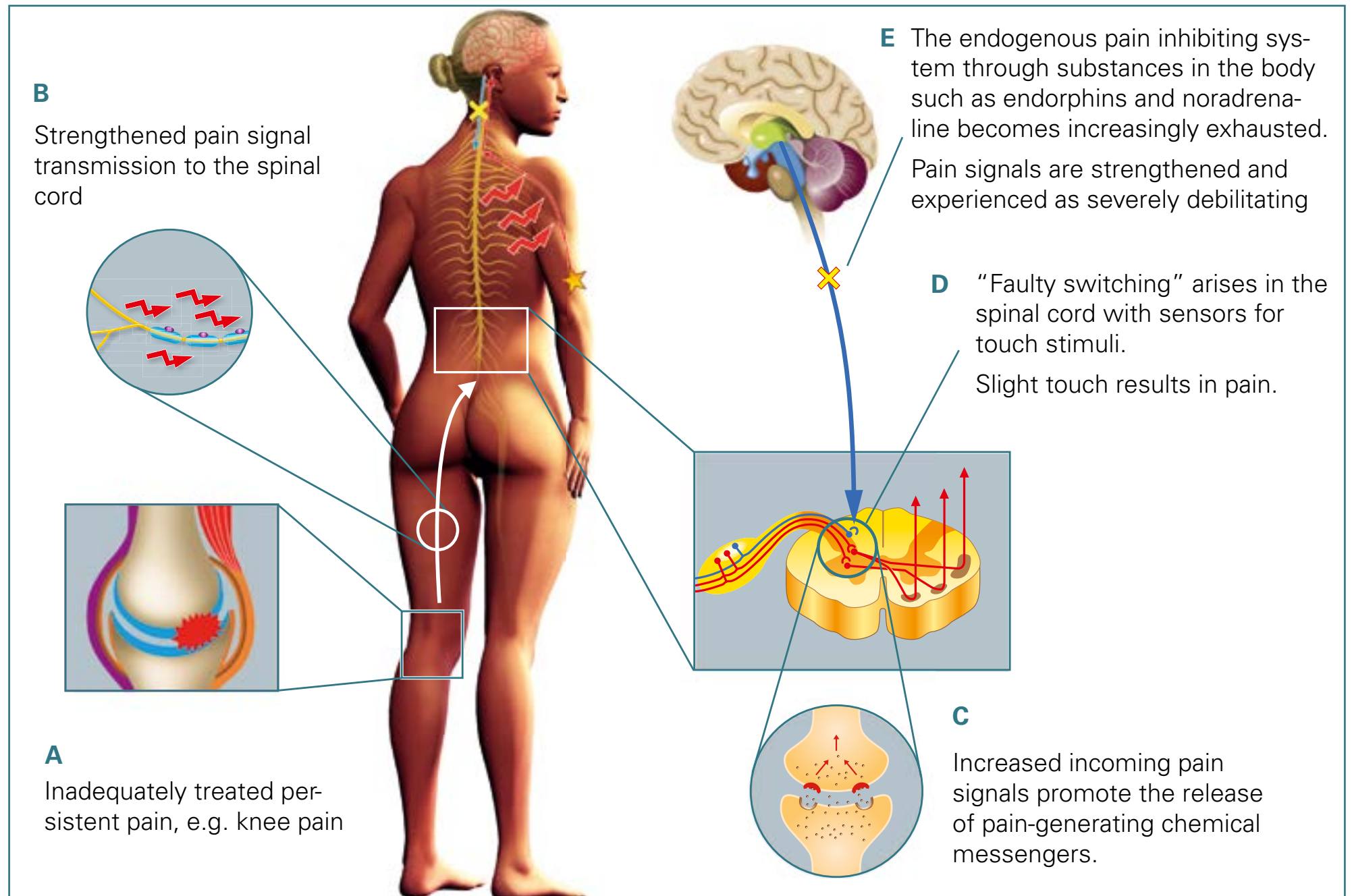


How does chronic pain arise? [1]

From constant pain stimuli to chronic pain



How does chronic pain arise? [1]

A Starting point: inadequately treated persistent pain

If pain-conducting C fibres are persistently excited, this leads to permanent “bombardment” of the central nervous system (brain and spinal cord) with pain stimuli.

B This is reinforced by peripheral nerve fibres being sensitised by lesions and inflammation and consequently firing pain signals to a greater extent (peripheral sensitisation).

C The bombardment leads to functional, structural, adaptive (neuroplastic) **changes in the brain and spinal cord**, which subsequently become independent of pain signals from the periphery (central sensitisation). The pain then continues to exist independently when the cause of pain has been removed.

For example, new receptors are formed post-synaptically in the posterior horn of the spinal cord and the reaction to pain stimuli is consequently increased (wind-up).

D With further progression, C fibres (fine pain fibres) may be completely destroyed. Intact A-beta fibres (fibres for non-painful mechanical pressure stimuli) can form new anatomical connections to the nerve cells in the spinal cord which are responsible for pain processing. **This faulty switching then leads to touch stimuli being perceived as pain.**

E The endogenous **pain inhibiting system in the spinal cord utilising the body’s own inhibiting substances, such as endorphins and noradrenaline, becomes increasingly exhausted** the longer the increased stimulus activity persists. Pain impulses are consequently transmitted to the brain unimpeded and may even be strengthened.

The pain thus becomes increasingly disconnected from the cause, an original injury, and a separate disorder develops.

[1] Voscopoulos C, Lema M. Brit J Anaesth (2010) 105(Suppl 1): i69-i85.