PART

I

PRINCIPLES OF EVIDENCE-BASED PHYSICAL THERAPIST PRACTICE

CHAPTER 1

EVIDENCE-BASED PHYSICAL THERAPIST PRACTICE

OBJECTIVES

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

1. Discuss the circumstances that have resulted in an increased emphasis on the use of evidence in practice.
2. Distinguish among definitions of evidence-based medicine, evidence-based practice, and evidence-based physical therapy.
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*.[1]
4. Describe evidence-based physical therapy focus areas.
5. Describe the general steps involved in evidence-based physical therapist practice.
6. Discuss the barriers to evidence-based physical therapy and possible strategies for reducing them in clinical practice.

TERMS IN THIS CHAPTER

Activity limitations (ICF model): "Difficulties an individual may have in executing activities."[2]

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.[3,4]

Diagnosis: "A process that integrates and evaluates data" obtained during a patient/client examination, often resulting in a classification that guides prognosis, the plan of care, and subsequent interventions.[1(p.45),4]

Disability (Nagi model): "The inability or restricted ability to perform actions, tasks, and activities related to required self-care, home management, work (job/school/play), community, and leisure roles in the individual's sociocultural context and physical environment."[1(p.31)]

Evaluation: "A dynamic process in which the physical therapist makes clinical judgments based on data gathered during the examination."[1(p.43)]

Evidence: "Any empirical observation about the apparent relation between events constitutes potential evidence."[5(p.6)]

Examination: "A comprehensive screening and specific testing process leading to diagnostic classification or, as appropriate, referral to another practitioner."[1(p.42)]

Functional limitations (Nagi model): "Occur when impairments result in a restriction of the ability to perform a physical action, task or activity in an efficient, typically expected, or competent manner."[1(p.30)]

Impairment (ICF model): "Problems in body functions or structure such as a significant deviation or loss."[2]

Impairment (Nagi model): "Alterations in the anatomical, physiological, or psychological structures or functions that both (1) result from underlying changes in the normal state and (2) contribute to illness."[1(p.30)]

Intervention: The purposeful use of various physical therapy procedures and techniques, in collaboration with the patient/client and, when appropriate, other care providers, in order to effect a change in the patient/client's condition.[1]

Outcome: "The end result of patient/client management, which includes the impact of physical therapy interventions"; may be measured by the physical therapist or determined by self-report from the patient/client.[1(p.43)]

Participation restrictions (ICF model): "Problems an individual may experience in involvement in life situations."[2]

Pathology (Nagi model): A disease, disorder, or condition that is "primarily identified at the cellular level" and is "(1) characterized by a particular cluster of signs and symptoms and (2) recognized by either the patient/client or the practitioner as 'abnormal.'"[1(p.29)]

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."[6(p.3)]

Prevention: Activities that attempt to (1) prevent a "target condition in susceptible or potentially susceptible populations" (primary prevention); (2) decrease the "duration of illness, severity of disease, and sequelae through early diagnosis and intervention" (secondary prevention); and (3) limit "the degree of disability and promote rehabilitation and restoration of function in patients with chronic and irreversible diseases" (tertiary prevention).[1(p.41)]

Prognosis: Prediction of the natural course of a condition or its development based on previously identified risk factors; also, "the predicted optimal level of improvement through intervention and the amount of time required to achieve that level."[1(p.46)]

Introduction

Use of *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 have published the definitive works that instruct physicians in the use of evidence in medical practice.[5,7] 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 health care policies and clinical guidelines.[8,9] Professional associations such as the American Medical Association, the American Heart Association, and the American Occupational Therapy Association have developed resources to help their members and consumers access evidence regarding a wide variety of diseases, treatments, and outcomes.[10-12]

The physical therapy profession also has expressed a commitment to the development and use of evidence. The American Physical Therapy Association envisioned that by 2020 physical therapists would be autonomous practitioners that, among other things, used evidence in practice.[13] Numerous articles regarding the methods for, benefits of, and barriers to evidence-based practice have been published in the journal *Physical Therapy*.[14-17] 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.[18] 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 "Hooked on Evidence," a database of research articles regarding physical therapy interventions for use in clinical practice,[19] and PTNow, a Web-based portal designed to facilitate efficient access to the latest evidence related to physical therapist practice.[20]

The ground swell of interest in the use of evidence in health care has 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.[21-24] In addition, the rapid evolution of Internet technology has increased both the dissemination of and access to health care research.

Related issues have stimulated the drive for evidence-based physical therapist practice, the most important of which is 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.[25] In light of these important developments, physical therapists should have an understanding of what evidence-based practice is, how it works, and how it may improve their clinical practice.

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."[3(p.71)]

"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

provides 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.'"[26(p.8)] In both definitions, 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 in all cases 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 that are 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**.[27]

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.[28] 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 progestin. 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.[29] 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 progestin therapy increased a woman's risk for the development of heart attacks, strokes, blood clots, and breast cancer.[23] 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 practice* (EBPT) 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*, *Second Edition*, establishes physical therapy as a profession that is grounded in an expanded disablement model originally articulated by Nagi.[1] The framework illustrated in **Figure 1-1** is largely consistent with

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.
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 his 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.

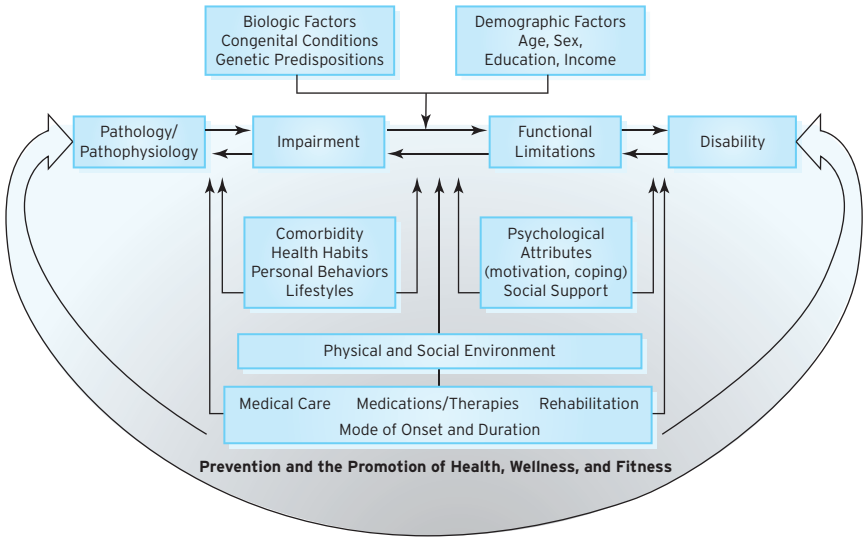
(*continues*)

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

Type of Reasoning Error	Nature of the Problem	Clinical Management Consequences
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.

Source: Adapted with permission from John Wiley and Sons. Croskerry P. Achieving quality in clinical decision making: cognitive strategies and detection of bias. *Acad Emerg Med*. 2002;9(11):1184–1204.

FIGURE 1-1 Expanded disablement model.



Source: Guide to Physical Therapist Practice. 2nd ed. *Phys Ther*. 2001;81(1):9–746. Reprinted with permission of the American Physical Therapy Association. Copyright © 2001 American Physical Therapy Association.

the more contemporary view of *disability* reflected by the World Health Organization's International Classification of Functioning, Disability and Health (ICF).[2] The model depicts the clinical aspects of a patient/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 *pathology*, *impairments* (ICF = impairments in body functions and structure), *functional limitations* (ICF = activity limitations), and disabilities (ICF = 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 therapy plan of care.

A definition of EBPT that reflects the intent of evidence-based medicine as well as the nature of physical therapist practice is offered here[1,30]:

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

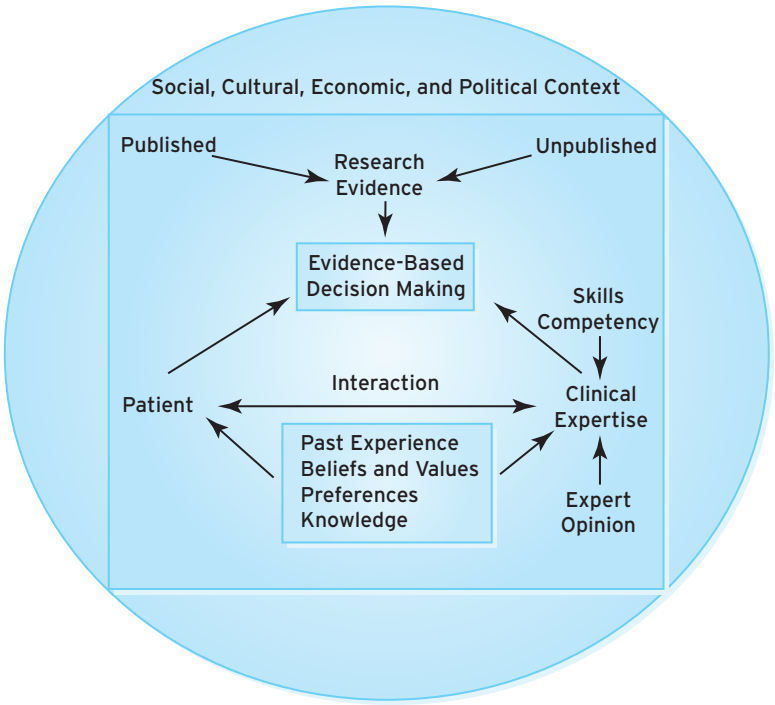
The term "open" implies a process in which the physical therapist is able to articulate in understandable terms the details of his or her recommendations, including (1) the steps taken to arrive at this conclusion, (2) the underlying rationale, and (3) the potential impact of taking and of refusing action. "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.[31] "Best available evidence" refers to timely, well-designed studies that are relevant to the question a physical therapist has about patient/client management. "Preferences and values" are the patient/client's "unique preferences, concerns, and expectations"[7] against which each option should be weighed and that ultimately must be reflected in a collaborative decision-making process between the therapist and the patient/client. This point is consistent with the emphasis on *patient-centered care* as articulated by the Institute of Medicine.[6] 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.[32] **Figure 1-2** provides an illustration of EBPT.

Evidence-Based Physical Therapist Practice Focus Areas

A clinician interested in evidence-based physical therapist practice rightly might ask, "Evidence for what?" The patient/client management model provides the answer to this question when one considers its individual elements.[1] 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. Evidence may assist the physical therapist in selecting the best techniques to correctly identify, quantify, and classify the patient/client'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/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

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



Source: This was published in *Evidence-Based Healthcare: A Practical Guide for Therapists*, Tracy Bury & Judy Mead, Page 10, Copyright © 1999 by Elsevier. Reprinted with permission from Elsevier.

(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 about the patient/client'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/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 physical therapy treatment options 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 physical agents, exercise, or some combination of both, will be most effective for this individual. Evidence may assist the therapist and the patient/client in a risk-benefit analysis by providing information about effectiveness and harm.

The end products of the patient/client management process are referred to as the *outcomes*, which should be distinguished from treatment effects.[32] The former focus on results from the patient/client's point of view that occurred at the conclusion of the episode of care. For example, return-to-work represents a commonly used 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 patient/client's goals for the physical therapy episode of care. Use of standardized outcomes measures, however, permits an analysis of progress over the course of an episode for a single individual, as well as a comparison across patients/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 standardized outcomes instrument will provide the most discriminating information with respect to changes in impairment in body functions and structures, activity limitations, participation restrictions, or health-related quality of life. A review of available evidence may assist the therapist in determining what outcomes are possible and which measurement tool is able to detect change in a consistent and meaningful fashion.

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/client's problem or concern. A search for relevant evidence to answer the question is then followed by a critical appraisal of its merits and conclusions, as well as a determination of its applicability to the patient/client. At the conclusion of the appraisal, the therapist will consider the evidence in the context of his or her clinical expertise and the patient/client's values and preferences during an explicit discussion with that patient/client.[4] Finally, the therapist and the patient/client will collaborate to identify and implement the next steps in the management process.

The process of EBPT depends on a variety of factors. First, physical therapists require sufficient knowledge about their patient/client's condition to recognize what is unknown. In other words, physical therapists must be willing to suspend the assumption that they have complete information about a patient/client's situation. In addition, physical therapists must have, or have access to, knowledge of the evidence appraisal process—that is, which features characterize stronger versus weaker evidence. 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/client management routine.

Results from a survey conducted by Jette et al. suggest that some of the requirements of EBPT are obstacles to its implementation.[16] 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. Nearly all respondents (96%) indicated they had access to evidence; however, 65% reported performing searches for evidence less than twice in a typical month. In addition, notable proportions of the sample indicated lower confidence levels in their abilities to execute effective search strategies (34%), appraise the evidence (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.

So, what can be done to reduce the barriers to effective EBPT? Clearly a philosophical shift is required to develop consistent behavior during a busy day of patient/client care. Management support in terms of the technology (e.g., Internet access), as well as time allotted in a therapist's schedule, would reflect the type of commitment needed. The time issue also may be helped by the use of services that locate, summarize, and appraise the evidence for easy review by practitioners. However, it should be noted that 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 consistently requires practice, just like any other skill. The process starts with the individual patient/client and the questions generated from the initial encounter, such as:

- 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?

A physical therapist's willingness to consider these questions consciously is the first step of EBPT. 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 will be difficult to implement in a consistent and time-efficient manner.

Summary

The use of 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. Evidence-based physical therapist practice is open, thoughtful decision making about the physical therapy management of a patient/client that integrates the best available evidence, clinical expertise, and the patient/client's preferences and values, within the larger social context of the patient/client and the therapist. Evidence may be used to assist decision making regarding measurement, diagnosis, prognosis, interventions, and outcomes. Requirements for EBPT include a willingness to challenge one's assumptions, the ability to develop relevant clinical questions about a patient/client, access to evidence, knowledge regarding evidence appraisal, and the time to make it all happen, as well as a willingness to acquire and practice 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:
   a. Authority
   b. Evidence
   c. Tradition
3. Describe a specific example of each type of knowledge in current physical therapist practice.
4. Discuss the potential contribution of evidence to each step of the patient/client management process. Provide clinical examples relevant to physical therapy to support your points.
5. Discuss the role of the patient/client in EBPT.
6. Complete the survey in **Figure 1-3** modified from Jette et al.[16] What do your answers tell you about your willingness and readiness to participate in EBPT?
7. Based on your results from the previous question, identify two changes you would need to make to enhance your ability to participate in EBPT. For each change, identify one strategy you could implement to move you in the right direction.

FIGURE 1-3 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 ☒ in the appropriate box that indicates your response.

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

For the following items, place a mark ☒ in the appropriate box that indicates your response for a typical month.

12. Read/review research/literature related to my clinical practice.
    ☐ ≤1 article ☐ 2–5 articles ☐ 6–10 articles ☐ 11–15 articles ☐ 16+ articles
13. 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
14. 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 ☒ in the appropriate box that indicates your response.

15. Practice guidelines are available for topics related to my practice.
    ☐ Yes ☐ No ☐ Do Not Know
16. I actively seek practice guidelines pertaining to areas of my practice.
    ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
17. I use practice guidelines in my practice.
    ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
18. I am aware that practice guidelines are available online.
    ☐ Yes ☐ No
19. I am able to access practice guidelines online.
    ☐ Yes ☐ No
20. 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 ☒ 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.

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

(*continues*)

FIGURE 1-3 **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

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 ☒ 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	☐	☐	☐
b) Absolute risk	☐	☐	☐
c) Systematic review	☐	☐	☐
d) Odds ratio	☐	☐	☐
e) Meta-analysis	☐	☐	☐
f) Confidence interval	☐	☐	☐
g) Heterogeneity	☐	☐	☐
h) Publication bias	☐	☐	☐

For the following items, rank your top 3 choices by placing numbers 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

Source: 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. Reprinted with permission of the American Physical Therapy Association. Copyright © 2003 American Physical Therapy Association.

References

1. American Physical Therapy Association. Guide to Physical Therapist Practice. 2nd ed. *Phys Ther*. 2001;81(1): 9–746.
2. World Health Organization. *Towards a Common Language of Functioning, Disability and Health. ICF*. Geneva, Switzerland: World Health Organization; 2002.
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*. 2nd ed. Chicago, IL: AMA Press; 2008.
6. Greiner AC, Knebel E, eds. Health Professions Education: A Bridge to Quality. Institute of Medicine Web site. Available at: www.nap.edu/catalog.php?record_id=10681. Accessed July 20, 2013.
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 Web site. Available at: www.ahrq.gov/research/findings/evidence-based-reports/index.html. Accessed July 20, 2013.
9. Medicare Evidence Development and Coverage Advisory Committee. Centers for Medicare and Medicaid Services Web site. Available at: www.cms.gov/Regulations-and-Guidance/Guidance/FACA/MEDCAC.html. Accessed July 20, 2013.
10. JAMAevidence. American Medical Association Web site. Available at: http://jamaevidence.com. Accessed July 20, 2013.
11. Process for Evidence Evaluation. American Heart Association Web site. Available at: www.heart.org/HEARTORG/CPRAndECC/Science/ILCOR/Process-for-Evidence-Evaluation_UCM_427548_Article.jsp. Accessed July 20, 2013.
12. AOTA's Evidence Exchange. American Occupational Therapy Association Web site. Available at: www.aota.org/en/Practice/Manage/Evidence-Exchange.aspx. Accessed July 20, 2013.
13. Vision 2020. American Physical Therapy Association Web site. Available at: www.apta.org/Vision2020/. Accessed July 20, 2013.
14. Fritz JM, Wainner RS. Examining diagnostic tests: an evidence-based perspective. *Phys Ther*. 2001;81(9):1546–1564.
15. Scalzitti DA. Evidence-based guidelines: application to clinical practice. *Phys Ther*. 2001;81(10):1622–1628.
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. Maher CG, Sherrington C, Elkins M, et al. Challenges for evidence-based physical therapy: accessing and interpreting high-quality evidence on therapy. *Phys Ther*. 2004;84(7):644–654.
18. Evidence in Practice. American Physical Therapy Association Web site. Available at: http://ptjournal.apta.org/content/82/1/6.full. Accessed July 20, 2013.
19. Hooked on Evidence. American Physical Therapy Association Web site. Available at: www.hookedonevidence.com. Accessed July 20, 2013.
20. PTNow. American Physical Therapy Association Web site. Available at: www.ptnow.org/Default.aspx. Accessed July 20, 2013.
21. Eddy DM. Evidence-based medicine: a unified approach. *Health Affairs*. 2005;24(1):9–17.
22. Steinberg EP, Luce BR. Evidence based? Caveat emptor! *Health Affairs*. 2005;24(1):80–92.
23. Women's Health Initiative Participant Information. Women's Health Initiative Web site. Available at: https://cleo.whi.org/participants/Pages/home.aspx. Accessed July 20, 2013.
24. Institute of Medicine Web site. Available at: www.iom.edu. Accessed July 20, 2013.
25. CMS Retains Clinical Study Requirement in Final TENS Decision Memo. American Physical Therapy Association Web site. Available at: www.apta.org/PTinMotion/NewsNow/2012/6/12/FinalTENSMemo/. Accessed July 20, 2013.
26. Hicks N. Evidence-based healthcare. *Bandolier*. 1997;4(39):8.
27. Croskerry P. Achieving quality in clinical decision making: cognitive strategies and detection of bias. *Acad Emerg Med*. 2002;9(11):1184–1204.
28. 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.

29. Mobasseri 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.
30. American Physical Therapy Association. *Normative Model of Physical Therapist Education: Version 2004*. Alexandria, VA; 2004.
31. 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.
32. Herbert R, Jamtvedt G, Hagen KB, Mead J. *Practical Evidence-Based Physiotherapy*. 2nd ed. Edinburgh, Scotland: Elsevier Butterworth-Heinemann; 2011.