Neurobiology of Somatization in < 20 minutes

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Learning Objectives

- Cognitive
  - New DSM V classification
  - Neurobiology of somatization

- Attitudinal
  - ↑ interest & awareness
  - ↑ compassion
QUIZ: Who had more pain?
Somatization, a definition

- a tendency to experience and communicate somatic distress in response to psychosocial stress
- indirect, unconscious, unintentional
- subjective reality
- pathophysiology evolving
- 1960s = Briquette's syndrome
- 1980s first in DSM III
- 2013 new classification DSM V
“By golly, you ARE crying on the inside!”

- DSM IV
  - Somatization Disorder
  - Undifferentiated Somatoform disorder
  - Somatoform disorder, NOS
  - Hypochondriasis
  - Pain disorders

- DSM V
  - Somatic Symptom Disorder
  - Illness Anxiety Disorder
DSM V Somatic Symptom Disorder

• A. Somatic sx: 1 or more, distressing, & disrupting of daily life.
• B. XS thoughts, feelings, behaviors with at least one of the following
  – Disproportionate & persistent thoughts of seriousness
  – Persistent high related anxiety
  – Excessive time & energy devoted
• C. Chronicity > 6 months
• D. Severity
  – Mild = one “B” criteria
  – Moderate = two or more “B” criteria
  – Severe = “moderate” + multiple somatic sx
DSM V Somatic Symptom Disorder

- Incorporates
  - Somatoform disorders, all
  - Hypochondriasis, symptom predominant
    - ~ 75% of hypochondriasis cases
  - Pain disorders

- Rationale
  - ↓ emphasis on the somatic symptoms
  - ↑ emphasis on the psychomotor response
DSM V Illness Anxiety Disorder

- A. Somatic sx are absent or mild
- B. Preoccupation with having or acquiring a serious illness
  - If risk factors present, preoccupation is disproportionate or excessive
- C. High anxiety and low threshold for becoming alarmed about health
- D. Excessive or maladaptive health behavior
- E. > 6 months, persistent or intermittent
  - Variation: Acute somatization in depression
- F. Not explained by other DSM disorder

**SUBTYPES:** Care seeking & Care avoiding
DSM V Illness Anxiety Disorder

- Incorporates hypochondriasis with absent or mild somatic symptoms
  - ~25% of hypochondriasis
Suffering in somatoform illness

- Disease
- Sickness
- Illness
Theoretical Mechanisms: *Social-psychological*

- **Psychodynamic**
  - defense mechanism
  - resolves conflict
- **Social learning**
  - “big kids don’t cry”
  - warrior training
  - sick role - 1° gain

Afferents only
Theoretical Mechanisms: **Neurobiologic**

- Variable CNS modulation of incoming sensory information, e.g.,
  - *conversion = excessive inhibition*
  - *somatization = inadequate inhibition.*

Gate Control System - Melzack & Wall, Science 1965

SG = Substantia Gelatinosa (dorsal horn).
St = spino-thalamic track.  T = thalamus
Modulation

Harrison’s Textbook 1983 (10th)  Harrison’s Textbook 1994 (13th)
Cingulate & insula

Somatosensory

PFC

Efferent modulation

+ affect modulating cortex
Theoretical Mechanisms:

A new Biopsychosocial Model

A developmental theory

- Somatization is not a disorder, but a developmentally appropriate response to stress in infants which normally diminishes with age as more mature capacities for distress and affect regulation are developed.

Theoretical Mechanisms: Biopsychosocial (Landa)

- Negative early inter-personal experiences with caregivers may interact with genetic predisposition, leading to disrupted neural circuits involved in affect regulation and interpersonal functioning,
- yielding the persistence into adulthood of developmentally earlier tendencies to experience distress somatically.
Theoretical mechanisms

Why rejection hurts: a common neural alarm system for physical and social pain.


- The loss of social bonds is one of the most painful experiences known to humankind.
- Somatic injury words describe social losses, e.g., “broken heart”, “hurt feelings”.
  - Common to many world languages.
Anterior Cingulate Cortex (ACC) activates when viewing video of human exclusion similar to the experience of experimentally induced somatic pain.

Eisenberger NI, Psychosomatic Medicine 2012;74:126-135
Evidence for overlap

- **Surgical cingulotomy** effectively treats intractable chronic pain.
- Still feel the pain but it no longer bothers them
  - Highlights role of ACC in the distressing rather than the sensory component of somatic pain
- **Also less sensitive to social pain**
Evidence for overlap

- Opioids reduce social pain
  - 1978 profoundly reduced crying and motor agitation of puppy dogs subjected to social isolation
  - 1988 same in rhesus monkeys
    - neuro-endocrine also blocked
    - naloxone blocked both
      - implicating the opioid receptor
Evidence for pain modulation

- Right ventral pre-frontal cortex is reciprocally activated in social and somatic pain and may act to down-regulate the distress of physical and social pain.

- Rx?
- Mindfulness training
IPV as neuro-disruption

- Prevalance: 29% ♀ & 23% ♂
- ♀ = ↑ physical, sexual, power & control IPV
- ♂ = ↑ verbal and psychological IPV
- ↑ likelihood of current poor health, depression, substance use, chronic disease, mental illness and injury
  - RR up to 2.6 X controls
- In multivariate analysis, psychological abuse = strongest association with adverse health outcomes.

- JAMA 2009;302:437
Patient Centered Care, a pilot RCT

- Patient-Centered Interviewing is Associated with Decreased Responses to Painful Stimuli.
Pain Response in anterior Insula following P-C Interview

RCT:
Patient-centered Interview

![Brain Image]

Photo of unknown physician

Photo of interviewer
QUIZ: Who had more pain?
Summary

✓ Suffering, disability and $
✓ ↑ Bio-psycho-social plausibility
✓ Warrants stronger clinical
  ✓ Confidence & compassion
  ✓ Team care planning
  ✓ Continued learning
The abstract ends here!

Questions?

- Answers $0.25
- Answers requiring thought $1.00
- Correct answers $2.50

Comments?
Diffusion tensor imaging

Fibers oriented left–right = red,

anterior–posterior = green,

superior–inferior = blue.