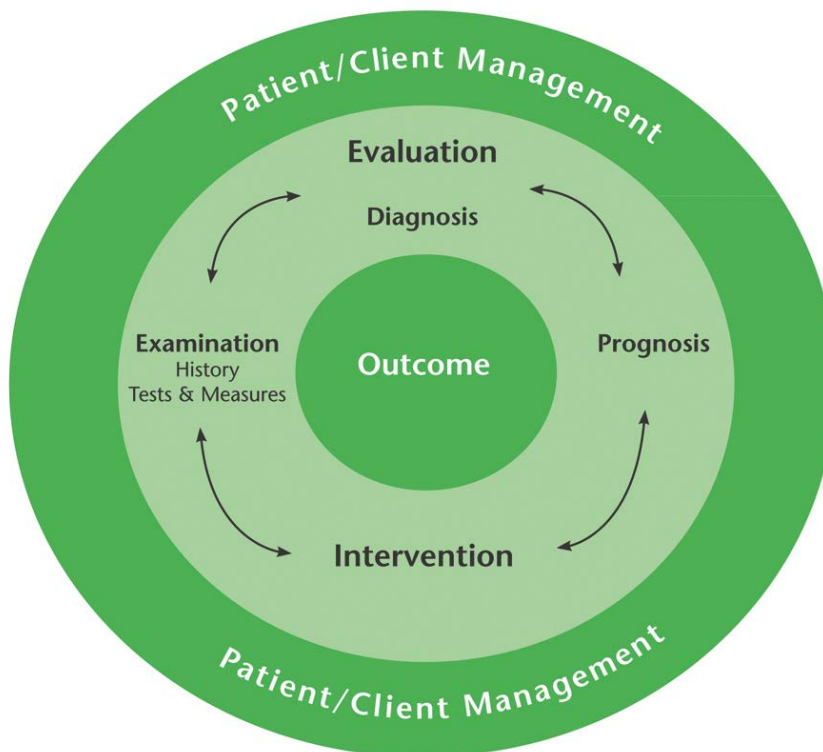


## Chapter 2

# How Are Physical Therapist Evaluations Performed, and What Tests and Measures Do Physical Therapists Use?

The evaluation portion of the management model (**Fig. 2-1**) consists of the following:

- Examination
  - History
  - Tests and measures
- Diagnosis
- Prognosis
- Intervention



**Figure 2-1.** Physical Therapist Patient/Client Management Model—Evaluation.

*Evaluation* refers to the physical therapist's synthesis of the findings from the history (including symptom investigation and the review of systems) and tests and measures (including initial screening or tests and measures of the 4 systems) to establish the diagnosis, prognosis, and plans for intervention as part of patient/client management. The clinical findings of the examination—such as the level of functioning, environmental and personal factors, and current health status--influence the intensity of the evaluative process. The physical therapist considers the onset of the current condition, the possibility of multisite or multisystem involvement, the presence of preexisting conditions or diseases, and the stability of the current and preexisting conditions.

Physical therapists also consider the probability of changes in functioning or prolonged impairment, activity limitations, and participation restrictions. They take into account relevant characteristics of the patient/client (eg, personal factors, values and preferences, and goals). Environmental factors, supports, services, and system needs also are considered, along with their impact on the current condition and goals of the patient/client.

## **Evaluation: Not a Linear Process**

The physical therapist's evaluation is an ongoing and iterative process that begins at the very first contact with the patient/client, including when the physical therapist starts gathering patient/client health information. Evaluation is a necessary process at the start of care to determine the diagnosis and prognosis; however, these elements may change throughout the episode of care based on additional information gathered during the examination and on the condition and patient/client response to care. As part of the evaluation, the physical therapist also

considers the patient/client response to tests and measures and interventions, integrating this information into the plan for intervention.

An evaluation is performed for all patients/clients who are seen by a physical therapist. Patients/clients are seen for tertiary, secondary, and primary prevention. (See “Key Concepts.”) In tertiary and secondary prevention, the evaluation generally is focused either on events that have occurred or on chronic conditions. In primary prevention, the evaluation is focused on potential diseases, health conditions, and injuries. An evaluation may focus on primary prevention concurrently with secondary and tertiary prevention.

## **Examination**

The examination has 2 components:

- Patient/client history (including symptom investigation and review of systems)
- Tests and measures ( including initial screening of the musculoskeletal, neuromuscular, cardiovascular/pulmonary, and integumentary systems)

Physical therapists obtain the patient/client history and perform tests and measures in order to make the diagnosis and determine the needs of the patient/client. The physical therapist has the responsibility to determine whether there is sufficient information to inform decision making regarding:

- Whether the patient/client would benefit from physical therapy

- Selection of interventions
- Development of the plan of care
- Implementation and progression of interventions

### ***Patient/Client History***

The history is a systematic gathering of data from the past and the present related to why the patient/client is seeking the services of the physical therapist. The data can be obtained through interview, through review of the patient/client health record, or from other sources.

The history includes information on the following:

- Demographic information
- Description of the current condition
- Reason for referral (if indicated)
- Personal and environmental factors, including social history, employment, and work (job/school/play)
- Growth and development
- Physical environment and available resources, including equipment
- General health status
- Social and health habits
- Family history
- Medical/surgical history
- Medications
- Diagnostic tests

- Current and previous functional status, including activity and participation.
- Needs for health restoration and risk reduction
- Coexisting conditions that might have implications for management

The history includes an initial investigation of symptoms that will be further explored during subsequent components of the examination. Symptom investigation is often critical in determining tests and measures that may be most appropriate to guide the evaluation.

The history also includes a **review of systems**. The review of systems consists of a series of questions or checklists that relate to general health and the functioning of specific body systems. The review of systems begins during the initial interview with the patient/client and usually is completed during the examination as physical findings and patient/client responses to questions prompt additional and more specific questions. The review of systems has multiple intended purposes:

- To identify symptoms originating from other body systems that may mimic those that can arise from the musculoskeletal, neuromuscular, cardiovascular/pulmonary, and integumentary systems, and, therefore, that can provide alternative explanations for the symptoms reported by the patient.
- To enhance the recognition and understanding of various symptoms to help identify malfunction in a specific body system resulting from (1) an undiagnosed disease or condition, (2) a worsening of a recognized condition, or (3) an adverse reaction to a medication or other medical treatment; any of these findings may indicate a need for referral or follow-up.

- To identify areas where the physical therapist may need to further assess risk, conduct additional screening, or recommend referral for risk assessment.
- To assist the physical therapist in determining whether physical therapy intervention is appropriate and whether communication with another health care professional is indicated.

The physical therapist uses both the information obtained during the history and the therapist's knowledge of available epidemiological data on the relative risk associated with various findings to begin to develop a hypothesis regarding the condition and to determine which tests and measures to use to determine an accurate diagnosis, prognosis, and plan of care.

### ***Tests and Measures***

Tests and measures are the means of gathering additional data on the patient/client. From the comprehensive history, including the investigation of symptoms and the review of systems, the physical therapist begins to determine patient/client needs and generates diagnostic hypotheses that may be further investigated by selecting more specific tests and measures. These tests and measures are used to (1) confirm or rule out the presence of and relationships among impairments of body function and structure, activity limitations, and participation restrictions and (2) establish a diagnosis, prognosis, and plan of care.

The physical therapist examination includes, at a minimum, screening or initial testing of the status of the musculoskeletal, neuromuscular, cardiovascular/pulmonary, and integumentary

systems. Vital signs should be collected on each patient/client as the minimum examination of the cardiovascular/pulmonary system. The specific tests and measures used for further assessment of the 4 systems will vary based on patient/client needs and condition in addition to the results of the history and initial tests and measures.

Each carefully tailored examination includes those specific tests and measures appropriate to the needs of the patient/client. Because the severity of patient/client conditions and needs varies, the examination process may vary and, therefore, may be as brief or as lengthy as necessary.

The physical therapist may decide to use one more than one test and measure or portions of several specific tests and measures as part of the examination, based on the purpose of the visit, the severity of the condition, the psychometric properties of the test or measure, and the clinical decisions made during the examination. Throughout the administration of tests and measures, the physical therapist observes and measures patient/client responses and begins to develop a preliminary diagnosis and prognosis that will lead to the selection of appropriate interventions to meet patient/client needs.

## Types of Tests and Measures That Physical Therapists Use

### Aerobic Capacity/Endurance \*

#### Description

*Aerobic capacity/endurance* is the ability to perform work or participate in activity over time using the body's oxygen uptake, delivery, and energy release mechanisms. Responses that are monitored both at rest and during and after activity may indicate the degree of severity of the impaired body function or structure, activity limitation, or participation restriction.

#### Indications

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for aerobic capacity/endurance tests and measures may include, but are not limited to, the following:

- Abnormal blood pressure
- Abnormal heart rate
- Abnormal oxygen saturation
- Abnormal respiratory pattern and rate
- Bed rest or other significant activity limitations
- Limited capacity for functional activities due to perceived exertion or shortness of breath

#### Tests and Measures

Examples include, but are not limited to, the following:

- Auscultation
- Blood pressure
- Breathlessness/dyspnea scales



- Electrocardiography
- Endurance testing
- Heart rate
- Oximetry
- Palpation
- Perceived exertion scales
- Pulmonary function tests
- Respiratory rate
- Shuttle tests
- Step tests
- Treadmill tests
- Walk tests
- Wheeled mobility propulsion tests

## Scenarios \*\*

- A 15-year-old teenager is deconditioned and unable to return to the current season of basketball status after bilateral femoral fractures. The physical therapist may use a shuttle test and treadmill test with a perceived exertion scale to determine the gap between current function and function needed to play basketball.
- A 13-year-old teenager is attending middle school in a small rural community. He receives special education due to difficulties with mathematical concepts, slow processing skills, and socioemotional challenges. He is referred for physical therapist evaluation due to limited stamina for classroom work and refusal to participate in gym classes. The physical therapist may complete an interest and participation inventory tool. After a relationship is established, the teenager may agree to complete a test of motor development to help identify problems or delays in motor development and assist in planning an intervention that meets his needs and areas of interests. A treadmill, stationary bicycle, or run/walk test also may be used to measure fitness level, as it could contribute to his feeling of exertion and refusal to participate. A perceived exertion scale may be used at varied levels of physical effort to quantify tolerance.
- A 70-year-old man is unable to walk to the local park to play checkers with his friends due to impaired endurance secondary to chronic obstructive pulmonary disease. The physical therapist may use a walk or treadmill test with a perceived exertion or breathlessness scale, in addition to measuring the oxygen saturation level to determine initial status for distance and speed.
- A 40-year-old woman with multiple sclerosis also has impaired endurance. She currently is able to perform independent transfers to and from her car and power wheelchair, which allows her to pick her children up at school. The physical therapist may use a perceived exertion scale to measure her exertion with different types of transfers.

- A 90-year-old woman was hospitalized on bed rest for 9 days for urinary tract infection, pneumonia, and exacerbation of underlying congestive heart failure. Before this hospitalization, she was independent in activities of daily living (ADL); however, she required assistance with instrumental activities of daily living (IADL). She currently is dependent in all ADL. The physical therapist may test her resting vital signs of blood pressure, heart rate, and respiratory rate in addition to her oxygen saturation level. The physical therapist also may administer a test to establish a baseline and monitor progress with a perceived exertion test to help the patient/client return to her pre-hospitalization activity level.
- A 26-year-old woman with rheumatoid arthritis was referred to a physical therapist following a motor vehicle accident in which her car was struck from behind. She is obese with increased thoracic kyphosis and is unable to work due to pain. The physical therapist may use a walk test to determine a baseline for activity levels.
- A 40-year-old woman has been active in a walking program and is interested in participating in running. Her initial goal is to run a 5K race, and her ultimate goal is to complete a marathon. The physical therapist may use a treadmill test and a perceived exertion scale for examination and reexamination to compare initial status with response to intervention.

*\* Tests and measures included in the Guide are only those that can be performed by a physical therapist. There are other tests and measures performed by other health care practitioners that may be critical to the physical therapist's decision-making process. Information from these tests and measures may be gathered from a patient/client chart, from communication with other providers, or from the patient/client as part of the history. A physical therapist also may refer the patient/client for testing that would be useful to patient/client management. Although this is valuable information used by the physical therapist, the tests and measures used to gather this type of information are not included in the Guide unless they can be performed by a physical therapist.*

*\*\* The scenarios are not intended to fully describe the tests and measures that would be used for each patient/client. The scenarios are narrowly focused to illustrate the category being addressed and are not intended to be inclusive of all tests and measures that would be performed in clinical practice. Tests and measures from a number of categories would be used in actual practice to support clinical decision making.*

## **Anthropometric Characteristics \***

### **Description**

*Anthropometric characteristics* are those traits that describe body dimensions, such as height, weight, girth, and body fat composition.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for anthropometric tests and measures may include, but are not limited to, the following:

- Abnormal blood pressure
- Abnormal body mass index (BMI) or waist circumference
- Abnormal fluid distribution/edema
- Amputation
- Anorexia
- Assistive technology prescription
- Congestive heart failure
- Edema
- Elderly individual living alone
- High-risk pregnancy
- History of mastectomy
- Poor body image
- Significant weight loss or weight gain

### **Tests and Measures**

Examples include, but are not limited to, the following:

- BMI
- Body length measurement
- Girth measurement
- Head circumference

- 297 • Height/weight measurement
- 298 • Impedance measurement
- 299 • Observation
- 300 • Scales
- 301 • Skinfold thickness measurement
- 302 • Volumetry
- 303 • Waist circumference
- 304

305 **Scenarios \*\***

- 306 • A 52-year-old woman currently has intermittent swelling of her left arm that varies with activity.  
307 Four years ago, she was diagnosed with breast cancer, which was treated with left modified  
308 radical mastectomy and auxiliary lymph node dissection. She has been in remission since her  
309 treatment and just had a follow-up scan. She continues to be in remission since her initial  
310 treatment. The physical therapist may take circumferential measurements of both arms for a  
311 comparison and to determine a baseline for the affected limb.  
312
- 313 • A 9-year-old girl sustained a motor and sensory complete C7 spinal cord injury (SCI) in a motor  
314 vehicle accident when she was 5 years of age. Recent radiographic examination showed a  
315 dislocation of the right hip with shallow acetabulum that requires surgery. She is independent in  
316 basic activities of daily living (ADL), and her goal is to return to her presurgery functional level.  
317 The parents are concerned that their daughter's body weight appears to be increasing more than  
318 they would expect for her age. The physical therapist may use an age-adjusted body mass  
319 measure and may take seated body measurements to determine whether the hip dislocation  
320 resulted in a leg-length discrepancy requiring seating system accommodation to prevent  
321 secondary complications of postural deformity or pressure. The therapist also may make a referral  
322 to a dietician for a healthy lifestyle plan.  
323
- 324 • A 68-year-old man had a right transtibial amputation (below-knee amputation) 6 years ago after a  
325 farming accident. He lost weight during the past 6 months and now finds that his prosthesis no  
326 longer fits properly. He has been trying to lose weight by changing his diet, but he now has  
327 difficulty ambulating and has some soreness when walking with the prosthesis. Visual inspection  
328 of the residual limb shows redness over the right tibial tuberosity. The physical therapist may  
329 measure the residual limb using girth measurements and contact the prosthetist for prosthetic  
330 modification.  
331
- 332 • A 37-year-old man is being seen by a physical therapist for a shoulder injury. As part of the  
333 routine examination, body mass index (BMI) is calculated, which puts him in the "high  
334 overweight" category. The physical therapist may use an additional test (waist circumference) to  
335 further confirm the finding.  
336

- A 42-year-old woman reports low back pain. She returns to the physical therapist who treated her shoulder injury last year. The therapist notes that the patient/client appears to be borderline cachectic, and her history reports a recent weight loss. Upon further questioning, she indicates that she did not attempt to lose weight and thinks the weight loss might be because of fatigue. She reports her back pain has been waking her up at night. The physical therapist is concerned a spinal pathology may be the cause of her pain. The physical therapist suggests some sleeping positions that might improve comfort and also contacts the primary physician to report findings and assists the patient in making an appointment with her physician prior to further physical therapy follow-up.

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## **Balance \***

### **Description**

*Balance* is the ability to maintain the body in equilibrium with gravity both statically (ie, while stationary) and dynamically (ie, while moving). Balance is the condition in which all of the forces acting on the body are in equilibrium such that the center of mass is within the stability limits and the boundaries of the base of support. The goals of attaining or maintaining a balanced state are achieved through integration, which includes, but is not limited to, visual, vestibular, neuromuscular, and somatosensory system integration. *Functional balance* requires integration and response to stimuli from the current environment, previous experiences, and/or current task requirements.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for balance tests and measures may include, but are not limited to, the following:

- Difficulty rising from a chair
- Difficulty with home, work, or leisure activities that require skilled balance reactions
- Falling 1 or more times during a year
- Fear of falling
- Gait impairments, such as short, uneven steps or a wide-based or very slow gait
- Inability to achieve and/or maintain normal posture, motor milestones, and/or normal mobility; loss of balance and/or falls; and/or history of disturbances of the central nervous system (including, but not limited to, age-related changes) known to disrupt posture, balance, and/or mobility.
- Inability to sit unsupported (hands-free) while maintaining a balanced, midline upright seated – posture
- Inability to stand unassisted with a narrow base of support
- Inability to stand with eyes closed
- Instability while reaching in any posture (eg, sit, stand)

- Patient/client is unable to turn in a circle or does so very slowly
- Use of assistive device

## Tests and Measures

Examples may include, but are not limited to, the following:

- Balance tests
- Cognitive screenings
- Environmental analysis
- Fall risk analysis
- Medication reviews
- Neuromuscular screening, including cranial nerves
- Positional testing
- Questionnaires
- Standardized gait analysis
- Strength and endurance testing
- Tandem or single-leg stance
- Technology-assisted analysis
- Vision assessment
- Vital signs

## Scenarios \*\*

- A 3-year-old child with cerebral palsy is brought to the physical therapist as the mother is concerned she has not yet begun walking. The physical therapist may perform balance tests in sitting and quadruped positions to determine how balance impairments may be affecting the child's ability to maintain an upright posture.
- A 61-year-old woman has been admitted to the acute rehabilitation hospital for a left middle cerebral infarct that occurred 10 days ago. She has a partial right visual field cut and is unable to stand without maximal assistance. The physical therapist will test balance in sitting, supported and unsupported, and perform balance testing in the hospital loaner wheelchair and seating system to determine baseline balance status and function. The physical therapist also may discuss initial goals with the patient.
- A 32-year-old experienced house framer is receiving physical therapy for an on-the-job back injury. His job requires him to be able to carry heavy loads while walking across narrow support beams. The physical therapist may decide to use a computerized, interactive technology system to evaluate balance in a variety of situations, especially those that simulate the conditions in which he works.

- An 88-year-old, community-dwelling, aging man is screened by a physical therapist at a community screening day. The physical therapist may decide to screen his balance and his risk of falling, using standardized balance testing that provides normative data for his age group.
- An 82-year-old man is healthy and active. He is planning a trip to Europe and is concerned about maintaining his balance while walking on cobblestones. The physical therapist administers a standardized gait analysis to determine his ability to maintain balance during gait on uneven surfaces. The physical therapist refers him to the 6-week balance improvement program at the community center, and the therapist repeats the examination at the end of the program.
- A 78-year-old man has been diagnosed with hypertension and an arrhythmia for which he takes medication. He has been feeling lightheaded and dizzy lately, especially after eating. He has significantly decreased his social activities for fear that he might have an episode of syncope. His goal is to return to his health and social habits, which includes weekly league bowling. The physical therapist may use auscultation and other vital sign measures to determine cardiac responses to changes in position and activity and a medication screen to determine the need for referral and consultation for polypharmacy.
- A 58-year-old woman with osteoarthritis and asthma has been feeling like the “room is spinning” intermittently and feels off balance when walking. She really wants to return to her exercise class at the senior center, but she is concerned that she may fall. The physical therapist may examine the vestibular system using positional testing.

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## **Circulation (Arterial, Venous, Lymphatic) \***

### **Description**

*Circulation* is the movement of blood through organs and tissues to deliver oxygen and remove carbon dioxide and the passive movement (drainage) of lymph through channels, organs, and tissues for removal of cellular byproducts and inflammatory wastes.

### **Indications**

Tests and measures may be indicated based on the patient/client history and self-report of symptoms or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for circulation tests and measures may include, but are not limited to, the following:

- Abnormal temperature of digits or abnormal response to cold
- Abnormal vital signs at rest or with activity
- Chronic dependent edema
- Congenital heart defect
- Deep vein thrombosis (DVT)
- Diabetes
- Lower-extremity pain that limits walking distance
- Lymphedema
- Painful edematous extremities
- Peripheral arterial disease
- Shiny, waxy lower extremities that are cool to the touch
- Venous insufficiency
- Vulvovaginal pain

### **Tests and Measures**

Examples may include, but are not limited to, the following:

- Ankle-brachial index (ABI)
- Capillary refill tests
- Doppler ultrasound test

- 504 • Girth measurements
- 505 • Model for assessment of DVT
- 506 • Palpation of pulses
- 507 • Skin temperature
- 508 • Treadmill tests for claudication
- 509 • Venous filling tests
- 510 • Volumetric measures
- 511 • Walk tests
- 512

### 513 **Scenarios \*\***

- 514 • A 52-year-old woman has intermittent swelling of her left arm that varies with activity. Four  
515 years ago, she was diagnosed with breast cancer that was treated with left modified radical  
516 mastectomy and axillary lymph node dissection. She has been in remission since her treatment.  
517 The physical therapist may use circumferential measurements to determine the status of swelling  
518 in the affected arm as a baseline for comparison during management.
- 519 • A 52-year-old man had a knee replacement 1 week ago. He reports calf pain and swelling, which  
520 are limiting his walking ability and his functional activity level at home. The physical therapist  
521 may use girth measurements and a model of assessment for DVT to determine the likelihood of a  
522 DVT and the need for notifying the primary care physician.
- 523 • A 62-year-old man reports cramping and pain in the legs when walking 1 or 2 blocks; his  
524 discomfort is relieved upon rest. He travels for his job and finds that his symptoms are limiting  
525 his performance. A physical therapist may perform palpation of pulses, an ABI or a Doppler  
526 ultrasound test, and a walk test to determine a baseline to help the patient/client determine goals  
527 for work.
- 528 • A 70-year-old woman with type 2 diabetes is independent in transfers and walking, but she is  
529 having difficulty sleeping because of leg pain. She does not notice the pain during the day when  
530 she is sitting in her chair. She would like to be able to sleep better at night. To help determine an  
531 optimal sleeping position, the physical therapist may palpate lower-extremity pulses, measure  
532 skin temperature, and use a walk test to determine whether the pain is due to arterial circulation  
533 insufficiency.
- 534 • A 55-year-old woman with obesity recently had a right total hip replacement. She should be out  
535 of bed and ambulating with assistance; however, she reports mild right lower-extremity pain that  
536 limits her mobility. The physical therapist may perform palpation of pulses and a lower-extremity  
537 Doppler ultrasound test to determine whether to treat her or contact her physician with the  
538 findings.
- 539 • A 56-year-old woman with post-polio syndrome resulting in quadriparesis uses a power  
540 wheelchair for all mobility up to 12 hours per day. She has severe chronic dependent lower-

extremity edema and is using ace wraps to attempt to manage edema, with no success. The physical therapist may use skin inspection, palpation of pulses, and capillary refill tests determine whether the addition of power seat functions to her current power wheelchair should be considered to address circulatory findings.

- A 55-year-old woman who has undergone chemotherapy in the past for breast cancer wants to improve her exercise endurance and fitness now that the physician says that she is in remission. She complains of leg fatigue and pain with walking. A physical therapist may measure pulses and perform an ankle-brachial index (ABI) test to establish a baseline and monitor progress toward her goals.
- A 42-year-old woman has a body mass index (BMI) of 32 and a history of type 2 diabetes. She is unable to walk more than 3 minutes at a time because of bilateral calf pain and is unable to walk with her friends. The physical therapist may measure skin temperature and conduct a treadmill test to determine the time of onset of pain.

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## **Community, Social, and Civic Life \***

### **Description**

*Community, social, and civic life* integration or reintegration involves the assuming or resuming of roles and functions in the community, such as gaining access to transportation (eg, driving a car, boarding a bus, negotiating a neighborhood), to community businesses and services (eg, bank, shops, parks), to public facilities (eg, attending theaters, town hall meetings, places of worship). Social integration or reintegration involves the assuming or resuming of roles and functions of avocational and enjoyable pastimes, such as recreational activities (eg, playing a sport) and age-appropriate hobbies (eg, collecting antiques, gardening, making crafts). Civic integration or reintegration refers to participation in and building of the community, including service, social connectedness, and political action.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for community, social, and civic life tests and measures may include, but are not limited to, the following:

- Abnormal movement control
- Amputation
- Asthma
- Calf cramps with walking
- Cerebral palsy
- Cerebral vascular accident
- Decreased endurance
- Decreased strength
- Isolation or depression
- Mobility limitations

- Pelvic floor dysfunction
- Peripheral vascular disease
- Rheumatologic disease

## Tests and Measures

Examples may include, but are not limited to, the following:

- Accessibility analysis
- Activity profiles
- Barrier identification, interviews, observations
- Disability indexes
- Environmental analysis
- Functional capacity tests
- Functional status questionnaires
- Health and well-being measures
- Instrumental activities of daily living (IADL) scales
- Interview
- Observations
- Quality of life measures
- Transportation analyses

## Scenarios \*\*

- A 44-year-old man with tetraplegia reports that he serves on the school board, attends frequent public meetings, and participates in the community wheelchair basketball team. This requires that he attend multiple meetings in addition to his typical daily activities, resulting in 10 or more car transfers per day. As part of the evaluation process, the physical therapist may administer activity profiles and perform a transportation analysis and functional capacity tests.
- A 6-years-old girl with spina bifida wants to participate in a swimming class. The physical therapist may accompany the girl and her mother to the pool prior to the first class to determine access options and consider what swimming activities may be most appropriate. The physical therapist may contact the instructor to discuss any needs for flotation assistance for the girl's lower extremities.
- A 55-years-old woman has multiple sclerosis that has progressed to the point that she is no longer able to participate in volunteer work at a community shelter. She previously had been able to walk to the shelter for planning meetings and to assist in meal preparation on the weekends. The physical therapist may obtain data through interview and observation and administer functional

status questionnaires, IADL scales, functional capacity tests, and a transportation analysis to identify past, current, and desired levels of functioning. The physical therapist may investigate the safety and feasibility of alternative forms of transportation, from a motorized scooter to local access buses with accommodations for access and regress.

- Based on physician report, a 45-year-old woman has type 2 diabetes that is poorly managed. She is amenable to starting an activity program to attempt to control her insulin levels. The physical therapist may assist in establishing a program that addresses self-monitoring and may help identify motivating factors in the community that can support participation in an activity program, such as a walking group.

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## **Cranial and Peripheral Nerve Integrity \***

### **Description**

*Cranial nerve integrity* is the intactness of the 12 pairs of nerves connected with the brain, including their somatic, visceral, and afferent and efferent components. *Peripheral nerve integrity* is the intactness of the spinal nerves, including their afferent and efferent components.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for cranial and peripheral nerve integrity tests and measures may include, but are not limited to, the following:

- Amyotrophic lateral sclerosis
- Cerebrovascular accident (CVA)
- Crush injuries
- Decreased expansion and excursion of chest with ventilation
- Difficulty dressing
- Encephalitis
- Erb palsy
- Guillain-Barré syndrome
- Increased falls
- Labyrinthitis
- Neuropathic ulcer
- Numb and tingling fingers or toes
- Repetitive activities
- Spinal cord injury
- Staggering gait

## Tests and Measures

Examples may include, but are not limited to, the following:

- Compression tests
- Discrimination/tactile sensory tests
- Dynamometry
- Electroneuromyography
- Manual muscle tests
- Observations
- Provocation tests
- Reflex testing
- Thoracic outlet tests
- Visual tests

## Scenarios \*\*

- A 38-year-old female software programmer reports a history of right upper-extremity pain that occurred over many years. She had carpal tunnel release on the right hand 4 years ago and reports that her symptoms were 90% resolved until 9 months ago. She describes occasional paresthesia in the volar aspect of her right forearm. The physical therapist may perform sensory tests in addition to upper-limb tension tests to compare the right arm with the left arm to assist in determining an appropriate plan to allow the patient to meet her goal of lifting and playing with her 3-year-old and 5-year-old without pain.
- A 50-year-old male engineer sustained multiple traumatic injuries in a motor vehicle accident. He reports difficulty pulling his right foot up. Prior to the accident, he was working full time and had no activity limitations. The physical therapist may perform a tactile test, a muscle test, and an electromyography test to make a diagnosis and assist in planning for intervention.
- A 71-year-old had an acute CVA that affected the left hemisphere. Because of his body positioning and apparent left-sided neglect, the physical therapist may use observation and a visual field test, tactile testing, and muscle testing to assist in determining an appropriate plan of care.
- A 50-year-old woman with an 8-year history of type 2 diabetes has been taking insulin; however, she reports that she is not very organized in monitoring her health needs, and she now is having difficulty with her balance and reports tingling in her feet. The physical therapist may perform manual muscle tests and sensory tests on both feet to measure the level of impairment to assist in developing a plan to increase her safety.



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## 773 **Domestic Life \***

### 774 **Description**

775 *Domestic life* is the ability to perform the more complex instrumental activities of daily living (IADL)  
776 required to live independently. These activities include structured play (for infants and children) and  
777 activities required to manage a home, such as shopping, household chores, caring for dependents, home  
778 maintenance, yard work, and money management.

### 779 **Indications**

780 Tests and measures may be indicated based on the patient/client history, including symptom investigation,  
781 or based on the detection of signs by the physical therapist during examination and patient/client  
782 management.

783  
784 Indications for domestic life tests and measures may include, but are not limited to, the following:

- 785 • Decreased balance (dynamic or static)
- 786 • Decreased cognitive function
- 787 • Decreased coordination
- 788 • Decreased joint mobility
- 789 • Decreased muscle endurance
- 790 • Decreased strength
- 791 • Decreased visual or auditory acuity
- 792 • Depression
- 793 • Difficulty performing housework (eg, cooking, cleaning, home maintenance, yard work)
- 794 • Loss of weight without apparent medical reason
- 795 • Perinatal limitations
- 796 • Slow, laborious movement or excessive time to complete instrumental activities of daily living
- 797 (IADL)
- 798 • Shortness of breath
- 799 • Structural and environmental home barriers
- 800 • Unkempt house or room

801

### 802 **Tests and Measures**

803 Examples may include, but are not limited to, the following:

- 804 • Caregiver abilities analysis

- Cognitive screening/assessments
- Depression screenings
- Home visits (eg, environmental safety analyses, including, but not limited to, lighting, accessibility, adaptability, safe habitation, and space needs)
- Observation of IADL
- Observation of specific identified problem tasks
- Pain measurement during domestic tasks
- Patient-specific IADL instruments

## Scenarios \*\*

- A 66-year-old man reports difficulty getting the grain into the feeder for his horse. The physical therapist may use a home visit to identify potential barriers and modifications or solutions.
- A 72-year-old woman who lives alone recently developed adhesive capsulitis and is having difficulty managing at home. The physical therapist may observe her performance of the activities that she reports she is unable to do without difficulty and then identify other tests and measures that may be needed to help increase independence.
- An 8-year-old girl with cerebral palsy and spastic hemiplegia is able to ambulate independently with an ankle-foot orthosis and a Loftstrand crutch on flat surfaces indoors and on the playground. The physical therapist may evaluate her ability to access and play on the playground equipment. The physical therapist also may use a variety of assistive technologies to determine adequate strategies to enable the girl to participate on the playground safely.

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## **Environmental Factors \***

### **Description**

*Environmental factors* are the factors that make up the physical, social, and attitudinal environments in which people conduct their lives. These factors include products and technology; natural and built environments; support and relationships; and services, systems, and policies. An environmental factor can be a barrier either because of its presence (eg, negative attitudes towards people with disabilities) or its absence (eg, the unavailability of a needed service). The effects of environmental factors on the lives of people with health conditions are varied and complex.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications may include, but are not limited to, the following:

- Anticipated life transitions
- Fall risk or history of falls
- Isolation
- Immobility, including barriers to safe home transfers or ingress and egress to the community
- Inability to negotiate physical barriers such as stairs, inclines, thresholds, uneven terrains, and floor coverings
- Stigmatizing or discriminatory practices that limit full inclusion in the community
- Unknown level of caregiver assistance

### **Tests and Measures**

Examples may include, but are not limited to, the following:

- Accessibility measurements of the built and applicable natural environment
- Angular and linear measurements of the physical environment

- Assistive technology needs analysis
- Barrier identification
- Caregiver abilities/caregiver resources analysis
- Environmental analysis
- Equipment trial and simulation
- Health and well-being measures
- Interview
- Observation
- Photographs/videos
- Quality-of-life measures
- Safety analysis
- Transportation analysis

## Scenarios \*\*

- A 24-year-old man with tetraplegia at the C3 level who is ventilator dependent is preparing for discharge to a home environment. He needs an analysis of his home environment, recommendations for home modifications, assistive devices, and training for himself and his personal care assistant. The physical therapist may perform an environmental and caregiver analysis and make detailed recommendations that include home modifications, equipment recommendations and justification, caregiver training in appropriate use, and referral to appropriate community resources.
- A 72-year-old woman with chronic obstructive pulmonary disease (COPD) and diabetic neuropathy has had frequent falls. She would like to remain living in her home and resides alone. The physical therapist may perform an environmental analysis of the floor surfaces and coverings, thresholds, and stairs; safety analysis (with or without an assistive devices for ambulation in her environment, appropriate use of footwear, and/or orthoses); and a lighting and obstacle analysis.
- A 52-year-old woman with multiple sclerosis (MS) who has a decrease in functional ambulation following a recent exacerbation resides in an apartment building with a 1-step entrance. She is no longer able to safely negotiate her environment using her rollator walker, and she is not able to use a manual wheelchair. She would be a candidate for a scooter if her building management would agree to ramp the 1-step entrance to the building. The physical therapist may assess and recommend community resources—including advocacy groups, such as the area independent living center or the local MS chapter—to help advocate for an accessible entrance to her building.
- A 6-year-old boy with muscular dystrophy (MD) has a declining ability to ambulate. He is an elementary student who is struggling to keep up with his peer group on the playground. His parents are concerned that, if he uses a wheelchair, he will give up ambulating altogether and his

status will decline more rapidly. The physical therapist may interview the parents to obtain information related to their knowledge and expectations surrounding MD and progression and may complete a functional and assistive technology needs analysis, an environmental analysis of home/school and terrains typically encountered, and a transportation analysis to determine capacity for safe transit of a wheeled mobility device in the family and school vehicles.

- A 72-year-old woman who lives alone recently developed adhesive capsulitis and is having difficulty managing at home. The physical therapist may observe the performance of activities that she reports she is unable to do and determine other tests and measures that may be needed to help increase independence.
- A 12-year-old boy with athetoid cerebral palsy is being evaluated for his potential to access switches for driving a power wheelchair. The physical therapist may examine his primitive reflexes (asymmetrical tonic neck reflex [ATNR] and asymmetrical tonic neck reflex [STNR]) as his neuromotor status will factor into the clinical decision making for selection of an access site and switch locations and selection of power seat functions. The physical therapist may determine that influence of STNR suggests that power tilt or recline is contraindicated or unsafe if the patient/client cannot quickly deactivate the switch.

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## **Gait \***

### **Description**

*Gait* comprises the functions of movement patterns that are associated with walking, running, or other whole-body movements.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for gait tests and measures may include, but are not limited to, the following:

- Complaints of pain with walking or running
- Coordination impairments (eg, balance disorders, ataxia, athetosis)
- Decreases in strength or range of motion
- Impaired endurance
- Inefficient locomotion (speed, endurance, safety)
- Report of falls
- Skeletal alignment or joint impairments
- Skeletal deformity
- Use or need of assistive technology for walking, running, or moving

### **Tests and Measures**

Examples may include, but are not limited to, the following:

- Gait analysis analysis (eg, gait cycle, cadence, stance time, toe off/heel strike, swing time, abnormal postural changes)
- Motion analysis
- Observation of the use of assistive/adaptive devices and orthotic and prosthetic devices
- Observation/qualitative analysis of movement patterns and functions
- Postural analysis
- Technology-assisted mobility analysis systems

**Scenarios \*\***

- A 26-year-old man sustained an incomplete spinal cord injury in a motor vehicle accident and has lower-extremity muscle weakness. The physical therapist may conduct a complete gait analysis to determine the effect of the weakness on his pattern of walking.
- A college football player has recurrent ankle injuries that he reports occur during backwards running. The physical therapist may use motion analysis to examine his backwards running gait cycle for abnormalities in foot and leg placement.
- A 56-year-old woman has had an above-knee amputation and has received her prosthesis. The physical therapist may conduct a specific gait examination with the new prosthesis, after each prosthetic adjustment, and at regular intervals of her training to measure progress toward a normalized gait.

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## **Joint Integrity and Joint Mobility \***

### **Description**

*Joint integrity* is the intactness of the structure and shape of the joint, including its osteokinematic and arthrokinematic characteristics. The tests and measures of joint integrity are used to examine the anatomical and biomechanical aspects of the joint. *Joint mobility* is the ability to move the joint and takes into account the structures and shape of the joint surfaces as well as the characteristics of tissue surrounding the joint. The tests and measures of joint mobility are used to examine both active and passive range of motion as well as arthrokinematic, osteokinematic, and accessory joint movements, which may or may not be under voluntary control.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for joint integrity and joint mobility tests and measures may include, but are not limited to, the following:

- Abnormal gait, locomotion, and balance
- Decreased muscle strength, endurance, and/or coordination
- History of a condition or disorder affecting 1 or more joints
- Joint injury
- Joint instability
- Joint pain
- Joint swelling
- Limited spine/extremity motion
- Observation of abnormal movement patterns
- Observation of abnormal posture
- Presence of activity limitations involving movement
- Symptoms that could be referred pain from a joint

## Tests and Measures

Examples may include, but are not limited to, the following:

- Active combined movement testing, such as a test that requires placing the hands behind the back
- Apprehension tests
- Arthrokinematics, including end-feel
- Arthrometry
- Compression tests
- Distraction tests
- Goniometry
- Ligamentous and joint capsule stability or integrity tests
- Manual tests of accessory motion
- Overpressure to active and passive movements to determine joint end-feel
- Passive accessory movement testing, passive physiological movement testing, and combined passive movement testing
- Qualitative movement analysis
- Technology-assisted analysis systems
- Ultrasound for joint morphology and movement

## Scenarios \*\*

- A 54-year-old woman has significantly decreased motion with pain in her right shoulder with no apparent etiology. The physical therapist may perform overpressure to active and passive movements of her shoulder to determine joint end-feel in addition to performing ligamentous and joint capsule stability or integrity tests.
- A high school athlete sustains a twisting knee injury with immediate effusion. Because the test results may guide management for this injury, the physical therapist may perform ligamentous stability tests, examine swelling, and measure AROM, PROM, and end-feels. The hip and ankle joints should be examined for associated injury.
- A 14-year-old girl is trying out for the girls' basketball team at her school. She has scheduled a pre-participation evaluation with a physical therapist in order to reduce her risk of injury. The physical therapist may use a goniometer or technology-assisted analysis system to measure lower-extremity joint alignment and motion.
- A 50-year-old carpenter has anterior and lateral shoulder pain that is exacerbated with overhead reaching and sleeping on his shoulder. He also reports occasional neck pain that may or may not

be related to his shoulder pain. The physical therapist may use a functional test to determine whether specific activities reproduce symptoms. The physical therapist may perform AROM, PROM, and accessory motion testing to the glenohumeral, acromioclavicular, cervical and thoracic spine joints.

- A 29-year-old woman is having pain in the low back and buttocks. She reports being 26 weeks pregnant and is having difficulty with transfers, walking, and sleeping. The physical therapist may perform a series of compression, distraction, and shear tests to determine whether the sacroiliac joint is a source of the pain.
- A 63-year-old sales clerk was recently involved in a motor vehicle accident in which the impact caused the door panel to strike her in the lateral left knee. She was otherwise uninjured. Since the accident, she reports medial right knee pain, difficulty bending the knee, and pain and giving way with walking. The physical therapist may perform goniometric measurements of knee ROM, a varus/valgus stress test, and tests for ligamentous stability to help determine when the patient/client can return to her job, which involves walking and standing.

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## **Mental Functions \***

### **Description**

*Mental functions* are functions of the brain, such as consciousness, orientation, cognitive functions, memory, temperament, and impulse control.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for mental functions tests and measures may include, but are not limited to, the following:

- Abnormal affect
- Cerebrovascular accident (CVA)
- Confusion
- Impulsive and unsafe behavior
- Impulsive or irrational behavior
- Inability to follow instructions
- Irrational behavior
- Lack of or excessive response to stimulation
- Limited ability or inability to engage in activity
- Medication side effects
- Motor planning or problem solving impairment
- Parkinson disease (PD)
- Perseveration in speech or action
- Somnolence
- Traumatic brain injury (TBI)
- Visual-perceptual impairment
- Way-finding impairment

### **Tests and Measures**

Examples may include, but are not limited to, the following:

- Adaptability tests
- Arousal and awareness scales, indexes, profiles, and questionnaires
- Attention tests
- Developmental inventories, indexes, and interviews
- Dual-task analysis
- Functional communication profiles
- Interviews
- Learning profiles
- Mental state scales
- Motor planning analysis
- Multi-step command analysis
- Observation
- Visual-perceptual tests
- Way-finding analysis

#### **Scenarios \*\***

- A 25-year-old woman sustained significant brain trauma secondary to a fall. She was in a coma for 5 days and now is alert but uncooperative and at times combative. The physical therapist may use a mental state scale to determine current status to help develop an effective plan of care for her current stage; the therapist then may use this baseline measurement to monitor patient/client status.
- A 64-year-old man had a CVA affecting the left temporal lobe. The physical therapist may use interview, multi-step command tests, motor planning analysis, visual-perceptual tests, and way-finding analysis to determine the most successful ways to structure a program to maximize safety, independence, and participation.
- A 77-year-old woman is referred to a physical therapist after she was identified at a community fair as being at fall risk due to a number of falls in the past year. Based on the history, the physical therapist notes that she sees a number of physicians and has prescriptions filled at multiple pharmacies. She scores poorly on a memory scales, has difficulty discussing her history, and describes some seemingly bizarre events. The physical therapist contacts the physician and instructs the patient/client to take all of her medication bottles to the physician visit. The therapist then schedules a follow-up visit and plans to discuss the apparent polypharmacy again with the physician to help determine possible etiologies of the falls.
- A premature infant has been identified by neonatal intensive care unit staff as appearing to have limited alertness and response to stimulation. The physical therapist may use observation and age-appropriate arousal and awareness scales to determine possible limitations and prepare a plan for physical therapist services.

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## **Mobility \***

### **Description**

*Mobility* is moving the body from one position to another or from one location to another and carrying, moving, or manipulating objects. This includes transitional positions to, from, and within the horizontal or vertical position (eg, rolling or moving from sitting to standing); maintaining the body in a needed position (eg, moving upper extremities while standing); and more complex mobility of moving from one point to another (eg, walking, running, climbing, and moving up and down stairs)—whether indoors or outdoors, from one room to another, or from one building to another building—and including being a passenger in a private or public vehicle. In addition, this may include the use of equipment to move from one place to another, such as use of skates, bicycles, and wheelchairs.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for mobility tests and measures may include, but are not limited to, the following:

- Compromised endurance
- Coordination impairments, including balance, ataxia, and athetosis
- Decreased, unsafe, or inefficient movement (eg, gait, transfers, wheelchair propulsion)
- Decreased strength or range of motion
- Development of pressure ulcers
- Increasing need for assistance in movement or position changes
- Inefficient locomotion (speed, endurance, safety)
- Report of falls
- Use or need of assistive technology for safe, efficient, and timely mobility

## Tests and Measures

Examples may include, but are not limited to, the following:

- Assistive technology trial and simulation
- Community balance tests (dynamic and static)
- Functional capacity tests
- Goniometric tests
- Manual or other muscle strength tests
- Mobility scales
- Motion analysis
- Observation/qualitative analysis of movement patterns and function
- Performance-oriented mobility analysis
- Postural analysis
- Technology-assisted mobility analysis systems
- Wheelchair propulsion and skills tests

## Scenarios \*\*

- A 3-year-old child is slow in moving in the supine position and in getting in and out of the sitting position. The physical therapist may use a pediatric mobility examination tool to analyze the child's motor development.
- A 14-year-old boy with T10 complete paraplegia uses a manual wheelchair full time. His current wheelchair is too small due to his recent growth spurt and cannot be adjusted. In addition to an assistive technology analysis, the physical therapist may perform a wheelchair propulsion analysis and wheelchair skills test. To help determine how to achieve optimal mobility for the boy's lifestyle and goals, the physical therapist may use interview and discussion to identify personal mobility goals and the environments typically encountered.
- A 73-year-old man has a long history of cardiac myopathy, and his son reports that he has fallen several times recently. The physical therapist performs a test for balance and gait to obtain a baseline measure of function prior to developing the plan of care.
- A 90-year-old woman in a nursing home is reported by the nurse to have a stage 1 pressure ulcer and is found to be at high risk for further skin breakdown. The physical therapist may measure bed and transfer mobility, using a functional mobility examination tool to determine the adaptive equipment and amount of assistance that the patient/client needs to reposition herself to prevent further skin breakdown.



- A 81-year-old woman reports difficulty negotiating the 3 steps into her home. The physical therapist may use mobility scales and observation to measure her mobility skills.

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## **Motor Function (Motor Control and Motor Learning) \***

### **Description**

*Motor function* is the ability to learn or demonstrate the skillful and efficient assumption, maintenance, modification, and control of voluntary postures and movement patterns.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for motor function tests and measures may include, but are not limited to, the following:

- Asymmetry of functional movement patterns
- Cognitive impairment limiting ability to efficiently perform movement tasks
- Delays in achievement of developmental motor skills
- Difficulties with sequencing and timing responses
- Neuromuscular conditions, injuries, or diseases

### **Tests and Measures**

Examples may include, but are not limited to, the following:

- Age-appropriate developmental motor tests
- Fine motor and manipulation tests
- Motion analysis/performance analysis
- Observation of dual task performance
- Patient-specific functional scales
- Test of dexterity or coordination
- Tests of motor planning or praxis

## Scenarios \*\*

- A young adult who had a traumatic brain injury 10 years ago has sequencing and motor planning limitations that do not interfere with his typical activities and participation; however, he is getting married and wants to learn to dance for his upcoming wedding. The physical therapist may perform a motor planning analysis, attention/concentration analysis with distracters, and a sequencing analysis for measuring baseline and identifying areas of limitation to help develop a home program that can be used in preparation for dance lessons.
- A 20-year-old college baseball pitcher has a history of rotator cuff repair of his pitching shoulder. He is 9 months postsurgery and is preparing to return to the sport. His physical therapist uses a motion analysis system to evaluate his pitching technique and make recommendations to improve efficiency of movement and pitching speed.
- A 7-year-old girl with a diagnosis of developmental coordination disorder has great difficulty on the playground engaging in group games with her peers. The physical therapist may use a test of motor planning or praxis and an age-appropriate developmental motor test to determine the area of motor function on which to focus intervention.
- A 21-year-old woman with mild cognitive deficit works at a restaurant where she buses tables. She has had some difficulty with carrying the tray of dishes and wants to address this. Her physical therapist may use fine motor and manipulation tests and perform a qualitative movement analysis and task analysis to identify the dysfunction or impairment so that the patient/client can assess her current ability with this task and then compare that to her postintervention self-assessment.
- A 10-year-old boy with a diagnosis of Asperger syndrome has difficulty riding a bicycle in his neighborhood. His physical therapist may use a test of coordination and motor praxis to identify the areas of difficulty he is having with this activity and plan a home exercise program.

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## **Muscle Performance (Muscle Strength, Power, Endurance, Length) \***

### **Description**

*Muscle performance* is the capacity of a muscle or a group of muscles to generate forces. *Strength* is the muscle force exerted by a muscle or a group of muscles to overcome a resistance under a specific set of circumstances. *Power* is the work produced per unit of time, or the product of strength and speed. *Endurance* is the ability of muscle to sustain forces repeatedly or to generate forces over a period of time. *Muscle endurance* includes functions associated with sustaining muscle contraction for isolated muscles, for muscle groups, and for whole-body musculature. *Muscle length* is the ability of a muscle to elongate in the direction opposite of its action. The muscle force that can be measured depends on the interrelationships among such factors as the length of the muscle, the velocity of the muscle contraction, and the mechanical advantage. Recruitment of motor units, fuel storage, and fuel delivery (in addition to balance, timing, and sequencing of contraction) mediate integrated muscle performance.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for muscle performance tests and measures may include, but are not limited to, the following:

- Abnormal gait, locomotion, or balance
- Balance impairments
- Functional limitations
- History consistent with muscle injury, weakness, disease, or pathology
- Impaired muscle tone, reflexive responses, coordination, or motor control

- 1433 • Limited spine/extremity motion
- 1434 • Muscle giving way during activities
- 1435 • Musculoskeletal pain
- 1436 • Observation of abnormal movement patterns
- 1437 • Observation of abnormal posture
- 1438 • Pain with muscle activity
- 1439 • Postural abnormalities
- 1440 • Activity limitations involving movement
- 1441 • Visible atrophy, deformity, or hypertrophy or visible or palpable defect, impaired muscle
- 1442 endurance for prolonged activity (eg, gait, self-propelling a manual wheelchair)
- 1443

#### 1444 **Tests and Measures**

1445

1446 Examples may include, but are not limited to, the following:

- 1447 • Activities of daily living scales
- 1448 • Dynamometry
- 1449 • Electroneuromyography
- 1450 • Functional movement screening tests
- 1451 • Functional muscle tests
- 1452 • Functional range-of-motion (ROM) tests
- 1453 • Goniometry
- 1454 • Instrumental activities of daily living scales
- 1455 • Manual muscle tests
- 1456 • Multisegmental muscle tests
- 1457 • Muscle length tests
- 1458 • Muscle performance tests
- 1459 • Myotome testing
- 1460 • Observation
- 1461 • Palpation
- 1462 • Physical capacity tests
- 1463 • Sit-to-stand tests

- 1464 • Technology-assisted analysis
- 1465 • Timed activity tests
- 1466 • Ultrasound imaging of muscle contraction and tissue morphology
- 1467 • Jump tests
- 1468 • Videos

1469

## 1470 **Scenarios \*\***

- 1471 • A competitive tennis player complains of shoulder pain during his serve. The physical therapist  
1472 may inspect the shoulder girdle for atrophy and perform muscle testing of the shoulder complex  
1473 using manual resistance or a dynamometer.
- 1474 • A patient with a diagnosis of spondylolisthesis is referred to physical therapy for treatment of his  
1475 chronic lower back pain. The physical therapist may evaluate morphology and function of the  
1476 transversus abdominus and lumbar multifidus muscles, using observation, palpation, and  
1477 ultrasound imaging.
- 1478 • A soldier sustained a gunshot wound to his posterior thigh. The physical therapist may inspect the  
1479 lower extremity for defects and atrophy and perform manual muscle testing of the lower  
1480 extremity. The physical therapist also may perform or recommend electrophysiological testing to  
1481 measure muscle function.
- 1482 • A 51-year-old man has an incomplete spinal cord injury sustained 4 days ago in a bicycle  
1483 accident and now is dependent in all mobility. The physical therapist may use manual muscle  
1484 tests of key muscles to document and monitor the extent of spinal cord damage.
- 1485 • A 72-year-old man with left hemiplegia was discharged from rehabilitation with a standard  
1486 manual wheelchair and taught to propel the wheelchair using his right arm and leg. He would like  
1487 to return to his prior level of functioning, which included caring for his grandchildren and  
1488 volunteering for his homeowners association. He reports that he can self-propel his wheelchair  
1489 only for short distances on tile surfaces and that he experiences fatigue on carpet, gravel, and  
1490 hills. The physical therapist may measure his muscle strength, muscle endurance, and functional  
1491 capacity for safe, efficient, and effective self-propulsion.
- 1492 • A 33-year-old woman is having pelvic pain and incontinence following the birth of her second  
1493 child 3 months ago. The physical therapist may use ultrasound imaging to measure pelvic floor  
1494 muscle function.
- 1495 • An 81-year-old woman wants to take part in a fitness program and is receiving a pre-participation  
1496 screening examination by a physical therapist. The physical therapist may use the 5-Times-Sit-to-  
1497 Stand Test to examine lower-extremity muscle performance and may use functional ROM tests to  
1498 determine the length of her quadriceps femoris and hamstring muscles.

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1511 *making.*

## **Neuromotor Development and Sensory Processing \***

### **Description**

*Neuromotor development* is a means of measuring maturity of the central nervous system as demonstrated by the acquisition and evolution of movement skills throughout the life span. *Sensory processing* is the ability to integrate information that is derived from the environment and from the body (proprioception, emotional response, physiological response) and to use that information for movement.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for neuromotor development and sensory processing tests and measures may include, but are not limited to, the following:

- Asymmetry of functional movement patterns
- Decreased participation in, or avoidance of, age-appropriate activities
- Delays in achievement of developmental motor skills
- Difficulty judging space and distances to objects and persons
- Difficulty performing movements and complex motor sequences
- Excessive or repetitive movements
- Impaired visual-perceptual processing and depth perception
- Increased muscle tone with change of temperature
- Neuromuscular injuries, diseases, or trauma
- Poor or decreased response to sensory stimuli
- Seeking or avoiding specific movements
- Signs of difficulty with transitional movements, locomotor, and/or manipulative skills



1538 **Tests and Measures**

1539 Examples may include, but are not limited to, the following:

- 1540 • Age-appropriate developmental motor development tests
- 1541 • Balance tests
- 1542 • Behavioral assessment scales
- 1543 • Early motor repertoire testing
- 1544 • Functional performance and capacity tests
- 1545 • Gait pattern analysis
- 1546 • Locomotor skills analysis
- 1547 • Manipulative skills analysis
- 1548 • Motor function tests (coordination, agility, initiation, modification and control of movement,  
1549 accuracy of point for communication, motor imitation)
- 1550 • Oral motor function (eg, chewing, facial expressions, and swallowing/breathing coordination),  
1551 phonation, and speech production observation
- 1552 • Screening of visual acuity and visual field awareness (visual-perceptual skill tests)
- 1553 • Sensorimotor integration analysis, automatic postural reactions (including postural and protective  
1554 reactions), and righting and equilibrium reactions
- 1555 • Sensory profile processing questionnaires and observational measures or profiles
- 1556 • Reflex integrity and reflex integration tests
- 1557 • Tactile discrimination tests
- 1558 • Test of praxis
- 1559 • Vestibular function tests
- 1560 • Visual gross motor skill
- 1561 • Wheelchair skills and wheelchair propulsion testing

1562  
1563 **Scenarios \*\***

- 1564 • A 69-year-old woman has left hemiplegia. Her family would like her to have a power wheelchair  
1565 to maximize her independence and function, but there are concerns about her ability to be safe as  
1566 she has some hemineglect. The physical therapist may perform visual field tests, visual-  
1567 perceptual skill tests, and functional performance and capacity tests using a power wheelchair.
- 1568 • A 4-year-old boy with Down syndrome has difficulty playing with his peers because he seeks  
1569 direct sensory input, which appears rough or aggressive to his classmates. The physical therapist

may ask the parent to fill out a sensory processing questionnaire to help determine sensory regulatory strategies. The physical therapist also may use a behavioral assessment scale.

- An 8-year-old boy with autism attends a third grade class in a large elementary school. He cannot navigate the school environment independently, and a paraeducator accompanies him at all times. The educational team, including the physical therapist, completes a school functional assessment tool to identify priorities for the student. The physical therapist also may observe spontaneous play during recess, play behaviors, and participation during regular classes, and gym class. The therapist may complete an observational gait analysis during transitions and a test of gross motor skills similar to physical education activities. In collaboration with the occupational therapist, the therapist may complete a sensory profile using parent and teacher questionnaires and a log of sensory seeking and avoidance behaviors observed across settings.
- A 2-year-old girl with cerebral palsy receives botulinum toxin type A injections to manage increased spasticity in her lower limbs and uses bilateral ankle-foot-orthosis and a walker, with close supervision, for mobility. The physical therapist may complete a gross motor function test to establish a motor performance baseline. Due to reported neglect in the patient's use of her left hand, the therapist may perform a test of visual field awareness and a test of tactile discrimination on the upper and lower extremities.
- A 5-month-old (adjusted age) premature infant was born at 27 weeks at a very low birth weight. The mother is concerned that the infant gazes more to one side and wants ideas to promote optimal development. The physical therapist may choose a test of motor development to determine the baby's developmental level. Tests of primitive reflexes, postural reflexes, and resistance to passive mobilization and stretch (tone scale) may be used to establish a baseline of neurological maturation and symmetry of motor function. The physical therapist may observe posture and may take pictures to document a baseline and progress if concerns of asymmetry in strength and flexibility arise.

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## **Pain \***

### **Description**

*Pain* is a disturbed sensation that causes suffering or distress. Pain is a process whereby the individual becomes aware of a progressively noxious sensation. Pain may be present with or without trauma and physical dysfunction. Pain may suggest the presence of other systematic dysfunction, and patient/client reports of pain may or may not correlate with clinical findings. Pain may progress from a physical experience to a multifactorial condition affecting functions, emotions, and perceptions. Pain may be sufficient to affect the ability to perform movements and activities that then affect the ability to assume social/work/family roles.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for pain tests and measures may include, but are not limited to, the following:

- Antalgic gait or altered postures
- Facial grimace
- Inability to tolerate touch
- Reluctance to move the affected body region
- Self-report of long history of fatigue
- Self-report of long history of pain
- Verbal or vocal pain expressions
- Visible injury (eg, swelling, deformity, and tissue disruption)

## Tests and Measures

Examples may include, but are not limited to, the following:

- Body diagrams and pain drawings and maps
- Descriptor tests (verbal and pictorial)
- Discrimination tests
- Fear avoidance
- Indexes or scales of pain levels at rest and/or during movement (numeric)
- Pain scales/visual analogue pain scale or faces scale
- Pain thresholds (pressure, heat, mechanical)
- Palpation
- Provocation/alleviation tests
- Questionnaires

## Scenarios \*\*

- A 42-year-old woman has a 9-month history of low back (LBP) pain that started after lifting up her child. Although previous LBP episodes had always resolved, this one has persisted despite several different interventions. The physical therapist may measure her average, worst, and minimal pain intensities using a written visual analog scale. In addition, the physical therapist may complete a pain questionnaire and pain drawing to determine the quality and location of the pain to better target interventions.
- A 63-year-old woman has a diagnosis of fibromyalgia. The physical therapist may measure her pain using a combination of pain tests, such as a visual scale at rest and with movement, a pain questionnaire (for quality), a pain drawing (for location), and pressure pain thresholds at common trigger point sites (for tenderness). The patient may be asked to complete a condition-specific questionnaire to determine which functional tasks are most impacted by her pain condition and to better direct interventions.
- A 45-year-old man is unable to work as a mechanic due to neck pain secondary to a whiplash injury. The physical therapist may use a questionnaire or a pain drawing to determine the site and level of his pain.
- A 68-year-old woman with rheumatoid arthritis is unable to cook, clean, or play with her grandchildren due to hand, wrist, shoulder, and knee pain. The physical therapist may select pain scales and questionnaires to determine the extent of her pain.

1667 • An 8-year-old with a femoral fracture is unable to walk without crutches or engage in age-related  
1668 play activity. The physical therapist may use an age-specific pain scale or drawings to analyze the  
1669 pain.

1670 • A 22-year-old soldier has phantom limb pain following transtibial amputation. He is unable to  
1671 tolerate the prosthesis to engage in gait training. The physical therapist may use provocation tests  
1672 or pain scales to measure the pain.

1673

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1686 *making.*

## **Reflex Integrity \***

### **Description**

Reflex integrity requires the presence of an intact sensory receptor, neural pathway, and a motor or glandular output. A *reflex* is a stereotypic, involuntary reaction to any of a variety of sensory stimuli.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for reflex integrity performance tests and measures may include, but are not limited to, the following:

- Abnormal static posturing
- Asymmetry of functional movement patterns
- Delays in achievement of developmental motor skills
- Limited capacity for functional activity due to poor coordination and balance
- Neuromuscular conditions, injuries, or diseases

### **Tests and Measures**

Examples may include, but are not limited to, the following:

- Automatic postural reactions, including protective reactions, righting, and equilibrium reactions
- Deep tendon reflexes
- Primitive reflexes and reactions
- Resistance to passive stretch (tone and spasticity scales)
- Vestibular reflexes

1713 **Scenarios \*\***

- 1714 • A 9-month-old child who was premature and had an intracranial hemorrhage in her first few days  
1715 of life is having difficulty keeping her balance in sitting when she reaches for toys. The physical  
1716 therapist may test her automatic postural reactions to examine her protective extension and sitting  
1717 equilibrium reactions.
- 1718 • A 6-year-old boy who was hit by a car 3 days ago has just awakened from a comatose state. He is  
1719 beginning to demonstrate random movements of his extremities. The physical therapist may test  
1720 deep tendon reflexes or resistance to passive stretch to determine symmetry and intensity of  
1721 responses.
- 1722 • A 14-year-old girl who had a traumatic brain injury 10 years ago would like to try out for  
1723 cheerleading. She would like to improve her reactions to unexpected movement. The physical  
1724 therapist may test her righting and equilibrium reactions to develop a home program.
- 1725 • A 35-year-old man reports dizziness, especially with rapid head movements. He states that he  
1726 does not have balance loss, but his symptoms keep him from pursuing his normal recreational  
1727 activities, such as surfing and kayaking. The physical therapist may test his vestibular reflexes to  
1728 determine whether they are impaired and to design the appropriate vestibular rehabilitation  
1729 program for him.
- 1730 • A 71-year-old man had a left cerebrovascular accident with right hemiparesis. Initial testing by  
1731 the physical therapist may include using scales to measure resistance to movement of his right  
1732 arm and leg in addition to testing his right reaction in sitting.
- 1733 • A 42-year-old woman reports low back pain that radiates into her left leg. The physical therapist  
1734 may test her patellar and Achilles reflexes as part of a comprehensive examination.

1735

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1748 *making.*

## **Self-Care \***

### **Description**

*Self-care*, also referred to as *activities of daily living* (ADL), is the ability to perform the activities that a person must be able to perform to take care of himself/herself, such as dressing, grooming, bathing, eating, and toileting.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for self-care tests and measures may include, but are not limited to, the following:

- Decreased balance (dynamic or static)
- Decreased cognitive function
- Decreased coordination
- Decreased joint mobility
- Decreased muscle endurance
- Decreased strength
- Decreased visual or auditory acuity
- Depression
- Loss of weight without apparent medical reason
- Perinatal limitations
- Poor hygiene
- Shortness of breath
- Signs of difficulty dressing
- Slow, laborious movement or excessive time to complete ADL



1776 **Tests and Measures**

1777 Examples may include, but are not limited to, the following:

- 1778 • Caregiver ability analysis
- 1779 • Cognitive screening/tests
- 1780 • Depression screenings
- 1781 • Home visits (eg, environmental safety analysis, including, but not limited to, lighting,  
1782 accessibility, adaptability, safe habitation, space needs)
- 1783 • Observation of ADL performance
- 1784 • Observation of specific, identified problem task
- 1785 • Patient-specific ADL performance

1786

1787 **Scenarios \*\***

- 1788 • A 69-year-old man who had a stroke 1 year ago currently is living in his home. He reports that he  
1789 is having problems taking care of himself. To help determine his needs as a community dweller,  
1790 the physical therapist may use a patient-specific functional ADL instrument to identify limitations  
1791 in safely dressing and transferring to and from the wheelchair.
- 1792 • A 45-year-old man is being followed by physical therapy for new onset of back pain. The  
1793 physical therapist may ask him to complete a functional questionnaire to determine what  
1794 activities he is having difficulty performing due to the pain.
- 1795 • A woman with a rotator cuff repair always asks for assistance in putting on her shirt at the end of  
1796 the treatment session. The physical therapist plans to determine her dressing and other self-care  
1797 limitations at the next visit.
- 1798 • A 78-year-old woman has difficulty washing her hair. The physical therapist may use an  
1799 interview and observation of movement to identify limitations in self-care.
- 1800 • An 80-year-old woman is receiving home health physical therapy, and her physical therapist  
1801 notices that her home often smells of residual smoke. The physical therapist may perform an  
1802 environmental safety assessment and cognitive screen to assist in determining whether the patient  
1803 can continue to live independently.

1804

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1818  
1819  
1820

REVIEW DRAFT

## **Sensory Integrity \***

### **Description**

*Sensory integrity* is the intactness of cortical sensory processing, including exteroceptors (superficial sensation), proprioceptors (deep sensation) and combined cortical sensations. Exteroceptors receive stimuli from the external environment via the skin and subcutaneous tissue and are responsible for the perception of pain, temperature, light touch, and pressure. Proprioceptors receive stimuli from muscles, tendons, ligaments, joints, and fascia and are responsible for position sense, kinesthesia, and vibration. Combined cortical sensations utilize exteroceptors and proprioceptors, along with cortical sensory association areas, to allow for perception of stereognosis, 2-point discrimination, graphesthesia, and double simultaneous stimulation. Along with sensory integrity tests, measurement of sudomotor function may be performed to determine peripheral nerve functioning.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications may include, but are not limited to, the following:

- Decreased balance
- Decreased coordination
- Frequent dropping of objects
- Graphesthesia
- History of falls
- History of injury during functional activities
- Pain of unknown origin
- Parasthesias, perception of numbness, or tingling
- Peripheral neuropathy

- 1847 • Poor manipulation skills
- 1848 • Repeated extremity or hand/foot injury with no known cause identified by patient/client
- 1849 • Self-report of inability to perform specific activities of daily living (ADL) due to limited
- 1850 “feeling”
- 1851 • Skin lesions that appear to be due to excessive pressure, abrasion, or burns
- 1852 • Slow, laborious movement or excessive time to complete ADL or instrumental activities of daily
- 1853 living (IADL)

1854

## 1855 **Tests and Measures**

1856 Examples may include, but are not limited to, the following:

- 1857 • Decreased muscle endurance
- 1858 • Functional tests (standardized fingering and handling)
- 1859 • Item identification
- 1860 • Light touch
- 1861 • Monofilament test
- 1862 • Pain/pin-prick
- 1863 • Proprioception testing
- 1864 • Sensory extinction testing
- 1865 • Stereognosis testing
- 1866 • Sudomotor function (sweat and skin wrinkle) measurement
- 1867 • Temperature sensation testing
- 1868 • Texture recognition testing
- 1869 • Touch-pressure threshold and localization
- 1870 • 2-point discrimination testing
- 1871 • Vibratory testing

1872

## 1873 **Scenarios \*\***

- 1874 • A 31-year-old man who sustained a laceration and had subsequent repair of the medial and ulnar
- 1875 nerves at the right wrist is unable to pick up small objects with his dominant hand using 2- and 3-
- 1876 point pinch. The physical therapist may utilize sensory testing of the hand, including light touch,
- 1877 pin-prick, vibration, and monofilament testing to determine the extent of nerve healing and
- 1878 vulnerability to injury.

- 1879
- 1880 • A 57-year-old man with herniated cervical disks (C6 and C7) has numbness in his distal upper  
1881 extremity. Sensory testing may be used as part of the upper-quadrant examination to determine  
1882 the extent of damage to the spinal nerves.
- 1883 • A 16-year-old fell from a bridge and sustained a fracture of his T12 vertebrae. The physical  
1884 therapist may use a pin-prick test to determine the level and completeness of the spinal cord  
1885 injury.
- 1886 • A 37-year-old woman had a work injury 1 month ago that crushed her hand between 2 metal  
1887 parts. She describes severe pain and inability to feel her index finger. She does not respond to  
1888 filaments touching the involved finger but says that she feels 2 points when touched with 1 point  
1889 during an innervation density test. The physical therapist may use sudomotor function tests to  
1890 determine whether the finger is truly denervated or functional tests to determine whether the  
1891 patient's fingering skills are consistent with verbal reports.
- 1892 • A 76-year-old woman had a middle cerebral artery cerebrovascular accident 1 week ago and  
1893 displays decreased balance and ambulation skills leading to dependence in transfers and mobility.  
1894 The physical therapist may use touch sensation and sensory extinction testing to help determine  
1895 the underlying causes of her balance and mobility limitations.
- 1896 • A 68-year-old man with type 2 diabetes and a balance disorder is unable to walk in the  
1897 community setting. The physical therapist may test light touch sensation and proprioception to  
1898 determine the underlying cause of the balance disorder. In addition, the physical therapist may  
1899 conduct a quantitative test of light touch sensation to determine the risk of ulcer development.
- 1900
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1913 *making.*
- 1914

## 1915 **Skeletal Alignment and Integrity \***

### 1916 **Description**

1917 *Skeletal alignment* is the positioning of the bones of the skeleton in relation to gravity, center of mass, or  
1918 base of support and the relationship of the individual body structures to each other. *Skeletal integrity*  
1919 indicates the absence of bony malformations, bony nodules, or decreased bony strength and density.

### 1920 **Indications**

1921 Tests and measures may be indicated based on the patient/client history, including symptom investigation,  
1922 or based on the detection of signs by the physical therapist during examination and patient/client  
1923 management.

1924 Indications for skeletal alignment and integrity tests and measures may include, but are not limited to, the  
1925 following:

- 1926 • Ankylosing spondylitis
- 1927 • Asymmetry of joint mobility or muscle performance
- 1928 • History of fractures/trauma
- 1929 • Kyphosis
- 1930 • Osteoporosis
- 1931 • Scoliosis

### 1933 **Tests and Measures**

1934 Examples may include, but are not limited to, the following:

- 1935 • Angle measurements
- 1936 • External postural support simulation
- 1937 • Leg length tests
- 1938 • Goniometry
- 1939 • Observation
- 1940 • Positional tests

1941	• Posture grids and plumb lines
1942	• Pressure mapping
1943	• Technology-assisted analysis
1944	• Shape capturing (ie, custom-contoured external postural supports)
1945	• Ultrasound imaging of skeletal morphology
1946	• Photographs/videos
1947	
1948	<b>Scenarios **</b>
1949	• A 4-month-old girl has torticollis that prevents proper head control and impedes her from rolling over. The physical therapist may perform a postural analysis, observation, angle measurements, and photographic documentation to help determine the degree of torsion.
1950	
1951	
1952	• A 45-year-old man with acute low back pain has trunk deviation to the left that limits his ability to do home maintenance. The physical therapist may use observation, palpation, postural analysis, supine-and-sitting mat evaluation, and measurement using a plumb line or posture grid to help determine the degree of malalignment.
1953	
1954	
1955	
1956	• A 79-year-old woman has severe kyphoscoliosis. The physical therapist may use observation, postural analysis, supine-and-sitting mat evaluation, shape capturing, measurement using a posture grid, and angle measurements using a goniometer or flexible ruler.
1957	
1958	
1959	• A 14-year-old boy with muscular dystrophy is unable to sustain a seated position without assistance. The physical therapist may use observation, palpation, supine-and-sitting mat evaluation, external postural support simulation, shape capturing, and pressure mapping to identify and recommend an appropriate seating and positioning system for functional posture when the patient/client is positioned in his power wheelchair.
1960	
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1964	• A 27-year-old man seeks out his physical therapist because of shoulder pain after a bicycle wreck. In addition to physical examination of the glenohumeral joint, the physical therapist may use palpation followed by ultrasound imaging of the clavicle to determine morphology and skeletal integrity.
1965	
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1968	* Tests and measures included in the Guide are only those that can be performed by a physical therapist. There are other tests and measures performed by other health care practitioners that may be critical to the physical therapist's decision-making process. Information from these tests and measures may be gathered from a patient/client chart, from communication with other providers, or from the patient/client as part of the history. A physical therapist also may refer the patient/client for testing that would be useful to patient/client management. Although this is valuable information used by the physical therapist, the tests and measures used to gather this type of information are not included in the Guide unless they can be performed by a physical therapist.
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1976 \*\* *The scenarios are not intended to fully describe the tests and measures that would be used for each*  
1977 *patient/client. The scenarios are narrowly focused to illustrate the category being addressed and are not*  
1978 *intended to be inclusive of all tests and measures that would be performed in clinical practice. Tests and*  
1979 *measures from a number of categories would be used in actual practice to support clinical decision*  
1980 *making.*

1981

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1982    **Ventilation and Respiration/Gas Exchange \***

1983    **Description**

1984    *Ventilation* is the movement of a volume of gas in and out of the lungs. *Respiration* is the exchange of  
1985    oxygen and carbon dioxide across a membrane, either in the lungs or at the cellular level.

1986    **Indications**

1987    Tests and measures may be indicated based on the patient/client history, including symptom investigation,  
1988    or based on the detection of signs by the physical therapist during examination and patient/client  
1989    management.

1990    Indications for ventilation and respiration/gas exchange tests and measures may include, but are not  
1991    limited to, the following:

- 1992        • Abnormal or adventitious breathing (eg, crackles, rales, decreased breath sounds)
- 1993        • Asthma
- 1994        • Bluish-purple-gray color of lips, gums, or nail beds
- 1995        • Chest pain
- 1996        • Chronic obstructive pulmonary disease (COPD)
- 1997        • Clubbing of fingers
- 1998        • Cough
- 1999        • Cyanosis
- 2000        • Cystic fibrosis (CF)
- 2001        • Decreased intercostal and accessory muscle strength
- 2002        • Desaturation on pulse oximetry
- 2003        • Dizziness
- 2004        • Dyspnea (shortness of breath) with activity or at rest
- 2005        • Fatigue
- 2006        • Forgetfulness or lack of focus
- 2007        • Headache
- 2008        • Hypertrophy of accessory musculature

- 2009 • Pallor
- 2010 • Postural defects (eg, barrel chest, scoliosis, kyphosis)
- 2011

## 2012 **Tests and Measures**

2013 Examples may include, but are not limited to, the following:

- 2014 • Auscultation of the heart
- 2015 • Auscultation of the lungs
- 2016 • Breathlessness/dyspnea scale
- 2017 • Chest circumference/expansion measure
- 2018 • Functional mobility and functional performance tests
- 2019 • Heart rate
- 2020 • Perceived exertion scales
- 2021 • Postural analysis (static and dynamic)
- 2022 • Pulmonary function tests (forced expiratory volume in 1 second [FEV<sub>1</sub>], forced vital capacity [FVC])
- 2023
- 2024 • Pulse oximetry
- 2025 • Respiratory muscle function
- 2026 • Respiratory rate, rhythm, and depth
- 2027 • Sputum description
- 2028 • Talk test
- 2029

## 2030 **Scenarios \*\***

- 2031 • A 6-year-old girl with cystic fibrosis has been admitted to the pediatric unit due to acute
- 2032 pseudomonas pneumonia. The physical therapist may auscultate the patient's lungs, evaluate the
- 2033 effectiveness of the patient's cough, describe the characteristics of sputum produced, and monitor
- 2034 oxygen saturation to determine airway clearance needs and response to interventions.
- 2035 • A 23-year-old man has been admitted to an inpatient rehabilitation unit due to an incomplete C7
- 2036 tetraplegia sustained in a motorcycle accident. The physical therapist may perform strength tests
- 2037 of the upper extremities and trunk muscles, as well as pulmonary function tests, to determine the
- 2038 patient's baseline inspiratory and expiratory capacities and their relationship to cough
- 2039 effectiveness.

2040

2041 • A 56-year-old man with a 40-pack-year smoking history has been referred to outpatient  
2042 pulmonary rehabilitation with a diagnosis of stage II COPD. The physical therapist may perform  
2043 a submaximal treadmill test and monitor vital signs, oxygen saturation, and perceived dyspnea to  
2044 determine a safe exercise prescription.

2045 • A 58-year-old man with COPD has dyspnea that is limiting his ability to walk 5 blocks with his  
2046 briefcase to catch the nearest bus to work in the morning. The physical therapist may use a pulse  
2047 oximetry and a dyspnea scale as part of the examination and to monitor progress.

2048 • A 61-year-old man with ankylosing spondylitis and impaired movement of chest expansion  
2049 reports decreasing endurance. The physical therapist may perform a postural analysis, both static  
2050 and dynamic, in addition to taking chest circumference/expansion measures to help develop an  
2051 appropriate plan of care.

2052  
2053 *\* Tests and measures included in the Guide are only those that can be performed by a physical therapist.*  
2054 *There are other tests and measures performed by other health care practitioners that may be critical to*  
2055 *the physical therapist's decision-making process. Information from these tests and measures may be*  
2056 *gathered from a patient/client chart, from communication with other providers, or from the patient/client*  
2057 *as part of the history. A physical therapist also may refer the patient/client for testing that would be useful*  
2058 *to patient/client management. Although this is valuable information used by the physical therapist, the*  
2059 *tests and measures used to gather this type of information are not included in the Guide unless they can*  
2060 *be performed by a physical therapist.*

2061 *\*\* The scenarios are not intended to fully describe the tests and measures that would be used for each*  
2062 *patient/client. The scenarios are narrowly focused to illustrate the category being addressed and are not*  
2063 *intended to be inclusive of all tests and measures that would be performed in clinical practice. Tests and*  
2064 *measures from a number of categories would be used in actual practice to support clinical decision*  
2065 *making.*

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## **Work Life \***

### **Description**

*Work life* is the process of assuming or resuming roles and functions at work (job/school/play), such as negotiating school environments, gaining access to work (job/school/play) environments and workstations, and participating in age-appropriate play activities.

### **Indications**

Tests and measures may be indicated based on the patient/client history, including symptom investigation, or based on the detection of signs by the physical therapist during examination and patient/client management.

Indications for work, employment, and education life tests and measures may include, but are not limited to, the following:

- Decreased cognitive function
- Decreased balance (impaired safety, fall risk)
- Decreased mobility (slow, laborious, inefficient, unsafe)
- Decreased visual or auditory acuity
- Impaired endurance (aerobic, muscle)
- Impaired functional mobility

### **Tests and Measures**

Examples may include, but are not limited to, the following:

- Activity profiles
- Assistive technology analysis
- Barrier identification
- Disability indexes

- 2100 • Environmental analysis
- 2101 • Fall scales
- 2102 • Functional capacity tests
- 2103 • Functional status questionnaires
- 2104 • Instrumental activities of daily living (IADL) scales
- 2105 • Interviews
- 2106 • Logs
- 2107 • Observations
- 2108 • Physical capacity tests
- 2109 • Transportation analyses
- 2110 • Videos
- 2111 • Work simulation tests

#### 2113 **Scenarios \*\***

- 2114 • A 10-year-old boy has spina bifida and uses a manual wheelchair to go to school. His parents  
2115 report that he does not play with other children during recess. The physical therapist may perform  
2116 an assistive technology analysis to determine whether the configuration of the manual wheelchair  
2117 is optimized for efficiency and function and a wheelchair propulsion and wheelchair skills test to  
2118 determine whether wheelchair training (eg, propulsion method, wheelies, management of ramps  
2119 and environmental barriers) will improve his performance. The physical therapist also may  
2120 interview teachers to help identify a plan to increase social interactions and play between the  
2121 child and his peers.
- 2122 • A 41-year-old has been on disability from work for the past 2 months. After improvement in his  
2123 condition, he is ready to return to work. The physical therapist may use activity profiles and  
2124 observations of work simulation tests to determine his ability to return to work full time.
- 2125 • A 57-year-old lawyer reports pain and numbness in both wrists and hands when working at the  
2126 computer for longer than 5 minutes. The physical therapist may use work simulation tests or job  
2127 site evaluation with videos to document current work conditions and justify the need to modify  
2128 her work station.
- 2129 • A 20-year-old woman had a spinal cord injury with resulting complete paraplegia. She would like  
2130 to return to college. The physical therapist may have her complete a log of activities that she  
2131 performs during a visit to the campus prior to her return to school to help identify barriers and  
2132 methods to overcome them.

2133

*\* Tests and measures included in the Guide are only those that can be performed by a physical therapist. There are other tests and measures performed by other health care practitioners that may be critical to the physical therapist's decision-making process. Information from these tests and measures may be gathered from a patient/client chart, from communication with other providers, or from the patient/client as part of the history. A physical therapist also may refer the patient/client for testing that would be useful to patient/client management. Although this is valuable information used by the physical therapist, the tests and measures used to gather this type of information are not included in the Guide unless they can be performed by a physical therapist.*

*\*\* The scenarios are not intended to fully describe the tests and measures that would be used for each patient/client. The scenarios are narrowly focused to illustrate the category being addressed and are not intended to be inclusive of all tests and measures that would be performed in clinical practice. Tests and measures from a number of categories would be used in actual practice to support clinical decision making.*

## **Decision to Continue/Retain, to Continue and Refer/Co-manage, or to Refer**

Based on the information gathered from the history and tests and measures, the physical therapist determines whether (1) intervention by a physical therapist is appropriate for this patient/client, (2) consultation with another health care provider, which may be another physical therapist, is required along with physical therapist intervention, or (3) intervention by a physical therapist is not indicated and the patient/client needs to be referred to another health care professional. When communication with another health care professional is warranted, the physical therapist is responsible for determining the urgency with which such consultation is needed and acting accordingly.

## **Diagnosis**

APTA's House of Delegates (HOD) policy on diagnosis by physical therapists states:

Physical therapists shall establish a diagnosis for each patient/client.

Prior to making a patient/client management decision, physical therapists shall utilize the diagnostic process in order to establish a diagnosis for the specific conditions in need of the physical therapist's attention.

A diagnosis is a label encompassing a cluster of signs and symptoms commonly associated with a disorder or syndrome or category of impairments in body structures and function, activity limitations, or participation restrictions. It is the decision reached as a result of the diagnostic process, which is the evaluation of information obtained from the patient/client examination. The purpose of the diagnosis is to guide the physical therapist in determining the most appropriate intervention strategy for each patient/client. In the

event the diagnostic process does not yield an identifiable cluster, disorder, syndrome, or category, intervention may be directed toward the alleviation of symptoms and remediation of impairments in body structures and function, activity limitations, or participation restrictions.

The physical therapist's responsibility in the diagnostic process is to organize and interpret all relevant information collected. The diagnostic process includes obtaining relevant history, performing systems review, and selecting and administering specific tests and measures.

When indicated, physical therapists order appropriate tests, including but not limited to imaging and other studies, that are performed and interpreted by other health professionals. Physical therapists may also perform or interpret selected imaging or other studies.

In performing the diagnostic process, physical therapists may need to obtain additional information (including diagnostic labels) from other health professionals. In addition, as the diagnostic process continues, physical therapists may identify findings that should be shared with other health professionals, including referral sources, to ensure optimal patient/client care. When the patient/client is referred with a previously established diagnosis, the physical therapist should determine that the clinical findings are consistent with that diagnosis. If the diagnostic process reveals findings that are outside the scope of the physical therapist's knowledge, experience, or expertise, the physical therapist should then refer the patient/client to an appropriate practitioner.

**DIAGNOSIS BY PHYSICAL THERAPISTS HOD P06-12-10-09**

### ***Diagnostic Process***

The diagnostic process includes collection and categorization of data, establishment of hypotheses, testing of each hypothesis by systematically ruling out alternatives, and confirmation or refutation of each hypothesis. To arrive at a diagnosis, physical therapists use their knowledge



of disease and injury, signs and symptoms, mechanisms of injury, outcome and prognosis, intervention response, and relevant personal and environmental factors.

Determining a diagnosis is a complex cognitive process that involves both reasoning and pattern recognition. Physical therapists may rely on different approaches to the diagnostic process depending on the situation, their own clinical experience, and other factors. The Hypothesis-Oriented Algorithm for Clinicians (HOAC)<sup>1,2</sup> is primarily a linear model that uses a systematic approach to generating, testing, and reformulating hypotheses about the diagnosis and the patient/client response to intervention. This form of diagnostic decision making, often referred to as *hypothetico-deductive* or *backward reasoning*, allows the physical therapist to generate workable hypotheses about complicated, nonroutine, or new patient/client problems. Clinicians who have gained familiarity with a particular set of routine problems are more likely to use *pattern recognition* (or *forward recognition*) to make rapid decisions about a diagnosis and plan of care.<sup>3</sup>

The diagnostic process is based on many components of the examination, including the use of the best available tests and measures. The therapist selects from among many tests and measures, using knowledge of the psychometric properties of the measurements obtained with the tests and measures to arrive at an accurate diagnosis.

The physical therapist develops a complete clinical picture of a patient/client—taking into account the accuracy of the tests and measures used—and synthesizes all test results as part of the diagnostic process. Many tests and measures of impairments of body function and structure,

activity limitations, and participation restrictions provide benchmarks of capacity and performance, thus allowing ongoing assessment of patient/client responses to interventions.

Sometimes it is not possible to come to an immediate decision about a diagnosis. In these cases, the physical therapist considers the problems that might explain the signs and symptoms. The physical therapist may begin generating a list of problems early in the diagnostic process; this list changes over time as the therapist gathers data throughout the examination. The purpose of differential diagnosis is to consider the possibilities that must be ruled out or confirmed to arrive at a conclusion that can lead to a successful plan of care and management for the episode of care.

The differential diagnosis list developed by the physical therapist may include several conditions. At times, the correct classification of clinical findings may best be decided by the physical therapist based on additional data gathered by the physical therapist, in communication and consultation with other health care professionals or by the patient/client response to intervention.

As in all other cases, the physical therapist is guided by patient/client responses to interventions and may determine that a repeated examination, consultation, or referral is appropriate at any point during management.

## ***Diagnostic Labels***

Traditionally, diagnostic labels focused on the pathology/pathophysiology (disease, syndrome, or lesion) to describe the diseased state of an individual. These labels typically identify disease, disorder, or condition at the level of the cell, tissue, organ, or system (health condition). The most extensive listing of such diagnostic labels can be found in the *International Classification of Diseases* (ICD).<sup>4</sup> The ICD is based on the World Health Organization's (WHO) continued efforts to classify health and disease.

Using a disease- or pathology-based diagnostic label can be useful in identifying a myriad of necessary health care services, including surgery and medications, particularly for acute or self-limiting conditions; however, a label of pathology/pathophysiology alone may be less useful in guiding subsequent physical therapist care, particularly when the condition has become chronic or when the label encompasses a wide range of sequelae. For example, the label of cerebrovascular accident (CVA)—although a necessary label—is not sufficient to guide the physical therapist's plan of care for a person who has had a CVA. Physical therapists, therefore, use descriptive labels to identify the potential and actual interaction of a health condition with functioning at the level of the system and at the level of the whole person (ie, participation of the person in society). To compare the care provided across patients/clients, the physical therapists must use a standardized specific system of diagnostic labels or classification, such as the ICF.<sup>5</sup>

Once the diagnosis has been established, the physical therapist must successfully communicate the findings of the examination and the diagnostic label or classification to other providers and

stakeholders (eg, researchers, payers, and regulators) as warranted. It is most important, however, that the patient/client and appropriate caregivers fully understand the diagnosis.

When the initial diagnostic process is complete, the physical therapist determines the prognosis. Although this is done at the start of care, the physical therapist is continuously analyzing information to reaffirm previous decisions, which may result in a modification of or an update to the prognosis.

## **Prognosis**

The prognosis is the likelihood of achieving a particular outcome. The prognosis also may include a prediction of levels of improvement that should be reached at specific intervals during the course of therapy. The prognosis is determined through analysis and synthesis of the clinical implications of the severity of the problem resulting from the interactive relationships among the health condition (disease, disorder, or condition), impairments of body function and structure, activity limitations, participation restrictions, and environmental and personal factors of the patient/client.

The physical therapist arrives at a prognosis through the body of available literature relevant to the health condition/diagnosis, the physical therapist's own clinical judgment, and information from the use of tests and measures. Past experience with similar patients/clients, well-documented and remembered with careful reflection, can be combined with the accuracy of prognostic tests to inform the physical therapist's decisions about the prognosis.

The prognosis may be reflected in the goals established by the physical therapist and patient/client. Goals, therefore, are the intended results of management or of the implementation of the plan of care. Goals are “patient/client-centric” and can address a desired status of:

- Body functions and body structures
- Activities and participation
- Health, wellness, or fitness
- Level of risk
- Environmental factors
- Individual satisfaction

The prognosis can provide important insight into the accuracy of the primary diagnostic hypothesis. Physical therapists reconsider the prognosis over the course of care, informed by the patient/client response to intervention as well as by other changes in patient/client status. When physical therapy intervention produces changes that are consistent with the evidence for prognosis for the patient/client condition, the diagnosis is likely to be correct; however, if intervention does not produce expected changes, a repeated evaluation or referral may be considered.

### ***Decision Making Under Uncertainty***

All clinical decisions have some element of uncertainty. Due to this uncertainty, errors in decision making—commonly referred to as *biases*—may exist. Examples of biases include:

- **Availability**—the ease with which a clinician brings information to mind

- **Representativeness**—believing in the likelihood of a rare diagnosis because the symptoms represent that clinical picture
- **Rule-in favoritism**—paying more attention to data that support a favorite hypothesis
- **Sunk costs**—believing that concern for resources already spent should have an impact on future decisions

These biases are overcome through the clinician's heightened awareness of their possibility and through review of data, particularly data that define the probabilities of events and the probabilities of the accuracy of tests.<sup>6,7</sup>

The process of seeking accuracy and precision through the diagnostic process requires balance. A level of accuracy or precision that will not alter the choice of interventions or the health or well-being of the patient/client is unnecessary and wasteful of health care resources and can be burdensome to the patient/client. Once the physical therapist has the information necessary to determine a strategy for management, additional diagnostic and prognostic tests are necessary only if the patient/client response to intervention is not meeting expectations.

### ***Plan of Care***

The plan of care summarizes and documents the results of the evaluation, including examination findings, diagnosis, prognosis, expected duration of the episode of care, and planned interventions. The plan of care includes statements that specify:

- Measurable goals and expected outcome status with related outcome measure(s)

- 2337       • Specific interventions to be used
- 2338       • Proposed duration and frequency of the interventions that are required to reach the goals
- 2339       and expected outcomes

2340

2341   The strategy to achieve the established goals and outcome status is developed during the  
2342   evaluation and is documented in the plan of care. When designing the plan of care based on the  
2343   evaluation, the physical therapist analyzes and integrates the clinical implications of the severity  
2344   of the pathology/pathophysiology (disease, disorder, or condition), the impairments of body  
2345   function and structure, the activity limitations, and the participation restrictions.

2346

2347   At this time, the physical therapist considers specific interventions to be used, including  
2348   proposed duration and frequency. The physical therapist again combines all components of  
2349   evidence-based practice (EBP) by:

- 2350       • Exercising sound professional judgment in the selection of interventions
- 2351       • Honoring patient/client values and circumstances in collaborating with the
- 2352       patient/client/family in making these decisions
- 2353       • Seeking the best available evidence in the literature in making these decisions

2354

2355   The physical therapist has access to an increasing number of evidence-based resources that can  
2356   be used to help guide these decisions. A growing number of clinical practice guidelines provide a  
2357   compilation of the evidence on tests and measures and interventions for certain patient/client  
2358   populations.

2359

2360 The plan of care includes necessary coordination, including referrals and communication of care,  
2361 to best meet the needs of the patient/client within the context of other care and services.

2362 Appropriate patient/client instruction should be included.

2363

2364 The plan of care is developed using the best available evidence for interventions, education, and  
2365 training. In developing the plan of care, the physical therapist may need to prioritize the  
2366 problems of the patient/client. The physical therapist takes into account the individual's values  
2367 and circumstances including the consideration of available resources.

2368

2369 Finally, the plan of care describes a program for the continued care of the patient/client beyond  
2370 the specific episode of physical therapy care. Particularly for patients/clients with chronic  
2371 diseases or lifelong disabilities, this may include information regarding ongoing management  
2372 how to recognize when a follow-up visit is needed and how to initiate that process.

2373

2374 Other elements of management that should be considered at this point in the evaluation include  
2375 the necessary coordination, collaboration and communication of care to best meet the needs of  
2376 the patient/client within the context of other care and services and appropriate patient/client  
2377 education. Finally, the physical therapist should begin to evaluate patient/client needs, in the  
2378 context of the collaborative team of providers as appropriate, for continued care beyond the  
2379 specific episode of care. These needs may include:

- 2380       • Discharge from a limited episode of care
- 2381       • Plan for transfer to another level of care
- 2382       • Referral to another practitioner for continued management of the patient/client



- Plan for follow up by the physical therapist or others, as needed
- Plan for self-management

### **Review and Modification of the Progression of Care**

Patient/client responses to interventions provide information to the physical therapist about the appropriateness of the plan of care. Based on patient/client responses, the physical therapist may decide to adjust or change the interventions. Whenever possible, patient/client responses are determined through outcome measurements.

Examination may be indicated to repeat and/or perform selected tests and measures after the initial examination to evaluate progress, to measure response to an intervention, and to determine whether to modify or redirect interventions. Indications for a subsequent examination include new clinical findings or a failure to respond to physical therapy interventions as expected. Examinations may be indicated more than once during a single episode of care and may be performed periodically over the course of a health condition, which, for some patients/clients, may be over the life span. For patients/clients with chronic or lifelong conditions, periodic follow-up or reevaluations may be needed to ensure safety and successful adaptation to changes in physical status, caregivers, environment, equipment, technology, or activity demands. Patients/clients should be discharged with the knowledge of when and how to access a physical therapist directly.

2404 When the physical therapist determines that the plan of care needs significant modifications, an  
2405 examination may again become necessary as part of the overall management of the  
2406 patient/client.

2407

#### 2408 **Episode of Physical Therapist Care**

2409 An episode of care is defined as a period of time in which a problem or condition is diagnosed,  
2410 treated, and managed. The episode of care should include all services provided to a patient/client  
2411 within a specific period of time across a continuum of care. It may be continuous, or it may  
2412 consist of a series of intervals marked by 1 or more brief separations from care; it also may  
2413 identify the sequence of care (eg, inpatient to outpatient) provided in various settings. An episode  
2414 of care is distinct from an episode of disease or illness; therefore, for chronic conditions, the  
2415 duration of an episode of physical therapy care usually is set at 1 calendar year. For acute  
2416 conditions, the period typically begins when the condition is first examined and ends when  
2417 treatment for the condition is completed.

2418

#### 2419 **Goals**

2420 Goals reflect the intended results of management and indicate the changes in impairments in  
2421 body function and structure, activity limitations, and participation restrictions and the changes in  
2422 health, wellness, and fitness that are expected as the result of implementing the plan of care.  
2423 Goals should be measurable, functionally driven, and time limited.

2424

2425 Goals link to patient/client functioning with expected outcomes of physical therapy and should  
2426 be formulated based on the evidence for prognosis at impairment and functional levels (eg,

strength goals should be based on the evidence for strength gains in a specific population with a particular condition). The goals with expected outcomes also should address risk reduction, environmental factors, and individual satisfaction.

The primary criterion for ending an episode of care is the achievement of goals and predicted outcome status. When physical therapy services are terminated prior to achievement of expected outcomes, patient/client status and the rationale for termination are documented.

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