<SUBSTANTIVE EDIT: Excerpt of a Chapter from a Clinical Manual>

<H1>CLINICAL SKILLS

<H2>Patient History

The history is a medicolegal document that follows the format used by medical disciplines with the addition of key elements that are unique to each specialty. It serves as a tool of communication for members of the rehabilitation team, as well as nonrehabilitation health care professionals, the patient's health insurance providers, and at times the facilities responsible for ongoing care postdischarge from an acute inpatient rehabilitation unit. Depending on the setting of patient care, the history may vary from a focused outpatient evaluation to a comprehensive inpatient assessment. Some patients, especially those being admitted to an acute inpatient rehabilitation unit, may have complex medical problems requiring input and confirmation of the history from the rehabilitation team members. Gathering a complete patient history can require several days as it often depends on input from the specialist, other members of the rehabilitation team, and the patient's family members or caretakers.

<H3>A. Chief Complaint

In many cases, patients who have sustained stroke, traumatic brain injury, or other diseases or injuries causing cognitive alterations will not be able to state a chief complaint. In these cases, it is acceptable for the physician gathering the history to specify the reason for admission as the chief complaint. The chief complaint for a patient admitted to an inpatient rehabilitation

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service is often associated with ambulation, activities of daily living, communication, or cognition. In the outpatient setting, the patient may have several reasons for seeking treatment. It is imperative to have the patient rank the complaints in order of most problematic to least bothersome, and to separate those problems that are unrelated to the chief complaint.

<H3>B. History of Present Illness

The history of present illness (HPI), when skillfully navigated by the physician, can be a valuable encounter between the patient and physician as it serves to establish the physician–patient relationship through the process of gathering information. As part of the HPI, details regarding current functional impairments, bowel and bladder impairments, and skin issues relating to the chief complaint should be solicited.

<H3>C. Past Medical and Surgical History

Details of the patient's past medical and surgical history allow the rehabilitation team and the leading physician to formulate an appropriate plan of care that includes necessary precautions that should be in place given the patient's previous history. This information can alter the patient's rehabilitation course. When interviewing a patient with possible cognitive impairments, knowledgeable family members, friends, and caretakers should also be interviewed. The interviewer should ask about the patient's history of cardiopulmonary disease and associated surgical treatments to ensure that the rehabilitation program does not exceed the patient's cardiopulmonary limitations. Functional limitations from pulmonary or cardiac etiologies should be noted, as should the modifiable risk factors for cardiac disease, such as smoking, hypertension, and obesity. Similarly, a history of musculoskeletal and rheumatologic

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disorders and related procedures should be sought. The functional impact of any premorbid disorders should be noted as the patient's baseline. The patient's history of neurologic ailments should also be solicited as this can help paint a picture of the premorbid functional level.

<H3>D. Family History

It is important to ask about a family history of cardiac disease, cancer, stroke, arthritis, diabetes, neurologic disease, hypertension, psychiatric disorders, and substance abuse. Because rehabilitation patients frequently experience pain and require treatment with appropriate medications, it is important to determine any patient or family history of alcohol or drug abuse.

<ref>Merikangas K, Stolar M, Stevens DE, et al: Familial transmission of substance use disorders. Arch Gen Psychiatry 1998;55:973–979.

<H3>E. Medications

Documentation of all prescription and over-the-counter medications and supplements is an important element of the history as inaccurate medications can adversely impact the patient's wellbeing and safety. In 2005, The Joint Commission established medication reconciliation—the process of comparing a patient's medication orders to all of the medications the patient has been taking—as its National Patient Safety Goal number eight in an effort to minimize polypharmacy-related errors (omissions, duplications, inaccurate dosages, and drug interactions) and promote systematic implementation of medication reconciliation procedures across patient care settings, particularly those involving transitions from one type or level of care to another.

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<ref>Institute of Medicine: *Preventing Medication Errors.* National Academies Press; 2006.

Greenwald JL, Halasyamani L, Greene J, et al: Making inpatient medication reconciliation patient centered, clinically relevant and implementable: A consensus statement on key principles and necessary first steps. Jt Comm J Qual Patient Saf 2010;36:504–513.

<H3> F. Social History

A social history describes the personal, vocational, and recreational aspects of the patient's life that bear clinical significance. Information about the patient's occupation, activities of daily living, social support, stresses, financial situation, insurance coverage, and recreational habits is included. Complete functional information is also obtained, such as the use of assistive devices, need for assistance, and ability to ambulate distances.

Particular importance should be given to the patient's environment and living arrangements; for example, whether the patient lives in a house or an apartment, the number of stories in the house or floor on which the apartment is located, whether it is necessary to negotiate stairs to obtain access to the home, and how many steps there are. Relevant information includes whether the stairs have a handrail, and on which side; whether there is elevator access; and home wheelchair accessibility. The location of the bedroom and bathroom should be noted, along with the presence or absence of grab bars in the shower. Much of this information is unique to the field of rehabilitation because a patient's functional status after discharge depends on his or her ability to negotiate the physical environment of the home.

Prior to discharge, the occupational therapist may visit the home to assess the types of equipment or modifications to the home that will be necessary for a safe discharge. In all cases

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it is important to inquire about the patient's support system, including family, friends, and caretakers, and the extent of assistance that can be provided upon discharge. The need for a home health aide or nursing staff to fill any voids in the care of the patient can then be identified.

Documentation of the patient's recreational habits, including history of smoking, alcohol, and drug use, is imperative. This information should be sought in an open-ended and nonjudgmental manner. Level of education and occupation should also be documented. If the patient's injuries prevent full return to his or her previous occupation, the need for vocational rehabilitation should be identified. Environmental modifications and assistive devices often make it possible for patients to return to their jobs.

<H3>G. Review of Systems

The end of the interview should include a complete symptom checklist addressing all of the vital physiologic systems (Table 1).

<INSERT Table 1 here>

<H2>Physical Examination

Initial assessment and documentation of the patient's vital signs (temperature, heart rate, blood pressure, and respiratory rate) is customary. An assessment of the cardiac, pulmonary, and abdominal systems is a necessary component of the examination. Specific areas that constitute a primary focus are described in detail below.

<H3>A. Cognitive Function

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<H4>1. **Mental status**—A mental status examination should be performed with questions aimed at determining but not limited to the patient's orientation, attention, recall, visuospatial abilities, and language. The patient's responses during the mental status examination can also provide insight into his or her language ability, medical deficits, and coherence of thinking. During this time the patient's speech and language pattern can be noted and documented.

<H4>2. **Consciousness**—It is essential to document the level of consciousness of the patient. Consciousness is the state of being aware of one's surroundings. The Glasgow Coma Scale—an objective method of documenting level of consciousness that assesses eye opening, motor response, and verbal response—is used to evaluate patients, particularly those with traumatic brain injury (see Chapter ■■). Coma is the state of unresponsiveness in which the patient's eyes are closed and in which there is an absence of sleep–wake cycles and no interaction of the patient with the environment. Comatose patients cannot be aroused and have no awareness of self or their surroundings. Those in a vegetative state lack awareness of self or the environment, but have intact sleep–wake cycles. In a minimally conscious state, patients have intact sleep–wake cycles and show evidence of inconsistent but reproducible awareness of self or the environment.

<H4>3. **Orientation**—Orientation is characterized by the awareness of one's person, place, and time. This can be assessed during the mental status examination by asking the patient to state his or her name, specify the present location, and give the date (including year and day of the week). Orientation is typically lost in the following order: time, place, and finally, person.

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<H4>4. Memory—The patient's memory can be tested by asking him or her to recount information pertaining to recent and remote events. Details about illness, dates of hospitalization, and day-to-day recall can serve to test recent memory. When testing memory, especially in a patient who has been hospitalized for a prolonged period, it is best to test objective facts using questions such as, "Who won the World Series?", or "Who is the president, now and previously?" Remote memory can be tested by asking the patient to relate personal details such as his or her date of birth, marriage date, and names of children. Additionally, the patient may be given a list of at least three words, and then asked to recall the given words after 5 and 10 minutes. In patients with obvious impairment, prompting may be necessary (ie, by giving the patient multiple choices, with one choice being the correct word).

<H4>5. Mood and affect—Patient mood and affect should be observed and documented. Mood refers to an inner state that is persistent. Affect refers to a feeling or emotion—often momentary—that is experienced in response to an external occurrence or thought. Mood alterations are common findings in patients with brain injuries. The examiner should assess for anxiety, depressed mood, fear, suspicion, irritability, aggression, lability, apathy, or indifference. Open-ended questions addressing the patient's feelings and spirits can be helpful in assessing mood. Patients with alterations of affect are often described as having a flat, dull, or monotonous affect.

<H4>6. Abstract thinking—The patient should be asked to interpret abstract statements such as, "a stitch in time saves nine," "a rolling stone gathers no moss," or "people who live in glass

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houses shouldn't throw stones." Keep in mind that cultural and language barriers may prevent adequate testing of abstract thinking.

<H4>7. Judgment and insight—Insight is determined by evaluating the patient's recognition of his or her medical problems. Judgment can be tested by asking open-ended questions such as, "Why are there laws?", or "What would you do if you found a stamped, addressed envelope on the street?"

<H4>8. Attention and concentration—Attention is demonstrated when the patient is alerted by a significant stimulus and sustains interest in it. Concentration refers to the ability to maintain ongoing mental effort despite distractive stimuli. A patient who is inattentive ignores the examiner's questions or loses interest in them quickly. A patient with impaired concentration is easily distracted by noises, sights, and thoughts while answering questions.

<H4>9. Apraxia—Apraxia is the inability to perform previously learned motor tasks correctly despite intact comprehension, complete cooperation, and intact motor and sensory function. In testing for apraxia, patients are usually asked to carry out a series of general activities or tasks that their injuries or illness should not have rendered them unable to physically perform. Patients with ideomotor apraxia are unable to carry out motor responses upon verbal command; however, these acts can be carried out spontaneously. For instance, a patient may be unable to brush his or her hair on command but can do so spontaneously. Ideational apraxia is an abnormality in the conception and sequencing of the movement patterns. Patients can be tested for this form of apraxia by asking them to demonstrate how to use a key, comb, or fork.

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<ref>O'Sullivan SB: Assessment of motor function. In: O'Sullivan SB, Schmitz TJ (Eds): *Physical Rehabilitation: Assessment and Treatment,* 4th ed. FA Davis, 2001.

Waxman SG: Appendix A: The neurologic examination. In: Waxman SG (Ed): *Clinical Neuroanatomy,* 26th ed. McGraw-Hill, 2010.

<H3>B. Communication

Language is a fundamental basic of human intelligence and key part of social interaction. All aspects of the patient's language ability should be examined, including naming, spontaneous production of speech, comprehension, repetition, reading, and writing.

<H4>1. Aphasias—Aphasias are abnormalities of language functions that are not due to defects of vision, hearing, or motor dysfunction. They can be divided into three categories: fluent, nonfluent, and anomic. Anomia, a deficit of naming, is a common finding in aphasic patients. When asked to name an object, patients often compensate for their deficit by describing the object with circumlocution. Patients with semantic paraphasia are able to identify the object; however, they offer an incorrect but related word in the same category. For example, a fork may be identified as a spoon. In phonemic paraphasia, the word approximates the correct answer but is phonetically incorrect; thus, a pencil may be described by the patient as a "pentil." Aphasias should be distinguished from dysarthria (described below), which is indicative of a motor problem.

<H4>2. Dysarthria—Dysarthria is a speech disorder in which the mechanism of speech articulation is deficient. However, the content of the speech itself is unaffected and there is no abnormality of the cortical language mechanism. Thus, the patient has intact comprehension of

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both the written and spoken word. Dysarthria can be characterized by difficulty in phonation, articulation, resonance, or respiration aspects of speech.

<H4>3. **Dysphonia**—Dysphonia is dysfunction in the production of sound. Respiratory movement paresis and pulmonary diseases can cause phonation problems. Dysphonia is often accompanied by hypophonia, which is a decrease in the voice volume due to restricted movement of the breathing musculature. Patients usually speak in whispers and are unable to shout. Indirect laryngoscopy can be utilized to examine the vocal cords for paresis. Vocal cords usually separate in inspiration; however, when they are paralyzed an inspiratory stridor can result. Bilateral vocal cord paresis causes patients to speak in whispers. If only one of the vocal cords is weak, the voice can become hoarse and raspy.

<H3>C. **Motor Function**

Lesions of the upper or the lower motor neurons can produce weakness. Signs of upper motor neuron lesions include increased muscle tone, hyperreflexia, and positive Babinski and Hoffman signs. Signs of lower motor neuron lesion include decreased reflexes, muscular atrophy, and fasciculations.

<H4>1. **Tone**—Tone is resistance of a muscle to passive movement at a joint. When normal, the limb being tested should be able to be moved easily without any resistance to varying direction and speed. Clonus is a cyclic alteration of muscle contraction of the agonist and antagonist muscles in response to a sustained stretch. Clonus is assessed by a quick jerk of the muscle and is usually tested at the ankle.

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Muscle tone can be tested using the modified Ashworth scale or the pendulum test. It is important to instruct the patient to relax prior to either test. The Modified Ashworth Scale is a reliable six-point ordinal scale used in measuring muscle tone that assigns a grade of 0, 1, 1+, 2, 3, or 4, with each grade representing a description of muscle tone. A grade of 0 indicates no increase in muscle tone. A grade of 1 indicates slight increase of muscle tone, manifested by a catch and release or by minimal resistance at the end range of motion when the affected parts are moved in flexion or extension. A grade of 1+ indicates slight increase in muscle tone, manifested by a catch, followed by minimal resistance throughout the remainder (less than half) of the range of motion. A grade of 2 indicates more marked increase in muscle tone through most of the range of motion, but the affected part is easily moved. A grade of 3 indicates considerable increase in muscle tone, with passive movement being difficult. The highest grade, 4, indicates that the affected part is rigid in flexion or extension. In the pendulum test, the patient is first asked to assume the supine position, and then to fully extend the knee and allow it to drop and swing in the motion of a pendulum. Normally, the limb will swing freely for several cycles, whereas a hypertonic limb will immediately return to the starting position.

<ref>Gregson J, Leathley M, Moore AP, et al: Reliability of the tone assessment scale and the modified Ashworth scale as clinical tools for assessing poststroke spasticity. Arch Phys Med Rehabil 1999;80:1013–1016.

<H4>2. Reflexes—Three groups of reflexes are tested: muscle stretch, superficial, and primitive.

<H5>a. Muscle stretch reflexes—The muscle stretch reflex is a muscle contraction in response to stretching within the muscle. Normal muscle stretch reflexes can be elicited by tapping over

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the muscle tendon with a reflex hammer, resulting in contraction of the muscle whose tendon is stretched (Table 2). The patient is positioned into the midrange of the arch of joint motion and instructed to relax in order to elicit a response. The response levels of the deep tendon reflexes are graded from 0 to 4+ (Table 3). A grade of 0 indicates no response; 1+ indicates depressed or suppressed reflex; 2+ indicates a normal response; 3+ indicates a response more brisk than usual; and 4+ indicates that the reflex is hyperactive with the presence of clonus. Clonus is a repetitive, usually rhythmic, and variably sustained reflex response elicited by manually stretching the tendon.

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<H5>b. Superficial reflexes—Superficial reflexes are motor responses to scraping of the skin. These reflexes are graded as present or absent, with prominently irregular responses graded absent as well. The plantar reflex is the most common superficial reflex and is elicited by applying a stimulus on the sole of the foot from the lateral border to up and across the ball of the foot. Flexion of the big toe or no response is normal; an abnormal response consists of dorsiflexion of the big toe with fanning of the other toes. This response suggests dysfunction of the corticospinal tract and is known as the Babinski sign. Other noteworthy signs are the Chaddock sign (dorsiflexion of the big toe when a stimulus is applied from the lateral ankle to the lateral foot) and the Stransky sign (which occurs when the little toe is flipped outward and results in an upturned great toe).

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<H5>c. Primitive reflexes—Primitive reflexes are an abnormal finding in older children and adults and represent a reversion to a more infantile level of reflex activity, suggesting significant

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neurologic abnormalities. The rooting and sucking reflexes are elicited, respectively, by stroking the patient's cheek or stimulating the area around the mouth. In response, the patient turns toward that side and makes sucking motions with the mouth. The grasp reflex is elicited by placing a finger onto the patient's open palm, resulting in a tightened grip when the examiner attempts to remove the finger. The palmomental response—a sudden contraction of the mentalis, or chin, muscle when the palm of the hand is quickly scratched—suggests unilateral damage of the prefrontal area of the brain. Finally, the snout reflex is pursing of the lip as a response to a tap right above or below the mouth.

<H3>D. Musculoskeletal System

Examination of the musculoskeletal system can be one of the most complex aspects of the general physical examination. The extent of the examination may vary depending on the problems being assessed. Throughout the examination, attention should be directed to both function and structure. The examination should be symmetric. The musculoskeletal examination incorporates inspection, palpation, assessment of joint stability, range of motion, manual muscle testing, and special tests.

<H4>1. Inspection and palpation—Inspection of the musculoskeletal system begins with observation of the patient during the history portion of the evaluation. The examiner inspects the limbs for symmetry, circumference, and shape, and the spine for common deformities such as scoliosis, kyphosis, and lordosis. In patients with amputation, the residual limb should be examined for level of amputation, length, and contour. The examiner also assesses the surrounding tissues, noting any skin changes, subcutaneous nodules, masses, edema, scarring,

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and muscle atrophy. The joints should be evaluated for swelling, warmth, tenderness, redness, and abnormal positioning.

<H4>2. Joint stability—Evaluation of joint stability should include assessment of bony consistency, capsular and cartilaginous integrity, and the strength of ligaments and muscles. Before assessing the involved joint in a patient with compromised function, the examiner should evaluate the noninvolved side as an aid to understanding the patient's biomechanics. Assessment of joint stability should start with identifying pain, guarding, or resistance in the involved joint. The next step should be an evaluation of joint play to assess end feel, capsular patterns, and joint mobility.

<H4>3. Range of motion—Joint flexibility is the range of motion (ROM) tolerated at a joint. Examining ROM establishes the existing mobility present in the joint being evaluated, which should then be compared with the unaffected joint. Goals and a treatment plan to increase or decrease the ROM can then be developed. ROM testing can also aid in diagnosing and determining the patient's joint function. This provides information regarding limitations if joint disease is suspected. Hypermobility or hypomobility of joints affect the patient's ability to perform activities of daily living. An example of joint hypomobility hindering a person's daily living activities is an inability to climb stairs due to a 70-degree restriction in knee flexion. Additionally, using joint ROM, the examiner can reassess the patient's status after treatment and compare it with the baseline at the time of initial treatment.

Factors affecting ROM include age, sex, joint structure, and muscles. Normally, the younger the subject is, the greater the ROM. Depending on age and specific joint action, males

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have a more limited range than females. Some individuals have hypermobile or hypomobile joints owing to genetics or posture.

ROM testing should be completed before strength testing. Using an instrument called a goniometer, the examiner measures joint ROM in the three cardinal planes of motion: sagittal, coronal, and frontal. The sagittal plane separates the body into left and right halves. The frontal (coronal) plane divides the body into anterior and posterior halves, and the transverse plane divides the body into superior and inferior parts. Measurement of each arch of motion should begin at 0 degrees and proceed toward 180 degrees. Most joints in the anatomic position are at 0 degrees of motion. As joint motion occurs, the amount of joint motion is positively recorded in degrees. For example, in shoulder forward flexion, the normal range for flexion in the 180-degree system is 0–180 degrees, and for extension, 0–60 degrees.

<H4>4. Muscle strength—Manual muscle testing is a procedure for evaluating the function and strength of individual muscles and muscle groups based on the effective performance of a movement in relation to the forces of gravity and manual resistance. When performing strength testing, a particular muscle or muscle group is first isolated, then an external force is applied. Manual muscle testing specifically measures the ability to voluntarily contract a muscle or muscle group at a specific joint. Tables 4 and 5 summarize joint movement ranges and innervation for all major upper and lower extremity muscle groups, respectively. The use of a dynamometer can add a degree of objectivity to measurements for pinch and grip.

<INSERT Tables 4 and 5 here>

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<H5>a. General Cconsiderations—¶
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