

Clinical Decision-Making and Examination

Clinical Decision-Making

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Chapter **1**

LEARNING OBJECTIVES

1. Describe an integrated framework for making clinical decisions and identify factors that affect clinical decision-making.
2. Describe the International Classification of Function (ICF) and its relationship to physical therapy.
3. Describe the key steps in the *Guide to Physical Therapist Practice* of the patient/client management process.
4. Map a participation goal into its relevant activities (ICF) and tasks (movement science).
5. Explain the role of movement observation of tasks in physical therapist examination.
6. Discuss strategies to promote shared decision-making to develop goals and the plan of care (POC).
7. Identify potential problems that could adversely affect the physical therapist's clinical decision-making.
8. Identify key elements of physical therapy documentation.
9. Discuss the importance of evidence-based practice in examination and developing the POC.
10. Analyze and interpret patient/client data, formulate realistic goals and outcomes, and develop a POC when presented with a clinical case.

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■ CLINICAL REASONING AND CLINICAL DECISION-MAKING

Clinical reasoning refers to the thinking and decision-making processes that are used in clinical practice.¹ Reasoning is a context-dependent way of thinking and making decisions in professional practice to guide practice actions.² It is a multidimensional, nonlinear cognitive process that involves synthesis of information and collaboration with the patient, caregivers, and health-care team. The clinician integrates information about the patient, the task, and the setting to reach decisions and determine actions in accordance with best available evidence. Clinical decisions are the outcomes of the iterative clinical reasoning process and form the basis of patient/client management. Numerous factors influence a clinician's decision-making, including their goals, knowledge base and expertise, psychosocial skills, problem-solving strategies, and procedural skills.

Decision-making is a shared process between the clinician and patient. Each of them brings their characteristics including their beliefs and biases, preferences, and values. The agreed upon goals between the therapist and the patient will be influenced by physical, psychosocial, educational, and cultural factors and overall resources, time, and level of financial and social support.

Frameworks and models may be used to organize the clinical reasoning process. Those frameworks may change over time based on the evolution of the field of physical therapy or the conceptualization of health. For example, the World Health Organization (WHO) used a disablement model (the International Classification of Impairments, Disabilities, and Handicaps [ICIDH]) that evolved into an enablement model called the International Classification of Functioning and Health (ICF).³ This resulted in changes in vocabulary and perspectives on how to view health (e.g., the term *disease* was replaced with *health condition*). Frameworks can be specific to the profession. In physical therapist practice, the American Physical Therapy Association's (APTA) *Guide to Physical Therapist Practice* is organized using the patient management system. In its third edition,⁴ the APTA changed from using the Nagi disablement model⁵ to using the enablement model of the ICF.⁶ Algorithms are also used to guide decision-making. Physical therapy-specific algorithms include the Hypothesis-Oriented Algorithm for Clinicians (HOAC) I and II.⁷ Clinical reasoning is also derived from the knowledge base or science that underpins the profession. Movement science and exercise science are two important bodies of knowledge that inform how we make clinical decisions.

Physical therapists practice in a variety of clinical environments including acute, rehabilitation, and chronic care facilities, as well as schools and community-based settings. They also provide physical therapy remotely

(e.g., teleconsultation and telerehabilitation). Therapists have many different roles in these settings, including direct patient care and case management as a member of a collaborative team, with referral to and consultation with other providers and supervision of personnel (e.g., physical therapist assistants, other support staff). Making clinical decisions is influenced by interaction and involvement of other providers, as depicted in Figure 1.1. Decision-making is also influenced by the clinical practice environment.

Primary care is generally the first level of care. Typically, patients are seen by a primary care physician or by a wide range of health-care professionals, including the physical therapist. Therapists provide integrated, accessible health-care services that address a large majority of personal health-care needs; develop a sustained partnership with the physician, other team members, and patient; and practice within the context of family and community. Primary care is provided in a wide variety of settings, including hospitals; rehabilitation centers; clinical practice settings; and school, industrial, or workplace settings.

Secondary care is more specialized and is provided to patients who are initially treated by other practitioners and then referred for specialist treatment and support. Examples of patients who may require secondary care include those with significant spinal cord injury (SCI), traumatic brain injury (TBI), or respiratory or cardiac disease.

Tertiary care is provided to patients in highly specialized, complex, and technology-based settings and in response to requests from other primary or secondary health-care practitioners for consultation and specialized services. Examples include specialized burn units, cancer units, or advanced neonatology services. Across the spectrum of settings, therapists have active roles in prevention and health promotion, wellness, and fitness with a wide variety of populations. Box 1.1 provides a summary of the terminology used to define clinical practice environments.⁴

Physical therapists today practice as primary care providers in complex environments and are called upon to reach increasingly complex decisions under significant practice constraints. For example, a therapist may be required to complete the examination and determine a plan of care (POC) for the patient with complex needs and multiple comorbidities within 24 to 48 hrs of admission to a rehabilitation facility. Limited insurance coverage with high co-pays and limited allocation of physical therapy treatment sessions also complicates the decision-making process.

This chapter presents an integrated framework for clinical decision-making with shared decision-making between the patient and the therapist depicted at the center.⁸ It is anchored by the *Guide to Physical Therapist Practice*, uses the language and concepts of the

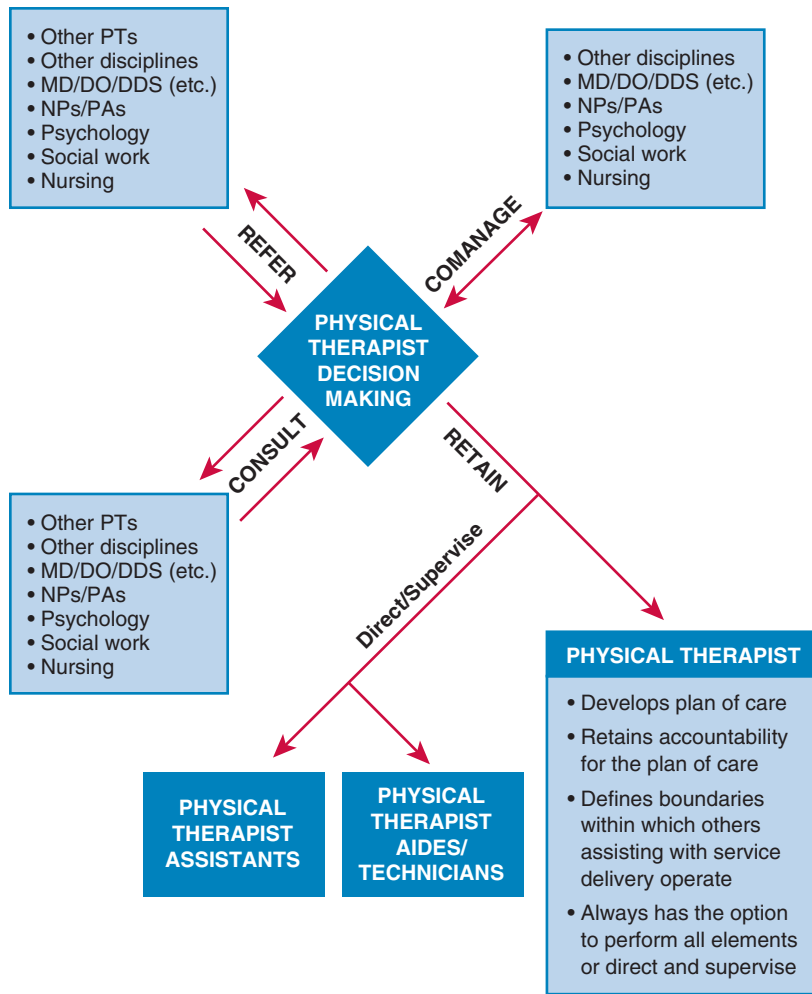


Figure 1.1 Physical therapist decision-making related to the involvement of other providers. *Introduction to the Guide to Physical Therapist Practice*. Guide to Physical Therapist Practice 3.0. American Physical Therapy Association; 2014. <http://guidetoptpractice.apta.org/content/1/SEC1.body>.

Box 1.1 Clinical Practice Terminology⁴

Primary care is defined as the provision of integrated, accessible health-care services by clinicians who are accountable for addressing a large majority of personal health-care needs, developing a sustained partnership with patients, and practicing within the context of family and community.

Secondary care is the care provided to patients who are initially treated by other practitioners and then referred to specialists/physical therapists.

Tertiary care is the care provided to patients in highly specialized, complex, and technology-based settings (e.g., burn units) or in response to requests of other health-care practitioners for consultation and specialized services.

Acute care involves the care of individuals with severe symptoms, illnesses, or life- or limb-threatening health conditions, regardless of their cause. It generally serves as an entry point to health care, is short term, and encompasses preventive and primary care.

Rehabilitation includes health-care services that help an individual keep, restore, or improve skills and functioning for daily living that have been lost or impaired because a person was sick, hurt, or disabled. These services may include physical therapy, occupational therapy, speech-language pathology, and psychiatric rehabilitation services in a variety of inpatient and outpatient settings.

Chronic care addresses preexisting or long-term illness and involves a continuum of integrated care over time and delivered in a variety of settings. It addresses loss of functional abilities and assists in helping individuals maintain independence and a high level of functioning. Chronic care encompasses medical care, rehabilitative care, and supportive services.

Telehealth is the delivery of services (consultation-direct care) remotely. May use telecommunications or digital technology.

(Continued)

Box 1.1 Clinical Practice Terminology⁴—cont'd

Prevention is the avoidance, minimization, or delay of the onset of impairment, activity limitation, and/or participation restrictions. Includes primary, secondary, and tertiary prevention initiatives for individuals as well as selective intervention initiatives for subsets of the population at risk for impairments, activity limitations, and/or participation restrictions.

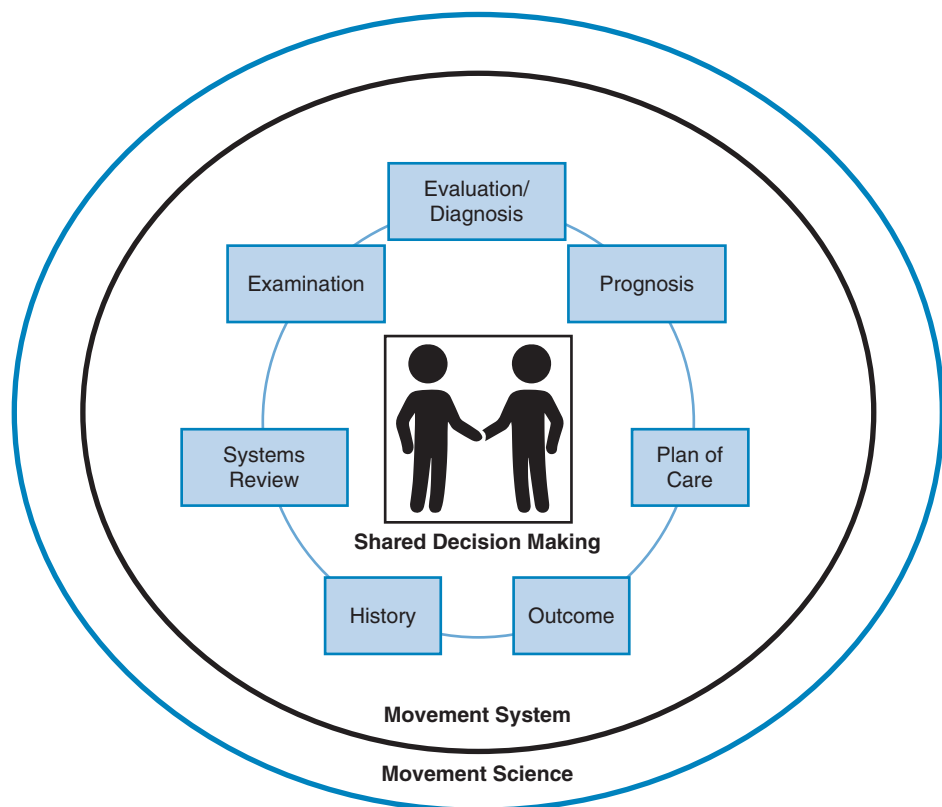
- **Primary prevention** prevents a target condition in a susceptible or potentially susceptible population through specific measures such as general health efforts.
- **Secondary prevention** decreases the duration of illness, severity of disease, and number of sequelae through early diagnosis and prompt intervention.
- **Tertiary prevention** limits the degree of disability and promotes rehabilitation and restoration of function in patients with chronic and irreversible diseases.

Health promotion is any effort taken to allow an individual, group, or community to achieve awareness of—and empowerment to pursue—prevention and wellness. Services include identifying risk factors and implementing services to reduce risk factors, preventing or slowing the functional decline and disability, and enhancing activity, participation, wellness, and fitness.

Wellness is a state of being that incorporates all facets and dimensions of human existence, including physical health, emotional health, spirituality, and social connectivity.

Clinical practice environments include hospitals, rehabilitation centers, outpatient clinical settings, home-based, school-based, sports settings and through telehealth.

Figure 1.2 Integrated Framework: Illustrates the centrality of the shared decision-making and the influence of both movement science and the movement system in the reasoning process. The patient/client management organizes the steps of the reasoning process. Hypothesis generation occurs at each step. While an episode of care may follow the steps sequentially, a prescribed order is not required.



ICF and Movement Science, as well the Movement System,⁹ and is driven by hypothesis generation and testing consistent with the HOAC. The integration of these frameworks and processes guides 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 (see Fig. 1.2). Each of the main elements will be explained further.

■ INTEGRATED FRAMEWORK: ELEMENTS OF CLINICAL REASONING

Shared Decision-Making

The physical therapist and the patient work together to make clinical decisions. Patients are encouraged to consider the benefits and harms of available treatment or management options, communicate their preferences, and collaborate with the clinician to choose the course of action that best fits their preference.^{10,11} An integrative model of shared decision-making includes essential elements such as explaining the problem, presenting options, discussing pros and cons of various options, checking patient understanding, deferring a decision about what action to take, and follow-up after the decision is made. Also taken into consideration are individual preferences, abilities, self-efficacy, patient readiness to change, and clinicians' knowledge.¹² A three-phase model of shared decision-making in physical therapy consists of:

1. Preparing for collaboration.
2. Exchanging information on options.
3. Affirming and implementing a decision.¹³

The authors of this model also provided specific evidence-based strategies and resources for implementing shared decision-making including the following:

- Health literacy universal precautions: making sure the clinician's language is simplified.
- Teach back: confirming that the patient understood the communication.
- Motivational interviewing: using techniques to engage the patient by eliciting, understanding, and addressing their ambivalence to adhere to therapy.
- Decision aids: using tools to increase patient knowledge of options and their relative value (for example the Ottawa personal decision guide worksheet to be used across multiple health conditions, <https://decisionaid.ohri.ca/decguide.html>).¹⁴ These tools have been shown to increase patient confidence, active involvement, and selection of more conservative treatments.¹⁵

Hypothesis-Oriented Algorithm for Clinicians

Physical therapists may use algorithms to guide their decision-making. An algorithm specific to physical therapy is the hypothesis-oriented algorithm for clinicians (original version, HOAC I, and revised version, HOAC II). The HOAC II^{7,16} provides a graphical step-by-step process for clinicians to gather information and tests their hypothesis on how to proceed with the examination and intervention. The HOAC acknowledges that there are both patient-identified problems (PIP) and nonpatient-identified problems (NPIPs). The NPIPs are identified by the clinician, often based on knowledge of

a health condition as well as observation of the patient. Once the problems are identified, there are decision steps and possible choices for evaluation and treatment planning. Hypotheses are generated about why the patient's problems exist, and criteria are generated to test the hypotheses. A series of questions are posed, typically in a branching program of yes/no choices, addressing whether the measurements met testing criteria, the hypotheses generated were viable, goals were met, strategies were appropriate, and tactics were implemented correctly. 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 as a framework for clinical decision-making, the therapist also distinguishes between existing problems and anticipated problems (including NPIPs), 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, Amyotrophic Lateral Sclerosis, for examples of hypothesis-oriented algorithms.

International Classification of Functioning, Disability, and Health

WHO's International Classification of Functioning, Disability, and Health (ICF) provides a model and common language by which to describe health conditions and organize information to classify patient's problems by clearly defining the complex interaction among health condition, body function/structure impairment, activity limitation, participation restriction, and contextual factors.³ The APTA has joined WHO, World Physical Therapy, and other international professional organizations in endorsing the ICF classification. Figure 1.3 presents the structure of the ICF model.⁴

The ICF provides descriptions of health, health conditions, functioning, and disabilities that are associated with a health condition and contextual factors that can influence outcomes.¹⁷ Health is defined as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. Health condition is an umbrella term for disease, disorder, injury, or trauma and may include other circumstances such as aging, stress, congenital anomaly, or genetic predisposition. It may also include information about pathogenesis and etiology. Health and health condition may be viewed on a continuum from wellness to illness. 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 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. For example, a patient with

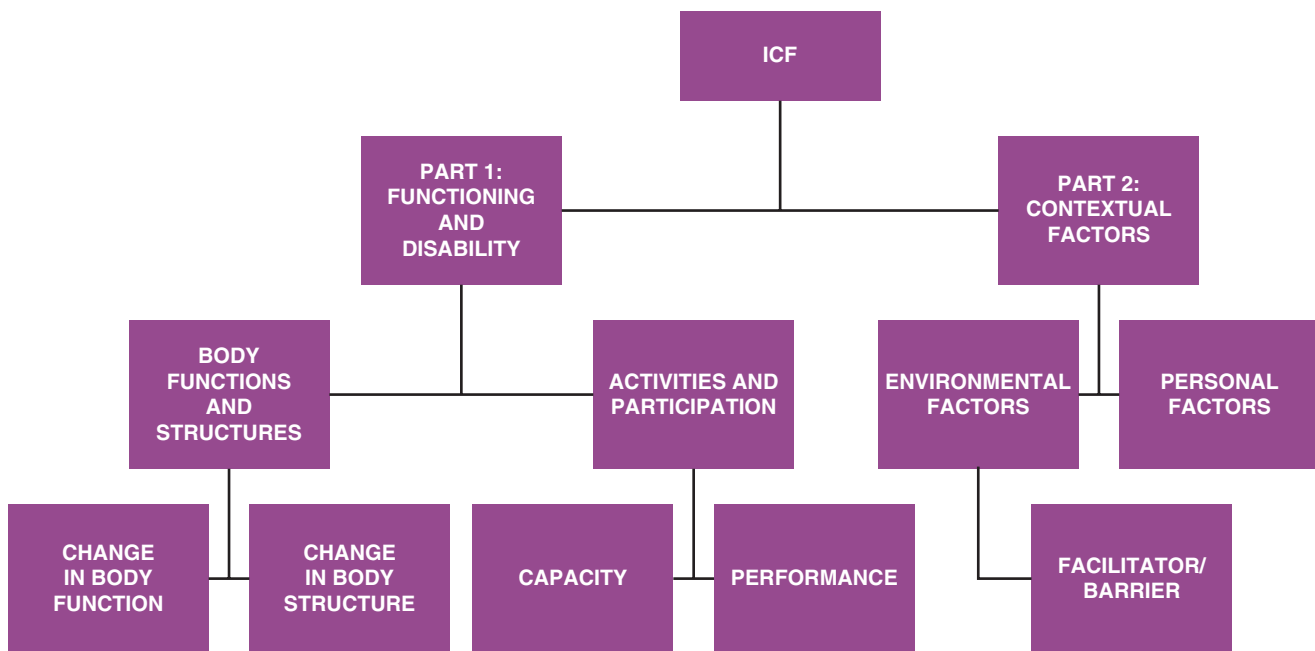


Figure 1.3 Structure of the International Classification of Functioning, Disability, and Health (ICF) model of functioning and disability. *Introduction to the Guide to Physical Therapist Practice*. Guide to Physical Therapist Practice 3.0. American Physical Therapy Association; 2014. <http://guidetoptpractice.apta.org/content/1/SEC1.body>.

stroke may present with sensory loss, paresis, dyspraxia, and hemianopsia (direct impairments). Impairments may be mild, moderate, severe, or complete and may be permanent (e.g., a complete spinal cord injury), resolve as recovery progresses (e.g., normal breathing after pneumonia), or become progressively worse (e.g., for a patient with a neurodegenerative disease such as Parkinson disease). Impairments may also be indirect (secondary), the sequelae or complications that 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 for a person with a stroke may include decreased vital capacity and cardiovascular endurance, disuse atrophy and weakness, contractures, pressure injuries, deep vein thrombosis, renal calculi, urinary tract infections, pneumonia, and depression.

Activity is the execution of a task or action by an individual. Activity limitations are difficulties an individual may have in executing tasks or actions. These can include limitations in the performance of cognitive and learning skills; communication skills; functional mobility skills such as transfers, walking, lifting, or carrying objects; and activities of daily living (ADLs). Basic activities of daily living (BADL) include self-care activities of toileting, maintaining hygiene, bathing, dressing, eating, drinking, and having social (interpersonal) interactions. The person with stroke may demonstrate difficulties in all these areas and be unable to perform the actions, tasks, and activities that constitute the “usual activities” for this individual.

Participation is an individual’s involvement in a life situation, the societal perspective of functioning. Participation restrictions are problems an individual may experience with involvement in daily 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, or other modes of communication, and managing finances, as well as work and leisure activities (e.g., sports, recreation, travel). Thus, the individual with stroke is unable to resume societal roles and activities such as working, parenting, attending church, or playing golf. In the section on examination, the relationships among participation, activity, and body function/structure are further described.

Performance describes what an individual does in their current environment, which includes use of assistive devices or personal assistance, whenever the individual uses them to perform actions or tasks. 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.

Capacity 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). 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).

Contextual factors represent the entire background of an individual's life and living situation. These include both environmental factors and personal factors. Environmental factors make up the physical, social, and attitudinal environment in which people live and conduct their lives. Factors range from products and technology (for personal use in daily living, communication, mobility, and transportation) 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).

Personal factors are the background of an individual's life, including gender, age, coping styles, social background, education, profession, past and current experience, overall behaviors, character, and other factors that influence how disability is experienced by an individual. Qualifiers include factors that serve as barriers or facilitators. Barriers (disablement risk factors) are factors within an individual's environment that, through their absence or presence, limit functioning and create disability. Facilitators (assets) are factors in an individual's environment that, through their absence or presence, improve functioning and disability. Both can range from mild to moderate to strong in their influence on functioning. Box 1.2 summarizes ICF terminology on functioning, disability, and health.¹⁷

Box 1.2 International Classification of Functioning, Disability, and Health (ICF) Terminology^{3,17}

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.

Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.

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 pathogenesis and etiology.

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.

Capacity describes an individual's ability to execute a task or an action (probable level of functioning in a given domain at a given moment).

Contextual factors represent the entire background of an individual's life and living situation.

- **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.
- **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.
- **Barriers** are factors within an individual's environment that, through their absence or presence, limit functioning and create disability.
- **Facilitators** are factors in an individual's environment that, through their absence or presence, improve functioning and disability.

Disability is an umbrella term for impairments, activity limitations, and participation restrictions. It denotes the negative aspects of the interaction between an individual (with a health condition) and that individual's contextual factors (environmental and personal factors).

Functioning encompasses all body functions and structures, activities, and participation.

Participation is an individual's involvement in a life situation; societal perspective of functioning.

Participation restrictions are problems an individual may experience in involvement in life situations. Participation restriction is determined by comparing an individual's participation to that which is expected from an individual without a disability in a particular culture or society.

Performance 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.

Performance qualifiers indicate the extent of participation restriction (difficulty) in performing tasks or actions in an individual's current real-life environment.

The ICF Checklist is a practical tool to elicit and record information on functioning and disability of an individual.¹⁸ WHO also has Core Sets, which provide a list of body structure/functions, activities, and participation that are commonly seen with certain health conditions. The Core Set is organized into categories such as neurological and musculoskeletal. These can be helpful for novice therapists when first learning the ICF and about a certain health condition (www.icf-research-branch.org/icf-core-sets-projects2).¹⁹

Movement Science and Movement System

Movement science informs clinical reasoning. Movement science is foundational for physical therapist practice.²⁰ It includes biomechanics, kinesiology, psychology, and neuroscience.²¹ Motor control and motor learning are distinct areas of study within the field of movement science. Many motor control theories guide the examination of movement. One of these is the “systems theory,” which frames motor control by examining the relationship between internal attributes of the person (specifically, cognition, perception, and action) and how these interact with the environment and the attributes of the specific movement or task.²² Movement science terminology provides useful language and tools for the physical therapy examination that are not provided by the ICF.²³ See Chapter 5, Examination of Motor Function, and Chapter 10, Strategies to Improve Motor Function, for further discussion.

The movement system is defined in APTA’s vision statement as “a collection of systems (cardiovascular, pulmonary, endocrine, integumentary, nervous, and musculoskeletal) that interact to move the body or its component parts” (www.apta.org/MovementSystem/).²⁴ In this chapter, it is used as a tool for screening and movement observation. Incorporating the movement system into physical therapy assessment may result in the creation of movement system diagnoses and a guide to interventions. How the movement system is integrated with physical therapist clinical reasoning is an ongoing area of study in the profession.

■ INTEGRATED FRAMEWORK: PATIENT/CLIENT MANAGEMENT

While the ICF offers a high-level model to organize information about a patient’s health conditions and many relevant factors to consider when examining and developing a POC for a patient, it is not specific to physical therapy. *The Guide to Physical Therapist Practice*, specifically in the patient/client management section, guides clinical reasoning for physical therapists.

Patient/client management involves identifying and defining the patient’s restrictions in participation and activities and impairments of body function and structure as well as the resources available to determine appropriate intervention. It 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.

The steps in patient/client management include (1) history and interview, (2) systems review, (3) examination, (4) evaluation of the data and identification of problems, (5) determination of the physical therapy diagnosis and prognosis, (6) POC with goals and intervention, and (7) reexamination and evaluation of treatment outcomes (see Fig. 1.2).

History and Interview

Information about the patient’s history and current health status is obtained from review of the medical record and interviews with the patient, family, and caregivers. The medical record provides detailed reports from members of the health-care team; processing these reports requires an understanding of the health condition, medical terminology, differential diagnosis, laboratory and other diagnostic tests, and medical management. The use of resource materials or professional consultation can assist the novice clinician.

The initial interview sets the stage for shared decision making. It is an important method used to obtain information from the patient, including learning patient goals, establishing rapport and mutual trust, ensuring open communication lines, and enhancing motivation. Communication skills and questioning techniques (e.g., motivational interviewing) are used to focus on the current health condition, past medical history, personal context, and emotional context. Several strategies are key to ensuring effective patient involvement, including active listening, empathy, building rapport, asking appropriate questions, summarizing and validating patient responses, and effectively using nonverbal communication cues. During the interview, the therapist should listen carefully to what the patient says and ask key questions that allow the patient to express feelings (e.g., What are you most concerned about?) and ideas (e.g., What are your thoughts or ideas about what may have caused this?). What do you expect or hope for? What would be important for us to include in your POC? Empathy is best relayed to the patient by recognizing the patient’s feelings and demonstrating understanding of the patient’s unique individual experiences (e.g., Can you help me understand how you see or experience your health condition?). Building good rapport allows the patient to feel comfortable and opens the lines of communication. The therapist’s communication (e.g., tone of voice, choice of language) and non-verbal communication (e.g., facial expressions, gestures, eye contact) influences the patient’s level of comfort with the interviewer and the overall outcome.

Conversely, the therapist should observe the patient for any physical manifestations that reveal emotional context, such as slumped body posture, grimacing, and

poor eye contact. The therapist should be sensitive to differences in culture and ethnicity that can influence how the patient or family member responds during the interview or examination process. Biases, prejudices, preconceptions, and judgments on the part of the therapist can interfere with active listening and in processing what the patient is saying. Ensuring effective communication with the patient promotes cooperation and serves to make the therapist's observations more valid, which is crucial to the success of the POC.^{25,26}

During the interview, the therapist asks the patient a series of questions, using both open-ended and closed-ended questions. Open-ended questions require more than a simple yes/no response (e.g., What symptoms are you currently experiencing?), while closed-ended questions limit the patient's responses to a yes/no answer or a nod (e.g., Do you have any pain today?).

Questions are posed regarding the history of the present health condition. Specifically, the patient is asked to describe current problems and their reason for seeking physical therapy, and to give a chronological account leading up to the episode of care. Questions then explore location, quality, and severity of the symptoms or problems as well as timing (occurrence), factors that aggravate or relieve them, and associated manifestations (other symptoms or problems) that may be occurring. Questions are posed regarding participation and activity (e.g., How has your health condition affected your daily life? What have you had to give up because of your health condition?). The patient will often describe their difficulties in terms of activity limitations or participation restrictions (what they can or cannot do). General questions about 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 "What problem(s) do you have when walking?" "Is this problem with walking made worse or better with the use of an assistive device?" Questions are also posed regarding the patient's past medical history, health habits (e.g., smoking history, alcohol use), family history, and personal and social history. Information about physical environment; vocation; recreational interests; exercise likes and dislikes; and type, frequency, and intensity of regular activity should be obtained.²⁵⁻²⁷ The types of data that may be generated from a patient history are presented in Figure 1.4.⁴ Sample representative interview questions are included in Box 1.3.

Pertinent information can also be obtained from the patient's family or caregiver. For example, patients with central nervous system involvement and cognitive and/or communication impairments and younger pediatric patients may 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. Some of the information obtained in the history and interview is relevant for the systems review.

Systems Review

The use of a screening examination (brief systems review) allows the therapist to quickly scan the patient's body systems and determine areas of intact function and dysfunction. Known health conditions are an important component of the screen. This information can be obtained by reviewing the medical record, using a medical screening questionnaire, and using the history and interview or specific tests and measures. It is recommended that clinicians collect the minimal data set (MDS) consisting of heart rate, blood pressure, orientation, communication, and learning style. While included in the MDS, it is important to highlight that screening cognitive and communication ability first guides how the examination and management are conducted.

A cognition and communication screening should include the following:

- Communication ability, affect, and language: assessment of the ability to produce and understand speech, and communicate thoughts and feelings
- Cognitive ability: assessment of consciousness, orientation (person, place, and time), expected emotional/behavioral responses, and learning preferences (e.g., learning barriers, education needs)

Then the clinician may conduct a systems screen based on movement system's six systems with information obtained first through interview and then through screening tests and measures. The systems, which are adapted from Deutsch et al.,²³ are presented below:

1. Cardiovascular: assessment (through interview) of shortness of breath, chest pain or pressure, irregular heartbeat, leg cramps with ambulation; and screening tests and measures of heart rate, blood pressure, temperature, pedal pulses, 2- or 6-minute Walk Tests (2MWT; 6MWT).
2. Pulmonary: assessment (through interview or observation) of shortness of breath, difficulty breathing, cough, wheezing; and screening tests and measures of breathing pattern respiratory rate, oxygen saturation, and 2- or 6MWT.
3. Integumentary: assessment and measurement of skin color, temperature, integrity, pliability (texture), presence of scar formation.
4. Musculoskeletal: assessment (through interview or observation) of joint pain, swelling or stiffness, weakness; and screening tests and measures of gross range of motion (ROM), gross strength, posture and symmetry, joint temperature and alignment, Five Times Sit to Stand Test.

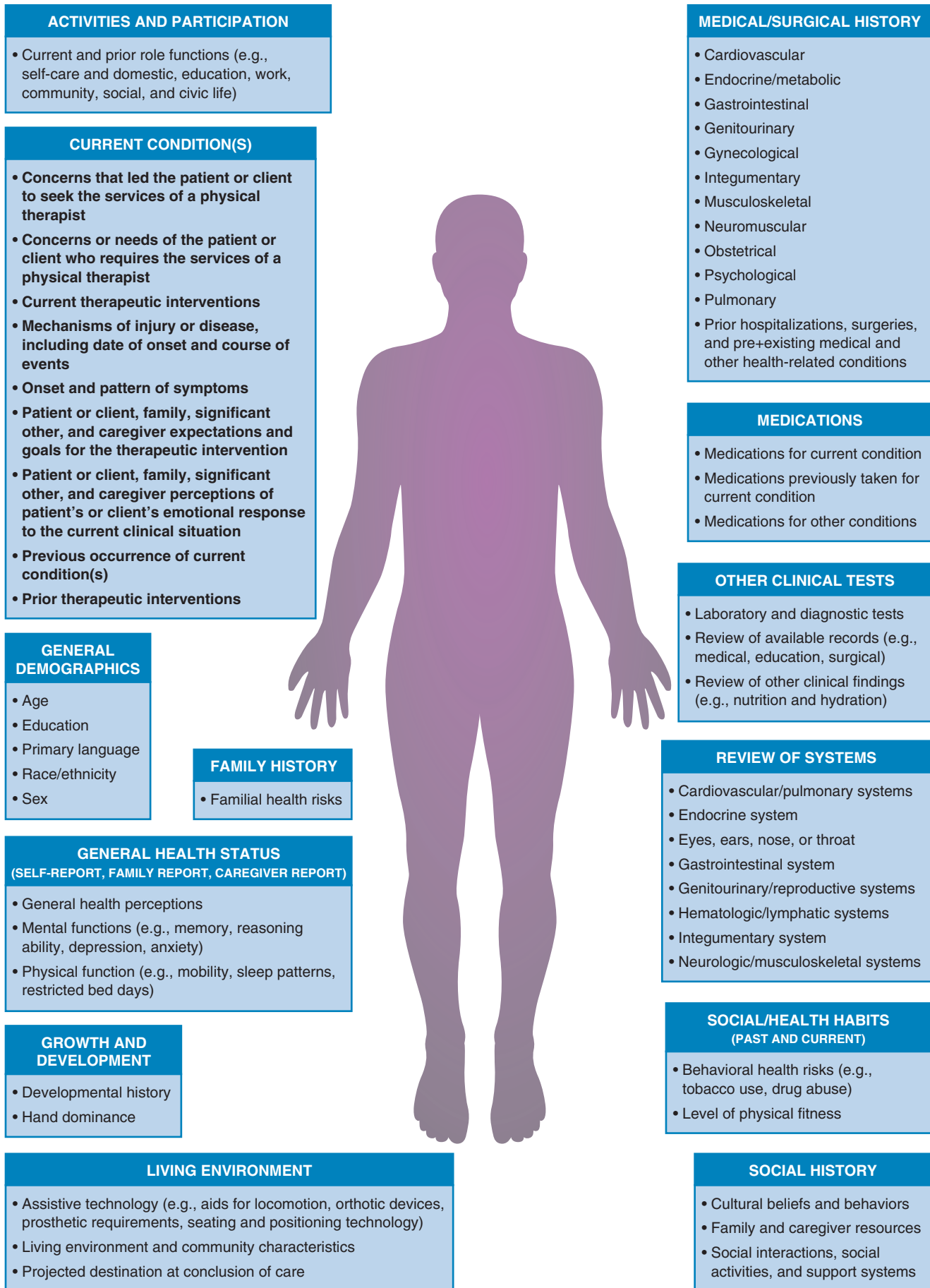


Figure 1.4 Types of data that may be generated from a patient or client history. *Principles of Physical Therapist Patient and Client Management. Guide to Physical Therapist Practice 3.0. American Physical Therapy Association; 2014. <http://guidetoptpractice.apta.org/content/1/SEC2.body>.*

Box 1.3 Representative Interview Questions^{23,26,27}**Patient's Reasons for Seeking Care**

- Why are you seeking care?
- What would you like to do? What activities and experiences are important to you? When was the last time you were able to do the activities you desire? What are you able to do? What are you unable to do?
- How limiting is the problem for which you are seeking care?
- How long have you had this problem?
- What do you think is contributing to this problem? What makes it worse? Better?
- Are there other factors or health conditions that you think I should know about?

Patient's Goals

- What do you hope to achieve with therapy?
- What would you consider as benchmarks (examples) of progress toward your goals?

Patient's Role in Society

- What roles do you play (e.g., at home, at work)?
- How do the identified problem(s) interfere with your important home, work, and social activities?

Patient's Resources and Constraints (including available social supports)

- What is your prior physical therapy experience, knowledge of your health condition, and recent physical activity?
- What kind of assistance do you get daily from family and friends?
- What additional assistance do you (or your family members, significant others) think you need from family or others?
- How feasible is access to health care—both financially and in terms of accessibility (e.g., distance, transportation, schedule, insurance coverage)?

Environmental Conditions in Which Patient Activities Typically Occur

- 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?

Patient's Preferences for Solutions

- How do you prefer to learn and remember (e.g., verbal, written)?
- How safe do you feel in your home environment? Community environment?
- What specific concerns or fears do you have? What is your greatest concern?
- What barriers might make it difficult for you to do what you need to do to participate in therapy or reach your goals?
- What do you consider as facilitators to reach your goals?
- How ready are you to assume an active role in managing your care?
- How comfortable are you in changing a particular behavior that needs to change to optimize your outcome from this episode of care?
- What problems might be anticipated in the future? What can you do to eliminate or reduce the likelihood of that happening?

5. Endocrine: assessment (through interview or observation) of fatigue, recent weight loss or gain, usual level of blood sugar when checked (diabetes); and screening tests and measures of the Functional Assessment of Chronic Illness Therapy-Fatigue scale, 2- or 6MWT.
6. Neuromuscular: assessment (through interview or observation) of numbness or pins and needles, weakness, dizziness, problem with balance/falls,

headaches, loss of consciousness, visual changes; and screening tests and measures of gross sensory screen, gross reflex screen, Romberg test, Single Leg Stance, myotome/dermatome tests, gait observation or the Timed Up and Go Test, Five Times Sit to Stand Test, Tandem Walking Test, 2MWT, 6MWT, 10-meter Walk Test, balance confidence (with the Activities-specific Balance Confidence scale).

It is worth noting that some assessments (e.g., shortness of breath for cardiovascular and pulmonary assessments) or specific measurements (2MWT and 6MWT for cardiovascular, pulmonary, neuromuscular assessment) may be used to assess several systems at the same time. Information is also obtained about other major body systems (e.g., gastrointestinal, genitourinary) to determine if referral for additional medical evaluation is needed. Understanding areas of deficit along with having accurate knowledge of the main health condition allow the clinician to (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; and (4) focus the search of the origin of symptoms to a specific location or body part. An important starting point for identification of areas to be examined 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 conducted by a dysphagia specialist (speech-language pathologist).

Screening is 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., preperformance examinations), and working adults to identify the risk of musculoskeletal injuries in the workplace (e.g., ergonomic examinations). These screens may involve observation, oral history, and 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 or briefly examine a patient for indications of changes in functional status. The therapist then determines the need for physical therapy services based on completing a screening examination.

Examination

The purposes of the examination are to collect baseline data on participation and activity that will be used to determine clinical outcomes of the episode of care. Data from movement observations-analyses and tests/measures of participation, activity, and body function/structure are used to inform the evaluation, diagnosis, and prognosis. Examination consists of:

1. Mapping the patient's participation goals into relevant activities, followed by movement observation and analysis of the relevant activities the patient needs to achieve the participation goals with concurrent hypothesizing about what interferes (body function/structure limitations, the environment, or personal factors) in achieving the goals (see Fig. 1.5, left side).
2. Performance of specific tests and measures that quantify and rule in or out hypotheses related to the movement observation and analysis reasoning (see Fig. 1.5, right side).

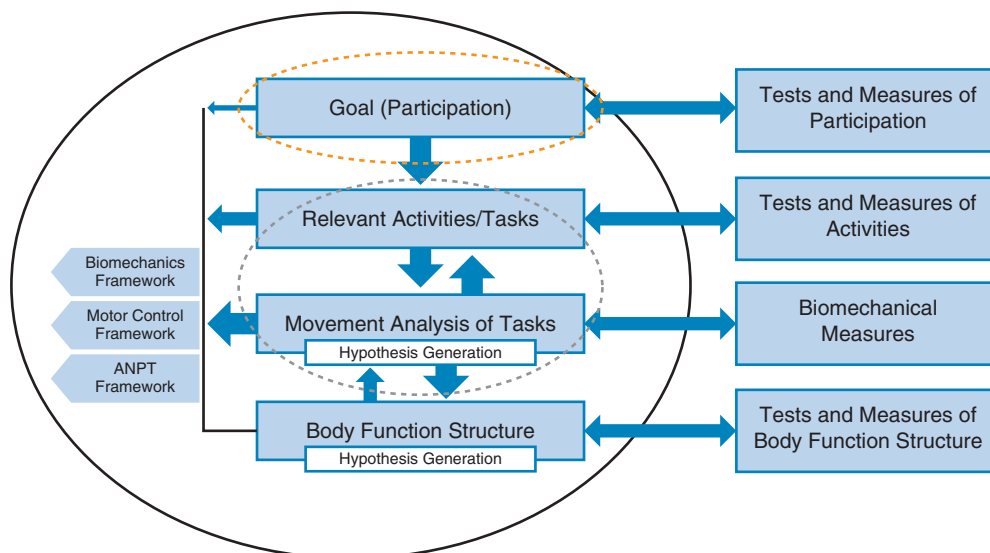


Figure 1.5 Examination consists of complementary processes of dissection of the participation goal into relevant activities, movement observation, and analysis of tasks (using three frameworks: biomechanics, Motor Control Framework, and Academy of Neurologic Physical Therapy (ANPT) Framework), hypothesis generation related to body function structure (left side) and administration of tests and measures (right side). The influences of ICF with personal factors (orange) and the environment (gray) are represented with dotted circles.

Participation Goal Mapping, Movement Observation, and Analysis of Relevant Tasks

First the clinician maps the client's participation goal into relevant component activities ICF or tasks (movement science) in the context of their personal factors identifying what the client is both able and unable to do. Activities that the clinician identifies as resources (able to do) need no further examination; those that are not performed successfully or efficiently require movement observation and are interpreted through a movement analysis of tasks.

The case study at the end of the chapter illustrates the process of mapping participation goals to relevant activities or tasks. One of client's participation goals is to return to gardening in her community garden. This participation goal requires that she walk on uneven surfaces (activity) and carry gardening tools while walking (activity), squat or bend down to the ground (task), sit on the ground (task), get up from the ground (task), shovel mulch into a wheelbarrow (task), transport mulch in the wheelbarrow (task), and manipulate tools and plants (task). These tasks may take place in various environmental conditions (e.g., weather, quality of the ground, and other people in the garden). Consideration will need to be given regarding which tasks she may need to delegate or have adapted to observe her hip precautions (e.g., transporting materials in the wheelbarrow or getting up from the floor).

Next, the clinician performs a movement observation and analysis of the relevant tasks that have been identified as important by the patient and the clinician. The term *tasks* is used here from movement science to be consistent with "task analysis" and "task-specific training." Movement analysis of tasks begins with movement observation, is followed by interpretation/analysis of how the task was performed, and leads to the generation of hypotheses of underlying body structure-function impairments. This information about the patient's movement is then analyzed and compared to what is known about typical performance of the relevant tasks under various environmental and contextual conditions to identify the specific aspects of movement that are problematic for the patient.

It is important that the clinician consider all aspects of the environment (physical, social, and attitudinal) included in the ICF. The environment has also been described from a movement science perspective using Gentile's taxonomy.²⁸ The taxonomy organizes movement into three factors:

1. Is the person stationary or moving?
2. Is the environment stationary or moving?
3. Is upper extremity manipulation required?

For the client in the case study with a participation goal of gardening, she needs to move and function in a stationary environment (garden) as a moving person with upper extremity (UE) manipulation tasks.

When feasible, movement analysis of activities-tasks should be examined in the environmental context in which the person executes them. For example, in the case study of the widow, the clinician may simulate an uneven surface and have the patient carry a bag with gardening tools while walking. The clinician then generates hypotheses about what may interfere with typical movement performance. Movement analysis of the tasks can be performed using biomechanical analyses of normal movement (e.g., gait, sit-stand, and running)²⁹⁻³¹ compared to movement changes as a result of disease, normal development, and aging.³²⁻³⁴ There are tools for movement observation and analysis (e.g., Motor Control Framework and the Academy of Neurological Physical Therapy Task Analysis) that can be applied regardless of health condition.^{35,36} The Academy of Neurological Physical Therapy Task Analysis framework has "observable constructs of movement" that can be observed across tasks. These would include description of, for example, movement symmetry and speed.³⁶

Based on the movement analysis of tasks, the clinician hypothesizes about potential body function/structure impairments that may interfere with optimal movement and activity-task performance. These hypotheses may be tested by combining movement observations with modification to the environment, as well as conducting relevant tests/measures (Fig. 1.5, right side). For example, the clinician may change the height of the chair during sit-stand to differentiate between a force-generation deficit or ROM limitation. Or, the clinician may measure lower extremity force generation using a Five Times Sit to Stand Test (activity) or manual muscle test and range of motion measurements of the hip (body structure/function). Where possible, the therapist should consult the literature for known relationships between body function/structure limitations and activity-task performance.

■ TESTS AND MEASURES

The use of tests and measures (Fig. 1.5, right side) complements the participation goal dissection and movement analysis of tasks (Fig. 1.5, left side). The selection of the tests and measures can occur at any level of the ICF categories (Fig. 1.5, right side) and should align with the patient's goals and as well as confirm the clinician's hypotheses that results from their movement observation. Tests and measures also provide performance-based and patient-reported measures to quantify the baseline participation, activity, and body function/structure impairment status. They are used to support the therapist's clinical judgments about the diagnosis, prognosis, and POC.⁴

Tests and measures may be performed in any order. 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 participation and