

**PART**

**I**

# **PRINCIPLES OF EVIDENCE- BASED PHYSICAL THERAPIST PRACTICE**

## **CHAPTER 1**

**Evidence-Based Physical  
Therapist Practice**

## **CHAPTER 2**

**What Is Evidence?**

## **CHAPTER 3**

**The Quest for Evidence: Getting Started**



# EVIDENCE-BASED PHYSICAL THERAPIST PRACTICE

## OBJECTIVES

Upon completion of this chapter, the student/practitioner will be able to do the following:

1. Discuss the circumstances that have resulted in an emphasis on the use of evidence in practice.
2. Distinguish among definitions of evidence-based medicine, evidence-based practice, and evidence-based physical therapist (EBPT) practice.
3. Discuss the use of evidence in physical therapist decision making in the context of the American Physical Therapy Association's *Guide to Physical Therapist Practice 3.0*.<sup>1</sup>
4. Describe focus areas of EBPT practice.
5. Describe the general steps involved in EBPT practice.
6. Discuss the barriers to EBPT practice and possible strategies for reducing them.

## TERMS IN THIS CHAPTER

**Activity limitations (ICF model):** "Difficulties an individual may have in executing activities."<sup>2</sup>

**Biologic plausibility:** The reasonable expectation that the human body could behave in the manner predicted.

**Clinical expertise:** Proficiency of clinical skills and abilities, informed by continually expanding knowledge, that individual clinicians develop through experience, learning, and reflection about their practice.<sup>3,4</sup>

**Diagnosis:** A process of "integrating and evaluating the data that are obtained during the examination to describe the individual condition in terms that will guide the physical therapist in determining the prognosis and developing a plan of care."<sup>1</sup>

**Evaluation:** The "process by which physical therapists

- interpret the individual's response to tests and measures;
- integrate the test and measure data with other information collected in the history;
- determine a diagnosis or diagnoses amenable to physical therapist management;
- determine a prognosis, including goals for physical therapist management; and
- develop a plan of care."<sup>1</sup>

**Evidence:** “A broad definition of evidence is any empirical observation, whether systematically collected or not. Clinical research evidence refers to the systematic observation of clinical events. . . .”<sup>5</sup>

**Examination:** “Physical therapists conduct a history, perform a systems review, and use tests and measures in order to describe and/or quantify an individual’s need for services.”<sup>1</sup>

**Impairment (ICF model):** “Problems in body functions or structure such as a significant deviation or loss.”<sup>2</sup>

**Intervention:** “Physical therapists purposefully interact with the individual and, when appropriate, with other people involved in his or her care, using various” procedures or techniques “to produce changes in the condition.”<sup>1</sup>

**Outcome:** “The actual results of implementing the plan of care that indicate the impact on functioning;” may be measured by the physical therapist or determined by self-report from the patient or client.<sup>1</sup>

**Participation restrictions (ICF model):** “Problems an individual may experience in involvement in life situations.”<sup>2</sup>

**Patient-centered care:** Health care that “customizes treatment recommendations and decision making in response to patients’ preferences and beliefs. . . . This partnership also is characterized by informed, shared decision making, development of patient knowledge, skills needed for self-management of illness, and preventive behaviors.”<sup>6(p.3)</sup>

**Prevention:** “The avoidance, minimization, or delay of the onset of impairment, activity limitations, and/or participation restrictions.”<sup>1</sup>

**Prognosis:** “The determination of the predicted optimal level of improvement in function and the amount of time needed to reach that level and also may include a prediction of levels of improvement that may be reached at various intervals during the course of therapy.”<sup>1</sup>

## Introduction

Use of systematically developed *evidence* in clinical decision making is promoted extensively across health care professions and practice settings. Gordon Guyatt, MD, David L. Sackett, MD, and their respective colleagues published the original, definitive works that instruct physicians in the use of clinical research evidence in medical practice.<sup>5,7</sup> In addition, federal agencies, including the Agency for Healthcare Research and Quality and the Centers for Medicare and Medicaid Services, evaluate the strength of published evidence during the development of clinical guidelines and health care policies.<sup>8,9</sup> Professional associations such as the American Medical Association, the American Heart Association, and the American Occupational Therapy Association also have developed resources to help their members and consumers access evidence regarding a wide variety of diseases, treatments, and outcomes.<sup>10-12</sup>

The physical therapy profession also has expressed a commitment to the development and use of published evidence. The American Physical Therapy Association envisioned that by 2020 physical therapists would be autonomous practitioners who, among other things, used evidence in practice.<sup>13</sup> Numerous articles regarding the methods for, benefits of, and barriers to evidence-based practice have been published in the journal *Physical Therapy*.<sup>14-17</sup> For several years, the journal also included a recurring feature, “Evidence in Practice,” in which a patient case was described and the subsequent search for, evaluation, and application of evidence was illustrated.<sup>18</sup> The journal also added features

such as “The Bottom Line” and podcasts in 2006 and 2008, respectively, to facilitate the translation of evidence into practice. Finally, the American Physical Therapy Association has created PTNow, a web-based portal designed to facilitate efficient access to the latest evidence related to physical therapist practice.<sup>19</sup>

The historical ground swell of interest in the use of evidence in health care resulted from the convergence of multiple issues, including (1) extensive documentation of apparently unexplained practice variation in the management of a variety of conditions, (2) the continued increase in health care costs disproportionate to inflation, (3) publicity surrounding medical errors, (4) identification of potential or actual harm resulting from previously approved medications, and (5) trends in technology assessment and outcomes research.<sup>20-23</sup> In addition, the rapid evolution of Internet technology increased both the dissemination of and access to health care research.

Related issues stimulated the drive for EBPT practice, the most dramatic of which was the use of evidence by commercial and government payers as a basis for their coverage decisions. For example, the Centers for Medicare and Medicaid Services ruled that insufficient scientific evidence existed to support the use of transcutaneous electrical stimulation for chronic low back pain and stated that patients must be enrolled in a clinical trial as a condition of coverage for this modality under the Part B benefit.<sup>24</sup> In light of these important developments, physical therapists needed an understanding of what evidence-based practice is, how it works, and how it may improve their clinical practice.

## CLINICAL SCENARIO

### Meet Your Patient

Anne is a 41-year-old, right-handed, high school chemistry teacher, and married mother of two boys aged 9 and 11. She presents to your outpatient physical therapy clinic with a 4-week history of progressively increasing pain that extends from her right elbow to midway down her lateral forearm. She denies previous injury to this upper extremity but notes that she spent several hours shoveling heavy wet snow from her front walk prior to the onset of her symptoms. Her pain makes it difficult for her to use a keyboard and mouse, grasp and manipulate pens and utensils, and maintain a grip on a full coffee mug or glass beaker. She also has discontinued her upper extremity strength training regimen and switched from an elliptical aerobic device to a recumbent cycle ergometer due to her symptoms.

She states that ice packs temporarily relieve her pain. She sought physical therapy because her primary care physician recommended anti-inflammatory medication and an orthopedic surgeon recommended a corticosteroid injection. She does not want to take medication in any form. She is anxious to resolve this problem as it interferes with her work and daily exercise program. Anne also has many questions about her options and any research available to prove or disprove their usefulness in her case.

**How will you describe the role of evidence in your clinical decision making?**



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### Evidence-Based What?

The use of evidence in health care is referred to by a variety of labels with essentially similar meanings. *Evidence-based medicine*, a term relevant to physicians, is defined as “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating individual *clinical expertise* with the best available clinical evidence from systematic research.”<sup>3(p.71)</sup>

“Evidence-based practice” and “evidence-based health care” are labels that have been created to link the behavior described by evidence-based medicine to other health care professionals. Hicks provided this expanded definition: “care that ‘takes place when decisions that affect the care of patients are taken with due weight accorded to all valid, relevant information.’”<sup>25(p.8)</sup> In all cases, evidence does not replace clinical expertise; rather, evidence is used to inform more fully a decision-making process in which expertise provides one perspective to the clinical problem.

Regardless of the label, the implicit message is that the use of evidence in clinical decision making is a movement away from unquestioning reliance on knowledge gained from authority or tradition. Authority may be attributed to established experts in the field, as well as to revered teachers in professional training programs. Tradition may be thought of as practice habits expressed by the phrase “this is what I have always done for patients like this one.” Habits may be instilled by eminent authority figures, but they also may be based on local or regional practice norms reinforced by their use in payment formulas (“usual and customary”) and in legal proceedings (“local standard of care”). Practice habits also may be reinforced by errors in clinical reasoning related to various biases and the inadequacies of experience-based problem solving, such as those described in **Table 1-1**.<sup>26</sup>

**TABLE 1-1** Examples of Biases and Heuristic Failures in Clinical Reasoning

Type of Reasoning Error	Nature of the Problem	Clinical Management Consequences
Ascertainment Bias	Occurs when a clinician draws a conclusion based on previously held expectations of a particular outcome (e.g., a physical therapist determines that a woman is catastrophizing her back pain experience because she has expressed job dissatisfaction).	The physical therapist forgoes clinical examination procedures that would have identified joint restrictions in the woman’s lumbar spine.
Confirmation Bias	Occurs when a clinician selectively focuses on information that confirms a hypothesis (e.g., a physical therapist remembers only those people with adhesive capsulitis of the shoulder who improved following application of ultrasound and forgets those people who did not improve with the same technique).	The physical therapist applies ultrasound to all people with adhesive capsulitis of the shoulder regardless of their response to the modality.

**TABLE 1-1**      **Examples of Biases and Heuristic Failures in Clinical Reasoning (Continued)**

<b>Type of Reasoning Error</b>	<b>Nature of the Problem</b>	<b>Clinical Management Consequences</b>
Recency Effect	Occurs when a clinician believes that a particular patient presentation or response is a common phenomenon because it is easily remembered (e.g., a physical therapist believes that fibromyalgia is more common in men than in women because her last two patients with this diagnostic label were male).	The physical therapist classifies all men with generalized pain in the upper back as having fibromyalgia.
	OR	
	Occurs when a clinician believes that a particular patient presentation or response is an uncommon phenomenon because it is not easily remembered (e.g., a new graduate physical therapist does not remember how to differentiate among various sources of painful conditions that express themselves in dermatomal patterns).	The physical therapist mistakes pain due to herpes zoster for radicular pain due to vertebral joint restriction in a person with an idiopathic acute onset of symptoms.
Representativeness Exclusivity	Occurs when a clinician draws conclusions about patient presentation or response based only upon those people who return for scheduled treatment sessions (e.g., a physical therapist believes all people with Parkinson's disease benefit from a particular balance program based on experience with people who have completed an episode of treatment versus those who have not).	The physical therapist applies the balance program exactly the same way for all people with Parkinson's disease who are referred to him for management.
Value Bias	Occurs when the importance of an outcome in the eyes of the clinician distorts the likelihood of the outcome occurring (e.g., a physical therapist's concern about undiagnosed fractures in acute painful conditions outweighs the data about prevalence of fractures under specific situations).	The physical therapist forgoes application of validated clinical prediction rules and refers all people with acute painful conditions for radiographic testing.

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Knowledge derived from authority and tradition often reflects an initial understanding of clinical phenomena from which diagnostic and treatment approaches are developed based on *biologic plausibility* and anecdotal experience. As such, this form of knowledge will continue to have a role as new clinical problems are encountered that require new solutions. The fundamental weakness in a clinician's dependence on this type of knowledge, however, is the potential for selection of ineffective, or even harmful, tests, measures, or interventions as a result of the lack of inquiry into their "true" effects. These cognitive and heuristic failures can lead to incomplete or incorrect conclusions about what is wrong with an individual patient and what is the most effective means for treating the problem.

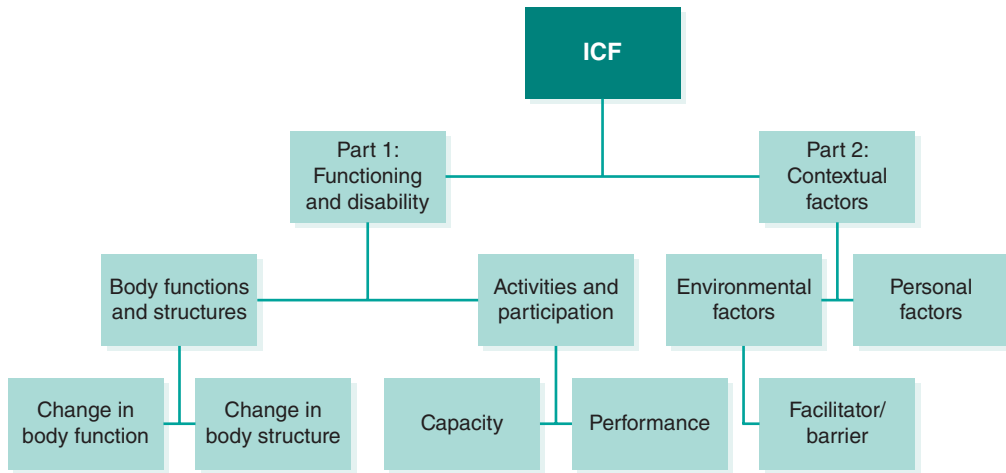
Straus et al. offer as an example the use of hormone replacement therapy in women without a uterus or those who are postmenopausal.<sup>27</sup> Women in these situations were observed to have an increased risk of heart disease that, from a biologic perspective, appeared connected to the loss of estrogen and progesterone. Replacing the lost hormones in an effort to reduce the risk of heart disease in these women made sense. The success of this treatment was confirmed further by observational studies and small randomized controlled trials.<sup>28</sup> However, the early termination in 2002 of a large hormone replacement therapy trial sponsored by the National Institutes of Health challenged the concept of protective effects from this intervention. The study's initial results indicated, among other things, that estrogen replacement did not protect postmenopausal women against cardiovascular disease as had been hypothesized. Moreover, long-term estrogen plus progesterone therapy increased a woman's risk for the development of heart attacks, strokes, blood clots, and breast cancer.<sup>22</sup> In effect, years of clinical behavior based on a biologically plausible theory supported by lower quality evidence were invalidated by a well-designed piece of evidence. This example is extreme, but it makes the point that health care providers should willingly and knowingly reevaluate the assumptions that underlie a practice that is based on authority and tradition supported by limited evidence.

## Evidence-Based Physical Therapist Practice

With that background in mind, this text has adopted the term *evidence-based physical therapist (EBPT) practice* to narrow the professional and clinical frame of reference. The definition of EBPT should be consistent with previously established concepts regarding the use of evidence, but it also should reflect the specific nature of physical therapist practice.

The American Physical Therapy Association's *Guide to Physical Therapist Practice 3.0* describes physical therapy as a profession informed by the World Health Organization's International Classification of Functioning, Disability, and Health (ICF).<sup>1,2</sup> This framework is an expansion of the biopsychosocial model of health that provides "a means not only to describe the states of illness and disability, but also to classify the components and magnitude of the level of health."<sup>1</sup> The model illustrated in **Figure 1-1** depicts the clinical aspects of a patient or client's situation, as well as the social context that shapes perceptions of health, wellness, illness, and disability for each individual. Within this framework, physical therapists examine, evaluate, diagnose, prognosticate, and intervene with individuals with identified *impairments, activity limitations, and participation restrictions*, as well as with persons with health, *prevention*, and wellness needs. These professional behaviors are summarized in the term "patient/client management." Finally, the management process incorporates the individual patient or client as a participant whose knowledge, understanding, goals, preferences, and appraisal of his or her situation are integral to the development and implementation of a physical therapist's plan of care.



**FIGURE 1-1** Structure of the ICF model of functioning and disability.**Structure of the International Classification of Functioning, Disability and Health (ICF) model of functioning and disability.<sup>5</sup>**

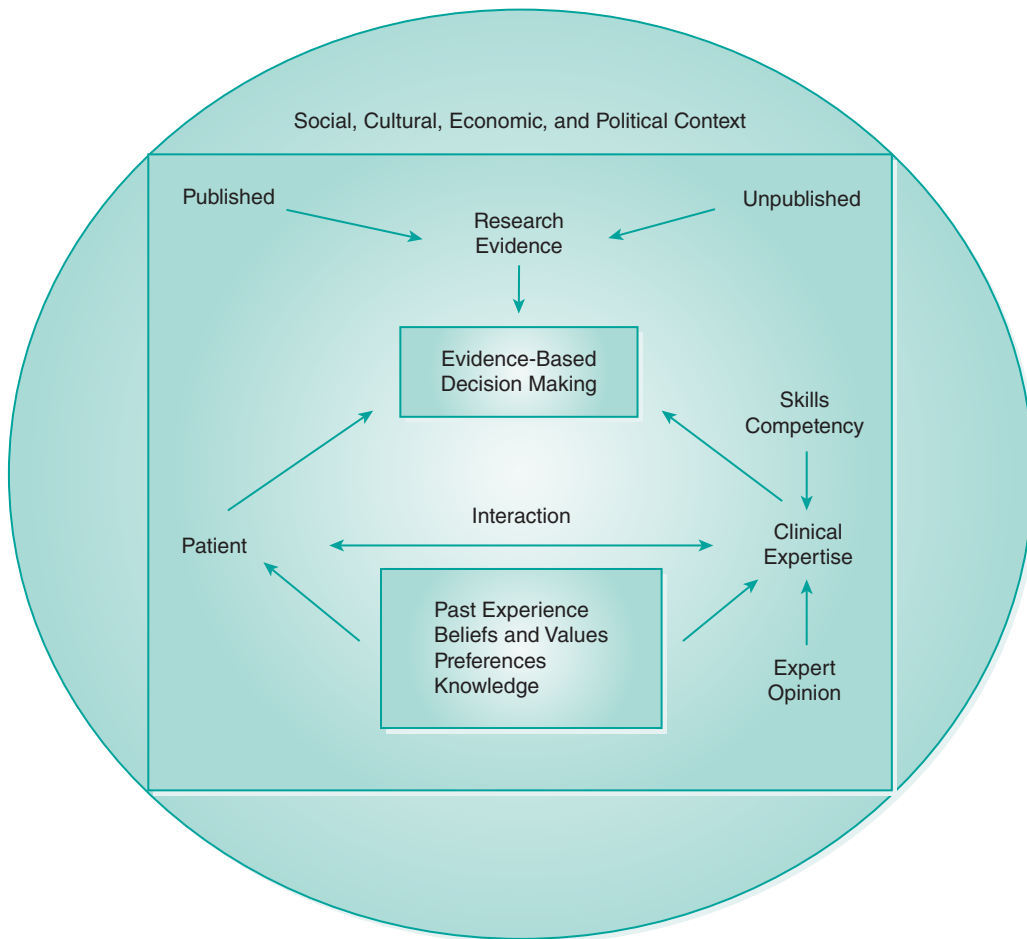
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A definition of EBPT practice that reflects the intent of evidence-based medicine as well as the nature of physical therapist practice is offered here:<sup>1,29</sup>

*Evidence-based physical therapist practice is “open and thoughtful clinical decision making” about physical therapist management of a patient or client that integrates the “best available evidence with clinical judgment” and the patient or client’s preferences and values, and that further considers the larger social context in which physical therapy services are provided, to optimize patient or client outcomes and quality of life.*

The term “open” implies a process in which the physical therapist is able to articulate in understandable terms the details of his or her recommendations, including (1) the steps taken to arrive at this conclusion, (2) the underlying rationale, and (3) the potential impact of taking and of refusing action. “Thoughtful clinical decision making” refers to the physical therapist’s appraisal of the risks and benefits of various options within a professional context that includes ethics, standards of care, and legal or regulatory considerations.<sup>30</sup> “Best available evidence” refers to timely, well-designed research studies relevant to the question a physical therapist has about a patient or client’s management. “Preferences and values” are the patient or client’s “unique preferences, concerns, and expectations”<sup>7</sup> against which each option should be weighed and which ultimately must be reflected in a collaborative decision-making process between the therapist and the patient or client. This point is consistent with the emphasis on *patient-centered care* as articulated by the Institute of Medicine.<sup>6</sup>

**FIGURE 1-2** Evidence-based physical therapist practice in a societal context.



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Finally, “larger social context” refers to the social, cultural, economic, and political influences that shape health policy, including rules governing the delivery of and payment for health care services.<sup>31</sup>

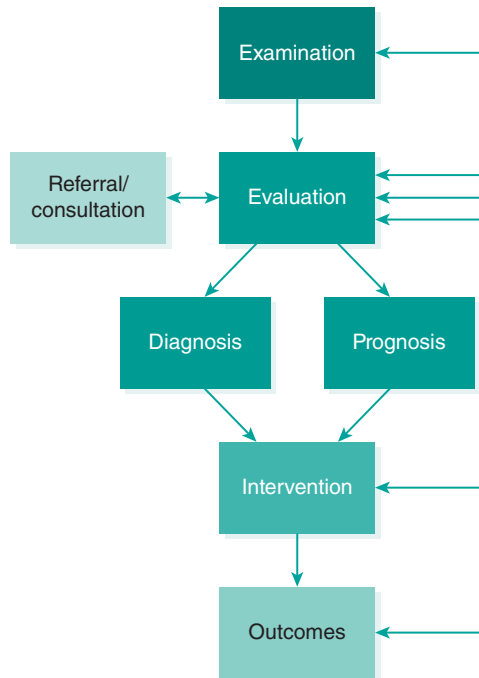
**Figure 1-2** provides an illustration of EBPT.

### **Evidence-Based Physical Therapist Practice Focus Areas**

A clinician interested in EBPT practice rightly might ask, “Evidence for what?” The process of patient/client management provides the answer to this question when one considers its individual elements

**FIGURE 1-3** The process of physical therapist patient/client management.

**The process of physical therapist patient and client management.**



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**(Figure 1-3).**<sup>1</sup> To conduct an *examination* and *evaluation*, physical therapists must choose, apply, and interpret findings from a wide variety of tests and measures, such as ligament stress techniques and quantifications of strength and range of motion. Similarly, accurate *diagnosis* of conditions resulting in pain depends on a properly constructed and tested classification scheme. Well-designed research may assist the physical therapist in selecting the best techniques to correctly identify, quantify, and classify an individual's problem, a result that will enhance the efficiency and effectiveness of service delivery.

*Prognosis* refers to a prediction of the future status of the patient or client that may reflect the natural course of a condition or result following physical therapy treatments or prevention activities. Predictive ability depends on the physical therapist's understanding of the phenomenon in question (i.e., accurate diagnosis), as well as the identification of indicators or risk factors that signal a particular direction. In all cases, the therapist must determine which of the numerous characteristics of the individual's physical, psychological, behavioral, and environmental situation will be most predictive of the outcome of interest. Evidence may identify the most salient factors that will produce the most accurate prediction.

The choice of *interventions* is the step in the patient or client management process that carries particular weight because of the dual responsibilities of the provider to “do good” (beneficence) and to “do no harm” (nonmaleficence). The stakes in this balancing act increase when the intervention in question has a risk of serious consequences, such as permanent disability or mortality. Most treatment options physical therapists implement are not “high risk” in this sense; however, the application of low-risk interventions that produce no positive effect does not meet the test of beneficence. A common clinical scenario is one in which a patient presents with a painful condition and the therapist must decide which manual techniques, exercise, or some combination of both, will be most effective for this individual. Relevant studies may assist the therapist and the patient in a risk–benefit analysis by providing information about effectiveness and harm.

The products of the patient or client management process are referred to as the *outcomes*, which should be distinguished from treatment effects.<sup>31</sup> The former focus on results that occurred at the conclusion of the episode of care from the individual’s point of view. For example, return-to-work represents a common outcome following outpatient orthopedic physical therapy management. In contrast, treatment effects represent the change, if any, in the underlying problems that prevented the individual from working. Outcomes usually are stated in functional terms such as “The patient will work 6 hours without pain.” Such statements reflect the individual’s goals for the physical therapy episode of care. Use of measures of standardized outcomes, however, permits an analysis of progress over the course of an episode for a single individual, as well as a comparison across patients or clients with similar issues. As with the selection of tests and measures used to quantify impairments and aid in diagnosis, a physical therapist must decide which instrument of standardized outcomes will provide the most discriminating information with respect to changes in impairment of body functions and structures, activity limitations, participation restrictions, or health-related quality of life. A review of available evidence may assist the therapist to determine what outcomes are possible and which measurement tool is able to detect change in a consistent and meaningful fashion.

Evidence also may inform a physical therapist’s understanding of patients’ or clients’ perspectives, beliefs, attitudes, or opinions as they experience health, disease, and/or disability and navigate health care services. The impact of these experiences on their relationships with others, their ability to engage in their environment, and their sense of self and relatedness to a larger community also may be relevant to physical therapists’ clinical decision making and anticipated outcomes. A review of studies that capture these experiences through the individual’s own words may facilitate the therapist’s effort to deliver patient-centered care (or “person-centered” services for clients).

### **The Process of Evidence-Based Physical Therapist Practice**

Evidence-based physical therapist practice as a process starts with a question in response to a patient or client’s problem or concern. A search for relevant studies to answer the question is then followed by a critical appraisal of their merits and conclusions, as well as a determination of their applicability to the individual. At the conclusion of the appraisal, the therapist will consider the evidence in the context of his or her clinical expertise and the individual’s values and preferences during an explicit discussion with that individual.<sup>4</sup> Finally, the therapist and that individual will collaborate to identify and implement the next steps in the management process.

Evidence-based physical therapist practice depends on a variety of factors. First, physical therapists require sufficient knowledge about their patient or client’s condition to recognize the unknown. In other words, physical therapists must be willing to suspend the assumption that they have complete information about an individual’s situation. In addition, they must have, or have access to, knowledge of the evidence appraisal process—that is, which features characterize stronger versus weaker study designs. Second, physical therapists need access to the evidence, a situation that has improved considerably with the advent of online databases and electronic publication of journals. Availability of these resources, however, does not ensure their efficient use, particularly when it comes to developing effective search

strategies. Third, physical therapists need the time to search for, appraise, and integrate the evidence into their practice. In busy clinical settings, time is a limited commodity that usually is dedicated to administrative tasks, such as documentation of services and discussions with referral sources and payers. Unless the entire clinic or department adopts the EBPT philosophy, it may be difficult for a single physical therapist to incorporate the behavior into his or her patient or client management routine.

Results from a survey conducted by Jette et al. in 2003 suggested that some of the requirements of EBPT practice are obstacles to its implementation.<sup>16</sup> Although most respondents ( $n = 488$ ) believed evidence was necessary for practice and improved quality of care, 67% of the subjects listed “lack of time” as one of the top three barriers to implementation of EBPT practice. Nearly all respondents (96%) indicated they had access to evidence; however, 65% reported performing searches for clinical studies less than twice in a typical month. In addition, notable proportions of the sample indicated lower confidence levels in their abilities to search effectively (34%), appraise the study designs (44%), and interpret results using terms such as “odds ratio” (47%) and “confidence interval” (37%). Finally, older therapists with more years since licensure were less likely to have the necessary training, familiarity with, and confidence in the skills necessary for effective EBPT practice.

Subsequent studies have suggested an overall improvement in physical therapists’ knowledge of and self-efficacy with evidence-based practice skills. However, changes in clinical decision making in response to available evidence continue to lag.<sup>32-34</sup> This disparity between EBPT knowledge and actual practice fuels the current interest in knowledge translation methods.<sup>34-38</sup> Jones et al. published a systematic review of the evidence regarding knowledge translation interventions in rehabilitation.<sup>35</sup> Thirteen of the articles included in the review were specific to physical therapist practice. All of these studies included some form of professional education regarding EBPT practice. Only two included audit and feedback mechanisms to study participants. Results were mixed, a finding Jones and colleagues attributed to the low methodological quality of most of the studies. Clearly, more work is needed to close the gap between the EBPT knowledge and skills acquired in professional physical therapist education and their application in clinical practice.

So, what can be done to reduce the barriers to effective EBPT practice? Perhaps most importantly, a philosophical shift is required to develop consistent behavior during a busy day of patient or client care. Physical therapists must value the contribution trustworthy evidence can make when integrated with clinical judgment and a patient or client’s values and preferences. Management support also is necessary in terms of EBPT education, access to evidence, time allotted in a therapist’s schedule, and ongoing feedback about the impact evidence has on patient or client outcomes. Use of services that locate, summarize, and appraise the evidence for easy review by practitioners may also help the time issue. However, physical therapists must determine whether the methodology used by these services is sufficiently stringent to provide an appropriate assessment of evidence quality. Databases dedicated to physical therapy evidence also may enhance the efficiency of the search process.

Ultimately, the ability to engage in EBPT practice consistently requires practice, just like any other skill. The process starts with the individual patient or client and the questions generated from the initial encounter, such as the following:

- Which tests will provide accurate classification of this person’s problem?
- What activity limitations can be anticipated if this problem is not addressed?
- What is the most effective intervention that can be offered for documented impairments in body functions and structure?
- How will we know if we have been successful?
- How can changes in this person’s quality of life that result from this episode of care be captured?
- Can the perspectives of other people who have similar issues or concerns inform my decision making for this individual?

A physical therapist's willingness to consider these questions *consciously* is the first step in EBPT practice. The word "consciously" is emphasized because it takes practice to develop the habit of openly challenging one's assumptions and current state of knowledge. Until this behavior becomes a routine part of one's practice, EBPT practice will be difficult to implement in a consistent and time-efficient manner.

### Summary

The use of systematically developed evidence in clinical decision making is promoted among many health professions in response to documented practice variation and increasing health care costs, as well as in response to a desire for improved quality of care. Evidence-based practice in any profession promotes less dependence on knowledge derived from authority or tradition through the use of evidence to evaluate previously unquestioned information. EBPT practice is open, thoughtful decision making about the physical therapist management of a patient or client that integrates the best available evidence, clinical expertise, and the patient or client's preferences and values, within the larger social context of the individual and the therapist. Well-designed research studies may inform decision making regarding measurement, diagnosis, prognosis, interventions, and outcomes, as well as the perspectives and experiences of individuals seeking physical therapist services. Requirements for EBPT practice include a willingness to challenge one's assumptions, the ability to develop relevant clinical questions about a patient or client, access to evidence, knowledge regarding evidence appraisal, and the time to make it all happen, as well as a willingness to acquire, practice, and evaluate the impact of the necessary skills described in this text.

### Exercises

1. Describe two factors that have prompted the emphasis on evidence-based practice in health care. How might evidence address these issues or concerns?
2. Discuss the strengths and weaknesses of clinical knowledge derived from the following:
  - a. Authority
  - b. Evidence
  - c. Tradition
3. Describe a specific example in current physical therapist practice of each type of knowledge listed in question #2.
4. Use Anne's case history and provide examples for each of the potential errors in clinical reasoning described in Table 1-1.
5. Discuss the potential contribution of evidence to each step of the patient or client management process. Provide clinical examples relevant to physical therapist practice to support your points.
6. Discuss the role of the patient or client in EBPT practice. Provide a clinical example relevant to physical therapist practice to support your points.
7. Think about your experiences in the clinical setting and complete the survey in **Figure 1-4** modified from Jette et al.<sup>16</sup> What do your answers tell you about your willingness and readiness to participate in EBPT practice?
8. Based on your results from the previous question, identify two changes you would need to make to enhance your ability to participate in EBPT practice. For each change, identify one strategy you could implement to move you in the right direction.

## FIGURE 1-4 Survey of beliefs and attitudes regarding evidence-based physical therapist practice.

**Appendix.**  
Evidence-Based Practice (EBP) Questionnaire

**This section of the questionnaire inquires about personal attitudes toward, use of, and perceived benefits and limitations of EBP.**

*For the following items, place a mark [X] in the appropriate box that indicates your response.*

- Application of EBP is necessary in the practice of physical therapy.  
 Strongly disagree     Disagree     Neutral     Agree     Strongly Agree
- Literature and research findings are useful in my day-to-day practice.  
 Strongly disagree     Disagree     Neutral     Agree     Strongly Agree
- I need to increase the use of evidence in my daily practice.  
 Strongly disagree     Disagree     Neutral     Agree     Strongly Agree
- The adoption of EBP places an unreasonable demand on physical therapists.  
 Strongly disagree     Disagree     Neutral     Agree     Strongly Agree
- I am interested in learning or improving the skills necessary to incorporate EBP into my practice.  
 Strongly disagree     Disagree     Neutral     Agree     Strongly Agree
- EBP improves the quality of patient care.  
 Strongly disagree     Disagree     Neutral     Agree     Strongly Agree
- EBP does not take into account the limitations of my clinical practice setting.  
 Strongly disagree     Disagree     Neutral     Agree     Strongly Agree
- My reimbursement rate will increase if I incorporate EBP into my practice.  
 Strongly disagree     Disagree     Neutral     Agree     Strongly Agree
- Strong evidence is lacking to support most of the interventions I use with my patients.  
 Strongly disagree     Disagree     Neutral     Agree     Strongly Agree
- EBP helps me make decisions about patient care.  
 Strongly disagree     Disagree     Neutral     Agree     Strongly Agree
- EBP does not take into account patient preferences.  
 Strongly disagree     Disagree     Neutral     Agree     Strongly Agree

*For the following items, place a mark [X] in the appropriate box that indicates your response for a typical month.*

- Read/review research/literature related to my clinical practice.  
 ≤ 1 article     2-5 articles     6-10 articles     11-15 articles     16+ articles
- Use professional literature and research findings in the process of clinical decision making.  
 ≤ 1 time     2-5 times     6-10 times     11-15 times     16+ times
- Use MEDLINE or other databases to search for practice-relevant literature/research.  
 ≤ 1 time     2-5 times     6-10 times     11-15 times     16+ times

**The following section inquires about personal use and understanding of clinical practice guidelines.** Practice guidelines provide a description of standard specifications for care of patients with specific diseases and are developed through a formal, consensus-building process that incorporates the best scientific evidence of effectiveness and expert opinion available.

*For the following items, place a mark [X] in the appropriate box that indicates your response.*

- Practice guidelines are available for topics related to my practice.  
 Yes     No     Do Not Know
- I actively seek practice guidelines pertaining to areas of my practice.  
 Strongly disagree     Disagree     Neutral     Agree     Strongly Agree
- I use practice guidelines in my practice.  
 Strongly disagree     Disagree     Neutral     Agree     Strongly Agree
- I am aware that practice guidelines are available online.  
 Yes     No
- I am able to access practice guidelines online.  
 Yes     No
- I am able to incorporate patient preferences with practice guidelines.  
 Strongly disagree     Disagree     Neutral     Agree     Strongly Agree

**The following section inquires about availability of resources to access information and personal skills in using those resources.**

*For the following items, place a mark [X] in the appropriate box that indicates your response. In items referring to your "facility," consider the practice setting in which you do the majority of your clinical care.*

- I have access to current research through professional journals in their paper form.  
 Yes     No
- I have the ability to access relevant databases and the Internet at my facility.  
 Yes     No     Do Not Know

*(continues)*

**FIGURE 1-4** Survey of beliefs and attitudes regarding evidence-based physical therapist practice. (Continued)

23. I have the ability to access relevant databases and the Internet at home or locations other than my facility.  
 Yes       No       Do Not Know       Agree       Strongly Agree

24. My facility supports the use of current research in practice.  
 Strongly disagree       Disagree       Neutral       Agree       Strongly Agree

25. I learned the foundations for EBP as part of my academic preparation.  
 Strongly disagree       Disagree       Neutral       Agree       Strongly Agree

26. I have received formal training in search strategies for finding research relevant to my practice.  
 Strongly disagree       Disagree       Neutral       Agree       Strongly Agree

27. I am familiar with the medical search engines (e.g., MEDLINE, CINAHL).  
 Strongly disagree       Disagree       Neutral       Agree       Strongly Agree

28. I received formal training in critical appraisal of research literature as part of my academic preparation.  
 Strongly disagree       Disagree       Neutral       Agree       Strongly Agree

29. I am confident in my ability to critically review professional literature.  
 Strongly disagree       Disagree       Neutral       Agree       Strongly Agree

30. I am confident in my ability to find relevant research to answer my clinical questions.  
 Strongly disagree       Disagree       Neutral       Agree       Strongly Agree

*For the following item, place a mark [x] in one box in the row for each term.*

31. My understanding of the following terms is:

Term	Understand Completely	Understand Somewhat	Do Not Understand
a) Relative risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Absolute risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Systematic review	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Odds ratio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Meta-analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Confidence interval	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Heterogeneity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Publication bias	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*For the following items, rank your top 3 choices by placing number in the appropriate boxes (1 = most important).*

32. Rank your 3 greatest barriers to the use of EBP in your clinical practice.

- Insufficient time
- Lack of information resources
- Lack of research skills
- Poor ability to critically appraise the literature
- Lack of generalizability of the literature findings to my patient population
- Inability to apply research findings to individual patients with unique characteristics
- Lack of understanding of statistical analysis
- Lack of collective support among my colleagues in my facility
- Lack of interest

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# References

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1. American Physical Therapy Association. *Guide to Physical Therapist Practice 3.0*. Available at: <http://guide.toptpractice.apta.org>. Accessed July 16, 2016.
2. World Health Organization. *Towards a Common Language of Functioning, Disability and Health. ICF*. Geneva, Switzerland: World Health Organization; 2002. Available at: <http://www.who.int/classifications/icf/icfbeginnersguide.pdf>. Accessed July 16, 2016.
3. Sackett DL, Rosenberg WM, Gray JA, Haynes RB, Richardson WS. Evidence-based medicine: what it is and what it isn't. *BMJ*. 1996;312(7023):71–72.
4. Higgs J, Jones M, Loftus S, Christensen N, eds. *Clinical Reasoning in the Health Professions*. 3rd ed. Oxford, England: Butterworth-Heinemann; 2008.
5. Guyatt G, Rennie D. *Users' Guides to the Medical Literature: A Manual for Evidence-Based Clinical Practice*. 3rd ed. Chicago, IL: AMA Press; 2014.
6. Greiner AC, Knebel E, eds. *Health Professions Education: A Bridge to Quality*. Institute of Medicine Website. Available at: <https://www.nap.edu/read/10681/chapter/1>. Accessed July 16, 2016.
7. Sackett DL, Straus SE, Richardson WS, et al. *Evidence-Based Medicine: How to Practice and Teach EBM*. 2nd ed. Edinburgh, Scotland: Churchill Livingstone; 2000.
8. EPC Evidence-based Reports. Agency for Healthcare Research and Quality Website. Available at: <http://www.ahrq.gov/research/findings/evidence-based-reports/index.html>. Accessed July 16, 2016.
9. Medicare Evidence Development and Coverage Advisory Committee. Centers for Medicare and Medicaid Services Website. Available at: [www.cms.gov/Regulations-and-Guidance/Guidance/FACA/MEDCAC.html](http://www.cms.gov/Regulations-and-Guidance/Guidance/FACA/MEDCAC.html). Accessed July 16, 2016.
10. JAMA evidence. American Medical Association Website. Available at: <http://jamaevidence.mhmedical.com>. Accessed July 16, 2016.
11. Process for Evidence Evaluation. American Heart Association Website. Available at: [http://cpr.heart.org/AHA/ECC/CPRandECC/ResuscitationScience/InternationalLiaisonCommitteeonResuscitation/ILCOR/UCM\\_476509\\_Process-for-Evidence-Evaluation.jsp](http://cpr.heart.org/AHA/ECC/CPRandECC/ResuscitationScience/InternationalLiaisonCommitteeonResuscitation/ILCOR/UCM_476509_Process-for-Evidence-Evaluation.jsp). Accessed July 16, 2016.
12. Evidence-based Practice & Research. American Occupational Therapy Association Website. Available at: <http://www.aota.org/Practice/Researchers.aspx>. Accessed July 16, 2016.
13. Vision 2020. American Physical Therapy Association Website. Available at: [www.apta.org/Vision2020/](http://www.apta.org/Vision2020/). Accessed July 16, 2016.
14. Schreiber J, Stern P, Marchetti G, Providence I. Strategies to promote evidence-based practice in pediatric physical therapy: a formative evaluation project. *Phys Ther*. 2009;89(9):918–933.
15. Stevans JM, Bise CG, McGee JC, et al. Evidence-based practice implementation: case report of the evolution of a quality improvement program in a multicenter physical therapy organization. *Phys Ther*. 2015;95(4):588–599.
16. Jette DU, Bacon K, Batty C, et al. Evidence-based practice: beliefs, attitudes, knowledge, and behaviors of physical therapists. *Phys Ther*. 2003;83(9):786–805.
17. Salbach NM, Jaglal SB, Korner-Bitensky N, et al. Practitioner and organizational barriers to evidence-based practice of physical therapists for people with stroke. *Phys Ther*. 2007;87(10):1284–1303.
18. Rothstein JM. Editors Notes. *Phys Ther*. 2002;82. Physical Therapy Journal Website. Available at: <http://ptjournal.apta.org/content/82/1/6.full>. Accessed July 16, 2016.
19. PTNow. American Physical Therapy Association Website. Available at: [www.ptnow.org/Default.aspx](http://www.ptnow.org/Default.aspx). Accessed July 16, 2016.
20. Eddy DM. Evidence-based medicine: a unified approach. *Health Affairs*. 2005;24(1):9–17.
21. Steinberg EP, Luce BR. Evidence based? Caveat emptor! *Health Affairs*. 2005;24(1):80–92.
22. Women's Health Initiative Participant Information. Women's Health Initiative Website. Available at: <https://www.nhlbi.nih.gov/whi/>. Accessed July 16, 2016.

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23. The National Academies of Sciences, Engineering, Medicine Website. Available at: <https://www.nationalacademies.org/hmd/>. Accessed July 16, 2016.
24. CMS Retains Clinical Study Requirement in Final TENS Decision Memo. American Physical Therapy Association Website. Available at: [www.apta.org/PTinMotion/NewsNow/2012/6/12/FinalTENSMemo/](http://www.apta.org/PTinMotion/NewsNow/2012/6/12/FinalTENSMemo/). Accessed July 16, 2016.
25. Hicks N. Evidence-based healthcare. *Bandolier*. 1997;4(39):8.
26. Croskerry P. Achieving quality in clinical decision making: cognitive strategies and detection of bias. *Acad Emerg Med*. 2002;9(11):1184–1204.
27. Straus SE, Richardson WS, Glaziou P, Haynes RB. *Evidence-Based Medicine: How to Practice and Teach EBM*. 3rd ed. Edinburgh, Scotland: Elsevier Churchill Livingstone; 2005.
28. Mobasser S, Liebson PR, Klein LW. Hormone therapy and selective receptor modulators for prevention of coronary heart disease in postmenopausal women: estrogen replacement from the cardiologist's perspective. *Cardiol Rev*. 2004;12(6):287–298.
29. American Physical Therapy Association. *Normative Model of Physical Therapist Education: Version 2004*. Alexandria, VA; 2004.
30. Guyatt GH, Haynes RB, Jaeschke RZ, et al. Users' Guides to the Medical Literature: XXV. Evidence-based medicine: principles for applying the Users' Guides to patient care. Evidence-Based Medicine Working Group. *JAMA*. 2000;284(10):1290–1296.
31. Herbert R, Jamtvedt G, Hagen KB, Mead J. *Practical Evidence-Based Physiotherapy*. 2nd ed. Edinburgh, Scotland: Elsevier Butterworth-Heinemann; 2011.
32. Manns PJ, Norton AV, Darrah J. Cross-sectional study to examine evidence-based practice skills and behaviors of physical therapy graduates: is there a knowledge-to-practice gap? *Phys Ther*. 2015;95(4):568–578.
33. Olsen NR, Bradley P, Lomborg K, Nortvedt NW. Evidence-based practice in clinical physiotherapy education: a qualitative interpretive discussion. *BMC Med Educ*. 2013;13:52.
34. Tilson JK, Mickan S, Howard R et al. Promoting physical therapists' use of research evidence to inform clinical practice: part 3 – long term feasibility assessment of the PEAK program. *BMC Med Educ*. 2016;16(1):144.
35. Jones CA, Roop SC, Pohar SL, Albrecht L, Scott SD. Translating knowledge in rehabilitation: a systematic review. *Phys Ther*. 2015;95(4):663–677.
36. Deutsch JE, Romney W, Reynolds J, Manal TJ. Validity and usability of a professional association's web-based knowledge translation portal: American Physical Therapy Association's PTNow.org. *BMC Med Inform Decis Mak*. 2015;15:79.
37. Hudon A, Gervais M-J, Hunt M. The contribution of conceptual frameworks to knowledge translation interventions in physical therapy. *Phys Ther*. 2015;95(4):630–639.
38. Schreiber J, Marchetti GF, Racicot B, Kaminski E. The use of a knowledge translation program to increase the use of standardized outcome measures in an outpatient pediatric physical therapy clinic: administrative case report. *Phys Ther*. 2015;95(4):613–629.