Chapter 15

Pain

Pain is endemic in the United States population, yet knowledge and understanding about this complex entity and its determinants, diagnosis, and treatment are only rudimentary. This is especially true of chronic pain. Thus, any discussion of permanent impairment because of pain will be problematic as well as controversial. The difficulties that physicians experience in dealing with pain are based, in part, on the following characteristics and perceptions.

1. Pain encompasses a multifaceted concept that transcends the traditional medical model of disease based on pathogenesis at the tissue or organ level. A perceptive concept of pain includes consideration of cognitive, behavioral, environmental, and ethnocultural variables as well as pathophysiologic factors.

2. Pain is subjective, and its presence cannot be validated or measured objectively. People tend to view pain complaints with suspicion and disbelief, as with complaints of fatigue. A report of the Social Security Administration in 1987 averred that it is impossible to understand the pain that another person is suffering.[14]

3. Impairment due to pain has not been well defined. No consensus exists about the occurrence of pain in healthy people, nor is there information about its occurrence by age group.

The medical, social, and economic consequences of pain are enormous. A national survey reported in a 1987 Institute of Medicine monograph indicated that about 6% of visits to physicians are for new pain, and a telephone survey disclosed that about 14% of persons 18 to 65 years old have pain for more than 1 month per year.[12] Data from the United States and other nations indicate that at least half of all persons experience moderate pain during their lives.

The federal government has recognized the impact of pain. The Secretary of the US Department of Health and Human Services in 1985 formed a commission on the evaluation of pain, which concluded that chronic pain is not a psychiatric disorder. The commission recommended further study of the subject by the Institute of Medicine.[12] Currently, the Social Security Administration is supporting an investigation to assess the validity of criteria for identifying individuals with chronic pain.

15.1 Basic Assumptions

The *Guides* is intended to provide a standard method of analysis for evaluation of impairing conditions. Fundamental to the *Guides* is that it applies only to *permanent* impairments, which are defined as those that are stable and unlikely to change in future months because of medical or surgical therapy. Permanent impairments are considered further in Chapter 1 and the Glossary (p. 315).

In general, the impairment percents given in the tables and figures applicable to permanent impairments of the various organ systems include allowances for the pain that may occur with those impairments.

In considering pain, it is prudent to list the following assumptions.

1. Pain evaluation does not lend itself to strict laboratory standards of sensitivity, specificity, and other scientific criteria.

2. Chronic pain is not measurable or detectable on the basis of the classic, tissue-oriented disease model.

3. Pain evaluation requires acknowledging and understanding a multifaceted, biopsychosocial model that transcends the usual, more limited disease model.

4. Pain impairment estimates are based on the physician's training, experience, skill, and thoroughness. As with most medical care, the physician's judgment about pain represents a blend of the art and science of medicine, and the judgment must be characterized not so much by scientific accuracy as by procedural regularity.

The important task of evaluating impairment due to pain is difficult but not impossible. Physicians initially may feel uncomfortable evaluating pain, but they regularly employ similar methods and approaches in arriving at diagnostic and therapeutic judgments. Physicians generally are comfortable making decisions on the basis of probabilities backed up by experience and stated in terms of reasonable medical certainty. Pain should be evaluated by physicians who are conversant with the disorder.

15.2 Definitions

Pain is ubiquitous. Pain is usually regarded as a warning signal that alerts the organism to potential tissue damage. Indeed, life without pain is hardly conceivable and would result in irrevocable harm. Yet, strangely, there is no consensus as to a meaningful definition of pain.

The International Association for the Study of Pain defines pain as "an unpleasant sensory and emotional experience with actual or potential tissue damage [that is] described in terms of such damage." The Commission on the Evaluation of Pain defines pain as a "complex experience, embracing physical, mental, social and behavioral processes, which comprises the quality of life of many individuals." Another definition views pain as an unpleasant subjective perception in the context of tissue damage.

Embodied in the definitions above are the following concepts. Pain is subjective and cannot be measured objectively. Pain evokes negative psychologic reactions, such as fear, anxiety, and depression. Pain is perceived consciously and is evaluated in the light of past experiences. People usually regard pain as an indicator of physical harm, despite the fact that pain can exist without tissue damage, and tissue damage can exist without pain.

15.3 Pain, Impairment, and Disability

The *Guides* defines impairment as the loss, loss of use, or derangement of any body part, system, or function. Thus, impairment is defined on an anatomic, physiologic, or psychological basis. This definition operates at the organ level and presumes a disease model that involves endogenous systems and generally is independent of the external milieu. In this narrow context, it would be difficult to consider pain an impairment.

But the *Guides* interprets the definition of impairment to involve also interfering with the individual's performance of daily activities (see Glossary). In this broader context, impairment is at the level of the individual, is based on an illness model, and is viewed as being dependent on personal needs and the demands of the external milieu. In this context, pain may be viewed as an impairment that should be assessed according to the individual's residual functional capacity. Chronic pain and pain-related behavior are not, per se, impairments, but they should trigger assessments with regard to ability to function and carry out daily activities.

These concepts and definitions are blurred by the operational definitions and demands in different venues dealing with pain, impairment, and disability. The Social Security Administration, for instance, gives credence to pain only insofar as it relates to an underlying physical or mental impairment (see Glossary). Workers' compensation programs vary from state to state in their constraints and procedures. The US Department of Veterans Affairs generally does not consider pain, except as a manifestation of a physical or mental impairment. Private disability insurance programs tend to recognize pain as an exacerbating factor, if there is an underlying physical or mental impairment.

Related Concepts

Disease: This is a pathologic process or disorder at the tissue or organ system level.

Illness: This is an adverse, unhealthy process or disorder that affects the individual. An illness must be viewed in the context of both the external and internal milieu and transcends pathogenicity at the tissue level.

Nociception: This is the perception of pain resulting from a noxious stimulus to a nociceptor. Complex neurochemical and neuroelectrical processes transmit pain impulses from the site of injury along the peripheral, autonomic, and central nervous systems.

Modulation: Transmission of pain impulses along multisynaptic pathways can result in significant alteration of the quality and intensity of the stimulus. Modulation occurs in the central nervous system.

Perception: Conscious awareness or recognition of pain is governed by the cerebral cortex. The pain impulse is evaluated through association pathways, and it may be identified as "suffering." The emotional content of the evaluation depends on such factors as the individual's personality characteristics and value system, cognitive awareness, experiences, education, and ethnocultural background. Pain is viewed as an unpleasant experience, and the emotional content frequently consists of feelings of fear, anxiety, frustration, and depression. The fear of pain may be more devastating than the pain itself.

Response: The individual's response to perceived pain depends on multiple factors in the internal and external milieu. The response involves the central nervous system and the autonomic nervous system, is involuntary as well as voluntary, and may be appropriate or inappropriate. Before the pain response, the pain experience of the individual is unknown to others. The pain response provides a "window" through which others can discern and evaluate the individual's pain experience.

Suffering: This is a state of severe distress associated with events that threaten the individual's intactness. Suffering may or may not be associated with pain. Suffering and pain are distinct entities.

Malingering: This is the conscious and deliberate feigning of an illness or disability. Malingering is discussed in the *Guides* chapter on mental and behavioral disorders (p. 291).

Functional capacity evaluation: This involves examining an individual as the individual performs activities in a structured setting. It does not necessarily reflect what the individual *should be able* to do, but rather what the individual *can* do or *is willing* to do at a given time. Functional capacity depends especially on motivation, cognitive awareness, behavioral factors, and sincerity of effort, and these characteristics have a major impact on the functional capacity assessment (FCA).

The functional capacity assessment, which is performed by or under the supervision of the physician, varies according to the physician's training, experience, skill, competence, and understanding of the assessment processes. A great need exists for a valid, accurate, reliable, and relevant instrument for performing the FCA, one that is based on the full range of abilities and activities of normal persons.

15.4 Classification and Models

Classifying pain in a multiaxial context is important from both a conceptual and an operational perspective. Several models are proposed: a functional classification depending on neuropsychiatric considerations; a clinical classification depending on pathogenesis; and an operational or interactive classification depending upon a biopsychosocial concept. The models are not necessarily mutually exclusive: a patient seen in the office or clinic might have pain encompassing aspects of several of the models.

Neuropsychiatric Model

Nociceptive or somatic pain results from actual or impending tissue damage. This pain represents the usual and most frequent acute pain experience. Pain arising from peripheral or visceral tissues is defined within established neuroanatomic and neurophysiologic

processes. Usually the pain is limited, easily diagnosed, short-lived, and readily treated. This type of pain occurs with a fractured bone, skin laceration or angina pectoris.

Neurogenic or central pain encompasses neuropathic and deafferentation pain. This pain results from spontaneous excitation within the central, peripheral, or autonomic nervous system and in the absence of any specific noxious painful stimuli. Making the diagnosis and evaluating this type of pain may be difficult, and the pain may be persistent and refractory to effective treatment. Examples include peripheral neuropathy, trigeminal neuralgia, and phantom limb pain.

Psychogenic pain is a psychiatric disorder that is part of such conditions as somatization disorder, thought disorder, mood disorder, and hypochondriasis.[1] Psychogenic pain should not be confused with chronic pain syndrome, which is *not* considered to be a mental disorder. Confusion arises because the chronic pain syndrome often is associated with emotional problems, such as depression and anxiety, which occur frequently in mental disorders.

Significant mind-body interrelationships exist with both the chronic pain syndrome and psychogenic pain. A useful diagnostic test is to ask the question, "Would the individual have pain if the mental disorder were absent?"

Pathogenesis Model

Primary pain is related to tissue trauma or physiologic disruption, either nociceptive or neurogenic. The link between the stimulus generating the pain and the resulting perception of pain is direct. The pain usually is acute and self-limiting. Examples include pain resulting from an acute sprain or renal lithiasis.

Secondary pain usually is the result of adverse pain behavior or ineffective medical treatment (iatrogenesis). Secondary pain arises not from the primary pain stimulus, but as the patient's reaction to the result of the primary pain problem. Secondary pain is likely to be persistent and difficult to manage. Examples of secondary pain include pain resulting from the treatment of a malignant neoplasm with surgery, radiation, or chemotherapy; pain resulting from substance abuse and dependency; and pain resulting from prolonged inactivity and deconditioning.

Biopsychosocial Model

Acute pain serves as an alerting mechanism that protects the individual. Acute pain usually is nociceptive, primary, and short-lived, and its psychosocial consequences are minimal. The perception of the pain and the individual's behavior and capability after the episode generally are commensurate with the noxious stimulus. The pain abates as healing occurs. Usually, acute pain is associated with conditions that are short-lived and self-limiting; thus, estimates of permanent impairment according to *Guides* criteria are not indicated.

Recurrent acute pain is a more complex subject than acute pain. This category involves the episodic painful sensations that occur in chronic disorders, such as the arthritides, trigeminal neuralgia, and some types of headache. Recurrent acute pain may be nociceptive or neurogenic, primary or secondary. Recurrent acute pain should not be confused with chronic pain, because the determinants are greatly different, especially the pathophysiologic ones.

The significance, evaluation, and medical management of recurrent acute pain are basically the same as for acute pain. However, the emphasis is on palliation and management and not on cure. Prognosis depends on the availability of effective treatment for the underlying pathologic process. Impairment is a function of the underlying disease process as modified by the superimposed pain and the patient's makeup.

Cancer-related pain, which frequently is referred to as chronic, intractable pain, represents one of the broadest syntheses of pain models because of the nature of the causative process. The pain may be nociceptive or neurogenic; primary or secondary; acute, recurrent, or chronic. Combinations of these varieties may occur. Understandably, significant psychological states often are at play in individuals with cancer. Fear, anxiety, depression, anger, denial, and other manifestations add dramatically to the patient's perception and interpretation of the pain experience.

In patients with cancer who have pain, the diagnosis and treatment usually have been accomplished as well as is possible. The goal of pain management is to provide a comfortable and dignified life. The basis of treatment includes the use of opioid and nonopioid analgesics, other pharmaceuticals, surgical intervention, and behavior modification techniques, including biofeedback, hypnosis, and relaxation therapy.

Chronic pain represents the nidus of the chronic pain syndrome. Chronic pain may be referred to as "chronic benign pain" to differentiate it from the pain related to a malignant neoplasm. Pain of long duration is properly referred to as "persistent pain," with the term "chronic pain" being reserved for the devastating and recalcitrant type with major psychosocial consequences. In this chapter, the term "chronic pain" is synonymous with "chronic pain syndrome." Under the *Guides* definitions, persistent pain may exist in the absence of chronic pain, but chronic pain always presumes the presence of persistent pain.

Chronic pain represents a malevolent and destructive force and generally is considered to be useless. Chronic pain is a self-sustaining, self-reinforcing, and self-regenerating process. It is not a symptom of an underlying acute somatic injury, but rather a destructive illness in its own right. It is an illness of the whole person and not a disease caused by the pathologic state of an organ system. Chronic pain is persistent, long-lived, and progressive. Pain perception is markedly enhanced. Pain-related behavior becomes maladaptive and grossly disproportional to any underlying noxious stimulus, which usually has healed and no longer serves as an underlying pain generator.

Chronic pain that is not recognized and properly treated results in a deterioration of coping mechanisms. Under such circumstances, limitations of functional capacity are apt to occur. The patient's maladaptive behavior may have medical, social, and economic consequences that greatly outweigh any somatic components of the illness. These consequences may include despair, alienation from family and society, loss of job, isolation, invalidism, and suicidal thoughts. Yet, chronic pain is not a psychiatric disorder.

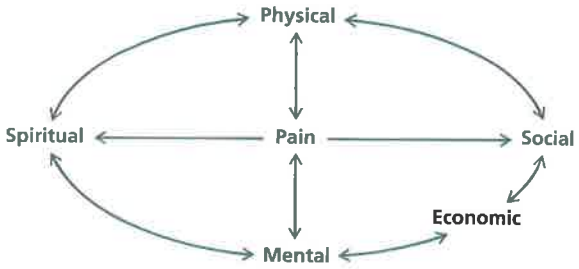
Chronic pain may result from inappropriate management of acute pain. It is not possible to predict the course of a patient's condition from inception of the noxious stimulus to the development of the complete chronic pain syndrome. However, there is some evidence relating the development of chronic pain to emotional abuse, sexual abuse, physical abuse, substance abuse, or abandonment by the primary caregiver. A history of childhood sexual or physical abuse is a common theme among female patients with chronic pain. Early detection and prompt, effective intervention require a high index of suspicion and are essential to effective management.

15.5 Dynamic Interrelationships of Models

It is important to recognize that changing interrelationships exist among the biologic, psychological, and socioeconomic components and modifiers of pain (Fig. 1, at right). The devastating, stultifying economic and social impacts of chronic pain are well known. The psychological impact is manifested by depression, withdrawal, anxiety, and other mood disorders, and the biologic consequences are beginning to be explored. Animal studies demonstrate that neuroendocrine changes related to pain, which involve the thalamic-pituitary axis and the limbic system, can alter behavior. Other experimental studies indicate that persistent pain may result in increased morbidity and mortality.

In considering the various pain classifications and models, it is important to recognize the ascending order: tissue, organ, and organism. Disorders affecting tissues and organ systems result in symptoms and disease, and acute and recurrent pain can be viewed in this context. Disorders affecting the individual as a whole result in illnesses, such as those that characterize chronic pain. Regarding pain and its interrelated determinants, it is wise to consider Dr. William Osler's maxim, "It is not nearly as important what illness a patient has, as what patient has the illness."

Figure 1. Biopsychosocial Modifiers of Pain.



15.6 Clinical Assessment

Assessing the magnitude of the patient's pain and pain-related impairment requires a multidisciplinary approach based on the biopsychosocial model. In general, the assessment calls for the traditional approach of the physician. However, assessing chronic pain is a complex and lengthy process that usually requires hours if not days to complete. In difficult cases, it may be appropriate to enlist the aid of physicians specializing in pain medicine.

The *Guides* Chapter 2 describes in general terms the methods that should be used to evaluate and estimate the extent of impairments. The following steps should guide the examination of a patient with a complex pain problem. Some important information, for instance, that is described in steps 4, 5, and 6 below ideally will be available to the evaluator because of others' examinations and studies. It is the physician's responsibility to ensure that the information, if it is used, is of good quality.

1. Review all available medical records and diagnostic studies. Communication with previous health care providers may be needed.

2. Obtain a complete medical history from the patient, speaking with persons in close contact with the patient as needed. Include a family, work, and social activities history. List affected daily activities (See p. 313).

3. Document all current complaints and the pain history. The pain history should include a description of onset, location, quality, progression, character, intensity, variability, frequency, duration, migration pattern, precipitating and aggravating factors, epiphenomena, treatment, medications, and other interventions used and results.

4. Perform a complete physical and neurologic examination.

5. Arrange appropriate ancillary studies, for instance, roentgenographic, magnetic resonance imaging, and electromyographic studies.

6. Psychological testing is an integral part of evaluating pain. Using the Minnesota Multiphasic Personality Inventory has become standard. Other instruments include the Cornell Medical Index Health Questionnaire, McGill Pain Questionnaire, Beck and Zung Depression Indices, and Westhaven-Yale Multidimensional Pain Inventory.

7. Formulate a diagnostic impression based on the accumulated information. This assessment should refer to the cause and classification of the pain, description of the biopsychosocial impact, and prognosis.

8. Estimate the extent of the pain and impairment using the procedures described in Section 15.9 (p. 311) and other parts of the *Guides* as appropriate.

Diagnostic Characteristics (the Eight *Ds*) of Chronic Pain

The presence of two or more of the following characteristics should be considered to establish a presumptive diagnosis of chronic pain syndrome.

1. *Duration*: In the past, the term "chronic pain" has been applied to pain of greater than 6 months' duration; however, current opinion is that the chronic pain syndrome can be diagnosed as early as 2 to 4 weeks after its onset. Prompt evaluation and treatment are essential.

2. *Dramatization*: Patients with chronic pain display unusual verbal and nonverbal pain behavior. Words used to describe the pain are emotionally charged, affective, and exaggerated. Patients may exhibit maladaptive, theatrical behavior, such as moaning, groaning, gasping, grimacing, posturing, or pantomiming.

3. *Diagnostic Dilemma*: Patients tend to have extensive histories of evaluations by multiple physicians. The patient has undergone repeated diagnostic studies, despite which the clinical impressions tend to be vague, inconsistent, and inaccurate.

4. *Drugs:* Substance dependence and abuse involving drugs and alcohol is a frequent concomitant. Patients are willing recipients of multiple drugs, which may interact adversely. Often they consume excessive amounts of prescribed drugs.

5. *Dependence:* These patients become dependent on their physicians and demand excessive medical care. They expect passive types of physical therapy over long time periods, but these provide no lasting benefit. They become dependent on their spouses and families and relinquish all domestic and social responsibilities.

6. *Depression:* The condition is characterized by emotional upheaval. Patients tend to have psychological test results that suggest depression, hypochondriasis, and hysteria. Cognitive aberrations give way to unhappiness, depression, despair, apprehension, irritability, and hostility. Coping mechanisms are severely impaired. Low self-esteem results in impaired self-reliance and increased dependence on others.

7. *Disuse:* Prolonged, excessive immobilization results in secondary pain of musculoskeletal origin. Self-imposed splinting may be validated by misguided medical directives to be "cautious," and this can result in progressive muscular dysfunction and generalized deconditioning. The secondary pain further aggravates and perpetuates the reverberating pain cycle.

8. *Dysfunction:* Having lost adequate coping skills, patients with chronic pain begin to withdraw from the social milieu. They disengage from work, drop recreational endeavors, tend to alienate friends and family, and become increasingly isolated, eventually restricting their activities to the bare essentials of life. Bereft of social contacts, rebuffed by the medical system, and deprived of adequate financial means, the patient becomes an invalid in the broadest sense: physical, emotional, social, and economic.

The physician should suspect the presence of the chronic pain syndrome if a patient does not respond to appropriate medical care within a reasonable period of time, or if the patient's verbal or nonverbal pain behavior greatly surpasses the usual response to a given noxious stimulus.

15.7 Treatment

Pain, including persistent and chronic pain, need not be a progressive, destructive force. But physicians who specialize in pain medicine consider chronic pain to represent a failure of traditional medical approaches that is characterized by repeated diagnostic studies, excessive use of medicines, prolonged use of passive physical therapy modalities, prolonged immobilization, and unwise surgical intervention. All of these approaches only perpetuate and augment the syndrome.

Nonmedical factors also may have substantial roles in chronic pain conditions. The authoritative commission on pain in 1987 noted that there are many ways to reward illness behavior and provide disincentives for recovery. From the patient's standpoint, pain can provide the rationalization for quitting an unpleasant job or provide a useful attention-getting device. Pain also may lead to expectation of financial gain through an illness-compensation system.

Chronic Pain

Effective treatment of persistent and chronic pain recognizes it as a multifaceted illness, rather than as a localized disease process. The focus of treatment is on management rather than cure. Management requires a multidisciplinary effort that is carried out at a comprehensive pain center on an inpatient or outpatient basis. The goals should be clearly defined and articulated. These include an increase in functional capacity and a decrease in dependencies on medication and medical care providers.

Pain-oriented behavior usually can be decreased. Although pain perception often is not diminished, the significance of pain to the patient can be reduced. Return to the work force is highly desirable, and this can be achieved in about one half of treated patients. A return of the work ethic in the patient with chronic pain depends on many variables, including character traits, personality, ethnic and cultural background, the presence of support systems, motivation, and satisfaction with the position held before the event that gave rise to the condition.

Effective management incorporates the three major pathways indicated below.

Rehabilitation: This includes physical rehabilitation, with mobilization, stretching, and strengthening exercises; and rehabilitation in terms of medical and psychological factors, including those that involve vocation, social relationships, and use of medications.

Behavior modification: This may include operant conditioning and relaxation therapy.

Cognitive therapy: This includes helping the patient understand and revamp thought processes aided by knowledgeable persons in medicine, psychiatry, and psychology. Patients with chronic pain must "take control" again and become responsible for their lives.

15.8 Estimating Impairment

If the patient's pain or pain-related condition is to be evaluated under the criteria of the *Guides*, by definition it must be one that is stable and unlikely to change in the future despite therapy (see Glossary, p. 315). Pain is a subjective perception. Usually no exact relationships exist among the degree of pain, extent of pathologic change, and extent of impairment.

Decreased ability to carry out daily activities may be one result of pain-related impairment. This decreased ability is *not* merely a function of verbal behavior. An individual who complains of constant pain but who has no objectively validated limitations in daily activities has *no* impairment. The proper test is not "Does this daily activity cause pain?" but rather "Can the patient perform this daily activity?"

Evaluating functional capacity (p. 305) is the process of assessing the patient's ability to carry out the activities necessary for daily living. There is no universally accepted standard, method, or instrument for evaluating functional capacity. Rather, functional capacity evaluation depends on medical experience and judgment. The process is a comprehensive, multidimensional assessment of the individual's capabilities, considering biologic, psychological, and social aspects of the individual's condition. This type of evaluation is more complex and difficult than estimating an impairment using anatomic or physiologic measures.

The validity of a functional capacity evaluation depends on the capability of the physician or the trained examiner acting under the physician's purview. The Visual Analogue Scale, a linear scale used to grade pain from 1 to 10 depending on severity, may be useful in determining pain intensity, but it must not be the primary criterion. The physician's judgment must be based on reasonable certainty. The goal should be to achieve precision, replicability, and interobserver agreement, not necessarily absolute accuracy.

Assessment Content

A comprehensive pain assessment includes clinical assessment (Section 15.7, p. 310); classification (Section 15.4, p. 305); and description of the effects of the pain on performing daily activities (functional capacity evaluation). In estimating the extent of pain-related impairment, the following criteria should be observed.

1. Acute pain is not a "permanent impairment."

2. Psychogenic pain is a mental disorder that should be evaluated according to the chapter on mental and behavioral disorders (p. 291).

3. Recurrent acute pain is likely to be classified as primary and nociceptive or neurogenic. Such pain relates clearly to well-defined diseases or pathologic entities.

4. Chronic pain (chronic pain syndrome) is likely to be classified as secondary pain. Chronic pain in the absence of objectively validated diseases or impairments, such as those that are described in the *Guides*, should be evaluated on a multidisciplinary basis by physicians with a special interest and background in pain medicine and considering the effects of the pain on the patient's ability to carry out daily activities. The Pain Intensity-Frequency Grid (Fig. 2, at right) should be used to describe the degree of impairment resulting from this disorder.

Figure 2. Pain Intensity-frequency Grid.

Intensity	Frequency			
	Intermittent	Occasional	Frequent	Constant
Minimal				
Slight				
Moderate				
Marked				

The Pain Intensity-frequency Grid (Fig. 2, above) should be interpreted according to the guidelines below. The physician should indicate in the impairment report in which category of the grid the pain impairment lies. In some instances, an impairment percent applicable to the patient's pain may be determined, if the condition causing the pain can itself be evaluated according to the criteria applicable to a particular organ system as with example 3 (p. 313).

Intensity

Minimal: The pain is annoying, but it has not been documented medically to have caused appreciable diminution in an individual's capacity to carry out daily activities. The pain does not interfere with sleep, and it requires only *occasional* use of nonnarcotic medication.

Slight: The pain is tolerated by the individual but has been documented medically to cause diminution in an individual's capacity to carry out *some* specified daily activities. The pain may interfere with sleep. Nonnarcotic medication may be consumed regularly, and occasional narcotic medication may be required.

Moderate: The pain has been documented medically to result in *extensive diminution* in an individual's capacity to carry out specific activities of daily living. The pain may be tolerable, but it interferes with sleep. It frequently requires use of narcotic medication, or it may require invasive procedures. Recreation and socialization are severely limited.

Marked: The pain precludes carrying out *most* activities of daily living. Sleep is disrupted. Recreation and socialization are impossible. Narcotic medication or invasive procedures are required and may not result in complete pain control.

Frequency

Intermittent: The pain has been documented medically to occur less than one fourth of the time when the individual is awake.

Occasional: The pain has been documented medically to occur between one fourth and one half of the time when the individual is awake.

Frequent: The pain has been documented medically to occur between one half and three fourths of the time when the individual is awake.

Constant: The pain has been documented medically to occur between three fourths and all of the time when the individual is awake.

15.9 Headache

Head, neck, and facial pain disorders, in this section referred to as headache disorders, possess some features that distinguish them from other painful disorders. Generally, however, these common disorders may be considered in terms of the same model.

The *primary headache disorders* include migraine, cluster headache, and tension-type headache. The *secondary headache disorders* are those that are associated with a variety of organic causes and with an identifiable, distinct pathologic process, of which head pain is a symptom. More than 300 organic disorders are capable of producing secondary headaches. However, more than 90% of headaches requiring medical attention are the result of one or more of the primary headache disorders.

Headache may present either in an intermittent, recurring fashion or in a persistent, constant form. Though headaches such as migraine are generally intermittent and periodic, they may evolve or transform to a state of constancy. Similarly, headaches secondary to organic processes may begin intermittently and then evolve to a more constant form.

Pathogenesis

Whereas muscular and vascular disturbance have been considered in the past to be the fundamental physiologic alterations causing primary headache disorders, current concepts of headache pathogenesis hold that these disorders arise from disturbances within the central nervous system. Supporting this neurogenic concept of migraine is the frequent presence of premonitory symptoms suggesting hypothalmic dysfunction; the presence of focal neurologic disturbances that cannot be explained solely by cerebral blood flow alterations; the accompanying features that include autonomic and systemic dysfunction; evidence concerning alteration of serotonin function; encephalographic alterations indicating neuronal disturbances during attacks; and the presence of inflammation within the trigeminal nerve vascular system that is induced by nervous system alterations.

Other evidence of this concept is that the primary headache disorders often improve with the use of pharmaceuticals and other therapeutic approaches that influence serotonin function independent of direct vascular or muscular effects.

Migraine

Migraine embodies an increasing variety of headache presentations, which range from typical, characteristic, periodic attacks to a daily persistent form. There is growing support for a concept suggesting that migraine represents a broad clinical spectrum. At one extreme are patients with an occasional intermittent migraine with aura, and at the other extreme are those with daily persistent pain similar to the traditional types of chronic tension-type headache.

Migraine may be defined as a complex neurophysiologic disorder characterized by episodic and progressive attacks of head pain with numerous neurologic, autonomic, systemic, and psychophysiologic disturbances. There is increasing recognition of migraine's capacity to transform or evolve from intermittent attacks to daily or almost daily head pain. This variant form most recently has been termed transformational migraine, progressive migraine, or pernicious migraine. Migraine is considered to be inherited as an autosomal dominant trait with incomplete penetrance.

Subclassifications of migraine reflect specific migraine syndromes and include ophthalmoplegic migraine, hemiplegic migraine, aphasic migraine, and retinal migraine. Major and sometimes prolonged disturbances of brain-stem function may occur with migraine, including dizziness with or without vertigo and disequilibrium; nausea, vomiting, diarrhea, and anorexia; loss of consciousness; sudden mood change; and dramatic disturbances, such as stupor, confusion, and ataxia.

Tension-type Headache

Many clinicians experienced with headache believe that tension-type headache represents a variant form of migraine. There is a significant overlap between the symptoms of tension-type headache and those of migraine, and a large number of patients with tension-type headache suffer superimposed periodic migraine.

Cluster Headache
Cluster headache is a devastating and painful affliction in which attacks of one-half hour to 1½ hours occur daily for weeks, months, or years at a time. Up to eight or more attacks may occur per day. The term "cluster headache" was originally used to describe the clustering or sequence of bouts of attacks in which the headache cycle occurred for a period of time, usually several months, and then remitted for a quiescent period referred to as the interim. A chronic form of cluster headache without an interim now is recognized.

Primary Headache Frequency Patterns
Three patterns of primary headache occur, as shown below, and these are independent of the specific diagnosis. Complex or mixed forms of headache may occur, in which varying intensities and frequencies of one form occur with superimposed features of another form.

1. Minimal, slight, moderate, and marked headache may occur in intermittent, occasional, frequent, or constant forms.

2. Cycles or episodes of the above may occur, lasting moments, hours, days, weeks, months, or years, which are followed by periods of complete or almost complete remission.

3. Constant and persistent pain of varying intensity may last years, decades, or a lifetime.

Chronic Pain
Chronic, intractable pain embodies a condition in which a malevolent and destructive influence occurs. Headache that evolves into chronic pain is a self-sustaining process and does not reflect an underlying acute somatic injury. Rather, the headache is a disorder in its own right and is chronic, long-lived, and progressive. The patient's pain perception is markedly enhanced, the pain behavior becomes maladaptive and counterproductive, and both behavior and perception are greatly disproportional to any identifiable underlying noxious stimulation.

Clinical Features Distinguishing Headache Illnesses from Other Painful Disorders
Many of the headache illnesses are accompanied by dramatic, often strokelike clinical phenomena that can be even more disruptive and disabling than the pain experience itself. Moreover, functioning in patients with headache syndromes often is compromised by the effects of excessively used sedative medications prescribed or taken to treat the headache.

Many headache symptoms persist beyond the period of pain itself or can occur hours or days in advance of an attack. After the acute episode, a period of mental dullness, fatigue, and somnolence occurs, which is similar to that seen in the postictal phase of an epileptic seizure.

Diagnostic and Therapeutic Considerations
Because the presence or suspected presence of a primary headache disorder does not exclude the presence of a separate, comorbid, distinct pathologic process that might be responsible for secondary headache, broad and careful diagnostic measures are required both initially and periodically. Moreover, in the presence of an intense pharmacotherapeutic program, the monitoring of blood levels of the pharmaceutical agent, organ responses, and cardiac status is required for safety. Screening studies are necessary to determine the safety of drug administration, and other measures may be required.

Determining Impairment
Impairment related to headache pain should be estimated according to the procedures described in Section 15.8 (p. 309) for evaluating other types of pain. It is important to remember that assessing *permanent* impairment refers to assessing a condition that is stable and unlikely to change in future months despite medical or surgical therapy. The vast majority of patients with headache will not have permanent impairments.

Examples of Evaluating Pain

Example 1: A 34-year-old man injured his back while lifting a heavy object; this injury was an L4 to L5 disk herniation causing radiculopathy. He had an operation for removal of the disk and had good pain relief for 3 weeks. He then developed constant low-back pain and burning pain radiating down the right leg to the toes. During the succeeding 2 years, he was under the care of a neurosurgeon, an orthopedic surgeon, and a neurologist, and the diagnoses of arachnoiditis and neuritis were made.

The man required the use of narcotics, anti-inflammatory drugs, and antidepressants, but these did not relieve his pain. He could not participate in recreational activities or sit long enough to drive, and he required assistance to put on his shoes and socks.

Diagnosis: Arachnoiditis; neuritis; disk herniation at L4 to L5.

Impairment: 10% whole-person impairment from a herniated disk, DRE lumbosacral category III (p. 110); pain impairment due to frequent pain of moderate intensity.

Comment: The man's pain, which followed the primary insult and a surgical procedure, and his inability to perform some daily living activities established the presence of chronic pain syndrome. Any peripheral nerve impairment other than that due to the L4 to L5 lesion should be determined by referring to criteria in Section 3.1 or 3.2 of Chapter 3 (pp. 15 and 75), and the whole-person impairment percent should be *combined* with the spine impairment percent (Combined Values Chart, p. 322).

Example 2: A 47-year-old woman bumped the dorsum of her right hand as she was stocking shelves at work. Within 24 hours, the hand became swollen and painful. Roentgenograms disclosed no fracture. Within a week of the injury, the hand had become red, swollen, and hot, and she was unable to tolerate stimulation of any kind of the affected part. A physician made the diagnosis of reflex sympathetic dystrophy. The patient underwent a series of stellate ganglion blocks, which did not provide lasting relief.

A year after the injury, the patient had a surgical sympathectomy, which did not relieve the pain. An examination showed that the woman held her right hand in a protected fashion guarded by the left hand. The history indicated that she could not perform domestic tasks and that she had to rely on family members to assist with dressing, hygiene, and most daily activities. She also no longer took part in social activities. She described her pain as being intense and constant and would not allow anyone to touch the affected limb.

Diagnosis: Reflex sympathetic dystrophy; impairment due to constant, marked pain.

Impairment: Impairment due to constant, marked pain.

Comment: The patient became totally focused on her pain, her life was consumed by the pain, and she was incapable of performing most daily activities.

An impairment percent related to the causalgia may be determined according to criteria in Chapter 3, Section 3.1 (p. 15) for impairment of hand and wrist motion and sensation.

Example 3: A 55-year-old executive developed trigeminal neuralgia affecting the maxillary and mandibular branches of the trigeminal nerve. The pain initially diminished with carbamazepine therapy, but after 2 years it recurred. It then became persistent, despite large doses of carbamazepine combined with baclofen and clonazepam and the adjunctive use of acupuncture. Chewing, swallowing, and toothbrushing initiated paroxysms of pain. If the man spoke cautiously, he could avoid pain most of the time. He could not go to work because of the attacks. He was unwilling to submit to surgical intervention.

Diagnosis: Trigeminal neuralgia.

Impairment: Impairment due to intermittent pain of marked severity.

Comment: The man's attacks were infrequent but severe, even though they lasted only a few minutes. The patient believed the attacks prevented his working, which required that he almost continuously converse in person or by telephone.

In this instance, a whole-person impairment percent may be derived by referring to the impairment criteria for cranial nerve V (Chapter 4, p. 139).

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