

Patient information

Chronic pain self-management

The physiology of pain and pain gates

Physiology of pain

Pain can be experienced in any part of your body and involves a number of different mechanisms:

- The pain most commonly felt when pain mechanisms are 'switched on' is technically known as 'nociceptive pain'.
- When body tissues are injured, inflammatory changes may occur leading to 'inflammatory pain'.
- If sensory nerves are damaged and malfunction the result is nerve pain or 'neuropathic pain'.
- When our internal organs are affected we may experience 'visceral pain'.
- It is possible to have pains involving more than one mechanism. These are referred to as 'mixed pains'.

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Anatomy & Physiology of Pain

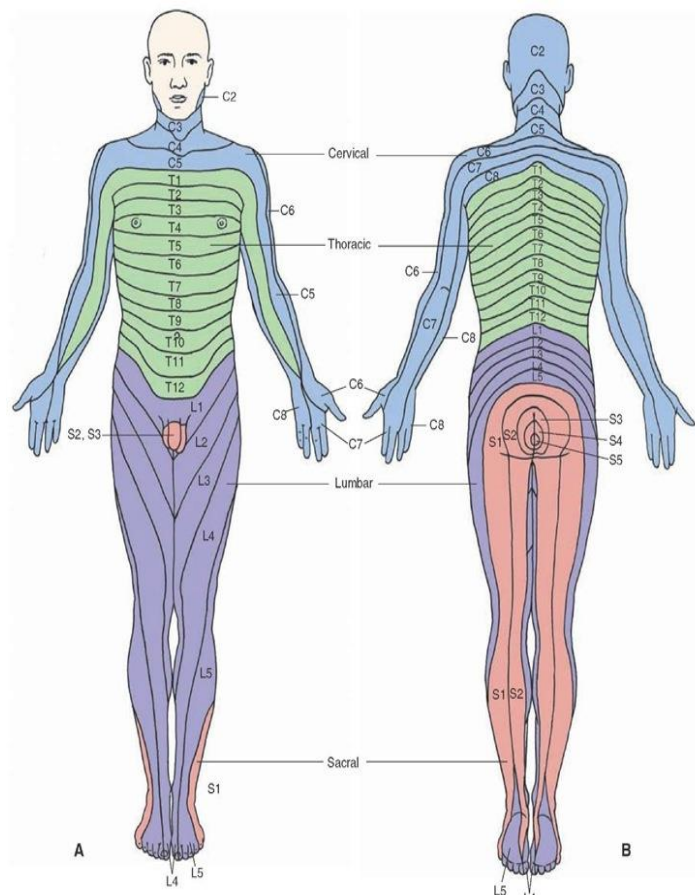
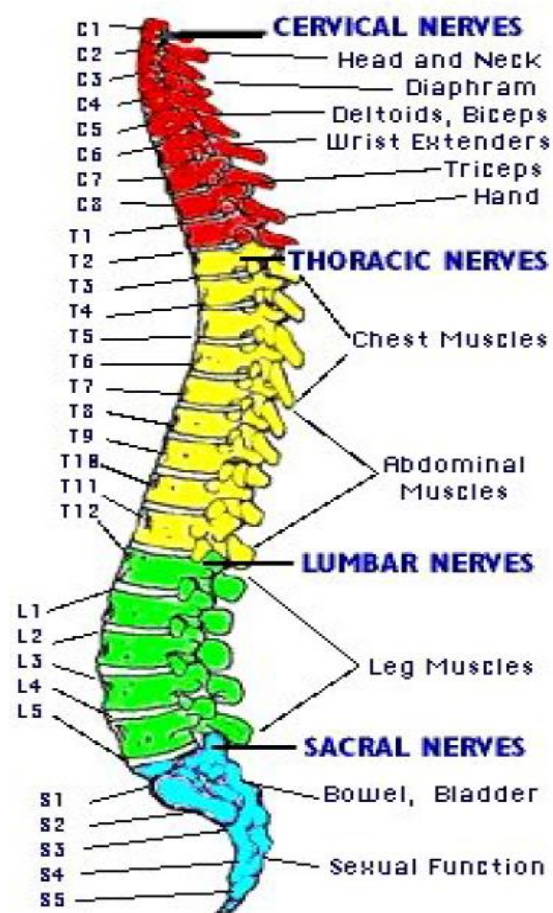
- Physiology of pain involves journey:
 - Transduction from site of stimulation of peripheral receptors to spinal cord.
 - Transmission up spinal cord.
 - Perception at cerebral cortex.
 - Modulation back down spinal cord.

Normally, when we feel pain, signals travel from part of the body along particular nerve fibres via the spinal cord to the brain. However, in some cases (for example, pain after a stroke) damage to the brain or to the spinal cord can cause pain to be felt in parts of the body which are not actually damaged. This type of neuropathic pain can be likened to a faulty burglar alarm — the alarm is sounding but there is no intruder.

Pain signals are initially processed in the spinal cord and then in the brain where there are connections with centres associated with anxiety, emotions, sleep, appetite and memory. This creates a very personal experience of pain for each person. The brain sends signals back to the spinal cord which can, in turn, reduce or increase the pain further. Nerve endings and parts of the spinal cord and brain can become over-sensitised as a result of constant pain input.

Understanding and Managing Long-term Pain Information for People in Pain:
 available from publications@britishpainsociety.org

Anatomy and physiology of the spine



Pain gates

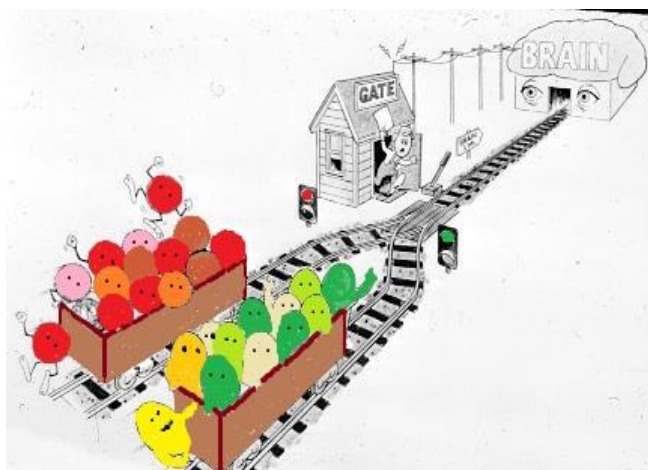
Pain levels may vary throughout the day. The gate control theory of pain formulated by Mellzak & Wall (1965) explains how this happens. The theory uses the idea of a gate located in the spine which can be opened to allow pain messages from the pain site through, or closed to stop pain messages being sent to the brain. The gate also opens and closes in response to messages being sent from the brain.

Actions which can close the pain gate and reduce pain:

- Pacing your activities
- Relaxation
- TENS
- Distraction
- Exercise
- Positive attitude
- Cognitive Behavioural Therapy
- Acceptance Commitment Therapy
- Medical hypnotherapy

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