

# ***MASSACHUSETTS PAIN INITIATIVE***

*THE EASTERN MASSACHUSETTS CHAPTER OF THE AMERICAN SOCIETY OF PAIN MANAGEMENT NURSING AND HOPEHEALTH*

**PRESENTS**

## **The Unintended Consequences of the Opioid Epidemic**

**Wednesday, October 26, 2016**

**7:30 AM to 4:00 PM**

**Holiday Inn Hotel and Suites, 265 Lakeside Ave., Marlborough, MA**

### **Program Schedule**

7:30 to 8:00	Registration / Continental Breakfast
8:00 to 8:30	Welcome/ MassPI update
8:30 to 9:45	The Unintended Consequences of Inadequate Pain Control Kevin Zacharoff, MD
9:45 11:00	The role of the Pain Pharmacist: Case Studies Michele Matthews, PharmD, CPE ,
11:00 – 11:15	break
11:15 – 12:30	Behavioral Interventions in Pain Management Robert Jamison, PhD
12:30:1:15	Lunch
1:15 -2:30	Role of an Integrative Medicine Group Visit to Support Health Behavior Change and Reducing Pain and stress. Paula Gardiner, MD
2:30 to 2:45	Break
2:45 to 3:45	Panel Discussion
3:45 4:00	Evaluations/ Closing



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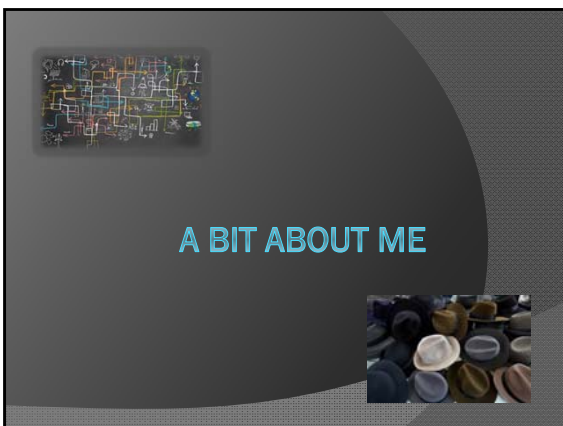
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## ISN'T THIS DISCUSSION REALLY ABOUT ETHICS?



- Autonomy
- Beneficence
- Non-maleficence
- Justice

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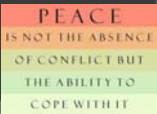
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## Three Major Ethical Issues

- Resulting in large part from:
  - Inappropriate use of pharmacologic and other modalities
  - Tensions and conflicts that develop within the environment
  - The under-treatment of chronic pain



Giordano, J. Schatman, M. An Ethical Analysis of Crisis in Chronic Pain Care: Facts, Issues and Problems in Pain Medicine: Part I (An Ethical Analysis of Crisis). Pain Physician 2008; 11:483-490.

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## The Overriding Ethical Mandate

- To relieve suffering<sup>1</sup>
  - Edwards<sup>2</sup> has suggested that, "...there is the duty to do all that can be done within the limits of current medical knowledge and available resources to relieve all the pain and suffering which can be alleviated"



1. Giordano, J. Schatman, M. An Ethical Analysis of Crisis in Chronic Pain Care: Facts, Issues and Problems in Pain Medicine: Part I. An Ethical Analysis of Crisis. Pain Physician 2008; 11:483-490.  
2. Edwards RR. Pain and the ethics of pain management. Soc Sci Med. 1984; 18:515-523.

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## Presumptions

- Clinicians *want* to treat patients with chronic pain
- Chronic pain is “*real*”
- Suffering from chronic pain causes harm
- The *moral objective* is to reduce/mitigate suffering
- Clinicians must recognize the physiological *and* psychological aspects of chronic pain
- It's often *not* easy...

1. Giordano, J. Schelman, M. AA Crisis in Chronic Pain Care: An Ethical Analysis Part Two: Proposed Structure and Function of an Ethics of Pain Medicine. Pain Physician 2009; 11:589-595

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## Isn't This a Negotiation about Ethical Issues?

- **Negotiation – def.**
  - The dialogue between two or more people or parties intended to reach a beneficial outcome
    - This beneficial outcome can positively influence all of the parties involved, or just for one or some of them



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## Barriers to Negotiation

- **Endless list:**
  - Preconceptions
  - Lack of trust
  - Informational vacuums
  - Systemic impediments
  - “Spoilers”
  - Cultural differences
  - Gender-related differences
  - Communication-level problems
  - Etc.

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### An Additional Ethical Dilemma



**Withhold opioids from patients with the risk of under-treatment of chronic pain and unnecessary suffering**

**Prescribe opioids for people at increased risk of addiction and other aberrant behaviors**

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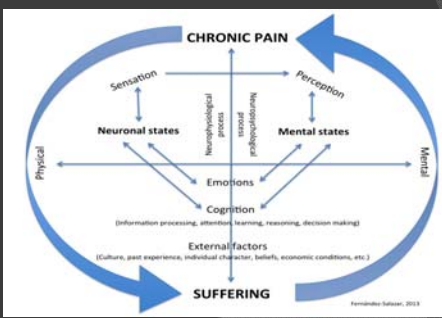
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### Negotiating Chronic Pain is Complex



The diagram illustrates the 'body-mind problem' with a central vertical axis labeled 'Neurobiological process'. On the left is 'Physical' and on the right is 'Mental'. 'Sensation' and 'Perception' are at the top, 'Neuronal states' and 'Mental states' are in the middle, and 'Emotions' and 'Cognition' are at the bottom. 'External factors' (Culture, past experience, individual character, beliefs, economic conditions, etc.) are shown at the very bottom. Large blue arrows form a cycle: 'CHRONIC PAIN' at the top, 'SUFFERING' at the bottom, and arrows pointing from Sensation to Perception, Perception to Suffering, Suffering to Emotions/Cognition, and Emotions/Cognition back to Sensation.

Fernández-Salazar M. The painfulness of pain and its representation in the brain: a model of the body-mind problem. J Nuova Crit. Rome, Italy. July 2013.

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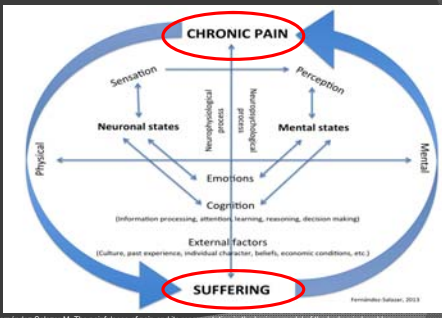
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### What are we Negotiating?



This diagram is identical to the one above, but with the terms 'CHRONIC PAIN' at the top and 'SUFFERING' at the bottom circled in red to highlight the central negotiation point.

Fernández-Salazar M. The painfulness of pain and its representation in the brain: a model of the body-mind problem. J Nuova Crit. Rome, Italy. July 2013.

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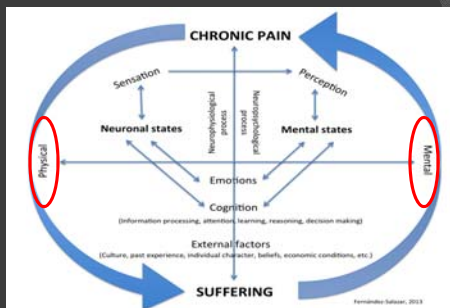
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## What are we Negotiating?



Fernández-Salazar M. The painfulness of pain and its representation in the brain: a model of the body-mind problem. *J Neurol Crit Care*. Rome, Italy; July 2013.

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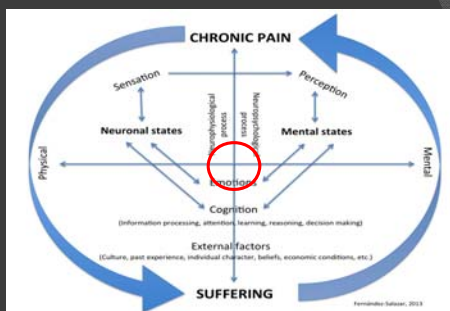
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## What are we *Really* Negotiating?



Fernández-Salazar M. The painfulness of pain and its representation in the brain: a model of the body-mind problem. *J Neurol Crit Care*. Rome, Italy; July 2013.

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## And What Happens if we Fail to Adequately Treat Chronic Pain ?

- ⦿ **Patient Level**
  - Physical/Physiological Consequences
  - Psychological Consequences
  - Emotional Consequences
  - Suffering
- ⦿ **Healthcare System Level**
  - \$\$\$
  - Clinician sense of accomplishment
- ⦿ **Societal Level**

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## Old Again, New Again

### Postoperative Pain Experience: Results from a National Survey Suggest Postoperative Pain Continues to Be Undermanaged

Jeffrey L. Apfelbaum, MD, Connie Chen, PharmD, Shilpa S. Mehta, PharmD, and Tong J. Gan, MD†

†Department of Anesthesia and Critical Care, The University Chicago Hospitals, Chicago, Illinois; †Pharmacia Corp., Skokie, Illinois; and †Department of Anesthesiology, Duke University Medical Center, Durham, North Carolina

*"Negative clinical outcomes resulting from ineffective postoperative pain management include deep vein thrombosis, pulmonary embolism, coronary ischemia, myocardial infarction, pneumonia, poor wound healing, insomnia, and demoralization"*

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## Consequences of Inadequately Treated Acute Pain

- *"Acute pain has been identified as a predictive factor for the development of chronic pain, and various data suggest that effective management of acute pain can reduce the risk for pain progression"*
- A study of 842 patients presenting to the ED with moderate to severe pain found that only 60% received analgesics, and 74% of patients continued to experience pain of moderate to severe intensity at discharge

Sinatra, R. Causes and Consequences of Inadequate Management of Acute Pain. Pain Medicine, 2010; 11: 1859-1871.

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## Physical/Physiological

- **Endocrine**
  - ACTH
  - Cortisol
  - Catecholamines
  - Insulin
  - Other altered metabolic disturbances



Greenberg, E. The Consequences of Chronic Pain. Journal of Pain & Palliative Care Pharmacotherapy, 2013;26:84-89.  
Pasero, C, Grace, JA, McCallister, M. Best practices in understanding the causes and effects of pain. In: McCaffery, M, Pasero, C, eds. Pain Clinical Manual, 2nd ed. St. Louis, MO: Mosby Inc., 1999:15-34.

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### Physical/Physiological

- **Cardiovascular**
  - Tachycardia
  - Increased PVR
  - Hypertension
  - Increased  $MVO_2$
  - Hypercoagulability



Greenberg, E. The Consequences of Chronic Pain. *Journal of Pain & Palliative Care Pharmacotherapy*, 2012;26:64-67.  
Passero C, Pace JA, McCaffery M. Basic mechanisms underlying the causes and effects of pain. In: McCaffery M, Passero C, eds. *Pain Clinical Manual*, 2nd ed. St. Louis, MO: Mosby Inc.; 1999:15-34.

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### Physical/Physiological

- **Respiratory**
  - Decreased respiratory airflow
    - Fast, shallow breathing
  - Muscle spasm
  - Inefficient respiratory function
    - $O_2/CO_2$  mismatching
    - Acidosis



Greenberg, E. The Consequences of Chronic Pain. *Journal of Pain & Palliative Care Pharmacotherapy*, 2012;26:64-67.  
Passero C, Pace JA, McCaffery M. Basic mechanisms underlying the causes and effects of pain. In: McCaffery M, Passero C, eds. *Pain Clinical Manual*, 2nd ed. St. Louis, MO: Mosby Inc.; 1999:15-34.

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### Physical/Physiological

- **Gastrointestinal**
  - Decreased motility
    - Gastric emptying
    - Intestinal clearance
  - Anorexia
  - Overall nutritional status



Greenberg, E. The Consequences of Chronic Pain. *Journal of Pain & Palliative Care Pharmacotherapy*, 2012;26:64-67.  
Passero C, Pace JA, McCaffery M. Basic mechanisms underlying the causes and effects of pain. In: McCaffery M, Passero C, eds. *Pain Clinical Manual*, 2nd ed. St. Louis, MO: Mosby Inc.; 1999:15-34.

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### Physical/Physiological

- **Musculoskeletal**
  - Muscle spasm
  - Muscle wasting
  - Muscle pain
  - Immobility
  - Diminished function
    - Deconditioning



Greenberg, E. The Consequences of Chronic Pain. *Journal of Pain & Palliative Care Pharmacotherapy*, 2012;26:64-67.  
Passero C, Pace JA, McCaffery M. Basic mechanisms underlying the causes and effects of pain. In: McCaffery M, Passero C, eds. *Pain Clinical Manual*, 2nd ed. St. Louis, MO: Mosby Inc, 1999:15-34.

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### Physical/Physiological

- **Renal**
  - Urine output
  - Volume status
  - Electrolyte imbalance



Greenberg, E. The Consequences of Chronic Pain. *Journal of Pain & Palliative Care Pharmacotherapy*, 2012;26:64-67.  
Passero C, Pace JA, McCaffery M. Basic mechanisms underlying the causes and effects of pain. In: McCaffery M, Passero C, eds. *Pain Clinical Manual*, 2nd ed. St. Louis, MO: Mosby Inc, 1999:15-34.

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### Physical/Physiological

- **Peripheral and Central Nervous System**
  - Compensatory mechanism that allows for neurons in the brain to compensate for injury and disease and adjust activity accordingly in response to new situations or to changes in environment
  - Involves either reversible inflammatory changes or physical remodeling of neuronal cytoarchitecture
  - ↓ inhibition of pain modulation
  - Ultimately leads to **central sensitization** (neuronal hypersensitivity)

Voskopoulou C, Lema M. When does acute pain become chronic? *Br J Anaesth*, 2010;105(suppl 1):40-45.

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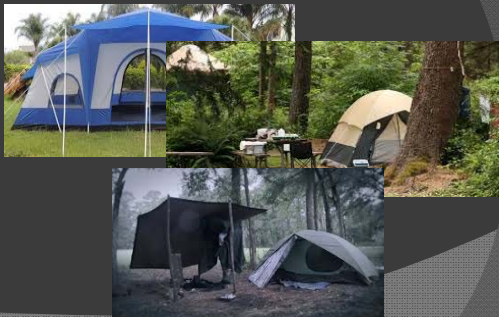
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## My Camping Experience



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## My First Failed Back Surgery Patient

- 29 y/o female
  - s/p 3 prior spine surgical procedures
  - Multiple courses of interventional treatments
  - Multiple healthcare practitioners, allied healthcare professionals, and complimentary and alternative medical professionals



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## Physical/Physiological Ultimate Consequences

- Weight loss
- Hyperglycemia
- Myocardial Infarction
- Deep vein thrombosis
- Atelectasis/pneumonia
- Bloating/constipation/paralytic ileus
- Fatigue
- Dehydration
- Edema
- Muscle wasting

Greenberg, E. The Consequences of Chronic Pain. *Journal of Pain & Palliative Care Pharmacotherapy*. 2012;26:84-89.  
Passero, C., Diego JA, McCallister M. Best practices in understanding the causes and effects of pain. In: McCallister M, Passero C, eds. *Pain Clinical Manual*. 2nd ed. St. Louis, MO: Mosby Inc; 1999:15-34.

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### Psychological/Emotional/Social

#### ● Negative Impact on overall Quality of Life

- Performance of activities of daily living
  - Work
  - Hobbies
  - Sexual relations
  - Other relationships
  - Sleep
  - Appetite



Rosenberg, M. Undertreated Pain Epidemic: Multi-Modality Approach to Pain Management. *Journal of Managed Care Medicine*. 2012. Vol. 15 Issue 1, 30-37.

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### Psychological/Emotional/Social

#### ● Profound Psychological/Emotional Consequences

- Fear
- Anger
- Depression
- Hopelessness
- Frustration
- Associated cognitive abnormalities
  - Sleep deprivation

Rosenberg, M. Undertreated Pain Epidemic: Multi-Modality Approach to Pain Management. *Journal of Managed Care Medicine*. 2012. Vol. 15 Issue 1, 30-37.

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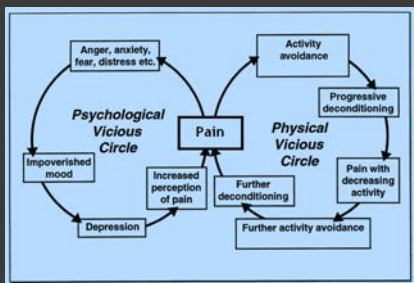
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### Physical/Physiological Consequences



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## The Healthcare System

- The prevalence and seriousness of chronic pain poses significant challenges to the system
  - Economic burden
    - \$\$\$
  - Unequal treatment across differing patient populations
  - Productivity
  - Opioids...
  - Educational stresses

Rosenberg, M. Underreported Pain Epidemic: Multi-Modality Approach to Pain Management. Journal of Managed Care Medicine 2012, Vol. 15 Issue 1, 30-37.

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## Absenteeism vs. Presenteeism

- Presenteeism
  - The problem of workers' being on the job but, because of illness or other medical conditions, not fully functioning—can cut individual productivity by one-third or more
  - Appears to be a much costlier problem than its productivity-reducing counterpart, absenteeism
    - Unlike absenteeism, presenteeism isn't always apparent

Hemp, P. Presenteeism at Work - But Out of It. Harvard Business Review, October 2004.

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## Absenteeism vs. Presenteeism

**Bank One Analysis**

**Harvard Business Review**  
Behind Door Number One

1. Ron Z. Goetzel, Stacy R. Long, Ronald J. Ozmnikowski, Kevin Hawkins, Shaohong Wang, and Wendy Lynch, "Health Absence, Disability, and Presenteeism Cost Estimates of Certain Physical and Mental Health Conditions Affecting U.S. Employees," Journal of Occupational and Environmental Medicine, April 2004.
2. Graphic from Bank One Analysis of Medical Costs.

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## The Clinicians

- **Clinicians involved in pain medicine commonly experience:**

- Psychological assaults on *their* self-esteem
  - Especially from patients who seem unreasonably demanding, overly critical, or threatening



Bangs J. Toward a more empathic relationship in pain medicine. Pain Medicine, 2008; 9(9): 1125-1129

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## The Electrician

- **47 y/o male**

- s/p inadvertent electrical burn right arm and chest
- Inadequately treated acute pain → chronic pain



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## The Pain Communication Cycle

- **The symptom**

- Shared goal is pain amelioration

- **Progress is often incorrectly defined by efficacy of acute pain treatment(s)**

- Or lack of it...Is chronic pain really acute pain treatment failure?
  - In whose eyes?
    - Patients usually blame the treatment (the Tx failed)
    - Healthcare providers blame the patient (Pt. failed the trial)



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## Stigma

Original Report  
Online Exclusive

Internalized Stigma in People Living With Chronic Pain

Olivia C. Waugh,<sup>\*</sup> Donald G. Byrne,<sup>\*</sup> and Michael K. Nicholas<sup>1</sup>

<sup>\*</sup>Research School of Psychology, Australian National University, Canberra, Australia.  
<sup>1</sup>Northern Clinical School, Kolling Institute of Medical Research, St. Leonards, New South Wales, Australia.

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## Society and Stigmas

- *"Often people use chronic pain to obtain narcotics"*
- *"People with chronic pain should be able to tolerate pain better as time goes on"*
- *"People with chronic pain cannot live a good, rewarding life"*
- *"People can tell that I have chronic pain by the way I look"*
- *"People with chronic pain tend to be exaggerating their pain for secondary gains (e.g., to get sympathy or financial compensation)"*
- *"Chronic pain is often all in a person's head"*
- *"Stereotypes about people with chronic pain apply to me"*

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## Other Important Unintended Consequences...

- Dissatisfaction
- Disillusionment
- The healthcare provider carousel
- Adherence-related issues
- Does pseudoaddiction really exist?
- The "fear of not knowing" does exist
- Suicide?

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## People Will do Whatever is Necessary

### Internet chronic pain patient survey (n=6,420) on reactions to the first 100 days following the rescheduling of hydrocodone

- 39.0% reported no changes
- 18.1% borrowed pain medications
- 17.1% turned to marijuana
- 13.1% used alcohol
- 2.3% used illicit drugs

Chambers J, Gleason RM, Kirsh M, Twilman R, Webster L, Berman J, Fudin J, Pasick SD. An Online Survey of Patients' Experiences Since the Rescheduling of Hydrocodone: The First 100 Days. *Pain Medicine*. 2016 Sep;17(9):1685-93.

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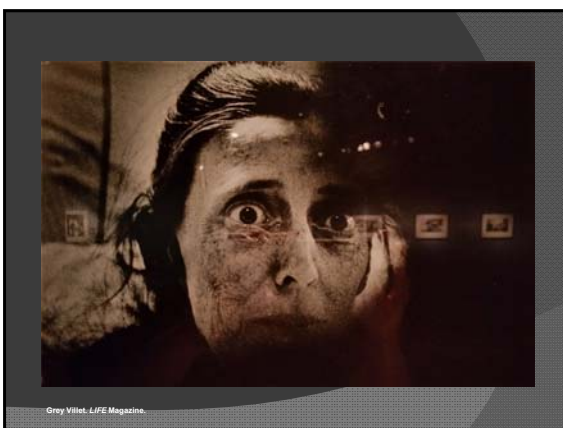
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## Ultimate Unintended Consequence

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# Can Behavioral Interventions Help Treat Pain Patients on Opioids?

**Robert N. Jamison, PhD**  
 Professor of Anesthesia and Psychiatry  
 Harvard Medical School  
 Pain Management Center  
 Brigham and Women's Hospital  
 Boston, Massachusetts

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## Disclosures

- No disclosures and no off-label uses of medications or devices will be discussed in this presentation

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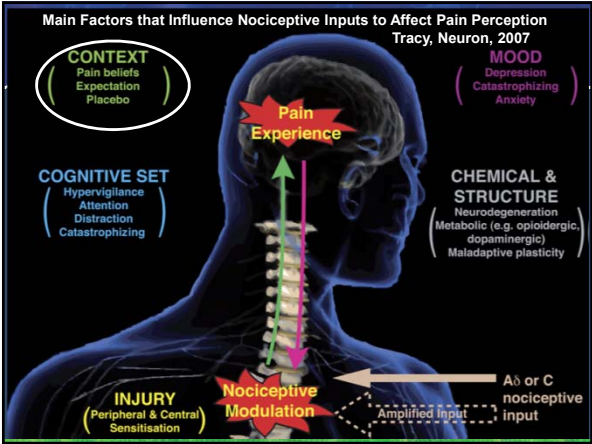
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## Comorbid Psychiatric Disorders and Chronic Pain

- Mood and anxiety disorders 2 to 3 times higher in chronic pain patients.
- Chronic pain significantly increases the risk of major depression.
- There is a higher incidence of personality disorders and substance abuse.

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**Fear of pain is more disabling than pain itself.**



**-G. Waddell**

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## Catastrophizing

A set of negative cognitions, emotions, attitudes, and beliefs related to pain (which has trait and state characteristics)



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- Magnification & Exaggeration
  - Rumination & Hypervigilance
  - Helplessness & Pessimism

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## Catastrophizing Increases Risk of Opioid Abuse

N=115 chronic musculoskeletal pts

SOAPP-R, BPI, PASS, BDI, PCS

High levels of catastrophizing were positively correlated with 1) increased pain sensitivity, 2) increased risk for prescription opioid abuse ( $p < 0.01$ ).



Martel et al., Drug & Alcohol Depend. 2013

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## Effect of Mood on Opioid Therapy

N=459 Pts

HADS Questionnaire (depression and anxiety)

Pts with moderate and high negative affect:

- 1) dropped out more,
- 2) reported higher pain scores,
- 3) had greater disability,
- 4) reported least benefit from opioids



Jamison et al, Pain Practice, 2013

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 RESEARCH EDUCATION TREATMENT ADVOCACY

PUBLISHED BY  
 ELSEVIER

The Journal of Pain, Vol 12, No 9 (September), 2011; pp 953-963  
Available online at www.sciencedirect.com

### Elevated Pain Sensitivity in Chronic Pain Patients at Risk for Opioid Misuse

Robert R. Edwards, Ajay D. Wasan, Ed Michna, Seth Greenbaum, Ed Ross, and Robert N. Jamison  
Department of Anesthesiology, Harvard Medical School, Brigham & Women's Hospital, Chestnut Hill, Massachusetts.

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## Quantitative Sensory Testing (QST) *Explaining the Variability in Pain Report*



Involves:

- (1) application of standardized noxious stimuli
- (2) standardized assessment of responses



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## Methods

- 276 patients with chronic spinal pain.
- Subjects completed questionnaires, including the SOAPP-R and measures of anxiety and catastrophizing (the Pain Catastrophizing Scale, PCS).
- Patients were also categorized as a function of opioid use (i.e., no opioid use, under 50 morphine equivalents (MEq) per day, and  $\geq 50$  MEq per day).

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## Methods

- The SOAPP-R was used to classify patients as "low-risk" (score of 18 or below) or "high-risk".
- No Opioids: (N=97) Low Risk=41, High Risk=56
- Low Opioids: (N=88) Low Risk=40, High Risk=48
- High Opioids: (N=91) Low Risk=34, High Risk=57

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## Methods

- Participants underwent an assessment of mechanical temporal summation using weighted **pinprick** stimulators.
- We bilaterally assessed **pressure pain** thresholds (PPT<sub>h</sub>) at the trapezius muscle and the metacarpophalangeal joint of the thumb.
- Contact **heat/cold** stimuli were delivered using a contact thermode (Medoc).

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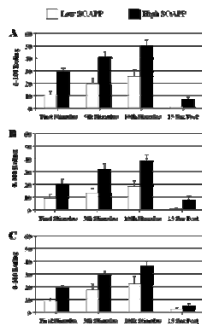
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## Punctate Mechanical Ratings

A= No Opioids

B= Low Opioids

C= High Opioids




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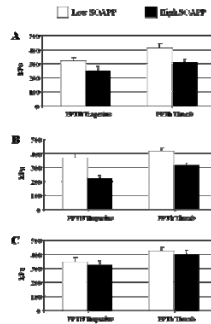
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## Pressure Pain Threshold

A= No Opioids

B= Low Opioids

C= High Opioids




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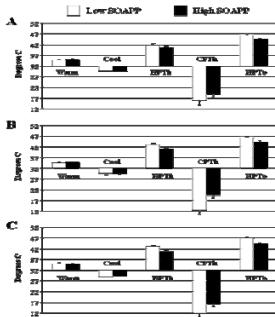
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## Thermal Pain Threshold Ratings

A= No Opioids

B= Low Opioids

C= High Opioids




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## Conclusions

- Pain-related distress (anxiety and catastrophizing about pain) predicted hyperalgesia (better than opioid-induced hyperalgesia)
- High-risk pain patients (on the SOAPP-R) were hyperalgesic relative to low-risk patients.
- Findings suggest that treating high levels of distress may contribute to reduced pain sensitivity.

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PAIN® 150 (2010) 390–400

PAIN®

www.elsevier.com/locate/pain

Research papers

Substance misuse treatment for high-risk chronic pain patients on opioid therapy: A randomized trial

Robert N. Jamison<sup>a,b,\*</sup>, Edgar L. Ross<sup>a</sup>, Edward Michna<sup>a</sup>, Li Q. Chen<sup>a</sup>, Caroline Holcomb<sup>a</sup>, Ajay D. Wasan<sup>a,b</sup>

<sup>a</sup> Pain Management Center, Department of Anesthesiology, Perioperative and Pain Medicine, Brigham & Women's Hospital, Harvard Medical School, Boston, MA, USA  
<sup>b</sup> Department of Psychiatry, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA

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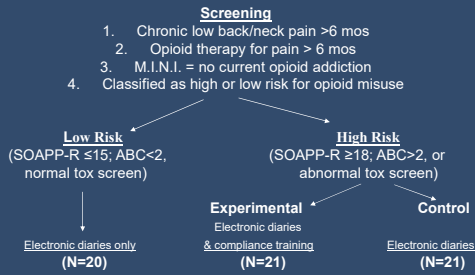
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## Study Design




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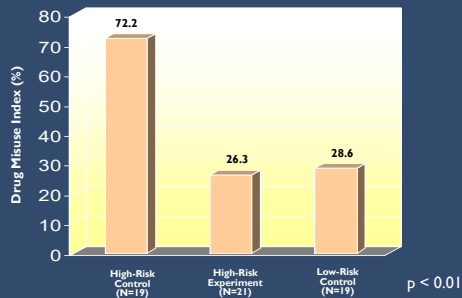
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## Drug Misuse Index




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**BRIGHAM AND WOMEN'S HOSPITAL**

ORIGINAL ARTICLE

**Beliefs and attitudes about opioid prescribing and chronic pain management: Survey of primary care providers**

Bekki N. Jamison, PhD, Kory Anne Sheehan, BA, Elizabeth Scanlan, NP, Michele Matthews, PharmD, Edgar L. Ross, MD

**ARTICLE INFO**

**ABSTRACT**

**Objective:** There is growing concern of medication misuse and noncompliance among patients with chronic pain prescribed opioids for pain. The aim of this survey was to obtain information from primary care providers (PCPs) about their perception of prescribing opioids for patients with chronic pain.

**Methods:** PCPs were invited to complete a packet of questionnaires about attitudes and concerns about opioids for chronic pain. These questionnaires

Jamison et al., JOM, 2014

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## Benefits of careful monitoring

Jamison et al., 2016

### Attitudes of Primary Care Practitioners in Managing Chronic Pain Patients Prescribed Opioids for Pain: A Prospective Longitudinal Controlled Trial

Robert N. Jamison, PhD,<sup>1</sup> Elizabeth Scanlan, NP,<sup>1</sup> Michele L. Matthews, PharmD,<sup>1</sup> Dylan C. Jurcik, BA,<sup>1</sup> and Edgar L. Ross, MD<sup>1</sup>

consisted of pain, mood, activity levels, healthcare utilization, and results of the Opioid Compliance Checklist, while practitioners in the control group did not receive the monthly reports.

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## Chronic Pain Management: Psychological approaches

- Relaxation training
- Biofeedback
- Cognitive-Behavioral Therapy (CBT)
- Acceptance Commitment Therapy (ACT)
- Hypnotherapy
- Graded exposure (In Vivo)
- Group and family therapy

(Turk & Gatchel, 2002)

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## Objectives of Cognitive/Behavioral Therapy

- Change patient's views of their problems from overwhelming to manageable.
- Reconceptualize personal views from passive to competent and resourceful.
- Teach patients to monitor maladaptive thoughts.
- Demonstrate how to use and when to employ these skills.

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## Mindfulness Meditation



**Addiction**  
FOR DEBATE

**Mindfulness-based treatments for co-occurring depression and substance use disorders: what can we learn from the brain?**

Julien K. Brown<sup>1</sup>, Sarah Bowen<sup>2</sup>, Joseph T. Smith<sup>1</sup>, G. Alan Marlatt<sup>3</sup> & Marc N. Potenza<sup>1,3</sup>

Mindfulness meditation is based on increasing intentional self-regulation. Goals include the attainment of both relaxation and greater focus of attention. Meditation helps to separate the sensation of pain from the thoughts about pain. In so doing, the individual can begin to accept the pain as it is without the negative cognitive and emotional connections that typically serve to make the experience of pain worse.

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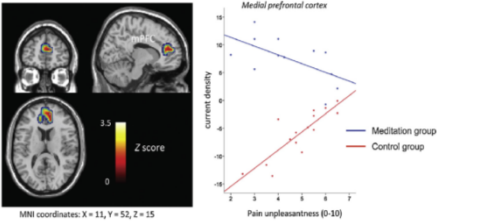
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## Meditation May Fundamentally Alter Pain Processing in the Brain

Review

**Mindfulness meditation-related pain relief: Evidence for unique brain mechanisms in the regulation of pain**

F. Zedelius<sup>1\*</sup>, J.A. Grant<sup>2</sup>, C.A. Brown<sup>3</sup>, J.G. McHuffie<sup>4</sup>, R.C. Coghill<sup>5</sup>



**Fig. 1.** Inverse correlations of pain unpleasantness with anticipatory neural activity in mPFC/ACC in meditators and controls. In a study comparing neural responses during anticipation of pain between a group with meditation experience and a control group with no meditation experience, a region in mPFC/ACC was more greatly activated in the meditation group, with greater activation predicting reducing pain unpleasantness ratings. In the control group, the opposite correlation was found with overall lower activity.

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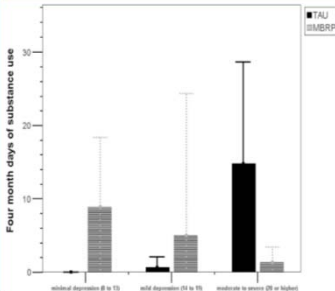
## Meditation & Substance Use

Depression, Craving and Substance Use Following a Randomized Trial of Mindfulness-Based Relapse Prevention

Katie Witkiewitz, PhD and Washington State University - Vancouver  
Sarah Bowen, PhD University of Washington

**Mindfulness-Based Relapse Prevention** was tested in 168 subjects. MBRP involves cognitive-behavioral techniques, and 30-45 min of daily mindfulness meditation to "increase discriminative awareness and acceptance, with a focus on discomfort."

**Results:** In those with elevated depression, MBRP reduces substance use and reported craving.



Depression Level	TAU (Days)	MBRP (Days)
moderate to severe (20 or higher)	~15	~10
moderate depression (10 to 19)	~5	~5
mild depression (0 to 9)	~10	~10

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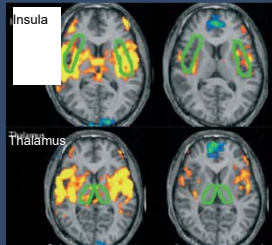
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## Distraction



Burn patients undergoing painful treatment procedures report large reductions in pain and use much less opioid medication when playing interactive VR video games. (Hoffman et al., 2012; Keefe et al, 2013)



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Given that altered attention or positively-valenced images can reduce pain activations, no surprise that imagery can be analgesic . . .



Review Article

Guided Imagery for Non-Musculoskeletal Pain: A Systematic Review of Randomized Clinical Trials

Paul Dussanli, PhD, Wroch Lesandowski, PhD, APRN, BC, Richard Terry, BS, PhD, Edward Ernst, MD, PhD, FMedSci, FSB, FRCP, FRCPsych, and Andrew Steiner, PhD

JPSM, 2012

Eleven RCTs showed significantly greater reduction of NMSP with GI than with no intervention, standard care, or breathing exercises.<sup>5,22-24,27,28,30,32-34</sup> Four RCTs showed no significant effect of GI over progressive relaxation,<sup>29</sup> standard care,<sup>31</sup> or no treatment.<sup>25,26</sup>

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## Biofeedback



Biofeedback in headache:  
An overview of approaches and evidence

### Biofeedback for pain management during labour (Review)

- Biofeedback is a set of treatment techniques that allows a patient to gain awareness over his or her body.
- The goal is to learn to gain voluntary control over some functions that are usually considered involuntary.
- Instruments measure physiological activity such as brainwaves, heart function, breathing, muscle activity, and skin temperature.
- Globally, biofeedback is a learning tool that helps patients to achieve a parasympathetic relaxation response.

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# Hypnosis



## Hypnosis and Clinical Pain

David R. Patterson and Mark P. Jensen  
University of Washington School of Medicine

Hypnosis has been demonstrated to reduce analgesic pain, and studies on the mechanisms of laboratory pain reduction have provided useful applications to clinical populations. Studies showing central nervous system activity during hypnotic procedures offer preliminary information concerning possible physiological mechanisms of hypnotic analgesia. Randomized controlled studies with clinical populations indicate that hypnosis has a reliable and significant impact on acute procedural pain and chronic pain conditions. Methodological issues of this body of research are discussed, as are methods to better integrate hypnosis into comprehensive pain treatment.

Hypnotherapy involves an altered state of awareness that is guided by suggestive statements made by the hypnotherapist. Participants are taught methods for reconnecting with this state of hypnotic relaxation at any time by using behavioral cues, such as deep breathing. A growing body of literature provides empirical support for the use of hypnotherapy for pain management. A recent meta-analysis of 13 controlled trials of hypnotherapy for a variety of chronic pain conditions, including cancer pain, arthritis, sickle cell pain, etc.

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# CBT "Adjunct"

93 patients with fibromyalgia were randomized to 14 weeks of standard care vs. group CBT vs. group CBT + hypnosis

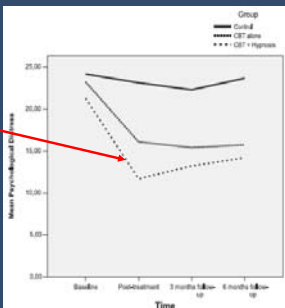


Table 3. Percentage of Participants With Minimal Clinically Significant Difference in Pain Intensity and FIQ Score at Post-Treatment, 3-Month Follow-Up, and 6-Month Follow-Up in Each Treatment Condition

Outcome	Control Group	CBT Alone	CBT Plus Hypnosis
Pain Intensity			
Post-treatment	16.7%	8.8%	31%
3-month follow-up	10%	14.7%	17.2%
6-month follow-up	13.3%	17.6%	27.6%

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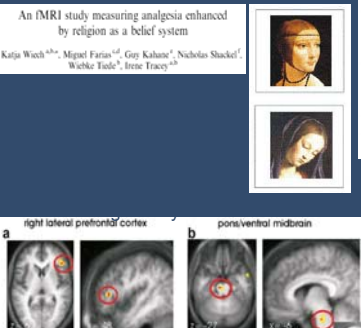
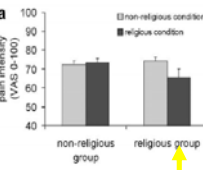
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# "Religious" Pain Modulation?

An fMRI study measuring analgesia enhanced by religion as a belief system

Katja Wirth<sup>1,2\*</sup>, Miguel Farias<sup>1,2</sup>, Guy Kabani<sup>1</sup>, Nicholas Shackel<sup>1</sup>, Wiebke Teale<sup>1</sup>, Irene Tracy<sup>1,3</sup>

Viewing an image of the Virgin Mary reduced the perceived pain intensity during standardized electrical stimulation

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**BRIGHTON AND WOMEN'S HOSPITAL**

## Can mobile technology help?

- Chronic pain assessment
  - Smartphone tracking
- Medical management
- Psychological approaches
  - Remote CBT
- Rehabilitation
  - Activity monitoring
  - Sleep and exercise monitoring




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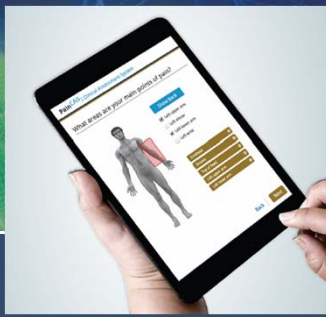
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PainCAS is a Web-based clinical tool for assessing pain and opioid risk in chronic pain patients




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## Challenges for mHealth Technology

- Information is not enough
  - ✓ Needs to engage
  - ✓ Needs to be relational
  - ✓ Needs to motivate
  - ✓ Needs to be adaptive
  - ✓ Needs to be easy
  - ✓ Needs to be fun
  - ✓ Needs to demonstrate caring




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**Virtually anything that sends a patient one of four messages – someone is listening to me; other people care about me; my symptoms are explainable; my symptoms are controllable – can bring measurable improvement in health.**

Howard Brody, M.D., Ph.D.

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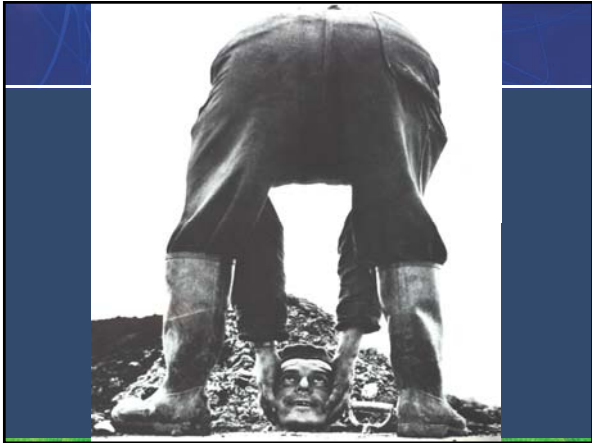
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**Thank you.**  
**Thank you very much.**

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