Objectives of the American College of Dentists

The American College of Dentists, in order to promote the highest ideals in health care, advance the standards and efficiency of dentistry, develop good human relations and understanding, and extend the benefits of dental health to the greatest number, declares and adopts the following principles and ideals as ways and means for the attainment of these goals.

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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FROM THE EDITOR

Creating Ethical Professionals

Richard Leakey, a renowned archeologist, writes in People of the Lake, "Culture allows Homo sapiens to lead lives of a diversity within the species that cannot be achieved by any other animal. Each one of us is born with the potential to live any of countless different lives, but we live just one, the one shaped by the rules of the culture in which we grow up."

Dr. Leakey's elegantly phrased observation is a reminder that we who practice dentistry are part of a culture that has shaped us since entering college, and particularly dental school. We possess a special language, traditions, perceptions, values and expectations for ourselves and colleagues; that is, we have a sense of ethics and professionalism. Yet, we are not an isolated culture. Dental culture is a specific expression of a larger culture of the health professions, itself a subculture in the community of learned professions whose principles have endured for centuries.

Dr. Leakey's observations prompt our focusing on the question, "How do we acquire, use and pass on the genetic material of dental culture?" Always a subtle, prolonged and difficult process, nurturing dental culture seems increasingly difficult in an American society that, in its good fortune, seems to be drifting further from the beliefs and traditions upon which it was founded, that seems to be constantly testing the limits of social boundaries and that seems to say, "Its okay to do it if you make money from it or it feels good." Dental ethics and commercial society are in dynamic tension, often leading dentists into confusion between their professional and entrepreneurial interests.

Commercialism entices and pressures all of us. As summarized by Jonathan Yardley, newspaper columnist, "The United States in 1994 is different from what it was in 1944, not merely for its infatuation with entertainment, its indifference to history and education, its overindulgence in material goods, its pervasive sense of entitlement, but because it seems to have lost its sense of nationhood."

Twentieth century America, with its increasingly effective and pervasive media marketing, has been changing social norms of acquisition from using things to using things up, and shifting responsibility (with commensurate authority) to government. Social trends are moving away from individual responsibility for oneself and others. It is not easy to promote the principles upon which the nation was founded when the commercial message is that "to be an American you must take care of number one."

Ethics and professionalism speak of dentists being responsible for their own actions and for being their brother's keeper. These characteristics are required for the long-term growth of civilizations and the professions within them. Where are individuals who possess such values to be found in contemporary American society? How are they to be nurtured?

Perhaps creating ethical professionals is the responsibility of the American College of Dentists. But then, who is the College? Are all Fellows examples and mentors so promising youth will aspire to a dental career because of its compatibility with their altruism and budding sense of self-worth? Do dental educators ensure that ethical considerations are integrated into every step of the professional education process? Is the creation of new dentists a harmonious, single-minded effort by parent education institutions and the practicing dental community?

Dentists are challenged to actively promote a dental career to youth who exhibit potential and to demonstrate the professional side of practice. Universities are challenged to instill and reinforce the importance of truth, goodness, beauty, liberty, equality and justice. Dental schools are challenged to further refine the developing mind so that the concept of a learned professional dominates every assessment of the patient's treatment method adopted and action taken, and assessment of the patient's best interest.
Professional organizations and colleagues are challenged to be the standard-bearer and mentor for young professionals by promoting the importance of life-long learning, basing practice methods on scientific foundations, and serving the profession and the community as well as one's clinical practice.

This issue of the Journal of the American College of Dentists includes a broad spectrum of subjects addressing professional values. Topics include a guest editorial defining standards for philanthropic foundations and articles about oral health goals, risk assessment and management, striving for a broad science base, obligations to profess i.e., to educate patients, and our need to support our professional education systems. A call for sound judgment is an undercurrent within each article.

Decades ago, my imagination was captivated by the title of Irving Stone's collection of biographies, Men to Match My Mountains. Indeed, individuals who possess a vision, sense of responsibility for themselves and others and initiative, have profoundly influenced the course of history. Dentistry has its share of individuals with these attributes. The annual publication of biographical sketches about individuals honored at the American College of Dentists convocation provide examples. In this issue, "Profiles in Professionalism" provides examples that may help inspire readers to renew their personal commitment to making a difference in their own unique time and place.

Serving as Acting Editor for the Journal of the American College of Dentists in 1994 has been a privilege and an honor. Although I sought neither the Acting Editor nor the Editor position, serving in a bridge role has rewarded me with a finer appreciation of the excellent work performed by College Officers, Regents and staff. I have been further inspired by the College's mission and its recent strategic plan. I am confident that, with continued insight by the Editorial Board and through Dr. David Chamber's excellent vision and commitment, the Journal will come ever closer to representing everything for which the College stands...ensuring the continued development of professional integrity in its broadest and most sublime dimensions.

Robert E. Mecklenburg, DDS, MPH

Please, These Covers Are Platinum

Visual conservatism connotes elegance. Thus, by the test of time evening dress is consistently of simple patterns in black and white, and carnival a panoply of clashing design and color. The cover of the Journal of the American College of Dentists was redesigned to make a clear statement about the College's mission, that is, its role as the dental leader for the preservation and enhancement of the highest standards and principles of the learned professions. These covers, with their conservative type, subtly shaded logo, simple design and rich metallic color, quickly set the Journal apart and convey the impression that its pages champion a noble cause.

Platinum is commonly used as a catalyst, unchanged, but facilitating action. It is used in dental practice, often alloyed to enhance the properties of other materials. Ethics and professionalism also facilitate and enhance, while remaining themselves unchanged. Some wag may suggest that the color gray was chosen for the covers by averaging color matches to the crowns of qualified Fellows (i.e. those who still have hair). Others might suggest that silver was chosen as a symbolic relation to the profession's long association with silver amalgam. Such remarks might be forgiven. Without ethics, dentists, individually and collectively, would have no guiding star and without professionalism no rudder as they chart their course daily in a sea of social change.
Guest Editorial

Dentistry & Philanthropy: Fortune Favors the Prepared

Robert J. Klaus*

Over the past several years there has been a proliferation of foundations within the dental community. Not counting those at dental schools, there are now well over 50 dental foundations, most of which appear to be organized to serve the “in-house” needs and purposes of professional and specialty groups.

But, as if to give a new twist to Gresham’s Law, the growth of more foundations has paralleled a steady diminution in the flow of philanthropic resources to dentistry. Dentistry’s share, as a percentage of overall charitable health care giving in the U.S., is about 0.3 percent, (1) and charitable dollars that are being generated for access to oral health care are lower than for any health area except rare and so-called “orphan diseases.” Major foundation support for dentistry is static, if not declining, and tends to be sporadic and discursive. At the same time, the sources of philanthropic money for dentistry, outside of foundations, are almost exclusively from the dental community itself. As one industry spokesman observed, “The same funds are recirculated annually with little or relatively no new money added.”

Beyond the decline in dollars, however, the multiplication of foundations has contributed to dentistry appearing to give a splintered and confusing message to current and potential benefactors and, by extension, to the public as well. This is not to argue that cause- and organization-specific foundations are not needed or do not play an important role; they do. But it begs understanding of the fact that there are many critical issues which can only be addressed by a well conceived, comprehensive, collective approach, inclusive of elements both within and outside of dentistry. Dentistry’s relationship to overall health care, health care reform, access to care, the future of dental education and the growing sophistication of the patient-consumer form a nexus of issues that require, among other things, the resources of corporate, private and public philanthropy. Perhaps more important, they require the successful coalition of diverse interests to make a compelling case to individuals, corporations and foundations outside the dental family that dentistry is integral to primary health care.

But, in the main, this is not being done. Conversations with representatives of major foundations and corporations over the past several years indicate a general belief that dentistry is non-competitive for philanthropic support. Reasons most commonly cited include lack of systematic and innovative approaches to problems and the absence of strategic alliances that can leverage ideas and resources, thereby extending the value of charitable contributions. In today’s environment, as management maven Peter Drucker observes, only those non-profit organizations which produce results, while managing growth and change, will attract philanthropic funds.

Given these circumstances, it is therefore appropriate that the dental community take another look at its own interests, purposes, goals and accomplishments and assess how and what kinds of foundations meet its needs. In making that reassessment it is important to keep several important standards and considerations in mind.

First, foundations are a public trust; they are chartered by state and the federal governments to advance the public good by carrying out specific, if limited, missions. Public trust can never be taken for granted; it is a prize that must continually be won. Failure to recognize this fundamental precept has undermined more than a few foundations and public charities in recent times, the most notable being the United Way. Once lost, public trust cannot be regained easily.

The work of foundations entails other responsibilities and commitments as well. These have been ar-
ticulated by, among others, the Council on Foundations and the National Charities Information Bureau, and they include:

**Accountability.** Above all, foundations are caretakers of others' money and must be accountable to them and to the public for the stewardship of all resources. Accountability requires publication and distribution of audits, guidelines, policies and programs.

**Independence.** A foundation must demonstrate judgment honed by a sense of mission, but informed by an independent board of directors that embodies diversity, is comfortable with change and welcomes ideas from all.

**Vision.** A foundation ultimately is judged by the inventiveness and genius of its programs and the effectiveness of its efforts. In a sense, foundations are the laboratories that test convention and assumption, and they should be willing to take prudent risks. It is necessary to always bear in mind the lesson from Proverbs, “Where there is no vision, the people perish.”

**Judgment.** A foundation's work must come to be regarded as an investment in ideas — ideas that work. Foundations have to develop a corpus of intellectual property which characterizes their work, enables them to meet challenges and provides the framework by which they examine themselves and are examined by others.

There is no promise that if dental foundations discharge their responsibilities according to the standards mentioned here, they will reverse the downward trend of philanthropic and charitable contributions. What is certain, however, is that dentistry's entire community of interest is at a turning point insofar as the development of financial resources is concerned. While the new pattern for developing such resources is not yet established, the old one is clearly inadequate for the future. Still, by emphasizing collaboration among its many foundations and by crafting imaginative alliances in and out of health care, dentistry can muster the philanthropic resources it will need for the coming decades. Fortune favors the prepared.

**References**

Celebrating the Year Of Oral Health: Changing Public Expectation and Challenges for the Profession

Robert J. Collins*

Abstract

The year 1994 was designated as the Year of Oral Health by the World Health Organization. The remarkable progress in oral health achieved in the United States over the past several decades is cause for celebration; however, the gains have not been equitably distributed and many challenges remain if good oral health is to become a reality for all Americans. Members of the dental profession in general, and Fellows of the American College of Dentists in particular, have a responsibility to be aware of not only the health of our individual patients but also the oral health of the public as a whole. Many opportunities to improve dental practice on the individual and community level exist. By taking action to better meet the overall oral health needs of society, the dentist can increase professional satisfaction, improve the health of the public, and enhance the status of the dental profession.

As has been its custom since 1950, the World Health Organization (WHO) holds an annual celebration of World Health Day by focusing on a particular global health issue. World Health Day (WHD) is acknowledged on April 7 each year – the day of the formal adoption of the official constitution of the WHO. The theme for WHD in 1994 was Oral Health for a Healthy Life. Many communities in the United States and around the globe held events celebrating the progress made in pursuit of the benefits of good oral health, while acknowledging the need to do more to extend those benefits to all sectors of society.

This year, the WHO, in cooperation with the Federation Dentaire Internationale (FDI) went beyond just a single day’s acknowledgment and declared all of 1994 as the Year of Oral Health. This joint declaration provides an unparalleled opportunity to raise the public consciousness regarding oral health. In the U.S. activities related to World Health Day and the Year of Oral Health are supported, in part, by the American Association for World Health (AAWH), which serves as the U.S. Committee for the WHO. Recognizing that global health is improved through local action, the AAWH provides resource materials (1) to assist communities in coordinating activities. For several years the rallying cry for the annual AAWH campaigns has been “Think globally, act locally!” The American Dental Association and many other professional organizations are acknowledging the Year of Oral Health during their annual meetings and at other planned events.

Professional and public involvement in the Year of Oral Health can perhaps best be captured by two words: Celebration and Challenge.

Progress in Oral Health

There is much for both the public and the profession to celebrate in this Year of Oral Health. The oral health of the public in the United States has never been better. Largely due to increases in exposure to fluoride, the prevalence of tooth decay in school children has declined substantially over the past two decades (2). Advanced periodontitis afflicts a relatively small proportion of adults (3). Edentulism is clearly on the decline (4). A recent national survey indicates that patients appear to be satisfied to a large degree with their dentists (5). Dental insurance coverage and the use of professional services also has been increasing. Although health expenditures as a percent of the Gross Domestic Product (GDP) have been rising, dentistry as percent of health expenditures has been declining (6). In spite of these and other gains, however, many challenges remain.

The views expressed herein are those of the author and do not necessarily reflect those of the U.S. Public Health Service.

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Remaining Challenges

Health Status

Oral diseases remain among the most ubiquitous of those facing Americans. More than 50 percent of children 5 to 17 years of age, and over 80 percent of 17-year old children, have experienced some dental decay. Not surprising, but perhaps more disturbing, is that the burden of oral disease is not distributed equitably. About 75 percent of the caries in children is found in only 25 percent of the population (6).

Higher oral disease levels are found in minority and low income populations. For example, Black, Hispanic and Native American children have one and one-half to three times the amount of untreated decay found in U.S. children (7). Low income adults of all ages are much more likely to suffer from complete tooth loss (8). Oral cancer kills approximately 8,000 Americans each year and the five year survival rates for Black and some Hispanic populations are significantly lower than for the White population (6).

Smoking and other tobacco use has been identified as a major risk factor for periodontal disease, oral cancer and other adverse health effects (9-11). Nonetheless, screening for oral cancer may not be a part of all dental exams, and those most at risk, i.e., tobacco users appear to be less likely to be examined for oral cancer (12).

Domestic violence is a growing problem often reflected in injuries to the orofacial complex, yet dental professionals often feel unprepared to intervene (13).

Access to Dental Care

Although dental costs as a percentage of health expenditures have been declining, national expenditures for dental services in the U.S. have risen dramatically since 1975. Current expenditures are about $40 billion and are expected to exceed $60 billion by the end of the century.

In the U.S. over 90 percent of dental care expenditures are paid by private sources, either “out-of-pocket” (56 percent) or by private dental insurance (34 percent). Only three percent comes from public sources, such as Medicaid. Dental benefits for eligible children are covered under the Early and Periodic Screening, Diagnosis and Treatment (EPSDT) provisions of Medicaid; however, the program is so underfunded that each year about 80 percent of eligible children receive no dental care at all. The Medicaid program supports little dental care for adults. Private dental insurance covers about 100 million persons; however, that still leaves about two-thirds of the U.S. population, about 150 million people, with no dental insurance. Furthermore, those least able to afford out-of-pocket expenditures for health care are also those least likely to have private dental coverage. About 85 percent of individuals with the lowest incomes have no dental coverage as opposed to only 40 percent for those with the highest incomes (6).

Access to dental care, as measured by at least one visit per year, has risen from 37 percent to 57 percent in the U.S. from 1958 to 1989. However, the most rapid growth came during 1958 through 1975, when the private dental insurance industry was rapidly expanding in the U.S. From 1975 to 1989 growth was much slower. At a result, it appears that we may have plateaued in terms of access to dental care (14). In such an environment, one would not expect to see gains in access to care for underserved groups. In fact, there are some data which now indicate that dentist to population ratios may be increasing in high income areas but declining in low and medium income areas (15).

Although there are certainly nonfinancial barriers to receipt of dental care, it is clear that the ability to afford care, either from out-of-pocket or through insurance coverage, is critical to access. Individuals with private dental insurance are much more likely to have a dental visit than those without coverage (8). Furthermore, there is increased use of dental services with increasing income. Over 70 percent of those with the highest levels of income have at least one dental visit per year compared to only 40 percent of those with the lowest incomes (6).
Ironically, those most in need of oral health care are least likely to receive it. The proportion of minority Americans with a dental visit for any reason is much lower than for White Americans, a difference that holds true at every age (8). When they do receive treatment, minority children are more likely to have teeth extracted (6). Low income seniors are least likely to have dental insurance and to seek dental care (16), and Medicare does not cover dental services.

Preventive Services
Fluoride and dental sealants have proven ability to dramatically decrease the incidence of dental decay. The dental profession can rightly cite its long-standing support for fluoride as a major contributor to the decline in oral disease. Nevertheless, the public understanding of the benefits of fluoride continues to be inadequate (17), a situation which may inhibit a wider adoption of this significant preventive measure. As a result, are these services reaching those most in need?

Over the past nearly 50 years, water fluoridation has been demonstrated to be effective in reducing caries. Because everyone consumes water, the benefit is distributed across the entire community regardless of race or socioeconomic status. In view of their lower exposure to dental care and supplemental forms of fluoride (8), the poor may benefit to a greater extent from water fluoridation.

About 135 million Americans, 54 percent of the U.S. population and 62 percent of those on public water supplies, receive drinking water that contains fluoride in amounts adequate to prevent tooth decay. The largest U.S. communities that are not fluoridated are concentrated on the east and west coasts, with over half the communities found in California (1). California is home to a large proportion of many minority populations in the U.S.. Los Angeles, California is our largest non-fluoridated city, as well as home to the largest Hispanic-American community. Fluoridation of such communities would be expected to yield significant benefit for the oral health of minority populations.

The increased availability of fluoride in the U.S. has been especially effective in preventing smooth surface caries. As a result, over 85 percent of tooth decay in children is now found on the pit and fissure surfaces, decay that could be prevented with dental sealants. A U.S. national health objective was established that 50 percent of all children should receive protective dental sealants by the year 2000 (7). Unfortunately, there has been very slow acceptance of this measure in the U.S. Although some state data (18-20) offer hope for improvement, results from the 1989 National Health Interview Survey (8) indicated only about 11 percent of children had received dental sealants, a very modest increase from about seven percent in 1986.

Many poor Americans are unable to obtain this relatively inexpensive preventive service (6). Less than five percent of children from families with the lowest incomes have received sealants, compared to 17 percent for those with the highest incomes. Because minority families are more likely to have lower incomes, it is not surprising that their children have lower exposure to dental sealants. For ages 9 to 11, only six percent of Black and 10 percent of Hispanic and other minority children had sealants, compared to 21 percent for White children. Overall, it is clear that target groups within the U.S. that could benefit most from preventive services are least likely to receive them.

To summarize the challenges to additional progress in oral health:
- Persons with lower incomes tend to have higher rates of active oral disease and total tooth loss.
- Use of services that could prevent or control oral disease is much less common among persons without dental insurance or substantial income.
- Private dental insurance is largely limited to those with higher incomes and the growth in private dental insurance appears to be leveling off.
- The public sector provides very little dental coverage.

Thus, it should hardly be surprising that the poor and minorities are less likely to obtain dental care and when they do, it is more often for relief of pain. As a result, caries, periodontal disease, oral cancer and tooth loss pose a heavier burden for minority populations and the poor.

What might be done in the U.S. to address disparities in oral health and access to care? There are two national initiatives, as well as many local and regional efforts, that have potential for further improving oral health.

Healthy People 2000
Healthy People 2000 is a national effort designed to improve the health of Americans through the widespread promotion of healthy behaviors by the public, health care providers, and organizations (7). It proposes quantified targets for 300 different health status, risk reduction, and health service objectives. The effort is heavily tilted to the primary prevention of diseases and conditions. The Healthy People 2000 objectives are designed to: increase the span of healthy life; reduce disparities in health status; and increase access to preventive services.

Oral health is one of the 22 national health priorities included in Healthy People 2000. There are 16 oral health objectives in the areas of health status, risk reduction and services and protection. They address: improved health status in regard to caries, edentulism, periodontal disease and oral cancer; reducing the
risk of disease through use of fluorides, sealants and education; and protecting health by ensuring access to care. In addition to objectives aimed at the nation as a whole, there are objectives targeting population groups for which special efforts are needed (21). The American Dental Association and many other major organizations in the U.S. have adopted the objectives of Healthy People 2000 (22).

In support of meeting these objectives by the year 2000, a special vehicle -- Oral Health 2000 -- has been created. Oral Health 2000, organized by the American Fund for Dental Health, is the largest collaborative effort undertaken on behalf of the oral health of Americans (23). The Oral Health 2000 National Consortium involves corporations, service organizations, the education sector, and many voluntary and professional organizations. Former U.S. Surgeon General C. Everett Koop serves as spokesperson for Oral Health 2000 and continues to promote the concept, “Without oral health, you are not healthy!” Dr. Koop himself, with support from both academia and industry, is promoting the early involvement of medical and dental students in the preschool environment to teach oral health habits as a first step to incorporating disease preventive practices into one’s lifestyle.

State consortia are now being developed or expanded in states (e.g., Kentucky, Texas, Rhode Island and others) to develop Oral Health 2000 on the local level (24). The consortia offer opportunities for involvement of dental professionals, industry, academia and many others in projects designed to identify needs, deliver services and make referrals.

Oral Health 2000 presents unlimited opportunity for collaborations that can promote public understanding of the importance of oral health and increase access to care. Most importantly, Oral Health 2000 is an overarching symbol of the spirit of voluntary cooperation that underlies many projects meeting public needs.

There are programs in many communities that offer opportunities for dental professionals to offer their services to those in need. A recent edition of the ADA News (25) described a number of specific examples of volunteer-based access programs in settings that include private offices, dental schools, community clinics and mobile units. The ADA's Council on Community Health, Hospital, Institutional and Medical Affairs provides assistance to state and local dental societies interested in developing programs for underserved populations. In addition, the National Dental Association has been very active in promoting access (26) and the newly formed Hispanic Dental Association is mobilizing to do so.

Public Expectation

As technology makes tolerance of oral pain, loss of function and ultimately, tooth loss. In the 19th century, extraction was still the norm, although replacements for function and esthetics were possible. In the 20th century, the dental profession was able to intervene earlier in the disease process and repair dental defects as an alternative to extraction. As the 21st century approaches, further technical advances have given us the tools to prevent much of the oral disease which afflicted previous generations.

Mecklenburg argued that public expectation as a whole may lag behind but is, nonetheless, moving in the same direction. Thus, there is growing awareness that protection from disease offers the potential for both an improved quality of life and substantial cost-savings for the patient.
and the public as a whole. Nonetheless, public knowledge about the appropriate methods for preventing dental disease continues to be inadequate, especially in ethnic and racial groups with low levels of formal education. If the Healthy People 2000 oral health objectives are to be attained, increased oral health educational efforts and access to affordable care must become a reality (17).

**Basis for Intervention**

How should individual dental professionals react to the Year of Oral Health? There is an obvious need to continue to provide effective oral health services for patients currently under care and to seek ways to improve those services. But what of those who have little or no access? Should we promote the inclusion of dental services in a system of universal coverage, a modification of the current system, or just an expansion of volunteerism? Is there a professional obligation to pursue the goal of improved oral health to the maximum benefit of our patients and our communities?

Maslow described five hierarchical needs critical to human development: physiological (food and water); safety; love and belongingness; self-esteem; and self actualization, or the need to pursue one's goals (28). Maslow argued that lower level needs critical to individual survival must be met before the human organism can pursue higher levels.

A profession displays its finest characteristics by providing its members the opportunity to attain self-actualization. It has been argued that self-actualization can result only from the efforts of a dedicated teacher (29). The term *doctor* in fact comes from the Latin *docere*, to lead or to teach. Thus, although dental professionals may meet physiological and safety needs by virtue of the income generated by a dental practice, and belonging and self-esteem needs through family and professional organization activities and service delivery, they achieve self-actualization through teaching; by doing so, they make it possible for others to take action to meet their own needs.

As a learned profession, dentistry should mold public expectation toward protection. Researchers must continue to develop improved methods for protecting health and communicate them to the profession and the public in a timely manner. The academic community must prepare today's students to be leaders in advocating prevention — with a special emphasis on identifying and nurturing those who are most likely to aid underserved populations. Today's practitioners must continue to seek educational experiences in not only the more technical aspects of dental practice but also in those that will enable them to help patients help themselves to remain in good health.

Comedian/philosopher Charlie Chaplin once said, "Man is an animal with primary instincts of survival. Consequently, his ingenuity has developed first and his soul afterward. Thus the progress of science is far ahead of man's ethical behavior." The business and professional aspects of a dental practice will always present potential conflicts. Society does not expect dentists to take vows of poverty. It does expect us to share the increased knowledge we have received and should continue to pursue for the benefit of society. A true profession is where science and ethics come together for the benefit of society; Fellows of the ACD are expected to be leaders in this area.

The purpose and objectives of the American College of Dentists (30) seem a perfect framework for pursuing the best that our profession has to offer. In general, they are intended to:

- Extend measures to control and prevent oral disorders.
- Encourage careers in dentistry so that dental health service will be available to all.
- Promote research.
- Improve the public's understanding of oral health service and its importance to optimum health.
- 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 acceptance of them.
- Encourage individuals to further the above objectives and to recognize contributions to areas which contribute to human welfare.

In a very real sense, science gives us the technical skills and judgment to provide dental care, conduct effective research, and instruct others. The underlying rationale for these activities comes from ethics, i.e., we choose to use our talents for the nobler intention of improving the health of the public. As professionals we may be rewarded (and usually are) by a higher income but that is secondary to the primary professional precept of service. A strong sense of ethics helps us to rise above our primal instincts, reach beyond our personal concerns, and assign ethical behavior its rightful place alongside science.

**Strategies for Action**

As individuals we have many ways to pursue the ideals of the Year of Oral Health. Actions one might take include: devoting a portion of one's practice time to those unable to obtain care elsewhere; adding oral cancer screening/tobacco counseling services; providing services to the needy on a part-time basis in a community clinic; contributing to the professional knowledge base through teaching or research or contacting public officials or professional organizations in support of expanding oral
Participating in community-wide strategies offers the dental profession an opportunity to make a contribution to the public health on a larger scale. Activities such as promoting water fluoridation can have an impact well beyond the boundaries of a clinical practice. The U.S. Public Health Service has cited fluoridation as one of the most economical preventive measures in the nation, one that, if extended to underserved populations, could result in substantial health care savings and improved oral health (36). Getting involved might be as simple as making a conscious effort to discuss fluoridation with patients or as complex as leading a community initiative to begin fluoridating.

If dental practices are to become more effective in creating access to care, health services research will be essential to achieving a better understanding of the effectiveness of various health care services and systems, developing appropriate practice guidelines, and, ultimately, improving the oral health of the public. Common problems faced by clinicians may offer them opportunities to develop and participate in their own education and research agenda (37).

On a larger front, have we thoroughly explored the issue of access to dental care for underserved populations? Do we believe the status quo to be acceptable? If not, have we made an individual assessment about the best way to increase the availability of services for those in need? Is access to some minimal level of dental services a necessity for all citizens? If so, how should this best be attained? Voluntary programs? Universal coverage? Regardless of one’s answer, the key is to ask ourselves these questions, use our knowledge and the range of information available (not just what others would have us believe), arrive at a good faith decision, and act upon it.

By pursuing any of the above or similar activities, dentists demonstrate their understanding of the true meaning of a profession. In doing so, they celebrate the positive effect the dental profession has had on the oral health of the public while accepting the challenge to always seek a higher standard and pursue the goal of oral health for all (38).

Conclusion

In 1994 more Americans than ever enjoy the benefits of good oral health due, in large measure, to our professional predecessors who wholeheartedly supported fluoride and other preventive measures. The status the dental profession enjoys today may well be due to society’s recognition of dentists as a community willing to put public good above personal financial gain (39). The challenge to continue to be worthy of this recognition remains.

Even the best of professionals can’t do everything. All of us, however, can find ways to improve our practices and to reach out to our communities. By so doing, we enhance our profession and improve oral health. The Year of Oral Health provides a unique opportunity to call attention to the importance of good oral health and to refocus our efforts to assist the public and our patients in attaining it.

As professionals we have an obligation to examine and understand the larger societal context and then take appropriate action to maximize our personal contributions to the social good. I can think of no saying that captures this approach more succinctly than: “Think globally, act locally!” The Year of Oral Health offers an opportunity to renew our efforts. Our fellowship in the American College of Dentists expects no less!
References


15. Greene JC. Diversity and access to care: National initiatives and local actions. 29th Annual Meeting of the United States Public Health Service Professional Association; 1994 Apr 7-9; Baltimore (MD).


Is Dental Practice Science Based?

Chester W. Douglass*

Abstract

This paper explores the thesis that the changing medical needs of dental patients, advances in biomedical research, and the confluence of the financing of medical and dental care will result in closer linkages between the medical and dental care delivery systems during the next century. Five trends have been documented in support of this thesis: the increasing number of elderly and their retention of teeth means there is a greater need for restorative dental care than in previous generations; the elderly have chronic diseases and are taking more medications; younger patients are presenting more frequently with infectious, systemic diseases such as HIV/AIDS. New scientific discoveries are opening new possibilities for patient care, which generate even higher expectations on the part of future consumers of medical and dental services. The health and fitness trend is not a fad; new knowledge regarding diet, nutrition, and exercise is identifying systemic risk factors related to common oral pathologies. Medical and dental educators are paying increased attention to the application of basic sciences to patient care. HMOs are increasing their market share of medical care delivery and expanding their services with preventive care and total patient care, including dental services. Data are provided documenting that dentists see these trends occurring in their private practices. The paper concludes that the application of advances in science and technology to oral health will improve the quality of dentistry. However, only new, effective preventive agents will decrease the cost of care, while improved diagnostics and restorative technologies could increase dental care costs. New diagnostic methods for the early detection of dental caries and periodontal disease should nevertheless make conservative therapies and earlier intervention more possible. Making such new services available to all sectors of society will be a challenge for the dental profession.

Questioning the science base for the practice of dentistry was first addressed by William J. Gies, who 70 years ago called for a dental curriculum and profession built on the science base of medicine. Gies (1) suggested that dentistry should be based on continually updated current scientific knowledge. After his report in 1926, dental school curricula were changed to include two initial years of basic sciences. Since then, how many of us have passed those courses and then proceeded to forget most, if not all, that we had learned (or memorized)? Times are now changing. Hence, the thesis of this paper: the practice of dentistry will become more closely allied with medicine and more science based in the 21st century than it has been in the 20th century because of the following:

- More older dental patients are retaining their teeth and presenting with chronic systemic diseases along with the medications to control these diseases.
- Biomedical research has produced scientific advances that are opening the door to the development of new preventive, diagnostic and therapeutic modalities.
- The medical and dental care financing and delivery systems may become more closely linked in the 21st century than they were in the previous 100 years.

There are five specific trends supporting the likelihood that this scenario will occur, at least in part.

1. Dental patients are changing. Dentists are treating greater numbers of older patients who have chronic systemic conditions and take one or more medications that can affect oral health. Increasing numbers of these elders have retained the majority of their natural dentition (2) and have greater need for restorative dental care than have previous generations (3). There also is a heightened awareness within dental offices of infectious systemic diseases such as HIV/AIDS and hepatitis.

2. Scientific developments are fast-paced. New scientific discoveries in the fields of cell biology, genetic engineering and material sciences

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have opened up new possibilities for patient care (4). Patient expectations are higher than those expressed by previous generations. They have heard about new technologies and want to receive benefits from them.

3. Health and fitness are not a fad. A whole new industry is developing around diet and exercise. There is new knowledge emerging on nutrition and oral health, which is identifying systemic and behavioral risk factors related to common oral pathologies (5,6). Interest in being fit and in shape correlates with interest in oral health.

4. Patient-oriented basic science teaching has finally arrived. Medical and dental educators are paying increased attention to the early application of basic sciences to patient care (7,8). Medication use, medical/legal pressures and new diagnostic and preventive paradigms are being emphasized in dental curricula.

5. Health maintenance organizations (HMOs) are offering dental services. The medical care delivery system now exhibits a significant trend toward HMOs with the integration of dental services and attention to preventive and total patient care, a service model in which dental care fits well. Dental care is also being integrated into the health services of homecare programs, nursing home facilities and ambulatory care centers, thus increasing linkages between dental and medical care within the financing and health care delivery system. Managed medical care concepts also are being applied to dental service benefit plans.

Changes in the medical status of dental patients already are apparent in one-third to two-thirds of practicing dentists’ offices. Dentists attending the annual meeting of the American Dental Association (ADA) in 1992 reported increases in the incidence of various chronic illnesses among their patients (9) (see Table 1). The majority of the dentists reported seeing more patients with heart disease, allergies and high blood pressure, and 49 percent of dentists reported an increase in patients with cancer. All four of these conditions are associated with the presence of older patients in dental practices.

Recent advances in molecular biology have made it possible to detect early genetic markers identifying patients at high risk for certain oral conditions. Such scientific abilities thereby raise a series of ethical issues, the discussion of which has been a priority of the American College of Dentists. The profession may be, in fact, moving toward a new definition of dental disease that can be diagnosed and treated in its earliest stages by a dentist. For these patients, dental care will be characterized by therapeutic methods similar to those of medical colleagues, that is, control of the disease process through oral pharmaceuticals (10). The number of patients appropriate for such therapies may be few, but they are present within most practices and their numbers will grow.

Scientific advances in imaging technology are already giving dentists the ability to detect small carious lesions (11). Also, advances in bacteriology (12), immunology and biochemistry have made possible the development of new diagnostic tests that can detect periodontal disease activity in shallow pockets, before advanced destruction of the periodontium occurs. This knowledge, along with the consideration of other risk factors, gives dentists the possibility of intervention at an earlier stage of the disease process.

A number of additional scientific advances were reported in the January and August 1994 special issues of the Journal of the American Dental Association. These papers describe oral pharmaceuticals currently

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<th>Table 1: Observed Change in the Incidence of Various Chronic Illnesses Among Patients of 448 Responding Dentists Over the Last Five Years</th>
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<td><strong>Increased</strong></td>
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available and on the horizon that will assist the dentist in prevention, diagnosis and therapy of periodontal disease, dental caries and soft tissue lesions. These developments provide evidence that the science base of dentistry is growing, and that the dental industry believes the market is or will be there to use new oral pharmaceuticals.

**Dental Education**

A call for the recognition of change is expected to be found in the Institute of Medicine (IOM) study of the Future of Dental Education, to be released in January 1995. A special committee chaired by Dr. John P. Howe, III, President of the University of Texas Health Sciences Center at San Antonio, and directed by Dr. Marilyn Field of the IOM staff, was charged to document the present state of relevant knowledge, the likely development of new knowledge and to develop a series of recommendations and courses of action that can be taken to prepare dental education for the future. Few of the ideas embodied in this and many other reports will seem new to many students of the dental profession. What is new in the Institute of Medicine study are the auspices under which the study was conducted and the thoroughness and breadth of its inquiry.

Dental care increasingly is rendered in the context of an extensive amount of diagnostic information. In addition, it is able to control the disease process with new types of oral pharmaceuticals and to treat the advanced stages of disease with new restorative materials and techniques. All of these advances are made possible by applying the science base of dentistry. Will dentists adapt to practicing more scientifically- and more medically-oriented dental care? Yes. In fact, most dentists do not need to be told these changes are coming; signs are already evident within their practices. The recent ADA/Colgate Oral Health Survey (9) found that of dentists attending the 1992 ADA annual meeting, 88 percent of those surveyed reported they would use new diagnostic methods for detecting early signs of dental caries, periodontal disease and oral cancer if such tests were scientifically sound. In addition, 73 percent are already seeing an increase in older patients in their practice; nearly all dentists are aware that middle-aged as well as older patients are taking more systemic medications than they have in the past. The majority of dentists (59 percent), reported they consult with patients' physicians on a monthly basis and 27 percent reported weekly communications with physicians. Moreover, the number of dentists attending continuing education courses related to these issues increases each year. Sales of new oral pharmaceuticals and a variety of new materials and devices to restore the dentition also are rising annually. Hence, most practicing dentists are already experiencing these changes and are preparing to meet the challenges of needing to provide more medically-based dental care.

**Will More Science-Based Dentistry Be Better?**

It is likely that as the science base of dentistry increases, the use of new diagnostic, preventive and therapeutic measures that improve the effectiveness of dental care may also add expense. The cost-effectiveness of new diagnostic methods and therapies will be an issue in the future. Very few technological innovations or products emerging from scientific breakthroughs have reduced the cost of medical or dental care.

Most products currently under development are used to diagnose and treat either the dental caries or periodontal disease process after it is already initiated. Thus, while the quality of patient care goes up, the cost of care is not significantly lower. Frequently, as with advanced restorative materials such as implants, new treatment methods are more expensive than those they replace. Yet, the likelihood that the oral health of the patient will be better served seems to be very high.

While a more medically-oriented and scientifically-based dental practice may be a change for some dentists, it will not be a dislocating change because it will be gradual. Furthermore, the forces underlying this seemingly fundamental shift are already being experienced by most practicing dentists and have been recognized by most dental schools. New dentists are being trained for this environment from the beginning of their dental education. They will come into the field already comfortable in applying increasing amounts of medical knowledge and scientific information to the routine daily practice of dentistry.

Dentistry has always been science based, but before society's investment in the National Institutes of Health, the scientific knowledge applicable to dental practice was mod-
est. Dominated by advanced forms of disease in the early part of the century, dentists did what they could. Until the introduction of scientific knowledge made available during the middle of the 20th century, dentists extracted a lot of teeth, made partial and full dentures, and restored whatever teeth they could. With the scientific advances of the past 50 years—the discovery of fluorides, a better understanding of the pathophysiology of disease processes, and advances in instrumentation and restorative technology—dentistry is moving toward the 21st century equipped with the science and technology that gives the profession the firepower to prevent oral diseases, detect them early, and control or treat them with oral pharmaceuticals and vastly improved restorative techniques. The science base of dentistry is improving and is now paying dividends in the form of better patient care and improved oral health for most Americans. It is a challenge to the dental profession to ensure that all members of society equitably enjoy these advances.

References
Abstract

An emerging and increasingly complex array of environmental health concerns face dental practitioners in both the private and public sectors. These concerns are challenging and possibly threatening the traditionally inviolable dentist-patient relationship. Regulatory bodies, health risk experts, attorneys, and enthusiastic media are inserting themselves into the process. Essential assets for "successful" dental practitioners include enhanced expertise in basic science and technology, including the area of risk assessment, and development of broadened perspectives and skills for communicating with patients and the public.

"Only the expert eye can distinguish between a vacuous research report and one with some real content. By the use or abuse of craft skills, it is possible for slip-shod experimental work to be dressed up in a conventional description, for unsound data to be converted into empty information by dubious mathematical techniques, and for incoherent argument to masquerade as close reasoning."

- Jerome Ravetz (1)

Dental Care - A "Risky" Business

The public and health care providers increasingly are being exposed to information about real and perceived health risks associated with dentistry and dental care delivery; (2-16 and Gerbert B: abstract presented at American Association of Dental Research meeting, Boston, 1991; Horowitz LG: abstract presented at the American Association of Public Health Dentistry meeting, Kissimmee, 1992). A few noteworthy examples include: the emergence of transmissible diseases in dentistry; continuing concerns over a variety of potential adverse health effects of fluorides and dental amalgams; and occupational risks of exposure to nitrous oxide. Oral diseases affect virtually the entire population (17-18); thus, most people require oral health care. However, perceptions of risk in the oral health care setting can be expected to produce broad-based public anxiety, which has been reported in the popular and professional literature (3-8,11,15). If people are afraid of dental care, they are likely to avoid seeking services they deem to be elective or deferrable. This makes it increasingly difficult to progress toward achieving the Healthy People 2000 Objectives for the Nation (19). At the same time, we know from national surveys of individual knowledge of diseases and their prevention (11,20,21) and individual health practices (22) that many people do not know what they need to know and fail to do what they need to do to be orally healthy.

Health care providers are in business for two things: to keep people healthy who are healthy; and to help people recover from diseases or injuries when they occur. Historically, this has been a rather paternalistic process, with providers often playing God rather than teacher, and offering patients and the public small roles and limited choices. Public education and communication generally has been one way, and often viewed as "motherhood and apple pie" (e.g. brush and floss your teeth and visit your dentist regularly). As experts, health care providers are not accustomed to negotiating solutions and options with patients or the public (23). Recent evidence indicates patients place a higher value on their dentist communicating with them about the important issue of infection control than the dentist places on such communication (24).

Broad-based concerns, such as environmental, generally have been handled in a similar manner (25). Basically, scientific experts were consulted on what they thought people should be told. Information then was packaged in the most attractive form(s) possible. This information


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was repeated over and over in print
and electronic forms and in public
forums, until it was felt that the public
understood, or should understand.
Full discussion of all of the reason-
able options, citing the possible risks,
costs, advantages, and personal re-
sponsibilities associated with each
option, has been the exception rather
than the rule in the public and pri-
ate sectors. Simply stated, as health
care providers and expert scientists,
we trusted exclusively and com-
pletely in our professional expertise
and we were trusted by our patients
and the public implicitly.

But things have started to change
(26). Increasingly, health care provid-
ers and scientists are discovering that
divine beneficence and technical ex-
pertise are not adequate for solving
complex, multi-factorial problems that
largely are affected by individual
thinking, decisions and actions. The
health professions are getting beat up
with issues related to real and per-
ceived risks. A recent article in Scien-
tific American (27) identified several
dozen risks, ranging from microwave
ovens to nuclear fallout, that the pub-
lic has been alerted to in recent years.
Three dental issues were notably in-
cluded: water fluoridation, diagnostic
x-rays, and mercury. Environmental
scientists, risk assessors, and regula-
tors are finding dentistry faster than
dentistry is finding them. The result is
that dental care providers may feel
"whip-sawed" between pressures
from government and the public.
Dental providers need to develop
new skills, broader perspectives, and
to acquire new information to rees-
ablish homeostasis in their profes-
sional lives.

Physician (Dentist!) Heal Thyself

Scientists and health care provid-
ers must communicate effectively
with the public and patients to
achieve the objectives of improved
personal, population, and environ-
mental health (28). Preventive-ori-
ented practice particularly relies on
anticipatory guidance. If scientists
and health care providers are to com-
municate effectively, however, they
must have the proper information to
share and they must be skilled
in methods of communicating
(12,28,29). On the first point, many of
the risk-related issues in dentistry are
scientifically and methodologi-
cally complex. Many dentists are
poorly informed about and generally
inexperienced in matters such as
quantitative risk assessment, labora-
tory bioassays, mutagenicity testing
and other modern risk assessment
techniques. Consequently, they
may be stymied or frightened by the
newer scientific approaches and thus,
unable to interpret them to their pa-
tients and the public. Further, even if
dentists possess knowledge in those
areas, communicating the most im-
portant information in an understand-
able fashion to patients and the pub-
lic is not easy. At the same time,
health professionals ethically are
bound not to use information and
communication skills in a manipula-
tive fashion. This would be inconsis-
tent with the role of honest broker
and could seriously undermine the
patient and public trust.

What is reasonable to expect a
dentist, oral health educator, or oral
health program administrator to
know in order to effectively commu-
nicate health risks and benefits to pa-
tients and the public? What does a
dental care provider need to know in
order to respond to the challenges of
the environmental regulatory com-
munity? The following objectives are
proposed as reasonable:

1. To understand generally the
current state of dental science and
the accepted methodologies relative
to quantitative and qualitative risk as-
essment.

2. To understand the difference
between risk assessment, risk man-
agement and risk communication.

3. To know the critical elements of
effective risk communication, that is,
the ability to communicate effectively
with patients and the public.

4. To understand the current sci-
entific facts of risks and benefits asso-
ciated with the different materials, de-
vices, drugs and treatments that are
part of clinic- and community-based
dental practice.

Measuring Risk

Most people are not fixated on
thinking about risks and may even
avoid thinking about the topic. How-
ever, risk is everywhere in our lives at
all times (30). Taking any specific ac-
tion always involves risks, as does
not taking a specific action in antici-
pation of or in response to a given
situation. Analytical and modeling
techniques can be employed in many
situations that provide options for
modifying risks. Risks often can be
described as probabilities, although
individual risk is much harder to
characterize. Population-based risk
statements should represent both a
point estimate and range. However,
there can be much confusion be-
tween average risks and the expected
personal risks that lead individuals
to make choices in their lives. People
tend to underestimate the personal
risks from choices they make them-
selves and to overestimate risks from
choices others make for them (31).
As an example, it is widely under-
stood that seat belts save lives; how-
ever, many people act as if they be-
lieve this applies to everyone else but
themselves.

A Basic Risk Primer

There is a lexicon for the risk area
important to understanding and com-
municating with risk specialists, al-
though there remains shades of difference in the ways different risk experts view certain issues. This section provides an overview of basic risk concepts and terminology.

Risk assessment characterizes the severity and probability of harm to human health as a result of exposure under plausible circumstances to a substance, agent, or activity (Figure 1). It is the technical assessment of the nature and magnitude of a risk (32). Quantitative risk assessments actually estimate the likelihood an adverse event will occur or the magnitude of the effects from an event, with variations in exposure factors (e.g., the number of deaths expected in a population per unit of exposure).

Risk analysis incorporates risk evaluation beyond the quantitative issues and, importantly, moves toward the utilization of risk information as a basis for risk management (i.e., risk reduction). It uses the tools of science, engineering and statistics to analyze risk-related decisions. Included are hazard identification, risk assessment, determination of the significance of risks, and communication of risk information (32).

Hazard identification is the initial step in risk analysis. A hazard is defined as a potential source of risk. Typically, we ask, "Is there a hazard and, if so, can we quantify it or come up with some semi-quantified method of characterizing it (33)?" Clinical dental examples include exposure to nitrous oxide, ionizing radiation, or infectious agents such as hepatitis B.

Risk can be defined as the possibility of experiencing harm from exposure to a hazard. It is important to identify the event(s) that create the possibility of harm and to make a statistical estimate of the likelihood harm will occur. Many kinds of scientific evidence and studies are used in this area, including studies in humans, animals and microorganisms.

Dose-response assessment produces quantitative data on the specific amounts of a risk agent that may reach the organs or tissues of exposed individuals; it also estimates the percentage of exposed populations that might be harmed or injured. Assessment should also consider sensitive sub-groups that could experience harmful effects from levels of exposure considered to be generally safe for the overall population.

A dose-response curve depicts health effects anticipated from specified doses. A familiar example in dentistry described by Dean (34) depicts the relationship between fluoride in drinking water and dental caries (Figure 2). Three basic types of dose-response curves are postulated (35) based on differing assumptions of variable dose effects (Figure 3). The assumptions from the curves play a significant role in risk management decisions such as regulation. It should be noted that real (laboratory- or clinically-derived), complete dose-response curves do not exist for many agents of concern in dentistry. In general, dose-response curves are constructed from only a few points, assuming this reflects the true underlying relationship. However, variables that may alter the dose-response effects are not always well characterized nor the magnitude of their effects quantified.

Risk management uses the information from risk assessment in conjunction with information about technical resources and knowledge of social, political and economic values to select actions to reduce the risk. This essentially involves policy analysis, including cost-benefit assessment, policy development and policy implementation.

The age old adage "dose makes the poison" is worth remembering as it relates to the extensive controversy surrounding substances known not to produce adverse measurable health outcomes at low doses yet that continue to be regulated. This emphasizes the important concept of threshold. There is a theory that for a category of risk agents, exposures below a certain level do not produce any measurable or significant risk - the no observed adverse effects level (NOAEL). For known carcinogens, this assumption typically is not made, that is, there is no safe exposure level. However, where the elimination of exposure is technically impossible or prohibitively costly, levels of acceptable risk may be established,
Figure 2. The Relationship Between Fluoride in Drinking Water and Dental Caries

![Graph showing the relationship between fluoride content in public water supply and dental caries incidence.]

Figure 3. Dose-Response Curves

![Graph illustrating dose-response curves, with measured risk at high dose and increasing incidence with increasing dose.]

A Word on Bias and Uncertainty

It is important to minimize the effects of bias in risk assessment but it may be impossible to keep it out completely. Valuations and estimates are used and are susceptible to bias. At a minimum, sources of bias should be identified along with their effects on the risk assessment. Uncertainty, or simply not knowing what is absolutely correct, permits bias to have a potentially large impact on the risk assessment. Curiously, some bias actually may be an advantage in risk management and risk communication in order to achieve equitably negotiated and useful solutions.

Quantitative risk analysis has the advantage that judgments can be incorporated to make assumptions and biases explicit. At the same time, care must be exercised to avoid over reliance on the quantitative estimates as absolute simply because they are numeric. Many assumptions in risk assessment have wide degrees of uncertainty (36).

Types of Scientific Evidence

The many types and sources of scientific evidence used to determine probable levels of risk can be placed in a general hierarchy based on their utility for making scientific judgments of cause and effect (Figure 4). There are advantages and disadvantages to each type and source of evidence. Generally, the non-peer-reviewed material is of less rigor and therefore of less value in making objective determinations of risk. It follows that peer-reviewed material generally may be ranked higher. It is important to note, promotional pieces like those from the American Dental Association on AIDS, infection control or dental amalgam may be based on scientific evidence but are not scientific studies per se; neither are promotional pieces produced by those opposed to community water fluoridation or the use of dental amalgam. Public or professional newspaper and magazine articles carry minimal weight in making objective scientific decisions.

Unpublished studies can be particularly problematic. They may appear quite thorough and scientific but, without the benefit of peer-review, it is not appropriate to draw conclusions from these reports. Self-published studies may be somewhat more useful, since once they have been published they can be assessed by the scientific community. However, one should question why studies are self-published rather than being processed through the rigors of formal peer review. Many regulatory decisions are based on peer-reviewed but unpublished data. The Food and Drug Administration receives data directly from manufacturers and clinicians that are used to make regulatory determinations. The Environmental Protection Agency also relies on special studies not published in peer-reviewed journals.

Peer-reviewed case reports can be extremely valuable for identifying potential problems and solutions. How-
ever, they cannot definitively establish whether there is a real risk, although they can offer evidence supporting the need for additional, more rigorous studies.

Higher on the hierarchy of scientific studies are: cross-sectional or correlational studies; community trials, such as the classic fluoridation studies; and, case-control studies comparing affected and not-affected individuals in an attempt to identify potential causative agents.

Finally, there are experimental studies – the most rigorous and reliable level of investigation. A classic experimental study involves two or more groups of subjects; subjects are randomly assigned to a group, with at least one group exposed to the factor (or treatment) under investigation. Subjects are followed to measure the relative level of effects. Studies of the carcinogenicity of fluoride in rodents are examples of experimental studies (35,37,38).

In evaluating the strength of data obtained from a study, the source of the data alone is not enough to establish whether the evidence is credible and/or strong. One must evaluate the actual data and study methods against technical standards widely employed in the research community for data collection, analysis and statistical treatment (39).

**Cause and Effects**

It is important that conclusions about cause and effect are based on a balanced consideration of all relevant studies of adequate rigor (40). One technique being used today is meta analysis, a quantitative method permitting aggregation of results from similar studies in order to increase the statistical power to detect relationships. Most often, however, overall conclusions of cause and effects are obtained by a systematic, somewhat subjective process, based on highly objective criteria. Commonly applied criteria include (41):

- Detection of an association;
- Presence of a dose-response relationship;
- Replication of findings under a variety of circumstances and by different investigators;
- Excluding alternative explanations and observer bias;
- Finding biological plausibility for the relationship;
- Observing disappearance of effect(s) when the cause is removed.

Scientific evidence can be derived from studies of humans, non-human primates, other animal species, and cell lines. High quality studies on human populations are the most relevant for drawing conclusions of cause and effects relative to human health.

**Risk Communication/Reduction**

The ultimate purpose in the objective assessment of risk is to establish the basis for taking actions to reduce risks. The decision to reduce risks invariably involves the expenditure of resources. It also encompasses making value judgments between reducing one type of risk or another, or reducing a risk at the cost of losing a benefit from other activities. In the end, value judgments always enter into decision-making and the public's judgment is a critical factor. Sandman has proposed a paradigm of *hazard versus outrage* for public reactions to risk (42,43). This perspective argues that the degree of public concern over an issue can be predicted roughly on valuing numerous factors that will characterize the risk in the public's mind. Is the risk voluntary or coerced on the public; natural or artificial; familiar or exotic; highly dreaded or non-dreaded; diffuse in time or focused; controlled by the individual or externally imposed; fair or unfair; morally relevant or morally irrelevant; openly disclosed or secretive; communicated comfortably or with arrogance and defensiveness? Risk issues that *flunk* a majority of these test items are candidates for poor outcomes in risk communication between health care providers, policy makers and the patients and publics that they serve.

Cardinal rules for risk communication have been formulated to assist us in knowing how to deal with patients and the public (44):

1. Accept and involve the public (and patients) as legitimate partners.
2. Plan risk communication strategies carefully and evaluate their effectiveness.
3. Listen to the public's specific concerns.
4. Be honest, frank, and open; do not make "boiler-plate" institutional denials of a problem(s) unless you

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**Figure 4. Hierarchy of Scientific Evidence**

**Category I - Peer-Reviewed**

- Clinical Trial (Experimental)
- Epidemiological
  - Case/Control (Retrospective)
  - Community Trial (Prospective)
  - Cross-sectional
- Case Report(s)

**Category II - Non Peer-Reviewed**

- Case Report(s)
- Unpublished
- Self-published
- Newspaper Articles
- Promotional Pieces
have thoroughly investigated from all perspectives.

5. Coordinate and collaborate with other credible sources.

6. Attempt to meet the needs of the media.

7. Speak clearly and with compassion.

It is difficult to argue that dentistry or any health science field has consistently followed these precepts in the past.

Dental personnel often need to communicate to the public through the media, rather than directly. These situations are risky since the person offering the information does not have ultimate control of the range of information, format of the communication, or context within which the information will be presented to the public. Likewise, the individual offering the information will have little or no opportunity to respond to editorial comments that may be appended to the information. Nevertheless, refusal to provide information is likely to be viewed by the public and the media with some suspicion.

Some guidance (29) on responding to media requests for information include:

1. Be clear about two or three key points you wish to get across; emphasize the importance of including these in the story. If you have opportunity, state the points more than once.

2. Do not assume that the interviewer knows much about the specific subject. They may not have knowledge from a related area, depending on whether they are a health/science reporter.

3. Avoid the use of jargon, but recognize this won't be easy.

4. Prepare a press release of risk information including information such as: the number of cases, types of disease, nature of research efforts, comparison of local, state, and national rates, possible causes and confounding factors.

5. Don't be afraid to say that you do not know the answer to a specific question but be ready to refer the interviewer to a reliable source. If you speculate, make sure the interviewer distinguishes clearly between facts and your speculation.

6. Be prepared to answer difficult questions concerning how you personally react to a specific risk situation. Identifying possible questions in advance and practicing responses with colleagues can reduce the trauma of surprise and lead to more accurate responses.

Like any skill, risk communication efforts become more effective with practice. Whether you are speaking with individual patients, in a town meeting or before a television camera, your working knowledge of the risk assessment, management and communication fields can enhance your skills and abilities.

References
4. Pare S. Beware the risks of water fluoridation (guest column). USA Today 1990 Feb 6:10A.


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Communicating Science to Our Patients and the Public

Irwin D. Mandel

Abstract

Communicating dental science, especially on issues of health and safety, is assuming increased importance in dental practice and in the relation of the profession to the public. Effective risk communication requires knowledge, balance and sensitivity to the concerns of our patients and the public. It is a skill that takes preparation, training and practice, and schools and professional organizations should be encouraged to include it in their educational programs. Presenting dental science to the public is a more difficult challenge than for the individual patient since there is no readily available site for exchange, such as the office, and no personally established relationship, credibility or trust. A larger cadre of trained spokespersons from the practice, public health, academic and research communities is needed, and more extensive multi-lingual and multi-cultural educational material should be made available for community outreach. Oral presentations to the public require different skills of both a verbal and nonverbal nature than for office communication or professional group presentation — and guidelines are offered.

Communicating Science to Patients

Most dentists and hygienists have difficulty acknowledging that one of their prime professional activities is communicating science to their patients. Communicating science! It's as if they have been accused of writing prose all their lives. Communication is the sort of thing taught at seminars on practice management and internal marketing. Science is the stuff of journal articles, research meetings and the science section of The New York Times and not the mini-lectures on dental decay, gum disease and oral hygiene often wedged between fillings, bonding, and scalings.

An uncommunicating, distanced professional attitude (perhaps best symbolized by the rubber dam) — still seen in many dental offices — is a vestige of a time (not too long ago) when patients were viewed in the traditional sense as sufferers — those who endured pain or trouble without complaining, calmly tolerating delay, confusion or inefficiency. We might add to the dictionary definitions of patients — never questioning a treatment plan or fee.

One of the most difficult transitions for many older practitioners to accept was the change in attitude and style from the passive patient to the active consumer searching for information, sharing concerns, questioning procedures and fees. For this new breed of consumer-patients the bully pulpit is not enough. Questions need to be addressed appropriately and communicating dental science is a must.
gesics. Waiting in the wings are: lasers; new therapeutic agents and oral health products; vaccines for caries, periodontal diseases and herpes; and, whatever technology transfer brings to our offices and is featured in tomorrow’s media.

As technology and life become more complex and the pace of innovation accelerates, the need and indeed the demand for authoritative information will increase. The dental office is one of the most appropriate places to fill that need and communicating dental science will play a larger role in dental practice. Recognizing that the underlying concern is health and safety, the overarching framework for practitioner-patient dialogue is risk communication, the third part of the triad that includes risk assessment and risk management.

Risk communication, a relatively new field, is defined as the exchange of information among interested parties about the nature, magnitude, significance or control of a risk (1). It is the process by which risks to health and safety are characterized and communicated. It is not eulogistic and defensive; nor is it public relations and marketing (2). The requirements are knowledge, objectivity (often very difficult) and balance, as well as a sensitivity to the concerns of the patients and the public. This is markedly different from the current view of risk assessment and management in dental practice, which is seen as primarily protecting the office against malpractice suits and OSHA complaints – often viewed as two of the modern dental plagues, as letters to the editor and cartoons attest. We view OSHA as the designated enemy, superseding even the insurance company.

Although many people no longer automatically perceive that the surrogate father/mother knows what is best, the dental office remains an ideal setting for risk communication. It fulfills many of the criteria that have been described as prerequisites for effective exchange (1): perceived caring and empathy; perceived competence and expertise; perceived honesty and openness; perceived dedication and commitment. These are the same characteristics that keep the patient going to a particular dental office. In risk communication, as in ongoing dental and medical care, caring and empathy are the most important considerations for the patient. Education is possible only after trust and credibility have been established (1).

Trust and credibility also require that the patient perceives the practitioner has competence and expertise, as sensed from the dental treatment received. For risk communication to be effective the practitioner has to demonstrate a command of the facts. This means making the effort, and it is not inconsiderable, to keep up with research and evaluations on the issues, materials and procedures. Self-education and continuing professional education become a must. The journals and the supplementary material being generated by the professional societies are helpful and effective. Professional organizations also provide material for distribution to patients. However, the patient pamphlet is not enough. Facts, especially in brochures where there is always some wisp of concern over self-interest, do not speak for themselves. They have to be appropriately framed and presented to be understood and accepted (1).

Risk communication is dependent on both verbal and non-verbal skills (1). Maintaining eye contact is critical. If possible, avoid physical barriers between you and the patient such as a desk. When the discussion is at the dental chair, the patient should be in an upright position and a mask should not be worn.

Current research indicates that in medical practice women tend to receive lower initial ratings from patients on competence and expertise (1), and are seen as less effective as risk communicators than men. This can be quickly overcome, however, by demonstrating a command of facts and a well organized response to questions. However, it should be noted women are perceived as more caring and honest and with greater dedication to the patient’s welfare than men (1).

A dental office offers a number of special advantages for risk communication. A large proportion of patients come for regular care and maintenance and therefore are relatively comfortable in the dental setting. The association with the dentist and hygienist is a close one, given the nature of the dental procedures. Trust and credibility have been established
over time and, unless there is acute pain, patients can pay close attention to the verbal interchange. In many offices patients see both the hygienist and the dentist, hence there is an opportunity for reinforcement of information.

The current concern with risk-related issues in the office setting does not mean that other forms of patient education efforts should be ignored. On the contrary, the channels of communication opened by discussions of risk issues should increase the opportunities for patient education in preventive dentistry and health maintenance by both dentists and hygienists. The customary topics of preventing caries and periodontal disease should be augmented by greater efforts in the areas of smoking cessation, oral cancer, alcohol and substance abuse, and nutritional counseling. This too is risk communication; it goes beyond furnishing relevant information and moves toward stimulating a sense of personal responsibility for health and eliciting and facilitating behavioral change.

Effective communication is not a reflexive activity but a skill that requires knowledge, preparation, training and practice. Dental and hygiene school curricula are very limited in this area. Preventive dentistry, behavioral science and community health programs, which are the natural habitats for such curricula, unfortunately shrank drastically during the 1980's when budget shortfalls deprived them of sustenance. Hopefully, with increased recognition of the expanding needs for communication skills generated by risk-related concerns and increasing emphasis on prevention in health reform plans, more learning opportunities will be offered at the undergraduate, graduate and continuing education levels by academic and public health institutions and professional organizations (2).

Communicating Science to the Public

Presenting dental science to the public is a more difficult challenge than it is for the individual patient. There is no readily available site for information exchange, such as a dental office. There may be no personally established relationship, credibility or trust. In addition, this is not a happy time for communicating science of any kind. With a growing list of environmental and safety concerns the public has difficulty distinguishing between the message and the messenger. It is certainly not that heady period when scientists were heroes and science was seen as a secular religion. Now the mad scientist who defiles nature is making a comeback in movies and novels, aided by the accoutrements of molecular biology. High on the list of problems in risk communication is the growing lack of trust in scientists and in responsible authorities in general (3). In an interview a few years ago, Dixie Lee Ray, former chair of the Atomic Energy Commission and former governor of Washington noted, "The public is far more likely to believe opponents of science and technology than to believe the supporters. In public debates opposition always wins because whoever is against any technology has only to make a charge, however preposterous; he doesn't have to prove it. The burden falls on the supporters of science to prove that the charge is groundless (4)." Anyone involved in debates on fluoridation and amalgam safety can verify this observation.

Despite the inauspicious atmosphere (no pun intended), there are many opportunities for communicating with the public on issues related to dentistry. During most of the 1980's much of this communication tended to be defensive, reflexive and largely ad hoc. That has changed, however, and there is now information, structure and guidance to the profession for a more positive and effective approach.

A critical element in communicating dental science is the availability of knowledgeable, trained spokespersons from the practice, public health, academic and research communities. Many scientists in all fields now recognize that popularizing science is a positive, not a negative attribute. Jeremy Bernstein, a respected physicist and essayist observed, "The very best popular science writing must come from scientists. For them, science is a part of everyday experience — their skin and bones — and this feeling is what emerges when a really good popular book is written by a scientist (5)." This can be extended to articles in the printed media, to public presentations and broadcast media, provided an effort is made to learn how to do it well. In the case of the health sciences the mantle can be worn by a variety of professionals with appropriate knowledge and training.

The American Dental Association (ADA) is one of the best current resources for training and materials. The ongoing National Spokespersons Program prepares dentists from different regions, as well as national officers to represent the ADA on major media outlets. This is augmented by a training program for spokespersons.
from constituent societies for local presentations, and a program for specialists, drawn from academic institutions as well as the practice community, on critical issues. Other sources of excellent educational materials are the National Institute of Dental Research, the American College of Dentists, the American Association for Dental Research and the various specialty organizations.

The increasing diversity of the U.S. population poses an especially difficult problem for educational outreach not only because of the multiple languages involved, but because of cultural attitudes and beliefs. Various groups and agencies, however, are addressing the problem and there is a growing body of material available. An excellent source is the Dental Health Foundation, which publishes Oral Health Education Materials Resource Guide (6), a comprehensive listing of materials available in a variety of languages.

The major determinants of success in communicating science to the public continues to be the message and the messenger. Each of us must shape our presentation to fit personal style and point of view. However, there are basic guidelines (7):

1. Know your audience. The public encompasses many populations, each with distinct backgrounds and interests. Adjust your emphasis and mode of presentation accordingly. Although the levels of interest and sophistication may vary, all groups are entitled to your concern and respect. This must be apparent to effectively convey your message.

2. Avoid jargon. It may be so entrenched in your vocabulary that you normally do not notice it — but be aware and try to substitute descriptive terms.

3. Introduce new terms gently. You do not have to avoid technical terms completely, but present an idea in descriptive terms before assigning it a name.


5. Whenever possible add a human element. Try to make it an interesting story, not a litany.

6. Use of numbers is acceptable provided it is not overdone. The public expects quantitation in a discussion of science.

7. Provide illustrations, as long as they are self-evident and do not require much explanation.

8. Repeat major ideas. State your main ideas, elaborate on them, and then sum up.

9. Avoid reading your presentation and do not memorize it. It's best to speak from notes to keep the presentation more fluid and direct.

10. Prepare for obvious questions the audience is likely to ask. Anticipate these when preparing your presentation.

Risks, Benefits and Choices

Although risk analyses and communication may seem to be abstract concepts, dental patients are certainly part of the concerned and contentious public. During the height of the media flurry on dental amalgam, an ADA survey of 1,000 dental patients revealed that nearly half believed that health problems could develop from amalgam fillings (8). In varying degrees all members of the profession became involved in ongoing dialogues, replacing the professional monologue as the prevailing communication mode in the dental office. A similar pattern prevails when fluoride safety issues are raised.

The U.S. Public Health Service (USPHS) reports on fluoride (9) and dental amalgam (10) offer models for how a communication interchange can be pursued. In both areas, review committees were charged with examining risks as well as benefits, considering the alternative choices, and then offering their recommendations. Patients and the public are entitled to a similar balance sheet. There is always some uncertainty in risk assessment. As noted by Victor Cohen, "We must always act on the basis of incomplete or uncertain information... science cannot prove a negative -- no study can ever prove that something is not harmful or does not exist (11)." However, the USPHS exhaustively reviewed all available studies and concluded, "It is inappropriate at this time to recommend any restrictions on the use of dental amalgam," and then went on to give the reasons (10). An expert review committee did the same for fluoride and recommended the continued use of fluoride in community water supplies as safe and effective (9).

Given the proclivity of much of the media to sensationalize any report of environmental hazard or potential threat to health and safety, we continually will be faced with a violation of a basic law of physics -- sound will travel faster than light.

The need to effectively educate and communicate will become increasingly more important to maintaining the trust and credibility dentistry has enjoyed in the past. It was noted that when it comes to environmental concerns, the public does indeed use The Book of Genesis as its bible -- carcinogenesis, teratogenesis and mutagenesis (12). A case in point is a recent poem, "Polite Nods from the Host" (13).
as one of the guests starts in on the carcinogens in cola, the criminal fluoridation of the water - our children will die riddled with cancer, he says, but with perfect teeth and the murmur of dinner-party assent rises in the salutary air.

These concerns cannot be summarily dismissed. We must follow the literature, examine new observations and evaluations in appropriate perspective, and share the balance sheets with our patients.

References
Abstract
Both higher education and the dental profession must seek to develop dentists who can combine technical competence with sensitivity to ethical and social concerns. Dental education and the overall higher education experience should seek to produce a practitioner who continues to develop as an ethical professional through ongoing learning, experience, and reflection. In pre-professional education, this goal requires integration of disciplinary content with consideration of contemporary issues that often provide the context for clarifying values and ethical behavior. As the knowledge explosion continues to splinter higher education into specialties and subcategories, attention must be given to integrating the campus as a learning community that promotes an interdisciplinary focus on societal issues. Higher education faculty serve as models for students in demonstrating the responsibility to relate one’s area of professional expertise to broader ethical and social concerns.

This paper offers perspectives from a full-time university administrator who is also a school of dentistry faculty member and a practicing dentist. Its content reflects on the role of higher education in shaping a dentist’s sense of self as a professional. A number of terms — values, ethics, social awareness, reflective thinking — are used to describe qualities important to the sense of dental professional identity. These terms suggest the complexity of the issue of professional identity development, as well as the fact that we are in the early stages of defining its parameters.

The challenge for higher education in addressing this issue is suggested by former U.S. Commissioner of Education Ernest Boyer (1):

"The crisis of our time relates...to the disastrous divorce of competence from conscience.... Professionals in almost every field...once they begin to practice their craft, must respond to questions that relate not just to the “what” and “how” of the field, but to the “why” as well. Specialists must make judgments that are not only technically correct but also include ethical and social considerations. And the values professionals bring to their work are every bit as crucial as the particularities of the work itself."

Thus, the issue at hand might be described as how higher education can help develop a practitioner’s professional conscience and ability to address those why questions. Pre-professional and professional education, as well as professional practice must address this issue in a manner responsive to evolving attitudes on health care and professional roles. Possible implications of the changing expectations for the dental profession and for the dental school curriculum are noted below.

The principal focus of this paper, however, is on the role of the pre-professional higher education experience in developing ethical dentists and other professionals. Although some very useful thinking is being done about the types of education that contribute to this goal, an expanded discussion is needed across a broad spectrum of educators and practicing professionals. Toward that end, much of the following discussion is relevant not only to dentistry but to a variety of professions.

The Professional Practice Context
What are the professional characteristics of the dentist we seek to produce? This is an important question because increasingly the full range of knowledge and experience required for practice cannot be provided in a four-year dental school curriculum. Rather, our goal should be to develop dentists who are committed to career-long learning and professional reflection.
One recent conceptualization of such professional qualities is offered by Schon (2), who suggests, "Some of the most important problems in practice are characterized by complexity, uniqueness, uncertainty, and conflicting values. The goal of practice is wise action. Wise action may involve the use of specialized knowledge, but central to it is judgment in specific situations, with conflicting values about which problems need to be solved and how to solve them."

The emphasis on "wise action" and judgment suggests that considerations relating to ethics and values are important in many aspects of professional practice. The work of a dentist often involves the concurrent application of technical expertise, experiential knowledge, and sensitivity to other concerns that may apply to a given situation.

The Dental School Context

Schon (2) proposes a reflective practicum or apprenticeship for a student to acquire both the direct experience and opportunities to interact with an expert to reflect on this experience. Such a practicum would emphasize learning by doing and interactive problem solving. The setting would be a controlled environment in which points of emphasis could be revisited and the pace adjusted to the needs of the student. As this supervised experience develops the tacit knowledge -- the knowing-in-action -- of a reflective practitioner, the supervising professional could guide the student in recognizing and addressing issues with ethical dimensions.

Cavanaugh (3) also suggests curricular approaches to promote career-long development of professional knowledge and ethics. She highlights the need to help students develop effective systems of learning to prepare them for self-directed, lifelong learning. Only a portion of a professional's knowledge comes from degree programs or continuing education. Students must be prepared to learn throughout their careers through reading, discussions with colleagues, and professional experiences. The curriculum should emphasize that ongoing professional development should also include opportunities for ethical reflection and growth.

In professional practice, there may be a number of paths to "wise action" depending on how one has developed and integrated various competencies, experiences, values, and learning styles. Consequently, whenever appropriate, educational activities should allow a variety of problem-solving approaches that are effective in given situations.

The Higher Education Context

Turning to the role of pre-professional higher education in preparing ethical dentists, there appears to be a need for the undergraduate experience to provide opportunities for ethical reflection comparable to those recommended above in the dental school context. Higher education, from its often religion-related origins in American society to its current preoccupation with political correctness, has frequently been prescriptive in presenting ethics and values to students. The challenge today is for higher education to encourage developmental, interdisciplinary, issues-based student reflection.

This challenge is made more difficult by the apparent lack of consensus regarding the optimal development of ethics and values in today's increasingly diverse student population. Although codes of speech and behavior are proliferating on many campuses, it has been noted that codes or statements of ethics seem to be most necessary when a cohesive culture no longer exists (4). To the probable relief of both students and administrators, most colleges have long since abandoned their in loco parentis role. Too frequently, however, student life and academics are handled as separate concerns, resulting in missed opportunities to promote the integration of values and social awareness with academics.

Despite the above concerns, we should recognize that the higher education experience already contributes much to the development of professional standards among dentists and other professionals. Smaller liberal arts colleges are often credited for giving attention to the individual developmental needs of students. Even in the complex setting of a large research university, however, undergraduate students have many opportunities to refine their personal values and ethical awareness.

An issue worth exploring is whether an expanded dialog among practicing professionals, professional education faculty, and undergraduate faculty could produce a more purposeful and coordinated approach. For this to occur, greater consensus may be needed on the role of institutions and professions in addressing a number of challenging societal issues, including those described in the next section.

The Issues Context

Ethical considerations cannot be taught effectively to students as abstractions, but rather in conjunction with reflecting on and responding to specific issues. Several topics with implications for ethics and values-related reflection receiving widespread attention in higher education are described below.

Diversity, The increasing diversity of the university campus and of the overall society is an obvious trend. It is worth reflecting on the implications of this trend as it will affect how we think about the membership of various groups, whether those groups are the faculty and students of the
university, or our colleagues and patients in professional practice. Issues of equity and equal opportunity are especially important to consider.

Community. We are challenged not only to respect ways in which we are different, but to acknowledge the ways in which we are similar or have common interests. Issues related to this topic include: respecting one's coworkers; refraining from any action that makes others feel excluded or harassed; and empowering others to contribute to decision-making processes. Emphasis should be placed on the interdependence of our roles and on the mutual respect that interdependence requires. Awareness of these perspectives will be particularly important in the increasingly interdisciplinary area of patient care.

Quality. In work settings throughout the nation, a new sense of the meaning of quality is emerging, a sense which we must bring to our educational and professional activities. This new perspective includes a commitment to monitor and improve processes, empower diverse teams of individuals to cooperate in developing these improvements, and assess outcomes through careful measurement and interaction with the organization's customers. If one requirement of ethical professional behavior is to do the best job, then we cannot ignore opportunities to improve clinical practice. Concepts such as "total quality management" and "continuous quality improvement" are now familiar in health care settings. Although many higher education institutions are trying to adopt these principles, greater attention must be given to the implication for how and what we teach.

Information Availability. In the midst of the current flurry of discussion about computer networking and information highways lies the realization that the roles of educators and other professionals may be substantially different in future years. If knowledge is power, what are the implications in an era when there will be widespread access to knowledge (or information, at least) from one's own home? How will dental practitioners responsibly access and share information in a way that contributes to the quality of people's lives?

Access and Affordability. These interrelated issues are particularly important for dental professionals as we participate in the current health care reform discussion -- a topic that illustrates the crucial intersection of professional identity, ethics, and social responsibility. In many ways, the issues of access and affordability as they relate to health care, education, housing, and other human needs, are the most fundamental questions our society faces.

A student entering dental school without having reflected on the above issues probably will be poorly prepared to think about dentistry's role in the current health care discussion, or even about his or her own personal role and responsibilities as a practicing dentist. Higher education faculty and administrators have the responsibility to take every appropriate opportunity to help students clarify their values and develop their ethical thinking on these and other contemporary issues.

Ethics Across the Educational Continuum

The above topics indicate the types of broad challenges facing higher education and indeed all sectors of society. They are representative of the types of issues that will often provide the context for discussions of appropriate standards and conduct with students. Most of the emerging issues, as well as the more traditional issues of ethics such as honesty, are not the subject matter of a particular course, but they can be a source of discussions in many courses. We are thus in a situation where every faculty member can promote reflection, yet we run the risk that no one will take responsibility without a greater institutional commitment to this priority.

As the knowledge explosion creates ever more academic subcategories and specialties, the need increases for all segments of higher education to affirm fundamental core values and functions. The success of dental schools in producing socially and ethically responsible dentists depends on the commitment of higher education to fulfill its original and ultimate purpose -- as a moral force in society helping people live better, more fulfilled lives. Although each segment of the higher education community has a specific and unique role in creating and imparting knowledge, there is a common responsibility to help students learn to use the knowledge, and its resulting power, wisely, justly, and well.

Developing a sense of ethical and socially responsible behavior is not the singular responsibility of any particular educational degree program. Indeed, it is a shared responsibility best accomplished when all segments of higher education work together to reinforce the message. Schools of dentistry derive very substantial benefits from their participation in the wider higher education community; in return, our schools should contribute to this community through interaction and leadership on issues such
as the development of ethically responsible professionals. Thus, the postsecondary educational process should be an interrelated continuum of learning experiences, fundamentally unified in their emphasis on articulating the role of an educated, responsible person in society.

**Campus Ethos and the Learning Community**

Because a national consensus on the role of higher education in the ethical development of students is unlikely in the near future, perhaps the most we can hope for at present is that individual college and university campuses decide ethical issues warrant an institutional self-examination. Wilcox and Ebbs (4) suggest the success of an institutional commitment to ethical development may depend on the ethos of the campus — its customs and practices, how its quality of life is defined, and how people are interconnected by their commitments.

As moral agents of society, colleges and universities have a dual responsibility to enrich the lives of students and to address the needs of the community. At a higher education institution where the campus ethos supports this dual responsibility, faculty and students seek ways to "forge connections among the often competing needs of the individual and society" in an environment where such discussions are encouraged and valued.

Wilcox and Ebbs suggest promoting the campus as a "learning community" which takes positive steps to counter the fragmentation and compartmentalization that occur with the knowledge explosion and increasing academic specialization. "The learning community does not deny the value of research or the scholar's freedom of inquiry, but, as a moral community, it does seek to organize them within an ethical domain of connectedness and mutual responsibility (4)."

**Liberal Learning**

What are the outcomes of a college or university environment emphasizing connectedness and ethical reflection? One desirable outcome suggested by Armour and Fuhrmann (5) is "liberal learning," described as "the common denominator between general and professional education." The authors emphasize that liberal learning should foster habits of the mind that carry over into majors and professions. Such learning relates to societal concerns, depends on student interpretation, and requires a context of values to give it meaning.

Armour and Fuhrmann (5) describe four goals of liberal learning, with the foremost goal being to teach students to refine their critical thinking skills. They suggest that higher-level thinking requires the ability to put personal biases aside in one's reasoning, to organize evidence from outside sources, and to evaluate other's opinions. Second, liberal learning should provide an opportunity for the learner to develop his or her own personal context through which to evaluate and participate in the learning activity. Third, liberal learning must emphasize the "value of values," the importance of reflecting both on the values the learner will adopt and the values the learner will challenge. Finally, communication must be emphasized if students are to share their insights and conclusions with others.

The differences between the role of liberal education and professional education in promoting liberal learning may not be as great as some think. In describing their work to encourage cooperation among liberal arts and professional faculty on one campus, Stark and Lowther (6) identify 10 areas where students can benefit from such faculty interaction: communication competence, critical thinking, contextual competence, aesthetic sensibility, professional identity, professional ethics, adaptive competence, leadership capacity, scholarly concern for improvement, and motivation for continued learning.

**The Individual Context**

Almost everyone agrees higher education has some responsibility to emphasize ethical development. At the same time, most educators probably admit they have a long way to go in developing the optimal educational experience for this purpose. Even within a single department, it may be difficult to create and sustain the learning community of connectedness and mutual responsibility that some advocate as a desirable model for student development.

Recognizing this, it may be appropriate to conclude the ultimate responsibility in higher education for fostering the development of students rests with the individual faculty member and administrator as they go about their daily professional responsibilities. We do not avoid this obligation simply because our institutions have not told us this is a priority, or it is not written in our job descriptions. This responsibility is inherent in the role of anyone who belongs to a "learned profession," whether that profession is dentistry or higher education.

Campus leaders meet their ethical responsibility by working for the common good, by being responsive and caring of constituents, and by working within a framework of shared beliefs concerning standards of acceptable behavior (4). An administrator who is a leader has the capacity to help people see the big picture and can assist them in overlooking differences to affirm the values they hold in common. Certainly, administrative leaders are essential in
the transformation of a campus into the type of learning community described in this paper.

The faculty member who accepts full responsibility as a member of the higher education community will give careful attention to relating course content and class discussions to the broader context of values inherent in almost every topic. In recent years, a misleading dichotomy has been promoted by critics of higher education, a criticism that faculty can be either good teachers or good researchers, but that the two roles are somehow mutually exclusive. The best faculty members are those who transcend the limiting expectations to realize the full potential of their professional lives. To paraphrase Chaucer, "gladly would they learn, and gladly would they teach," and they share this enthusiasm with their colleagues and their students.

To be fully engaged with a discipline or profession requires a broad perspective relating one's scholarly endeavors to realizing human potential in an inclusive and caring society. Sharing this broad perspective with one's students and faculty colleagues, and in turn encouraging their contributions, constitute the rudiments of the campus ethics of ethos and learning community.

Higher education has always had an important role in preparing students for dental school and the dental profession beyond the simple transmission of disciplinary knowledge. Concepts for ethical conduct must be developed and various habits of the mind encouraged, including an enthusiasm for mastering challenging subject matter and for continual learning. Ideally, various sectors of higher education and the professions will seek opportunities to interact in deliberations on the qualities we seek to promote in our students. All of us would benefit from a greater realization of our interdependence and mutual responsibilities in this regard.

Although efforts are being made at some higher education institutions to promote ethical development in a conscious and coordinated way, this responsibility often falls to the individual faculty member or practicing professional. Rather than be discouraged by this realization, we should never underestimate the positive ethical influence that a single individual can have on students and professional peers.

One way to view ethical behavior is to regard it as a willingness to be connected -- a willingness to go beyond the insulation of narrowly interpreting one's professional role in order to be connected to the concerns of other individuals and to the overall well-being of society. The challenge exists both for higher education faculty and for practicing dentists to explore such connections with their students, patients, peers, and community. Each time such a connection is made, one more part of the foundation is in place that supports sustained attention to ethical development of students and practitioners throughout higher education and the professions.

References

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Higher Education and Health Professions Education: Shared Responsibilities in Engaging Societal Issues and in Developing the Learned Professional

Dominick P. DePaola*

Abstract
Higher education and, in turn, health professions education are being buffeted by a multiplicity of external and internal forces. Issues related to fiscal constraints, higher education's crisis of values and the teaching/research and educational outcomes dilemmas are explored. The increasing accountability of higher education by its public, including measures of institutional effectiveness exacerbate these forces. Health professions education programs and their parent universities and colleges must take better advantage of their respective resources and become united around central educational paradigms and outcomes. The ability of higher education and health professions education to engage and connect to societal issues is critical to the appropriate education of the student and to institutional survival. By interweaving the philosophy and culture of the university or college setting in the fabric of health professions education and particularly dental education, an environment could be created that results in a true learning institution. That is, one in which students and faculty learn together in all settings. The outcomes of such engagement are shared responsibilities and the creation of the learned professional, one who is connected to the world and is not trapped by parochial knowledge. Thus, the continuum of health professions education transcends technical and cognitive achievement but addresses core societal values as well. This paper then explores some of the factors impacting upon higher education and assesses their influence on the nation's health professions schools, and, specifically, colleges of dental medicine.

Arguably, American higher education has been characterized as the finest in the world, providing more opportunities for more students than virtually any other nation. It has enjoyed the support of the public and, in turn, state, federal and private sector financial support. Nevertheless, there are reports of growing dissatisfaction with the escalating costs and so-called productivity of higher education. Indeed, there have been many treatises written in recent years describing the plight of higher education and/or providing recommendations to enhance the nation’s higher education enterprise (1-3).

In a recent address to the National Association of Colleges and University Business Offices (NACUBO), Elfin (4) reported the public continues to look favorably upon colleges and universities, but the issue of high cost and a return for their investment casts a darkening shadow over this positive imagery. Indeed, the financing of higher education is but one of the myriad of issues confronting higher education leaders. The ability to cope with the forces impacting upon higher education is one of the primary determinants of the survival of colleges, universities or professional schools. The inextricable linkage between the higher education community and health professions education schools and programs mandate that neither an academic nor fiscal quarantining between the two occurs (5). The purpose of this paper is to explore some of the factors impacting upon higher education and to assess their influence on the nation’s health professions schools and, specifically, dental colleges.

Primary Forces Impacting on Higher Education
Although there are many external forces impacting higher education, Atwell (6) identified five primary issues: fiscal constraints; the expanding view of higher education as
consumer good; the increasing emphasis on specific vocational training; the compromise of institutional autonomy; and, the growing pressure for educational accountability. When juxtaposed with issues related to campus diversity, access to education, the continuing tug of war regarding tenure and promotion, the growing dissatisfaction with the quality of undergraduate education, the imperative for the nation to compete in a global economy, the explosive growth of information science, biomedical science and technology, the crisis of values facing society and the nation's campuses, and the growing disparity between research and teaching, it should not be surprising that American higher education is being battered, maligned and increasingly questioned. There is no doubt that these forces and issues, as well as others, profoundly influence the parent college and/or university and its schools and programs, as well. A number of these issues are germane to health professions education and particularly dental education. These include fiscal constraints, the crises of values and the teaching/research and educational outcomes debates.

Fiscal Constraints

Perhaps no other force has such a dramatic impact on higher education as the issue of fiscal constraint. The continuing decline in higher education funding by the federal government is almost common knowledge. Indeed, the fiscal year 1995 budget for higher education passed by Congress in September 1994 (H.R. Bill 4606) cuts overall funding for higher education and includes a reduction in Pell Grant funding, State Students Incentive Grants and Graduate Fellowships, while maintaining funding for other aid programs at current funding levels, including Perkins Loans capital contributions and Federal Educational Opportunities Grants (7). Other federal appropriations received modest funding increases including the National Institutes of Health (NIH) and the National Science Foundation (NSF) (7). At the same time, it appears that state funding to most institutions of higher learning is stabilizing in 1995 after years of budgetary reductions; however there is not much hope of any substantive increase in fiscal resources on the horizon to compensate for the previous steep declines. The forecast continues to be increased expectations for higher education with declining resources. How to "do more with less" has become a nationwide question and is tied directly to institutional outcomes.

Although the short-term financial crisis seems to have eased, the nation's colleges and universities continue to respond by closer monitoring of expenditures, administrative reorganizations and consolidation of academic programs (8). Indeed, 40 percent of all institutions have eliminated academic programs in recent years and most colleges and universities have restructured their operations (8).

The impact of this poor funding picture on dental education has been nothing short of disastrous. Following the great appropriations mismatch for health professions education in the mid-1970's, declining federal and state resources have resulted in a changed dental education infrastructure, including the closure of six dental schools. Additionally, other dental schools have fused, merged or consolidated academic departments and administrative functions to address both cost and functional issues, including retrenchment mandates from the parent institutions' central governing bodies (9). Rising tuition and fees to compensate for lost revenue have created a scenario where the average dental student indebtedness is in the $60,000 range. Rising clinic fees to adjust for declining federal and state resources could have an effect on the pool of teaching patients and, thus, the education programs of some institutions. At the same time, federal and state statutes and regulations, including the Americans with Disabilities Act (ADA), Occupational Health and Safety Administration (OSHA) and Centers for Disease Control and Prevention (CDCP) guidelines have increased the overall cost of providing education and have
demanded new and expensive bureaucracies to keep abreast of these statutes. These factors increase the cost of dental education and call into question whether access to dental education is becoming out-of-reach to the lower socioeconomic sector of society simply on the basis of cost. Interestingly, the dilemma is that while costs could be eroding the ability of the lower socioeconomic sector to access education, educators are devoting increased resources to reach this same sector of society.

The untoward outcome is an apparent increase in student indebtedness, where more students are borrowing large sums of money using interest rate-sensitive loans such as HEAL. This could have a potentially devastating effect on the ultimate ability of graduates to both establish a practice and repay these loans (10). Should this trend continue, the result would be a reduction in access to education by the underserved and underprivileged. This may become apparent in the near term as student aid programs diminish (8). This hardly seems like a healthy picture especially considering the country's expanding pluralistic society.

An important overlay in terms of fiscal constraints that impact upon dental education is the overall cost per student of the educational process itself. The cost of dental education historically is amongst the highest on the university or academic health center campus, primarily due to the intense student-faculty ratios needed in the education process. Unfortunately, there are limited methods available to reduce costs or increase revenues to compensate for the high fixed costs of dental education. Faculty practice, which is an integral component of medical education and medical practice, is relatively limited in scope in dental education. Indeed, within some institutions the advent of dental practice plans has created a town and gown friction that is not always easily resolvable. Institutions therefore continue to seek cost reductions to compensate for financial dilemmas, further exacerbating the academic tensions within the institution.

Importantly, the reduction in government funding has also greatly limited research funds so that less than one in five approved research grants is now being funded. This particular fiscal constraint not only limits the research potential of institutions and particularly dental institutions, but it also discourages the potential dentist/scientist from considering an academic/research career. The irony is that these fiscal constraints continue to impact upon the educational program at a time when there is increasing accountability for more competent, better trained, socially-sensitive practitioners of dental medicine. For example, as dental institutions move to more intimate learning settings, including problem-based learning, faculty development needs increase as does the demand for faculty time. Yet, resources to expand and/or retrain faculty are not readily available. The net effect is pressure on the institutions to do more with less, or to do less with less. Both scenarios are rate-limiting and contribute to morale issues within the dental and health professions education community as well as the parent university or academic health center.

Crisis of Values

The Wingspread Group report on expectations for higher education (1) spends a great deal of time describing the nation's higher education system's intimate involvement in and contributions to society's larger crisis of values. The Wingspread report characterizes these values as campus intolerance, college sports cheating, ethical lapses by administrators, faculty members and trustees, and cheating and plagiarism by students. The report also states the importance of higher education's role in the transmission of core societal values is even greater today than it was years ago. The report concludes there is anecdotal evidence suggesting there is too little attention on too few campuses to the responsibility to transmit the compelling core values any society needs to sustain itself (1).

Another important conclusion of the Wingspread report states, "Every institution of higher education should ask itself what it proposes to do to assure that next year's entering students will graduate as individuals of character, more sensitive to the needs of the community, more competent in their ability to contribute to society, and more civil in their habits of thought, speech and action (1)." Indeed, the fractious society of special interest groups grabbing for or protecting their pieces of the American pie have infiltrated the nation's campuses (11). As one might suspect, this struggle is reflected in the educational and administrative processes, including those in health professions education. The extension of this apparent or real crisis of values can also be seen in academic health centers and in dental education. Perhaps it is best exemplified by the expanding nature of misconduct in science issues and the promulgation of multitudinous federal rules and regulations to address these matters.

Perhaps more insidious is the crisis of values which also results from the conduct of the education system of dental medicine. For decades the conceptual model has been a 2 + 2 approach to education, that is, the basic and preclinical sciences are primarily housed in the first two years, with the clinical sciences dominating the last two years of the curriculum. Although there have been many attempts to change this approach in the last decade, the 2 + 2 model remains
the predominant and outmoded educational experience that many students receive in this nation (9). An important ingredient of the system has been the clinical requirement. Although it has some noteworthy goals in terms of producing technical/clinical competence, the requirement system may create an ethical dilemma pitting the students' needs to provide a certain type and number of therapies against the patients' needs. For example, if a student realizes he or she needs a specific requirement to gain a successful grade in the institution or a specific kind of patient to successfully complete the mock and/or state licensing boards, those patients often are squirreled away; care is delayed with the expectation that this patient would be a good test and/or board case. Students may try to sell certain types of care to patients in order to seek better grades rather than to benefit the patient. Are students rewarded for manipulating patients? If so, is this the message they take into practice? Unfortunately, there is no perfect system to adequately measure clinical competency. But, the issue of expanding the envelope of dental education and clinical performance assessment beyond the current paradigm is critical to the continuing integrity of dental education and its role in sustaining the learned profession. The requirement for dental education to rethink the educational process, including the content of dental education, the method(s) by which the educational offerings are delivered, and the methods by which students are evaluated has never been greater. This archaic educational system continues to result in a costly educational experience and, in some instances to create ethical dilemmas for the student.

Although this paper is not a treatise on ethics and professional behavior, these issues are part of higher education's mission and reflect, in part, anticipated outcomes of the educational experience. In many ways, the ethics of health professions students, and indeed all students in institutions of higher learning, are reflective of parental norms, peer pressures, faculty role modeling and a host of societal issues. We often expect that a student entering health professions education already has an ingrained personal code of ethics and behavior which will govern his/her professional life. However, the experiences in professional schools will shape short-term and long-term professional behavior. At the very least, dental education should provide an environment that positively reinforces societal values and professional norms which are particularly important in conducting patient assessment and clinical care. Some of these issues clearly interdigitate with one another. For example, the increasing ethnic and cultural diversity extent on the nation's campuses and reflected in dental education's changing student profile demand an increased sensitivity to addressing clients' diverse needs and the accompanying demands for appropriate interpersonal skills.

Bragg suggested several structures of the educational setting that influence socialization (12). These include: 1) selecting students; 2) isolating students from outside influences; 3) consistency of institutional or program goals; 4) explicitness of values and role models; 5) providing opportunities for practicing responses; and 6) providing both positive and negative sanctions as feedback to students. Stark and colleagues (13) suggested that in professional education, including dental education, relationships with supervising practitioners appeared to need strengthening to model appropriate behavior for students. This requires a clear understanding and expectation of professional norms that are reinforced in the classroom and the clinic. Thus, the critical nature of the crisis of values that envelopes higher education clearly impacts substantially and directly on health professions education, including dental education. The critical issue becomes how to address this crisis of values while at the same time juggling the fiscal constraints of the institution with expanded expectations in performance at every level.

**Teaching, Research and Educational Outcomes**

The value of undergraduate instruction is being called into question today. The attitude extent on university and college campuses is research and teaching are somehow incompatible; professors are judged and rewarded for their research while teaching is a secondary obligation (14). Vest (14) further defines the issue by discussing the legitimate concerns about the quality of education in the nation that must be addressed and states that posing the issue as a conflict between teaching and research misses the point. In a comprehensive review of this subject, Feldman concludes the evidence does not support the good teacher equals the good researcher argument, but neither does it support claims that doing research detracts from being an effective teacher (15,16). Unfortunately, the real issues overlooked in these debates are qualitative rather than quantitative in nature. That is, the quality of research and teaching are important, not necessarily the quantitative productivity profiles often ascribed to effective teaching or research. Clearly, teaching and research are each essential to institutions of higher learning and each deserves appropriate recognition and reward (16). Frankly, the current debate on teaching versus research is an excellent example of the fragmentation existing in higher education, and, particularly in health professions...
programs, including dental education. Unfortunately, instead of focusing on appropriate expectations and educational outcomes of the educational process, the focus is much more centered on issues of disciplinary turf and territorialism. There is no doubt that faculty must be scholars who add to existing knowledge for others and not merely disseminators of information, and there must be an appropriate balance between research and teaching (17). Clearly, there is an inextricable link between the generation of knowledge and the application of knowledge. Thus, the debate should be centered on defining the desired educational outcomes. In this way, the academic infrastructure that will permit the institution to best fulfill its mission can be defined.

Of course, this scenario can and probably should result in a change in the educational delivery system. It may mean, for example, better use of campus or departmental resources to teach interdisciplinary subject matter. Indeed, if a department was expected to contribute to specific educational outcomes, tasks could be divided among faculty according to each professor's respective skills. Such a change would require new assessment procedures, where differences in faculty contributions to departmental objectives could be acknowledged and rewarded (18).

Unfortunately, one of the greatest forces impacting upon higher education is inertia and the zealousness associated with maintaining the status quo. Much of the work of the Pew National Dental Education Program was designed to get institutions and their faculty involved in planning and strategic thinking and, thus, to have ownership of the changes necessary to sustain dental education in the next millennium (9). Although there has been some reported progress, resistance to change continues to have a stranglehold on dental education institutions as well as other components of higher education. It is incomprehensible that educational institutions which represent the repository of knowledge—the truth seekers and the discoverers of information—are among the most difficult sites to effect change. Unfortunately, the appeal of self-interest often wins over what is necessary for the common good. Much of the blame resides in the institutions themselves since they have institutionalized monuments to the status quo and, through failed leadership, have not insisted on either excellence or assessments of quality of the educational process.

Dental education institutions are caught in this seemingly bottomless vortex of barriers to change. Yet, there are educational outcomes upon which we must all agree; these include the competent practitioner of dental medicine, skilled in biologic science, technical efficiency and social consciousness. Additionally, the outcome must be to graduate the learned professional, one who is not afraid of requisite continuous competency assessment, but who embraces the notion. In translating these two rather simplistic educational outcomes into the educational infrastructure, a number of questions come to mind. Does higher education consistently encourage and reward the program which is truly interdisciplinary, or multidisciplinary, or does it continue to encourage and reward the discipline-based program? Does higher education and, in particular, dental education, create an educational environment where students work with a sense of adventure and imagination, or does it create an environment where jumping through hoops is the educational expectation? Does higher education and dental education create the truly life-long learner, one dedicated to the pursuit of knowledge and, in the case of the clinician, advances in patient care, or does it create the individual who sees education merely as a means to an end-point? Does higher education best utilize its resources and talents to support its health professions schools and programs, or does it view them as drain on the budget? Does dental education effectively utilize the resources available in higher education to support academic environments aimed at sustaining and enhancing core societal values and imbue in its students a sense of ethics and professional conduct, or does it create an environment of conflicting ethical signals and dilemmas? Does higher education provide the environment to change the student recruitment paradigm such that issues other than grade point averages are truly considered or does it create a system and environment that rewards schools for success based on raw numbers?

Postscript

Clearly, the impact of the factors described in this paper, plus the many that were mentioned only in passing, have profound influences on student recruitment and selection behaviors, student and faculty performance and evaluation and institutional productivity and effectiveness. The collective influence challenges the very notions governing the learned professions and brings into sharp focus the critical nature of the mutually supportive and nurturing role the universities and colleges play with their health professions schools. Enabling students to reach their full potential as players in society, and as players in the adventure of creating and understanding, requires they are taught how to advance knowledge (14). It is also imperative that students in all education settings, including dental education, be taught in a manner where they are connected to the world and the quality of connected-
ness is ingrained in the very culture of the institution.

Perhaps this paper’s message is that health professions education, including dental education, is absolutely and unequivocally interwoven with the philosophy, culture and nature of the university or college setting and, in turn, societal values. In this regard, the cost of educating dental students is not seen as a burden to the university or college, nor is the education of the dental student seen as distinct and remote from other programs occurring in the university. In turn, the dental faculty and students can better engage in the mission of the institution by contributing to its intellectual climate, its core societal and cultural values and thus, a vital, thriving and integral component of the university. The net outcome is that the learning institution is created, not a research or teaching or dental or medical institution, but one in which students and faculty learn together in the classroom, the laboratory, the clinic and the community (14). In this view, education of the student takes precedent and the students and faculty are connected to the world, not trapped by their own parochial knowledge. The primary educational and technological transfer that governs this view of an integrated, connected view of academic dental medicine is the transfer of an educated mind.

Conclusions

Dental schools and other health professional schools are buffeted by many of the same factors that impact upon all higher education, in addition to those factors unique to professional education. At the same time, dental schools and other health professional schools make important contributions to academic health centers and to the university communities in which they reside. Unfortunately, resources available in these institutions are not always used as fully or effectively as they can be. The time is nigh to recognize there are common threads which unite academia, centered around educational outcomes. Health professional education and the broader health education community need to utilize each other’s resources, talents and models to develop quality education programs that are a continuum transcending technical and cognitive achievements and addressing the social dilemmas of our times. Perhaps in this manner, a recidivation and agreement on the necessity of connecting the educational programs and thus, the students to society can be achieved. Agreement on core issues of education leading to appropriate educational outcomes will ensure that higher education and health professions education will play a mutually supportive and interrelated role in communicating what it is an educated person should know.

References


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Profiles in Professionalism: 
Foundations for Today 
Harold Hillenbrand 

Clifton O. Dummett

A primary exemplar of the ideal of the American College of Dentists was the late Harold Hillenbrand, Executive Director Emeritus of the American Dental Association and recipient of the American College of Dentists’ most prestigious awards — the William J. Gies Award and the Award for Excellence. The year 1994 marks the 25th anniversary of his retirement as the top executive of the ADA, a post in which he served with rare skill during unparalleled changes in national and international affairs of the past half century.

Harold Hillenbrand was born in Chicago on July 19, 1906, the third of nine children. He obtained a strong basic academic foundation and graduated from Chicago’s Loyola Academy. He received an equally robust and liberal predental education at the School of Arts and Sciences of Loyola University, and thereafter enrolled at Loyola’s Chicago College of Dental Surgery. In due time he obtained BS and DDS degrees.

Dr. Hillenbrand was first a successful private dental practitioner and enjoyed an 11 year association with his father, an equally gifted general clinician. Additionally, young Hillenbrand became an Associate Professor of Ethics and Social Relations at his alma mater and served in that capacity for 13 years.

Hillenbrand was gifted in literary, elocutionary and orthographic pursuits. It was inevitable that he would bring those skills to benefit dental education, administration and organization. The successes of his extramural activities were fully appreciated and he was soon elevated to the position of spokesman for the dental profession.

Harold Hillenbrand served periods as Editor of the Chicago Dental Society, of the Illinois Dental Journal, of Desmos (official publication of Delta Sigma Delta). In 1942 he was made Assistant Editor of the Journal of the American Dental Association (JADA); in 1945 he was appointed JADA Editor, but he resigned that position the following year to become Secretary of the American Dental Association. It was in this role that Harold Hillenbrand was able to demonstrate his unique capabilities. During the next 22 years of an exciting, industrious, scholarly and distinguished career, Hillenbrand worked endlessly for the Association and for dentistry. In this tenure, he accomplished much that had never been attempted before and more than has since been contributed to organized dentistry.

A reprise of some of Hillenbrand’s more notable accomplishments include: his unprecedented expansion of ADA programs; his visits to the Far East and his more than 40 crossings of the Atlantic Ocean, all in the interest of advancing dentistry’s standards throughout the world; his basic contributions as the first dentist selected to serve as advisor on the U.S. delegation to the World Health Organization; his publications on dental socioeconomics; his single-minded efforts in helping to eliminate ethnic, racial and religious distinctions in organized dentistry; his firm embrace of dental professional autonomy which led to the upgrade of dentistry in the U.S. Armed Services, the Public Health Service and the Veterans Administration; his superb executive skills which made the ADA one of the leading and most respected health professional organizations around the world; and his leadership role in the construction of the ADA’s 23-story headquarters building in Chicago, an achievement universally acknowledged as a testimonial to his genius.

Younger dentists, unaware of who and what have gone into making dentistry the force it has become, need to know more about stalwarts such as Hillenbrand who exemplified the admirable personal and professional qualities which the College has espoused since its inception.

References
Profiles in Professionalism:
Foundations for Tomorrow

Linda C. Niessen

Dominick P. DePaola

Any trepidation that one may harbor about the future of the dental profession dissolves when in the presence of Dr. Linda C. Niessen. She serves her profession and the public with enthusiasm and brilliance. Her endeavors hold a promise of becoming a sound legacy for future generations of dentists. Dr. Niessen actively engages in all five core duties of a professional: service, research, education, management, and the defense of high principle. Beyond these vital professional pursuits, she keeps her profession in proportion with her duties to her community and family. In other words, she demonstrates attributes that characterize distinguished Fellows.

Dr. Niessen is Associate Dean for External Affairs and Professor and Chair of the Department of Public Health Sciences at the Baylor College of Dentistry in Dallas, Texas. The road to these positions was built by achievement in diverse positions. In 1977, she graduated cum laude from the Harvard School of Dental Medicine and from the Harvard School of Public Health. This was followed by three years in the U.S. Public Health Service at USPHS Indian Hospital in Talahina, Oklahoma. In addition to clinical care, she initiated a school fluoride mouthrinse and tablet program and successfully worked with tribal and community workers to fluoridate the Talahina water supply. In addition, she met and married John Lonergan, M.D., a physician also working with the Indian Health Service.

By 1982, Dr. Niessen had earned her Master of Public Policy from the John F. Kennedy School of Government, Harvard University. She then became Director, Geriatric Dental Program at the Veterans Administration Medical Center, Perry Point, Maryland. This formed the foundation for her expertise in geriatric dentistry. From 1984 to 1991, she organized and became the director of the first Department of Veterans’ Affairs dental public health residency program, a responsibility she held for six years. She was a professor in the Baltimore College of Dental Surgery during her Maryland years.

In 1990, Dr. Niessen was awarded the Distinguished Alumna Award from Harvard School of Dental Medicine and in 1987 was elected to membership in the American College of Dentists. In 1991, Dr. Niessen accepted a position with the Baylor College of Dentistry as Director of Geriatric Oral Medicine and Executive Assistant to the President and Dean, coupled with a second role in the Office of the Chief of Staff, Veterans’ Administration Medical Center in Dallas. She continued her responsibility as the director of the VA dental public health residency program in Dallas. Another professional mentor role was serving as the director of a dental research fellowship. She was later named Chair of the Department of Public Health Sciences and Associate Dean for External Affairs at Baylor College of Dentistry.

Dr. Niessen has been diligent in serving her profession. After earning her certificate as a Diplomate of the American Board of Dental Public Health, she became an officer and eventually president of the American Association of Public Health Dentistry. She was president of the Student Clinicians of the American Dental Association. She is a past president of the American Association of Women Dentists, and has since served as a spokesperson for gender equality and women’s opportunity in the profession. She has been a consultant to several federal agencies and national organizations and a Trustee Advisor for the American Fund for Dental Health. Since 1987, Dr. Niessen has been a consumer advisor for the American Dental Association. Currently, she is serving as a member of the American Board of Dental Public Health.

In addition to frequently speaking at professional meetings and presenting continuing education courses, Dr. Niessen has 45 journal publications, 25 published abstracts, 10 chapters in books and is a co-editor for one book. Topics include the range of her research and experience, but predominate in geriatric dentistry, dental health services research, and oral health policy. During the past decade, she has received eight funded
research grants. She is a member of three journal editorial boards and has served two others.

Dr. Niessen and her husband periodically use their vacations as volunteers to the Indian Health Service. By serving briefly in remote and overburdened hospitals, medical and dental care can continue while assigned physicians and dentists take their vacations. Throughout the year, Dr. Niessen is a community volunteer by serving as a Director, Dental Health Programs, Inc., Dallas, and a member of The Women’s Center of Dallas. Dr. Niessen’s and Dr. Lonergan’s two sons thrive on the activities of a dynamic household.

Not surprising, Dr. Niessen is the recipient of numerous honors, awards and recognitions. Yet, reader attention is not invited because of Dr. Niessen’s singular achievements. All may be pleased by knowing of them. Why is she brought to the attention of readers? She is recognized primarily for having touched the lives of many people. She is recognized for providing evidence of attributes that should dwell in all dentists; a love of people, the desire to help make someone’s life a little easier and filled with a little more hope and dignity; a hunger for new knowledge and ideas; and to make her career a life of joy. She embraces change for the ideas, professional development opportunities, and new friendships it brings. The profession will thrive if the coming generation of dentists follows examples of the likes of Dr. Linda Niessen.
The *Journal of the American College of Dentists* seeks to serve as a vehicle for presentation, discussion and debate on a broad range of issues that may shape the future of dentistry and oral health. As such, the *Journal* invites contributions in three broad categories: 1) analytical reviews of conditions and trends in oral health, oral health care, and related areas of science, technology; 2) articles addressing ethical and professional issues related to the art and science of dental practice; 3) articles promoting professional understanding and insight about social conditions and trends that may impact upon oral health and/or the ability of dentists to serve the public.

A manuscript is considered with the understanding that its essential substance has not been or will not be published or submitted elsewhere. This restriction does not apply to abstracts, proceedings or news reports of professional meetings. Copyright of the paper reverts to the American College of Dentists. All manuscripts will be reviewed for their relevance to the *Journal*, quality, clarity and accuracy. Manuscripts must be prepared according to guidelines presented below. Authors should contact the American College of Dentists for further information about the *Journal*s procedures.

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**Preparing a Manuscript**

**Format.** The *Journal* generally follows the guidelines of the International Committee of Medical Journal Editors (N Engl J Med 1992;324:424-28), also known as the "Vancouver Style." This style is widely used in medical, dental, scientific and scholarly journals.

All text must be typed double-spaced on one side of 8.5 x 11 inch (212 x 297mm) white paper, with 1 inch margins on all sides. Number pages consecutively, beginning with the first title page, with the page number in the upper right-hand corner of each page. Assemble material in the order discussed below.

**First title page.** Include: 1) main title, which should be concise but informative; 2) "running title" not to exceed 30 characters; 3) first name, middle initial, and last name of each author, with highest academic degree(s) and institutional affiliation; 4) disclaimers, if any; 5) name and address of author responsible for correspondence about the manuscript; 6) name and address of author to whom requests for reprints should be addressed, or statement that reprints will not be available from the author; 7) source(s) of support in the form of grants, equipment, drugs, or all of these; 8) number of manuscript pages and number of figures and tables, if any; and 9) up to six key words or phrases that will assist in cross-indexing the paper (best chosen from *Index Medicus* and Dental Descriptors in *Index to Dental Literature* when possible).

**Second title page.** Give only the title of the paper so that reviewers are blind to authorship. Authors' names should not appear on any manuscript page other than the first title page.

**Abstract.** Limit the abstract to 200 words. Summarize the focus, key issues and major conclusions
and/or recommendations of the paper.

Text. The Journal emphasizes assessment of the professional environment rather than strictly controlled scientific investigation. As such, the format for text is flexible for descriptive-type manuscripts. In general, it is suggested that the manuscript include an introduction or background section, clearly stating the purpose and focus of the paper. Authors are encouraged to use subheadings to organize major sections of the manuscript. A summary or conclusion should be used, when appropriate.

For manuscripts presenting results from scientific investigation, including observational and experimental studies, authors should generally organize the text into major sections of: Introduction, Methods, Results, and Discussion. Long articles may need subheadings within some sections (especially Results and Discussion) to clarify the content. A more complete description of the organization and content of the sections within manuscripts presenting investigational work is available from the American College of Dentists and in the New England Journal of Medicine reference, cited above.

Acknowledgments may be included at the end of the manuscript text. This section should reference any grant, contract or financial support for the work as well as any meetings where the material was presented orally or in poster form. When acknowledging individuals, only acknowledge persons who have made substantive contributions to the paper and/or study. Contributors are responsible for obtaining written permission from everyone acknowledged by name.

Footnotes. Footnotes should not be used except in tables and figures. Such information, if it is relevant, should be incorporated into the text.

References. The Journal uses the "Vancouver Style" for references. Within the text, number references using Arabic numerals in the order cited in the text, tables and figures. Place reference numbers within parentheses at the end of the sentence or after the relevant point (e.g., "Smith and Jones (18) stated that..."; or "Smith and Jones stated that access to care is less in Hispanic than Black populations (18).").

List only references accessible to readers. Cite personal written communications in the text only, indicating in parentheses that this is a personal communication and providing the source and date. Abstracts not published in the periodical literature (e.g., printed only in an annual meeting program) may be cited only as written communications in parentheses in the text. Avoid using other unpublished observations. Authors must verify all references to insure they are correctly cited.

In preparing the reference list at the conclusion of the manuscript, please note the following. The Journal allows the listing of up to six authors on a reference; for more, list the first three and add et al. The title of the journal should be abbreviated according to the designations listed in the Index Medicus and in the "Serials Indexes Section" of the Index to Dental Literature.

Examples of acceptable reference formats are provided below:

| Journals |
| Standard journal article |
| Organization or corporate group author(s) |
| As an option, if a journal carries continuous pagination throughout a volume, the issue number may be omitted. |
| No author given |
| Journal supplement |

| Books and Other Monographs |
| Personal author(s) |
| Editor(s), compiler as author |
| Chapter in a book |
| Published proceedings paper |
| Woolfolk MW. Review of the literature: psycho-social aspects of den-
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Monograph 5: Tobacco and the Clinician: Interventions for Medical and Dental Practice

Tobacco use is established as a major risk factor for numerous oral and general adverse health conditions. Nicotine is highly addictive. Tobacco use disables and kills hundreds of thousands of individuals every year. Brief, simple tobacco use intervention methods have been shown to significantly increase patient quit rates. Children and youth should be encouraged to avoid or postpone initiation. Thus, dentists have an ethical obligation to master and routinely use scientifically sound minimum intervention methods in their practices.

The National Cancer Institute (NCI) has released its fifth monograph on smoking and tobacco control, Tobacco and the Clinician: Interventions for Medical and Dental Practice. In 1984, the NCI began funding a series of 12 clinical trials in an effort to develop more effective intervention methods for use by physicians, dentists, and other health care professionals with their patients who smoke. More than 100,000 patients and 6,100 physicians and dentists were involved in these trials. This monograph distills from these and other related studies a clear picture of what interventions work, how to strengthen clinician interest in providing cessation assistance, and how to institutionalize the provision of clinical tobacco intervention services within the health delivery system. The monograph also provides many practical tips for involvement by health care providers in community-based smoking control activities.

A limited number of copies are available. For more information, contact Mr. Donald Shopland, Coordinator, Smoking and Tobacco Control Program, National Cancer Institute, EPN 241, 9000 Rockville Pike, Bethesda, MD 20892, or call (301) 496-8679, or Dr. Robert Mecklenburg, Dental Coordinator (301) 330-9409.

Acknowledgments

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Reviewer efforts ensure that the Journal maintains a standard of excellence that is a reflection of the College. Reviewers accomplish this, not only by critically reviewing and judging the suitability of material for publication, but by contributing to the refinement of work accepted for publication and by providing guidance to authors of work not accepted so that their future publishing endeavors can be more effective.

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