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Functional somatic syndromes, interoception and pain

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Objectives

- Functional somatic syndromes
 - What they are
 - How they present and who they affect
- Interoception
 - What it is
- Pain
 - Review of physiology
- The neuroscience and their overlap
- Biopsychosocial model

Functional Somatic Syndromes

- What are they?
 - Syndromes: cluster of symptoms/signs occurring together with sufficient frequency to be recognised as a clinical entity
 - Symptoms unexplained by medical investigation
 - Sometimes referred to as medically unexplained symptoms/syndromes
 - If investigation yields results
 - symptoms inconsistent with findings

Functional Somatic Syndromes

- Association with autonomic dysregulation
- Association with stress dysregulation
- Increasingly recognised amongst 'established' diagnostic populations

Functional Somatic Syndromes

- What are they?
 - Functional gastrointestinal disorders
e.g. IBS
 - Musculoskeletal disorders
e.g. FM, CFS, chronic lower back pain
 - Genitourinary
e.g. interstitial cystitis
 - Neurological
e.g. tension headache/migraine

Functional Somatic Syndromes

- Burden
 - Prepared to sacrifice 25% remaining life
 - Pain in e.g. IBS equated to childbirth
 - QoL ratings worse than ESRF, DM
 - Economic:
 - time off work: 20% greater than controls
 - Impaired productivity 30% of the time
 - healthcare costs

Drossman et al 2009
Agrawal and Whorwell, 2006
Frank et al 2002
Gralnek et al 2002
Spiegel 2009

Functional Somatic Syndromes

- Common
- Important
- Costly

Functional Somatic Syndromes

- Who are they?
 - Multiple symptoms, often multiple systems
 - Negative affect and perceived loss of control
 - Anxiety and feared loss of control
 - Altered attention/concentration/memory
 - Often a history of abuse
 - No psychiatric history but FH common
 - Often complicated by iatrogenic addiction
- Disorders of enhanced interoception

Interoception

- What is interoception?
 - Sensitivity to stimuli occurring within the body
 - Normal physiological processes
 - Abdominal bloating/passage of flatus
 - Awareness of heartbeat
 - Autonomic nervous system
 - Predominantly unconscious
 - Visceral functions
 - Sympathetic
 - parasympathetic

Interoception

- What is enhanced interoception?
 - Enhanced sensitivity to stimuli occurring within the body
 - Greater awareness of normal physiological processes
 - Autonomic dysregulation
 - Even in patients without visceral symptoms
 - e.g. greater awareness of heartbeat in patient with FM

Functional Somatic Syndromes

- Overlap
 - One versus many
 - Patterns
 - Somatic versus visceral
 - Systems
 - Dysregulated affect
 - Dysregulated ANS
 - Dysregulated hedonics
- Chronic pain
 - Present in the diagnostic criteria for most
 - Significant

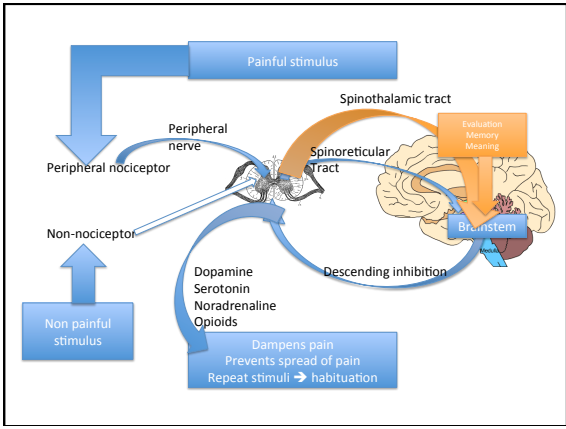
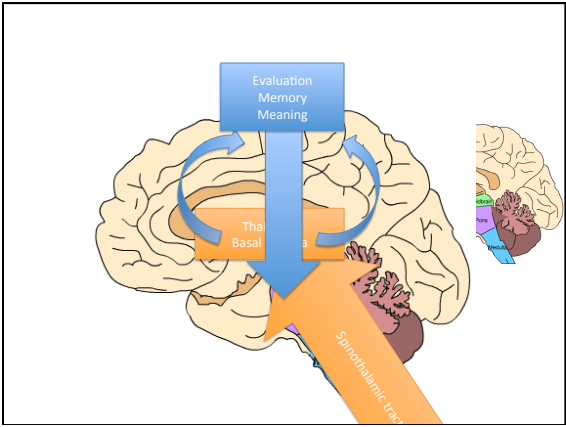
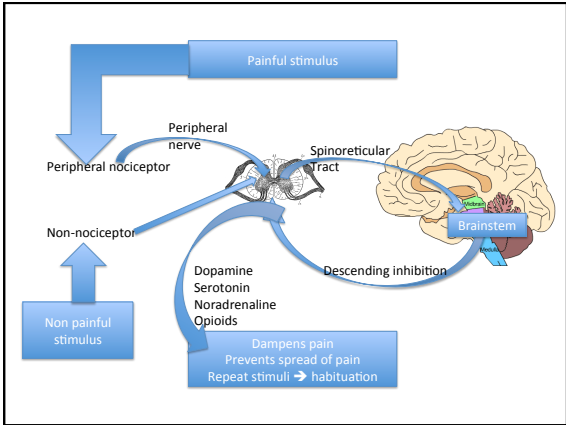
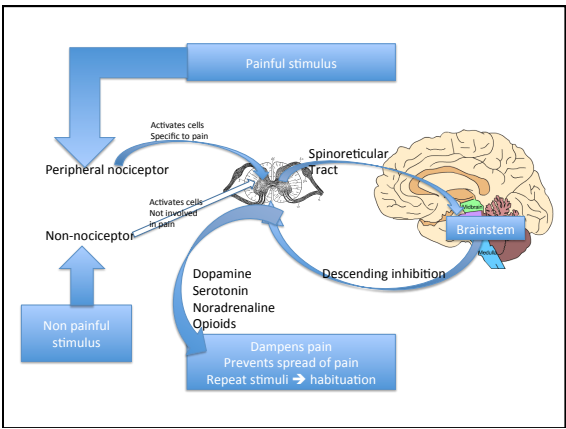
Acute pain

“An unpleasant sensory or emotional experience that is associated with actual or potential tissue damaging stimuli”

- Specific injury
- Tissue damage
- Self-limiting
- Ceases once healing occurs

Acute Pain

- Two components
 - Spinal component
 - Brain component
- In reality these are confluent



Chronic pain

- "...a continued state of suffering.....pain that persists past the healing phase following an injury"
- What is "normal healing time" - Is it measurable?
 - Normally take a fixed time after onset:
 - Chronic back pain = 6 months
 - Post herpetic neuralgia = 3 months
- "...the persistence of the *memory* of pain and/or the inability to *extinguish* the *memory* of pain evoked by an initial inciting injury"

Merskey & Boduk 1994
Apkarian 2009

Chronic pain

- 2009 but desperately outdated
- The assumptions are that:
 - Pain requires peripheral damage or injury to occur
 - Degree of peripheral damage or injury correlates with pain
 - If there is a disparity here it is all “psychological”:
 - you are a bit nuts my dear and you need to see a psychiatrist

Chronic pain

- And yet
 - This still informs diagnostic criteria
 - Still informs which specialist you see
 - We continue to treat chronic pain as we would acute pain
 - Patients are left in pain
 - For up to 2 years per patient!

Chronic Pain

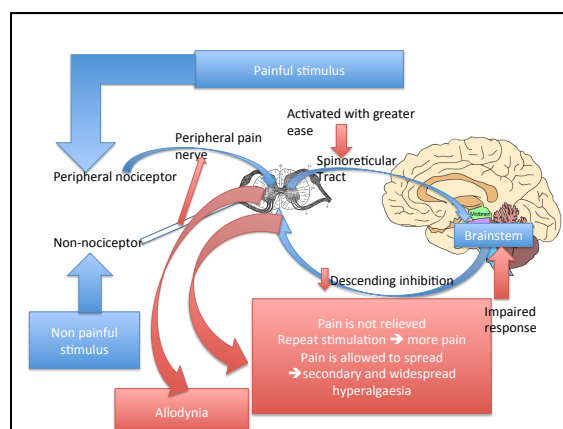
- So let’s put it right.
- There are similarities to acute pain
- The differences are more important
- The neurophysiology is paramount

Chronic Pain

- Two components
 - Spinal component
 - Brain component
- In reality these are confluent

Spinal cord mechanisms

- When exposed to a constant stimulus, we may habituate
 - The pain is still noticeable
 - But is less ‘painful’
- Or we may become sensitised
 - Pain persists
 - Pain becomes worse
 - Pain moves from one site to another

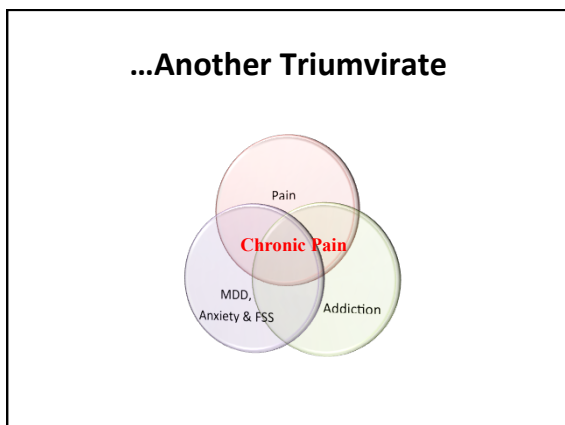


Overlap

- Functional somatic syndromes
 - Sensory
 - Emotion
 - Cognition
 - Motivation
 - Salience and reward
- Feel
- Think
- Behave

Overlap

- Addiction
 - Sensory
 - Emotion
 - Cognition
 - Motivation
 - Salience and reward
- Feel
- Think
- Behave



- Why is this important?
- It tells us something about neurotransmission

Neurotransmitters

<p>FSS/MDD/anxiety</p> <ul style="list-style-type: none"> • Serotonin (5HT) • Noradrenaline (NA) • Dopamine (DA) • Opioid system • Dysfunction in 1/more of these circuits → \$ of MDD, anxiety or FSS 	<p>Chronic pain</p> <ul style="list-style-type: none"> • Serotonin (5HT) • Noradrenaline (NA) • Dopamine (DA) • Opioid system • Dysfunction in 1/more of these circuits → chronic pain
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Neurotransmitters

<ul style="list-style-type: none"> • Serotonin (5HT) • Noradrenaline (NA) • Dopamine (DA) • Opioid system 	<ul style="list-style-type: none"> • suppress sensation of normal bodily functions • suppress sensation of normal bodily functions • Dampens pain, application of importance (salience) and focuses attention • prevents spread of pain, dampens pain, reinforces behaviour
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They are vital for interoception

- This has the potential to explain why
 - Pain is a common presenting complaint in affective disorders
 - Why affective disorders are so common in chronic pain syndromes
 - How pain can occur arise apparently autonomously
 - Such as seems to occur in the FSS
 - ?autonomous central augmentation

- So the FSS
 - Autonomic dysregulation
 - Chronic pain
 - Sensitisation/augmentation
 - Affect dysregulation
 - Chronic pain
 - Sensitisation/augmentation
 - Hedonic/motivational dysregulation
 - Chronic pain
 - Sensitisation/augmentation

- ### Overlap
- | | |
|--|---|
| <ul style="list-style-type: none"> – Sensory – Emotion – Cognition – Motivation – Salience and reward | <ul style="list-style-type: none"> – Feel – Think – Behave |
|--|---|

- So the FSS
 - Autonomic dysregulation
 - Chronic pain
 - Sensitisation/augmentation
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 - Chronic pain
 - Sensitisation/augmentation
- Feel
- Behave

- ### Cognitive components
- Sensations and feeling affect our beliefs about things
 - Beliefs about the meaning of the symptoms
 - Beliefs about the cause of the symptoms
 - Fear of further pain (or other central symptom) and of the activities that may exacerbate it
 - threat of pain
 - anticipation of pain
 - salience of pain
 - Vigilance
 - Catastrophisation
 - All → physiological (ANS) arousal → increased pain, avoidance and reinforcement

- So:
 - How we **feel** affects our **beliefs**
 - affect our **thoughts/cognitions**
 - which affect our **behaviour**

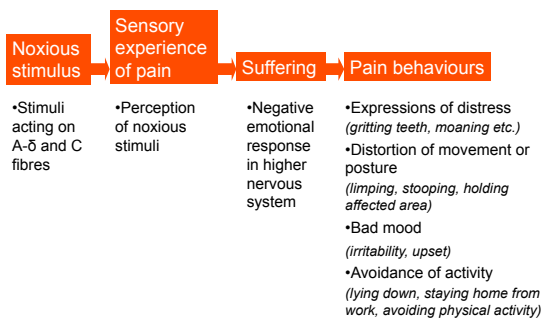
Four Types of Pain Behaviours

- Negative affect
- Facial/audible expression of distress
- Distorted ambulation or posture
- Avoidance of activity

Four Types of Pain Behaviours

- Let's put those together....

Pain behaviours



Pain behaviours

- Ordinarily this stops.....
.....because the pain stops

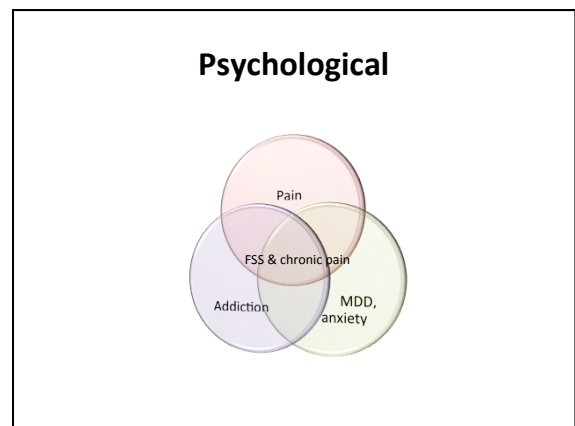
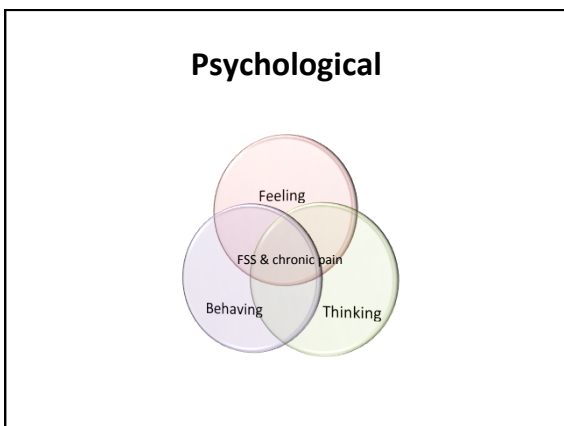
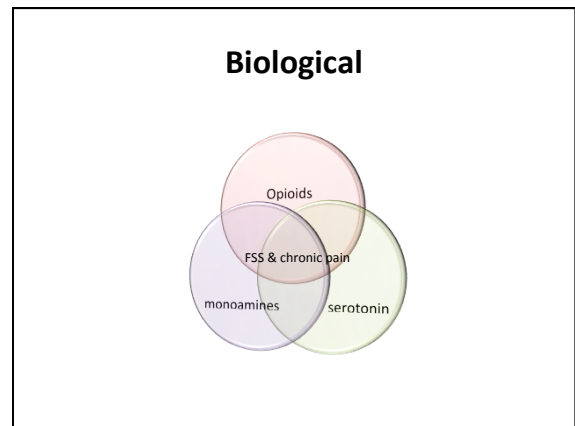
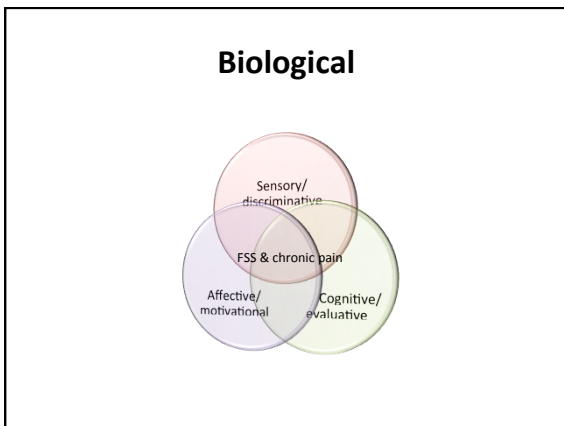
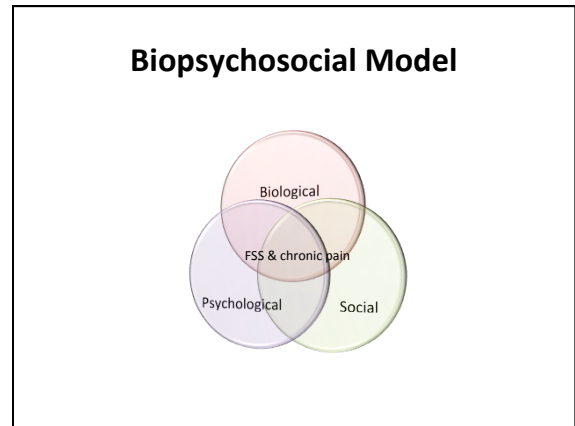


Altered activity

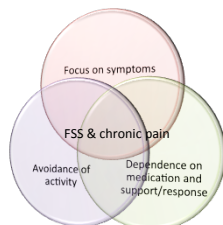
- More disability, MDD and anxiety:
 - avoidance behaviour
 - excessive persistence
 - Pacing
- Pacing = a combination of pain and activity avoidance, a "hidden form of avoidance behaviour", might implicate compromises to the patient and suggest greater subjective disability
- Pacing associated with worst disability
- YET IT IS ADVISED IN EVERY PAIN CLINIC!!!

Kindermans et al 2011

- Best approach
 - Behavioural intervention: graded exercise therapy
 - Demonstrated as effective in
 - CFS
 - FM
 - Others to a lesser extent



Social



FSS and Chronic pain

- Best conceived of in biopsychosocial model
- Dysregulation of
 - ANS
 - Affect
 - Hedonics
 - DA, Op, 5HT, NA
 - Social dynamics
- Treated along these lines:
 - Antidepressants, antipsychotics
 - CBT
 - GET (but never pacing!)

Questions?