

## PAIN AND ITS CLASSIFICATION AND MECHANISM

Pain is a distressing feeling often caused by intense or damaging stimuli. The International Association for the Study of Pain's widely used definition defines pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage". Pain motivates the individual to withdraw from damaging situations, to protect a damaged body part while it heals, and to avoid similar experiences in the future. Most pain resolves once the noxious stimulus is removed and the body has healed, but it may persist despite removal of the stimulus and apparent healing of the body. Sometimes pain arises in the absence of any detectable stimulus, damage or disease.

Pain is the most common reason for physician consultation in most developed countries. It is a major symptom in many medical conditions, and can interfere with a person's quality of life and general functioning. Simple pain medications are useful in 20% to 70% of cases. Psychological factors such as social support, hypnotic suggestion, cognitive behavioral therapy, excitement, or distraction can affect pain's intensity or unpleasantness. In some debates regarding physician-assisted suicide or euthanasia, pain has been used as an argument to permit people who are terminally ill to end their lives.

### Classification:

#### Duration

Pain is usually transitory, lasting only until the noxious stimulus is removed or the underlying damage or pathology has healed, but some painful conditions, such as rheumatoid arthritis, peripheral neuropathy, cancer and idiopathic pain, may persist for years. Pain that lasts a long time is called chronic or persistent, and pain that resolves quickly is called acute. Traditionally, the distinction between acute and chronic pain has relied upon an arbitrary interval of time between onset and resolution; the two most commonly used markers being 3 months and 6 months since the onset of pain, though some theorists and researchers have placed the transition from acute to chronic pain at 12 months. Others apply acute to pain that lasts less than 30 days, chronic to pain of more than six months' duration, and subacute to pain that lasts from one to six months. A popular alternative definition of chronic pain, involving no arbitrarily fixed durations, is "pain that extends beyond the expected period of healing" Chronic pain may be classified as cancer pain or else as benign

#### Allodynia

Allodynia is pain experienced in response to a normally painless stimulus. It has no biological function and is classified by stimuli into dynamic mechanical, punctate and static. In osteoarthritis, NGF has been identified as being involved in allodynia. The extent and intensity of sensation can be assessed through locating trigger points and the region of sensation, as

well as utilising phantom maps

#### Phantom

Phantom pain is pain felt in a part of the body that has been amputated, or from which the brain no longer receives signals. It is a type of neuropathic pain.

The prevalence of phantom pain in upper limb amputees is nearly 82%, and in lower limb amputees is 54%. One study found that eight days after amputation, 72% of patients had phantom limb pain, and six months later, 67% reported it.

Some amputees experience continuous pain that varies in intensity or quality; others experience several bouts of pain per day, or it may reoccur less often. It is often described as shooting, crushing, burning or cramping. If the pain is continuous for a long period, parts of the intact body may become sensitized, so that touching them evokes pain in the phantom limb. Phantom limb pain may accompany urination or defecation.

Local anesthetic injections into the nerves or sensitive areas of the stump may relieve pain for days, weeks, or sometimes permanently, despite the drug wearing off in a matter of hours; and small injections of hypertonic saline into the soft tissue between vertebrae produces local pain that radiates into the phantom limb for ten minutes or so and may be followed by hours, weeks or even longer of partial or total relief from phantom pain. Vigorous vibration or electrical stimulation of the stump, or current from electrodes surgically implanted onto the spinal cord, all produce relief in some patients.

Mirror box therapy produces the illusion of movement and touch in a phantom limb which in turn may cause a reduction in pain.

#### Breakthrough

Breakthrough pain is transitory pain that comes on suddenly and is not alleviated by the patient's regular pain management. It is common in cancer patients who often have background pain that is generally well-controlled by medications, but who also sometimes experience bouts of severe pain that from time to time "breaks through" the medication. The characteristics of breakthrough cancer pain vary from person to person and according to the cause. Management of breakthrough pain can entail intensive use of opioids, including fentanyl.

#### Asymbolia and insensitivity

The ability to experience pain is essential for protection from injury, and recognition of the presence of injury.

Episodic analgesia may occur under special circumstances, such as in the excitement of sport or war: a soldier on the battlefield may feel no pain for many hours from a traumatic amputation or other severe injury.

Although unpleasantness is an essential part of the IASP definition of pain, it is possible to induce a state described as intense pain devoid of unpleasantness in some patients, with morphine injection or psychosurgery. Such patients report that they have pain but are not bothered by it; they recognize the sensation of pain but suffer little, or not at

all. Indifference to pain can also rarely be present from birth; these people have normal nerves on medical investigations, and find pain unpleasant, but do not avoid repetition of the pain stimulus.

Insensitivity to pain may also result from abnormalities in the nervous system. This is usually the result of acquired damage to the nerves, such as spinal cord injury, diabetes mellitus (diabetic neuropathy), or leprosy in countries where that disease is prevalent. These individuals are at risk of tissue damage and infection due to undiscovered injuries. People with diabetes-related nerve damage, for instance, sustain poorly-healing foot ulcers as a result of decreased sensation.

### **Mechanism:**

#### **Nociceptive**

Nociceptive pain is caused by stimulation of sensory nerve fibers that respond to stimuli approaching or exceeding harmful intensity (nociceptors), and may be classified according to the mode of noxious stimulation. The most common categories are "thermal" (e.g. heat or cold), "mechanical" (e.g. crushing, tearing, shearing, etc.) and "chemical" (e.g. iodine in a cut or chemicals released during inflammation). Some nociceptors respond to more than one of these modalities and are consequently designated polymodal.

Nociceptive pain may also be classed according to the site of origin and divided into "visceral", "deep somatic" and "superficial somatic" pain. Visceral structures (e.g., the heart, liver and intestines) are highly sensitive to stretch, ischemia and inflammation, but relatively insensitive to other stimuli that normally evoke pain in other structures, such as burning and cutting. Visceral pain is diffuse, difficult to locate and often referred to a distant, usually superficial, structure. It may be accompanied by nausea and vomiting and may be described as sickening, deep, squeezing, and dull. Deep somatic pain is initiated by stimulation of nociceptors in ligaments, tendons, bones, blood vessels, fasciae and muscles, and is dull, aching, poorly-localized pain. Examples include sprains and broken bones. Superficial somatic pain is initiated by activation of nociceptors in the skin or other superficial tissue, and is sharp, well-defined and clearly located. Examples of injuries that produce superficial somatic pain include minor wounds and minor (first degree) burns.

#### **Neuropathic**

Neuropathic pain is caused by damage or disease affecting any part of the nervous system involved in bodily feelings (the somatosensory system). Neuropathic pain may be divided into peripheral, central, or mixed (peripheral and central) neuropathic pain. Peripheral neuropathic pain is often described as "burning", "tingling", "electrical", "stabbing", or "pins and needles". Bumping the "funny bone" elicits acute peripheral neuropathic pain.

#### **Nociplastic**

Nociplastic pain is pain characterized by a changed nociception (but without evidence of real or threatened tissue damage, or without disease or damage in the somatosensory system).

This applies, for example, to fibromyalgia patients.

#### **Psychogenic**

Psychogenic pain, also called psychalgia or somatoform pain, is pain caused, increased, or prolonged by mental, emotional, or behavioral factors. Headache, back pain, and stomach pain

are sometimes diagnosed as psychogenic. Sufferers are often stigmatized, because both medical professionals and the general public tend to think that pain from a psychological source is not "real". However, specialists consider that it is no less actual or hurtful than pain from any other source. People with long-term pain frequently display psychological disturbance, with elevated scores on the Minnesota Multiphasic Personality Inventory scales of hysteria, depression and hypochondriasis (the "neurotic triad"). Some investigators have argued that it is this neuroticism that causes acute pain to turn chronic, but clinical evidence points the other direction, to chronic pain causing neuroticism. When long-term pain is relieved by therapeutic intervention, scores on the neurotic triad and anxiety fall, often to normal levels. Self-esteem, often low in chronic pain patients, also shows improvement once pain has resolved.

