

The ADEA-NIDCR National Research Conference on Putting Science into Practice: The Critical Role of Dental Schools

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The scientific horizons for academic dentistry have never been brighter. Scientific advances are providing new and challenging research findings in caries, periodontal disease, biomaterials, and other diseases and conditions through epidemiological, behavioral, and health promotion research and molecular and genetic research. The Surgeon General's report, *Oral Health in America: A Report of the Surgeon General*, clearly positions oral health as a part of total health and points to the emerging science that links oral infections and systemic conditions.¹ The release of the human genome report, the emergence of the knowledge base of biomimetics and bioengineering, an enhanced understanding of environmental, behavioral, and genetic interactions, and the expanding capability of information technology promise virtually limitless potential for disease prevention, promotion, and intervention. The National Institute of Dental and Craniofacial Research's (NIDCR) strategic plan reflects these new scientific opportunities by underscoring research needs related to inherited diseases and disorders, infectious diseases and immunity, neoplastic diseases, chronic and disabling diseases, biomaterials, biomimetics and tissue engineering, and behavior, health promotion, and the environment.

While new basic biomedical and clinical research opportunities abound, making the most of them is not without significant challenges. The National Research Council reports that establishing independent research careers is increasingly difficult for new scientists.² A significant disparity exists between the number of new Ph.D.'s, especially in the

basic biomedical sciences, and the available academic or research positions. While the need for clinical researchers to translate research into health improvements grows, economic barriers often dissuade would-be researchers from careers as scientific investigators. The demands for clinical researchers to generate income through the provision of patient care further restricts research activities.^{2,3} A study conducted by the Association of American Medical Colleges describes clinical research as the "‘neck of the scientific bottle’ through which all scientific developments in biomedicine must flow before they can be of real-world benefit to the public."⁴ The study goes on to identify nine core problems that place the nation's clinical research enterprise at risk. Another study of research leaders in academic health centers concludes that the clinical research workforce and infrastructure may need to be expanded to keep up with advances in basic research.³

Dental schools represent the one place where teaching, research, and patient care focusing on the dental and craniofacial complex occurs. But the research mission of dental schools is faced with a number of challenges, such as: a critical and growing shortage of faculty;^{5,6} traditional curricula that often fail to incorporate scientific research into the educational experience of students and lack of basic and clinical science integration throughout the predoctoral program;⁷⁻⁹ competing expectations from parent institutions and the dental practice communities;¹⁰ and recent university budget cuts in the face of a declining economy.

A National Conference on the Critical Role of Dental Schools in Research

ADEA and NIDCR held their first jointly sponsored national research conference for dental school deans, associate deans for research, and university vice presidents for research on October 30-31, 2001, in Bethesda, Maryland. The purpose of this meeting was to launch a series of coordinated initiatives to help all dental schools explore new research opportunities and develop national strategies to meet challenges. Fifty-four of the sixty-five U.S. and Canadian dental schools participated, as well as a number of university vice presidents of research (or the equivalent) and special guests. Cosponsors were the American Association for Dental Research (AADR), the American Dental Association (ADA), the Hispanic Dental Association (HAD), the National Dental Association (NDA), and the Society of American Indian Dentists (SAID).

The title of the conference, "Putting Science into Practice: The Critical Role of Dental Schools," reflected the supposition that dental schools not only play a vital role in behavioral, basic biomedical, and clinical science, but they are also an essential resource for the translation of research findings into health improvements for the public.

In preparation for the conference, ADEA commissioned papers to address four issues fundamental to the research mission of dental schools: the role and importance of research and scholarship in dental education and practice; the cost, workforce needs, and infrastructure requirements for basic and clinical research; local, regional, and global partnerships in developing research programs; and resources for the new investigator. These papers were distributed to conferees prior to the conference and formed the basis for three roundtable discussions during the first day. Three of these papers were edited by their authors based on conference feedback and appear in this issue of the *Journal of Dental Education*.

The first day's roundtable discussions took place in groups of approximately ten participants, each group pre-selected to represent the range of research activities and levels of funding in dental schools. ADEA and NIDCR staff were present at each roundtable to record feedback on a series of questions related to each discussion paper. In addition to

participating in two of these roundtables, vice presidents for research engaged in an open forum with Dr. Lawrence Tabak, Director of NIDCR, to discuss opportunities for research, perceptions of NIDCR and dental schools, and ways to strengthen the research enterprise of dental schools. During the first day's plenary sessions, conferees learned about infrastructure funding available through the National Center for Research Resources and opportunities for dental students at the National Institutes of Health through the Clinical Research Training Program. In the final plenary session that day, Dr. Richard W. Valachovic, Executive Director of ADEA, summarized the day's activities and charged the participants for the planning activities scheduled for day two.

The second day of the conference was a focused experience specifically designed for dental school deans and associate deans for research. Based on the first day of discussions, deans and associate deans participated in workgroup discussions to develop strategies at their home institutions that would foster their research enterprise. The sessions provided the occasion for conferees to compare efforts at their respective institutions and to seek advice from their peers on effective strategies and programs. In addition, discussions focused on how ADEA, NIDCR, AADR, ADA, and other organizations could work together on a national scale to enhance research in all dental schools.

Outcomes of the Conference

The ideas and recommendations arising from this ADEA-NIDCR research conference are ambitious and far-reaching. There are no quick fixes to the problems of faculty shortages, inadequate infrastructures, university budget cutbacks, rising demands on faculty time, growing expectations of universities and academic health centers, and other factors that threaten to undo the research programs and plans of dental schools. The challenge for the conference sponsors and cosponsors—and dental school leaders at each individual institution—is to implement as many short-term strategies as possible, while maintaining a focus on longer-term initiatives in the face of threats to the research enterprise. ADEA, NIDCR, AADR, the ADA, and others continue to plan and to act deliberately in response to the conference.

Overall, the conference served to publicize a variety of ongoing activities and act as a catalyst for several new initiatives. Ten of these activities and initiatives are highlighted in the following sections.

Planning Awards for Improvement of Research Infrastructure in U.S. Dental Schools

When the NIDCR Advisory Council met on January 28, 2002, at the NIH campus, it approved the concept of Planning Awards for Improvement of Research Infrastructure in U.S. Dental Schools. The objective of these awards is to provide resources to develop and implement comprehensive plans to improve research structure, recruit research personnel, and establish cooperative links. Approximately ninety people participated in an ADEA, AADR, and International Association for Dental Research Joint Symposium on Wednesday, March 6, 2002, in San Diego to learn about the next steps for these planning awards from Dr. Lawrence A. Tabak, Director of NIDCR, and Dr. J. Ricardo Martinez, NIDCR Associate Director for Program Development.

The planning grants, funded through the P 20 mechanism, will be implemented in two phases: a planning phase and an implementation phase. The first year will focus on the development of a comprehensive plan based on a needs-assessment. Funds provided during Phase I can be used for technical assistance activities, institutional assessment, and staff, supplies, and services in the development of the plan. The plan should identify an area or areas of research, steps to create a critical mass of researchers, steps to acquire or improve infrastructure, cooperative links, methods and processes for training plans, and long-term institutional goals.

The implementation phase will cover the second and third year of the award. Funds may be used to recruit and integrate scientists; to create or renovate research facilities; to develop shared research; and to purchase research equipment. The initial Request for Applications (RFA) will be issued in August 2002, with letters of intent due in November 2002 and applications in December 2002. Applications will likely be reviewed in February and March 2003. The first awards are projected for July 2003. The RFA will be reissued in 2003, with a similar

timetable and a second set of awards to be granted in 2004.¹

Regional Workshops

In support of the planning awards and to explore other strategies for the development and growth of research in dental schools, planning is under way for a series of regional workshops to occur in August and September 2003. The workshops are intended for faculty, students, and research administrators. Topics will include scientific opportunities; portfolio analyses; current and future NIDCR priorities and initiatives; training opportunities and programs; testimonials from successful grantees; and technical assistance with the Planning Awards for Research Infrastructure and Capacity Building in Dental Schools RFA. More information is forthcoming from NIDCR and ADEA about these regional meetings.¹¹

Continued Advocacy for NIDCR

On April 23, 2002, Dr. David C. Johnsen, President of ADEA, gave testimony to the House Appropriations Subcommittee on Labor, Health and Human Services, Education, and Related Agencies. President Johnsen reported that oral health researchers in U.S. dental schools, working in collaboration with the NIDCR, have built a base of scientific and clinical knowledge that has been widely communicated and used to improve oral health. He also emphasized that oral, dental, and craniofacial research is a national asset, but noted that this asset is endangered by the lack of candidates pursuing research careers.

On behalf of ADEA, President Johnsen offered the Association's recommendations for the Fiscal Year 2003 federal appropriations for dental education and research. He affirmed ADEA's endorsement of the AADR priorities for NIDCR and joined AADR in requesting an appropriation of \$420 million for NIDCR.¹² He also recommended that the subcommittee encourage NIDCR to expand loan forgiveness programs for researchers and that the National Institutes of Health collaborate with the Health Resources and Services Administration to fully integrate oral health care into the multidisciplinary research component of the Centers of Excellence in Women's Health.

Advocacy for Faculty Loan Repayment Programs

The Title VII Faculty Loan Repayment Program (FLRP) assists dentists and other qualified clinicians to enter academia. It is the only federal program that endeavors to increase the number of faculty members from among those who are economically disadvantaged. This program takes on additional significance in light of current and predicted faculty shortages. During his testimony to the Subcommittee on behalf of ADEA, Dr. Johnsen recommended that Congress increase funding and broaden eligibility for the Faculty Loan Repayment Program to faculty members with qualifying student loan debt, regardless of their background. He also recommended that Congress create a separate program directed at eliminating faculty shortages in the nation's fifty-five dental schools. Dr. Johnsen also recommended that General and Pediatric Dentistry residents who are committed to academic careers be eligible for FLRP awards. He strongly urged the subcommittee to reject the Bush Administration's decision to zero fund these critical Title VII diversity programs, and to expand them instead.

Best Practices in Research

Subsequent to the research conference, ADEA issued a call to dental school deans for best practices in dental education, with a special focus on best practices in research. "Best practices" can be defined as the most innovative strategies, approaches, programs, processes, and systems that dental schools utilize to fulfill their missions of teaching, research, and patient care. Ultimately, best practices are models, examples of superior performance, that allow dental schools to learn about what works and what does not and to obtain assistance from peers in designing and implementing new programs and processes or making current ones more effective.

Fourteen best practices in research were submitted for publication and dissemination to all dental schools. These best practices include such areas as predoctoral research programs, centers for biomaterials research and clinical research, and models for collaborative research across the academic health center. ADEA published a special monograph, *Best Practices in Dental Education, 2002*, in July 2002. Nine best practices in research from *Best Practices in Dental Education, 2001* are currently available from ADEA or at the ADEA website (www.adea.org).

Addressing Faculty Competencies and Curricula for the Twenty-First Century

On October 25-26, 2002, ADEA, the Marquette University School of Dentistry, and the Fund for the Improvement of Post Secondary Education (FIPSE) will cosponsor a national conference and workshop to address faculty competencies for the future and curricular change. This conference will include the ADEA Councils of Faculties, Sections, and Students as well as the academic deans from dental schools in the United States and Canada. Conferees will consider actual and needed curricular change in dental education, including those important to scientific research and the integration of the basic and clinical sciences. The conference will also address the desired competencies for the dental faculty member for the twenty-first century, including those necessary for research scholarship.

ADEA Academic Dental Career Center

ADEA is currently developing an Academic Dental Career Center for its website. The first phase will provide the means for ADEA to post faculty vacancies on the World Wide Web. The second phase will establish the means for job seekers to post their curriculum vitae. The third phase will automatically alert job seekers of posted positions that meet criteria specified by the job seeker. ADEA anticipates the first phase to be completed and the website activated by mid-summer 2002. Phases two and three are projected for completion by the fall 2002. ADEA's goal is to link the ADEA Academic Dental Career Center to dental and dental-related websites around the world, thereby creating a global awareness of opportunities at academic dental institutions and the means for institutions to monitor a registry of job seekers. The ADEA Academic Dental Career Center will also include information about academic careers for students, research opportunities through NIDCR and other sources, and funding resources.

Collaborative Efforts with AADR

In March 2001, the ADEA and the AADR Boards of Directors created a task force to address issues of common concern to both associations. The task force has met several times since its inception,

most recently at the ADEA and AADR annual sessions. Of particular interest to the task force is faculty recruitment and development. Among other issues, the task force is exploring ways to enhance overlap of the ADEA and AADR annual meetings. The task force has submitted recommendations to the respective annual session planning groups of each organization for programming that will address such issues as opportunities for a career in research; a program for student research; building research partnerships; successful strategies for grant writing; and public policy and advocacy for research interests. It is expected that the AADR-ADEA task force will be the primary conduit for collaborative efforts between the two associations.

Collaborative Efforts with the ADA

In 2001, the ADA, one of the cosponsors of "Putting Science into Practice: The Critical Role of Dental Schools," held two Dental Education Summit Meetings with participants appointed by then-ADA President Dr. Robert M. Anderton to represent ADA agencies and other organizations. ADEA appointees and staff made significant contributions to these meetings. Discussions focused on three interrelated, ADA board-mandated topics: the cost of dental education, dental student indebtedness, and recruitment of dental school faculty. As a result of these summit meetings, the 2001 ADA House of Delegates adopted four resolutions calling for increasing member awareness, increasing federal/state funding initiatives, increasing endowment fund support, and establishing debt consolidation services for members.

Under the leadership of current ADA President Dr. Gregory Chadwick, the ADA Dental Education Summit Meetings will reconvene in 2002. ADEA will continue to play a role in these meetings, with President David Johnsen and Dr. Lawrence Goldblatt, Chair of the ADEA Council of Deans and Dean, Indiana University School of Dentistry, serving as ADEA appointees. The 2002 meetings will not only seek to develop action steps in response to the 2001 ADA House of Delegates resolutions, but they will also address the issues of the research mission and infrastructure needs of dental schools.

Developing a National Plan

One recommendation arising from the conference was the proposal that ADEA, AADR, ADA, NIDCR, and others develop a national plan to sup-

port research in all dental schools. Through its Center for Educational Policy and Research, ADEA will convene in 2002 a strategic planning group to explore collaborative efforts and national partnerships in support of the research enterprise of dental schools and other academic dental institutions. ADEA anticipates further examination of other recommendations arising from the conference and the appropriate action steps to move these recommendations forward.

Conclusion: Dental Schools as a National Resource

One of the key findings of the 1995 Institute of Medicine report, *Dental Education at the Crossroads*, and the 1998 American Dental Education Association (ADEA) Leadership Summit Conference was that dental education and dental schools are national resources. Dental schools are strategically positioned to contribute to emerging research opportunities—they are the conduits through which scientific developments in oral and craniofacial research can be of practical benefit to the public. Like other schools in the health professions, dental schools must seek innovative ways to meet the challenges of emerging research paradigms.

Meeting these challenges will require collaborative and interdisciplinary efforts, developing an infrastructure supportive of a research mission, continually developing faculty to pursue basic, clinical, and behavioral research, and recruiting and retaining the best and brightest researchers. Careful consideration must be given to ensure that the research, education, and service missions of dental schools complement each other. Meeting these challenges necessitates that the leaders in dental education and other key stakeholders understand the vast array of research opportunities and plan strategically to utilize the funding and human resources of those who have the capacity to support research in dental schools.

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Deputy Director, NIDCR, and Chief Dental Officer of the U.S. Public Health Service; Dr. Laura Neumann, ADA Group Associate Executive Director, Professional Services and Education; Dr. J. Ricardo Martinez, Associate Director for Program Development, NIDCR; and Dr. Lawrence Tabak, Director, NIDCR.

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10. For example, Resolution 85, 2001, ADA House of Delegates: "Resolved that the ADA advocates policy that will establish education, research and access to the underserved as the sole missions of dental clinical training programs, and that revenue generated should support only dental clinical training programs and their parent dental institutions. . . ." This resolution has been referred to the appropriate agencies for study and report back to the 2002 ADA House of Delegates.
11. Tentative plans and timetable presented by Dr. Lawrence Tabak and Dr. J. Ricardo Martinez, March 3, 2002, San Diego, California, ADEA-AADR Annual Session.
12. AADR Priorities: new saliva-based diagnostic tools; temporomandibular joint disorders as a complex disease; restoring health to orofacial tissues and organs using biomimetic, tissue engineering, and stem cell approaches; stem cell and lineage analysis of orofacial structures; oral mucosal vaccination against HIV infection and HIV-related opportunistic infections; the role of microbial biofilms in the pathogenesis of oral disease; infrastructure development: building research capacity of the nation's dental schools.