

# THE PAIN OF TRAUMA, THE TRAUMA OF PAIN

## **Psychological trauma and its physical consequences**

Bennet Davis, M.D.



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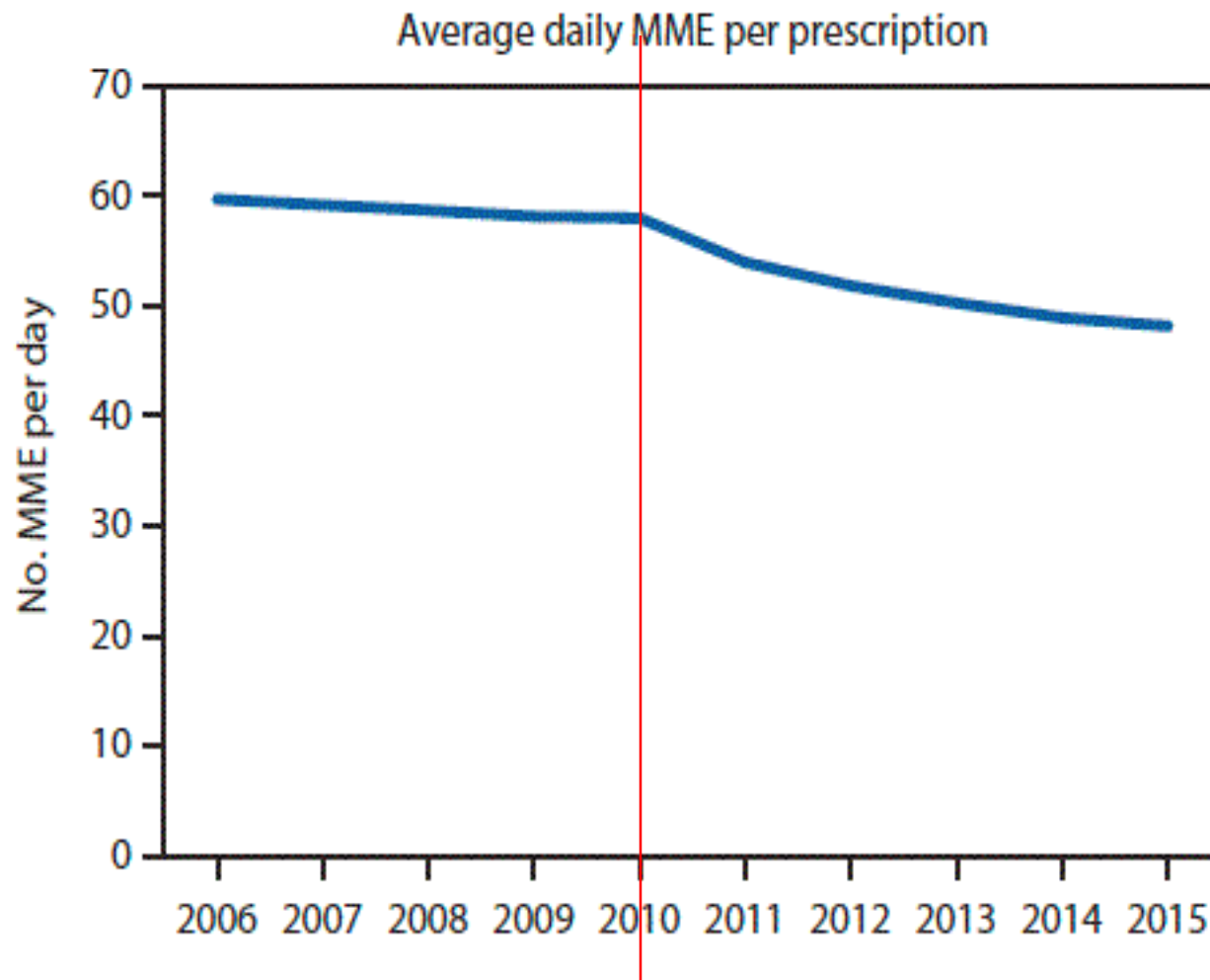
**August 2011**

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## **PRESCRIPTION DRUG CONTROL**

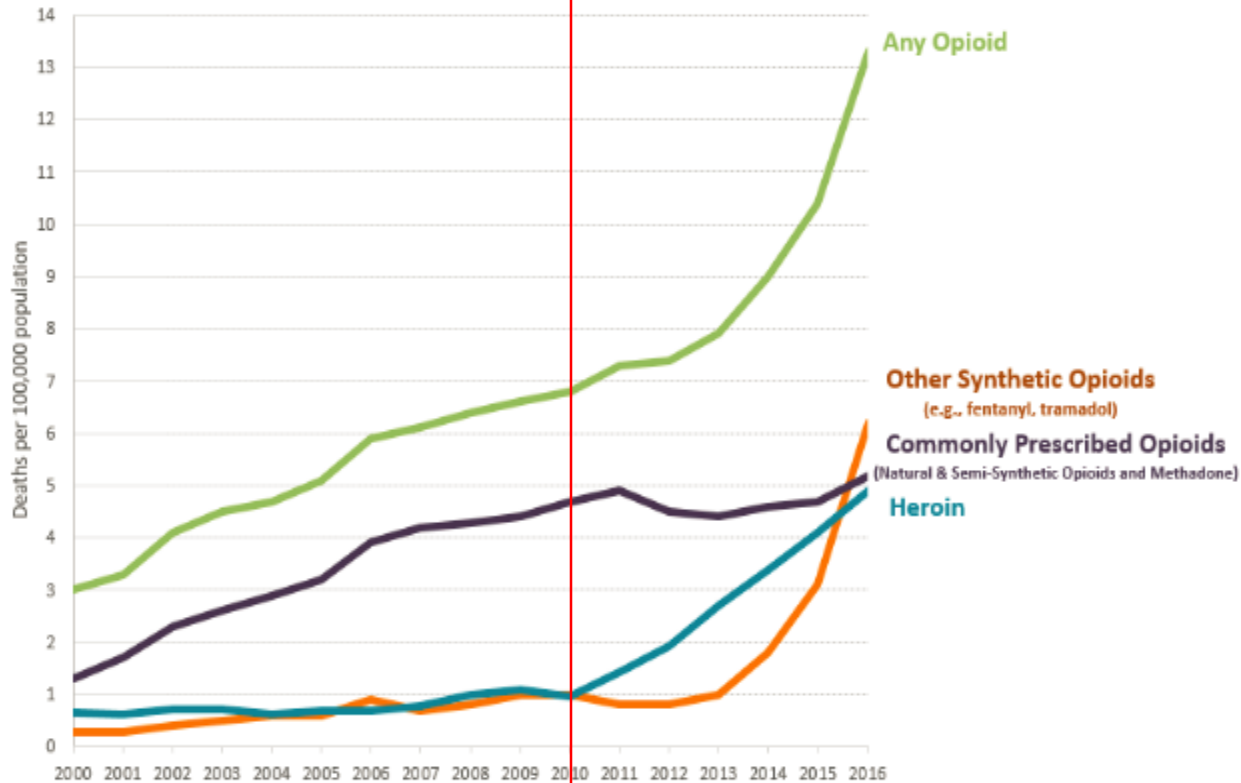
### **DEA Has Enhanced Efforts to Combat Diversion, but Could Better Assess and Report Program Results**

both criminal and regulatory cases, DEA used those resources to increase regulatory investigations of the registrants. As a result, the number of regulatory investigations more than tripled between fiscal years 2009 and 2010. DEA also



Vital Signs: Changes in Opioid Prescribing in the United States, 2006–2015  
CDC Weekly / July 7, 2017 / 66(26);697–704

## Overdose Deaths Involving Opioids, United States, 2000-2016



SOURCE: CDC/NCHS, National Vital Statistics System, Mortality. CDC WONDER, Atlanta, GA: US Department of Health and Human Services, CDC; 2016.  
<https://wonder.cdc.gov/>.

[www.cdc.gov](http://www.cdc.gov)  
Your Source for Credible Health Information

# What if this is correct?

## **We would focus research and resources on trauma**

The current addiction-focused approach to solving the opioid crisis does not explicitly include trauma:

In April 2018, NIH launched the HEAL (Helping to End Addiction Long-term) Initiative, an aggressive, trans-agency effort to speed scientific solutions to stem the national opioid public health crisis. This Initiative will build on extensive, well-established NIH research, including basic science of the complex neurological pathways involved in **pain** and **addiction**, implementation science to develop and test treatment models, and research to integrate behavioral interventions with Medication-Assisted Treatment (MAT) for **opioid use disorder (OUD)**.

<https://www.nih.gov/research-training/medical-research-initiatives/heal-initiative>





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10,000AD

nociceptive pain

1980

The age of  
neuropathic pain  
from physical nerve  
injury

2000

The age of  
neuropathic pain  
from experiential  
nerve injury

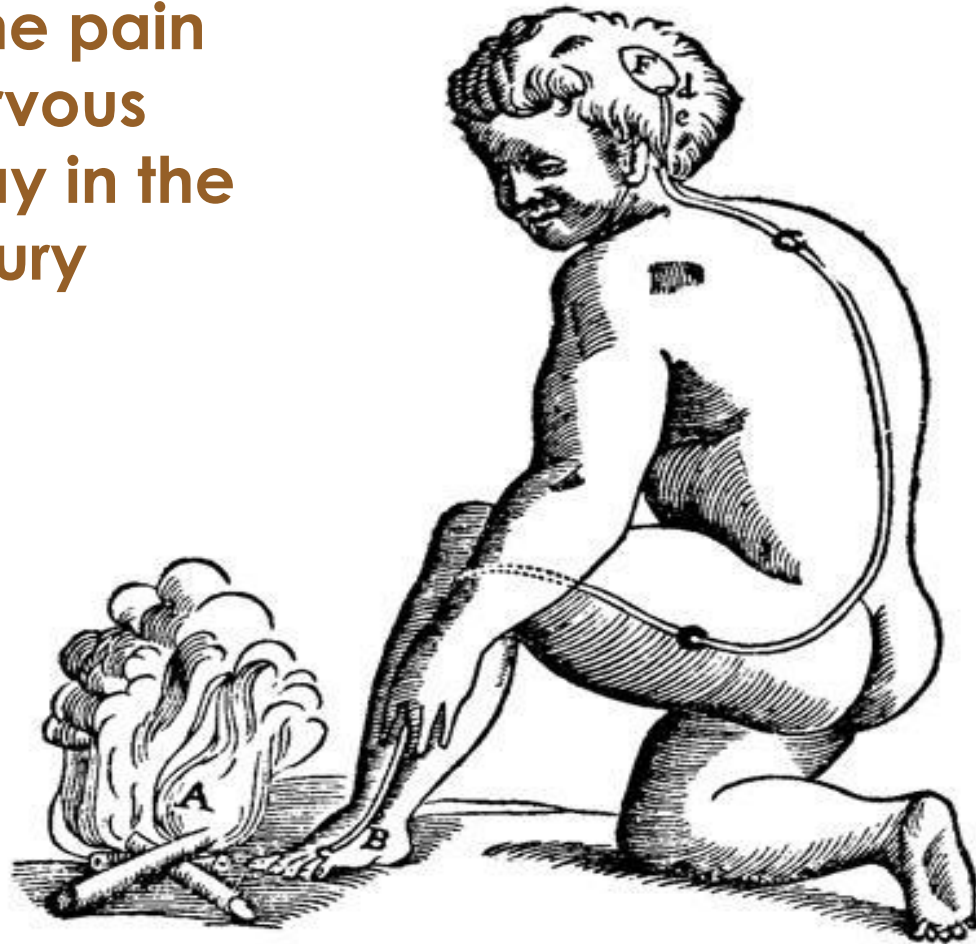
20 years ago:

**International  
Association for the  
Study of Pain (IASP)  
definition of pain**

An unpleasant sensory  
and emotional experience  
associated with real or potential  
tissue damage, or described in  
terms of such damage.



René Descartes  
conceived the pain  
sensing nervous  
system this way in the  
17<sup>th</sup> Century





# Nociceptive Pain



Transduction (Nociceptors)



Transmission (Peripheral nerve)



Modulation (Spinal cord & Thalamus)



Perception (Somatosensory cortex)

# Nociceptive Pain

## Pain Stimulus

(trauma, inflammation, heat, etc.)



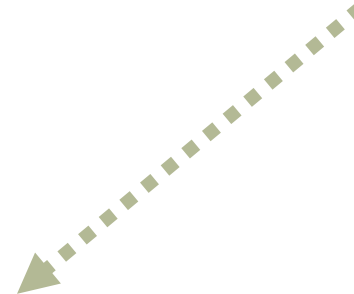
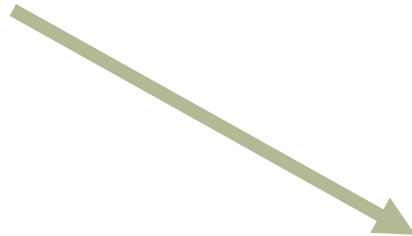
Sensory  
processing  
of pain  
stimulus



Emotional  
processing  
of pain stimulus



Emotional  
Distress and  
Unpleasantness



**PAIN** AND DISABILITY

## Examples

- Arthritis (degenerative or inflammatory)
- Radiation fibrosis from cancer
- Burns
- Back pain
- Fractures

Described as: **“sharp, dull, aching”**



Transduction (Nociceptors)



Transmission (Peripheral nerve)



Modulation (Spinal cord & Thalamus)



Perception (Somatosensory cortex)

# Neuropathic pain from nerve injury



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Physical injury to the nervous system, or modification of the nervous system by chemicals, inflammation...



**Altered Sensory  
processing**

# Neuropathic pain from nerve injury



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Non-painful  
stimuli



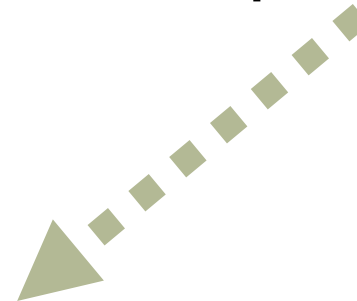
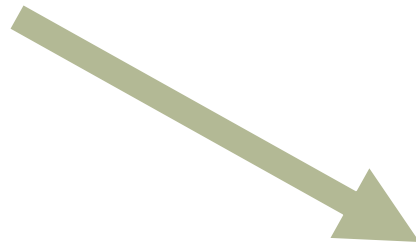
Altered Sensory  
processing



Emotional  
processing  
of pain stimulus



Emotional  
Distress and  
Unpleasantness



**PAIN AND DISABILITY**

## Examples

- Diabetic and other neuropathies
- Post herpetic neuralgia
- CRPS
- Phantom limb pain
- Spinal cord injury and post stroke pain
- Brachial plexus injury
- Opioid induced hyperalgesia

Described as:

**“burning, shooting, electrical” with heightened sensitivity to stimuli**





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10,000AD

1980

2000

nociceptive pain

The age of  
neuropathic pain  
from physical nerve  
injury

The age of  
neuropathic pain  
from experiential  
nerve injury

# 2014 IASP Updated Definition of Pain

Many people report pain **in the absence of tissue damage** or any likely pathophysiological cause; **usually this happens for psychological reasons.**

# Neuropathic Pain From Experiences That Injure the Nervous System



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No physical nerve injury

**TRAUMATIC EXPERIENCE**  
(War, abuse, disaster, etc)



**Altered  
Sensory processing  
of pain stimulus**  
STIMULUS

# Neuropathic Pain From Experiences That Injure the Nervous System



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Non-painful  
stimuli



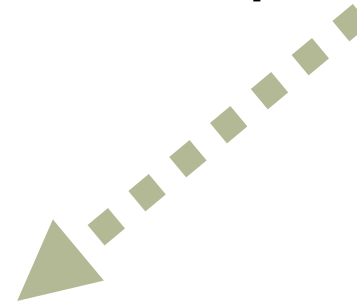
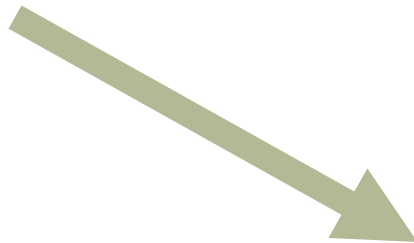
Altered Sensory  
processing



Emotional  
processing  
of pain stimulus



Emotional  
Distress and  
Unpleasantness



**PAIN AND DISABILITY**

Pain from traumatic experiences that change the nervous system to make it more sensitive to pain



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Pain described as:  
“cruel, punishing, fearful, horrible”

# Experimental evidence that psychological trauma leads to altered sensory processing

- Deep pain (pressure) thresholds were found to be lower in the back AND the hand in subjects with LBP who had a history of psychological trauma; lower only in the back in subjects w/o psychological trauma, "...suggests trauma induced abnormalities in central pain processing..."<sup>1</sup>

1. Tesarz J. Distinct quantitative sensory testing profiles in nonspecific chronic low back pain subjects with and without psychological trauma. Pain 2015; 156: 577-86

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- Higher pain ratings to hand immersion in cold water in psychological trauma exposed women compared to non-trauma exposed controls. <sup>2</sup>

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- Higher pain ratings to hand immersion in cold water in psychological trauma exposed women compared to non-trauma exposed controls. <sup>2</sup>
- Lower ischemic pain threshold in women with psychological trauma history compared to women without trauma history. <sup>3</sup>

1. Tesarz J. Distinct quantitative sensory testing profiles in nonspecific chronic low back pain subjects with and without psychological trauma. Pain 2015; 156: 577-86
2. Gomez-Perez L. Association of trauma, post traumatic stress disorder, and experimental pain response in healthy young women. Clin J Pain 2013; 29: 425-34
3. Creech S. Written emotional disclosure of trauma and trauma history alter pain sensitivity. J Pain 2011; 12: 801-10



## **What the patients describe**

- Chronic abdominal pain
- Headache
- Chronic back pain
- Diffuse polymorphous pain

## **Medical diagnoses under which these patient may be “misfiled”**

- Chronic back pain
- Headaches
- Chronic abdominal pain
- Fibromyalgia
- Dysautonomia
- Joint hypermobility syndrome
- Chronic Lyme Disease
- Functional movement disorders
- Dystonia
- Small Fiber Neuropathy
- Multiple sclerosis
- Lupus
- Rheumatoid arthritis
- Mold exposure
- Toxic exposure (metals pesticides)

## A little bit about psychological trauma and PTSD

- Psychological trauma increases lifetime risk of the top 7 diseases that kill Americans
- PTSD is more common in wealthy countries
- The U.S. prevalence of PTSD ranks in the top 4 (Others; Canada, Australia, Netherlands)
- Perhaps as many as 40 million Americans carry a burden of psychological trauma sufficient to influence their physical health.

# A little bit about psychological trauma and PTSD

In the U.S. we do not treat psychological trauma effectively

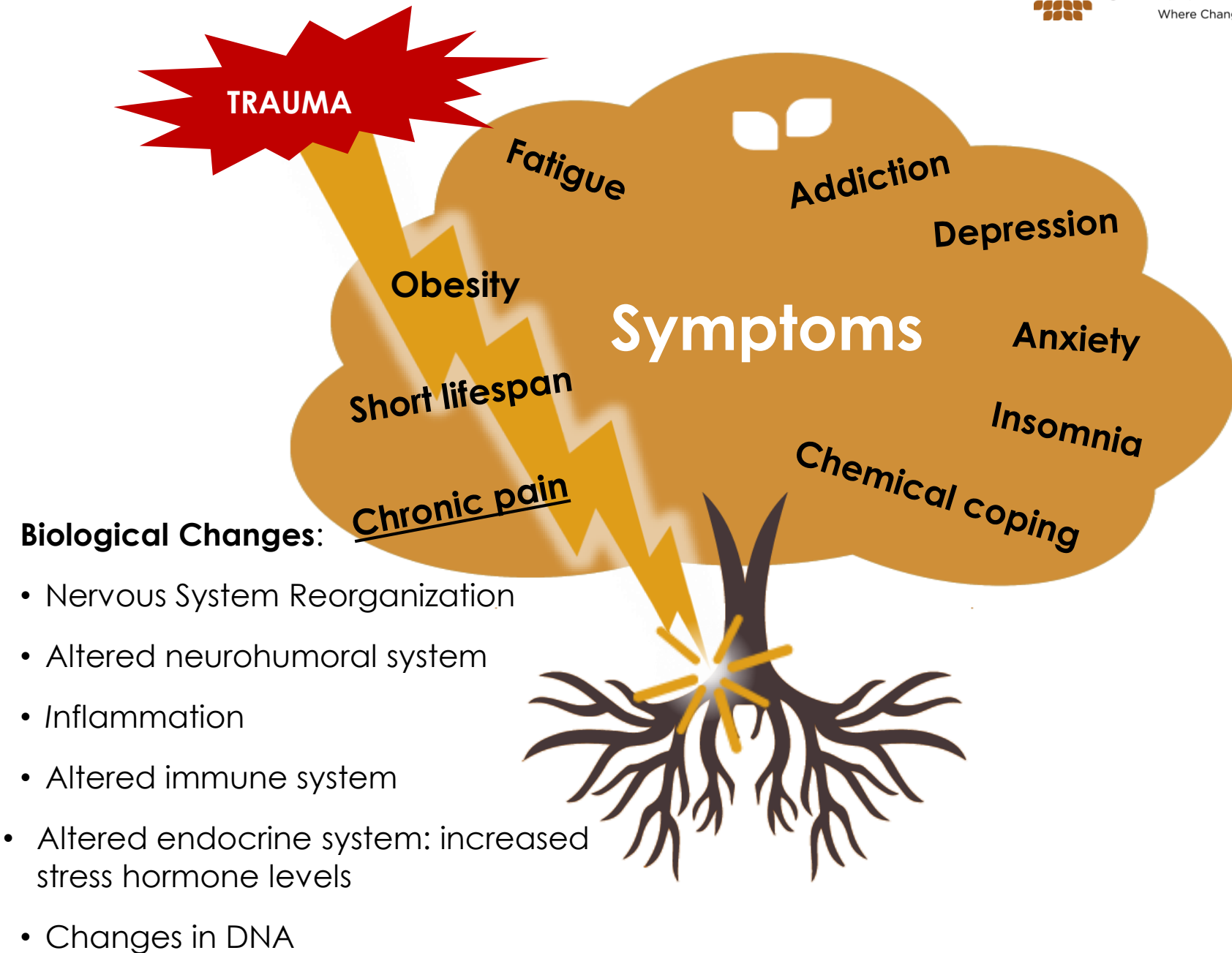
- - PTSD and psychological trauma are dramatically underdiagnosed in the U.S.: estimates are that 85% of cases of PTSD are undiagnosed
  - In the U.S. system the 10 minute doctor visit limits primary care level mental health screening and care coordination with behavioral health specialists
  - In the U.S. system we have undervalued behavioral health specialists
  - We have not understood the importance of the PTSD/psychological trauma – medical illness connection



# Trauma is underdiagnosed

“PTSD remains largely undiagnosed and undertreated in mental health outpatients, even in teaching hospitals, with diagnosis rates as low as 4% (when published prevalence is between 14 and 50% in this population)”

Miele, D., O'Brien, E J). Underdiagnosis of posttraumatic stress disorder in at risk youth. *Journal of Traumatic Stress*, 2010; 23(5): 591–598



- **>70,000 people** given the ACE questionnaire
- **12.5%** had **4 or more** “ACEs”
- The higher the score, the more **adult medical and mental health problems**
- These problems are independent of lifestyle, they are the result of biological brain changes caused by trauma
- Very few general medical community and pain clinics (and addiction medicine clinics) screen for trauma



# Neuropathic Pain From Experiences That Injure the Nervous System



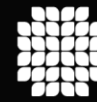
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## Clues:

- “Nothing works for my pain” besides medications with psychotropic action (includes opioids, benzodiazepines, etc.)
- Diffuse pain with no clinical cause evident
- Multiple somatic complaints
- Disability is out of proportion to objective clinical pathology
- Pain behaviors seem out of proportion to the severity of the painful stimuli
- Emotionally charged behaviors in the office – crying, etc
- Patient describes pain using emotionally charged words: “I cry in pain”

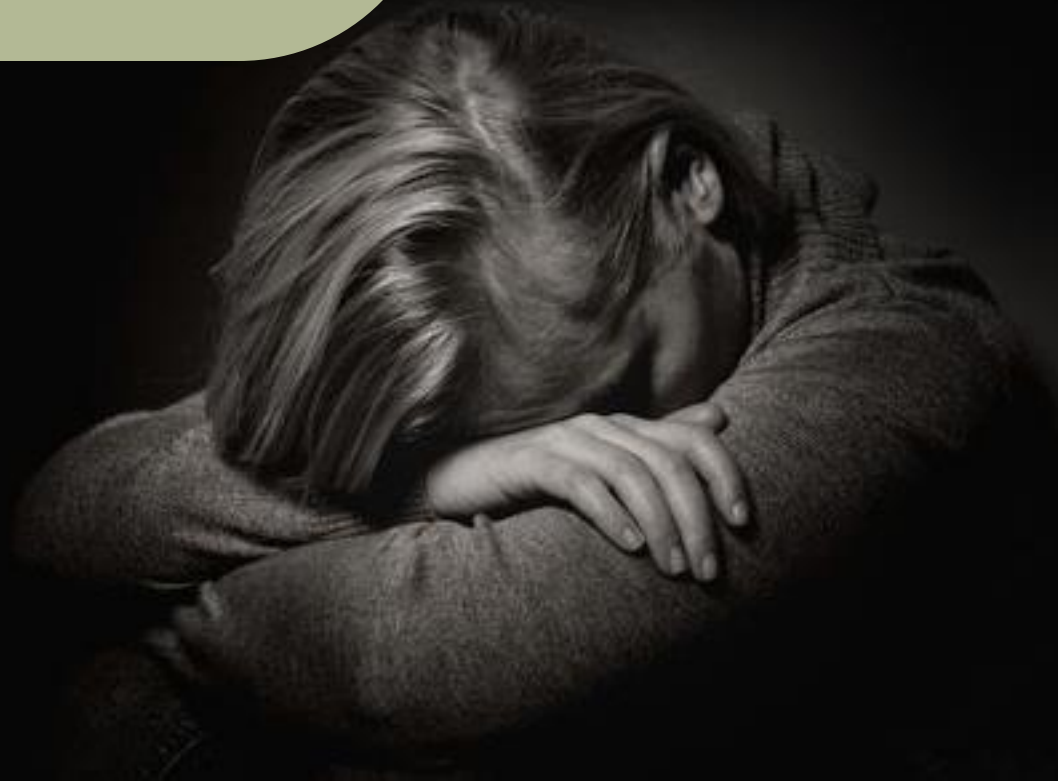
# Emotional Pain

- Social rejection
- Grief
- Borderline PD
- Depression

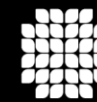


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Can  
**“real”  
pain**  
occur **ONLY**  
for **psychological**  
**reasons**



# CASE STUDY



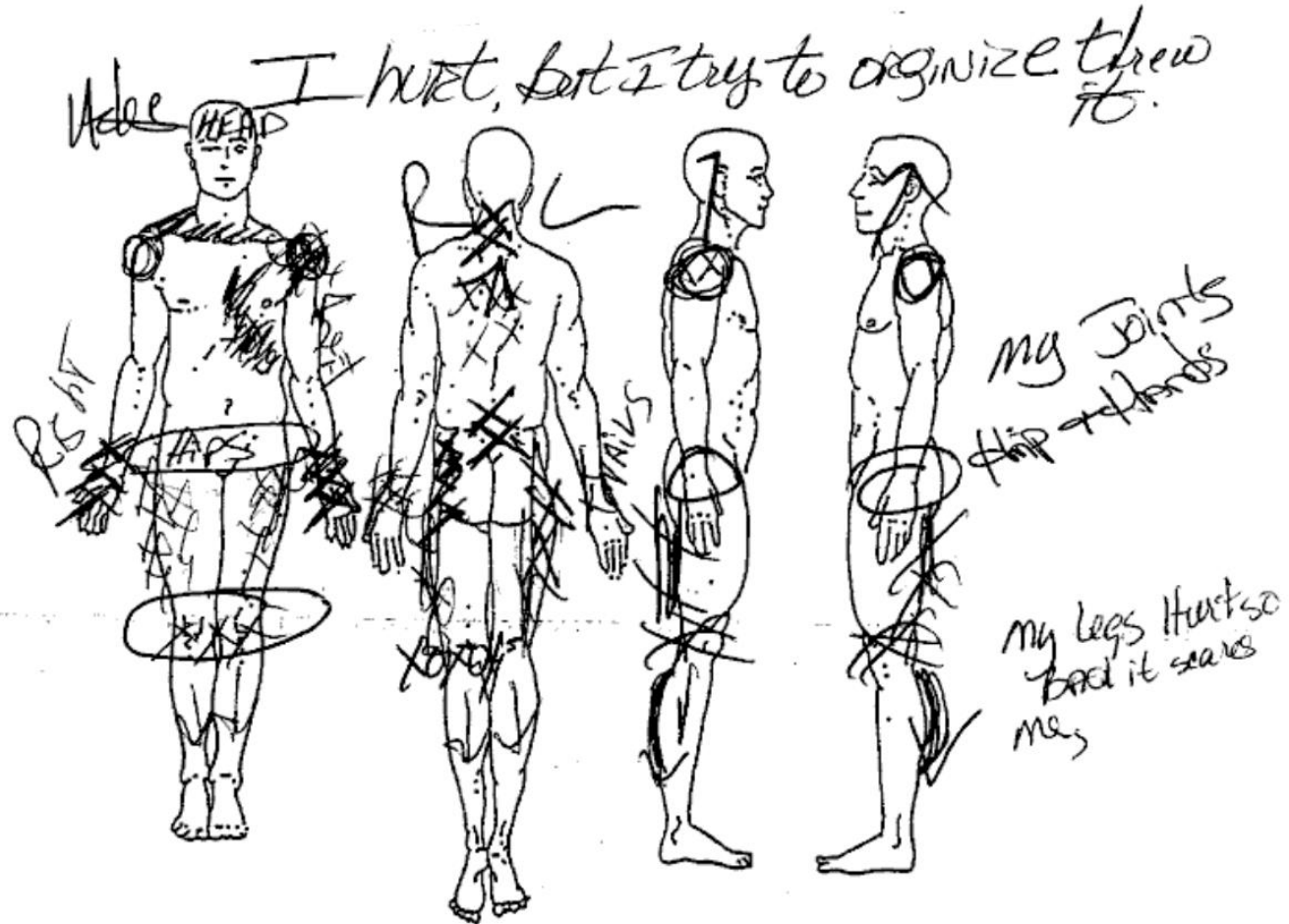
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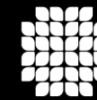
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Please fill in the "Pain Diagram" below to let us know where your pain is and where it hurts the worst.

**Shade** or **color** the areas on your body where you feel pain.

Mark severe locations with "O"s and use an "X" where it is the **Worst**.





A patient was caught up in a hostage situation.

She was unharmed (physically).

She presented to IPCA in referral from her PCP with complaints of 3 years of diffuse pain that was not responding to opioid at high doses.

Referring diagnosis was "fibromyalgia"

# Making it real: A typical primary care 'Chronic Pain Patient'

1:



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Please respond to each item by marking one box per row.

In the past 7 days...

	Had no pain	Mild	Moderate	Severe	Very Severe
PAINQU6 How intense was your pain at its worst?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input checked="" type="checkbox"/> 5
PAINQU8 How intense was your average pain?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input checked="" type="checkbox"/> 5

	No pain	Mild	Moderate	Severe	Very Severe
PAINQU21 What is your level of pain right now?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input checked="" type="checkbox"/> 5

# Making it real: A typical primary care 'Chronic Pain Patient'

## 2:



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GAD-7 Screening Questions

	During the last 2 weeks, how often have you been bothered by the following problems?	not at all	several days	more than half the days	nearly every day
1	Feeling nervous, anxious, or on edge	0	1	2	3
2	Not being able to stop or control worrying	0	1	2	3
3	Worrying too much about different things	0	1	2	3
4	Trouble relaxing	0	1	2	3
5	Being so restless that it is hard to sit still	0	1	2	3
6	Becoming easily annoyed or irritable	0	1	2	3
7	Feeling afraid as if something awful might happen	0	1	2	3

Total Score: 21 = Add columns: \_\_\_\_\_ + \_\_\_\_\_ + 21

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>



# Making it real: A typical primary care 'Chronic Pain Patient'

3:



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PHQ-9 - Patient Health Questionnaire - 9 - English

Over the last 2 weeks, how often have you been bothered by any of the following problems?

	Not at all 0	Several days 1	More than half the days 2	Nearly every day 3
1. Little interest or pleasure in doing things			✓	
2. Feeling down, depressed, or hopeless			✓	
3. Trouble falling/staying asleep, sleeping too much			✓	
4. Feeling tired or having little energy			✓	
5. Poor appetite or overeating			✓	
6. Feeling bad about yourself; or that you are a failure or have let yourself or your family down			✓	
7. Trouble concentrating on things, such as reading the newspaper or watching television			✓	
8. Moving or speaking so slowly that other people could have noticed. Or the opposite; being so fidgety or restless that you have been moving around a lot more than usual			✓	
9. Thoughts that you would be better off dead or of hurting yourself in some way	✓			

0 16

10. How difficult have these problems made it for you to do your school, work, taking care of things at home, or get along with other people? (circle one)

Not difficult at all (1) Somewhat Difficult (2) Very Difficult (3) Extremely Difficult (4)

# Making it real: A typical primary care 'Chronic Pain Patient'



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4:

Adverse Childhood Experience (ACE) Questionnaire  
Finding your ACE Score on Nov 10 24 04

While you were growing up, during your first 18 years of life:

1. Did a parent or other adult in the household often ...  
Swear at you, insult you, put you down, or humiliate you?  
or  
Act in a way that made you afraid that you might be physically hurt?  
(Yes) No If yes enter 1 1
2. Did a parent or other adult in the household often ...  
Push, grab, slap, or throw something at you?  
or  
Ever hit you so hard that you had marks or were injured?  
(Yes) No If yes enter 1 1
3. Did an adult or person at least 5 years older than you ever ...  
Touch or fondle you or have you touch their body in a sexual way?  
or  
Try to or actually have oral, anal, or vaginal sex with you?  
(Yes) No If yes enter 1 1
4. Did you often feel that ...  
No one in your family loved you or thought you were important or special?  
or  
Your family didn't look out for each other, feel close to each other, or support each other?  
Yes No If yes enter 1 1 my mom's side of family
5. Did you often feel that ...  
You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you?  
or  
Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?  
(Yes) No If yes enter 1 1 my mom
6. Were your parents ever separated or divorced?  
(Yes) No If yes enter 1 1
7. Was your mother or stepmother:  
Often pushed, grabbed, slapped, or had something thrown at her?  
or  
Sometimes or often kicked, bitten, hit with a fist, or hit with something hard?  
or  
Ever repeatedly hit over at least a few minutes or threatened with a gun or knife?  
(Yes) No If yes enter 1 1
8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?  
(Yes) No If yes enter 1 1 mom
9. Was a household member depressed or mentally ill or did a household member attempt suicide?  
(Yes) No If yes enter 1 1 me
10. Did a household member go to prison?  
(Yes) No If yes enter 1 1

Now add up your "Yes" answers: This is your ACE Score 9

# What is Pain 2018 ?

An experience  
produced by any  
combination of  
these processes:

- *Nociceptive pain* Noxious stimulus required
- *Neuropathic pain*
  - Neuropathic from physical nerve damage, “PDNP”
  - Neuropathic from experiential nerve damage, “ENP”
- Emotions

# Implications for pain treatment

## 1. Pain from tissue damage

- Diagnose and treat the physical condition(s) causing pain
- Palliate pain
- Treat co-occurring psychological distress related to loss of function
- Help the patient to engage
- Family therapy to address the family system pathology.

# Implications for pain treatment

## **2. Pain from traumatic experiences**

- Diagnose and Treat trauma and any mental health sequelae of trauma
- Help the patient to engage
- Family therapy to address the family system pathology.
- Palliate pain.

## Implications for pain research

# DO OPIOIDS WORK FOR CHRONIC PAIN?

Conventional answer: “it is remarkable that opioid treatment of long-term/chronic non-cancer pain does not seem to fulfil any of the key outcome opioid treatment goals: pain relief, improved quality of life and improved functional capacity.”

“Opioid usage was significantly associated with reporting of moderate/severe or very severe pain, poor self-rated health, not being engaged in employment, higher use of the health care system, and a negative influence on quality of life as registered in all items in SF-36.”

# Implications for pain research

- The previous study and all others like it do not exclude people using opioid to treat anxiety, to address trauma, or as part of an addiction disorder
- For example: “Patients with severe depression or posttraumatic stress disorder symptoms were not excluded because these patients often receive opioids in practice.”<sup>1</sup>
- **The studies on long term opioid for chronic pain included many (mostly?) people with mental health diagnoses driving opioid use**
- **The literature on opioid effectiveness does not assess opioid effectiveness for neuropathic or nociceptive pain and we cannot conclude anything about opioid effectiveness for MSK pain or neuropathic pain from this literature**

1. Krebs E. Effect of Opioid vs Nonopioid Medications on Pain-Related Function in Patients With Chronic Back Pain or Hip or Knee Osteoarthritis Pain- The SPACE Randomized Clinical Trial. JAMA March 6, 2018; 319(9): 872-882

# Implications

## Improving Our Conversations With Patients



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### The Body

Sensing



### The Nervous System

Modulating and transmitting



### The Mind

Perceiving &  
Adding meaning

1. Nociceptive pain

2. Neuropathic pain due to  
physical nerve injury

3. Neuropathic pain due to  
experiential nerve injury

4. Emotional pain

MIND - BODY





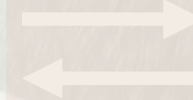
## The Body

Sensing



## The Nervous System

Modulating and transmitting



## The Mind

Perceiving &  
Adding meaning

### 1. Nociceptive pain

- Opioids
- NSAID
- Corticosteroid
- Exercise and diet
- Pain procedures
- Surgery to treat pain

- Physical Therapy
- Orthopedics
- Neurosurgeons
- Rheumatologists
- Pain Medicine Spec.
- PCP coordinating treatment



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## The Body

Sensing

## The Nervous System

Modulating and transmitting

## The Mind

Perceiving &  
Adding meaning

**2. Neuropathic pain due to physical nerve injury**

**3. Neuropathic pain due to experiential nerve injury**

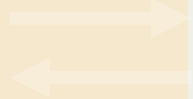
- Opioids
- SNRI, gabapentin, pregabalin
- Neurocognitive therapies (SE, EMDR)
- Acupuncture
- Nerve blocks
- Neurostimulation
- Cognitive/behavioral therapies

- Health psychology
- Therapists
- Neurology/Pain Medicine
- Chinese and Ayurvedic practitioners



## The Body

Sensing



## The Nervous System

Modulating and transmitting



## The Mind

Perceiving &  
Adding meaning

### 4. Emotional pain

- Opioids
- Antidepressants
- Anxiolytics
- Antipsychotics
- Psychodynamic therapy
- Cognitive/behavioral therapies
- Psychiatrist
- Therapist
- Neuropsychologist

**Who are these people who accidentally overdose on prescription opioid, or have moved to illicit opioid and accidentally overdose?**

- Non-addict using prescription opioid obtained from friends, family, and the street who accidentally overdose?
- People prescribed opioid, suffering a chronic painful illness that responds to opioid, who accidentally overdose?
- Addicts who accidentally overdose?
- People with ENPP using opioids to treat anxiety, depression, PTSD who accidentally overdose?



## Hypothesis

Many of these people are not addicts, rather they are people with ENPP using opioid to treat anxiety, PTSD, trauma

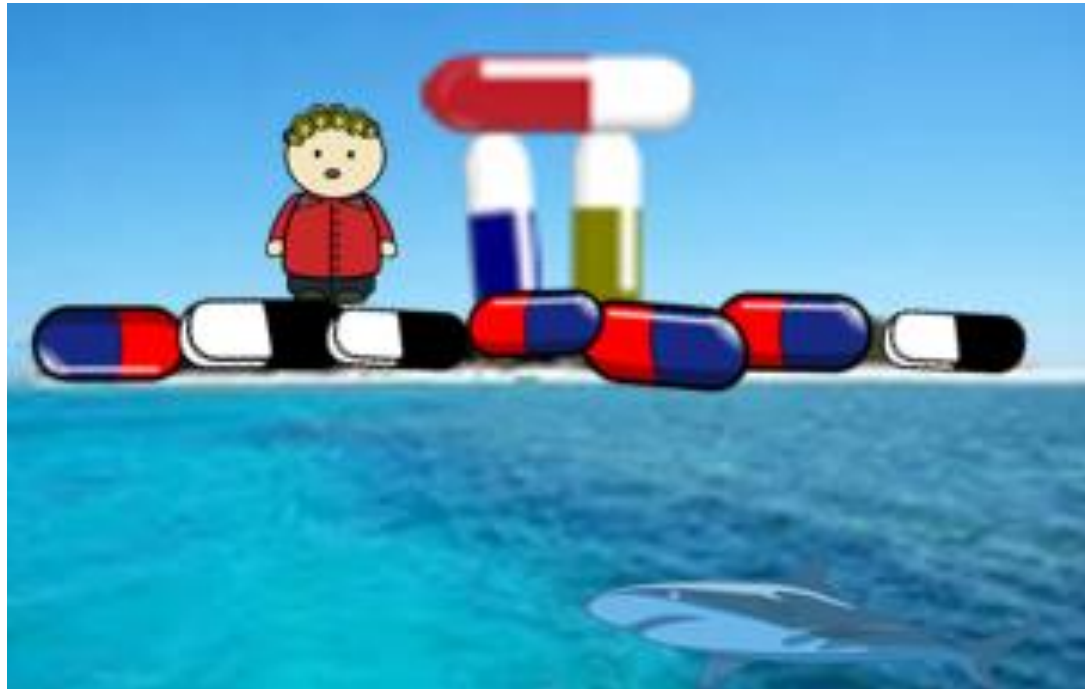


## How many?

- Fibromyalgia
- Chronic abdominal/pelvic pain
- Chronic back pain
- Chronic headache
- Dysautonomia
- Joint hypermobility syndrome
- Chronic Lyme Disease
- Functional movement disorders
- Dystonia
- Small Fiber Neuropathy
- Multiple sclerosis
- Lupus
- Rheumatoid arthritis
- Mold exposure
- Toxic exposure (metals pesticides)



# Implications for helping people who on pain meds but should not be



# Implications for helping people on pain meds

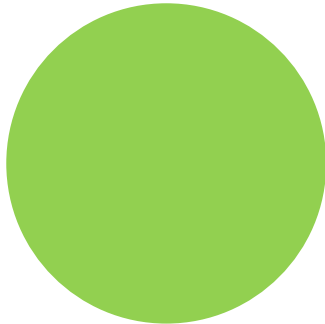
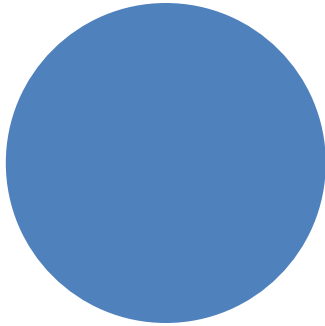
## Who shouldn't be



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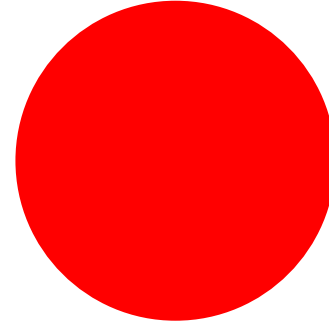
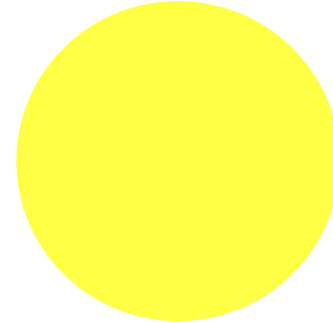
Recognize that there are FOUR populations of patients on “pill Island” and that treatment is different for each"

Patients with trauma driven pain and **no** OUD



Patients with nociceptive or neuropathic pain and **no** OUD

Patients with OUD, may have pain, may not



Patients with no pain, treating anxiety with opioid



# Evidence that opioid is used as a psychotropic for many of our people on chronic opioid therapy



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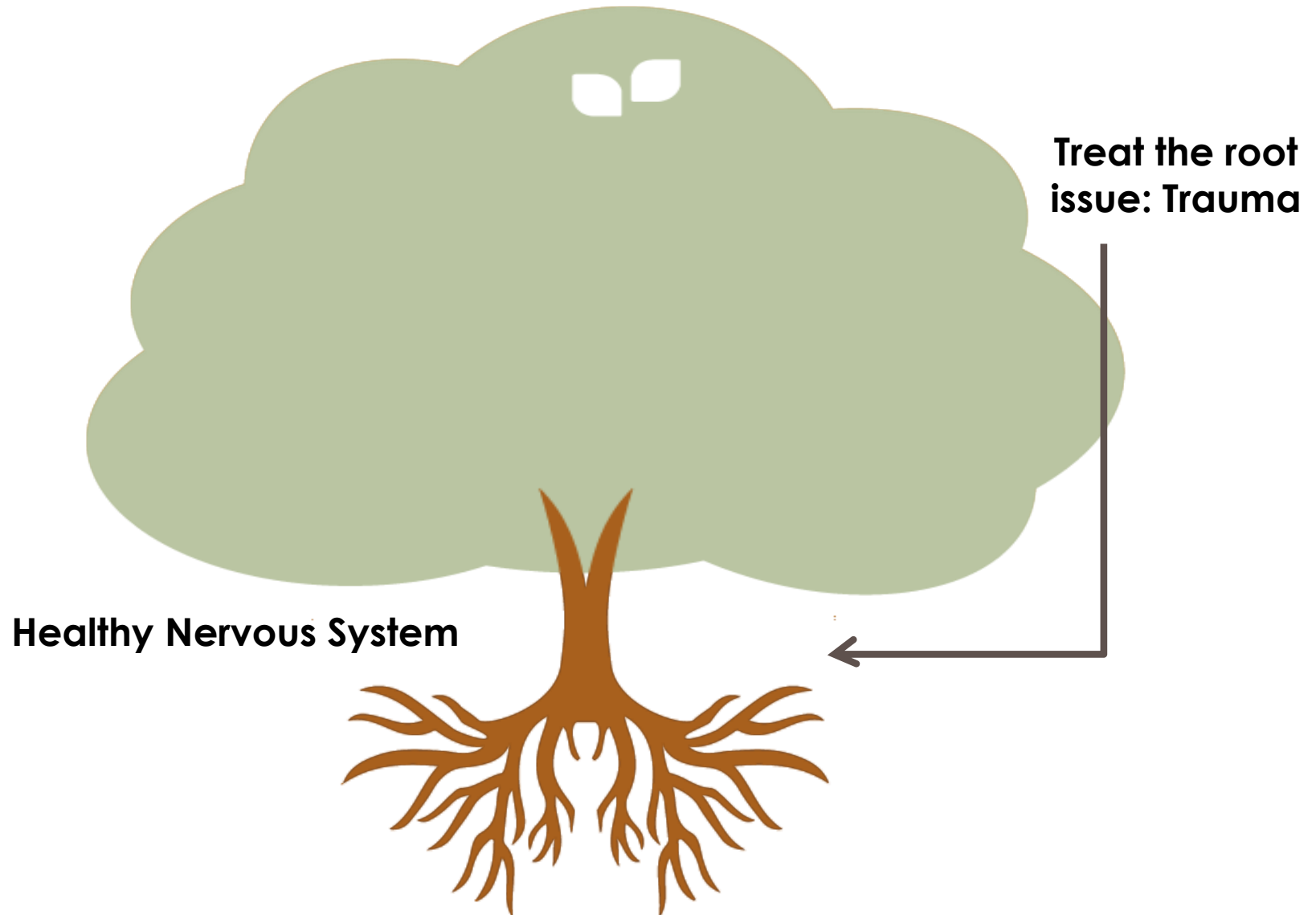
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**51%** of the opioid pain killer prescriptions written in the United States go to the **16%** of the American population with mental health diagnoses of Anxiety or Depression

An American with Depression or Anxiety is **4 x more likely** to be prescribed an opioid pain killer than an American without these diagnoses

# Implications for Solving the Opioid Crisis

Understand that trauma treatment can change the game



# Treating Trauma

## Heavy lifting: approaches to the nervous system



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### Cognitive /Behavioral therapies

- Neurocognitive
  - EMDR
  - Somatic experiencing
  - Organic Intelligence
  - Cognitive processing therapy
- CBT, DBT, others

# Treating Trauma

**Stabilize the nervous system, reduce inflammation  
and stress hormone levels**

- Supportive Medications
  - Antidepressant
  - Anti-anxiety
  - Medications for Sleep, Nightmares
  - Ketamine
  - Naturopathic
  - Eastern Medicine
- Acupuncture and related techniques
- Meditation, relaxation techniques
- Diet
- Exercise
- *Sleep*

# Treating Trauma

## Stabilizing relationships

- Family therapy
- Individual therapy
  - Boundaries
  - Resilience training
  - Grief therapy
- Group therapies



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Trauma can be easily  
screened and  
effectively treated  
at low cost relative  
to the cost of treating  
the consequences of  
untreated trauma

**eliminating the opioid**







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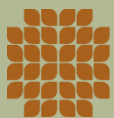
## CRISIS AVERTED

Patient NOT in ER for  
poisoning from opioid,  
usually plus benzodiazepine  
and more

# THANK YOU

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