

Chronic Pain

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Primary & Secondary Chronic Pain (NICE 2021)

Chronic primary pain can be considered to be pain with **no clear underlying cause** or pain **with an underlying cause** (or any associated distress or disability) that is **out of proportion to any observable injury or disease**

Chronic secondary pain exists when an underlying condition adequately accounts for the pain or its impact

Chronic primary pain and chronic secondary pain can coexist



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Primary Chronic Pain

Chronic pain that has no identifiable cause although it might have been triggered by a clinical event such as an episode of back pain or sciatica

Chronic primary pain is generally neurological in origin

There is no local tissue damage that sends messages via the pain nerve fibres to the brain, but messages from many different nerve fibre types are interpreted by the brain as representing pain

The over-interpretation of primary chronic pain signals by the nervous system often leads to “central sensitisation of pain”

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Secondary Chronic Pain

Chronic pain related to an underlying condition e.g. osteoarthritis of the hip or knee

Secondary chronic pain is generally “nociceptive” i.e., the pain nerves are stimulated by chemical changes at a cellular level and send messages to the brain indicating there is local tissue damage

Generally the pain is improved when the underlying condition is treated and the “pain generator” is removed

Secondary chronic pain can, and often does, coexist with Primary Chronic Pain

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Primary Chronic Pain and Central Sensitisation

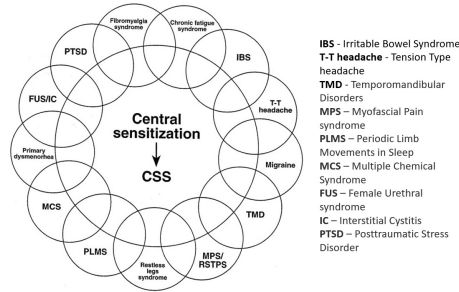
Chronic pain causes a decrease in grey matter in the cortical representation of the affected area.

Intensity of pain is correlated to extent of shrinkage

In many chronic pain syndromes central sensitisation is the common pathophysiological contributor

Fibromyalgia also has impaired descending inhibition as another contributor

There are a number of predetermined risk factors for chronic pain.



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NICE 2021 Recommendations for Treating Primary Chronic Pain

Encouragement of physical activity and a supervised group exercise programme

Acceptance and commitment therapy (ACT)

Cognitive behavioural therapy (CBT)

but not biofeedback

However, acupuncture, having previously been removed from guidelines due to lack of evidence, is now recommended again

Amitriptyline, citalopram, duloxetine, fluoxetine, paroxetine or sertraline are recommended, after a full discussion of the benefits and harms, and a detailed explanation that they may help with quality of life, pain, sleep and psychological distress, even in the absence of a diagnosis of depression

NICE specifically states that there is no role for opioids, non-steroidal anti-inflammatory drugs (NSAIDs), benzodiazepines, gabapentin, pregabalin, ketamine, paracetamol, local anaesthetics, antipsychotic drugs or trigger point injections, *due to lack of evidence*

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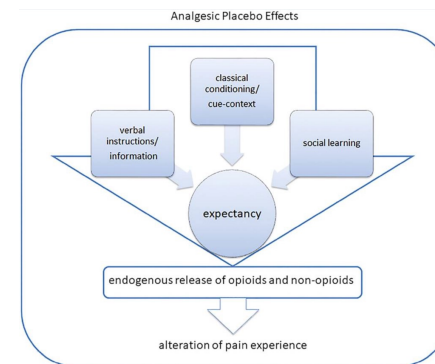
Limitations of NICE 2021 Recommendations for Treating Primary Chronic Pain: The Real World

Response from the Faculty of Pain Medicine and British Pain Society in 2021:

While some aspects of the guidance have been welcomed, particularly the emphasis on patient-centred biopsychosocial assessment, and the recognition that chronic primary pain can coexist with chronic secondary pain, concerns have also been expressed, including by the Faculty of Pain Medicine and the British Pain Society. The judgement that pain, distress and disability are disproportionate is arguably entirely subjective, and there is no guidance regarding which investigations should be undertaken, by whom, or how much investigation is enough. ICD-11 also includes subdivisions of chronic primary pain, such as chronic visceral primary pain, chronic musculoskeletal primary pain, and chronic headache or orofacial primary pain, which are not discussed by NICE and could reasonably be expected to be underpinned by different mechanisms. Critics have highlighted the risks of misdiagnoses and missed diagnoses, that relevant Cochrane reviews were not considered among other evidence, and that local service provision - especially psychological therapies, exercise, acupuncture and secondary care pain services - is highly variable.

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Primary Chronic Pain: The Effect of Placebo



Anticipation of pain relief is known to activate descending inhibitory pathways i.e. *placebo analgesia*

fMRI studies have shown that placebo treatment activates brain regions of Anterior Cingulate Cortex, Prefrontal Cortex and Periaqueductal Grey also activated by opioids are involved in emotional modulation of pain

Attentional modulation of pain activates the Primary Somatosensory Cortex and the Insula

Hence placebo modulation is not dependent on attention redirection which is targeted with neuromodulation

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Neurofeedback training using Axon

Home-Based EEG Neurofeedback Intervention for the Management of Chronic Pain

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Results of Proof-of-Concept Trial in the UK (2020/21)

n = 16

- 69% responders
- 50% > 30% improvement in pain
- 69% significant improvement in QoL
- 69% improvement in depression / anxiety
- 63% improvement sleep quality
- 69% who upregulated alpha had improved pain

Provisional results of RCT in New Zealand (2022)

n = 116

- 79% responders
- 47% > 30% improvement in pain
- 64% improvement in depression / anxiety / stress
- 66% improvement sleep quality
- 67% improvement pain catastrophising
- 64% who upregulated alpha had improved pain

Neurofeedback Training: Live Demo