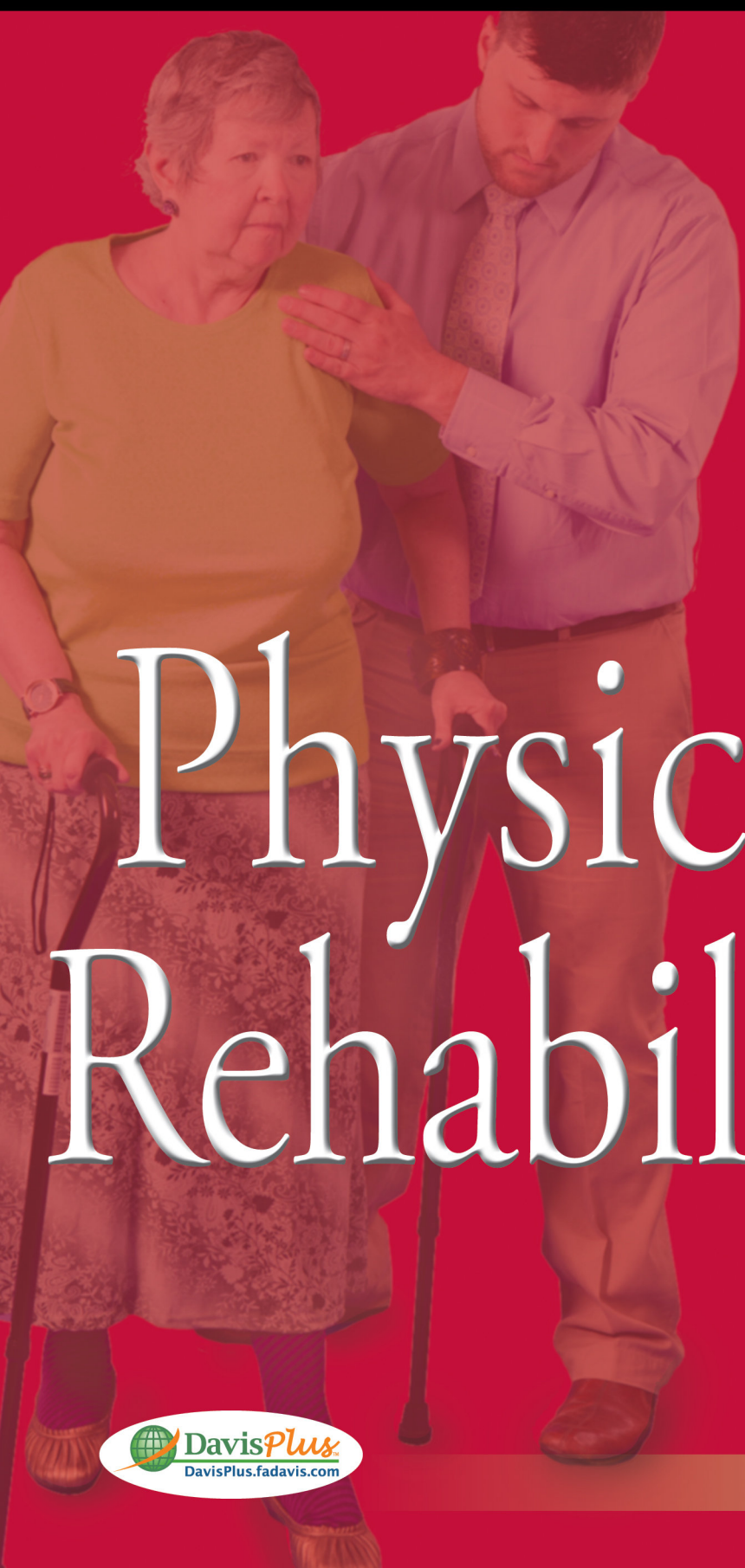
Susan B. O'Sullivan • Thomas J. Schmitz • George D. Fulk

SIXTH EDITION



Physical Rehabilitation

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PREFACE

With the sixth edition of *Physical Rehabilitation*, we continue a tradition of striving for excellence that began more than 25 years ago. We are gratified by the continuing wide acceptance of *Physical Rehabilitation* by both faculty and students.

The text is designed to provide a comprehensive approach to the rehabilitation management of adult patients. As such, it is intended to serve as a primary textbook for professional-level physical therapy students, and as an important resource for practicing therapists as well as for other rehabilitation professionals. The sixth edition recognizes the continuing growth of the profession and integrates basic and applied clinical research to guide and inform evidence-based clinical practice. It also integrates terminology, practice patterns, specific tests and measures, and interventions presented in the American Physical Therapy Association's *Guide to Physical Therapist Practice* and the World Health Organization's *International Classification of Functioning, Disability, and Health* (ICF).

Physical Rehabilitation is organized into three sections. Section One (Chapters 1–9) includes chapters on clinical decision making and examination of basic systems, as well as examination of functional status and the environment. Section Two (Chapters 10–29) addresses many of the diseases, disorders, and conditions commonly seen in the rehabilitation setting. Appropriate examination and intervention strategies are discussed for related body structure/function impairments, activity limitations, and restrictions in social participation. Health promotion and wellness strategies are also considered. Emphasis is placed on parameters of learning critical to ensuring the patient/client can achieve anticipated goals and expected outcomes. The final section, Section Three (Chapters 30–32), includes orthotics, prosthetics, and the prescriptive wheelchair.

A central element of the text is a strong pedagogical format designed to facilitate and reinforce the learning of key concepts. Each chapter of *Physical Rehabilitation* includes an initial content outline, learning objectives, an introduction and summary, review questions for self-assessment, and extensive references. Additional supplemental readings and recommended resources are also provided. Key terms are bolded throughout each chapter indicating their inclusion in a master glossary toward the end of the text. Application of important concepts is promoted through end-of-chapter case study examples and guiding questions designed to enhance clinical decision making skills. Disability-focused chapters contain *Evidence Summary Boxes* that summarize and critically appraise research focused on a particular topic or intervention relevant to the chapter content. Our hope is that the boxes may provide a model for readers to continue to critically examine clinical practice using validated clinical methodologies. We also hope it will inspire enthusiasm about the importance of continuous, lifelong, self-directed learning.

The visuals have been substantially enhanced with the addition of many new illustrations and photographs. Changes in design and the introduction of a full-color format provide a reader-friendly environment, as well as augment understanding of content. New to the sixth edition are 13 online case studies with accompanying video segments illustrating aspects of the initial examination, interventions, and outcomes for patients undergoing active rehabilitation. The cases were authored by practicing therapists from various parts of the country who were directly involved in the care of the case study patient participant. The case studies include patients with chronic obstructive pulmonary disease and respiratory distress syndrome, burns, amputation, spinal cord injury, Parkinson's disease, traumatic brain injury, stroke, and vestibular dysfunction. Questions are posed that address key elements in developing the plan of care for each patient. All case study materials (patient history, examination data, video segments, answers to guiding questions for student feedback) are available online at Davis*Plus*.

Also new to this edition are sample examination questions consistent with the format of the National Physical Therapy Examination. In separate files, answers to the questions are provided for student feedback that are also available at Davis*Plus*.

As we have noted in previous editions, our greatest asset and inspiration in preparing the sixth edition of *Physical Rehabilitation* has been an outstanding group of contributing authors. We are most fortunate to have this group of talented individuals whose breadth and scope of professional knowledge and experience seems unparalleled. These individuals are recognized experts from a variety of specialty areas who have graciously shared their knowledge and clinical practice expertise by providing relevant, up-to-date, and practical information within their respective content areas. To our group of contributors, we enthusiastically welcome the many talented, dedicated clinicians whose knowledge and clinical skills are well represented in the online case study materials that accompany the text. To the sixth edition, a welcome is also extended to George D. Fulk as a new contributing editor.

The sixth edition has also benefited from the input of numerous individuals engaged in both academic and clinical practice settings who have used and reviewed the content. We are grateful for their constructive feedback and have instituted many of their suggestions and

changes. As always, we welcome suggestions for improvements from our colleagues and students.

As physical therapists continue to take on more and greater professional responsibilities and challenges, the very nature of this text makes it a perpetual "work in progress." We are grateful for the opportunity to contribute to the academic literature in physical therapy, as well as to the professional development of those preparing to enter a career devoted to improving the quality of life of those we serve.

We acknowledge the very important contributions that physical therapists make in the lives of their patients. This book is dedicated to those therapists—past, present, and future—who guide and challenge their patients to lead a successful and independent life.

—Susan B. O'Sullivan
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The ongoing development of *Physical Rehabilitation* has been in all aspects a collaborative venture. Its fruition has been made possible only through the expertise and gracious contributions of many talented individuals. Our appreciation is considerable.

Heartfelt thanks are extended to our contributing authors. Each has brought a unique body of knowledge, as well as distinct clinical practice expertise, to their respective chapters. Their commitment to physical therapist education is collectively displayed in content presentations that carefully reflect the scope of knowledge and skills required of a dynamic, evolving physical therapy practice environment. We are extremely grateful to each of our contributors and heartened by the excellence they bring to the sixth edition.

Heartfelt thanks are also extended to the practicing clinicians who prepared the case studies and video segments. Their contributions expertly move text content to clinical practice and significantly add to the development of clinical reasoning skills of our readers. We would like to thank Edward W. Bezkor, who served tirelessly as Case Study and Multimedia Editor and effectively coordinated case study contributions, as well as many production elements. Thanks also to Yvonne Gillam, Freelance Editor and Media Consultant, and Liz Schaeffer, Developmental Editor/Electronic Products Coordinator, for their work in editing the patient videos.

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We would like to thank Evangelos Pappas, Test Bank Editor, for his expertise and efforts in developing guidelines for questions consistent with the National Physical Therapy Examination format and soliciting expert item writers for the test bank of examination questions. Our hope is that the test bank will become a valuable resource for both faculty and students who use our book.

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We wish to thank the numerous students, faculty, and clinicians who over the years have used *Physical Rehabilitation* and provided us with meaningful and constructive comments that have greatly enhanced this edition. It is our sincere hope that this feedback will continue.

Finally, we are grateful for our continuing strong and productive working relationship that has allowed us to complete a project of this scope through six editions.

—Susan B. O'Sullivan
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CONTENTS

SECTION ONE

Clinical Decision Making and Examination

Clinical Decision Making

Susan B. O'Sullivan, PT, EdD

Chapter 1

LEARNING OBJECTIVES

1. Define *clinical reasoning* and identify factors that affect clinical decision making.
2. Describe the key steps in the patient/client management process.
3. Define the major responsibilities of the physical therapist in planning effective treatments.
4. Identify potential problems that could adversely affect the physical therapist's clinical reasoning.
5. Discuss strategies to ensure patient participation in the plan of care (POC).
6. Identify key elements of physical therapy documentation.
7. Differentiate between the clinical decision making approaches used by the expert versus novice physical therapist.
8. Discuss the importance of evidence-based practice in developing the POC.
9. Analyze and interpret patient/client data, formulate realistic goals and outcomes, and develop a POC when presented with a clinical case study.

CHAPTER OUTLINE

CLINICAL REASONING/ CLINICAL DECISION MAKING

Clinical reasoning is a multidimensional process that involves a wide range of cognitive skills physical therapists use to process information, reach decisions, and determine actions. Reasoning can be viewed as an internal dialogue that therapists continuously employ while meeting the challenges of clinical practice. *Clinical decisions* are the outcomes of the clinical reasoning process and form the basis of patient/client management. A number of factors influence decision making, including the clinician's goals, values and beliefs, psychosocial

skills, knowledge base and expertise, problem-solving strategies, and procedural skills. Many of these factors are the focus of discussion in later chapters in this text. Decision making is also influenced by patient/client characteristics (goals, values and beliefs, and physical, psychosocial, educational, and cultural factors) as well as environmental factors (clinical practice environment, overall resources, time, level of financial support, level of social support).

Decision making frameworks, such as algorithms, have been developed by experienced practitioners to guide clinicians in their reasoning processes. For example, Rothstein and Echternach developed the Hypothesis-Oriented Algorithm for Clinicians II (HOAC).[1] An algorithm is a graphically represented step-by-step guide designed to assist clinicians in problem solving by considering several possible solutions. It is based on specific clinical problems and identifies the decision steps and possible choices for remediation of a problem. A series of questions are posed, typically in yes/no format, addressing whether the measurements met testing criteria, the hypotheses generated were viable, goals were met, strategies were appropriate, and tactics were implemented correctly.

Hypotheses are defined as the underlying reasons for the patient's problems, representing the therapist's conjecture as to the cause. Problems are defined in terms of activity limitations. A "no" response to any of the questions posed in an algorithm is an indication for reevaluation of the viability of the hypotheses generated and reconsideration of the decisions made. In using HOAC II as a model for clinical decision making, the therapist also distinguishes between existing problems and anticipated problems, defined as deficits that are likely to occur if an intervention is not used for prevention. The value of an algorithm is that it guides the therapist's decisions and provides an outline of the decisions made. See Chapter 17, Figures 17.7 and 17.8, for examples of problem-centered algorithms.

Physical therapists today practice in complex environments and are called upon to reach increasingly complex decisions under significant practice constraints. For example, a therapist may be required to determine a POC for the complicated patient with multiple co-morbidities within 72 hours of admission to a rehabilitation facility. Reduced levels of treatment authorization with shorter and shorter stays in rehabilitation also complicate the decision making process. Novice practitioners can easily become overwhelmed. This chapter introduces a framework for clinical decision making and patient/client management that can assist in organizing and prioritizing data and in planning effective treatments compatible with the needs and goals of the patient/client and members of the health care team.

INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY, AND HEALTH (ICF)

The World Health Organization's (WHO's) *International Classification of Functioning, Disability, and Health (ICF) model* provides an important framework of terminology for understanding and categorizing health conditions and patient problems by clearly defining health condition, impairment, activity limitation, and participation restriction.[2] The American Physical Therapy Association (APTA) has joined the WHO, the World Confederation for Physical Therapy (WCPT), the American Therapeutic Recreation Association (ATRA), and other international professional organizations in endorsing the ICF classification. Figure 1.1 presents the ICF model of disability.

Impairments are the problems an individual may have in body function (physiological functions of body systems) or structure (anatomical parts of the body). The resulting significant deviation or loss is the direct result of the **health condition**, a disease, disorder, injury, or trauma, or other circumstance, such as aging, stress, congenital anomaly, or genetic predisposition. For example, a patient with stroke may present with sensory loss, paresis, dyspraxia, and hemianopsia *(direct impairments)*. Impairments may be mild, moderate, severe, or complete and may be permanent or resolving as recovery progresses. Impairments may also be *indirect* (secondary), the sequelae or complications that

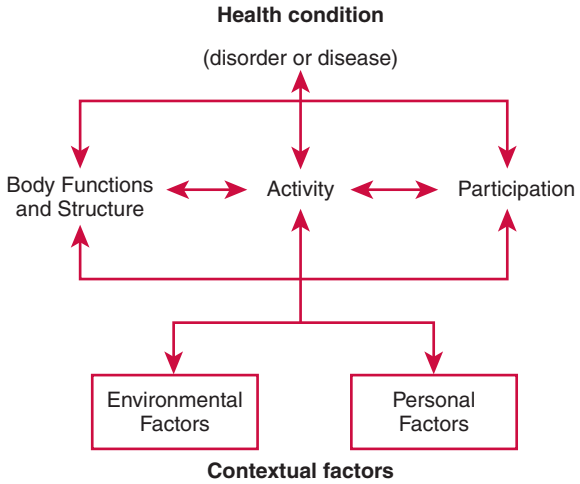


Figure 1.1 ICF Model of Disability. The WHO classification of functioning, disability and health (ICF). World Health Organization. ICF: International Classification of Functioning, Disability, and Health. 2002. Geneva, Switzerland, p 18, with permission. *(Form for request for permission available at www.who.int/about/licensing/copyright_form/en/index.html.)*

originate from other systems. They can result from preexisting impairments or the expanding multisystem dysfunction that occurs with prolonged bedrest and inactivity, an ineffective POC, or lack of rehabilitation intervention. Examples of indirect impairments include decreased vital capacity and endurance, disuse atrophy and weakness, contractures, decubitus ulcers, deep venous thrombosis, renal calculi, urinary tract infections, pneumonia, and depression. The term *composite impairment* refers to impairments that are the result of multiple underlying origins, the combined effects of both direct and indirect impairments (e.g., balance deficits, gait deficits).

Activity limitations are difficulties an individual may have in executing tasks or actions. Activity limitations can include limitations in the performance of cognitive and learning skills, communication skills, ***functional mobility skills*** (**FMS**) (such as transfers, walking, lifting or carrying objects), and ***activities of daily living*** (**ADL**). ***Basic activities of daily living*** (**BADL**) include self-care activities of toileting, hygiene, bathing, dressing, eating, drinking, and social (interpersonal) interactions. The person with stroke may demonstrate difficulties in all of the above areas and be unable to perform the actions, tasks, and activities that constitute the "usual activities" for this individual.

Participation restrictions are problems an individual may experience in involvement in life situations and societal interactions. Categories of life roles include home management, work (job/school/play), and community/leisure. These include ***instrumental activities of daily living*** (**IADL**) such as housecleaning, preparing meals, shopping, telephoning, and managing finances, as well as work and leisure activities (e.g., sports, recreation, trips). Thus, the individual with stroke is unable to resume societal roles such as working, parenting, attending church, or traveling.

Performance qualifiers indicate the extent of participation restriction (difficulty) in performing tasks or actions in an individual's current real-life environment. All aspects of the physical, social, and attitudinal world constitute the environment. Difficulty can range from mild to moderate to severe or complete. ***Capacity qualifiers*** indicate the extent of activity limitation and are used to describe an individual's highest probable level of functioning (ability to do the task or action). Qualifiers can range from the assistance of a device (e.g., adaptive equipment) or another person (minimal to moderate to maximal assistance) or environmental modification (home, workplace). Thus, the patient with stroke may demonstrate moderate difficulty in locomotion in the home environment (performance qualifiers) and require the use of an ankle-foot orthosis, small-based quad cane, and moderate assistance of one (capacity qualifiers).

Environmental factors make up the physical, social, and attitudinal environment in which people live and function. Factors range from products and technology (for personal use in daily living, mobility and transportation, communication) and physical factors (home environment, terrain, climate) to social support and relationships (family, friends, personal care providers), attitudes (individual and societal), and institutions and laws (housing, communication, transportation, legal, financial services, and policies). Qualifiers include factors that serve as barriers (disablement risk factors) or facilitators (assets). Barriers can range from mild to moderate to severe to complete. Facilitators can also range from mild to moderate to substantial to complete.

Box 1.1 summarizes ICF disablement terminology. The ICF Checklist (Version 2.1a, Clinician Form for the International Classification of Functioning, Disability, and Health) is a practical tool to elicit and record information on functioning and disability of an individual.[3]

PATIENT/CLIENT MANAGEMENT

Steps in patient/client management include (1) examination of the patient; (2) evaluation of the data and identification of problems; (3) determination of the physical therapy diagnosis; (4) determination of the prognosis and POC; (5) implementation of the POC; and (6) reexamination of the patient and evaluation of treatment outcomes (Fig. 1.2).[4]

Examination

Examination involves identifying and defining the patient's problem(s) and the resources available to determine appropriate intervention. It consists of three components: the patient history, systems review, and tests and measures. Examination begins with patient referral or initial entry (direct access) and continues as an ongoing process throughout the episode of care. Ongoing reexamination allows the therapist to evaluate progress and modify interventions as appropriate.

History

Information about the patient's past history and current health status is obtained from review of the medical record and interviews (patient, family, caregivers). The medical record provides detailed reports from members of the health care team; processing these reports requires an understanding of disease and injury, medical terminology, differential diagnosis, laboratory and other diagnostic tests, and medical management. The use of resource material or professional consultation can assist the novice clinician. The types of data that may be generated from a patient history are presented in Figure 1.3.[4]

The interview is an important tool used to obtain information and gain understanding directly from the patient. The therapist asks the patient a series of questions regarding general health, past and present medical conditions/complications, and treatment. Specifically

Box 1.1 Terminology: Functioning, Disability, and Health

Health condition is an umbrella term for disease, disorder, injury, or trauma and may also include other circumstances, such as aging, stress, congenital anomaly, or genetic predisposition. It may also include information about pathogeneses and/or etiology.
Body functions are physiological functions of body systems (including psychological functions).
Body structures are anatomical parts of the body such as organs, limbs, and their components.
Impairments are problems in body function or structure such as a significant deviation or loss.
Activity is the execution of a task or action by an individual.
Activity limitations are difficulties an individual may have in executing activities.
Participation is involvement in a life situation.
Participation restrictions are problems an individual may experience in involvement in life situations.
Contextual factors represent the entire background of an individual's life and living situation.
- **Environmental factors** make up the physical, social, and attitudinal environment in which people live and conduct their lives, including social attitudes, architectural characteristics, and legal and social structures.
- **Personal factors** are the particular background of an individual's life, including gender, age, coping styles, social background, education, profession, past and current experience, overall behavior pattern, character, and other factors that influence how disability is experienced by an individual.

Performance qualifier describes what an individual does in his or her current environment. (The current environment includes assistive devices or personal assistance, whenever the individual uses them to perform actions or tasks.)
Capacity qualifier describes an individual's ability to execute a task or an action (highest probable level of functioning in a given domain at a given moment).

From World Health Organization (WHO): *International Classification of Functioning, Disability and Health* (ICF).[3]

the patient is asked to describe the current problems, primary complaint (reason for seeking physical therapy), and anticipated goals/expected outcomes for the episode of care. The patient will often describe his or her difficulties in terms of activity limitations or participation restrictions (what he or she can or cannot do). The patient is then asked a series of questions designed to explore the nature and history of the current problems/primary complaint. General questions about functional activities and participation should be directed toward delineating the difference between *capacity* and *performance*. For example, "Since your stroke, how much difficulty do you have walking long distances?" "How does this compare to before you had the stroke?" (capacity). Questions directed toward examining performance can include "How much of a problem do you have in walking long distances?" "Is this problem with walking made worse or better with the use of an assistive device?" Questions are also posed regarding the patient's social and physical environment, vocation, recreational interests, health habits (e.g., smoking history, alcohol use), exercise likes and dislikes, and frequency and intensity of regular activity. Sample interview questions are included in Box 1.2.[4, 5]

Pertinent information can also be obtained from the patient's family or caregiver. For example, patients with central nervous system (CNS) involvement and severe cognitive and/or communication impairments and younger pediatric patients will be unable to accurately communicate their existing problems. The family member/caregiver then assumes the primary role of assisting the therapist in identifying problems and providing relevant aspects of the history. The perceived needs of the family member or caregiver can also be determined during the interview.

The therapist should be sensitive to differences in culture and ethnicity that may influence how the patient or family member responds during the interview or examination process. Different beliefs and attitudes toward health care may influence how cooperative the patient will be. During the interview, the therapist should listen carefully to what the patient says. The patient should be observed for any physical manifestations that reveal emotional context, such as slumped body posture, grimacing, and poor eye contact. Finally, the interview is used to establish rapport, effective communication, and mutual trust. Ensuring effective communication with the patient and cooperation serves to make the therapist's observations more valid and becomes crucial to the success of the POC.

Systems Review

The use of a brief *screening examination* allows the therapist to quickly scan the patient's body systems and determine areas of intact function and dysfunction in each of the following systems: cardiovascular/pulmonary, integumentary, musculoskeletal, and neuromuscular. Information is also obtained about cognitive functions, communication, learning style, and emotional status. Areas of deficit together with an accurate knowledge of the main health condition (disorder or disease) (1) confirm the need for further or more detailed examination; (2) rule out or differentiate specific system involvement; (3) determine if referral to another health care professional is warranted (triage); and (4) focus

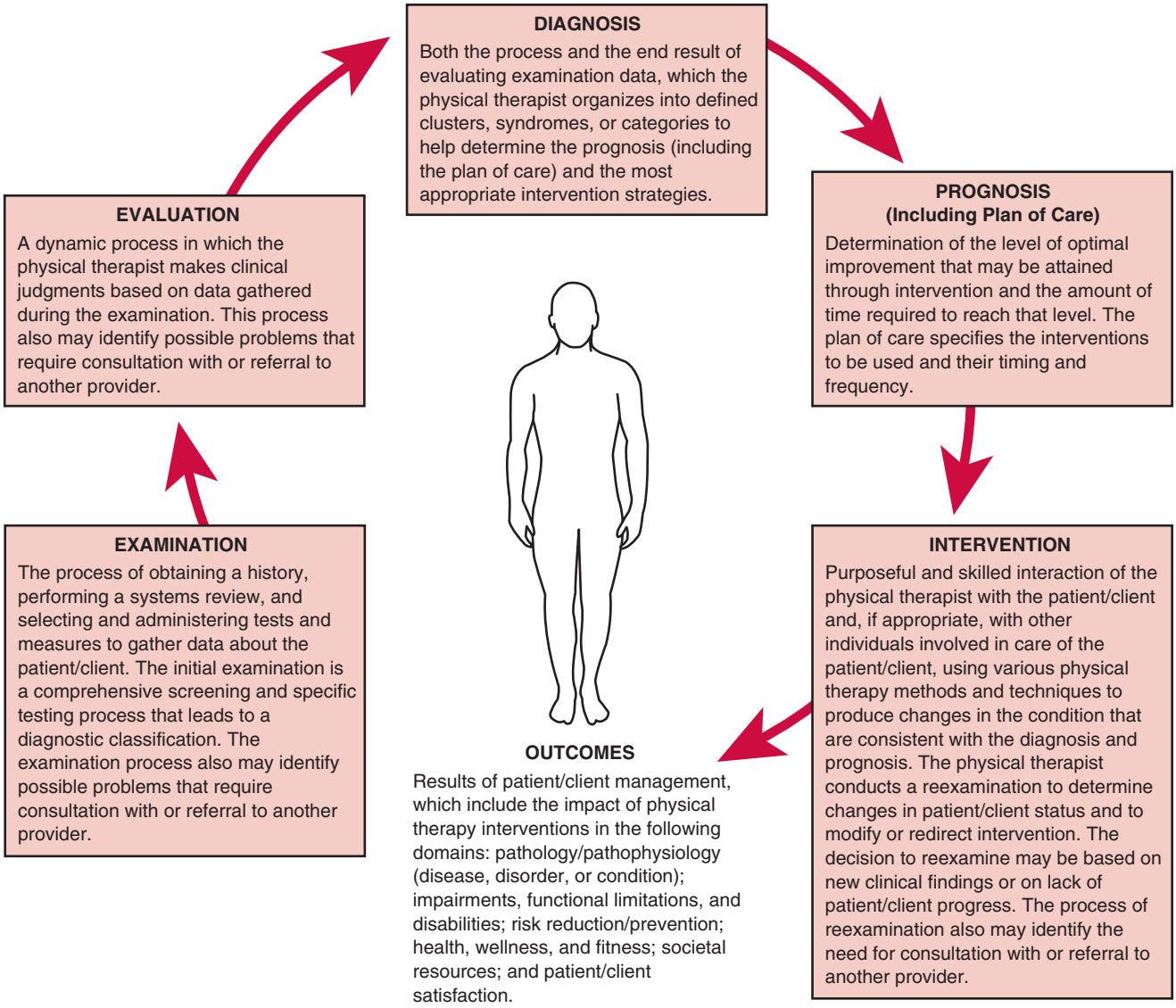


Figure 1.2 Elements of patient management leading to optimal outcomes. *(From APTA* Guide to Physical Therapist Practice [4, p. 35] *with permission.)*

the search of the origin of symptoms to a specific location or body part. An important starting point for identification of areas to be screened is consideration of all potential (possible) factors contributing to an observed activity limitation or participation restriction. Consultation is appropriate if the needs of the patient/client are outside the scope of the expertise of the therapist assigned to the case. For example, a patient recovering from stroke is referred to a dysphagia clinic for a detailed examination of swallowing function by a dysphagia specialist (speech-language pathologist).

Screening examinations are also used for healthy populations. For example, the physical therapist can screen individuals to identify risk factors for disease such as decreased activity levels, stress, and obesity. Screening is also conducted for specific populations such as pediatric clients (e.g., for scoliosis), geriatric clients (e.g., to identify fall risk factors), athletes (e.g., in pre-performance examinations), and working adults (e.g., to identify the risk of musculoskeletal injuries in the workplace). These screens may involve observation, chart review, oral history, and/or a brief examination. Additional screening examinations may be mandated by institutional settings. For example, in a long-term care facility, the therapist may be asked to review the chart for indications of changes in functional status or need for physical therapy. The therapist then makes a determination of the need for further physical therapy services based on completing a screening examination.

Tests and Measures

More definitive tests and measures are used to provide objective data to accurately determine the degree of specific function and dysfunction. Examination begins at the level of impairments, for example, diminished muscle strength (manual muscle test [MMT]) and impaired range of motion (ROM) (goniometric measurements), and progresses to functional activities (6-minute Walk Test, Timed Up and Go, Berg Balance Test). Alternatively,

General Demographics
- Age
- Sex
- Race/ethnicity
- Primary language
- Education

Social History
- Cultural beliefs and behaviors
- Family and caregiver resources
- Social interactions, social activities, and support system

Employment/Work (Job/School/Play)
- Current and prior work (job/school/play), community, and leisure actions, tasks, or activities

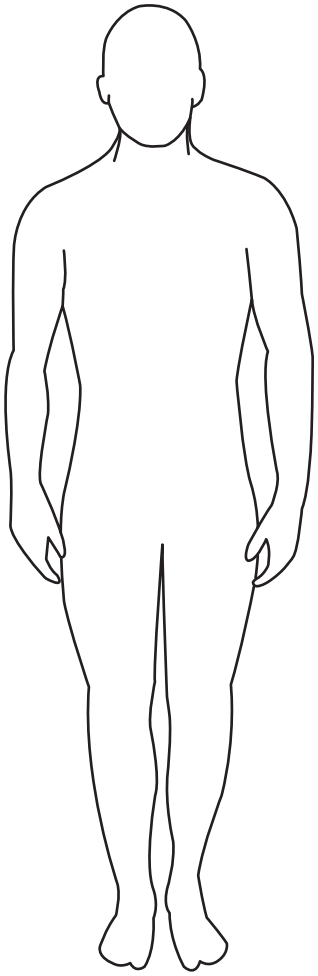
Growth and Development
- Developmental history
- Hand dominance

Living Environment
- Devices and equipment (eg., assistive, adaptive, orthotic, protective, supportive, prosthetic)
- Living environment and community characteristics
- Projected discharge destinations

General Health Status (Self-Report, Family Report, Caregiver Report)
- General health perception
- Physical function (eg., mobility, sleep patterns, restricted bed days)
- Psychological function (eg., memory, reasoning ability, depression, anxiety)
- Role function (eg., community, leisure, social, work)
- Social function (eg., social activity, social interaction, social support)

Social/Health Habits (Past and Current)
- General health perception
- Physical function (eg., mobility, sleep patterns, restricted bed days)
- Psychological function (eg., memory, reasoning ability, depression, anxiety)
- Role function (eg., community, leisure, social, work)
- Social function (eg., social activity, social interaction, social support)

Family History
- Familial health risks



Medical/Surgical History
- Cardiovascular
- Endocrine/metabolic
- Gastrointestinal
- Genitourinary
- Gynecological
- Integumentary
- Musculoskeletal
- Neuromuscular
- Obstetrical
- Prior hospitalizations, surgeries, and preexisting medical and other health related conditions
- Psychological
- Pulmonary

Current Condtion(s)/ Chief Complaint(s)
- Concerns that led the patient/client to seek the services of a physical therapist
- Concerns or needs of patient/client who requires the services of a physical therapist
- Current therapeutic interventions
- Mechanisms of injury or disease, including date of onset and course of events
- Onset and patterns of symptoms
- Patient/client, family, significant other, and caregiver expectations and goals for the therapeutic intervention
- Previous occurrence of chief complaint(s)
- Prior therapeutic interventions

Functional Status and Activity Level
- Current and prior functional status in self-care and home management, including activities of daily living (ADL) and instrumental activities of daily living (IADL)
- Current and prior functional status in work (job/school/play), community, and leisure actions, tasks, or activities

Medications
- Medications for current condition
- Medications previously taken for current condition
- Medications for other conditions

Other Clinical Tests
- Laboratory and diagnostic tests
- Review of available records (eg., medical, education, surgical)
- Review of other clinical findings (eg., nutrition and hydration)

Figure 1.3 Types of data that may be generated from patient history. *(From APTA* Guide to Physical Therapist Practice [4, p. 36] *with permission.)*

the therapist may begin with an examination of functional performance, during which the therapist analyzes the differences between the patient's performance and the "typical" or expected performance of a task. For example, the patient with stroke is asked to transfer from bed to wheelchair. The therapist observes the performance and determines that the patient lacks postural support (stability), adequate lower extremity (LE) extensor strength to reach the full upright position, and adequate ROM in ankle dorsiflexors. The therapist then progresses

Box 1.2 Sample Interview Questions

I. Interview questions designed to identify the nature and history of the current problem(s):
What problems bring you to therapy?
When did the problem(s) begin?
What happened to precipitate the problem(s)?
How long has the problem(s) existed?
How are you taking care of the problem(s)?
What makes the problem(s) better?
What makes the problem(s) worse?
What are your goals and expectations for physical therapy?
Are you seeing anyone else for the problem(s)?

II. Interview questions designed to identify desired outcomes in terms of essential functional activities include the following:
What activities do you normally do at home/work/school?
What activities are you unable to do?
What activities are done differently and how are they different (i.e., extra time, extra effort, different strategy)?
What activities do you need help to perform that you would rather do yourself?
What leisure activities are important to you?
How can I help you be more independent?

III. Interview questions designed to identify environmental conditions in which patient activities typically occur include the following:
Describe your home/school/work environment.
How do you move around/access areas in the home (i.e., bathroom, bedroom, entering and exiting the home)?
How safe do you feel?
How do you move around/access areas in the community (i.e., workplace, school, grocery store, shopping center, community center, stairs, curbs, ramps)? How safe do you feel?

IV. Interview questions designed to identify available social supports include the following:
Who lives with you?
Who assists in your care (i.e., basic activities of daily living [BADL], instrumental activities of daily living [IADL])?
Who helps you with the activities you want to do (i.e., walking, stairs, transfers)?
Are there activities you have difficulty with that would benefit from additional assistance?

V. Interview questions designed to identify the patient's knowledge of potential disablement risk factors include the following:
What problems might be anticipated in the future?
What can you do to eliminate or reduce the likelihood of that happening?

Sources: Section I: from the Documentation Template for Physical Therapist Patient/Client Management in the *Guide to Physical Therapist Practice* (4, pp. 707–712); Sections II–IV adapted from Randall (5, p. 1,200).

to a detailed examination of impairments. The decision as to which approach to use is based on the results of the screening examination and the therapist's knowledge of the health condition. Key information to obtain during an examination of function is the level of independence or dependence, as well as the need for physical assistance, external devices, or environmental modifications.

Adequate training and skill in performing specific tests and measures are crucial in ensuring both validity and reliability of the tests. Failure to correctly perform an examination procedure can lead to the gathering of inaccurate data and the formation of an inappropriate POC. Later chapters focus on specific tests and measures and discuss issues of validity and reliability. The use of disability-specific standardized instruments (e.g., for individuals with stroke, the Fugl-Meyer Assessment of Physical Performance) can facilitate the examination process but may not always be appropriate for each individual patient. The therapist needs to carefully review the unique problems of the patient to determine the appropriateness and sensitivity of an instrument. Box 1.3 presents the categories for tests and measures identified in the *Guide to Physical Therapist Practice*.[4]

Novice therapists should resist the tendency to gather excessive and extraneous data in the mistaken belief that more information is better. Unnecessary data will only confuse the picture, rendering clinical decision making more difficult and unnecessarily raising the cost of care. If problems arise that are not initially identified in the history or systems review, or if the data obtained are inconsistent, additional tests or measures may be indicated. Consultation with an experienced therapist can provide an important means of clarifying inconsistencies and determining the appropriateness of specific tests and measures.

Evaluation

Data gathered from the initial examination must then be organized and analyzed. The therapist identifies and prioritizes the patient's impairments, activity limitations, and participation restrictions and develops a *problem list*. It is important to accurately recognize those clinical problems associated with the primary disorder and those associated with co-morbid conditions. Table 1.1 presents a sample prioritized problem list.

Impairments, activity limitations, and participation restrictions must be analyzed to identify causal relationships. For example, shoulder pain in the patient with hemiplegia may be due to several factors, including hypotonicity and loss of voluntary movement, which are direct impairments, or soft tissue damage/trauma from improper transfers, which is an indirect impairment, resulting from an activity. Determining the causative

Box 1.3 Categories for Tests and Measures

Aerobic Capacity/Endurance
Anthropometric Characteristics
Arousal, Attention, and Cognition
Assistive and Adaptive Devices
Circulation (Arterial, Venous, Lymphatic)
Cranial and Peripheral Nerve Integrity
Environmental, Home, and Work (Job/School/Play) Barriers
Ergonomics and Body Mechanics
Gait, Locomotion, and Balance
Integumentary Integrity
Joint Integrity and Mobility
Motor Function (Motor Control and Motor Learning)
Muscle Performance (Including Strength, Power, and Endurance)
Neuromotor Development and Sensory Integration
Orthotic, Protective, and Supportive Devices
Pain
Posture
Prosthetic Requirements
Range of Motion (Including Muscle Length)
Reflex Integrity
Self-Care and Home Management (Including Activities of Daily Living and Instrumental Activities of Daily Living)
Sensory Integrity
Ventilation and Respiration/Gas Exchange
Work (Job/School/Play), Community, and Leisure Integration or Reintegration (Including Instrumental Activities of Daily Living)

Adapted from APTA *Guide to Physical Therapist Practice*.[4]

factors is a difficult yet critical step in determining appropriate treatment interventions and resolving the patient's pain.

The skilled clinician is able to identify the role barriers and facilitators in the patient's environment in order to incorporate measures to minimize or maximize these factors into the POC. A POC that emphasizes and reinforces facilitators enhances function and the patient's ability to experience success. Improved motivation and engagement are the natural outcomes of reinforcement of facilitators. For example, the patient with stroke may have intact communication skills, cognitive skills, and good function of the uninvolved extremities. Facilitators can also include supportive and knowledgeable family members/caregivers and an appropriate living environment.

Diagnosis

A *medical diagnosis* refers to the identification of a disease, disorder, or condition (pathology/pathophysiology) by evaluating the presenting signs, symptoms, history, laboratory test results, and procedures. It is identified primarily at the cellular level. Physical therapists use the term **diagnosis** to "identify the impact of a condition on function at the level of the system (especially the movement system) and at the level of the whole person."[4] Thus, the term is used to clarify the professional body of knowledge as well as the role of physical therapists in health care. For example:

Medical diagnosis: Cerebrovascular accident (CVA)
Physical therapy diagnosis: Impaired motor function and sensory integrity associated with nonprogressive disorders of the central nervous system—acquired in adolescence or adulthood[4, p. 365]
Medical diagnosis: Spinal cord injury (SCI)
Physical therapy diagnosis: Impaired motor function, peripheral nerve integrity, and sensory integrity associated with nonprogressive disorders of the spinal cord[4, p. 437]

The diagnostic process includes integrating and evaluating the data obtained during the examination to describe the patient/client condition in terms that will guide the prognosis and selection of intervention strategies during the development of the POC. The *Guide to Physical Therapist Practice* organizes diagnostic categories specific to physical therapy by *preferred practice patterns.*[4] There are four main categories of conditions: Musculoskeletal, Neuromuscular, Cardiovascular/Pulmonary, and Integumentary, with preferred practice patterns identified in each (see Appendix 1.A). The patterns are described fully according to the five elements of patient/client management (i.e., examination, evaluation, diagnosis, prognosis, and intervention). Each pattern also includes reexamination to evaluate progress, global outcomes, and criteria for termination of physical therapy services. Inclusion and exclusion criteria for each practice pattern and criteria for multiple-pattern classification are also presented. The patterns represent the collaborative effort of experienced physical therapists who detailed the broad categories of problems commonly seen by physical therapists within the scope of their knowledge, experience, and expertise. Expert consensus was thus used to develop and define the diagnostic categories and preferred practice patterns. Given the central role of physical therapists as movement specialists, the therapist will need to focus the diagnosis on the results of activity analysis and movement problems identified during the examination when formulating the prognosis and POC.

The use of diagnostic categories specific to physical therapy, as Sarhman points out, (1) allows for successful communication with colleagues and patients/caregivers about the conditions that require the physical therapist's expertise, (2) provides an appropriate classification for establishing standards of examination and treatment, and (3) directs examination of treatment effectiveness, thereby enhancing evidence-based practice.[6] Physical therapy diagnostic categories also facilitate successful reimbursement when linked to functional outcomes and enhance direct access of physical therapy services.

Table 1.1 Sample Prioritized Problem List for a Patient With Stroke

Direct Impairments	Indirect Impairments	Composite Impairments	Activity Limitations	Participation Restrictions
R hemiparesis RUE > RLE	R shoulder subluxation	Balance deficits Standing > sitting	Dep bed mobility: minA	Dec community mobility
	Dec ROM R shoulder	Gait deficits	Dep BADL: min/mod A	IADL: unable
Hypotonicity RUE	Kyphosis, forward head	Dec endurance	Dep transfers: modA X 1	Dec ability to perform social roles: husband
Spasticity RLE: knee ext, plantiflexors			Dep locomotion: modA X 1	
Synergy patterns RLE > RUE			Stairs: unable	
Mild dysarthria			Inc fall risk	
Mild cognitive deficits: dec STM				
Dec motor planning ability				
CO-MORBIDITIES:	Diabetic Peripheral Neuropathy			
Dec sensation both feet		Dec balance	Inc fall risk	
Small ulcer L foot (5th toe)		Dec endurance		
		Gait deficits: requires special shoes		Dec community mobility

Contextual factors: physical, social, attitudinal
One-level ranch house; entry with 2 steps, no handrails
Highly motivated
Personal factors: individual's life and living situation
Spouse is primary caregiver; has osteoporosis and decreased vision (bilateral cataracts).
Has 2 involved sons living within 30 mile radius.
Key: BADL: basic activities of daily living; Dec: decreased; Dep: dependent; IADL: instrumental activities of daily living; Inc: increased; minA: minimal assistance; modA: moderate assistance; RLE: right lower extremity; RUE: right upper extremity; STM: short term memory.

Prognosis

The term **prognosis** refers to "the predicted optimal level of improvement in function and amount of time needed to reach that level."[4, p. 46] An accurate prognosis may be determined at the onset of treatment for some patients. For other patients with more complicated conditions such as severe traumatic brain injury (TBI) accompanied by extensive disability and multisystem involvement, a prognosis or prediction of level of improvement can be determined only at various increments during the course of rehabilitation. Knowledge of recovery patterns (stage of disorder) is sometimes useful to guide decision making. The amount of time needed to reach optimal recovery is an important determination, one that is required by Medicare and many other insurance providers. Predicting optimal levels of recovery and time frames can be a challenging process for the novice therapist. Use of experienced, expert staff as resources and mentors can facilitate this step in the decision making process. For each preferred practice pattern, the *Guide to Physical Therapist Practice* includes a broad range of expected number of visits per episode of care.[4]

Plan of Care

The **plan of care** (**POC**) outlines anticipated patient management. The therapist evaluates and integrates data obtained from the patient/client history, the systems review, and tests and measures within the context of other factors, including the patient's overall health, availability of social support systems, living environment, and potential discharge destination. Multisystem involvement, severe impairment and functional loss, extended time of involvement (chronicity), multiple co-morbid conditions, and medical stability of the patient are important parameters that increase the complexity of the decision making process.