ABSTRACT. Pediatricians have an important role to play in the advancement of child health research and should be encouraged and supported to pursue research activities. Education and training in child health research should be part of every level of pediatric training. Continuing education and access to research advisors should be available to practitioners and academic faculty. Recommendations to promote additional research education and support at all levels of pediatric training, from pre-medical to continuing medical education, as well as suggestions for means to increase support and mentorship for research activities, are outlined in this statement.

INTRODUCTION

To promote the goal of the American Academy of Pediatrics (AAP) to advance the health and well-being of children and their families, it is necessary to enhance quality child health research in the 21st century. Pediatricians contribute significantly to child health research, and they should be supported to pursue research activities. Education in research methodology should be provided to all pediatricians-in-training, and continuing education and access to research advisors should be offered to practitioners and academic faculty. The AAP encourages efforts to identify and reduce barriers experienced by trainees, practitioners, and academic faculty pursuing research.

Approximately 10% of all graduates of pediatric residency programs pursue traditional research careers. Funding by the National Institutes of Health (NIH) to support research training in pediatrics, including individual fellowship grants, is at only 10% of the level of support provided for research training in internal medicine. This discrepancy challenges the ability of pediatric departments to continue to produce pediatric scientists capable of becoming NIH-funded independent investigators or investigators who are competitive for research support from other federal agencies (eg, Agency for Healthcare Research and Quality, Maternal and Child Health Bureau) and foundations. Furthermore, graduates of fellowship programs who have received research training are finding it difficult to secure the necessary resources to conduct meaningful research.

Protected research time is decreased as a result of an increasing demand for clinical service and administrative responsibilities. For example, a recent survey of developmental-behavioral pediatricians showed that, even for those who had completed fellowship training, on average, only 6% of their time was spent on research activities; most of their time was spent on direct patient care.

Most pediatricians choose careers as practitioners, clinician educators, or both. Research training early in their careers will facilitate an understanding of research methodologies and an ability to critically evaluate scientific papers and the evidence base for current and future clinical practice. This is required to create an evaluative culture among pediatricians.

As Chambers observed, “Practicing evidence-based medicine without knowing how the evidence is assembled is as absurd as managing asthma without knowledge of respiratory physiology.”

In many situations, the evidence base for pediatric topics is quite limited. Given adequate training and support, practitioners can be valuable contributors to this evidence base through clinical research and can participate as part-time clinical investigators. The highly successful Pediatric Research in Office Settings (PROS) network is one example of how pediatricians in practice settings have been major contributors to the expanding evidence base of clinical pediatrics.

The need exists at all levels of pediatric training for education regarding the widest possible spectrum of child health research, including not only biomedical science but also epidemiology, public health, behavioral sciences, health services, prevention, quality measurement, and quality improvement. Advances in clinical medicine do not result solely from translation of advances in basic or biomedical sciences to patient care settings. The process is bidirectional, wherein knowledge gained in clinical settings also informs inquiry in the basic sciences. The recent reorganization of institutional review groups at the NIH to convene reviewers of the basic science and clinical research disciplines, as opposed to a system that promoted the review of basic science and clinical research proposals in distinct review groups, reflects the growing recognition that multidisciplinary collaboration improves the quality of all medical research. To ensure that this collaboration is productive, all pediatric clinicians and researchers will need an appreciation, and at least a limited understanding, of the full continuum of child health research.

The practice of clinical medicine and the conduct of medical research are multidisciplinary. Such a
multidisciplinary approach requires research training to provide exposure to multiple disciplines so that pediatric researchers can draw on the expertise of other professionals and contribute to ongoing research within other disciplines. Some pediatricians may benefit from seeking secondary degrees (PhD, MPH, etc) to enhance their own research capabilities.

The AAP encourages all groups involved in medical education to collaborate on the development of a curriculum in research methodology for pediatric trainees that introduces core skills of designing, conducting, and interpreting child health research. Different competencies will be required at different levels of training and practice. To be able to evaluate and use medical literature competently, all pediatricians will require a basic knowledge of scientific methods, research design fundamentals, and core statistical principles and a familiarity with related terminology. Experience in conducting literature reviews, including Internet-based searches, and awareness of options for continuing medical education related to research are necessary to maintain these core competencies. For pediatricians planning to continue research activities beyond residency, additional training and experience will be required in designing research, collecting and coding data, conducting and interpreting data analyses, and communicating results and conclusions effectively through oral, written, and electronic means.

The research knowledge and skills of practitioners and academicians need to be enhanced through continuing medical education. Effective advisors must be readily available for pediatric residents, fellows, practitioners, and academicians to nurture the evolving research skills of pediatricians throughout their careers. Attention should be given to ensure that adequate access to research advisors is available for women, minorities, and other groups that are currently underrepresented in child health research.

It is a high priority to implement strategies to maximize incentives and minimize barriers to entering pediatric research careers, such as excessive debt, or to pursuing research within clinical settings, such as demands for increased clinical productivity.

RECOMMENDATIONS

Research Training Before Medical School

- Research training must begin early, ideally as a component of premedical course work. Toward this goal, health researchers, including child health researchers, should encourage high school and college students to become involved in research, thereby promoting an early interest in, appreciation of, and commitment to health research. They are encouraged to use funding mechanisms provided by NIH and other funders to support such efforts.

Research Training in Medical School

- Medical schools should consider recommending or requiring thesis projects for their students and should provide the protected time, necessary resources, and faculty advisors. Electives in research for credit (such as during the summer after the first and second year of medical school) or a year out for fellowship for medical students to permit completion of a research project are additional options that can be established to support early development of the skills needed to conduct quality research.

- Groups involved in medical education are urged to collaborate in the development of a research methodology curriculum that covers the core skills of designing, conducting, and interpreting health research that could be part of the preclinical curriculum. The curriculum should also include the ethical dimensions of research, including informed consent, protection of research subjects, conflict of interest, and patient privacy, which are relevant to a research curriculum for physicians at any level of training or practice. Federal training dollars could be leveraged to support innovation in curriculum for the integration of research education throughout the training and careers of physicians.

Research Training in Pediatric Residency Programs

- A research curriculum for pediatric residents, which can be integrated into a conference schedule, should be developed. The primary goal of this curriculum is to equip pediatric residents with the skills necessary to evaluate and use medical literature competently and should equip the resident with a basic knowledge of scientific methods, research design fundamentals, core statistical principles, and the means to conduct literature reviews.

- Pediatric residency programs should promote research electives in block rotations or as longitudinal protected time (such as 4–6 hours per week throughout the 3 years of residency) and encourage trainees to participate in a research project during their residency, as is currently required by approximately one quarter of pediatric residency programs in the United States. Protected time, necessary resources, and faculty advisors are critical components in developing a research career or becoming involved in clinical research as a pediatric practitioner and should be readily available at all levels of pediatric training.

- The Residency Review Committee and the American Board of Pediatrics should review requirements for accreditation and certification and ascertain if current requirements promote attainment of necessary research knowledge.

Research Training in Pediatric Fellowship Programs

- Fellowship programs should include advanced formal course work in research methodology that covers the widest possible spectrum of child health research. A research methodology curriculum for all fellowships in pediatrics should be developed that will outline the minimal core
knowledge and skills expected of all child health researchers across subspecialties and general pediatrics to facilitate collaboration and to improve the quality and practical relevance of research conducted.

• Programs should assign all fellows to work with experienced faculty research preceptors. As recommended by Kelch and Novello,9 programs should consider establishing a research advisory committee, similar to a doctoral thesis committee, to provide guidance to the trainee.

• To support mentorship, federal training grants should provide faculty salary support in addition to trainee stipends. Institutions applying for fellowship training support should describe their plans for mentorship activities. Federal agencies can develop means to offer, and perhaps even require, formal training for proposed research mentors as part of their agreement for funding fellowship programs.10

Research Training Within Continuing Medical Education

• For continuing education of practitioners and academic faculty, centers of excellence and professional organizations can establish training programs in which intensive, brief training in research methodology is provided.

• Opportunities for pediatric practitioners to participate in research activities should be expanded. Practice-based research networks, such as PROS,5 as well as research mentoring programs (such as the recently created AAP research mentorship program for primary care pediatricians) are already affording many practitioners this opportunity. Efforts like these should be further promoted and expanded to reach practitioners previously underrepresented in these activities, especially those who care for minority and underserved populations.

Loan Forgiveness and Research Support

• Programs should be developed that provide federal support for repayment of educational debt for physicians pursuing careers in child health research11,12 similar to those currently in place for physicians who practice clinical medicine in underserved communities or physicians who research acquired immunodeficiency syndrome, infertility, or contraception.

• Mechanisms should be developed for distribution of federal research funds to academic centers for start-up funding of child health research, especially for junior investigators.

• Secure and sustained resources need to be identified to cover costs of research education at all levels, including subsidizing faculty time, space, supplies, and equipment.

• Innovative means to promote financial support for child health research should be pursued. Because child health research is central to efforts to improve quality of medical care, mechanisms need to be explored by which managed care companies and health insurers could be encouraged to invest in health research generally, and particularly in child health research activities.

• Professional organizations providing oversight for training of pediatricians and major federal funders of child health research (eg, NIH, Health Resources and Services Administration, and Agency for Healthcare Research and Quality) should collect data to monitor the quality of pediatric research training, the number of pediatric researchers completing training and their productivity as researchers, and the level of support for child health research activities to ensure that there is ongoing progress in these areas. Training institutions and individual trainees should appreciate the importance of collaborating in these efforts.

REFERENCES


3. Ayresley-Green A. What’s to be done about the malaise in science

**ERRATUM**

An editing error occurred in a response to a letter to the editor that appeared in the April 2001 issue of *Pediatrics* entitled “Prenatal Treatment of Congenital Adrenal Hyperplasia: Author Differs With Technical Report.” On page 805, the last sentence of the reply by Frias et al reads:

The memory of the tragedies associated with prenatal use of dexamethasone and thalidomide demands no less.

That sentence should read:

The memory of the tragedies associated with prenatal use of DES (diethylstilbestrol) and thalidomide demands no less.
Promoting Education, Mentorship, and Support for Pediatric Research
Committee on Pediatric Research
Pediatrics 2001;107;1447
DOI: 10.1542/peds.107.6.1447

The online version of this article, along with updated information and services, is located on the World Wide Web at:
/content/107/6/1447.full.html