Modern notions of pain

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Pain

- How much do you know?
‘Explain Pain’, David Butler & Lorimer Moseley
Key messages

- Pain is an output from the brain
- Pain is not an accurate indicator of tissue damage
- Pain is NOT in your mind
- Pain is influenced by many factors
Pain is a response to perceived threat
The Neurotag

- Network of interconnected neurons in the brain
- Produces an output
- Activation threshold
- Each neuron can be modulated by others

From Explain Pain by Butler & Moseley
Pain Neurotag

- Brain changes: function & structure
- Persisting pain: sensitised & disinhibited neurotag
- Sensitised: increased excitability
- Disinhibited: decrease in inhibition of non-member cells | a loss of neurotag precision
- e.g./ pain spreads, moves; imprecise movement
Pain neurotag

Body neurotags

- Representations of the body and space
- Imprecision
- CRPS: Hand representation area
It feels weird

From Explain Pain by Butler & Moseley
Representation of space
Cross your arms

- Positioning the affected limb into the space of the unaffected limb
- Ease of movement
- Ease of symptoms
- ‘Protected’ space
What influences pain?

- Emotional state
- Stress: ↓ & ↑
- Fatigue
- Hormones
- Ill-health (immune system)
- What we see, hear, smell..
- Thoughts
- Exercises
Stress

- Physiological response to perceived stress
- Pain is a stressor
- Stress induced hyperalgesia
- Stress induced analgesia
What can we do?

- Pain mechanism based treatment
  - CNS adaptations
  - Peripheral nerve health
  - Inflammation
CNS adaptations

- Cognitive modulation
- Graded Motor Imagery
- Tactile discrimination

Marinus et al. 2011
Graded Motor Imagery

- Sequence of treatments
- Part of a programme
- Graded exposure
  - Observation
  - Graded left/right judgments
  - Imagined movements
  - Mirror therapy
  - Functional training
Tactile discrimination

- Determine 2 points
- Mislocation of tactile stimuli
- Imprecise somatotopic maps
- Training
Training & treatment

- Comprehensive biobehavioural model
- Treat the person as much as the condition (Sacks)
- Desensitise, reorganise & re-inhibit for precision
- Reduce psychological & physical perception of threat
- Promote healthy behaviours for tissue health
- Progressive rehabilitation
Thanks to

- Mick Thacker KCL
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- David Butler
- Louis Gifford
- Pain Scientists & writers
- Clifford Woolf
- Herta Flor
- Oliver Sacks
- VS Ramachandran
- Antonio Damasio
- Joseph LeDoux