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PTSD and chronic pain
What is the relationship between chronic pain and trauma?

Physical Trauma → Chronic Pain

Psychological Trauma

Risky behavior

Overwhelming threat
Suzanne, 36yr with abdominal pain

- Onset abd pain 29yr, diverticulosis with abcess, sigmoid colectomy
- 8/11 stabbed in RLQ by unknown man outside her apartment with superficial abd wound, bruises
- Current difficult divorce after loss of pregnancy, husband revenge?
- Denies earlier trauma, no memory of HS years during parental divorce
Suzanne, 36yr with abdominal pain

- Nightmares of stabbing
- Increased startle response
- Avoids reminders and path outside her apt where stabbing occurred
- Emotional numbing and withdrawal
What is psychological trauma?

- Experienced, witnessed, learned about, or repeated exposure to:
  - Actual or threatened death
  - Serious injury
  - Sexual violence
History of PTSD

- Civil War: traumatic stress self-medicated with opiates and alcohol
- 1900’s: trauma reactivates childhood traumas and conflicts
- WW1: ‘shell shock’ (TBI)
- WW2: ‘combat neurosis’, ‘battle fatigue’, ‘concentration camp syndrome’
- Vietnam War: PTSD
- Iraq/Afghanistan: PTSD + TBI
PTSD in DSM-V (2013)

- Exposure to traumatic event
  - Threat: death, serious injury, integrity
  - Response: intense fear, helplessness

- Traumatic event intrusions
  - Recurrent, involuntary, distressing memories
  - Recurrent distressing dreams of trauma
  - Dissociative reactions (e.g., flashbacks)
  - Intense distress at reminders
  - Physiological reaction to reminders
Persistent avoidance of reminders

- Efforts to avoid associated memories, thoughts, feelings
- Avoidance of external reminders like activities, places, people
PTSD in DSM-V (2013)

- Negative alterations in cognitions and mood
  - Inability to recall important aspect of trauma
  - Persistent negative beliefs about oneself
  - Persistent distorted cognitions regarding cause/consequences of traumatic event
  - Diminished interest important activities
PTSD in DSM-V (2013)

- Negative alterations in cognition and mood (continued)
  - Persistent negative emotional state (fear, horror, anger, guilt, shame)
  - Markedly diminished interest in activities
  - Feeling of detachment from others
  - Inability to experience positive emotions
Marked alterations in arousal and reactivity

- Irritable behavior and anger outbursts
- Reckless or self-destructive behavior
- Hypervigilance
- Exaggerated startle response
- Difficulty concentrating
- Sleep disturbance
Diagnosing PTSD

- Exposure to trauma
- Re-experiencing
- Hyper-arousal
- Avoidance
- Cognitions / Mood

>1 month
Significant distress or impairment

Memories
Dreams
Flashbacks
Physiological reactivity to reminders
Psychological distress at reminders

Memories, thoughts, or feelings
External reminders (activities, places, people, conversations, objects, situations)

Irritability & anger
Reckless / self destructive behavior
Hypervigilance
Startle
Concentration
Sleep difficulties

Memory loss
Negative beliefs
Self blame
Negative emotions
Anhedonia
Detachment
Lack of positive emotions

From Kari Stephens PhD
PTSD symptoms emerge in 30% of those exposed to extreme stressors within days of the exposure, but usually resolve in a few weeks.

For 10-20%, PTSD symptoms persist with impairment in functioning.

50% with PTSD improve without treatment in 1 year, 10-20% develop a chronic disorder.
PTSD epidemiology

- US
  - Lifetime prevalence: 6.8%
  - 12-month prevalence: 3.6%
- Vietnam veterans
  - Lifetime prevalence: 18.7%
  - 12-month prevalence: 9.1%
- Iraq veterans: 12.6%
- Afghanistan veterans: 6.2%
39% of MVA survivors
39% of assault victims
Injured workers sent for rehab 35%
Fibromyalgia 20% curr., 42% life
35-50% of patients w PTSD have chronic pain
In young adults, PTSD is the psych disorder most strongly associated with medically unexplained pain (Andreski et al. 1998).
PTSD-Pain theories

- **Severe acute pain as traumatic**
  - Acute pain level predicts PTSD (Norman 2007)
- **Mutual maintenance** (Sharp & Harvey 2001)
  - Chronic pain as reminder of traumatic event
- **Perpetual avoidance** (Liedl & Knaevelsrud, 2008)
  - Re-experiencing triggers arousal, which leads to avoidance and pain through muscle tension.
- **Perceived injustice** (Sullivan MJL et al 2009)
  - Predict persistence of PTSD after whiplash injury
MODEL FOR MUTUAL MAINTENANCE OF PAIN AND PTSD (N=827 AUSTRALIAN TRAUMA PATIENTS)

PTSD and opioid use in veterans

- 141,029 Iraq/Afghanistan veterans with chronic pain, ~10% opioid tx.
- 6.5% of veterans w/o MH disorders
- 11.7% with non-PTSD MH disorder
- 17.8% of veterans with PTSD
  - higher-dose opioids, 2 or more opioids
  - receive sedative-hypnotics concurrently
  - obtain early opioid refills
  - Highest rates adverse clinical outcomes

Seal K et al, JAMA. 2012;307(9):940-947
Among indigent primary care pts, PTSD assoc w more pain, opioids
- All PTSD sx related to pain, impairment
- Only avoidance related to opioid use

Among Af-Am MH patients, PTSD most strongly assoc w opioid use

Violence exposure or PTSD predicts opioid abuse among teens
Severity of PTSD and opioid use

- Severity of PTSD highly correlated with severity of opioid abuse
  - Heroin (Dell’Osso, 2014)
  - Prescription opioids and sedatives (Meier, 2014)
  - Medical cannabis and opioids (Bohnert, 2014)

- Prolonged opioid use after physical trauma (Helmerhorst, 2014)
What do opioids do for PTSD?

- Release of β-endorphin in amygdala after stress inhibits overactivation of HPA axis
- Acute mu opioids after trauma decrease PTSD risk by inhibiting fear-related memory
- K- opioids initially promote escape but then induce anxiety, depression, drug craving

- Chronic opioid use associated with avoidance cluster of PTSD symptoms, but not with improved pain, depression, anxiety outcomes
Endogenous opioid system

Endogenous Opioids

Pro-opiomelanocortin (POMC)
- Pro-endomorphin
  - \(\beta\)-endorphin
    - \(\mu/\delta\)-receptors

Pro-enkephalin
- Met-Enkephalin
- Leu-Enkephalin-2

Pro-nociceptin
- Orphanin-FQ/Nociceptin
- Dynorphin A
- Dynorphin B

\(\mu\)-receptors
\(\delta\)-receptors
ORL-receptors
\(\kappa\)-receptors
PC-PTSD screening tool

In your life, have you ever had any experience that was so frightening, horrible, or upsetting that, in the past month, you:

1] Have had nightmares about it or thought about it when you did not want to? YES / NO

2] Tired hard not to think about it or went out of your way to avoid situations that reminded you of it? YES / NO

3] Were constantly on guard, watchful, or easily startled? YES / NO

4] Felt numb or detached from others, activities, or your surroundings? YES / NO

¾ yes = positive screen

PTSD-pain treatment tracking

- PTSD and chronic pain tend to improve together
- Track PTSD improvement with PCL-5
  - Available from [www ptsd va gov](http://www.ptsd.va.gov)
- Track pain interference
  - With general activities
  - With enjoyment of life
Psychotherapies (NNT<5)
- Prolonged Exposure (PE) therapy (high)
- cognitive restructuring (CR, CPT) (mod)
- cognitive behavioral therapy (CBT)-mixed therapies (mod)
- eye movement desensitization and reprocessing (EMDR) (mod-low)
- narrative exposure therapy (mod-low)
Evidence-based treatments for PTSD

- Pharmacotherapies (NNT ~8)
  - SSRI/SNRIs: fluoxetine, paroxetine*, sertraline*, and venlafaxine*
  - Nefazodone (liver toxicity)
  - Prazosin (nightmares)
  - Bupropion, trazodone, buspirone: UNKNOWN
  - Lamotrigine, gabapentin, antipsychotics: NOT ALONE
  - Tiagabine, topiramate, valproate, guanfacine: NOT EFFECTIVE
  - Benzodiazepines: NOT RECOMMENDED
    - Promote dependence, avoidance, inhibit learning
Psychotherapy and/or pharmacotherapy?

- Begin with simple grounding exercises and behavioral activation
- Effect sizes larger for psycho-therapies than pharmacotherapies
- Most treatment guidelines (VA, NICE) recommend psychotherapies as first line treatment
- Adding psychotherapy to medications helps, adding meds to psychotherapy does not
Dissociation can become a conditioned response

- Dangerous and dysfunctional for the patient
- Shut down immune functioning

What PCP’s can do:

- Educate
- Use/teach grounding skills – orienting to the present through cuing to date, time, location, safety, physical, etc.
  - Name 5 things you hear, see, feel, smell

from Kari Stephens
Avoidance maintains PTSD symptoms

• Limits functionality
• Reinforces anxiety
• Increases pain interference

What PCP’s can do:

• Encourage behavioral activities to approach rather than avoid to “unlearn” fear and target functionality
• Start with VERY small targets (can be physical or mental), follow-up with patients

from Kari Stephens
Best EBTs for PTSD: Cognitive-Behavioral Treatments

(Kaysen, 2009)

2 Top CBT Therapies

- PE: Prolonged Exposure
  (Foa)
- CPT: Cognitive Processing Therapy
  (Resick)

Active Component

- Exposure
  - Facing the trauma
  - Facing the thoughts
  - Facing avoidant behaviors
- Brief versions are being tested

from Kari Stephens
Prolonged Exposure Therapy
(developed by Edna Foa)

- PE focuses more on Feelings (panic, anger) while CPT focuses more on the Thoughts associated with traumatic memories
- PE teaches that a memory of a rape or combat scene cannot hurt you
  - Psycho-education
  - Breathing re-training for relaxation
  - Exposure to traumatic memories
    - In-vivo exposure vs imaginal exposure
Cognitive Processing Therapy (developed by Patricia Resick)

- CPT focuses on how trauma has changed how the patient thinks. It tries to address erroneous thoughts that haunt him/her:
  - I should have done this...
  - I should have been quicker...
  - I cannot cope
  - The world is an evil place...
Cognitive Processing Therapy (developed by Patricia Resick)

- Phases of CPT
  - Psychoeducation (what is PTSD?)
  - Cognitive restructuring (labeling, correcting)
  - Exposure to written narrative of trauma
- CPT and PE are equally effective
  - Each doubles the chance of PTSD remission
  - Effects of 10-12 sessions last for 5 years
Eye-Movement Desensitization and Reprocessing (EMDR, Shapiro)

- Patient is instructed to think (not talk) about traumatic event while relaxing and tolerating whatever emotional distress occurs.
- Therapist directs patient in movements:
  - Saccadic eye movements back and forth
  - Rotate hands on thighs repeatedly
- It appears movements are not essential, but may serve to ground patient during traumatic memory recall and processing.
Stress Inoculation Therapy

- Toolkit of coping strategies and skills
  - Relaxation training through breathing control
  - Role playing to help dealing with stressors
  - Thought stopping to address traumatic thoughts
- Does not classically involve an exposure component
### Cautions for *Trauma Focused Cognitive Behavioral Therapy for PTSD*

#### Iatrogenic Dangers:
- Exposure with no coping or avoidance prevention
- Repressed memories
- “Exploring” the past in psychotherapy

#### Requirements for engaging Trauma Focused CBT:
- Able to attend sessions
- Adequate support
- Trained provider available
- Adequate mental status

*from Kari Stephens*
VA’s Coach Apps

from Kari Stephens
Prazosin for PTSD, nightmares

- Central a1-adrenergic receptor antagonist that reduces NE stimulation, startle, and nightmares of PTSD
- Proven in multiple small RCTs
  - Multicenter RCT in VA underway
  - Rapidly increasing use throughout VA
- Same short-term effectiveness as quetiapine, but better long-term
Begin 2mg qHS (1mg in frail)
Increase by 2mg per week, to cessation of nightmares or 10mg
Orthostatic hypotension, max on first night
Often effective within first week
May break through originally effective dose, but can recapture
Doxazosin may work as alternative
Suzanne 36yr, Abd pain and PTSD

- Previous 3mo. EMDR therapy
- Venlafaxine 300mg
- Prazosin 6mg
- Oxycodone ~35mg/day
- Alprazolam 1mg qHS
- Engaged in Trauma-focused CBT
  - Completed 4 sessions
  - Continues to be employed
Physical and psychological trauma may contribute to pain chronicity, severity
Pain and PTSD mutually reinforcing
PTSD strongly associated with opioid use, abuse
  - Use linked with PTSD avoidance symptoms
BZs produce dependence, avoidance
Meds: venlafaxine, nefazodone
Therapy: PE, CPT, EMDR, SIT
Basics: open the topic, grounding, BA
Psychotherapy is first-choice PTSD tx.
- Basic: grounding, behavior therapy
- Advanced: exposure, cognitive reprocessing

Pharmacotherapy for PTSD can help
- Opioids and BZs promote dependence, avoidance
- SSRI/SNRI difficult due to arousal and anxiety
- TCAs, 5HT2 blockers useful
- Prazosin can be helpful