



Dr. Mann

A problem list for dental research

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Abstract

This article is taken from a speech presented at the International Symposium on the Prevention of Periodontal Disease in Children and Young Adults. The author presents the basic concepts of the problem-oriented medical care system developed by Dr. Lawrence Weed and a brief description of the problem-oriented curriculum and patient care programs in the School of Dentistry at the University of Mississippi Medical Center. This background information provides the rationale for the development of a list of five problems relating to dental research in the United States with suggested methods for resolution. The problems included: funding of dental research; populism and its effects on research policy; lack of innovation or venturesomeness; creation of the proper environment for research in schools of dentistry; and a lack of emphasis on preventive and behavioral research in oral disease. The author concludes that the identification and resolution of problems in dental research requires the understanding and total efforts of faculty, investigators, and administrators in dental education and research.

I am very pleased to have been asked to give the banquet speech for the International Symposium on the Prevention of Periodontal Disease in Children and Young Adults. The American Academy of Pedodontics and the University of Iowa have gathered an outstanding faculty which, in my opinion, represents the world leaders in the field of pediatric periodontal disease. The organizing group and the Office of Maternal and Child Health, the Bureau of Community Health Services of the Department of Health and Human Services are to be commended for their efforts to help increase our knowledge of the prevention and treatment of periodontal disease in children.

Having agreed to present this speech, I did what most speakers and writers do to prepare — the MEDLARS search, selection of pertinent articles, reading, picking the brains of my colleagues, and then isolating myself for several nights surrounded by stacks of journals, books and photocopies of articles.

As I delved deeper, I realized that the standard approach to writing an article was inappropriate for

this subject. Furthermore, in looking at the list of learned faculty who were participating in this symposium, I told myself to shelve the scholarly approach and take a more personal tack. Experience, along with intellect and experimentation, are, after all, the essential ingredients of knowledge. Thus, I would like to share with you some of my ideas about dental research based on my experience as a dentist who has been a dental educator for the past eighteen years and a dean for six. I don't pretend to have all the answers, but I have gained a somewhat unique perspective in the last three years. As a member of the National Institute of Dental Research Advisory Council and as a member of the executive committee of the American Association of Dental Schools, I have been able to identify some of the major problems in dental research in the United States — particularly those problems which relate to the administration of dental education.

At the outset, I apologize to those faculty from other countries for the chauvinism of my remarks, since most of the problems I will discuss deal with research in my country. However, my guess is that we have problems in common and an identification of those in the United States and suggestions for their resolution may be useful in other countries as well.

Before we consider the problems of dental research, I would like to comment briefly on the concept of problem orientation in medical education developed by Dr. Lawrence Weed of the University of Vermont College of Medicine^{1,2}. Dr. Weed has made many contributions to the system of patient care in medicine, and his ideas have been a major factor in the development of the patient care program and the curriculum of the University of Mississippi School of Dentistry.^{3,4} As a result of our early interest in the problem-oriented system for patient care, the faculty at Mississippi applied Dr. Weed's concepts to the development of our curriculum. Nineteen problems were identified as the central focus of our teaching program. Included are such problems as caries, missing teeth, fear and anxiety, poor oral hygiene, malocclusion, and periodontal disease.

Our early idealism and innovation have been tempered by tradition and time, but we continue to be committed to the problem-oriented approach in our clinical care system and our curriculum. I might add that Dr. Gordon Rovelstad, as chairman of our Curriculum Committee, and Dr. Ames Tryon, as chairman of our Patient Care, Audit and Review Committee, have been leaders in the development and direction of our curriculum and patient care programs. Their dedication and hard work have been critical factors in what I believe will be a major contribution to dental education. I am also pleased with the interest in our curriculum and patient care system which they have stimulated among pedodontists throughout the country. The response of pedodontic departments in other dental schools has been particularly meaningful.

After this brief review of problem orientation, I trust you will understand why I have chosen to title my address "A Problem List for Dental Research." The basic purpose of a problem list is to permit me to communicate with you at various levels of abstraction, depending upon my level of understanding of each of these problems. For example, the funding of dental research is a problem at a high level of abstraction. Perhaps I can illustrate the point by using high blood pressure as an example. I could list the problem as "essential hypertension" which is abstract — a real wastebasket term. Or, I could indicate the problem as "patient who has a blood pressure of 180/115." As listed, one problem is very specific while the other is very abstract. My level of understanding of the problems also depends upon my ability to assemble all of the data relating to each.

My reason for discussing Weed's approach is to show you the rationale for establishing a problem list. In this instance, we can assume that dental research is the patient. I have examined the patient, assembled the data, and drawn up a problem list. My understanding of some of these problems is better than for others, and my objective is to list and discuss each with you.

Research funding is our first problem, and the forecast for increased funding in the 1980s is not particularly promising. My mind boggles at the complexity of the issues and the federal budgetary process — it can only be described as a veritable nightmare. William Carey, the executive officer of the American Association for the Advancement of Science, had this observation about the difficulty in analyzing the federal budget as it relates to research.⁵

"The task of preparing this fifth budget report has been an exercise in uncertainty as the entire budget-making process of the federal government has sought to adapt to faster changing economic and political pressures. The lesson has been driven

home forcefully that decisions on funding research and development are not isolated or sheltered by some overarching view of what constitutes social assets, but instead are just as much at risk as that vastly larger family of social decisions that is represented by the budget of the United States in its entirety."

In the 1960s, research funds made up nearly 40 percent of the budgets of medical schools in the United States. Now this support has dropped to less than 25 percent of their budgets.⁶ Unfortunately, replacement of most of these funds will come out of patient and student pockets through ever increasing fees and tuition. The need to increase the amount of money for dental research is a problem for all schools of dentistry, particularly in view of increasing costs, greater competition for private support, and loss of capitation dollars. Fortunately, some groups are beginning to speak up for basic and clinical research in dentistry.

The National Affairs Committee of the American Association for Dental Research has been organized and works closely with such organizations as the Delegation for Basic Biomedical Research of the Association of Independent Research Institutes to inform the Congress of the special needs of dental research. Now that the halcyon days of the 60s are past, dental educators and those in dental research should become active participants in national affairs and be prepared to speak up for our research needs. I can personally attest that your concern will not fall on deaf ears.

In January of this year, Dr. Gunnar Ryge and I were the two members of the NIDR Advisory Council asked by Dr. Scott to attend budget hearings he and his staff held with NIH Director Frederickson. As council members, Dr. Ryge and I were able to help Dr. Scott convey the message that dental education institutions are relatively more dependent on the federal sector for research funds than medical schools. Private foundations and national associations tend to give most of their support to medical research.

Funding is a problem now; it will get worse. Thus, it is imperative that individual investigators and administrators become actively involved in planning efforts to inform funding agencies about the importance and needs of our programs.

The second major problem which I associate with dental research is what I call populism in establishing policy. Apparently, this is not simply an American problem. A report issued by the Organization for Economic Cooperation and Development, whose membership includes 25 countries, lists as one of the major pressures on their universities "changing social values" which lead to a democratization of decision-making within universities. This pressure then leads

to "bureaucratization of university research." Furthermore, the report states that social pressures for applied research may lead to short-term, politically expedient studies which satisfy various population groups, but contribute relatively little to basic research.

I assure you that this problem is not unique to those 25 countries of the Organization for Economic Cooperation and Development. There are many special interest groups in the United States which effectively lobby Congress to earmark monies for certain diseases. Last year, for example, the funding for NIDR specified that "brittle bone disease" should be a target area for investigation and receive special emphasis.

Other diseases have received similar special consideration from certain congressmen through a phenomenon sometimes facetiously referred to as "the disease of the month club." Diabetes is a good example. I realize the severity of this disease, and obviously, it should receive an adequate share of funds and attention. But year after year, it seems to be singled out for special consideration. As a result, grant applications relating to diabetes often receive the stamp of "high program relevancy" at NIDR. Thus a grant with a marginal priority rating could be moved into the group that is fundable.

The question is, where does it end? How many different diseases can receive special consideration for funding? Should funds be allocated for the sake of gaining some legislator additional votes? An article in the *Washington Post* last June reviewed the problems Congress has in allocating funds for health research when its members are besieged by organizations pressuring them to support "their" disease. The article described how one person appeared before a congressional committee to take issue with the manner in which funds were appropriated. The interesting part of this story is that the individual was a diabetic who once headed a state diabetes association. The testimony of this retired clothing manufacturer from Elkins Park, Pennsylvania was a refreshing breeze in over 5,000 pages of testimony before the subcommittee. His words were eloquent in their simplicity:⁹

"It is the process that concerns me . . . This is an awful way to do things. The appropriations are made on the basis of who makes the most noise. I am not against research. I just want to see reason applied to the decisions on spending."

Populism and its political effects may be an even greater danger should legislation currently under consideration be passed by Congress. I refer to H.R. 7036, the Health Research Act of 1980, and S. 988, the Health Sciences Promotion Act of 1979. As Dr. Julius Krevans said in a recent article in the *New England*

Journal of Medicine, both of these pieces of legislation would, ". . . subject the NIH to increased direct involvement with the political process." Hopefully both of these bills will be delayed for lengthy debate before action, if any, is taken on these far-reaching proposals.

Communication between scientists and the public is important, but we should not permit total control by either segment. The involvement and aggressiveness of many diverse groups may end up resulting in no control whatsoever: certainly anarchy is not the way to allocate research dollars. In Europe, research councils which set policy and direction are sometimes motivated more by social concern than by a commitment to basic research.

A third problem which I would share with you is what has been described as a "lack of venturesomeness" by Dr. Martin Meyerson, president of the University of Pennsylvania.

I first heard him use this phrase at a meeting sponsored by the American Association of Medical Colleges. Representatives from several organizations and institutions met with NIH Director Frederickson to express their concerns about federally sponsored research in universities and health science centers. One of the most interesting questions raised came from Dr. Meyerson who said that it was almost impossible for him as a university president to allocate funds for high-risk research even though there is potentially large return. He also asked why NIH could not reduce its response time in order to encourage highly innovative approaches in research.

As many of you already know, the process for grant applications, review, and funding is long and involved. Unfortunately, there seems to be no way to respond quickly to an idea that is innovative enough to have the potential for considerable benefit. The National Commission on Research cites this as one of the inadequacies mentioned by critics of the peer review process who describe the problem as an "inability or unwillingness to recognize and recommend support for highly innovative, high risk proposals."¹⁰ In an attempt to respond to this criticism, the NCR recommended that the rating system for peer review be changed and that criteria should include an evaluation of the "innovativeness of the proposal."

It will be interesting to see if this recommendation is implemented. Hopefully, it will encourage investigators to stick their necks out a bit and not simply play it safe because their peers may shoot them down. Daniel Greenberg candidly expressed it this way in a recent issue of *Omni* magazine.¹¹

"Tight budgets have made the American scientific community very cautious in recent years.

Doctoral students seek out low-risk research topics because long projects and blind alleys can sabotage a career before it begins. This conservatism extends to the agencies that support research: the bureaucrats in charge don't want to risk having supported a far-out project that falls on its face. Scientists, however, have made some of the most notable advances by bucking the tide, by not playing it safe. What's needed, then, is explicit recognition that long-shot research is important and must be backed by the money to support it . . . To stimulate creative research, each federal agency must set aside one or two percent of its basic research budget for innovative projects outside the bureaucratic mainstream."

The fourth problem which I would like to discuss is that of the environment for research in schools of dentistry. As is often the case, I am speaking to the wrong audience; my comments over the next few minutes should be addressed to those faculty and administrators who are not like you. Those who have little or no interest in research, either basic or clinical, and are content simply to put in their time.

As the dean of a new school, I know how difficult it is to recruit and keep faculty. I've also been a department chairman and understand the pressures of faculty promotion. I've played the game of putting people up for promotion when I should have had the courage to say no. It was simpler to let the promotions committee or the dean be the villain in that game. In retrospect, I realize I was not doing my job to create an academic environment for my department and the university.

This lack of emphasis on research by clinicians is catching up with us. The number of physician and dentist investigators is declining steadily while the number of Ph.D. biomedical investigators has continued to expand.¹² The implications of the trend are that fewer and fewer people will be available for clinical investigations. The problem is even further aggravated by those studies which suggest that academic centers will become more dependent on income generated by their faculty. The push for more service and more clinical income can only mean less time for research, thus compounding the problem. However, increased patient care may help solve the problem if some of the funds generated in practice were to be allocated for research.⁶

The dental curriculum should also stimulate pre- and postdoctoral students to participate in research activities.¹³ Recent legislation has encouraged this by providing research fellowships for students for summer study. However, the most important stimulus must come from an educational program — a program that is flexible enough to permit students to partici-

pate in research in ways such as honors programs, combined degree programs, and electives. Dental schools must foster an academic environment which recognizes the importance of research. The dean can't do this alone, although it is imperative that administrators obtain funds to permit faculty to buy needed equipment and hire support staff. More importantly, however, an attitude for research must be developed at the departmental level since departments are the fundamental academic units within schools. I would charge each department chairperson to bear down, to stimulate, to cajole, to persuade, even to direct that research be an important departmental activity.

Then and only then will individual faculty get the message that promotion is not based on seniority alone. Deans and chairpersons should not be afraid to lead as Clark Kerr said.¹⁴

"Many administrators today, it seems to me, are concentrating on having a low profile, on personal survival. The times require, however, I believe, a more activist approach to guide constructive change and to resolve conflicts in productive ways."

The fifth and final problem which I would like to share with you is one of particular interest to me. In my view, the problem is a lack of emphasis of prevention and behavioral studies. As a practicing periodontist I am continually impressed with the need for communication, for helping patients recognize the importance of helping themselves. Like most in my specialty, I was once enamored of surgical techniques, but have come to realize that a patient's attitude and behavior are the critical factors in the control of periodontal disease. This is one reason why your deliberations and your sharing of knowledge of periodontal disease in children is, in my view, so important.

I do not mean to imply that nothing is being done at NIH or NIDR, for this is not the case. Weiss and Shields have presented a recent review of the history and development of what they call the biobehavioral sciences with NIH.¹⁵ Although they refer to NIDR as one of the institutes which has "made considerable progress" in the development of programs in behavioral medicine, I would not agree. A review of the number of applications and grants funded would show that the Pain Control and Behavioral Studies Program Branch of NIDR is consistently well below the other program areas. However, Dr. Scott is committed to the development of behavioral programs through support of efforts such as the National Research Conference on Oral Health Behavior held in April, 1980. A continuing high level of priority for research in this area was proposed by the participants. The publication of the proceedings of that conference will hopefully provide further stimulus and direction for the

NIDR Advisory Council.

My original problem list was longer than I have presented today. Like the novice investigator going after his graduate degree, I had identified more problems than I could handle in a reasonable time. It's good to know that I can still, at my age, muster more enthusiasm than I can manage. In addition to those problems which I've listed:

- funding
- populism and research policy
- lack of venturesomeness
- environment for research in schools of dentistry
- lack of emphasis on prevention and behavioral studies

My original list also contained:

- effect of rules and regulations
- redundancy and relevancy
- training of dental scientists
- Goldhaber's bandwagon effect

Many of you could add to the list, but I trust you understand my reluctance to go further. I have attempted to point out some of the more pressing problems of dental research having given you my reasons for following the problem-oriented approach. My approach has been personal and not scholarly, but I feel an obligation to share my experiences and thus my knowledge with you; there has been relatively little intellect applied and no experimentation.

Finally, I would like to close with apologies to those responsible for the administration of dental research programs at the NIH and at schools and research institutions throughout the country, both public and private. I have talked about problems which, unfortunately, places emphasis on the negative aspects of dental research. I believe it is just as important to point out the positive side, and an impressive list of accomplishments could just as easily be drawn up for dental research.

I am reminded of the time I was meeting with our first class midway through their final year. There was a laundry list of problems (we had taught them problem orientation very well), and at the end of my meeting I asked, "O.K., I've heard the problems — is there anything good about the program?" One of the students replied, "Dr. Mann, everything we haven't told you is great."

I still haven't figured out all the ramifications of that one, but I will conclude by saying that everything I haven't told you about dental research is great. We should not be ashamed. Dental research has a proud and noteworthy record of achievement. My problem list has been presented simply to increase our level of understanding and to help all of us, administrators, faculty, and investigators do better in our efforts to move forward in programs of dental research.

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