Many professionals work closely with physicians and nurses to provide healthcare that is safe, patient-centered, efficient, equitable, timely, and effective. These professionals represent many and varied allied health disciplines. Each allied health professional is ethically accountable for bringing a theoretically-sound and evidence-based approach to problem-solving in healthcare delivery. Although allied health research is in its infancy, the breadth and depth of its potential contributions to effective healthcare research and its interprofessional application may be under-recognized, particularly by funding agencies. The purpose of this paper is to define allied health, clarify its theoretical and scientific foundation, emphasize the breadth of its application to evidence-based practice, and document its relevance to, and suitability for, funding through national organizations. J Allied Health 2011; 40(3):161–166.

Definition of Allied Health

ALLIED HEALTH PROFESSIONS may be defined as those health professions that are distinct from medicine, dentistry, and nursing.1–3 All are integral to the safe, patient-centered, and effective provision of healthcare. The professions included in allied health vary from country to country; however, estimates suggest that as much as 60% of the healthcare workforce in the United States may be classified as allied health.4 This estimate likely overestimates the size of the allied health workforce, as it appears not to distinguish between licensed/certified allied health professionals and other unlicensed support personnel, but it does emphasize the large contribution that allied health professionals make to the healthcare workforce.

According to the Association of Schools of Allied Health Professions (ASAHP), allied health professionals are, among others, “involved with the delivery of health or related services pertaining to the identification, evaluation and prevention of diseases and disorders; dietary and nutrition services; and rehabilitation and health systems management.”5 In the United States Code of Federal Regulations (CFR, Title 42: Public Health), allied health is defined by exclusion. Specifically, Chapter 6A of Title 42, Subchapter V, Part F, Sec. 295p states that the term “allied health professional” relates to a professional who is not a physician, registered nurse, physician assistant or doctor of osteopathy, dentistry, veterinary medicine, optometry, podiatric medicine, chiropractic, clinical psychology, or pharmacy. The CFR also stipulates that persons with a graduate degree in public health or health administration or a degree in social work or counseling are important to healthcare but are not considered allied health professionals.3,5–7

The Patient Protection and Affordable Care Act (P.L. 111-148) that became law in March 2010 further defines allied health professionals as follows6,7:

The term “allied health professional” means an allied health professional as defined in section 799B(5) of the Public Health Service Act (42 U.S.C. 295p(5)) who—(A) has graduated and received an allied health professions degree or certificate from an institution of higher education; and (B) is employed with a Federal, State, local or tribal public health agency, or in a setting where patients might require health care services, including acute care facilities, ambulatory care facilities, personal residences, and other settings located in health professional shortage areas, medically underserved areas, or medically underserved populations, as recognized by the Secretary of Health and Human Services.

In addition, and consistent with the focus of this paper, allied health is included in eligibility criteria for participa-
tion in grant programs administered by the U.S. Department of Labor and the U.S. Public Health Service.

Important allied health organizations in the U.S. include the Association of Schools of Allied Health Professions (ASAHP),\(^5\) the Commission on Accreditation of Allied Health Education Programs (CAAHEP),\(^8\) the Health Professions Network (HPN),\(^9\) the National Network of Health Career Programs in Two-Year Colleges,\(^10\) and the National Society of Allied Health.\(^11\) These organizations advocate for the inclusion of non-nurse, non-physician, non-dentist professions in allied health such as therapists (respiratory, physical, occupational, and speech-language-swallowing), diagnostic personnel (medical laboratory scientists, imaging specialists, such as radiographers, nuclear medicine technologists, and sonographers), and general care providers, such as nutritionists and dietitians, physician assistants, and medical assistants. A number of less well-known healthcare professions also may be considered allied health.\(^12-14\) Table 1 lists many of the well-known and lesser-known allied health professions.

Practitioners in all areas work together and support each other in providing healthcare that addresses the components advocated by the Institute of Medicine—namely, that the service delivered is safe, patient-centered, timely, equitable, efficient, and effective.\(^2,15\) The effectiveness of the service provision presumes that it is theoretically-sound, based on peer-reviewed findings in published literature, and incorporates the perceptions and needs of each patient. These three components are the integral aspects of evidence-based practice,\(^16\) and allied health professionals have the same responsibilities to address these three components as do physicians, nurses, and other health care professionals.

### Need for Evidence-based Practice in the Allied Health Professions

Although the allied health professions are diverse, there is a pervasive movement to establish and promote evidence-based practice to support the quality, effectiveness, and efficiency of clinical practice across the professions.\(^17\) Histori-
cally, the allied health professions have been theoretically-based, attempting to translate the experiences of clinicians and the science of other fields (medicine, basic science, education) into practice without discipline-specific evaluation. Limitations existed. In large part, these limitations emanated from the immaturity of the professions, the preponderance of clinicians as opposed to researchers, and the relative lack of preparation of these clinicians to engage in research.

For many professions, entry into clinical practice occurred through associate degree or baccalaureate degree preparation. Academic faculty in these programs frequently had training at the master’s or advanced certificate level. This academic education was not sufficient to prepare them for arduous scholarly endeavors, nor did it establish for clinicians-in-training the importance of theoretically-driven and scientifically-grounded practice. However, within the last few decades, there has been a significant push to establish evidence-based practice guidelines within the fields to support licensure and scope-of-practice decisions and to achieve reimbursement for care provided. Further, educational preparation has been elevated in many professions from certification to baccalaureate degrees (e.g., Athletic Training, Dental Technician, Nursing, Physician Assistant) and then from baccalaureate preparation to advanced degrees (e.g., Master’s degrees in Occupational Therapy and Physician Assistant, and professional doctoral degrees in Audiology, Nursing Practice, Physical Therapy, and Speech-Language Pathology).

With the transitioning of educational preparation, there also has been an increased preparation of faculty across the professions and, thus, an expanded network of scholars prepared to establish the science of the fields. Additionally, the elevation of educational programming has included better preparation of graduates to be consumers of the scientific literature and contributors to research in clinical practice, including research design, data analysis, and critical thinking. In combination, these changes have resulted in emerging evidence within the fields to support and refine clinical practice. However, there is much more to do.

As an example, the American Physical Therapy Association recently published an extensive research agenda that included:

1. Basic research to evaluate genetic, anatomical, physiological, and environmental factors that impact disease, treatment, and recovery, and the ability of treatment to modify these factors;
2. Clinical research to develop and evaluate effective treatment methods, including timing, frequency, intensity, and dosage of optimal treatments and methods for predicting injury and recovery;
3. Educational research to determine the best methods of training clinicians and specialists for entry-level and advanced practice, life-long learning, and evidence-based practice;
4. Epidemiological research to determine the incidence of health conditions treated by physical therapists;
5. Health services research to evaluate the impact of treatment on health care costs and to determine the cost effectiveness of interventions;
6. Workforce research to identify issues, best practices, and need for changes in scope-of-practice; and
7. Measurement development and validation research to determine best measures for treatment effectiveness. This agenda could be translated to all allied health professions and is an effective illustration of the need to expand research activities and to enhance the funding base for research across the professions.

Breadth of Research

As noted, allied health professionals, working collaboratively with other primary healthcare providers, are essential components of the healthcare delivery system and represent many distinct scientifically- and theoretically-driven disciplines. As these allied health professions have matured and developed, their research agendas have broadened to reflect the numerous and diverse areas of expertise within the professions. Table 2 illustrates this point by listing the number of publications derived from a PubMed query (search conducted July 8, 2011, on pubmed.gov for the last 5 years) using allied health profession search terms. A similar query, conducted on the same date, found more than 80,000 publications for nursing alone. This difference may be artificially large, since queries such as these may fail to capture all publications in the respective professions listed because many allied health journals are not catalogued in PubMed. However, this comparison suggests that although there is a developing research presence from the allied health professions, there is a discrepancy in the amount of research published across these professions. This discrepancy illustrates the need for further research growth.

The majority of allied health research is relevant and applicable to clinical practice. In keeping with national trends, there also is a common thread of interdisciplinary collaboration among all allied health professions, regardless of the specific area of research. This interdisciplinary approach is particularly attractive at the present time given the emergence of the National Institutes of Health (NIH)-funded Clinical Translational Science Awards. There are currently more than 50 Clinical and Translational Science Centers that have received these awards. These Centers are either in the process of developing, or have already developed, an infrastructure and interdisciplinary research teams that will be able to conduct important clinical trials. Allied health professions are already involved in many of these centers and need to continue to play a key role in these ambitious endeavors. The following sections briefly describe several types of research relevant to allied health and in which allied health can play a pivotal role.

Bench to Bedside Research

Bench to bedside research, a possibly under-appreciated area of investigation, encourages the translation of scien-
Outcomes research aims to monitor and improve the quality of healthcare that people receive. Data are gathered to assess the impact of healthcare practices and interventions, including changes in one's ability to function independently, general health, and one's quality of life. These data assist in identifying and addressing barriers to optimal healthcare and are essential for both patients and allied health professionals to understand the benefits and risks of treatments in making informed decisions. Further, data from outcomes research facilitate the implementation of effective and appropriate public policy. Outcomes research is an integral aspect of comparative studies to document the effectiveness of various interventions.

Comparative Effectiveness Research

Comparative effectiveness research (CER) has been eloquently defined as: "the generation and synthesis of evidence that compares the benefits and harms of alternative methods to prevent, diagnose, treat, and monitor a clinical condition or to improve the delivery of care. The purpose of CER is to assist consumers, clinicians, purchasers, and policy makers to make informed decisions that will improve health care at both the individual and population levels." Allied health professionals need to be critically involved with this type of research to improve clinical practice, particularly when there are several accepted approaches to prevent, diagnose, treat, or monitor a given condition, and to develop practice guidelines. Moreover, CER can be used to demonstrate the added value of an allied health intervention to standard medical care, such as exercise training in patients with heart failure. Thus, CER is essential in supporting the initial clinical implementation of allied health professions and refining practice patterns once a clinical presence has been established.

Across this research continuum, allied health professionals are contributing to the scientific literature despite few funding programs targeted to them. The continuation of high quality research necessitates appropriate and sustained levels of funding.

Needs for Funding

All of the allied health professions build and maintain bodies of knowledge that can be inclusive and yet support unique, discipline-specific practices. Scholars within and outside the allied health professions also contribute to these knowledge bases. Such contributions from scholars outside the allied health professions are valuable and needed. However, reliance on others to build a profession's knowledge base erodes the responsibility of the profession to build and maintain its own body of knowledge.

The research requirements of allied health generally fall into the following categories: basic science research, clini-
doctoral fellowships, which are limited nationally in most allied health professions, and funded career awards to fully prepare scholars for competitive grantmanship. In addition, funding opportunities directed specifically at allied health professions are critical to the continued development of evidence-based practice, optimal training methods, and program evaluation to ensure safe and effective healthcare for the future.

REFERENCES


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