

## **Increasing Adoption of New Innovations and Effective Practice Recommendations**

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The adoption of new innovations and practice recommendations can be a slow and haphazard process. There is a well documented lag between the publication of evidence and its implementation in clinical practice. In Scotland, we are using a multifaceted approach to this issue.

### **The Effective Dental Practice Program**

One approach is to develop a program of research specifically dedicated to investigating the translation of knowledge into evidence-based dental practice within primary dental care services as well as dental education. The Effective Dental Practice (EDP) Program now includes a range of such studies funded by the Medical Research Council, the Chief Scientists Office, the National Institute for Health Research Health Technology Assessment, the Economic and Social Research Council and the Scottish Government.

For example, the ERUPT trial examined the effect of 2 different implementation strategies to increase the adoption of effective practice recommendations in Scotland – a specific fee for service and a general education course. One-hundred and forty-nine general dental practice GDPs returned data on 2,833 children who had treatment records showing at least 1 erupted second

molar. The trial demonstrated that a fee for a preventive fissure sealant would increase the number of children receiving such care by 10%. The results of this trial informed and influenced the Scottish Executive policy decision to change the fee for item of service for this particular treatment.

### **Scottish Dental Practice Based Research Network**

Another approach is to encourage dentists, trainers and academics involved in dental education and dental research in Scotland to join the Scottish Dental Practice Based Research Network (SDPBRN). The aim of the SDPBRN is to encourage, facilitate and conduct high quality research specific to the primary care setting, and to disseminate information relevant to the provision of evidence-based primary dental care. The network maintains a register of current research and research ideas, along with current contact details of members in order to facilitate research collaborations. The SDPBRN has supported the collaboration of the National Health Service Education for Scotland, the Dental Health Services and Research Unit and dental deaneries in England, Wales and Northern Ireland. This enabled the conducting of a series of practice-based randomized controlled trials, surveys and cohort studies.

### **The Cochrane Oral Health Group**

Another approach is to contribute to the Cochrane Oral Health Group (OHG). This is part of the Cochrane Collaboration, an international, non-profit and independent organization dedicated to making up-to-date, reliable and accurate information about the effects of health care readily available worldwide. High quality systematic reviews of current available best evidence is of particular importance in dentistry, where many dentists work in rela-

tive isolation with little hope of critically evaluating the thousands of journal articles published each year or of verifying the claims of those advocating novel interventions or materials. This has resulted in a number of problems. Interventions are being adopted despite evidence against their use, costly interventions are being adopted at the expense of cheaper, equally effective ones, interventions are not adopted despite evidence for net clinical benefit and interventions are adopted in the absence of quality evidence.

The OHG comprises an international network of health care professionals, researchers and consumers. The work of the OHG is carried out by over 617 members from 40 different countries around the world. Members contribute in many different ways: preparing systematic reviews, peer reviewing, manually searching journals, translating articles and offering consumer input. Activities are coordinated by its Editorial Base, located within the School of Dentistry, University of Manchester, United Kingdom. To date, the OHG has published 90 systematic reviews and 73 protocols. Its performance has ranked it third out of the 24 United Kingdom National Health Service funded groups.

### **Apply Psychological Models to Understand and Facilitate Professional Behavior Change**

Since adopting new evidence into practice often requires clinicians to change their behavior, another approach we are taking is to use psychological models to understand and investigate factors associated with implementing evidence-based dental practice. These models explain behavior in terms of predictive beliefs which can be influenced, as well as methods for measuring and influencing them. In effect, they provide a means of focusing the design of a knowledge translation intervention and include an expla-

nation of how it will work. Psychological models have informed the design of interventions, increased our understanding of our research results, as well as the likelihood of our intervention success. For example, most knowledge translation interventions are focused on the “why” and the “what” of evidence-based practice. Using psychological models and methods has allowed us to accumulate evidence suggesting that dentists also need to plan in more detail about when and how they can implement evidence-based behaviors.

### **Translation Research in a Dental Setting**

The final avenue is using a multidisciplinary team of experts to help synthesize the evidence from trans-

lation research programs with the practical realities of health care and clinical settings as understood by different perspectives. The Translation Research in a Dental Setting (TRiaDS) collaboration includes academics, dentists and doctors from primary and secondary care, psychologists, economists, statisticians, trialists and policy makers. The overall aim is to develop an evidence-based framework for choosing and designing knowledge implementation interventions with the greatest likelihood of success, whether these interventions take place at the initial development and presentation of the evidence, guideline design, the level of the organization or the level of the individual clinician or patient. The TRiaDS framework will be based

on the results of a program of high quality randomized controlled trials (RCTs) on the translating of dental guidance into practice. The first RCT, comparing 2 strategies for the implementation into practice of Scottish Dental Clinical Effectiveness Program (SDCEP) decontamination guidance (*Cleaning Dental Instruments*) is already underway. It is expected that the development of a coherent theoretical framework for understanding patient, professional and organizational behavior change will also have applications outside dentistry. SDCEP was initiated to provide guidance in areas of uncertainty for dental health care practitioners in Scotland and to date have worked in 7 priority areas.

## Historical Overview of Models of Practice Based Research; NIDCR DPBRN Grant Initiative

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Dental practice-based research is research conducted in clinical practices by practitioners and their staffs that is designed to answer questions dental professionals face during routine care of patients. The origins of practice-based research can be traced back to small groups of European medical practitioners who began sharing information pertinent to patient care and clinical outcomes. The early precursors to today's practice-based research networks (PBRNs) were the European sentinel networks of the 1970s. This sentinel model soon took hold in the U.S. as the Ambulatory Sentinel Practice Network (ASPN) followed closely by the establishment of the Pediatric Research in Office Settings (PROS) in 1984.<sup>1</sup> Currently, there are over 120 primary care PBRNs known to be active in the U.S., which include about 20,000 practices of pediatrics, family medicine and general internal medicine located in all 50 states.<sup>2</sup>

In 2005, the National Institute of Dental and Craniofacial Research (NIDCR) funded 3 large dental PBRNs for a period of 7 years at a cost \$75 million, the largest single project in the history of the NIDCR. These dental PBRNs are composed of academic hubs and coordinating centers that leverage the research strengths of these institutions with

the real work environment of clinical practice. The primary purpose of these grants is to provide an infrastructure to conduct multiple clinical trials and prospective observational studies that answer questions facing general dental practitioners in the routine care of their patients. The PBRN infrastructure is also designed to provide a flexible and adaptable electronic communications network/platform that ensures a common means for connectivity, data sharing and communication within the PBRN and with other medical and dental PBRNs currently in existence or that may be created in the future. There are presently over 500 practices involved in this project in more than 20 states and Scandinavia.

Practice-based research networks can generate important and timely information to guide the delivery of health care and improve patient outcomes. Many of the unique questions faced by dental health practitioners on a daily basis are most appropriately addressed in dental practice settings in the context of the oral health care delivery system. Indeed, the recent American Dental Association Future of Dentistry Report specifically recommended that national clinical research networks be established, which link treatment approaches and outcomes in private practice settings.<sup>3</sup> By connecting practitioners with experienced clinical investigators, PBRNs can enhance the clinical research agenda of the NIDCR and produce findings that are immediately relevant to practitioners and their patients. PBRNs support a variety of clinical studies with clear and easily defined outcome measures, and they typically draw on the experience and insight of practicing clinicians

to help identify and frame research questions. Because research is conducted in the real-world environment of dental practice, results are more likely to be readily accepted and adopted by practitioners and translated into daily practice. Moreover, because PBRNs use the existing personnel and infrastructure of established dental practices, certain types of clinical studies can be conducted in a cost-effective manner.

Although dental PBRNs were initially established to engage general dental practitioners in the research process, membership has now been expanded to include dental specialists and other key members of the dental team, including dental hygienists. In addition to roles as research coordinators and clinical research associates, dental hygienists are certain to have the opportunity to develop studies of interest to the dental hygiene community and to serve as principal investigators on these projects.

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## **An Update from the PEARL Network and Serving as a Practice Research Coordinator for the PEARL Network**

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The Practitioners Engaged in Applied Research and Learning (PEARL) is a dental practice-based research network (PBRN) comprised mainly of general dental practitioners who conduct clinical research within the setting of their private practices. The PEARL Network is 1 of 3 national dental PBRNs supported by a grant from the National Institute of Dental and Craniofacial Research (NIDCR). A distinctive feature of the studies conducted within dental PBRNs is the direct impact of study results on the daily clinical practice of dentistry. Each of the 3 national dental PBRNs has evolved its own unique organizational structure. The PEARL Network is supported by the NIDCR, which provides financial support, The EMMES Corporation of Rockville, Md., which functions as the data coordination and analy-

sis center and the New York University College of Dentistry, which provides central administrative support. From within the PEARL administrative center, 5 pharmaceutical industry standard clinical research coordinators directly interface with member practices to assist with study initiation, assurance of data quality, compliance with Good Clinical Practice and the protection of human subjects, as well as answer any questions or problems that arise during the conductance of PEARL Network studies. At present, the PEARL Network consists of 188 dental practitioners from 21 states largely located within the northeastern U.S.

Practitioner-investigators of the PEARL Network suggest ideas for research that arise during the course of providing dental care that are ranked for priority by the Network membership. Research ideas given the highest priority are developed into formal research protocols by the PEARL administrative center, with assistance in study design and data analysis by the EMMES Corporation. At present, the PEARL Network has completed or is conducting 8 studies that range from surveys of practice procedures to effectiveness studies to randomized clinical trials. Present studies include: the treatment of deep carious lesions, post-operative hypersensitivity after placement of resin-bonded composite restorations, risk assessment for osteonecrosis of the jaw, outcomes of endodontic therapy, use and effectiveness of analgesics in dental practice and the treatment of hypersensitive non-carious cervical lesions. Within the next 3 years additional studies are

planned that include: assessment of the criteria used in general practice for periodontal diagnosis, treatment and maintenance recall, oral cancer screening diagnostics, a new caries classification system and its use in non-surgical treatment of reversible carious lesions, outcomes of implant therapy, outcomes of all-ceramic crowns and outcomes of periodontal therapy. The PEARL Network is also extending its studies to include medical PBRNs, and will conduct studies in collaboration with the other 2 national PBRNs on the impact of PBRN research findings on clinical practice, treatment of temporomandibular joint dysfunction and oral cancer detection.

Opportunities for dental hygienists to participate in the PEARL Network include becoming a Practice Research Coordinator (PRC) for a PEARL Network practitioner-investigator practice. PRCs in many PEARL practices function as the liaison between the practice, the PEARL administrative center and the EMMES Corporation. PRCs help recruit appropriate patients into PEARL research protocols, help train staff in conducting research studies, help in the collection and recording of data and participate in data quality assurance procedures. Additional, unique opportunities for dental hygienists to participate in the PEARL Network may arise depending upon the results of the periodontal diagnosis, treatment and maintenance and recall study and periodontal outcomes studies. Additional information on the PEARL Network and opportunities for participation may be found on the PEARL Network public Web site, [www.pearlnetwork.org](http://www.pearlnetwork.org).

## An Update from “The Dental DPBRN”

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The Dental Practice–Based Research Network (DPBRN) was developed in response to a 2004 initiative from the National Institute of Dental and Craniofacial Research (NIDCR).<sup>1</sup> The mission of DPBRN is “To improve oral health by conducting dental practice–based research and by serving dental professionals through education and collegiality.” It is committed to maximizing the practicality of conducting research in daily clinical practice across geographically dispersed regions, so its structure is designed to focus some activities at the regional level (e.g., close interactions with practitioner–investigators) and other activities that can be done on behalf of the entire network centrally (e.g., study development).<sup>1,2</sup>

The DPBRN central administrative base is at the University of Alabama at Birmingham, comprising the Office of the Network Chair and the Coordinating Center. DPBRN is unique in that it encompasses 4 regions in the U.S. and 1 in Scandinavia. For 2 DPBRN regions, collaborations were established with 2 organizations: HealthPartners (HP) of Minneapolis, Minn. and Kaiser Permanente Northwest/Permanente Dental Associates (PDA) of the greater metropolitan Portland, Ore. area. HP is a prepaid, multi–specialty group that provides comprehensive health care. PDA is a multi–specialty dental group that contracts with Kaiser Permanente Northwest (KPNW) to provide dental services for KPNW prepaid comprehensive health plan members. The 5 DPBRN regions are:

1. The Alabama/Mississippi region, which almost entirely comprises persons in private practice, although a few practices are in public health settings
2. The Florida/Georgia region, which also comprises almost entirely persons in private practice, although a few practices are in public health settings
3. The Minnesota region, which comprises providers employed by HealthPartners and providers in private practice in Minnesota
4. The Permanente Dental Associates region (PDA), which comprises entirely practitioner–investigators in Oregon and Washington in the PDA organization, in cooperation with the Kaiser Permanente Northwest Research Foundation’s Center for Health Research
5. The Scandinavian region, which comprises dentists and dental hygienists in Denmark, Norway and Sweden, about one–half are in private practice and one–half are in a public health setting

The Executive Committee is the main decision–making body of the network and is structured to make DPBRN a practitioner–driven network. It makes decisions on operational issues, considers appropriateness and suggests changes in study procedures, reviews the network’s progress and prioritizes research topics, among other duties. The committee meets approximately 6 times each year, with most meetings held by videoconference. By design, majority voting authority resides with its 6 practitioner–investigator representatives. In addition to 1 practitioner–investigator from each of DPBRN’s 5 regions, there is a member–at–large representative for the combined Alabama/Mississippi and Florida/Georgia regions. To be eligible to serve as a practitioner–investigator representative, a DPBRN practitioner must meet the following criteria: be a licensed

practitioner, be a general dentist or dental hygienist who sees patients in a general practice setting, has participated in at least 1 DPBRN clinical study, has access to e–mail, is able to receive attachments via e–mail and is willing to communicate via e–mail on a regular basis and is able to participate in the regularly–scheduled meetings. One vote is also given to each of 3 non–practitioner–investigators (Network Chair, Principal Investigator of the Coordinating Center, NIDCR representative).

Both dentists and dental hygienists can be DPBRN practitioner–investigator members. To become a member of DPBRN, practitioners must complete a 101–item enrollment questionnaire. The Enrollment Questionnaire is publicly available at <http://www.DPBRN.org> under the [Enrollment/Join](#) tab. DPBRN has 20 approved studies as of June 2009. Stratified by phase, the titles of these studies are:

### Data collection completed

- Dental tobacco control randomized clinical trial
- Practice–based root canal treatment effectiveness
- Assessment of caries diagnosis and caries treatment
- CONDOR case–control study of osteonecrosis of the jaws
- Retrospective cohort study of osteonecrosis of the jaws
- Reasons for placing the first restoration on permanent tooth surfaces

### In data collection phase

- Reasons for replacement or repair of dental restorations
- Patient satisfaction with dental restorations
- Longitudinal study of dental restorations placed on previously un–restored surfaces
- Prevalence of questionable occlusal caries lesions
- Development of a patient–based provider intervention for early

caries management

- Blood sugar testing in dental practice

### Approved by the Protocol Review Committee, but not in data collection phase yet

- Longitudinal study of questionable occlusal caries lesions
- Longitudinal study of repaired or replaced dental restorations
- Hygienists' internet tobacco cessation randomized clinical trial
- Perioperative pain and root canal therapy
- Persistent pain and root canal therapy
- Assessing the impact of participation in practice-based research on clinical practice and patient care
- Incidence of post-operative infection after oral osseous surgery
- CONDOR Temporomandibular Joint Disease Study

Experiences in DPBRN demonstrate that dentists and dental hygienists from a broad array of practice settings and geographic regions will readily contribute research ideas and participate in practice-based studies. Benefits to participating in DPBRN have comprised a broad range (Table 1). As practitioner-investigators become knowledgeable of the benefits to their practices and patients, and see others being successful with their PBRN participation, they become motivated to engage in the excitement of discovery and the camaraderie from interacting with fellow practitioner-investigators.

PBRNs are based on the understanding that the experience, insight and practical wisdom of daily clinical practitioners and their patients are powerful means to advance the health of the population and address challenges encountered in daily clinical practice. The dental care sector can play an active role in these advancements, showing that knowledge transfer not only

Table 1. Benefits of participating in DPBRN as communicated by DPBRN practitioner-investigators

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| <ul style="list-style-type: none"><li>• Distinguishes the practice from other practices, acting as a practice promoter or practice builder</li><li>• Enhances communication with patients by showing that the practitioner-investigator cares about the scientific basis of daily clinical practice</li><li>• Provides a focus for clinical excellence by devoting increased short-term attention to 1 particular area of clinical practice at a time</li><li>• Projects can improve the quality of dental care by contributing to the scientific basis for the dental procedures that are their focus</li><li>• Receive Continuing Education credit for attendance at DPBRN annual meetings and participating in training and certification activities for specific DPBRN studies</li><li>• Practitioner-investigators decide what studies are done and what treatment is done – not third parties</li><li>• Receive financial remuneration for the time spent doing research</li></ul> | <ul style="list-style-type: none"><li>• Increases the practice's visibility and stature among dental patients</li><li>• Expands the vision for patient care by including a formalized research and quality improvement component</li><li>• Can improve the logistics of daily clinical operations, serve as a team builder for practice staff and engage the entire staff in the excitement of discovery and quality improvement</li><li>• Provides venues for collegial interactions and exchange of ideas with fellow practitioner-investigators – become part of a community of learning and camaraderie</li><li>• Allows practitioner-investigators to see what is effective in their practices in comparison to other practices – using results that are presented anonymously</li><li>• Potential to present at local, state, national and international dental meetings and research conferences</li><li>• Receive certificates suitable for framing and display in the office</li></ul> |
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happens in the research-to-practice direction, but also in the practice-to-research direction.

### Acknowledgments

This investigation was supported by NIH grants DE-16746 and DE-16747. An Internet site devoted to details about DPBRN is located at [www.DPBRN.org](http://www.DPBRN.org). Persons who comprise the DPBRN Collaborative Group are listed at <http://www.DPBRN.org/users/publications>. Opinions and assertions contained herein are those of the authors and are not to be construed as necessarily representing the views of the respective organizations or the National Institutes of Health.

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## **An Update from Northwest PRECEDENT (Practice- based REsearch Collaborative in Evidence-based DENTistry)**

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Northwest Practice-based REsearch Collaborative in Evidence-based DENTistry (PRECEDENT), 1 of 2 dental practice-based research networks (PBRNs) funded and established in 2005 by the National Institute of Dental and Craniofacial Research (NIDCR), draws member-dentists from Washington, Oregon, Idaho, Montana and Utah. Faculty and staff at the University of Washington and Oregon Health and Science University Schools of Dentistry have oversight and management responsibilities for the network, while data management is performed by Seattle Based Axio Research. Presently, there are 159 fully trained member-dentists in the 5-state region. The training required for active participation in network studies involves a 4 hour DVD course on principles of clinical research, an online course in the Responsible Conduct of Research for human subjects' protection and documentation of an understanding of HIPAA as it applies to research. Northwest PRECEDENT also includes a sub-network of 57 orthodontists and the "Friends of Northwest PRECEDENT," dentists outside of the network states who participate in surveys and are kept up-to-date on PRECEDENT activities.

The first study conducted in the network, Study 001, Oral Disease Markers Survey, achieved 2 prima-

ry aims. The first, to initiate dentists to the practice of research through a minimal risk study, introduced required staff training, random selection of patients, the patient consent process, data collection protocols, online data entry and quality control measures. Secondly, the study design gathered data about the disease patterns of patients attending the practices of Northwest PRECEDENT dentists. This provides valuable background information for planning future studies.

Beyond Study 001, ideas for study development are generated and/or evaluated by the member-dentists. The validity of caries risk assessment techniques emerged as a primary concern for network-dentists. Study 002, Salivary Markers in Caries Risk Assessment, examines the respective contributions of environmental data and salivary characteristics to caries risk by following a cohort of patients over 2 years. A future corollary to Study 002 will assess genetic markers for caries in collaboration with ongoing work at the University of Pittsburgh.

While the reliability of the salivary tests was being assessed prior to implementation, PRECEDENT rolled out Studies 003 and 004. Study 003, Case Control Study of Osteonecrosis of the Jaw, was a collaborative effort across the 3 PBRNs. Study 004, Computer Assisted Relaxation Learning, tests a desensitization protocol for needle phobias.

Study 005, Assessing the Outcomes of Cracked Teeth, will be launched this summer. Just as the cause, diagnosis and treatment of cracked teeth often presents a dilemma to the practitioner, the hypothesis and protocol development for this practice-based study presented challenges. The result is an observational study using a cracked tooth registry. A significant hurdle is to establish a method to calibrate participating dentists in assessment

of cracks when it is not feasible to bring all examiners together for training.

The first large randomized clinical trial developed in the PRECEDENT network, Study 006, Comparing Mineral Trioxide Aggregate (MTA) and Calcium Hydroxide as Direct Pulp Capping Agents, has been launched. Dentists are randomized to use of either MTA or Calcium Hydroxide for all pulp capped teeth in their practices with vitality assessed at 2 years. This study introduces PRECEDENT dentists to routine adverse event reporting and study monitoring by a Data and Safety Monitoring Board.

Linked studies 007 and 008 confront the challenge of dentin hypersensitivity. Study 007 surveys members and Friends of PRECEDENT regarding their assessment methods for dentin hypersensitivity and treatment preferences. The cross-sectional design of Study 008 will ascertain the prevalence of dentin hypersensitivity in network practices.

The extraction of third molars is not without risk. Study 009 recruits a cohort of 16 to 22 year olds who have never had a third molar extracted and follows them for 2 years. Data gathered includes dentists' assessment and rationale for recommendations regarding third molars, patients' compliance with those recommendations and outcomes for both compliant and non-compliant patients.

Study 010 surveys dentists from the PBRNs on the impact of their participation and the translation of evidence to clinical practice and patient care. One of the ultimate goals of the dental PBRN is to improve the translation of research findings to clinical practice. Historically, this translation from academia to medical and dental practice has spanned as much as 20 years.

The orthodontic sub-network's first study entails a survey regarding use of Temporary Anchorage

Devices (TADs) and gathers information on outcomes by those who use TADs.

Six studies have received concept approval by the members of PRECEDENT's executive committee and NIDCR. A faculty member at either Oregon Health and Science University or University of Washington takes the lead on research design and full protocol development. Once a study protocol has received approval from the network's Protocol Review Committee, the work of operationalizing the study begins with the development of study materials (manual of procedures, data collection forms, etc.) and training procedures for the offices.

Most studies are rolled out to practices in waves with a regional

coordinator making an initial training call. Three of the 4 regional coordinators are dental hygienists, as the background and experience of hygienists make them ideal coordinators. They assist office staff in completing all necessary training and calibration to initiate the study. An in-office visit follows with the enrollment of the first couple of patients to ascertain compliance with staff training, human subjects' protection and study procedures. Quality assurance measures continue with review of data entered online, regular office contact and random site visits at study completion for data verification. In some PRECEDENT practices, dental hygienists gather study data and/or function as in-office coordinators. Finally,

study results are presented at well-attended PRECEDENT annual meetings, research conferences and as manuscripts submitted to various journals.

The oversight and management by University of Washington and Oregon Health and Science University of this network involves a large and diverse team of faculty and staff researchers, including several hygienists. The work of developing and operationalizing studies is truly a collaborative effort, crossing disciplines, institutions and networks. It is, however, the enthusiasm of the member-dentists and their staff and their willingness to learn and implement disciplined research methodology that generates new evidence for the practice of dentistry.



## How Can Dental Hygiene Interface with Dental Practice–Based Research Networks?

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During Plenary Session II, we gained important insights about the history and status of Practice–Based Research Networks (PBRNs), including the Scottish Dental PBRN and the 3 National Institute of Dental and Craniofacial Research (NIDCR) funded PBRNs. I have the honor and privilege to serve as a member of the NIDCR PBRN Monitoring Committee (MC) representing the American Dental Hygienists' Association (ADHA). The MC is comprised of representatives from NIDCR, professional organizations, specific content experts and a public advocacy member. The MC meets twice annually to conduct a review of the progress of the PBRNs, and to provide feedback to PBRN program directors and to NIDCR. In addition to these responsibilities, I represent the interests of organized dental hygiene to NIDCR and report back to ADHA.

Established networks provide the infrastructure needed to conduct research that can strengthen clinical decision making and improve the delivery of patient care. Dental hygienist researchers have many opportunities to interface with existing PBRNs. When planning collaborative projects, the following 4 considerations should be taken into account:

1. Utilization and sustainability of

resources

2. Potential topics for study
3. Translation of study results
4. Establishing key relationships

As with any research grant, the funds will eventually run out, causing investigator focus to shift towards project sustainability. NIDCR has made a \$75 million dollar investment into this 7 year project, and now in its fifth fiscal year, both the funding agency and the networks must carefully evaluate plans for the future. There are many positive outcomes that have been achieved by this project, including well-established training and certification programs for clinician investigators, institutional review board (IRB) and other procedures for protocol review, liaisons with hundreds of private dental offices and community centers across wide geographic distances and diverse population groups and sophisticated bioinformatic systems to analyze data. At this time, no one dental hygiene organization has the same degree of financial, manpower, technical, statistical nor expert resources to recreate these same outcomes, nor should an attempt be made when these resources have already been successfully put into place. To maintain this level of progress, the networks should first seek collaborative relationships with other interested professional groups to maximize the utilization of limited resources for mutual gain, and seek additional opportunities for funding to sustain their existing programs.

Established networks could logically question what dental hygienist investigators will bring to future collaborations. First, dental hygienist investigators should obtain their own funding to conduct collaborative studies within the networks. Arguably, the majority of existing network studies is of greater interest to, and applies more directly to, the practice of dentistry, which is appropriate given the objectives of the grant. This is not to suggest that

the networks do not currently support studies relevant to dental hygiene interests, but it is unrealistic to expect them to obtain monies for all future projects. Dental hygienists need to seek funding opportunities from a variety of sources, including federal agencies. Second, the dental hygiene research community and can provide guidance and direction to clinicians interested in forming these collaborations, and offer additional training opportunities for grant writing and mentoring. Third, organizations will need to rethink their own priorities to help to underwrite related costs. New funding programs need to be created through our foundations and centers for research for targeted support of these objectives. Undoubtedly, obtaining funding will continue to be the greatest challenge.

Many established dental hygienist investigators can bring leadership, programmatic and statistical expertise to the networks as support. Clinician hygienists already demonstrate an eagerness to receive training as principle investigators, and are already working in practices and community centers enrolled in the networks. Many dental hygienists are working with unique populations in specialized care settings that would allow them to study clinical problems in smaller, often under-represented groups.

Research interests will invariably differ among investigators, and the network infrastructure provides an opportunity to conduct studies of broader interest. Network settings will allow us to:

- Learn about “best practices” for providing services and improving outcomes
- Examine clinician practice behavior
- Analyze outcomes based upon the sequence of care
- Identify effective methods for promoting behavioral change
- Develop patient registries that reflect demographic and dis-

ease descriptors by practice setting and SES

- Review dental, insurance and electronic records for disease patterns and trends
- Test and validate the utility of screening tools and devices

Network practices are not suitable for studying workforce issues such as supervision or regulatory issues that are politically-driven, nor under the current federal auspices should they be used for commercial product testing or development.

Dental hygiene professionals act as important advocates by translating the knowledge gained from practice-based research into our professional activities. We must remember that our clinicians do not always attend many of the scientific meetings where new study findings are presented. It is necessary to invite network representatives to our local

study clubs and to state, regional and national meetings to meet with clinicians. Dental hygienists who are already working within these networks should be encouraged to attend and participate in these events. We must inform and invite the networks to submit abstracts to scientific sessions at dental hygiene meetings, and use our meetings and professional publications for dissemination of findings.

Translating research into the hands of practitioners takes an enormous amount of work, and the Practice Impact Group of the NIDCR-funded project is identifying factors that may allow for faster implementation of study findings into practice. Interim results are often viewed cautiously, especially by our academic institutions, so it is important to include our faculty in discussions about progress within

networks. Eventually, findings from practice-based research will be included in our curriculum. Several of the network leaders have already developed courses and teaching materials for use in dental schools. Perhaps a relationship can be established with our dental hygiene faculty to develop similar materials and information exchange.

Even with sound, emerging evidence, clinicians do not always accept new findings, and there will be many opportunities to study the factors that limit or encourage changes in practice. Engaging clinicians in the conduct of studies that support change may be an effective strategy for enhancing the perceived value of adopting new behavior. Undoubtedly, clinicians are an important driving-force behind research that improves practice.