

Pain... what is it good for?

What is pain? What is the physiological reason for pain? Are there organs of pain? What measures pain? How do we manage pain? Are there different kinds of pain? What does pain have to do with the study of Herbs?

Pain could be the result of a number of activities.

- ☼ Tissue damage is the oldest theory of reasons for pain. When any cell in the body is damaged, it releases certain chemicals called histamines, kinins and prostaglandins. Sensory receptors called **nociceptors** bind with the chemicals and send a message along a nerve to the brain that there's been tissue damage in the specific area, and the brain registers that there's injury, tells us it hurts, and prevent further damage to the tissue.
- ☼ Pain can also be the result of other sensory receptors being stimulated too much. Ever feel pain when there's too much heat, cold, pressure (before there's actual tissue damage)? The receptors responding to temperature, touch and pressure can signal pain in the brain when they are stimulated too much, independent of tissue damage. *Why would this be helpful?* We feel pain from too much heat and move away from it before we are burned to the point of damaging the tissue.
- ☼ Other stimuli that illicit pain are, distension or dilation of an organ (Ever had a belly hurt when it was too full?), prolonged muscular contraction, muscle spasms, or inadequate blood flow to an organ.
- ☼ The latest thought on other pain-causing stimuli is that the brain itself not only passively *registers* pain but can *generate* the pain experience. Pain can be perceived even in the absence of external stimuli. ***The brain can decide a region of your body hurts, independent of all the reasons above!*** Pain is not "felt" in one region of the brain, but rather input is gathered from incoming sensory nerves, memory and mood and the brain collectively decides there's pain. Suddenly we perceive pain in the shoulder or the lower back, even when there is no tissue damage because the brain has decided so.

The reason for pain physiologically is to stop whatever the activity causing the pain. Pain signals something is wrong, and must be dealt with and changed. Once pain is registered, the body will begin to reflex certain muscles to splint the area and prevent further injury and pain. (Have you experienced your body splinting for you without your voluntary input?)

The brain measures pain. Once the nociceptors have signaled tissue damage, the brain interprets the signal. The signal from the periphery ends up in a specific place in the sensory cortex of the cerebrum. Wherever the signal ends up is the area we perceive pain. Our pinky toe hurts when we stub it because the nerve impulse ends up in the pinky toe area of our cerebrum. Let's pause here for theatrical effect... **WE FEEL PAIN IN OUR PINKY TOE BECAUSE OUR BRAIN PROJECTS THE SENSATION OF PAIN TO THAT AREA!** We feel pain because our brain says so. If we didn't have a brain to register and project, we wouldn't feel pain. "*No brain no pain*".

Since pain is being monitored and "felt" in the cerebrum, the intensity of pain is also related to our emotional-state, stress level, and memory of pain in the past.

Pain can be managed in a myriad of ways.

1. Remove the tissue-damaging stimulus. (It's important to note here that if you remove the thorn that was in your leg, it will still hurt after. Why? Because the tissue is still damaged and releasing chemicals.)
2. Remove the chemicals that initiate the pain message to the brain. (the salicylates in, willow block the formation of prostaglandin's... aspirin and ibuprofen (N.S.A.I.D.S.) too.)
3. If a nociceptor has been stimulated recently, it is more sensitive and will send the pain message much more easily in the immediate future. (It will actually take *fewer stimuli* to initiate the pain.)
4. Pain can also be influenced at the level of the spinal cord. "Spinal taps" place chemicals in the subarachnoid space, which stops all sensations below the level of the spinal tap. Cordotomy, surgery that severs the spinal cord in certain areas, blocks the pain transmission from reaching the brain permanently at the level of the spinal cord (If it's successful).
5. Nerve cell communication about pain, in stations between the spinal cord and sensory cortex of the cerebrum could be altered by **endorphins** and **enkephalins**, which are chemicals produced by the brain. (The former causes euphoric feelings similar to morphine while the later actually is able to override or stop pain transmissions. These are types of neurotransmitters we mentioned earlier.)
6. And lastly, suffering associated with pain is enormously influenced at the cerebral level by the meaning ascribed to it. Morphine, which, is used for pain management, does not change anything in the pain pathway, it merely changes our emotional attachment to the pain in the brain. We don't care that it hurts.

Types of pain.

Acute pain occurs very rapidly after the stimulus is applied and is known as sharp, fast and pricking. Acute pain is felt superficially and not in the deeper regions of the body. These pain sensations are carried by medium diameter A-fiber nerves.

Chronic pain begins slowly and gradually increases in its intensity over the next few seconds or minutes. It may be excruciating, burning, throbbing, aching and slow. Chronic pain may be at the level of the skin or deeper in the internal organs. This pain sensation is carried by small, unmyelinated C-fibers.

Referred pain is usually only in visceral pain and not in somatic pain. Usually organs cause pain in the skin just overlying them, but they may also cause pain in other areas away from the organ. This is called referred pain. The same segment of spinal nerve as the stimulated organ services this "outlying" area. (Where do men suffering from a "heart attack" usually feel the pain? Down their left arm, the same segment of the spinal cord that connects to the arm connects to the heart.)

Phantom pain is experienced by individuals who have had a limb amputated. They may also feel itching, pressure and tingling. One theory states that the remainder of the sensory neuron or nerve, from the amputated limb still transmits information and the brain thinks it's coming from the nonexistent limb. Another theory believes the brain itself generates sensory impulses *about* the body.

Herbs works with a variety of levels for pain management.

- ❁ **Analgesics** (*absence of sensation of pain*): Some herbs that contain salicylates are proven to be analgesics They work to decrease the number of prostaglandins released from the injured cells. Aspirin is a manufactured form of one of the salicylates, salicylic acid.
- ❁ **Vasodilators** increase blood flow to areas, which removes toxic wastes that sensitize nociceptors. (They are more apt to fire an impulse signaling pain when wastes are around them.)
- ❁ **Anti-inflammatory.** Inflammation releases chemicals, which stimulate nociceptors. Reducing inflammation will also stop pain caused by inflammation.
- ❁ **Anti-spasmodics** lengthen shortened or tight muscles. This stops a known stimulus for pain; contracted muscles. This also increases blood flow and oxygen to surrounding organs; another known cause of pain (ischemia).
- ❁ **Pleasurable tastes and aroma.** Pleasurable sensations travel more quickly to the brain than painful sensations. Focusing on the pleasure could decrease the perception of pain.
- ❁ **Anti-anxiety.** Lowering a person's stress level makes it more difficult to initiate the pain signal (more pain-causing stimulus is needed to cause the same amount of pain as when they were stressed).
- ❁ **Sedatives** act to decrease tension in the brain and body. Pain from tension will be decreased.
- ❁ **Rubefacients** (*to make red*) are better for chronic conditions. Create heat and redness which decreases pain by stimulating the larger A-fibers, increasing the production of endorphins by the CNS, and washing away some of the irritants or pain chemicals from the nociceptors by increasing blood flow to the area.
- ❁ Perceived control over pain has been proven to lessen it and a client choosing to come in and work with the practitioner is something a client has control over. If the client can come in, receive treatment, and feel less pain, there is hope they could feel less pain in the future. The clients have empowered themselves by coming in and getting treatment and gaining a sense of control over their pain.
- ❁ The body and brain are given a memory of a more pleasurable, pain-free experience. (pleasure is possible, and so is hope of being pain-free)