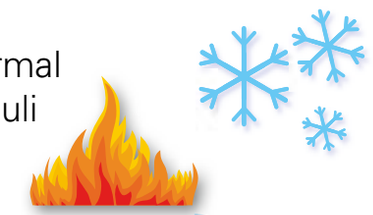
Acute pain – a protective function

External pain stimuli

A

Thermal stimuli



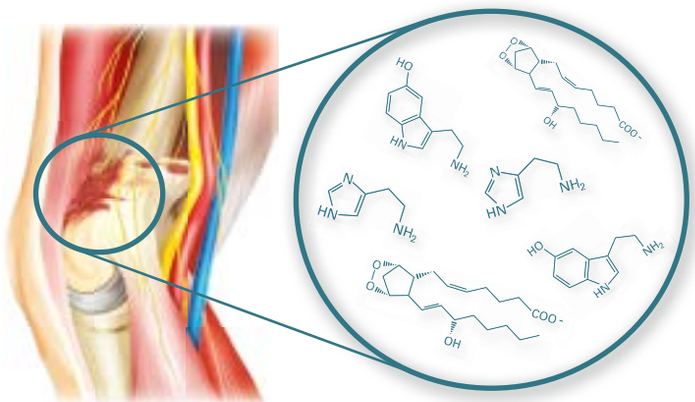
Mechanical stimuli

Chemical stimuli

Pain stimuli due to endogenous substances

B

Chemical stimuli

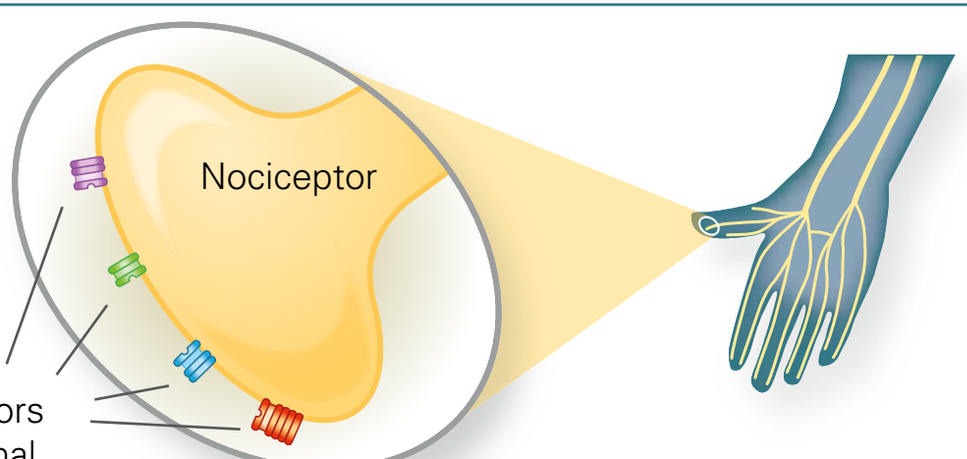


Inflamed knee joint

Inflammatory mediators

Nociceptors, our "pain sensors"

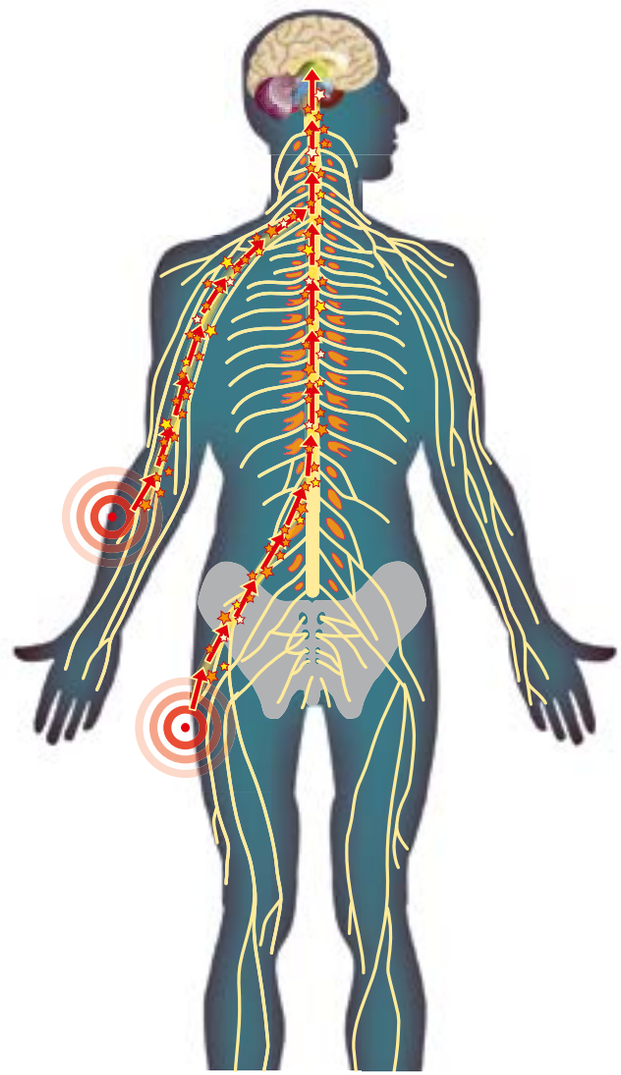
C



Transmission of pain

D

Perception of pain develops in the brain!



Acute pain – a protective function

Pain has a purpose: it makes us aware of harmful influences and **protects the body against permanent damage.**

A Painful external stimuli

Typical **pain-triggering stimuli** are thermal stimuli (very hot or very cold), mechanical stimuli and chemical stimuli.

B Pain stimuli due to the body's own substances

In addition to the pain stimuli that act on the body from the outside, there are also substances produced by the body known as pain mediators that may trigger chemical stimuli.

They arise, for example, after injury and in inflammation, as body cells then trigger a **cascade of biochemical reactions.**

C Nociceptors

These stimuli are picked up by **"pain sensors", known as nociceptors.**

Nociceptors are **free nerve endings** located in the skin and almost all organs.

They are commonly polymodal, meaning that they can respond to more than one stimulus (mechanical, thermal, chemical).

There are **special receptors** on the surface of the nociceptor **for the various types of stimulus.**

When a stimulus arises (e.g. very high temperature), the corresponding receptor is activated, so that it generates signals that are conducted to the spinal cord.

Some receptors on the nociceptors may become more sensitive in the presence of inflammatory mediators and transmit stimuli to a greater extent.

D Pain transmission

Pain stimuli, starting from the nociceptors, are conducted along nerve pathways via the spinal cord to the brain and are processed there.

The actual perception of pain only arises when the stimuli reach the brain.