

Figure 1.1 The dynamic relationship among theory, research, and practice.

profession must enable its members to offer highquality services that will benefit clients. Thus, when health-care professionals provide services to clients, the knowledge and skills they use should be "justified in terms of a systematic and shared body of professional knowledge" (Polgar & Thomas, 2000, p. 3). This knowledge includes the underlying theory that informs practice and the tools and procedures that are used in practice.

Research is the means by which the profession generates evidence to test and validate its theories and to examine and demonstrate the utility of its practice tools and procedures. Therefore, our profession has an ongoing obligation to support occupational therapy professionals who choose to undertake systematic and sustained research.

Research for Professional Recognition and Support

The occupational therapy profession depends on societal support. This support ranges from subsidizing educational programs that prepare occupational therapists to reimbursing occupational therapists for their services. Societal support for the health-care professions cannot be assumed; the individuals who make public policy and decide what health-care services are needed increasingly rely on scientific evidence to determine where limited public and private resources should be directed. As a result, research is increasingly necessary to ensure that resources will be available to support the profession. Christiansen (1983) notes, "It seems clear that as administrators and policymakers render decisions about how health care

providers are used and reimbursed, those disciplines with objective evidence of their effectiveness and efficiency will have a competitive advantage" (p. 197). He concludes that research is an economic imperative for the profession.

Without the development of a research base to refine and provide evidence about the value of its practice, occupational therapy simply will not survive, much less thrive, as a health profession (Christiansen, 1983; Christiansen & Lou, 2001; Cusick, 2001).

Evidence-Based Practice

The obligation of the profession to conduct research that refines and validates its knowledge base is paralleled by an obligation of individual therapists to engage in **evidence-based practice** (EBP) (Taylor, 2000). Evidence-based practice is an approach to practice that assumes the active application of current, methodologically sound research to inform practice decisions and treatment options in light of a client's preferences, expectations, and values (Sackett, 2002).

The process of evidence-based practice begins with a clinical situation that poses a unique question or challenge for the practitioner (Sackett, 2002). Using evidence-based practice, the practitioner engages in a highly deliberate, publicly transparent, and well-reasoned use of clinical research findings to inform decision-making about an individual client in an actual practice situation (Sackett, 2002). Those who approach clinical decision-making from an evidence-based perspective consider what clients value, prefer, and expect

CASE EXAMPLE

Dr. Kerstin Tham is an occupational therapist who specializes in the neurorehabilitation of individuals who have had a cerebrovascular accident (CVA), or stroke (Fig. 1.2). After working with a number of clients with many different kinds of impairments resulting from their CVAs, Kerstin observed that unilateral neglect was one of the most difficult and frustrating impairments to treat in occupational therapy.

Unilateral neglect is an impairment in which people no longer recognize half of their own bodies or perceive half of the world around them. As a consequence, people neglect these regions of the self and the world, for example, washing only one side of the body, eating only the food on one-half of a plate, and bumping into objects that they do not perceive to be present.

For answers, Dr. Tham turned to the existing evidence base, which consisted of a number of published journal articles citing research findings about various training approaches to treat people with unilateral neglect. The common finding, however, was that these approaches had *not* been shown to be very successful in improving the overall functioning of people with this problem.

Dr. Tham became convinced that the research describing unilateral neglect had one major flaw: It always examined how neglect appeared from the outside, that is, how it appeared to clinicians and researchers. The researchers never asked the individuals with CVA what it was like to experience the impairment. So, she decided to undertake research that would describe neglect **phenomenologically,** or from the point of view of the person who had it. Her goal was to provide insights into how to improve service provision to individuals with the impairment.

In a qualitative study in which she observed and interviewed four women over an extended period of time, Dr. Tham and her colleagues came to provide some startling insights into the nature of unilateral neglect (Tham, Borell, & Gustavsson, 2000). For example, they found that people with neglect felt that the neglected body parts were not their own or were not attached to their bodies. Their research described a natural course of discovery in which individuals with neglect came to understand that they had the impairment and were able to make sense of the strange and chaotic experiences of their bodies and the world.

In a subsequent investigation, Dr. Tham and a colleague went on to examine how the behavior of other people influenced the experiences and behaviors of a person with neglect (Tham & Kielhofner, 2003). She is continuing this line of research, which is providing a new approach to understanding and providing services to persons with unilateral neglect. Moreover, she and her doctoral students have expanded these ideas and are now examining the experience of persons with other types of perceptual and cognitive impairments following acquired brain injuries (Erikson, Karlsson, Söderström, & Tham, 2004; Lampinen & Tham, 2003).



Figure 1.2 Kerstin Tham, OT, PhD, is an occupational therapist and researcher.

from the health-care encounter, alongside their own ever-growing clinical experience, practical skill sets, and educational backgrounds (Sackett, 2002). Evidence may be used to shed light on:

- The anticipated course and outcome of a particular impairment, symptom, or diagnosis
- The relevance and accuracy of a selected assessment tool
- The nature, conduct, and expected outcome of a chosen intervention

Accordingly, whenever possible, practitioners should select intervention strategies and tools that have been empirically demonstrated to be effective (Eakin, 1997). This process requires practitioners to remain up to date with new developments in their practice areas. It also requires practitioners to develop the ability to conduct thoughtful and efficient literature reviews and possess knowledge about how to evaluate published research in terms of its quality and level of methodological rigor (Sackett, 2002).

The Canadian Association of Occupational Therapists' position statement on evidence-based occupational therapy is available online (Canadian Association of Occupational Therapists, Association of Canadian Occupational Therapy University Programs, Association of Canadian Occupational Therapy Regulatory Organizations, & the Presidents' Advisory Committee, 2009). It defines evidence-based occupational therapy as the client-centered enablement of occupation, based on client information and a critical review of relevant research, expert consensus, and experience.

Bennett and Bennett (2000) describe the process of how evidence-based practice informs clinical decision-making within occupational therapy. According to this approach, the clinical questions being considered must address the nature of specific clients and client groups, as well as their treatment contexts. This definition stresses that the relationship between clinician and patient is centrally important in clinical decision-making.

After a clinical question is defined, the next step in the process involves conducting a literature review. During this review, practitioners must be cognizant of the quality and standards by which the research has been conducted. Then, match the evidence to each feature of the client's context, including the client as an individual, the client's desired occupation, and the client's environment. Within this process, the client acts as an active and engaged partner with the practitioner.

In 2002, Dysart and Tomlin surveyed 209 practicing occupational therapists to determine the extent to which they access, use, and apply

clinically relevant research findings in practice (Dysart & Tomlin, 2002). Findings revealed that occupational therapy practitioners were using evidence in practice to a modest degree; more than one-half (57 percent) relied on one to five evidence-based treatment plans per year.

In sum, evidence-based practice requires an ongoing commitment from researchers to investigate problems and answer questions that emerge out of practice. Equally, it requires an enduring commitment from practitioners to access, evaluate, and use this research to inform their decision-making in everyday practice. It also requires the client's perspective and involvement (Bennett & Bennett, 2000). Evidence-based practitioners integrate their own expertise with the best available research evidence. The next section briefly examines some of the ways in which research provides evidence for practice.

Clinical Expertise and Evidence-Based Practice: A Collaborative Approach

Evidence-based practice integrates individual clinical expertise with the best available external clinical evidence from systematic research (Sackett, Rosenberg, Grey, Haynes, & Richardson, 1996). Clinical expertise refers to the proficiency and judgment that individual practitioners acquire through experience. Best available external clinical evidence refers to findings from highest available quality, clinically applied, research studies within the field's scientific literature.

It is clear from this definition that evidence-based practice relies on practitioners' clinical expertise when applying research evidence to practice. Sackett et al. (1996) state that neither clinical expertise nor the best available external evidence alone are enough for evidence-based practice; external clinical evidence can inform but can never replace individual clinical expertise. Clinical expertise is what determines whether the external evidence applies to the individual patient (i.e., whether and how it matches the client's clinical state, predicaments, and preferences).

Sackett, Straus, Richardson, Rosenberg, and Haynes (2000) later described evidence-based practice as the integration of best research evidence with clinical expertise and patient values. With this updated definition, the patient's values are acknowledged as an equally important and necessary ingredient in the practice of EBP as research evidence and clinical expertise (Fig. 1.3).

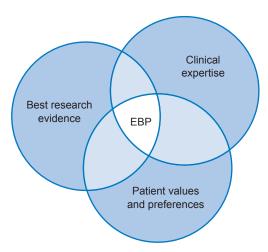


Figure 1.3 Evidence-based practice is the integration of best research practice, clinical expertise, and patient values and preferences.

The Role of Evidence-Based Practice in Occupational Therapy

Evidence-based practice evolved from the principles of evidence-based medicine (EBM), a concept that originated in the 1980s at McMaster University in Canada (Taylor, 1997). EBP emerged within health care and health education in the 1990s. It is now widely known that research evidence must be used as a primary foundation for informing occupational therapy practice (Stronge & Cahill, 2012).

Since the introduction of EBP in occupational therapy, there continues to be discussion about its implementation. There is an increasing recognition that the implementation of evidence-based practice is a complex process that may need to be adapted to ensure its applicability to occupational therapy. To implement EBP in occupational therapy, the synthesis of the available evidence with clinical expertise and judgment, as well as knowledge of the values and preferences of the clients, is critical (Graham, Robertson, & Anderson, 2013; Pighills, Plummer, Harvey, & Pain, 2013; Stronge & Cahill, 2012). Authors have also argued that the direct adoption of EBM and its established prescriptive guidelines may not adequately reflect the philosophical beliefs and the highly contextualized and dynamic nature of occupational therapy (Graham et al., 2013; Pighills et al., 2013; Stronge & Cahill, 2012).

Evidence-based occupational therapy is an offshoot of evidence-based practice that recognizes the range of sources and scope of evidence available to occupational therapists (Zimolag, French, & Paterson, 2002), including:

- · Research evidence
- Information provided by the client for determining occupational priorities and capacities
- The knowledge that occupational therapists have gained from past experience

Based on those definitions, the essence of EBP may be summarized as follows:

- Evidence-based practice involves more than just the use of research evidence.
- Clinical expertise is as important to evidencebased practice as research evidence.
- Client input is vital to the decision-making process in evidence-based practice.
- Health-care decisions are also influenced by available resources.

For example, a client has had several acute episodes of low back pain that he states have led to decreased participation in work, play, and home activities. After assessment, it is clear that the client has low flexibility and endurance, and he reports high levels of pain. He has had several courses of physical therapy but continues to have problems. The client states that he would like to miss less work, improve his ability to play with his children, and improve his overall fitness level. The practitioner working with the client believes that a course of intensive work-related occupational therapy will benefit the client and provides him with the following information to help him make his decision: "Mr. Koifier, you have had chronic low back pain for 1 year now. Your physical therapy has helped some, but you continue to have trouble with home activities, and you feel that your overall fitness level is low. I would like to suggest a course of therapy in which you attend daily therapy lasting 4 hours a day. The therapy is designed to improve your flexibility, endurance, strength, and work ability. A recent study reported that this type of therapy was superior to a threetimes-a-week physical therapy program in decreasing sick days, improving flexibility and endurance, and assisting people to getting back to leisure and sports activities. For example, there was a 17 percent greater decrease in sick days for people who received this type of therapy, a 29 percent increase in endurance, and a 17 percent decrease in pain. In addition, one in five clients in this type of intervention report the improved ability to participate in sports and leisure activities."

This type of evidence-based statement provides the client with information that will help him to make a more informed decision as to whether the additional time and effort required to attend the more intensive program will be worth it.

How Research Supports Practice

Research supports practice in many different ways, including:

- Generating foundational knowledge used by therapists
- Proving the need for occupational therapy services
- Developing and testing the theories that underlie practice
- Generating findings about the process and outcomes of therapy

The following section examines each of these ways in which research supports and advances practice.

Generating Foundational Knowledge

Much of the background information that occupational therapists use on a daily basis stems from research. Often, a long history of investigation is behind what has become common knowledge. Knowledge of musculoskeletal anatomy, neuronal transmission, the milestones of child development, the nature of personality, and the etiology and prognoses of diseases has resulted from thousands of studies.

Over decades, investigators examined these phenomena, providing analyses that were subsequently verified or corrected by others. In time, this knowledge was accumulated and refined until it became part of the repository of knowledge that informs occupational therapy practice. This knowledge is ordinarily generated by individuals who are not occupational therapists; however, their research is important to occupational therapy practice.

Proving the Need for Occupational Therapy Services

Without clear identification of need, one can neither decide what services to provide nor accurately evaluate the value of any service. **Needs assessment research** determines what clients require to achieve some basic standard of health or to improve their situation (Witkin & Altschuld, 1995). It focuses on identifying gaps between clients' desires and their situations (Altschuld & Witkin, 2000).

Needs assessment is particularly important in identifying the nature and consequences of new types of disabilities and new circumstances that affect persons with disabilities, and in identifying problems not previously recognized or understood. For example, studies have indicated that HIV/ AIDS increasingly affects individuals from underserved minority populations and individuals with histories of mental illness, substance abuse, poverty, limited education, and limited work experience (Centers for Disease Control and Prevention [CDC], 2001; Karon, Fleming, Steketee, & De Cock, 2001; Kates, Sorian, Crowley, & Summers, 2002). Research has also shown that although newer drug therapies have lowered AIDS mortality, the chronic and disabling aspects of the disease and its numerous associated conditions continue to pose challenges for those affected (CDC, 2001). Many people with HIV/AIDS struggle to overcome personal, financial, and social challenges that affect their desire to live independently and return to the workforce (McReynolds & Garske, 2001). In addition to these general characteristics of the AIDS population, a needs assessment study demonstrated that individuals' perceptions of needs differed by race, ethnicity, and gender (Sankar & Luborsky, 2003).

Together, these studies indicated that individuals with HIV/AIDS would potentially benefit from an individualized intervention designed to help them achieve independent living and employment as they envisioned it. These studies provided a foundation on which to propose a study of that type of occupational therapy intervention (Paul-Ward, Braveman, Kielhofner, & Levin, 2005).

Developing and Testing Occupational Therapy Theory

Every profession makes use of theories that underlie and explain its practice. By definition, the explanations offered by a theory are always tentative. By testing these explanations, research allows theory to be corrected and refined so that it provides increasingly useful explanations for practice. Ideas about how research refines and tests theory have evolved over the centuries, but research remains the primary tool by which a theory can be improved.

Practice theory research explains problems that therapists address and justifies approaches to solving them that are used in therapy. Consequently, the testing and refinement of such theories through research contributes to advancing practice. Therapists should always judge and place their

confidence in the explanations provided by any theory in relation to the extent to which that theory has been tested and developed by research.

The motor control model provides one example of how research tests theory with implications for practice. Occupational therapy practice for individuals with central nervous system damage has been guided by the motor control model, which is a theory of how people control movement. Toward the end of the 20th century, this model, which previously saw the control of movement as being directed exclusively by the brain, began to change. A new conceptualization (Mathiewetz & Bass-Haugen, 1994, 2002) argued that movement is a result of the interaction of the human nervous system, the musculoskeletal system, and the environment. This theory emphasized the importance of the task being performed and the environment (e.g., the objects used) in influencing how a person moves. The implication of this theory was that the tasks chosen and the objects used in therapy would have an impact on recovery of coordinated movement.

Occupational therapists conducted research that illustrated clearly that the nature of the task being done and the environment do affect the quality of movement (Lin, Wu, & Trombly, 1998; Mathiowetz & Bass-Haugen, 1994; Wu, Trombly, & Lin, 1994). These and other studies (Ma & Trombly, 2002; Trombly & Ma, 2002) now provide evidence that tasks involving meaningful objects and goal-oriented activities positively influence performance and motor learning.

A wide range of research can be used to test and develop theory. In fact, no single study can ever test all aspects of a theory. The types of studies that are typically used to examine and develop theory include:

- Studies that aim to verify the accuracy of the concepts by asking whether there is evidence to support the way a concept describes and/or explains certain phenomena
- Studies that ask whether there are relationships between phenomena as specified by the theory
- Studies that compare different groups of participants on concepts that the theory offers to explain the differences between those groups
- Studies that examine the potential of the theory to predict what will happen

Over time, as the evidence accumulates from such studies, informed judgments can be made about the accuracy and completeness of a theory. Findings from such research typically lead to alterations in the theory that allow it to offer more accurate explanations. Because the theories used in occupa-

tional therapy typically seek to explain problems that therapists encounter in practice and how therapists attempt to solve those problems, these types of studies directly inform practice.

Providing Evidence About the Nature and Outcomes of Therapy

Many types of studies examine the various aspects of occupational therapy practice and its outcomes. These are typically studies that:

- Are undertaken to develop and test assessments used in practice
- Examine the clinical reasoning of therapists when they are making decisions about therapy
- Determine the outcomes that result from therapy
- Examine the process of therapy (i.e., asking what goes on in therapy)
- Use participatory methods to investigate and improve services in a specific context

Studies That Test Assessments Used in Therapy

A number of interrelated forms of inquiry are used to develop and test assessments used in the field; the aim of assessment research, sometimes referred to as psychometric research, is to ensure the dependability of those methods (Benson & Schell, 1997). Dependable assessments are reliable; that is, they yield consistent information in different circumstances, at different times, with different clients, and when different therapists administer them. A dependable information—gathering method must also be valid, providing the information it is intended to provide. Studies that examine whether an assessment is valid are typically those that:

- Ask experts whether the content of an assessment is coherent and representative of what is intended to be gathered
- Analyze the items that make up an assessment to determine whether they coalesce to capture the trait they aim to measure
- Ask whether the assessment correlates with measures of concepts that are expected to concur and whether it diverges from those with which no relationship is expected
- Determine whether they can differentiate between different groups of people

In addition to studies that examine the reliability and validity of assessments, there are studies that examine their clinical utility. Such studies may

ask therapists and/or clients whether they find the assessments informative and useful for identifying problems and making decisions about theory. The development of any assessment ordinarily involves a series of studies that contribute to the ongoing improvement of the assessment over time.

Studies of Clinical Reasoning

Occupational therapists work with clients to identify their problems and choose a course of action so clients may manage their problems and improve their functioning through engaging in occupations. Research that examines how occupational therapists identify problems and make treatment decisions is referred to as **clinical reasoning research** (Christiansen & Lou, 2001; Rogers, 1983; Schon, 1983). Investigations that examine clinical reasoning constitute an important area of research in occupational therapy.

One of the most influential studies of clinical reasoning, by Mattingly and Flemming (1994), identified different types of reasoning that characterized occupational therapy practice. Their research has served as a framework for understanding how occupational therapists make sense of and take action with reference to their clients' problems and challenges in therapy.

Outcomes Research

Outcomes research is concerned with the results of occupational therapy. Investigations that examine the outcomes of occupational therapy services include:

- Investigations of specific intervention strategies or techniques
- Studies of comprehensive occupational therapy programs
- Inquiries that examine the occupational therapy contribution to an interdisciplinary program of services (Kielhofner, Hammel, Helfrich, Finlayson, & Taylor, 2004)

The study of occupational therapy techniques and approaches helps refine the understanding of these discrete elements of practice. This type of research examines outcomes specific to an intended intervention. Such studies may also seek to determine the relative impact of different techniques or approaches, such as comparisons between individual versus group interventions.

Studies of comprehensive occupational therapy programs ask whether an entire package of services produces a desired outcome. Such studies typically examine the impact of services on such outcomes as independent living, employment, and enhanced school performance. A well-known example of this type of research is a study by Clark and colleagues (1997), which documented the positive outcomes of an occupational therapy program for well elderly individuals. Finally, studies that examine the effect of interdisciplinary services can also document the impact of the occupational therapy component of such services.

Inquiry Into the Processes of Therapy: Mechanisms of Change

It is important not only to understand whether interventions work but also *why* they work or do not work. This approach is often referred to as **process research** or **formative research**. This approach involves understanding the **mechanisms of change**, that is, the processes by which an intervention creates change in a client. Studies that examine the effect of interventions are increasingly focusing on identifying the underlying mechanisms of change (Gitlin et al., 2000). Often, an important prelude to designing intervention outcome studies is to examine what goes into therapy in order to improve upon services before they are more formally tested.

An example is a study by Helfrich and Kielhofner (1994) that examined how clients' occupational narratives influenced the meaning they assigned to occupational therapy. This study showed how the meanings of therapy intended by therapists were often not received by or in concert with clients' meanings. The study findings underscored the importance of therapists having knowledge of their clients' narratives and organizing therapy as a series of events that enter into those narratives. Such studies of the process of therapy provide important information about how therapy can be improved to better meet clients' needs.

Participatory Research

A new and rapidly growing approach to investigation is **participatory research**. This approach involves researchers, therapists, and clients doing research together to develop and test occupational therapy services. Participatory research reverses the traditional role in which the occupational therapist decides on what research questions to answer and what procedures to use. Instead, it relies on the client to drive, or heavily influence, these decisions. Participatory research embraces the idea of partnership in which all the constituents work together and share power and responsibility to investigate, improve, and determine the outcomes of service. It also involves innovation in which

new services are created to respond to problems that are mutually identified by researchers, therapists, and clients.

This type of research is especially useful for contributing knowledge that practitioners can readily use and that consumers will find relevant to their needs. An example of this kind of study involved developing and evaluating a consumer-driven self-management program for individuals with fatigue and other impairments associated with chronic fatigue syndrome. This program provided clients an opportunity to learn self-advocacy skills, energy conservation, and other ways to improve their quality of life, functional capacity, coping skills, and resource acquisition (Taylor, 2004).

Summary

This chapter introduces the necessity of research for the occupational therapy profession and emphasizes that research gives clients and the public reason to have confidence in occupational therapy services and outcomes. Research also provides the rationale for administrators and policymakers to support occupational therapy services.

The chapter also examines the evolution of evidence-based practice and its applications in occupational therapy. Additionally, this chapter covers the types of research most often conducted by occupational therapists, ranging from needs assessment to theory development, to psychometric research, to clinical outcomes studies and participatory research. Each of the key elements of the profession (research, theory, and practice) influences the others. Theory and research evidence guide practice. Practice raises problems and questions to be addressed in theory and research. Research tests theory and practice, providing information about their validity and utility, respectively.

Other chapters in this text explain the nature, scope, design, methods, and processes of research and illustrate the wide range of tools that researchers use for their inquiries. Throughout the text, as you encounter multiple discussions of how research is performed, it is important not to lose sight of *why* it is done. Remember Yerxa's (1987) observation that "Research is essential to achieving our aspirations for our patients and our hopes and dreams for our profession" (p. 415).

Review Questions

 Describe three approaches to occupational therapy practice that have been informed by research. Provide specific examples.

- 2. What are some likely consequences if research is not conducted or used to enhance occupational therapy practice?
- 3. How did evidence-based practice originate? What is the difference between evidence-based medicine and evidence-based practice in occupational therapy?
- Compare and contrast participatory research and outcomes research in occupational therapy, describing the utility of each in context.
- 5. How does needs assessment research differ from practice theory research? Describe two different practice situations in which each of these approaches would be appropriate, and explain why they would be appropriate.

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