

Types of pain

'Not all pain is the same'

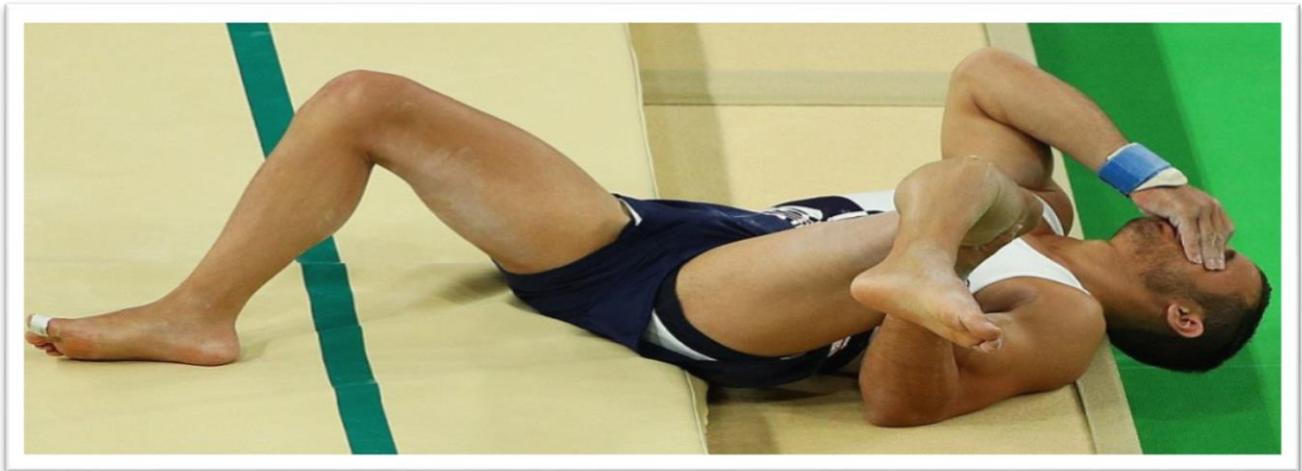
- Pain is classified according to:
 - **Duration**
 - Acute pain
 - Chronic pain
 - **Cause (if known)** e.g. cancer, whiplash, herpes zoster
 - Cancer pain
 - Non-cancer pain
 - **Mechanism (if known)?**
 - The 3 Ns**
 - Nociceptive pain (tissue-damage or inflammatory pain)
 - Neuropathic pain (nerve-damage pain)
 - Neuroplastic pain (neuro-processing pain)
 - **Other types of pain**
 - Allodynia (touch-pain)
 - Phantom pain
 - Referred pain
 - Visceral pain
 - Mixed pain (e.g. surgical wound)
 - Widespread pain

Duration

- **Acute pain** < 3 months duration
- **Chronic pain** ≥ 3 months, or pain lasting beyond the time of normal tissue healing

Acute pain

- Defined as '*pain of recent onset and probable limited duration. It usually has an identifiable temporal and causal relationship to injury or disease*' (Ready 1992).
- Alarm-system pain
- Physiological process that protects tissues from damage
- Adaptive & protective
- Pain in proportion to amount of tissue damage (except for a paper cut!)
- Pain decreases as tissues heal
- Usually a clear cause (e.g. fracture, appendicitis, sunburn)
- Pain behaviours are adaptive (crying, splinting a limb, calling an ambulance)
- Pain behaviours attract help from other (e.g. gymnastic with leg fracture at Olympics, labour pain)
- Evolutionary advantage: highly preserved in nature



Fast fact: Scientists plan to introduce 'pain systems' in robots to protect them from damage, just like the Terminator!

Chronic pain

- Defined as '*pain \geq 3 months, or pain lasting beyond the time of normal tissue healing*' (Merskey & Bogduk IASP 1994)
- Pain alarm-system malfunction
 - alarm keeps ringing when there's no tissue emergency
- Does NOT protect tissues from damage
- Pathological processes are involved
 - central sensitization, allodynia, impaired pain-inhibition, nerve damage, anxiety
- Maladaptive (serves no useful purpose)
- Pain is out-of-proportion to amount of tissue damage
- Pain continues after tissues have healed
- Usually no clear cause
- Chronic pain behaviours are maladaptive
 - e.g. attention-seeking, fear-avoidance of painful movements, drug-taking, secondary gains

- Chronic pain behaviours DO NOT (usually) attract help from others
 - associated with *stigmatization* and *negative empathy*

Cause

Cancer pain

- Due to cancer processes or treatments
 - e.g. nerve invasion, metastases, chemo-radiotherapy, surgery
 - e.g. pelvic pain due to cervical cancer, bone pain due to bones metastases
- Pain tends to worsen over time if untreated (i.e. progressive)
- Pain is usually chronic, but may be acute (e.g. pain due to new fracture from bone metastases)

Non-cancer pain

- Pain is usually chronic, but may be acute
- Many causes, including surgery, trauma, degenerative disease (e.g. arthritis), headache, childbirth, nerve compression or injury (e.g. sciatica, "neuralgia")
- The cause may not always be obvious
 - e.g. chronic non-specific low back pain (the most common chronic pain diagnosis)

Mechanisms

3 Ns: Nociceptive, Neuropathic, Neuroplastic

Nociceptive pain (tissue-damage pain)

- Shares characteristics with acute pain
- Alarm pain
- Physiological pain
- Inflammatory pain
- Caused by activation of nociceptors in damaged or inflamed tissues
- Pain described as sharp, throbbing or aching
- Pain is usually well localised
 - patient is able to point exactly to where the pain is

Neuropathic pain (nerve-damage pain)

- Pain due to damage or disease of the sensory nervous system
 - e.g. shingles, painful diabetic neuropathy, spinal cord injury
- Abnormal firing of damaged nerves (ectopics) (e.g. epilepsy, ventricular ectopics)
 - like a sparking power line that's fallen off a pole during a storm
- Being a problem of 'damaged wiring', neuropathic pain has 'electrical qualities'
 - shooting, stabbing, zapping, lightning, sparking, electric-shocks, also burning & aching
- May report numbness, pins and needles
- Allodynia (touch-pain) is the cardinal feature of neuropathic pain

Neuroplastic pain (neuro-processing pain)

- Pain due to dysfunction in 'pain-signal' (nociceptive) neuro-processing

- Pain-alarm programming problem
- Major cause of chronic pain
 - e.g. allodynia, fibromyalgia, whiplash-associated neck pain
- **Central sensitization** ('pain-signal' amplification) is main cause of neuroplastic pain
 - also altered spinal cord inhibition, cortical and neuro-immune changes
- Allodynia (touch-pain) is the cardinal feature of neuroplastic pain

Other types of pain

- **Allodynia** (touch-pain) (Greek for 'other pain')
 - pain due to a stimulus that's not usually painful e.g. touch, brush, toothpick, cold tuning fork
 - allodynia is THE cardinal sign for central sensitization and neuropathic pain
- **Phantom pain**
 - pain is a body region where there are no tissues
- **Referred pain**
 - pain in a body region not linked directly to the source of pain (nociception)
 - projected pain
 - visceral pain is usually referred e.g. cardiac pain is felt in jaw and left arm
 - due to convergence of visceral and body surface (somatic) sensory signals in the dorsal horn of spinal cord
 - e.g. diaphragmatic pain is felt in shoulder, renal pain is felt in flank
- **Visceral pain**
 - pain arising from internal body organs
 - referred pain
 - poorly localised and diffuse
 - dull, aching, cramping, waxing-and-waning
 - autonomic overdrive (sweating, nausea, hyperventilating)
 - strong emotion responses (fear, distress, crying, vocalising, rolling-around)
 - *angor animi*: a strong sense of doom & panic, going to die
 - e.g. period pain, heart attack, kidney stones, labour pain