

Critical Issues in Dental Hygiene

Building a Research Infrastructure

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It is widely recognized that dental hygiene practice must be based on sound research and scientific information. To promote research and advance the scientific base of dental hygiene practice, a research infrastructure is required. Such an infrastructure will support research efforts and enable the systematic and purposeful building of a rigorous body of knowledge.

What is research infrastructure? Research infrastructure fosters the development and advancement of long-term research programs, enables discussion and dissemination of research findings and supports the systematic building of a scientific knowledge base that informs practice. There are 5 essential and inter-related elements of research infrastructure that are common to other professions.¹ These elements are:

- A critical mass of researchers/scientists
- Research priorities that produce clinically relevant knowledge
- Communication systems that promote linkages among researchers and increase access to research findings
- Funding mechanisms to support research
- Demonstrated value for research and its relationship to practice

There are many approaches by which each one of these elements can be developed and advanced in dental hygiene. Highlighted are some of the critical considerations related to each element.

Critical mass of researchers/scientists: An important component of an infrastructure is the presence of a sizable number of professionals trained and actively participating in

research. Although there has been an increase in the number of doctoral-prepared dental hygienists, there are 18 programs that award a master's degree in dental hygiene, dental hygiene education or oral biology, and none that award a doctoral degree. Ideally, researchers in the profession should be prepared through doctoral education in dental hygiene. Recently, leaders in dental hygiene education proposed a curriculum model for the doctorate in dental hygiene.^{2,3} Proponents of the doctoral degree in dental hygiene strive to achieve what is considered among the hallmarks of any true profession – the terminal degree in the field. These programs emphasize leadership and scholarship – skills that are essential in the workplace and for successful interdisciplinary, collaborative efforts. However, until such programs exist, dental hygienists must receive their doctoral education in other disciplines. This is not to diminish the importance of the pursuit of doctoral studies in other fields. Arguably, the profession gains diversity in its perspective and direction from those hygienists who share new ideas and knowledge obtained from their scholarly work in other disciplines. Diversity of education among our scholars allows the profession to not just aim higher towards the terminal degree, but also expands the breadth and depth of the knowledge base of the profession.

To increase the number of researchers in dental hygiene, graduate education and research as a career path must be actively promoted. Faculty and students need to be socialized to the importance and benefits of research and doctoral education. Mechanisms for supporting advanced education and systems

for mentoring are required to enable novice researchers and those in the profession who are not doctoral-prepared to engage in the research process effectively.

Identifying research priorities: Identifying specific areas of inquiry and obtaining consensus on priorities for investigation is another element of a research infrastructure that enables systematic knowledge building. Research priorities in a profession are commonly established by assessing current activities, generating state-of-the-art papers on key areas, systematically obtaining input from the research community and disseminating, discussing and then refining priorities. Research priorities must be based on scientific merit, match with funding opportunities and lead to the building of a knowledge base that is specific to the practice of dental hygiene. A shared vision of the research priorities for dental hygiene provides a basis for establishing partnerships with other organizations and agencies that have areas of interest in common with dental hygiene. An initial step in this area was taken by the National Center for Dental Hygiene Research (NCDHR) by sponsoring the North American Dental Hygiene Research Conference, held in June 2009 in Bethesda, Maryland. The first day of the conference was hosted at the National Institute of Dental and Craniofacial Research (NIDCR) and the National Institutes of Health (NIH), with the specific goals of sharing strategic plans for conducting oral health research from the perspectives of the NIDCR, the Canadian Institutes of Health Research, the ADHA and the Canadian Dental Hygienists Association.

As priorities are identified, difficult choices will have to be made as to the areas of inquiry that can be initially supported by the profession. All topics of potential importance cannot be immediately supported given the limited opportunities for funding and scarce professional resources (e.g., limited numbers of doctoral-prepared researchers).

Communication systems to promote linkages: The need for effective communication systems as part of a research infrastructure become increasingly important as the research efforts of a profession expand and mature. Strategies that support linkages and dissemination of research include traditional mechanisms such as annual research meetings and conferences, published papers and proceedings and research journals. Electronic communication, such as the Internet and web, offers an exciting approach to promote scholarly exchange and to disseminate and access research information. This technology can also be used to establish linkages among researchers at the local, national and international levels without regard to geographic location. Dental hygiene has developed some of these communication strategies. However, greater emphasis must be placed on creating opportunities for presentation and discussion of research, the basis and foundation of scientific work. Conferences, webinars, podcasts and targeted publications, such as special journal supplements, can be used to increase the dissemination of timely information and can reach large numbers of dental hygienists.

Funding for research: It is essential for a profession to devote a portion of its assets for funding research activities, and we must continue to develop mechanisms to secure and dispense monies and other critical resources needed to achieve our research goals. The ADHA Institute for Oral Health offers support for

research studies that are primarily at the pilot stage of development. This level of support assists students and novice investigators to explore new ideas, as well as provide an opportunity for an established researcher to enter a different area of inquiry. In addition, many academic and health institutions provide intramural funding for pilot research that may be available to dental hygienists. Other professional associations offer scholarships to graduate students for thesis and dissertation study. This is a viable strategy to promote in dental hygiene as well. Obtaining funding for large-scale and multi-site studies requires having pilot data and establishing an area of expertise or track record that is compatible with the research priorities of the agency or foundation from which funding is being sought. This takes time and requires enabling dental hygienists to build a research career path in order to become competitive for funding.

Valuing research: Underlying each component discussed above is the fundamental value that a profession must place on the work of research. For example, nursing is a profession that has deliberately focused its efforts on valuing and building an effective research infrastructure. As a result of these efforts, nurses have joined the mainstream scientific community and have received the highest level of federal recognition, the establishment of the National Institute of Nursing Research at the NIH. An important strategy for increasing the value of research is to increase its visibility in all aspects of professional activities. As discussed in a previous edition of this column, the National Dental Hygiene Research Agenda should be used to drive the efforts of the association, including establishing priorities for funding and directives for targeted research efforts.⁴

Does dental hygiene have a research infrastructure? Dental hy-

giene has an emerging infrastructure that must be purposely advanced and supported. Components of this infrastructure include an increasing number of dental hygienists who are doctoral-prepared, a national research agenda from which priorities can be identified and professional association support of small pilot research efforts. In 1994, the NCDHR systematically began developing the infrastructure by training collaborative teams of dental hygiene researchers. At the end of a 3 year funding cycle, 14 teams (65 individuals) initiated pilot research that addressed an area of the National Dental Hygiene Research Agenda. It was hoped that their efforts would build a program of research that would serve as a basis for additional centers of excellence. Through 2 additional cycles of funding, the National Center received support to establish an electronic communication system, the DHNet, to enhance dissemination and communication among researchers, and to advance training in evidence-based decision making. As a result of the North American Dental Hygiene Research Conference, the NCDHR will be enhancing an electronic network of dental hygiene researchers and providing a mechanism for sharing research investigations and fostering collaboration to strengthen the research infrastructure.

These activities are promising and suggest the viability of a center-approach to advance research in dental hygiene. Nevertheless, a research infrastructure suggests a level of coordination and integration of activities that goes beyond any one institution, organization or center. Building an infrastructure for dental hygiene will require considerable commitment, communication, time and energy on the part of the professional associations, educational programs and the dental hygiene scientific community at large. Gaining support from university administration, government, private industry and foundations also will be critical.

To expedite the development of a research infrastructure, a nationally coordinated effort is required. We believe that the initial focus and funding of this effort should be on the priorities identified from the National Dental Hygiene Research Agenda. Although these recommendations were made 15 years ago in 1994, they are still current today.¹

Building an infrastructure is particularly critical for dental hygiene in today's health care environment. Limited availability of research support necessitates careful examina-

tion and consensus as to the next steps for advancing professionalization. However, achieving excellence in practice, the cornerstone of professionalization, is intricately tied to and dependent upon putting into place a viable structure for the conduct of research.¹

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