt.

- Exams are not uniform, often lack validity, and seldom focus on the skills that truly protect the public, e.g. diagnosis or emergency care.
- Live patients introduce significant variables among examinees, heightening the stress and anxiety of the examination. Patients are often difficult to find; and, if the procedure is not completed appropriately, problems with continuing care can arise.
- Schools are forced to "teach to the boards," limiting curricular exposure in other important areas in an already overcrowded curriculum.
- The need to take and pass state board examinations seriously limits mobility. With the increasing number of women graduates, family moves to different states become more difficult and stressful. Many would like to continue to practice at least part time and could provide valuable service, but state boards are a barrier. Movement across state lines is much easier in almost any other profession requiring only verification of educational qualifications and examination of credentials.
- Finally, state boards provide a onetime assessment of a dental professional's skill and knowledge but are not a measure of continuing competency as time passes.

There have been many improvements in dental education in recent years. National Dental Board Examinations in the Basic and Clinical Sciences are continually revised and have improved markedly. Passage of these examinations is a requirement for promotion and graduation in dental and, of greater importance, possible methods for dental boards to assess continuing competence. It is not clear that requiring certain continuing education hours is at all related to competence. If state boards discontinued examination of new graduates, continuing competence could be pursued

A cting alone or only in self-interest may turn out to be dangerous to self-preservation.

schools. Accreditation of dental schools is more rigorous and now evaluates competencies including patient care. Competency-based education requires faculties to evaluate a wide range of student competencies with comprehensive evaluation methods. These competencies include not only clinical technical skills but also quality issues related to patient care including risk assessment, diagnosis, treatment planning, and continuing care skills. Both simulations and "standardized patients" are now being used in some schools to help evaluate a wide variety of competencies that may not have been directly experienced by all students with their patients. As stated earlier, extensive changes are occurring in both teaching and evaluation in all dental schools; and these changes are leading to competent graduates ready for dentistry's tomorrow.

Perhaps the time has therefore come for state dental boards seriously to look at the requirement to examine new graduates. A wealth of data exists from dental boards, schools, the profession, and the public from which to make a considered judgement. If all are truly "learning organizations," there should be substantial agreement on the competencies needed by a new graduate and how they can best be evaluated. Such discussions would lead to the identification of the competencies for proficient and expert dentists with a greater likelihood of identifying dentists whose competence levels needed improvement, thus protecting the public.

To encourage meaningful dialogue and learning, we propose an interim step for state and regional dental boards.

Recommendation #7

State and regional dental boards should eliminate didactic examinations and accept the far more comprehensive National Board Examinations as evidence of appropriate knowledge. The clinical examination should also be eliminated for dentists who have completed at least one year in an approved general practice residency or specialty education program. This is intended to be a temporary step while boards, schools, and organized dentistry review the need to clinically examine new graduates. Meanwhile, every effort should be made to eliminate the use of patients for clinical exams by substituting simulations and/or standardized patients.

Conclusion

Tomorrow's dentistry will be different. Not just because of technological innovations, or changes in practice styles, or the decline in dental disease needs and increase in dental wants, but also because, with unlimited information obtainable, the number of variables in diagnosis has increased; and clinical decision-making will be more difficult. Questions about dentistry abound: e.g. student debt, licensure, practice patterns, effects of reimbursement on practice, evidence and outcomes-based dentistry, effects of practice setting on performance, malpractice and fraud patterns, product and procedure choices, utilization rates, and career patterns. The best answers are likely to come from those who can correlate the information and learn from it.

Even a cursory look at some of the questions just posed makes it clear that different organizations (i.e. schools, dental associations, state boards, public health departments insurance companies) can access and provide different pieces of the information. Partnerships will need to be formed to find the answers and more importantly to make the right decisions. Therein lies the challenge. Will we make the effort to work together to address these problems? Acting alone or only in self-interest may turn out to be dangerous to self-preservation. Working together to fulfill the oral health needs of the American ultimately will be people in everyone's best interest.

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Evaluation of Attitudes— Dental Class of 1991: A Nine-Year Longitudinal Study

Michael D. McCunniff, DDS, MS and Lyndal G. Holmes, DDS, MS

Abstract

A longitudinal sample of students at a Midwest dental school was surveyed with regard to eleven attitudes about their choice of a dental career, their feelings about dental education, and their views of the dental profession. The survey was repeated seven times for the same respondents: at freshman orientation, at the end of the first, second, third, and fourth years, two and a half years, and five years following graduation. Respondents reported being optimistic about the profession, with the exception of a consistent loss of confidence in the validity of initial licensure examinations. They also felt positive about their education; although the third year placed the most stress on their positive views.

R ast studies in dental education from the 1970s have shown that student attitudes do change during their education (Steinberg, 1973). Many factors have been found that influence and shape students' attitudes during their professional careers. Many students develop attitudes that conform to the majority of their classmates' attitudes (Bader, 1984; Becker & Geer, 1966; Cain, Silberman, Mahan, & Meydrech, 1983; Lee, McCluggave, Weinbert, & Glover, 1975; Morris & Sherlock, 1971; Parrish, 1968). Other studies have found that students tend to adopt the attitudes and opinions of faculty to whom they are exposed during their education (Kleinman, 1983; McGhan et al, 1985; Ondrack, 1975; Reid, 1978; Schwarts, 1980; Vann, 1979). Students also have been found to change attitudes during their transition from contact with academic faculty to clinical faculty (Ondrack, 1975). Some studies have looked at the effect of dental school curriculum on student attitudes. One study found increasing cynicism and decreasing humanitarianism during students' professional education. These attitudes, however, were found to reverse after graduation (Moody, Tassel, & Cash, 1974). Similar findings were noted in medical and nursing education (Gary & Newman, 1962; Moody, 1973). One study did find the highest percent of students with negative attitudes occurring during the third year of dental school (Lancaster, Gardiner, Strother, & Boozer, 1989).

During the mid-1980s, the Commission on Dental Accreditation implemented specific outcomes standards for all U. S. Dental schools. Standard 8 (now Standard 1) states that each dental school must regularly evaluate the degree to which its goals are being met through a formal assessment of student outcomes. Results of the assessment process must be used to evaluated the school's effectiveness in meeting its goals and fostering enhanced student achievement. Outcomes measures include, as appropriate, results of licensure examinations, graduation rates, and job placement rates. Senior surveys, which are administered by the American Association of Dental Schools, are also now included in dental school evaluations of curricula. However, there is currently no formal recommendation to



Dr. McCunniff is Assistant Professor in the Department of Dental Public Health & Behavioral Science and Dr. Holmes is Associate Professor in the Department of Periodontics, both at the School of Dentistry, University of Missouri–Kansas City. The address for correspondence is 650 East 25th Street / Kansas City, MO 64108-2784.

Table 1. Response	e Rate by Ye	ear				
Orientation	1st Yr	2nd Yr	3rd Yr	4th Yr	2 Yrs Out	5 Yrs Out
Aug 1987	May 1988	May 1989	May 1990	May 1991	Nov 1993	May 1996
100%	92%	84%	86%	82%	39%	41%

follow and evaluate students beyond their educational training.

Once students have graduated, a variety of experiences begin to influence and change their attitudes. Few studies have recently looked at the transition and modification of attitudes from a professional dental school education to private practice. The purpose of this study was to conduct a longitudinal study of a dental school class though four years of dental school followed by a five-year post-graduation evaluation in order to examine areas of attitudinal change.

Methods

In response to the recommendations from the 1980s Commission on Dental Accreditation and with funding form a Pew Foundation grant, a student survey was developed to begin addressing a formal assessment of outcomes in dental education. A total of 100 questions were developed for the survey instrument.

During student orientation at a Midwest dental school in August 1987, 102 freshman dental students were asked to voluntarily complete the questionnaire to asses their attitudes on a variety of areas pertaining to school. A Likert scale was used with responses ranging from strongly agree to strongly disagree. Students were instructed to mark on an answer sheet the response that best represented their feelings about each question. Students were given the option to respond "no opinion" by leaving the answer blank. Percent of strongly agree, agree, disagree, and strongly disagree were computed for each item. The attitude scale was combined as follows: strongly agree and agree were considered agreement, neutral remained a separate category, and disagree and strongly disagree were considered disagreement.

The survey was administered again voluntarily in May of 1988 at the completion of the students' first year. The questionnaire was then administered to the class each May at the end of the academic semester through 1991, just prior to graduation. Follow-up surveys were mailed to all graduates two and one half years post graduation and five years post graduation. Overall percents were computed for each item for each year. The response rates for each year are given in Table 1.

For this study, only 14 questions were evaluated out of the 100 available. The specific questions were chosen based on their perceived relevance to a dental student through four years of dental school and up to five years in practice. Only seven of the questions appropriately addressed attitudes that incoming dental students could answer at orientation, based on their backgrounds and experiences. These questions related to their opinions on selecting their dental school,



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cheating, the number of practicing dentists in the country, patients' rights to basic care, fear of contracting AIDS, and the future of dentistry. The questions used in this study were divided into three categories based on their subject content. The three categories related to (a) general dental education, (b) specific questions related to the dental school in ethics and grading, and (c) the practice of dentistry.

Results

School of Dentistry: Agreement generally remained high on how qualified students felt about their skills upon graduation compared to other dental school graduates. The highest scores occurred during orientation and the lowest scores during the students' third year. There was a consistent decrease in the percent of agreement through the third year regarding the students' perception about how concerned the school was about them as individuals. Again, the third-year students had the lowest rating in percent agreement. The percent agreement continued to increase from that point in time. The students' attitudes toward choosing their specific dental school dropped significantly by the end of the first year and reached its lowest percent agreement by the end of the third year. The percent agreement increased consistently from then on. Five years post graduation, the percent agreement rose to nearly the same level as existed at orientation. There was a continuous increase in agreement that if students had known that a dental education would cost so much they would have reconsidered dental school. The percent rose during the four years of school and two and a half years after graduation, but began to decrease at the five-year postgraduation evaluation.

Dental School Ethics, Grading, and Clinical Teaching: There was a consistent increase in agreement that those caught cheating on exams should be dismissed from school. The highest percent agreement occurred during the five-year post-graduation evaluation. The percent of agreement regarding the possibility of students cheating on exams even if it meant the difference between passing and failing varied from 15% at orientation to 31% at graduation and then dropped to 10% five years later. Agreement generally remained high when students were asked whether faculty



 Table 2. Opinions Regarding Dental School Education (Percent)

Statement		Orient	1st Yr	2nd Yr	3rd Yr	4th Yr	2 Out	5 Out
I will be as qualified a dentist	A*	98	83	85	70	87	88	93
upon graduation as the grad-	Ν	0	1	1.	3	0	5	0
uate of any other dental school in this country	D	2	16	14	27	13	7	7
The dental school is concerned	А	97	63	53	35	50	60	67
about me as an individual and	Ν	0	1	0	1	0	3	0
my well being	D	3	36	47	64	50	37	33
I am pleased that I selected	А	96	76	76	56	71	78	86
this dental school to attend	Ν	1	3	0	2	0	5	0
	D	3	21	24	42	29	17	14
If I had known that a dental	А	6	13	19	20	29	33	26
education would cost so much	Ν	1	2	0	0	2	3	0
l would have reconsidered dental school	D	93	85	81	80	69	64	74
* A = agree, N = neutral, D = disc	agree							

would help when asked to do so. Students consistently disagreed that grades were too high. There was general agreement that clinical requirements were not too high, except during the third year.

The Practice of Dentistry: The percent agreement regarding the statement that there are too many dentists in the country increased, except during the third year, but started to drop at the five-year evaluation. The lowest percent of agreement was during orientation and the highest at graduation and two and a half years later. There was a dramatic decrease in agreement that dental board examinations are a good evaluation of one's ability. The highest agreement was during orientation and the lowest agreement was at five years following graduation. There was a high general agreement that everyone, no matter how economically depressed, has the right to basic dental care. This percent started to decline following graduation. The lowest percent agreement with this statement occurred five years post graduation. There was a consistent decrease in agreement about the fear of contracting AIDS. Agreement consistently remained high that the future of dentistry is positive.

Discussion

The percent agreement from freshman orientation to post graduation did not change for some of the opinion items sampled in this study. Students felt that they would be as qualified as any student graduating from another dental school and still maintained that opinion five years following graduation. Students maintained consistent agreement regarding cheating. They felt that even if it meant not passing, the majority would not cheat. Agreement changed only 5% over the nine years of the study. They also maintained consistent agreement, except during the third year, that their clinical requirements were not too high during their dental education. Finally, students felt that the future of dentistry is good; agreement changing only 6% over the nine years.

The results of this study are in line with those reported by Lancaster (1989) that negative attitudes increase during the students' academic training, with the greatest negativity occurring during the junior year. This was evident in all three major categories of questions asked.

The most dramatic change during the nine-year period was in the ques-

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tion regarding whether or not dental board examinations were a good evaluation of one's ability. The percent agreement ranged from an initial high of 94% at freshman orientation to 17% agreement five years following graduation. These results are similar to previous studies that found state dental boards were poor predictors of student competency (Bales, 1991; Buchanan, 1991; Gugoni, 1992; Hutchinson, 1992; Nash, 1992). In 1997, the Invitational Conference for Dental Clinical Testing Agencies proposed a twelve-point "agenda for change." This proposal was drafted and accepted by the American Dental Association, the American Association of Dental Examiners, the American Association of Dental School, and the American Student Dental Association to address issues related to the clinical licensure examination process. The goal of this agenda is to increase the effectiveness and fairness of the examination process. Graduates continue to express strong opin-



ions regarding the effectiveness of dental boards, even once in practice.



Attitudes regarding cheating changes by 30% over the nine-year period. At orientation, only 46% of the students agreed that students who were caught cheating should be dismissed from school, compared to 76% five years post graduation. This change may be due to the loss of educational pressures, a change in ethical thinking after being in practice, lack of tolerance for cheating, or effective ethics education in school. These findings correspond to other studies that found students tend to be less tolerant of cheating over time (Beemsterboer, 1997; Sierles, 1980; Westerman, 1996).

From the clinical standpoint, the fear of contracting AIDS decreases with time. Recent studies on attitudes regarding provision of care for HIV/ AIDS patients have shown similar trends in the profession (Danile, 1998; McCarthy, 1999). These results suggest that practitioners are better educated regarding the risks associated with the treatment of HIV/AIDS patients and are comfortable with infection control procedures as a means for preventing transmission. The question does not, however, ask what percent of respondents' patient population is thought to have HIV/AIDS. It may be that those responding do not feel they have many HIV/AIDS patients.

Students perceived during the third year of dental school, which is the beginning of clinical comprehensive care for patients, that they received the least help from faculty. This may be attributed to a combination of factors. Clinical design of the school, faculty availability, and patient assignment may have had a significant impact on the students' attitudes. Prior to starting clinical rotations, students receive a three-day orientation with specific details outlined in a clinical manual. These results suggest that perhaps the information received during the clinic orientation is not adequately preparing the students for the beginning of their clinical rotation. This may in turn lead to loss of clinical experiences as students try to assimilate clinical protocol.

Agreement generally remained low when students were asked if their clinical requirements were too high, except for a significant increase during the third year. Students generally felt that their requirements were not too high or were perceived as being satisfactory or adequate during their education.

The percent agreement increased steadily when students were asked whether they would have reconsidered dental school if they had known how much education would cost. This attitude did not begin to decrease until five years following graduation. Five years post graduation, onefourth of the practitioners state that they would reconsider dental school. Student debt continues to rise (American Dental Association, 1993). Previous studies have shown that financial reasons were good predictors of job satisfaction (Logan, 1997; Rice, 1997). The combination of student debt and poor job satisfaction may account for the 25% of practitioners questioning whether they should have attended dental school. Additional variables that may have influenced this attitude include costs related to establishing practice, building a successful practice, stress, and patient relations.

Table 3. Opinions Regarding Dental School Ethics, Grading, and Clinical Teaching (Percent)

Statement		Orient	1st Yr	2nd Yr	3rd Yr	4th Yr	2 Out	5 Out
Anyone caught cheating should	A*	46	50	72	66	67	70	76
be dismissed from dental school	Ν	5	2	1	1	0	3	0
	D	49	48	27	33	33	27	24
If it meant the difference of	А	15	28	23	19	31	23	10
passing or failing, I would cheat	Ν	1	2	0	2	0	0	0
on an exam	D	84	70	77	79	69	77	90
Most faculty are very helpful	А	94	85	70	63	76	85	81
when asked to help	Ν	3	2	0	0	0	0	0
	D	3	13	30	37	24	15	19
Grades at this school are too	А	15	37	47	31	44	30	33
high	Ν	6	3	2	3	4	0	2
	D	79	60	51	66	52	70	65
Clinical requirements are too	А	16	21	30	68	35	15	12
high	Ν	5	19	8	1	2	3	2
	D	79	60	62	31	63	82	86

* A = agree, N = neutral, D = disagree

The attitude that everyone, no matter how economically depressed, has a right to basic dental care has remained consistently high during dental school, but started to decline post graduation. The lowest level of agreement occurred at the five-year postgraduation evaluation. The ADA Principles of Ethics and Code of Professional Conduct state in the preamble: "The Association believes that dentists should posses not only knowledge, skill, and technical competence, but also those traits of character that foster adherence to ethical principles. Qualities of compassion, kindness, integrity, fairness, and charity complement the ethical practice of dentistry and help define the true professional."

These survey results suggest that more attention and effort needs to be placed on the professional and ethical obligations of practicing dentistry.

Limitations of the study include the potential effect of experimental mortality. Only 41% of graduates participated in the five-year survey. Participation in the study was voluntary. However, after graduation, participation dropped dramatically. Possible reasons for the low response rate could be apathy toward school, surveys not reaching the dentists, or lack of interest in further participation. A second limitation of the study was the inability to track subjects. Students were not coded from the beginning of the study and this prevented

Table 4. Opinions Regarding the Practice of Dentistry (Percent)

evaluation of individual changes over time.

The American Association of Dental Schools conducts an annual survey of graduating seniors to obtain information about their financing of dental education, graduating indebtedness, practice plans, nature of plans for postdoctoral education, and impressions of the adequacy of time that was directed to various areas of instruction. The survey instrument is prepared by AADS. Each school uses its own survey distribution and collection system to conduct the survey. Surveys are returned to AADS for analysis and reporting.

With many schools participating in the AADS survey (94% in 1997),

Statement		Orient	1st Yr	2nd Yr	3rd Yr	4th Yr	2 Out	5 Out
There are too many dentists in	A*	25	28	37	27	46	48	40
this country	Ν	2	0	1	1	2	0	0
	D	73	72	62	72	52	52	60
Dental Board exams after grad-	А	94	64	40	27	21	18	17
uation are a good evaluation	Ν	0	9	7	2	1	0	2
of one's ability	D	6	27	53	71	78	82	81
Everyone, no matter how ec-	А	97	86	88	94	93	83	79
onomically depressed, has the	Ν	0	2	0	0	0	0	0
right to basic dental care	D	3	12	12	6	7	17	21
The catching of AIDS is a	А	79	78	65	72	82	78	60
concern of mine	Ν	1	2	1	0	0	0	0
	D	20	20	34	28	18	22	40
I think the future of dentistry	А	99	93	94	98	93	95	93
is good	Ν	0	2	1	1	1	0	0
	D	1	5	5	1	6	5	7

* A = agree, N = neutral, D = disagree



we do see a snapshot at the time of graduation. But this does not show changes during the educational process nor the effects private practice may have on attitudes after graduation. The purpose of the survey reported in this article was to track the attitudinal changes during the educational process and the first years of practice. One recommendation to help better understand dental school's educational outcomes would be to extend the AADS survey to include evaluation of students during the educational process as well as post graduation for two and five years. This would also address the Commission on Dental Accreditation standard mandating that all dental schools regularly evaluate the degree to which their goals are being met through a formal assessment of outcomes.

In summary, results have shown that a number of attitudes have remained relatively stable and others have shown a significant change over the nine-year period of study. It is important for an educational institution to measure and evaluate these attitudes of students and address those that do not meet the school's goals and objectives and may lead to undesirable professional consequences. Changes in curriculum, however, should not be based on students' attitudes alone. Such ongoing and systematic collection of data will result in a better assessment process to evaluate the school's effectiveness in educating dental students.

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Technical Glossary

Editor's note: In as an effort to make research papers that contain technical concepts more "user friendly," the Journal will attach a technical glossary to these papers where it seems useful.

Cross Sectional and Longitudinal Sampling. Two partners in a dental practice want to find out whether patients who have been with the practice for several years have better overall oral health than those who are new to the practice. They agree on a homemade index of oral health that includes consideration of decayed teeth, restorations that need replacement or repair, periodontal health, and occlusion. But the partners disagree on how the sample should be drawn. One partner wants to choose at random ten patients who have been in the practice for less than one year, ten who have been patients less than two years, ten from the two-to-three year period, and so forth up to five years. This is called a *cross sectional* sampling design. All data are collected at a single time from groups that differ in their "starting points." The other partner would prefer to pick ten patients and measure them all one year following the initial appointment, again two years, three, four, and five years later. This is called a *longitudinal* sampling design. All subjects start at the same time and measurement is spread over time.

The partners disagree over which design offers the most protection from sampling bias-systematic errors that would support wrong conclusions. The partner who dislikes the cross sectional design is worried about the potential for treatment-by-sampling biases. Can one be certain that the initial treatment for patients was the same five years ago as it is today? If better diagnosis comes from the partners gaining experience (as it does in fact), the more recent samples of patients will appear to enjoy as an unfair advantage. The partner who dislikes the longitudinal design is worried about experimental mortality. Can one be certain that the patients who drop out of the practice are the same as an those who remain? If patients with poor health are more likely to leave the practice (as they are in fact), the more long-term patients will appear to enjoy an unfair advantage.

Each sampling technique is subject to its own type of bias. Besides this, there is always less variance in the longitudinal sample. In addition to all other types of variance, there is variation (one would hope of a random nature) among the patients. Because there are more subjects in the cross sectional design for a given number of observations than there are in the longitudinal design, there will be less variation in the latter technique. It is advantageous to reduce this type of "noise." Here is where the problem comes in. Classical statistical techniques *assume* that a cross sectional approach is being taken to sampling. When a longitudinal method is employed, classical statistics overestimate the significance of the results. Special and complex adjustments (known as an "multivariate" or repeated measurements statistics) are required. Statisticians have been complaining for years about failure to make these corrections and thus the tendency to report studies in the literature that claim significant results when there are none. The practice of inflating significance with multiple measures continues.

The most common reason for preferring cross sectional designs is a practical one. It costs more and takes longer to develop longitudinal data. In many cases, such as an new product testing, the time delays can be fatal. Who wants to learn that a product is statistically significantly better than a control product if neither of them is still on the market?

Public Perception of DDS Versus DMD Degrees

James A. Lalumandier, DDS, MPH; Marsha A. Pyle, DDS, MEd; and Danny R. Sawyer, DDS, PhD

Abstract

There are currently two degrees awarded to dental graduates from U.S. dental schools. The aim of this study was two-fold: (1) to determine the level of confusion among lay personnel concerning these degrees and (2) to identify and explore any basis for any public opinion. Five hundred and twenty-four lay persons were interviewed in Cleveland and the surrounding area. Chi-square analyses were employed to determine the effects of gender, frequency of dental visits, types of dental insurance, education level, age, income, and race on public perception of the DDS and DMD degrees. Fewer than 20% of those interviewed knew that a DDS and DMD received the same level of training. Of those who indicated there was a difference in training, 69% felt that DMDs had more training than DDSs. Since the majority of lay persons were confused about the two degrees, the establishment of one unified dental degree may contribute to a better public understanding of the education and capabilities of dentists.

onfusion has existed for more than one hundred and twenty-five years over the meanings of the two degrees conferred upon dental graduates. The Doctor of Dental Surgery

(DDS) was the first dental degree granted by the Baltimore College of Dental Surgery in 1846. Twenty-three years later, in 1869, the Harvard Dental School initiated confusion by awarding the Doctor of Dental Medicine (DMD) degree. Currently, of the fifty-five dental schools in the U.S., thirty-six award the DDS and nineteen award the DMD. Overall, nearly two-thirds of all dental schools grant the DDS, however, within the last fifty years nine new schools have decided to award the DDS while twelve additional new schools elected to award the DMD. Most recently, Nova Southeastern University College of Dental Medicine in Florida which accepted its first class in September 1997, will be awarding the DMD in the year 2001.

The history of the two dental degrees has its roots in ancient medicine. Traditionally, medicine has been separated into two distinct disciplines. The first used medicines in the art of healing and the second used surgery in treating disease. For the ancient physicians who treated dental disease, surgery was the treatment of choice. Even two-hundred years ago, surgery was often the only choice available to treat disease or relieve dental pain. Even the Father of Modern Scientific Dentistry, Pierre Fauchard, referred to himself as "Surgeon Dentist" in Le chirurgien dentiste, ou, traité des dents (Fauchard, 1728). One hundred years after Fauchard's treatise on dentistry, the dentist-turned-physician, Dr. Samuel Sheldon Fitch introduced the title "Dental Surgeon" to replace "Surgeon Dentist." By the time the first dental school was founded in 1840, the words dental surgeon and dental surgery were in vogue, and it was determined that graduating students would receive the Doctor of Dental Surgery degree.

The DDS degree stood as the only degree awarded dentists for over a



Dr. Lalumandier is Executive Officer, Department of Community Dentistry; Dr. Pyle is Assistant Professor; and Dr. Sawyer is Professor and Chair, Department of Oral Diagnosis and Radiology at Case Western Reserve University, School of Dentistry, 10900 Euclid Avenue, Cleveland, Ohio 44106-4905, (216) 368-3276, jal10@po.cwru.edu. The authors acknowledge Barbara Anderson, Diveya Reddy, and Judi Chesler for their assistance interviewing.

quarter century until the Harvard Dental School was established in 1867. Two years later Harvard awarded its first graduates the DMD on February 16, 1869. The DMD degree originated from the work of a Harvard Latin Scholar who suggested that "Medicinae Doctor" be prefixed with "Dentaraie" to become "Dentaraie Medicinae Doctor" or DMD. However, the DMD degree never became widely used by dental schools, and the DDS degree remained the more popular degree even one hundred years following its inception. Only since WWII has the DMD dramatically increased in popularity. With the increased popularity of the DMD, confusion between the two dental degrees has only heightened for both lay and professional groups.

In 1963 a resolution was proposed to the ADA House of Delegates asking for consolidation of the DDS and DMD degrees. In both instances the ADA referred the matters to its

Council on Dental Education which. together with the American Association of Dental Schools, surveyed dental school deans. While the surveys showed that the majority of deans believed that the DMD degree more adequately described dentists of today, they were inclined to leave the decision of granting either degree to the individual dental schools (American Association of Dental Schools, 1965). During this time, camps were forming that favored either the DDS degree (Robinson, 1966) or the DMD degree (Burket, 1966). By 1972, the ADA passed a resolution encouraging dental schools to award the DMD degree (American Dental Association, 1972). However, in 1991 a third resolution was proposed to the ADA House, but this time it was determined that there was no significant confusion about the two degrees and no action should be taken (American Dental Association, 1991).

	Sample Size (n)	Percentage (%)
Gender		
Male	188	35.9
Female	332	63.4
Missing	4	0.8
Race		
Caucasian	265	50.6
African American	n 170	32.4
Asian	5	1.0
Other	9	1.7
Missing	75	14.3
Education		
Less than high sch	nool 31	5.9
High school	199	38.0
2-year college	117	22.3
4-year college	93	17.7
Graduate school	77	14.7
Declined to respo	ond 7	1.3

The purpose of this study was (1) to determine the level of confusion among lay persons concerning these degrees and (2) to identify and explore any basis for any public opinion.

Methods

An interview survey (Figure 1) was developed by the authors to gather demographic data of those interviewed and information by which we could determine any perceived differences in training between those receiving the two dental degrees. Potentially sensitive questions such as highest level of education completed, age, and income of the respondents were asked late in the interview process to increase response rates. Both questions on gender and race were recorded by interviewers from observations. Questions 3 through 5 were asked in order of complexity. Question 6 was asked to determine the proportion of those questioned who knew that both abbreviations referred to non-physicians. Question 7 was asked to answer any differences in level of education and training and Question 8 identified the degree with the higher perceived level of training.

Interviewers were trained by one of the developers of the questionnaire. A total of five interviewers was used in four designated locations in Northeast Ohio: a Midwestern private school of dentistry, a Midwestern community college, a suburban Midwestern city, and an inner city church. These locations offered different population groups: the majority of people interviewed were questioned at Case Western Reserve University Dental Clinic and represented a racially mixed diverse group with incomes ranging from low to middle class. Of those seen in the dental clinic, most were interviewed at their initial visit to the school before they could develop biases towards a particular degree. Cuyahoga Community College gave an additional number of individuals with diverse ethnicity having incomes in the low to middle ranges. Hudson is a small town lo-

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	Today	/'s date://19		
2.	Locat	ion:		
3.	lf you	needed a filling who would ye	ou visit?	
	(1)	DDS	(3)	either DDS or DMD/doesn't matter
	(2)	DMD	(9)	not sure/don't know
1.	lf you	needed dental surgery who w	vould yo	u visit?
	(1)	DDS	(3)	either DDS or DMD/doesn't matter
	(2)	DMD	(9)	not sure/don't know
5.	lf you	had a heart problem and nee	eded de	ntal surgery who would you visit?
	(1)	DDS	(3)	either DDS or DMD/doesn't matter
	(2)	DMD	(9)	not sure/don't know
5.	lf you	needed to have your append	lix remo	ved who would you visit?
	(1)	DDS	(4)	neither DDS or DMD
	(2)	DMD	(9)	not sure/don't know
	(3)	either DDS or DMD/doesn't n	natter	
7.	Do bo	oth professionals have the same	e level o	of training?
	(1)	yes (skip to Q-9)	(9)	not sure/don't know (skip to Q-9)
	(2)	NO		
3.	If ans	wer to Q-7 is no, who has the l	higher le	evel of training?
	(1)	DDS	(9)	not sure/don't know
	(1) (2)	DDS DMD	(9)	not sure/don't know
low	(1) (2) we wou	DDS DMD Id like some information about	(9) t vou	not sure/don't know
low v	(1) (2) we wou What	DDS DMD Id like some information about is your zip code?	(9) t you.	not sure/don't know
low \ 9. 0.	(1) (2) we wou What Wher	DDS DMD Id like some information about is your zip code? was your last dental visit?	(9) t you.	not sure/don't know (9) not sure/don't know
low \ 9. 0.	(1) (2) we wou What Wher (1)	DDS DMD Id like some information about is your zip code? was your last dental visit? within the year	(9) t you.	 not sure/don't know (9) not sure/don't know (9) not sure/don't know
low v 9. 0.	(1) (2) we wou What Wher (1) (2)	DDS DMD Id like some information about is your zip code? was your last dental visit? within the year longer than a year	(9) t you.	 not sure/don't know (9) not sure/don't know (9) not sure/don't know
low v 9. 0. 1.	(1) (2) We wou What When (1) (2) How	DDS DMD Id like some information about is your zip code? was your last dental visit? within the year longer than a year do you pay for dental care?	(9) t you.	not sure/don't know (9) not sure/don't know (9) not sure/don't know
low v 9. 0. 1.	(1) (2) What What (1) (2) How (1)	DDS DMD Id like some information about is your zip code? was your last dental visit? within the year longer than a year do you pay for dental care? cash	(9) t you. 	not sure/don't know (9) not sure/don't know (9) not sure/don't know Medicaid
low \ 9. 0. 1.	(1) (2) What What (1) (2) How (1) (2)	DDS DMD Id like some information about is your zip code? was your last dental visit? within the year longer than a year do you pay for dental care? cash private dental insurance	(9) t you. (3) (9)	not sure/don't know (9) not sure/don't know (9) not sure/don't know Medicaid not sure/don't know
low x 9. 0. 1.	(1) (2) What What (1) (2) How (1) (2) What	DDS DMD Id like some information about is your zip code? was your last dental visit? within the year longer than a year do you pay for dental care? cash private dental insurance is the highest level of educatio	(9) t you. (3) (9) on that y	not sure/don't know (9) not sure/don't know (9) not sure/don't know Medicaid not sure/don't know You have completed?
low v 9. 0. 1.	(1) (2) What What (1) (2) How (1) (2) What (1)	DDS DMD Id like some information about is your zip code? was your last dental visit? within the year longer than a year do you pay for dental care? cash private dental insurance is the highest level of education non-high school araduate	(9) t you. (3) (9) on that y (4)	not sure/don't know (9) not sure/don't know (9) not sure/don't know Medicaid not sure/don't know You have completed? graduate of 4-year colleae program
low \ 9. 0. 1.	(1) (2) What What (1) (2) How (1) (2) What (1) (2)	DDS DMD Id like some information about is your zip code? was your last dental visit? within the year longer than a year do you pay for dental care? cash private dental insurance is the highest level of education non-high school graduate high school graduate	(9) t you. (3) (9) on that y (4) (5)	 not sure/don't know (9) not sure/don't know (9) not sure/don't know Medicaid not sure/don't know Medicaid not sure/don't know you have completed? graduate of 4-year college program attended grad or professional school
low v 9. 0. 1.	(1) (2) What What (1) (2) How (1) (2) What (1) (2) (3)	DDS DMD Id like some information about is your zip code? was your last dental visit? within the year longer than a year do you pay for dental care? cash private dental insurance is the highest level of education non-high school graduate high school grad or GED araduate of 2-year college	(9) t you. (3) (9) on that y (4) (5) (9)	not sure/don't know (9) not sure/don't know (9) not sure/don't know Medicaid not sure/don't know You have completed? graduate of 4-year college program attended grad or professional school not sure/don't know
low \ 9. 0. 1. 2.	(1) (2) We wou What When (1) (2) How (1) (2) What (1) (2) (3) What	DDS DMD Id like some information about is your zip code? was your last dental visit? within the year longer than a year do you pay for dental care? cash private dental insurance is the highest level of education non-high school graduate high school grad or GED graduate of 2-year college year were you born? 19	(9) t you. (3) (9) on that y (4) (5) (9)	not sure/don't know (9) not sure/don't know (9) not sure/don't know Medicaid not sure/don't know You have completed? graduate of 4-year college program attended grad or professional school not sure/don't know
low v 9. 0. 1. 2.	(1) (2) We wou What (1) (2) How (1) (2) What (1) (2) (3) What (8)	DDS DMD Id like some information about is your zip code? was your last dental visit? within the year longer than a year do you pay for dental care? cash private dental insurance is the highest level of education non-high school graduate high school grad or GED graduate of 2-year college year were you born? 19 unwilling to disclose	(9) t you. (3) (9) on that y (4) (5) (9) –	not sure/don't know (9) not sure/don't know (9) not sure/don't know Medicaid not sure/don't know you have completed? graduate of 4-year college program attended grad or professional school not sure/don't know
low v 9. 0. 1. 2. 3.	(1) (2) We wou What Wher (1) (2) How (1) (2) What (1) (2) (3) What (8) What	DDS DMD Id like some information about is your zip code? n was your last dental visit? within the year longer than a year do you pay for dental care? cash private dental insurance is the highest level of education non-high school graduate high school grad or GED graduate of 2-year college year were you born? 19 unwilling to disclose is your household's yearly inco	(9) t you. (3) (9) on that y (4) (5) (9) me?	not sure/don't know (9) not sure/don't know (9) not sure/don't know Medicaid not sure/don't know You have completed? graduate of 4-year college program attended grad or professional school not sure/don't know
low v 9. 0. 1. 2. 3.	(1) (2) What What (1) (2) How (1) (2) What (1) (2) (3) What (8) What (1)	DDS DMD Id like some information about is your zip code? was your last dental visit? within the year longer than a year do you pay for dental care? cash private dental insurance is the highest level of education non-high school graduate high school grad or GED graduate of 2-year college year were you born? 19 unwilling to disclose is your household's yearly inco less than \$20.000	(9) t you. (3) (9) on that y (4) (5) (9) me? (4)	 not sure/don't know (9) not sure/don't know (9) not sure/don't know Medicaid not sure/don't know Medicaid graduate of 4-year college program attended grad or professional school not sure/don't know \$60.000 or more
low v 9. 0. 1. 2. 3. 4.	 (1) (2) We wou What (1) (2) How (1) (2) What (3) What (8) What (1) (2) 	DDS DMD Id like some information about is your zip code? n was your last dental visit? within the year longer than a year do you pay for dental care? cash private dental insurance is the highest level of education non-high school graduate high school grad or GED graduate of 2-year college year were you born? 19 unwilling to disclose is your household's yearly inco less than \$20,000 \$20,000 to \$39,990	(9) t you. (3) (9) on that y (4) (5) (9) – me? (4) (8)	 not sure/don't know (9) not sure/don't know (9) not sure/don't know Medicaid not sure/don't know Medicaid graduate of 4-year college program attended grad or professional school not sure/don't know \$60,000 or more unwilling to disclose

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Table 2: Sample Freq	uency Counts	by Dental	Degree
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	Restorations	Oral Surgery ⁽¹⁾	Oral Surgery with Heart Condition ⁽²⁾	Appendix Removal	Higher Education ⁽³⁾
Dental Dear					
	64 6	245	110	10	10.4
DDS	01.0	04.0	14.9	1.9	12.1
DMD	5.2	25.0	40.3	23.1	69.0
Either	12.8	12.4	12.8	3.1	NA ⁽⁴⁾
Neither	NA ⁽⁵⁾	NA ⁽⁵⁾	NA ⁽⁵⁾	50.8	NA ⁽⁵⁾
Not sure	20.4	27.9	31.7	21.2	18.9

(1) Missing value=1

⁽²⁾ Missing values=2

⁽³⁾ N=232 who answered no to Question 7, "Do both professionals have the same level of training?" and therefore answered Question 8, "Who has the higher level of training?"

⁽⁴⁾ Not applicable because survey instrument did not contain either as a response for question 8.

⁽⁵⁾ Not applicable because survey instrument did not contain neither as a response for questions 3 through 5 and 8.

cated mid-way between Cleveland and Akron, Ohio, and is predominately a higher socioeconomic community which serves as a bedroom community for Cleveland-Akron Consolidated Metropolitan Area (CMSA). The church was chosen because it had predominately an urban African-American congregation.

Northeast Ohio, in particular the Cleveland-Akron Consolidated Metropolitan Area with a combined population of nearly three million residents, was chosen for this study due to proximity of the investigators. While a convenience sample was employed, the sampling scheme used four different locations to capture a diverse sample with regard to gender, race, and socioeconomic status. From each of four locations, individuals were chosen at random to be part of the survey.

Questionnaires were edited for completeness and accuracy and coded where necessary. The SPSS for Windows software package was used for data computation. Chi-square (χ^2) analysis was employed to determine the effects of gender, frequency of dental visits, type of dental insurance, education level, age, income, and race on public perception of the DDS and DMD degrees.

Results

Sample Results: The sample of persons (see Table 1) interviewed yielded a total of 524 people surveyed over a three-month period (April-June) in 1997. Three hundred twenty-six were interviewed at the school of dentistry, 86 at the community college, with 54 and 58 surveyed at Hudson, Ohio, and at the church, respectively. The majority of those interviewed were females (63.4%), slightly over half the respondents (50.6%) were white; and nearly three-quarters (72.1%) had visited a dentist within the year. While nearly one-quarter (22%) of respondents were unwilling to disclose their

household yearly income, 22.5% had incomes less than \$20,000, 22.7% had incomes ranging from \$20,000 to \$39,999, and 32.8% had incomes of \$40,000 or greater. Unlike incomes, only seven individuals refused to indicate their highest level of education. The overwhelming majority had at least a high school education (n=486)with 22.3% having graduated from a two-year college program, 17.7% graduated from a four-year college and 14.7% had attended graduate or professional schools. Respondents ranged in age from 18 years to 95 years with the greatest numbers (n=185) between 30 and 50 years of age; 172 respondents were 50 years old or greater, and 132 participants under 30 years of age.

Statistical Analysis Results: Subjects responded to survey questions of increasing technical difficulty relating their perceptions of whether they would choose to have a DDS or DMD complete the specific dental or medical procedure. As the dental procedures increased in technical ability from Question 3 to Question 6, those interviewed were more likely to respond DMD than DDS (see Table 2).

To Question 3, "If you needed a filling, who would you visit?" 61.6% answered DDS and only 5.2% responded DMD while 20.4% responded "don't know" (see Table 2). Using chi-square analysis all seven variables studied were statistically significant (see Table 3). Females were more likely to know that either DDS or DMD could place fillings. Females were 2.5 times more likely to respond correctly than males (16.3% vs 6.4%, respectively). Those interviewed who also had a dental visit within the year were 1.6 times more likely to respond correctly than those who had a dental visit more than a year ago (13.8% vs 8.8%, respectively). Medicaid respondents were more likely to know the right answer than those who paid for dental care with cash or private dental insurance (14.6% vs 12.7% vs 12.6%, respectively). Education also proved to be an important factor with those

Survey Questions	DDS (n)	DMD (n)	Either (n)	Not Sure (n)	χ²	P-value
Gender ⁽¹⁾					12.14	0.007
Male (n=188)	124	8	12	44		
Female (n=332)	199	19	54	60		
Dental visits ⁽²⁾					19.23	0.004
<1 year (n=378)	242	22	52	62		
>1 year (n=136)	78	5	12	41		
Payment method ^{(;}	3)				28.74	<0.001
Cash (n=237)	145	12	30	50		
Insurance (n=231)	153	15	29	34		
Medicaid (n=41)	15	0	6	20		
Education ⁽⁴⁾					65.67	<0.001
<high (n="31)</td" schl=""><td>9</td><td>3</td><td>1</td><td>18</td><td></td><td></td></high>	9	3	1	18		
High schl (n=199)	111	14	21	53		
2-yr col (n=117)	72	5	17	23		
4-yr col (n=93)	71	3	16	3		
Grad educ (n=77)	57	2	10	8		
Age ⁽⁵⁾					41.89	<0.001
<30 yrs (n=132)	61	6	30	35		
30-50 yrs (n=185)	127	6	26	26		
50 & > (n=172)	110	13	5	44		
Income ⁽⁶⁾					16.53	0.011
<\$20k (n=118)	60	7	18	33		
\$20k-\$39k (n=119)	77	6	10	26		
> \$40k (n=172)	117	7	27	21		
Race ⁽⁷⁾					22.00	<0.001
White (n=265)	179	8	34	44		
Non-white (n=184)	93	17	19	55		
		(4) Missioo volue	s=7			
$^{(2)}$ Missing values=10)	⁽⁵⁾ Missing values	=35			
$^{(3)}$ Missing values -15		⁽⁶⁾ Missing values	=115			
11133119 V010C3-10		⁽⁷⁾ Missing values	=75			

Table 3: Chi-Square Results of Statistical Significance for Question Three "If you needed a filling who would you visit?"

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having some college knowing the correct answer more frequently than those with a high school education or less (15.0% vs 9.6%, respectively). Younger individuals responded correctly more frequently than those 30 to 50 years old or those over 50 years (22.7%) vs 14.1% vs 2.9%, respectively). Individuals earning \$20,000-\$39,999 yearly were less likely to know the correct answer compared to individuals earning less than \$20,000 or those earning \$40,000 or more, (8.4% vs 15.3% vs 15.7%, respectively). Caucasians were slightly more likely to know the right to answer over nonwhites (12.8% vs 10.3%).

To Question 4, "If you needed dental surgery who would you visit?" 34.5% answered DDS with 25.0% responding DMD (see Table 2). Using chi-square analyses, only gender, age, income, and race were statistically significant (see Table 4). Females were 2.3 times more likely to know the correct answer than males (15.7% vs 6.9%). Again, younger individuals were more likely to know the right answer over older respondents (18.3% for those under 30 years, 13.0% for 30-50 year olds, and 8.1% for those 50 years and greater). Individuals earning less than \$20,000 (17.8%) were most likely to know the right answer over those

earning \$40,000 plus (13.4%) or \$20,000-\$39,999 (8.5%). Again, Caucasians (13.6%) were more likely to give correct answers compared to nonwhite respondents (8.7%).

With Question 5, "If you had a heart problem and needed dental surgery who would you visit?" only 14.9% answered DDS while 40.3% responded DMD. Females were more likely to know the right answer than males but the result was not statistically significant (p=0.056). The only variables statistically significant were last dental visit and income (see Table 5). Individuals who had visited the dentist within a year were more likely

Table 4: Chi-Square Results of Statistical Significance for Question Four "If you needed dental surgery who would you visit?"

Survey Questions	DDS (n)	DMD (n)	Either (n)	Not Sure (n)	χ^2	P-value
Gender ⁽¹⁾					10.12	0.018
Male (n=188)	75	45	13	55		
Female (n=331)	106	86	52	87		
Age ⁽²⁾					28.26	<0.001
<30 yrs (n=131)	33	46	24	28		
30-50 yrs (n=185)	61	49	24	51		
50 & > (n=172)	69	27	14	62		
Income ⁽³⁾					13.19	0.040
<\$20k (n=118)	35	34	21	28		
\$20k-\$39k (n=118)	39	24	10	45		
> \$40k (n=172)	60	49	23	40		
Race ⁽⁴⁾					11.12	0.011
White (n=264)	77	73	36	78		
Non-white (n=184)	79	36	16	53		

(1) Missing values=5

(2) Missing values=36

⁽³⁾ Missing values=116

(4) Missing values=76

Survey Questions	DDS (n)	DMD (n)	Either (n)	Not Sure (n)	χ^2	P-value
Dental visits ⁽¹⁾					18.02	0.006
<1 year (n=376)	67	145	50	114		
>1 year (n=136)	11	65	15	45		
Income ⁽²⁾					15.92	0.014
<\$20k (n=118)	15	53	17	33		
\$20k-\$39k (n=118)	24	40	12	42		
> \$40k (n=171)	12	81	27	51		
⁽¹⁾ Missing values=12 ⁽²⁾ Missing values=117						

Table 5: Chi-Square Results of Statistical Significance for Question Five "If you had a heart problem and needed dental surgery who would you visit?"

to respond with the right answer compared to those who had not seen a dentist in over one year (13.3% vs 11.0%). Those earning \$40,000 or greater were more likely to know the right answer over those with lower

income with 15.8% for >\$40,000 vs 14.4% for <\$20,000 vs 10.2% for \$20,000-\$39,999.

Table 6: Chi-Square Results of	Statistical	Significance	for Question Si	X
"If you needed to have your append	dix remove	d who would ve	ou visit?"	

Survey Questions	DDS (n)	DMD (n)	Either (n)	Neither (n)	Not Sure (n)	χ²	P-value
Education ⁽¹⁾					••••••••	105.9	<0.001
<high (n="31)</td" schl=""><td>0</td><td>13</td><td>3</td><td>7</td><td>8</td><td></td><td></td></high>	0	13	3	7	8		
High schl (n=199)	3	47	11	85	53		
2-yr col (n=117)	3	26	2	65	21		
4-yr col (n=93)	1	20	0	59	13		
Grad educ (n=77)	0	15	0	48	14		
Income ⁽²⁾						28.41	<0.001
<\$20k (n=118)	4	38	8	44	24		
\$20k-\$39k(n=119)	3	24	3	55	34		
> \$40K (n=172)	1	36	1	103	31		
(1) Missing values=7							
⁽²⁾ Missing values=115	j						

Table 7: Chi-Square Results of Statistical Significance for Question Seven

"Do both professionals have the same level of training?"

Survey Questions	Yes (n)	No (n)	Not Sure ((∩) χ ²	P-value
Income ⁽¹⁾				17.82	0.023
<\$20k (n=118)	29	49	40		
\$20k-\$39k (n=118)	22	46	50		
> \$40k (n=171)	35	80	56		

With Question 6, "If you need to have your appendix removed who would you visit?," the majority of those interviewed knew that it was neither DDS or DMD (see Table 2). However, some respondents obviously did not know the meaning of the abbreviations. Table 2 shows that those interviewed and choosing a dental degree overwhelmingly selected DMD (23.1%) over DDS (1.9%). Those with greater education (see Table 6) knew the correct answer over those with less education. Interviewees with some college knew the correct answer more frequently than those with a high school education or less (59.9% vs 40.0%). Likewise, those with greater income knew the answer more than those earning less income. Those earning \$40,000 or more were more likely to know the right answer over those with lower income with 59.9% for > \$40,000 vs 46.2% for \$20,000-\$39,999 vs 37.3% for < \$20,000.

For Question 7, "Do both professionals have the same level of training?" only 19.6% of those interviewed realized that both DDS and DMD have the same level of training. Furthermore, only the income variable was statistically significant by chisquare analysis (see Table 7). Individuals with incomes less than \$20,000

(24.6%) had the most correct answers vs individuals with incomes between \$20,000-\$39,999 (18.6%) vs those with incomes greater than \$40,000 (20.5%). Of the 232 interviewed who answered Question 8, "Who has the higher level training?," the vast majority of (69.0%) declared that the DMD had more training than the DDS (12.1%). The remaining 18.9% responded not sure (see Table 2). For the variables studied, only income and race were statistically significant (see Table 8). Of those who thought there was a difference in training, 81.0% of the group in the highest income bracket thought DMD had more training compared to 56.6% of the middle income and 67.3% of the lower income group (p=0.015). Caucasians (82.3%) were more likely than non-whites (49.5%) to think DMDs had more training than DDSs (p < 0.001).

Discussion

For the lay person interviewed in this study, confusion about the differences between the two dental degrees definitely exists. Only 19.6% knew that the DDS and DMD degrees required the same level of training. While nearly 40% were not sure, over 40% felt that there was a difference in training. For every person who knew the correct answer, two were not sure, and two felt there was a difference in training. If one perceives a difference in training, which degree is more preferable in the eyes of the public and what is the basis of the preference? As individuals were questioned as to which professional they would visit for treatment, it became apparent early in the interview process that as the complexity of procedures increased more and more people responded with DMD over DDS. When analyzing responses from Questions 3-7 and only considering those who responded with either DDS or DMD, a definite pattern was established. For fillings, only 5.2% felt it necessary to visit a DMD. However if one needed dental surgery, one-quarter would elect to visit a DMD while one-third would see a DDS. As a patient's health condition worsened, people said they would be much less likely to see the DDS and opted to visit a DMD, nearly three times more frequently. Even for those procedures outside the realm of dentistry, the DMD was the overwhelming professional of choice. At the conclusion of the interview, a great many people commented that they felt the DMD sounded more like a medical doctor because of the MD portion of the abbreviation, and therefore the DMDs were able to perform more complex procedures as compared to the DDS degree.

The sample of lay persons surveyed showed confusion and differences in perception of dental professionals based on the degree conferred. While this particular study population more positively perceived the DMD over the DDS degree, it can not be construed as a generalizable sample. Although we choose a diverse sample of subjects from a multitude of sites, the sampling frame was convenient in design to include Northeast Ohio communities in particular the Cleveland-Akron CMSA with a population of nearly three million with approximately 80% Caucasian, 17% African American, 1% Asian, and 2% other. Within this geographic

area, the vast majority of dentists graduated either from Case Western Reserve University or The Ohio State University School of Dentistry, both granting a DDS degree. While the majority of practicing dentists hold a DDS degree, there were some who have a DMD degree, especially from the University of Pittsburgh School of Dentistry. Since over half of those interviewed were surveyed in an institution which conferred the DDS degree and with the majority of practicing dentists having the DDS degree, one may presume the bias would gravitate toward the DDS degree. Unexpectedly, the result was just opposite.

Additional studies are required to assess the level of confusion between the two dental degrees, particularly in areas where both degrees are equally represented; to identify and explore the more positively perceived degree; and if in fact one unified dental degree might serve the dental profession in decreasing confusion among the lay public. As Dr. Lawrence Meskin stated in a JADA editorial, there should be one unified dental degree to eliminate ambiguity and maximize public understanding, and that degree should be based on the highest yield of public confidence in the dental profession (Meskin, 1993). The important issue is not which degree should be used, but whether one degree should be used. With additional survey design research aimed at both the lay population and dental professionals (dental schools deans, faculty, and alumni), the one unified degree could be determined. If unification is not possible, the dental profession needs to educate the lay public that both dental degrees are exactly the same. As with this study, additional research will identify those population groups of the lay public who should be targeted in the education process.

Conclusion

Both dental degrees require the exact same level of training and expertise and it should be the responsibility of the dental profession to promote greater dissemination of this information to the public. Confusion exists among lay persons regarding the similarity of training for dentists graduating with the DDS or DMD degrees. Future consideration of the establishment of one unified degree for dentists may ultimately contribute to enhanced public understanding of the training and capabilities of licensed dental clinicians in the United States.

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Table 8: Chi-Square Results of Statistical Significance for Question Eight "If answer to Q-7 is no, who has the higher level of training?"

Survey Questions	DDS (n)	DMD (n)	Not Sure (n)	χ²	P-value
*				40.04	0.045
Income	0	0.5	~	12.34	0.015
<\$20K (N=52)	8	35	9		
\$20k-\$39k (n=53)	6	30	17		
> \$40k (n=84)	7	68	9		
Race**				28.75	<0.001
White (n=113)	9	93	11		
African Am (n=85)	15	43	27		
Asian (n=3)	1	1	1		
Other (n=3)	0	1	2		
* Missing values=43					
** Missing values=28					

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Technical Glossary

Editor's note: In an effort to make research papers that contain technical concepts more "user friendly," the Journal will attach a technical glossary to these papers where it seems useful.

Chi-square: The most common measure of strength of association between variables that are categories is the chi-square test. (χ^2 , the Greek letter, rhymes with "my share.") Assume that a dentists notices 8 failures of composite restorations during a month and 12 failures of amalgams. On the face of it, amalgams are more likely to fail. But this conclusion ignores the baseline. Let's also assume that this dentist uses composites in 30% of the cases and amalgams in 70% of the cases. There were 20 failures (eight composite and 12 amalgam); if they were distributed randomly there should be six composite failures (20 * .3) and 14 amalgam failures (20 * .7). Now it appears that composites have the higher failure rate. Chi-square is an easy statistic to calculate by hand, and the formula is found in all introductory statistics texts.

The most common form in which chi-square is encountered in the literature is a 2 x 2 table or some other measure of association between two variables. Let's make the case of composite and amalgam more interesting by looking at failures of restorations in molars, incisors, and other teeth. Now we have a 2 (materials) by 3 (location) table, with counts of the number of failures in each of the six cells. The expected number of failures for composites in incisors is the probability of the restoration being a composite (composite / total number of restorations that failed) multiplied by the probability of being in an incisor (incisor / total number of restorations that failed). The difference between the expected number

of failures in each category and the observed number is used in calculating the chi-square. The larger the differences between the expected frequencies in each category and the observed frequencies, the larger the chi-square value and the smaller the probability that the results are due to chance alone.

The chi-square test is used when the results one is looking at are counts (not values such as millimeters of attachment or degree of failure-just a dichotomous yes or no). The variables one is exploring are also categories (type of restoration, location in the arch) that cannot necessarily be arranged in order (arch position can but restoration type cannot). A significant chisquare value shows that the association between variables is not random, but it does not prove that one is causing the effect seen in the other.

The Effects of Gender and Race on Practice Pattern Preferences of Dental Students

Janice M. Butters, RDH, MPH, EdD and Paul A. Winter, PhD

Abstract

Type of practice arrangement is an important decision for student dentists, and one that has implications for the future delivery of dental care. This study examined the effects of two student-related characteristics, gender and race, on dental student preferences for three practice arrangements: solo ownership, group ownership, and employee practice. Dental students read content-validated practice descriptions and rated each practice in terms of long-range practice preferences. The descriptions differed according to three practice-related factors: (a) decision-making autonomy, (b) income opportunity, and (c) financial risk. The independent variables were student gender and student race. The dependent variable was student rating of a dental practice. Results indicated that student preferences for different practice arrangements differ by gender and by race. Males rated the solo owner arrangement more favorably than did females and Whites rated the solo owner arrangement more favorably than did African Americans. Also, females demonstrated a stronger preference for group practice than did males, while African Americans rated the employee practice arrangement more favorably than did the solo owner favorably than did males, while African Americans rated the employee practice arrangement more favorably than did males, while African Americans rated the employee practice arrangement more favorably than did the male favorably than did the male favorably than did males, while African Americans rated the employee practice arrangement more favorably than did the male favorably than did the male favorably than did the favorably than did the male favorably than did

he type of practice activity to pursue during the course of a dental career is one of the most important decisions made by student dentists or by beginning practitioners. Career opportunities include positions in the public health arena, military dentistry, academics, and private dental practice. Existing research indicates that most dentists, at least as a primary source of income, choose to pursue a career in private practice (American Dental Association, 1993). However, even in the private practice arena there are still decisions to be made. Traditionally, solo

private practice has been, and continues to be, the predominant mode of dental practice in the United States, although in recent years there has been an increase in the percentage of dentists choosing to practice in other types of arrangements. The percentage of private practitioners working in a solo arrangement reached its peak in 1977 at 77% (Nash, 1991) and currently stands at 68.7% (American Dental Association, 1997). The remaining 31% of private practitioners have opted to practice with at least one other dentist (American Dental Association, 1997), either in an employee arrangement or in a practice with multiple owners.

The choice of practice arrangement pursued by dentists is important not only to the individual practitioner, but to the larger society as well, for three reasons. First, the type of practice arrangements students intend to pursue are linked to health care delivery and financing issues. For example, with the growth of managed care and the number of group practices, the profession may reflect an increased need for employee dentists. Second, the type of arrangement in which dentists choose to practice has implications for manpower planning (Waldman,



Dr. Butters is Associate Professor, Department of Periodontics, Endodontics, and Dental Hygiene, University of Louisville School of Dentistry, and Dr. Winter is Assistant Professor, Department of Administration and Higher Education, University of Louisville School of Education. Address correspondence to Dr. Butters at jmbutt01@gwise.louisville.edu

Table 1. Descriptive S	statistics for Study Participants
<u>Age (Years)</u>	
Mean	25.6
SD	3.0
Range	21-43
<u>Gender</u>	
Male	50.0% (88)
Female	50.0% (88)
Race	
African American	50.0% (88)
White	50.0% (88)
<u>Hometown</u>	
Urban	61.9% (109)
Rural	38.1% (67)
Marital Status	
Married	32.4% (57)
Not married	67.6% (119)

1981; 1983; 1985). Some research has indicated that employee dentists, particularly female practitioners, work fewer hours than do owner dentists (American Dental Association, 1989). Knowledge of student practice preferences, then, is important as we strive to ensure that the dental profession's capability to provide service is in line with societal needs. Finally, an awareness of student preferences regarding practice type is important for dental school administrators and for dental educators with respect to recruiting students into the profession and adequately preparing students to pursue and to succeed in their career opportunity of choice.

Changes in the practice patterns of private practitioners, coupled with the impact those changes may have for

the dental care system, have led to research exploring student and dentist characteristics which may affect practice arrangement preferences. Because of the increase in the number of women entering the profession, one characteristic which has been of primary interest is that of student or practitioner gender. With respect to gender, studies of both practitioners and of students (American Academy of Pediatric Dentistry, 1992; American Dental Association, 1989; Austin & Tenzer, 1980; Avery & Martin, 1988; Dolan, 1991; Dolan & Lewis, 1987; Goswami & Nikias, 1979; Hanes, Myers, Dushku, & Davis, 1992; Martens, Glasrud, & Burton, Niessen, 1993; Niessen, 1985; Kleinman, & Wilson, 1986; Price, 1990; Price & Fotos, 1987; Roberts,

McIver, & Phillips, 1993; Roeder & Harrison, 1989; Rosner, 1984: Solomon & Hayes, 1995; Solomon & Kleinman, 1985; Solomon & Pait, 1980: Solomon & Stoll, 1984: Talbot, 1961; Tillman & Horowitz, 1983; Waldman, 1972; 1981; 1983; 1992; Wilson, Branch, & Niessen, 1988; Winter & Butters, 1998) have resulted in three consistent findings. First, at the outset of their careers, females show a stronger preference for employee practice in the dental profession than do males. Second, females are more likely than are males to remain employee dentists for a longer period of time. Third, even on a longterm career basis, females are less likely than are males to become solo practice owners and more likely than are males to choose group owner or partnership arrangements.

Race is another personal characteristic that has been examined with regard to its effect on practice pattern preference, although research in this area is scarce. Mesa, Clark, Austin, and Barden (1981) investigated differences in career plans attributable to student race and found that practice preferences differed by ethnic background. White students indicated a stronger preference for self-employment in private practice whereas African American students expressed stronger interest in pursuing a residency followed by employment in a salaried position. Taylor and Kress (1987), surveying minority and nonminority students, reported that minorities were more likely than non-minorities to anticipate practicing in the public sector or pursuing a GPR followed by private practice. One study has been reported with regard to the preferences of practicing dentists. Price (1991) surveyed minority female dentists to gather information about current practice pattern status. Nearly all the respondents in this study were general dentists, with the majority in private practice. Of the private practitioners, 45% were associates, 20% were solo practitioners, and 37% were in a partnership or group arrangement.

Gender and race are important characteristics to examine with respect to effects on practice arrangement preferences. With regard to gender, the enrollment of females in dental schools has shown a 14% increase during the past decade and now stands at approximately 36% of total enrollment (Sinkford, 1992; 1998). Given the magnitude of these demographic changes in the dental student population and the resulting changes which will occur in the practitioner population, knowledge about the practice pattern preferences of today's female students is important in order to anticipate the effect these changes may have on the future dental care deliverv system.

With regard to race, there has been a decrease in the enrollment of minorities in dental schools in recent years, with the number of African American students decreasing from 973 in 1994 to 883 in 1997 (Sinkford, 1998). This represents less than 6% of the total dental school enrollment by a population group that comprises 12% of the total population (Sinkford, 1992). This finding is of particular concern for three reasons: (a) the African American population group is increasing as a percentage of the total population in the United States (Murdock & Hoque, 1998); (b) African Americans are an underserved dental population (Sinkford, 1992); and (c) minority graduates are likely to be the primary providers of services for the groups they represent (Tay-lor & Kress, 1987). Thus, information regarding the practice preferences of minority students takes on added significance relative to dental care delivery for a growing minority population which is already underserved.

Finally, there is a need for new research about gender and race from a research methods perspective. Most existing research about student practice preferences was developed using the survey questionnaire approach. While surveys have rendered valuable information, survey instruments do not permit a direct examination of possible gender by race interaction effects relative to practice choice decisions. This limitation was addressed in this study through the use of an experimental design that made it possible to determine if a gender by race interaction impacts practice choice decisions.

The purpose of this study was to explore two characteristics hypothesized to influence dental student practice arrangement preferences: student gender and student race. The study employed a factorial experiment with a balanced design to assess preferences under conditions where students make simulated practice pattern choices. Students reacted to content-validated descriptions of different practice arrangements which defined the characteristics of the practice, rather than simply responding to the name of the arrangement as has been done in most previous research. Because a balanced design was used, equal numbers of males and females and equal numbers of Whites and African Americans were included in the study, facilitating comparison of these population groups on an equal basis. Finally, the factorial experiment enabled the analysis not only of gender and race as main effects, but of any interactions that may be present, an issue heretofore not addressed in dental practice preference research. Accordingly, the null hypotheses tested in this study stated that (1) there are no differences in student ratings of dental practice patterns associated with student gender (male, female), (2) there are no differences in student ratings of dental practice patterns associated with student race (African American, White), and (3) there are no differences in student ratings of dental practice patterns associated with an interaction between student gender and student race.

Methods

The design selected for this study was a factorial experiment as specified by Campbell and Stanley (1963). The data analysis procedure was a 2 x 2 completely crossed, fixed-factor analysis of variance (ANOVA) with equal cell sizes (n=44). One hundred seventy-six students were selected at random from all dental students enrolled in two dental schools in the Southeast in the fall of 1998. Descriptive statistics for the study participants are shown in Table 1.

The sample size for the experiment was determined by a power analysis conducted according to procedures explicated by Cohen (1988). Analysis of preferences for the three practice arrangements required that three ANOVAs be performed. Accordingly, the level of significance was adjusted to .02, rather than the conventional level of .05, to control for the familywise error rate associated with performing multiple statistical tests with the same data (Keppel, 1991). The specifications for the power analysis included (a) a defined level of significance (alpha=.02), (b) a medium effect size (omega-squared=.06), and (c) a specified power level (power=.80). The above procedures rendered a cell size of 44 and a total sample size of 176.

The study participants completed a biographical data sheet and rated content-validated descriptions of three dental practice arrangements (solo owner, group owner, employee). Descriptions were composed of factors rated unanimously by a panel of experienced dental educators as being reflective of only one practice arrangement in order to provide the content validation. The descriptions differed according to three practice-related factors: (a) decision-making autonomy, (b) income opportunity, and (c) financial risk. Statements describing a solo ownership practice reflected complete decision-making autonomy on the part of the dentist, the opportunity to receive all income generated by the practice, and the assumption of all financial risks associated with the practice. Statements depicting a group ownership practice described practice partners sharing responsibility for practice-related decisions, sharing the

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practice income, and sharing the financial risks associated with the practice. Statements describing the dentist as having employee status reflected minimal decision making authority, income limited to a salary or percentage of production, and no personal liability for financial risks associated with the practice.

There were two independent variables examined in this study: student gender (male, female) and student race (African American, White). Both were assigned variables, with variable levels determined via participant selfreports on the biographical data sheets. The balanced ANOVA design resulted in equal representation in the study for males (n=88) half of whom were African American and females (n=88) half of whom were African American.

The dependent variable for each ANOVA was student rating of the

dental practice arrangement as a longterm career choice. Accordingly, the rating instrument contained instructions to rate the practice descriptions based on practice preferences "five years after graduation." Each participant reviewed and rated all three practice descriptions using two fivepoint Likert-type scales (5 being more favorable than 1). The two rating items were (a) likelihood of pursuing the practice arrangement described and (b) likelihood of practicing in the arrangement if available. The scale anchors for both items were "not at all likely" at the low end and "extremely likely" at the high end. The scores for the two items were summed to form an additive composite score for each description. Order of the items comprising the two composite scores was varied to control for possible order effects us-

Table 2. Summary of Means and Standard Deviations for Student Ratings of Solo, Group, and Employee Practice Arrangements

Gender		Mc	le	Female		
Race		African American	White	African American	White	
Solo	x	8.52	9.32	7.55	8.66	
	SD	1.91	1.25	2.21	2.03	
Group	x	6.41	5.36	7.11	6.80	
	SD	2.29	2.43	2.38	2.46	
Employee	x	5.05	3.00	4.77	3.50	
	SD	2.92	1.79	2.26	1.90	

<u>Note</u>. Means and standard deviations are based on additive composite scores.

ing counterbalancing procedures recommended by Keppel (1991).

To determine if students would perceive the differences in the practice arrangement descriptions, a pilot group composed of dental students (n=52) used the above instruments to rate the dental practice arrangements. Each pilot participant reviewed and rated one of the three practice arrangements. After performing the rating, participants completed a oneitem questionnaire to determine if the participants could identify the type of practice arrangement described on the research instrument. Fifty-one of the pilot participants (98%) correctly identified the arrangement, indicating the factors associated with the practice arrangements were perceived as intended.

Results

A reliability analysis was performed to assess the internal consistency of the composite scores for the dependent variable in the three ANOVAs. The computed coefficient alpha was .93 for the solo practice composite score, .95 for the group practice composite score, and .96 for the employee composite score. All reliability coefficients were within the acceptable range recommended by Nunnally (1967) for use of a composite score in statistical analysis.

The means and standard deviations for the ANOVA procedures are shown in Table 2. Table 3 contains the results of the ANOVAs. For the solo practice arrangement, there were two significant sources of variance: the main effect for gender and the main effect for race. Males rated the solo owner arrangement more favorably than did females. Also, Whites rated the solo owner arrangement more favorably than did African Americans. To assess the practical significance of these results, omega-squared was computed. The full ANOVA model explained 9.1% of the variance in student ratings of the solo practice arrangement.

For the group practice arrangement, one source of variance was significant. Females demonstrated a stronger preference for group practice arrangement than did males. Omegasquared calculations indicated that 4.2% of the variance in student ratings of the group practice arrangement was explained by student gender.

For the employee practice arrangement, the ANOVA results indicated that the main effect for race was the only significant source of variance. African Americans rated the employee practice arrangement more favorably than did Whites. The percent of variance in student ratings of the employee practice arrangement explained by student race was 11.5%.

Discussion

The purpose of this study was to explore the main and interaction effects of two student-related characteristics (gender and race) on dental student practice arrangement preferences. The results supported rejection of two null hypotheses at the .02 level. Those hypotheses were: (1) there are no differences in student ratings of dental practice patterns associated with student gender, and (2) there are no differences in student ratings of dental practice patterns associated with student race. No significant differences in student ratings of dental practice patterns associated with an interaction between gender and race were detected. Accordingly, the third null hypothesis tested in this study was not rejected.

With respect to the solo owner arrangement, this study indicates that males rate the solo owner arrangement more favorably than do females and Whites rate the solo owner arrangement more favorably than do African Americans. These findings suggest a preference on the part of both males and Whites for a practice arrangement in which they can maximize their income potential while assuming the financial risk and decisionmaking responsibilities of a business owner. For the group owner arrangement, results indicate that females are more attracted than are males to becoming one of multiple owners of a practice, an arrangement characterized by sharing financial risk and decisionmaking, as well as sharing practice income, with other practice owners. With respect to the employee arrangement, African Americans rate that arrangement more favorably than do Whites. This finding suggests that African Americans prefer to minimize financial risk and decision-making responsibilities while maximizing income security, characteristics associated with an employee practice arrangement. In general, these findings are consistent with previous research about practice preferences, with one exception. Most previous studies have reported a stronger preference on the part of females than on the part of males for employee practice, a difference not detected in this study.

Historically, African Americans have faced greater economic hardship than have Whites, reporting lower median household incomes (Murdock & Hoque, 1998) and difficulty in securing business loans (Sinkford, 1992). The disparity between African American and White economic status may account for (a) the lower preference of African American participants for a practice arrangement involving maximum financial risk and (b) the greater preference of African American participants for a practice arrangement (i.e., employee) with minimal financial risk.

With regard to differences by gender, several researchers have reported differences between male dentists and female dentists in work intensity (American Dental Association, 1989; Avery & Martin, 1988; Dolan, 1991; Dolan & Lewis, 1987; Martens, Glasrud, & Burton, 1985; Price & Fotos, 1987; Roberts, McIver, & Phillips, 1993; Roeder & Harrison, 1989; Rosner, 1984; Solomon & Hayes, 1995; Tillman & Horowitz, 1983; Waldman, 1981; 1985; 1992; Wilson, Branch, & Niessen, 1988), with females working fewer hours and taking more career leaves than their male counterparts. This finding is particularly true for practitioners with children (Brennan, Spencer, & Szuster, 1992; Matthews & Scully, 1994; Tillman & Horowitz, 1983; Whitehead, Williams, & Eccles, 1977). It may be that female dental students perceive that it is more feasible to work fewer hours in order to meet family obligations when practicing in a group owner arrangement, rather than a solo owner arrangement, because practice responsibilities as a group owner, including the continuity of patient care, are shared with others.

Dental student preferences regarding the practice patterns they intend to pursue are important considerations for the dental profession, as well as for health policy analysts and dental educators concerned with the future of the profession. Knowledge of student preferences provides insight into critical planning issues regarding the dental care delivery system, dental school curricula, and dental student recruitment. With regard to the dental care delivery system, growth in the number of group practices has been documented in the literature (Waldman, 1991). Given the increase in the number of female dental students and dentists, and the stronger preference of females for practicing in a group arrangement, it seems likely that the proportion of group practice arrangements in the delivery system will be maintained, if not increased.

It will be important for health care policy analysts to monitor current and future trends in practice patterns in two regards. One factor is the effect that the growth of group practices has on the status of alternative payment plans in the dental care system. Solo dental practitioners have shown resistance to managed care systems, often believing that such plans interfere with their decision making authority as sole business owners. Practitioners pursuing alternative arrangements, such as group ownership, have already chosen to share that authority with others, indicating that these individuals may be attracted to

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	Source	df	SS	MS	F	Omega Squared
Solo	Gender	1	29.455	29.455	8.260*	.038
	Race	1	40.091	40.091	11.243**	.053
	Gender x Race	1	1.114	1.114	.312	
	Error	172	613.318	3.566		
	Total	175	683.978			
Group	Gender	1	50.205	50.205	8.790*	.042
	Race	1	20.455	20.455	3.581	
	Gender x Race	1	5.818	5.818	1.019	
	Error	172	982.409	5.712		
	Total	175	1,058.887			
Employee	Gender	1	.568	.568	.111	
	Race	1	121.114	121.114	23.709**	.115
	Gender x Race	1	6.568	6.568	1.286	
	Error	172	878.636	5.108		
	Total	175	1,006.886			

Table 3 Applyses of Variance for Student Batings of Sala Group, and Employee Practice

less business autonomy than are their solo practice counterparts. Accordingly, a growth in the number of group practices could have a significant impact on the status of alternative payment plans and financing arrangements in the dental arena. The second factor policy analysts will need to monitor is practice pattern trends with regard to the adequacy of personnel supply. Research indicates females tend to work fewer hours in the practice of dentistry than do males (American Dental Association, 1989; Avery & Martin, 1988; Dolan, 1991; Dolan & Lewis, 1987; Martens,

Glasrud, & Burton, 1985; Price & Fotos, 1987; Roberts, McIver, & Phillips, 1993; Roeder & Harrison, 1989; Rosner, 1984; Solomon & Hayes, 1995; Tillman & Horowitz, 1983; Waldman, 1981, 1985, 1992; and Wilson, Branch & Niessen, 1988). A preference for a practice pattern in which job responsibilities are shared with others, such as a group owner arrangement, would enhance the possibility and ease of decreased practice intensity. Thus, the practice pattern choices, as well as the work intensity, of females as a growing segment of the dental profession should be monitored

to ensure that the personnel supply is adequate to meet public needs.

Another issue regarding the delivery of dental services relates to the study finding that African American students have a stronger preference for employee practice on a long-term basis than do White students. That many minority graduates will choose to practice in a minority neighborhood to address access problems for members of the populations they represent has been discussed previously (Taylor & Kress, 1987). It is a concern, therefore, that rather than establish a new practice in an

underserved area, the findings of this study indicate that African American students may prefer to work as an employee dentist in an existing practice. Coupled with a decrease in the number of African American dental students and an increase in the African American population these findings imply that there may be an adverse effect on the accessibility of dental care for African Americans, a population which is already underserved. Several barriers for African Americans in the dental profession have been identified in the literature (Feinberg, 1992; Sinkford, 1992). These include difficulty in securing practice loans, negative racial stereotypes, patient respect in a discriminatory society, perceived limitations on the kinds of patients African American dentists can treat, lack of opportunities for advancement, few professional contacts, and a lack of mentoring networks and role models. While each of these barriers may be important, none has been explored empirically to detect the effect it may have on the practice pattern preferences of students or practitioners. The experimental design used in this study demonstrates a methodological approach for assessing the above barriers. If access problems are to be anticipated and resolved additional information about factors affecting student career paths is critical.

Student practice pattern preferences also have implications for dental educators as they shape the curricula of the future. The demographics of dental students are changing, and with this diversity comes differences in career aspirations. The results of this study reflect that diversity exists with differences in student preferences detected in both gender and race. Clearly, the characteristics of the different practice patterns addressed in this study indicate that students will require different knowledge and skills to pursue each of the different arrangements. For example, students electing to enter a solo practice may require

more knowledge about the financial and personnel management aspects of a practice, while students pursuing an employee position would require knowledge about job negotiation skills. Although all students should be exposed to the range of career opportunities available to them, dental educators, particularly those teaching in the practice management curricula, should be aware of the diversity of student desires and ensure all students are equipped with the knowledge and skills they will need to succeed in the career path of their choice.

Knowledge about dental student practice preferences may also benefit dental school administrators involved in student recruitment. Due to the historical predominance of solo private practice in the dental profession, many potential students may view solo practice as being the only path open to them. This study indicates that student practice preferences vary by gender and race, with females more than males, and African Americans more than Whites, preferring arrangements other than solo ownership practice. Dental school administrators may be well advised to acknowledge these findings in student recruitment efforts, emphasizing to potential students that the range of professional opportunities, even within the private practice setting, is sufficiently broad to accommodate diverse student career aspirations.

Conclusion

This study examined the effects of student gender and student race on dental student preferences for three private practice arrangements. The results indicated that preferences differ by both gender and by race; however, no differences resulting from an interaction between gender and race were detected. These findings have implications for the dental care delivery system, as well as for future research regarding the effect of student-related variables on practice preferences, as we strive to improve access to dental care and to ensure that dental school curricula include career-related information appropriate to student needs and desires.

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Technical Glossary

Editor's note: In an effort to make research papers that contain technical concepts more "user friendly," the Journal will attach a technical glossary to those papers where it seems useful.

Analysis of variance: Analysis of variance, commonly abbreviated ANOVA, is a statistical test used to investigate differences among means for various groups. The key word is "among." The commonly used t-test is used to test for differences *between* two means; ANOVA is used to test for differences *among* two or more. There are three typical indications for using this statistical test.

More than two groups, one classification variable: What if a researcher has data on the average number of complaints by patients for the dentists in five different component societies? One approach is to perform a t-test comparing the average number of complaints in Component A against Component B, Component A against Component C, etc. There would be twenty-four such tests. Recall that a p-value of .05 means that one in twenty insignificant differences will test significant by chance alone. Besides the hassle of repeating the calculations for t-tests when there are multiple groups, there is the danger of finding a "statistical difference" by accident. A one-way ANOVA solves this problem in a single test. It is called "one-way" because there is only one classification dimension–components, in this example.

More than one classification variable: What if there are two classification variables to be explored at the same time? Perhaps the researcher has both general practitioners and specialists in two components. The difference between generalists and specialists could be tested by the conventional t-test, as could the difference between components in a separate t-test. Alternatively, both tests could be performed simultaneously in a two-factor ANOVA. The advantage of the ANOVA, besides the ease of computation, is that the effects of practice type are "held constant" while testing for practice type. This can be especially important if there is an association between the two classification factors, for example if there are a large number of specialists in one of the components.

Interaction effects: Sometimes the effects of classification variables are systematically related. Imagine the case where there are a lot of complaints against the specialists in one component and many against the generalists in another component. Performing two t-tests will show that there are no effects for either practice type or components-the differences cancel each other out on average. A two-factor (or multiple factor if one is ambitious) ANOVA is designed to handle this. The results are tests of the main effects, one test for each classification factor, and tests of interactions. An interaction need not be of the "fully crossed" variety-specialists getting more complaints in one component; generalists more in the other. There can also be partial crosses-no differences in Component A but big differences in Component B. Interactions are an engine that drives research. Refinement in knowledge often takes the form of questions such as "Why is this drug effective only in certain types of patients?" or "Is this new material technique sensitive?" Practitioners often practice as if there were interaction effects, preferring different procedures in different contexts.

History

Believe in the Tooth Fairy

Eric K. Curtis, DDS, FACD

Practically every country has peopled its imagination with magical beings who are held responsible for mysterious phenomena. The folkways of other lands have produced pantheons of spirits and sprites, elves, pixies and leprechauns. Informal, pragmatic America, though, has only one indigenous, nonholiday-oriented, supernatural being. It's the tooth fairy.

That's not to say the tooth fairy's uniqueness denies it a pedigree. Western civilization has enjoyed the intervention of various divine dental intercessors through the millennia, from Hygiea, daughter of the Greek medical deity Asklepios, to St. Apollonia, patron saint of toothache. The tooth fairy has more immediate roots in European traditions of a tooth mouse. It was once believed that cut hair, nail clippings, and lost teeth remained magically connected to their former owners, and might be used for casting spells or otherwise influencing the people who grew them. Traditionally people all over the world hid such body parts to prevent them from falling into the wrong hands. A lost baby tooth was often placed in a mouse or rat hole, in the hope both that it would be safe and that the new replacement tooth would take on the qualities of the creature who finds it-and who chews better than rodents? A Ukrainian custom calls for kids to throw their tooth over their shoulder onto

the roof of the house and chant, "Mouse, mouse, here is a tooth of bone; give me one of iron." In Spain, France, Italy, and Germany a tooth mouse exchanges baby teeth for small gifts.

The images of America's own transcendent tooth broker run the gamut, from animal (modern children's books in this country have also presented the tooth fairy as a mouse, as well as a snake and a rabbit) to human, child to elderly adult, and ugly to beautiful. Originally the tooth fairy, often called the Good Fairy before World War II, was probably male. But ever since Walt Disney's cartoon Peter Pan made Tinkerbell into a miniature Marilyn Monroe, the tooth fairy's gender has leaned the other way. According to a 1982 survey by Northwestern University researcher Rosemary Wells, 74 percent of all respondents were sure the tooth fairy is female. In "The Tooth Hurts," a 1992 play by David S. Raine, the Tooth Fairy, whose name is Mavis, is training a guy named Leon to be her replacement. Although eager to break into "the mythological icon racket," Leon is slightly uncomfortable with the job title and would rather be called "Tooth Master." Mavis knows she'll have to fire him.

Whatever its external packaging, the American tooth fairy has far outgrown its folk origins as a pediatric protective procedure. Modern tooth fairy lore is all about psychology. In

1958 Harvey S. Lewis wrote a landmark study titled, "The Effect of Shedding the First Deciduous Tooth upon the Passing of the Oedipus Complex of the Male," in the Journal of the American Psychoanalytic Association. Lewis declared that the "shedding of deciduous teeth is an event of universal biological significance." No wonder the emblem of exfoliationthe tooth fairy-has become a national icon. As its psychic implications emerged the tooth fairy acquired credentials as a broad metaphor for loss, opportunity, greed, love, gullibility, and authority.

The tooth fairy pops up everywhere in popular culture. A lost tooth, of course, is its familiar point of departure. For example, when a deciduous denticle is knocked out, University of Southern California professor Ronald Johnson advised in a 1989 *Update in Pediatric Dentistry* not to replant it: "Avulsed primary teeth should be given to the tooth fairy!" But the tooth fairy's flexible persona is



Dr. Curtis is in private practice in Safford, AZ. He is Past President of the American Academy of the History of Dentistry and Editor of the *Journal* of the Arizona State Dental Association.



worth much more to society than just a balm for the trauma of tooth loss. The tooth fairy as metaphor quickly overflows its dental meaning, reaching past the teeth to stand for lost youth and lost opportunity. "Hi, I'm the tooth fairy," announces a tennis shoeclad figure hovering over the bed of a startled middle aged man in a 1987 *New Yorker* cartoon. "Want to buy some of your teeth back?"

In the 1997 Disney TV movie *Toothless*, Kirstie Alley stars as a newly-deceased dentist in limbo, assigned to work her way to heaven by taking a turn as tooth fairy. Children who still have primary teeth (and are light sleepers) might catch a glimpse of her, but their innocence slips away with every tooth's transaction. Once the last deciduous tooth is gone, Alley's tooth fairy becomes invisible to the now-unbelieving adolescents.

Every loss represents a change or transition, and change can mean opportunity. As political humorist P.J. O'Rourke knows, opportunity can be optimized by preparation. To make a point about political posturing in his 1990 book on the foibles of government, Parliament of Whores, O'Rourke seizes on a comparison he knows will be instantly understood: "Democrats are...the party of government activism, the party that says government can make you richer, smarter, taller and get the chick weed out of your lawn. Republicans are the party that says government doesn't work, and then they get elected and prove it. One philosophy is not necessarily an improvement on the other, but if you want the tooth fairy to come, you've got to have some teeth under your pillow."

In government, by the way, the tooth fairy wields its share of political power. Reports that the Occupational Safety and Health Administration's bloodborne pathogens standard required employers to treat bodily tissue, including teeth, as potentially infectious sent OSHA chief Joseph Dear running to Congress in 1995 to testify, "OSHA has not banned the tooth fairy; dentists can give children their extracted teeth."

Chalk another one up for capitalism. America's optimistically commercial culture spectacularly transformed a musty superstition into a cheerful business transaction. While the tooth fairy may use all those teeth for building fairy castles, as some children's books suggest, or for adding stars to the night sky (one inventive story even shows the tooth fairy carefully cutting strips of enamel to make piano keys), the kids have their own strong motivation for tucking those pearly lumps under the pillow. In the 1938 Little Rascals episode, "The Awful Tooth," three boys go to the dentist to have their teeth extracted, because they want baseball equipment and they've heard the Good Fairy gives cold cash for teeth. The last line of "Tony's Wish," a 1972 poem about the tooth fairy by Bonnie Nims, reads: I wish I had nine hundred teeth. Suppose I did look funny? I wish I had nine hundred teeth. I sure could use the money.

How much money? Through the century, the going rate went from a nickel to a dime, then to a quarter; at least one children's Tooth Fairy book is titled *No Tooth, No Quarter.* But a 1970s quarter adjusted for inflation is a dollar. In the 1980s, jokes circulated: "She got a dollar, because it was a buck tooth." The *Wall Street Journal* reports that the average rate of exchange per baby tooth these days is \$1.75, up from \$1 in 1990.

The Tooth Fairy, a symbol of trust and goodwill, can be counted on to work out a fair exchange. In a curiously endodontic episode of the Nickelodeon cable network's edgy cartoon *Ren and Stimpy*, Ren suffers a toothache. Stimpy persuades his pal that if he plucks out the offending tooth-nerve, the Nerve Ending Fairy will pay a visit and leave a \$100 to buy new teeth. Ren obligingly slides the slithery pulp under his pillow. The Nerve Ending Fairy, a hairy gnome with a gravely voice, shows up later that night, muttering, "I smell something stinky!" The fairy digs noisily through his pocket, and discovers he's fresh out of \$100 bills. "Wait," the fairy growls, still rummaging. "A ball of lint...It's good enough for him." Shocking. Mavis the Tooth Fairy from David Raine's play, on the other hand, berates her trainee for being duped: "Last week you gave five dollars and fifty cents to a kid who put Chiclets under his pillow."

Wild swings in the reimbursement schedules might reinforce some observers' interpretion of the tooth fairy as an emblem of crass manipulation. Robert E. Horseman, longtime Journal of the California Dental Association humor columnist, argued in 1991 that the permanent dentition "is wasted on pre-pubescent children who couldn't care less [about teeth] except as a Tooth Fairy extortion scam." Complained Phoenix New Times writer Michael Burkett the same year in a column called The Dad Zone, "Children are greedy little capitalists...The minute my son had his first tooth-fairy cash in hand, he started yanking on the rest of his teeth."

But for adults, even cynical ones, the tooth fairy's ministrations are still a function of affection. When the Little Rascals ask the dentist to pull their teeth, he arranges instead for the Good Fairy to bring them a baseball and glove. A physician colleague of mine tells the story of a little girl who lost a tooth and put it under the pillow for the tooth fairy. She woke up during the night to discover the tooth had become lodged in her ear. The child's parents rushed her to the doctor, who removed the offending body from the auditory canal-and switched it for a dollar. He presented the money to his young patient, telling her that's what he found instead of her tooth.

In many families the tooth fairy represents a measurement of parental love. A woman quoted by *Ladies Home Journal* in 1992 described feeling neglected by her folks as a child: "They never did any of the childhood stuff-you know, the birthday par-

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ties, the Tooth Fairy, the circus." In Bernard Slade's 1975 drama Same Time Next Year, a father's yearly romantic tryst with an old flame is threatened by a phone call from his daughter. Confesses the dad as he agonizes over canceling the rendezvous: "Her tooth came out. She can't find it and she's afraid the tooth fairy won't come. That thin, reedy little voice. Do you know what that does to me?"

The tooth fairy, product of parental benevolence, signifies, on the flip side, foolish naiveté. "It's a paradox," begins *The Dad Zone* 's Burkett. "You try to instill in your child a deep, abiding respect for truth and honesty...Yet you can look the kid straight in the eye and tell him that when his teeth fall out, he should put them under his pillow so a winged denizen of brownieland can sneak into his room at night, swap his baby bicuspids for cash, then vanish into the darkness like a deranged ivory poacher." Parrying a pointed question about alleged criticism of other candidates in a May 1992 *Time* magazine interview, presidential contender Ross Perot scoffed, "Anybody who thinks that...believes in the tooth fairy."

"I can't believe you've never even seen the tooth fairy," Dennis the Menace says to his dentist. But the truth of human experience is that everyone has seen the tooth fairy. The tooth fairy is authority. It's a teacher, even an arbiter of morals. In another "Dennis the Menace" segment, Dennis knocks out a friend's tooth and slips it under his own pillow. His mother quickly decrees that the tooth fairy will not honor the contract: "The Tooth Fairy hates fighting." Various children's books depict the tooth fairy as a sort of dental hygiene educator. In a natural extension of the notion, dentists themselves may assume, Kirstie Alley-like, the mantle of Tooth Fairy. The mother of one of my young patients recently told me, "My daughter Brittany asked me

where I was going. I said, 'To the dentist.' She asked, 'which one?' I told her, 'The same one you go to.' Brittany said, 'Oh, good! He's my tooth fairy!'"

Just last week my 11 year old son Tristan, who quoted verbatim dialogue from the Nerve Ending Fairy cartoon for this article, spent part of his Saturday morning wiggling out a deciduous canine. He wanted me to observe the event, not as his dentist but his dad. "How much do you think this is worth tonight?" he asked. Tristan is circumspect and discreet. At his age he has never disavowed Santa, careful to not disturb the promise of that season. His subtle negotiation reminded me of a cartoon: Two boys are walking together. "If I stop believing in the tooth fairy, will I stop getting quarters under my pillow?" one asks. "Nah, don't worry," his buddy replies. "What's important is that your parents still believe."

And I do.

Public Health and Its Enemies

David W. Chambers, EdM, MBA, PhD, FACD

his column begins on a personal note. A few years ago Philip Blackerby sent to me a treasure-his manuscript copy of the seminal article "Why not a department of social dentistry?" This paper appeared in the Journal of Dental Education in September 1960 and has had as much impact as any article published in that journal. It was the first piece of dental literature I was directed to read as a young assistant professor at the University of North Carolina in 1969. Dr. Blackerby, a Fellow of the College, was Dean at Louisville and for many years associated with the Kellogg Foundation in Michigan. His call produced results in almost every American dental school, generating departments of community dentistry, dental ecology, public health dentistry, preventive dentistry, and dental practice. He was accused for his efforts of being a communist (that is what they called dentists who favored managed care in those days) and of being the father of preventive dentistry and the behavioral sciences dental curriculum. He was neither. What Philip Blackerby had in mind was a faculty and a curriculum dedicated to everything a dentist needs to

know in addition to technical skills and basic science knowledge in order to promote oral health. His objective was to create what he called "professionally competent citizens."

For a while, it looked as though Dr. Blackerby was going to carry the day. By the mid 1970s nontechnical, nonbiomedical science curriculum in dental schools nationally had reached 7%, and almost 7% of all faculty had appointments in disciplines other than clinical or biomedical sciences. Today the numbers stand between 2% and 3%. Dr. Blackerby's vision of educating the professionally competent citizen dentist is beginning to fade. Philip Blackerby died last year.

What Is Public Health?

Public health is concerned with the conditions that cause health. In 1988 the Institute of Medicine defined public health as "what we as a society do collectively to ensure the conditions in which people can be healthy." The alternative to public health is private practice. This is the "health care" model, the goal of which is to correct the consequences of disease. Of the 157,000 dentists in the United States, approximately 1,000 are engaged in

public health (about half of one percent). This figure may be an overstatement since many are delivering private dental care funded by public agencies.

The World Health Organization has articulated a definition of health that goes well beyond a preoccupation with disease: "A state of complete physical, mental, and social well-being, not merely the absence of disease or infirmity."

Although health care and health are related, they are certainly not the same thing. One is a goal and the other is a means. There are two problems here. First, health care is only one of the means for producing health, and often not the most effective. For example, only one-sixth of the increased years of life expectancy attainted in this century can be attributed to health care. Only 10% of the preventable premature deaths worldwide are the result of lack of care. And the World Bank estimates lack of essential clinical services as only 11% to 24% of the global burden of disease. In terms of creating that "complete physical, mental, and social wellbeing," the strategy of fixing the problems after they arise and doing so



one by one tends to be less effective and more expensive than the public health alternatives. In dentistry, the effects of fluoride depict much the same story.

Second, too much emphasis on the means draws attention away from the beneficiary and places it on the provider. Recently a panel of six specialists made recommendations to the administrators of a public assistance dental program we were studying. than "needs." We certainly would not graduate any one from our dental school simply because they present a patient family they have restored or maintained in maximum possible oral health. We demand technical skill, and lots of it.

Public health practitioners are almost invariably trained initially as primary health care providers. They do not, however, use such skills except in an incidental fashion. The three proce-

C apitation plans are inherently offensive to the surgical mentality because they seek to pay based on results.

Five of the six independently recommended that one or more fees be increased in their own specialty. As well-intended as these recommendations were, their health impact is ambiguous at best. Because the funds available for the program are fixed, moving dollars from one specialty to another would be advantageous only if we agreed on which specialty needed the additional funds; the independent, contradictory recommendations don't help. Further, because the funds are limited, an increase in fees for a procedure in one discipline actually reduces the amount of care provided in that discipline. The only one who benefits is the provider who spends less time making the same money.

In some cases, health care is inversely related to health. The DMF rate among Americans is highest for women; precisely that group receiving the most care. One CE guru put it bluntly when talking to a group of graduating seniors in the dental school where I teach. He advised that patients do not need oral health; the true purpose of dentistry is to give patients what they "want," a reconstructed smile. There is a certain commercial power in the appeal to "wants" rather

dures of public health are identification and analysis of disease patterns, policy creation, and promotion of access (or in some cases barriers such as disincentives for smoking).

There are five enemies to public health.

Surgery

Public health practitioners occasionally provide health care, but seldom do they perform surgery. Surgery here is understood to mean mechanical repair or replacement of body tissues to compensate for the consequences of disease or trauma or to promote a more desirable body image. That would include extractions, prosthesis, operative dentistry, and bleaching, for example. This is probably two-thirds of what American dentists spend their time on and accounts for nearly all of their income.

The high status of surgery in both dentistry and other health professions is a comparatively recent phenomenon. Until the Brothers Mayo were able to assemble large numbers of patients in a hospital setting and use anesthesia effectively to generate enormous incomes, "sawbones" enjoyed little respect. Only one hundred and fifty years ago, physicians stood clearly on top of the medical hierarchy. Surgeons were considered technicians and apothecaries tradesman. The Hippocratic Oath forbids doctors from engaging in some surgery, and the corpus generally discourages all forms of cutting. The old story about barbers practicing dentistry is a distortion. They practiced exedontic surgery until dentists took over the business.

Beyond the obvious difference of the balance between heads and hands inherent in the distinction between a physician and a surgeon, there is an important matter of the relationship between provider and procedure. The surgeon must be directly in contact with his or her instruments to provide health care. The physician can prescribe or delegate but the surgeon cannot. This leads to four important conclusions. First, the amount of health care is strictly limited to the number of surgeons practicing. This makes health care a rationed and scarce resource. Second, because the surgeon's fingerprints are on the procedure, the type of procedures preferred will be those that involve little or no participation on the part of the patient or environmental circumstances. The development of procedures and the preferences of practitioners will in part be determined by the amount of control they can exercise as well as by the needs of the patient. Third, compensation will be based on procedures rather than results. Capitation plans are inherently offensive to the surgical mentality because they seek to pay based on results. Fourth, responsibility is transferred entirely to the health care provider. The patient and the environment may be expected to corporate in minimal ways, but they are not expected to produce an improvement in health.

All four of the consequences of the surgical orientation work to the detriment of public health.

Diagnosis

Although public health workers frequently perform epidemiological studies, screenings, and evaluations,



they almost never diagnose. The assessment function of public health is primarily aimed at determining the extent and changing nature of health conditions, their location in various populations, and their associations with environmental and other causal circumstances. For the most part, these assessments are concerned with groups of individuals, many of whom may never become patients. The health care professional has been very jealous to establish clear boundaries between assessment and diagnosis.

Sometimes diagnosis is thought of as identifying the causes and nature of a health problem. This is almost never the case in dentistry. The definition of diagnosis is the creation of a treatable entity by a qualified person. Before hysterics were invented in the nineteenth century, there was little for psychoanalysists to do. The development of Attention Deficit Disorder has created a new type of patient and new types of therapy. Some diagnostic categories have lost their umphbilious humor being an example. In some cases a diagnosis can alter the legal or economic status of individuals. A diagnosis of a sprained ankle so bad that one is eligible for workers compensation or a judgment of mental incompetency are such examples.

Diagnosis is an overlay of the taxonomy of medicine on physical conditions in people. There is some give and take in the way diagnostic categories are overlaid. For example, nascent caries might be a Class I restoration, a "watch." or fluoride treatment. Which of these alternatives is the correct diagnosis will depend more on the practitioner than the patient, the circumstances, or public policy. Diagnosis is obviously grounded in the biology of health and disease; it is equally grounded in preferences for procedures and the status of providers.

The gap between public health and health care goes farther than the difference between assessment and diagnosis as a professionally educated way of viewing health and disease. Some assessments actually threaten diagnostic categories that are valuable to certain groups of health care providers. Status of third molars, incipient caries, temperomandibular dysfunction, and even claims of mercury toxicity are examples. It remains a curiosity that dentistry's treatment codes have been so well developed while diagnostic codes languish in political 'territorial" debates.

Patients

Patients are an enemy of public health precisely because their interests are mistaken for the interests of the public. There are many more people in the category of public then there are in the category of patient, and, as a general rule, patients differ from the nonpatient public in important ways. Patients tend to be better educated, more affluent, and suffer from fewer health problems than do nonpatient members of the public.

The definition of patient is grounded in health care behavior rather than health status or need for relief from conditions caused by disease. The two essential criteria needed to be classified as a patient include ability to pay and willingtion for patients' rights rather than supporting the rights of members of the public who suffer from disease and other misfortunes.

The Commons

In 1776, a Scotsman named Adam Smith proposed an economic rule called the "invisible hand." He argued that in a free economy, the collective impact of each individual pursing his or her own economic interest would result (by the operation of the invisible hand) in the maximum collective good. For over two centuries, this has been a mainstay argument of free market economists such as presidents of insurance companies and owners of managed care programs. But as any professional is quick to point out, this is a little more complex. In fact, Adam Smith's invisible hand is appropriate in some circumstances and fails to be effective in others. Sometimes it appears to be a matter of whose ox gets gored; actually it is a matter of whether there is a surplus or a shortage of common resources.

About 1830, a pamphlet appeared which was authored by a man named William Forester Lloyd. He asked

The definition of diagnosis is the creation of a treatable entity by a qualified person

ness to place one's self under the direction of a health care provider. It is not even necessary that a person have an illness or trauma in order to be a patient. Various estimates place the proportion of dental office visits at approximately one-third that are nonsymptomatic with another third being the continuation of care from an earlier symptomatic visit (only one third).

Some have found it ironic that various health care professions have lined up to support potential legislathat we reflect on the analogy of a commons, the grassy area owned by a town and available for public use. If a farmer pastured a few head of cattle in the commons, it would cause no public harm and be of personal benefit to the farmer. If several other farmers did the same, all would benefit and the economy in the town would prosper. But what happens when the carrying capacity of the commons is reached so that additional cattle begin to destroy the value or even the availability of the commons?



Individual farmers cannot be expected to voluntarily limit the use of common resources. The individual benefit to farmers of an additional head of livestock exceeds their partial share of the reduced value of the commons. The rational alternative is to continue to destroy common resources for individual benefit. Our national parks, the freeway system, and the way we handle pollution are all examples of this inescapable erosion of the public good by the multiple pursuit of private interests. In health care, helmet laws and legal action against tobacco companies are recent attempt to address the problem of the commons. An example that is not as obvious is the hospital. This is a community resource that is used for the economic advantage of physicians and for others in support areas such as diagnostic testing. Research knowledge and development of materials and equipment are also "in the commons" but are used primarily by privileged groups.

There are cultural differences in the approach to the problem of the commons. For example, the Japanese and Swiss are much more ready to limit ining to do with health; it is the appeal to individual choice. Freedom of choice is used as an argument against managed care because patients are at stake. The same argument is not used in the case of fluoridation of public water supplies. We are not talking about patients and fluoride, we are talking about the public.

It may have been noted by the perceptive reader that prevention has not yet been mentioned. There has always been a close association between public health and prevention-although this association is accidental rather than essential. Primary prevention can be performed by dentists and nondentists a like. The fact that it is nonsurgical and tends to be reimbursed at low levels means that it is often left to public health practitioners. Individual Americans are willing to pay for prevention-membership in health clubs, diet books, and contraceptives. What we are reluctant to pay for is measures that will prevent loss among the public generally. It is the tragedy of the commons turned around; the loss to us individually in taxes or other support for public health will always exceed our estimated fair share of the

The two essential criteria needed to be classified as a patient include ability to pay and willingness to place one self under the direction of a health care provider.

dividual freedoms for the common good. Americans, with our Anglo-Saxon heritage, represent an extreme favoring the individual over the group voice. Both mainline political parties would prefer private enterprise providing services over the government doing so if the costs and benefits are even closely comparable.

One of the most effective arguments against managed care has noth-

benefit to us personally. Personal prevention is fine if the benefits are tangible and reasonably immediate; public prevention is another matter.

Another enemy hiding in the commons is the issue of the public voice. As Philip Blackerby pointed out in his original paper, "The business of everyone is no one's business." Who speaks for the public? The public's interests are always complex and difficult to articulate. More important, however, is the difference in credence that is inherent in speaking for one's self or speaking on behalf of others. There is a compelling face validity when an individual tells you what his or her best interests are. That same conviction is lacking when anyone speaks on behalf of others. The public has no direct voice in oral health; it only has multiple representational voices, and these often compete with each other.

Ethics

Even ethics are an enemy to public health. Ethics as the academic study of right or wrong is not an issue; but professional codes of conduct (often called ethical codes for their PR value) can be. At one time the Code of Ethics of the American Medical Association censored physician who practiced in infirmaries (public health clinics) or as company doctors or worked on a retainer for mutual benefit organizations such as the Masons on grounds that this denied income to other physicians. Current ethical codes have dropped such language but retained their egocentric orientation. Health professional codes are made by practitioners for practitioners and regulate the conduct of professionals with regard to each other and with regard to patients. They are silent on the issues of the public and of health, and they lack input from the public.

Professionals working in the public health field seldom use the language of ethics. Instead, they are concerned with the language rights. There are two important differences between ethics and rights. Rights are owned by the recipients of actions based on who they are, not on what they have done. Ethics, in contrast, is concerned with the behavior or character of the person who is acting. Our normal concern is with patient rights and provider ethics, even though the other way around might make sense. Second, ethical dilemmas are solved



within one individual's conscience while conflicts among rights are debated publicly among groups. (There is an exception to both of these rules with regards to one branch of ethicsdiscursive ethics-which recognizes no priority of position in ethical matters and considers ethical behavior a community issue.)

Although some health care professionals are ready to recognize that paemployment, sickness, disability, widowhood, old age, or lack of lively-hood in circumstances beyond his control."

This is exactly the situation created by the public health perspective. Two rights are advocated as universal that are in direct conflict with each other in many practical applications. The health care perspective on this problem is to advance one horn of

Policy is not a comfortable matter for health care practitioners. It means democratic debate over conflicting rights among all those who are affected by the policy.

tients have certain rights with respect to their health care seeking behavior, there are few who are ready to explore the consequences of saying that all people have a right to be healthy.

In 1948 the United Nations General Assembly passed Resolution 217. the "Universal Declaration of Human Rights." Article 23-3 in this declaration affirms the right of professionals to be appropriately compensated for their health care services: "Everyone who works has the right to just and favorable remuneration ensuring for himself and his family an existence worthy of human dignity." The declaration also recognizes the right to health: "Everyone has the right to a standard of living adequate for health and well being of himself and his family, including food, clothing, housing, medical care, necessary social services, and the right to security in the event of unthis dilemma at the expense of the other. Care is rationed to those who are able to pay for it and agree to the conditions of such care subject to the ethical standards created by the care providers. This system has worked well for the majority of people in countries with advanced economies and may be the only practical alternative.

It certainly is not public health and it operates on a set of assumptions about how conflict is resolved that are different from the public health model. The three techniques of public health are assessment, access, and policy. Policy is not a comfortable matter for health care practitioners. It means democratic debate over conflicting rights among all those who are affected by the policy.

The United Nations Universal Declaration of Human Rights proposes just such a mechanism for ad-

dressing conflicts. Article 29-2 states: "In the exercise of his rights and freedoms, everyone shall be subject only to such limitations as are determined by law solely for the purpose of securing due recognition and respect for the rights and freedoms of others and of meeting the just requirements of morality, public order, and the general welfare of a democratic society." In the end, public health policy is the enemy of health care. This is not just a matter of bad policy or even of policy that is damaging to the interests of individual health care providers; it is an issue of who should decide about the allocations of resources for health-the public, patients, or providers?

Forty years ago when Philip Blackerby asked the rhetorical "Why not a department of social dentistry?" he was not advocating that the public health perspective replace the health care model and neither is the current writer. I believe what Blackerby had in mind was establishing balance; opening both eyes to give better perspective and depth perception.

It is required of public health dentists that they earn a dental degree and be fully competent to perform all technical procedures expected of a general practitioner. On top of this, their training provides them with facility in the additional tools of assessment, securing access, and developing health care policy. There is no corresponding requirement that a general dentist be exposed to or be knowledgeable about the issues in the conditions that affect health among patients and others who are not patients. I think Philip Blackerby had in mind addressing this imbalance.



Recommended Reading

* Foucault, Michel (1973). The birth of the clinic: An archaeology of medical perception. A. M. S.

Smith (Trans.). New York, NY: Vintage Books. ISBN-679-75334-6; 215 pages; about \$10. Traces the origins of modern medicine from the end of eighteenth century when physicians connected what was given to per-ception to its underlying foundations. Typical obscure way Foucault expresses himself: "What counts in the things said by men is not so much what they may have thought or the extent to which these things represent their thoughts, as that which systematizes them from the outset, thus making them thereafter endlessly accessible to new discourses and open to the task of transforming them" (xix)-rough translation: classifying the causes of disease and pronouncing diagnoses is a foundation for accumulating knowledge in a science or a profession. Foucault is a contemporary French philosopher who describes his method as "archaeology." By this he means an effort to use history and critical analysis of statements stripped (as far as possible) of their assumed meaning. He is a postmodern philosopher which means that he believes the rational march of scientific and social progress based on the discovery of a natural world such as Newtonian physics is a flawed enterprise. His writing style is so obscure that some philosophers have accused him of intentionally attempting to remain ambiguous.

* Hardin, Garrett, (1968). The tragedy of the commons. Science, 162, 1243-1248.

Adam Smith's "invisible hand" is an economic theory that maximum public good comes from individuals pursuing their own good in a free market. This theory works in some conditions and not in others. Hardin discusses those situations where the pursuit of individual good damages common resources, such as freeways, pollution, and population. The "tragedy" of the (destruction) of the commons is its inevitability. Appeals to rational or ethical behavior fail because the good and wise respond, leading to a natural selection advantage for the mean and stupid. Only mutual coercion, mutually agreed can break the cycle.

Mann, J. (1997). Medicine and public health, ethics, and human rights. Hastings Center Report.

Develops the contrast between rights and ethics. The former belong to groups by their nature and operate through public policy; the latter are individual and concerned with behavior. Public health suffers from lack of a conceptual framework and common vocabulary. A significant issue in medicine is recognizing where individual responsibility for health care (services to individuals) passes to social responsibility for the health status of groups.

Mann, J. M., Gruskin, S., Grodin, M. A., & Annas, G. A. (Eds.) (1999). Health and Human Rights. New York, NY: Routledge.

Collection of reading that presents public health as a field devoted to raising the dignity of man and protecting individuals for dangers, both personal (such as smoking) and external (war and poverty).

* Starr, Paul (1982). The Social Transformation of American Medicine. (First Book: A Sovereign Profession: The Rise of Medical Authority and the Shaping of the Medical System) New York, NY: Basic Books. ISBN 0-465-07935-0; 232 pages; about \$15.

A combination of sociology and history, Starr explores the rise of the American medical establishment from the early nineteenth to the early twentieth centuries. During this period the profession was transformed from a loose collection of practitioners who enjoyed modest income and status to one of great power. The central theme is one of accumulating authority-recognized control over a sphere of action. Primarily, physicians reserved the market to themselves, enforced behavioral norms on members, and appropriated public resources such as hospitals and research knowledge for their exclusive use without paying for them. There are chapters on the early, disorganized state of the profession, the economic viability of medicine as Americans congregated in cities at the end of the nineteenth century, the use of licensure and accrediting of schools and hospitals to consolidate power, taking over hospitals, control of public health, and fending off corporate interests.

Editor's Note

Summaries are available for the three recommended readings preceded by an asterisk (*). Each is about four pages long and conveys both the tone and content of the book through extensive quotations. These summaries are designed for busy readers who want the essence of these references in fifteen minutes rather than five hours. Summaries are available from the ACD Executive Office in Gaithersburg. A donation to the ACD Foundation of \$15 is suggested for the set of summaries on public health and its enemies; a donation of \$50 would bring you summaries of all the 1999 leadership topics.

