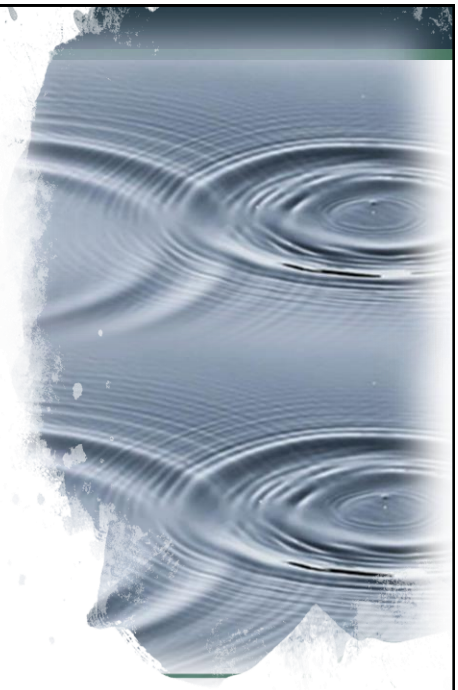
Evidence-based nonpharmacologic pain medicine as culture change in practice, education and policy: How do we get there from here?

Heather Tick, MD

Overview

- Pain crisis in US
  - Burden of pain including economic impact
- Opioid epidemic
  - Adverse effects and addiction liability
  - Continued inadequate pain care
- Evidence-based nonpharmacologic options
  - Acute pain inpatient setting
  - Acute pain outpatient setting
  - Cancer pain
  - Chronic pain



Burden of pain including economic impact

- $560-635 billion annual cost of pain care
  - Exceeds annual expenditures for heart disease, cancer, diabetes combined
- 11-47% of US population have chronic pain
  - Low back, neck, OA, headache most common
  - Leading cause of disability globally
  - Expected to rise with increase in diabetes, obesity and surgeries
- 17.8% GDP spent on healthcare; significant portion on pain
- $78.5 billion annual opioid overdose, abuse, dependency
  - 2015 private insurers and employer self-funded plans pain $16,000 more per patient w/dx opioid abuse or dependence than for any other diagnosis

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Pain Task Force White Paper Accessed by 5000+ colleagues

- www.nonpharmpaincare.org
- Researchgate
- Including DoD, VA, CMS, NIH, multiple professional organizations and researchers around the world

Tick H, Nielsen A, Pelletier KR, Bonakdar R, Simmons S, Glick R, Ratner E, Lemmon RL, Wayne PM, Zador V. Evidence-based Nonpharmacologic Strategies for Comprehensive Pain Care: The Consortium Pain Task Force White Paper. *Explore (NY).* 2018.

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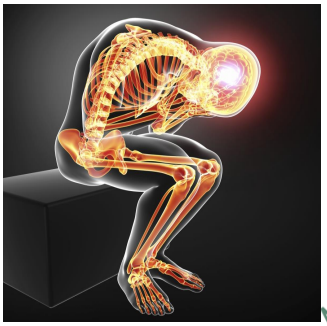
ACUTE

CHRONIC



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ACUTE PAIN

A DANGER alert system
A signal of potential life threatening injury
A brain process (no brain no pain)
A need for urgent action
Subject to modification by the CNS

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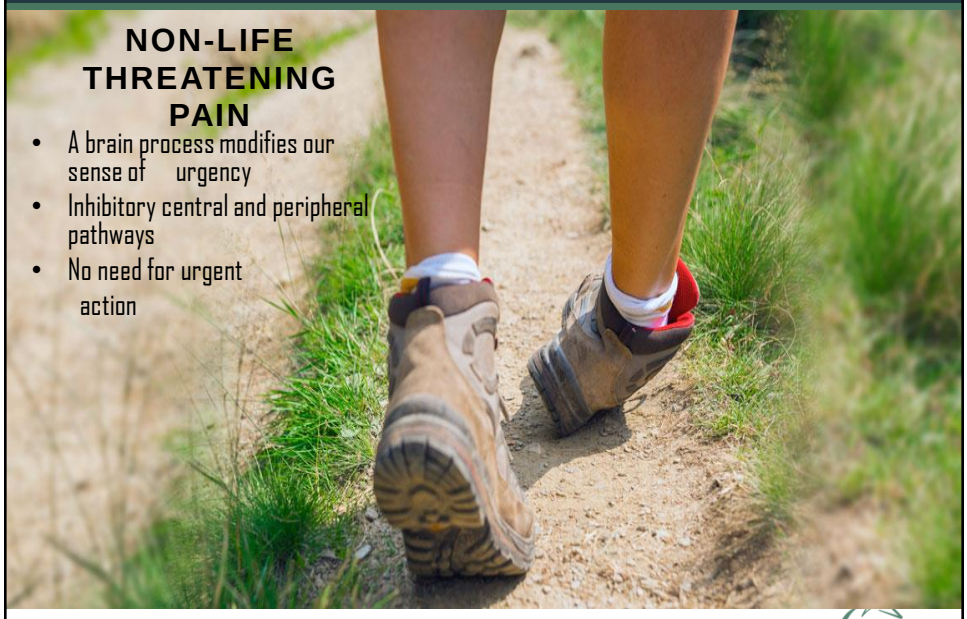
NON-LIFE THREATENING PAIN



- A brain process modifies our sense of urgency
- Inhibitory central and peripheral pathways
- No need for urgent action

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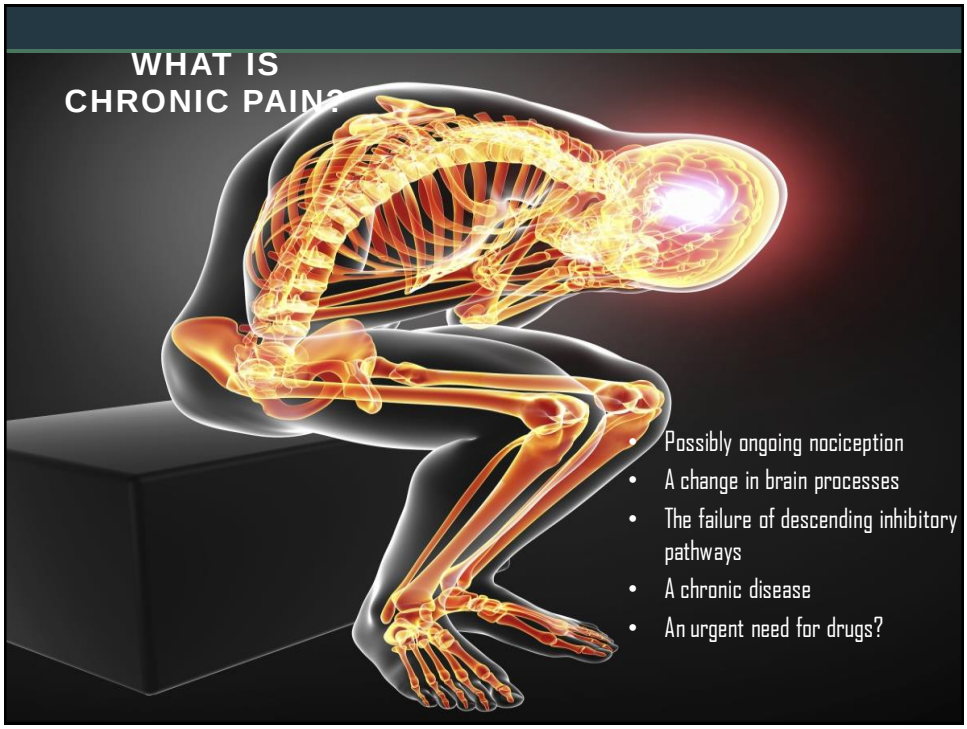
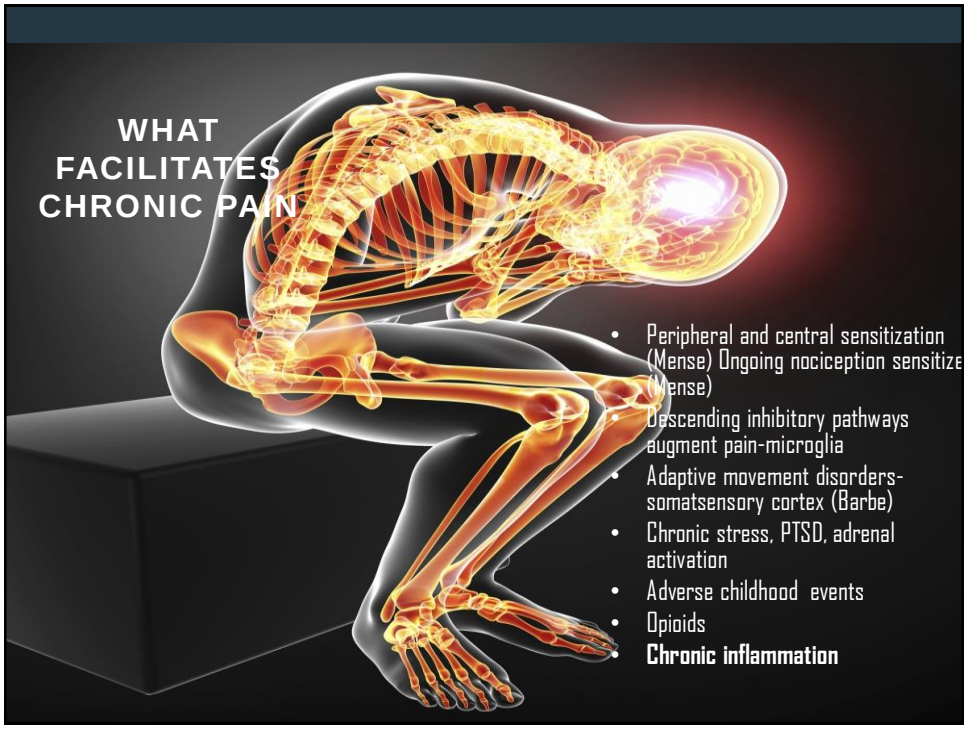

WHAT IS CHRONIC PAIN?
Possibly ongoing nociception
A change in brain processes
The failure of descending inhibitory pathways
A chronic disease
An urgent need for drugs?


WHAT FACILITATES CHRONIC PAIN
Peripheral and central sensitization (Mense) Ongoing nociception sensitize (Mense)
Descending inhibitory pathways augment pain-microglia
Adaptive movement disorders-somatsensory cortex (Barbe)
Chronic stress, PTSD, adrenal activation
Adverse childhood events
Opioids
Chronic inflammation

WHAT IS PAIN

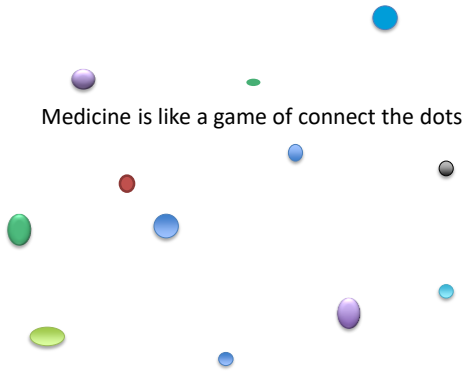
- A sensation
- A signal of injury
- A chronic disease
- A brain process
- A need for drugs

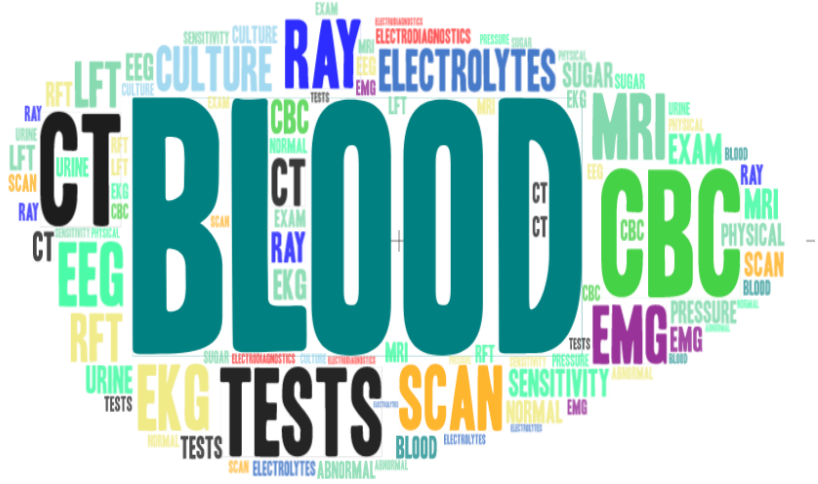
CHRONIC DISEASE

- Chronic diseases cause 7 in every 10 deaths each year in the United States.
- About 133 million Americans—nearly 1 in 2 adults—live with at least one chronic illness.
- More than 75% of health care costs are due to chronic conditions.

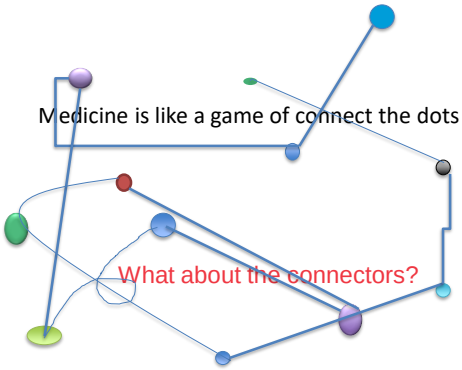
http://www.cdc.gov/chronicdisease/resources/publications/aag/chronic.htm (accessed 9.15.13)

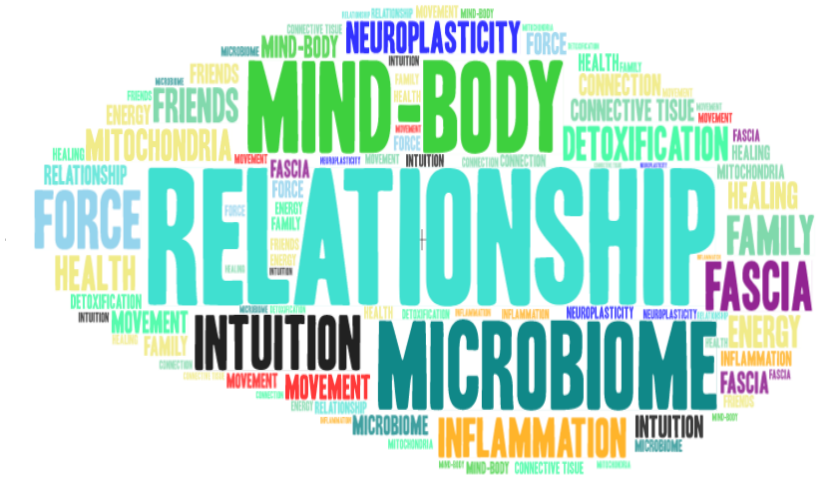
Medicine is like a game of connect the dots





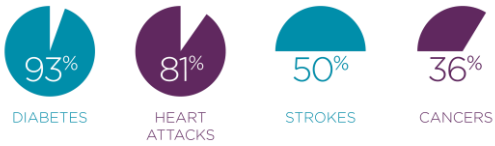
Tree


Medicine is like a game of connect the dots
What about the connectors?


MIND-BODY
NEUROPLASTICITY
FRIENDS
MITOCHONDRIA
DETOXIFICATION
RELATIONSHIP
FORCE
HEALTH
FAMILY
FASCIA
INTUITION
MOVEMENT
MICROBIOME
INFLAMMATION
CONNECTIVE TISUE
ENERGY
HEALING
CONNECTION

THE KEY TO HEALTH:

WOULD YOU TAKE A DRUG THAT
PREVENTED THIS PERCENTAGE OF DISEASES?



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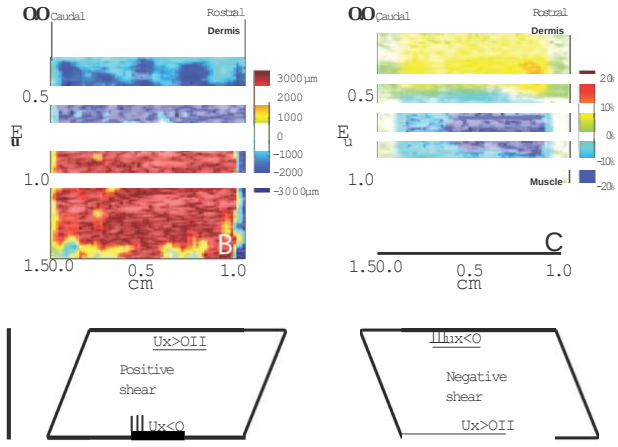
Connective tissue, stretching, inflammation & musculoskeletal pain

Helene M. Langevin, MD-
Dr. Langevin is Professor in Residence of Medicine at Harvard Medical School, Senior Scientist in the Department of Medicine Division of Preventative Medicine at the Brigham and Women's Hospital, and Director of the Osher Center for Integrative Medicine at Harvard Medical School and Brigham and Women's Hospital, Boston MA. She is also Visiting Professor of Neurological Sciences at the University of Vermont, Burlington VT.

MYOFASCIAL PAIN

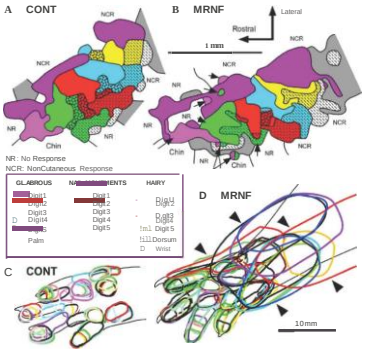
- Engell S, Triano JJ, Fox JR, Langevin HM, Konofagou EE. Differential displacement of soft tissue layers from manual therapy loading. *Clin Biomech (Bristol, Avon).* 2016 Mar; 33:66-72. PMID: 26954891.
- Tesarz J, Hoheisel U, Wiedenhöfer B, Mense S. Sensory innervation of the thoracolumbar fascia in rats and humans. *Neuroscience*. 2011 Oct 27;194:302-8. doi: 10.1016/.



MOVEMENT AS PAIN RELIEF

Movement Disorders in Chronic Pain

- **Mary Barbe** Temple University, (Peripheral and central changes combine to induce motor behavioral deficits in a moderate repetition task. *Experimental Neurology*. 2009;220(2):234–245. doi:10.1016/j.expneurol.2009.08.008.)
- **Vitaly Napadow**, Harvard (Somatosensory cortical plasticity in carpal tunnel syndrome treated by acupuncture. *Human Brain Mapping*. 2006;28(3):159–171. doi:10.1002/hbm.20261.)
- **Shirley Sahrmann**, Washington University St Louis, (The Human Movement System: Our Professional Identity, Phys *Ther*, March 13, 2014, doi: 10.2522/ptj.20130319



BIOCHEMICAL and HORMONAL DYSREGULATION: PAIN

- Low endorphins
- High inflammatory biomarkers
- Sleep disruption with low melatonin
- Cortisol high then low
- Cortical changes
- Cognitive changes

TREATMENT WITH OPIOIDS

- Master disruptor of all hormonal and inflammatory systems
- Endogenous opioid system dysregulation
  - Attachment
  - Reward
  - pain pathways
  - hormones

Ballantyne, Jane C, and Mark D Sullivan. "Discovery of Endogenous Opioid Systems: What It Has Meant for the Clinician's Understanding of Pain and Its Treatment." *Pain.* 158, no. 12 (2017): 2290-300.

THERAPEUTIC ORDER

The 6 Principles of Naturopathic Medicine:

- First, do no harm – utilize the most natural, least invasive and least toxic therapies
- The healing power of nature –trust in the body's inherent wisdom to heal itself
- Identify and treat the causes
- Doctor as teacher
- Treat the whole person
- Prevention

https://aanmc.org/naturopathic-medicine/

INADEQUATE PAIN CARE

- Even with prescribed opioids, 70% patients still complain of moderate to severe post-op pain
- Lack of evidence for safety or effectiveness of opioids for chronic non-cancer (CNCP) pain.
- Unimodal pain care with opioids as the cornerstone can be considered disadvantaged care

Evidence confirms:

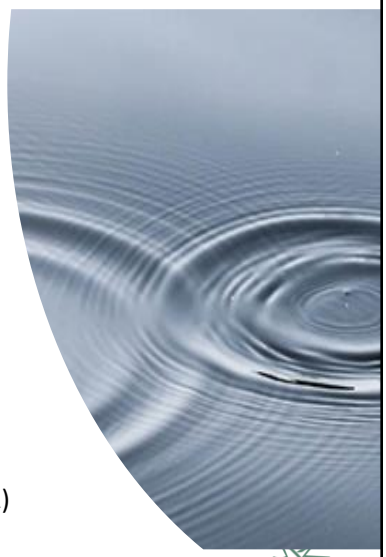
- Nonpharm Options
- Clinically effective
- Professions regulated by States
- Regulated scopes of practice
- consistent standard that uses evidence-based benefits and harms for inclusion of medical/health practices

The Joint Commission (TJC)

- Revised 2000 pain mandate
- Clarified to include nonpharm Jan 1, 2015
- Effective January 1, 2018
- 'Hospitals provide nonpharmacologic options for patients with pain'
- Scorable Element of Performance

https://www.jointcommission.org/assets/1/18/Joint_Commission_Enhances_Pain_Assessment_and_Management_Requirements_for_Accredited_Hospitals1.PDF

Acute pain inpatient setting



- Post-operative pain
  - Acupuncture therapy
  - Massage therapy
  - Mind body directed therapies
    - Music therapy
    - Suggestive techniques and guided imagery
    - Virtual reality-assisted distraction (VR)

Acute pain inpatient setting
Post-operative pain

- Acupuncture therapy
- 5 systematic reviews meta-analyses
  - Acupuncture reduces pain and opioid consumption 20-30%
  - Post-knee arthroplasty: reduced and delayed opioid need
  - Ear acupuncture: immediate pain relief sustained at 48 hrs. equivalent to analgesics
- Reduces opioid-related side effects: nausea, dizziness, sedation, pruritus and urinary retention
- Reviews support use of acupuncture as adjunct for surgical pain
- Acupuncture therapy is safe, low AE and accepted in adult, pediatric and pregnant patients

Acute pain, trauma and ED

- Acupuncture therapy in ED
  - Systematic review with meta-analysis
    - Improved levels of pain and patient satisfaction in ED (2017)
    - Low cost and low AE
  - Retrospective trial acup decreased pain comparable to analgesics with additional benefit of reduced anxiety
  - RCT acupuncture superior to IV morphine (2016)
    - Pain relief
    - Onset of action
    - Fewer AE

Post-operative pain

- Massage therapy
  - 2 systematic reviews with meta-analyses
  - Massage reduces post-op pain and anxiety in surgical patients
- RCTs massage for post-op pain and anxiety
  - Major surgeries military setting
  - Post-cesarean
  - Cardiac surgery
  - Thoracic surgery
- Massage therapy is safe; rare serious AD and low rates of minor complaints such as muscle soreness

Mind body for acute inpatient

- Music therapy: 3 systematic reviews with meta-analysis
  - Peri-op music reduced pain in pediatric surgery (2015)
  - Reduces pain in burn patients during tx procedures (2017)
  - Music decreases pain, distress and analgesic use (2016)
- Suggestive techniques: one meta-analysis
  - Alleviate post-op pain especially in minor surgeries (2014)
- Virtual reality-assisted distraction (VR)
  - Reduces burn-induced and burn wound care pain in adults and children (2011-2017 trials)

Safety mind body

- Music therapy, suggestive techniques, guided imagery are safe options to improve post-operative recovery
- VR risk of nausea
  - Safety requires 'safe areas', 'spotting' and debriefing

Cancer pain: Acupuncture therapy

- SysRevMeta: effective for malignancy and surgery-related pain (2017)
- SysRevMeta: acup relieved joint pain in breast cancer tx induced menopause (2017)
- Effective in radiation sxs, pain of dysphagia, peripheral neuropathy

Cancer pain
Massage therapy

- SysRevMeta: massage for cancer patient pain, fatigue and anxiety compared to active comparators or usual care (2016)
- Meta: massage effective for relief of cancer pain especially surgery-related pain (2015)
- RCT massage effective for meta-static bone pain, mood status, relaxation and sleep (2011)
- Beneficial for children with cancer and blood diseases (2009, 2012)

Cancer pain
Mind body approaches

- SysRev: Web-based mindfulness (ehealth) supportive for cancer patients sx burden (2009)
- SysRevMeta: MBSR beneficial psych impact breast cancer patient QOL, mood, distress (2012, 2017)
- SysRevMeta: Music therapy improves cancer pain, emotional distress from pain w/small, significant reduction in opioid, nonopioid meds (2016)

American College Physicians Guidelines (ACP)

Acute, subacute low back pain

- Superficial heat
- Massage therapy
- Acupuncture therapy
- Spinal manipulation
- If pharma desired (increase AE risk)
  - NSAIDs
  - Skeletal muscle relaxants (equivocal evidence)

American College Physicians Guidelines (ACP)

Chronic LBP

- Exercise, multidisciplinary rehab
- Acupuncture therapy
- MBSR
- Tai chi and Yoga
- Progressive relaxation, laser therapy, operant therapy
- CBT
- Spinal manipulation

Cancer pain
Acupuncture therapy

- American Society of Clinical Oncology Clinical Practice Guidelines found acupuncture was effective in improving pain (2016)

US Dept Health and Human Services Agency for Healthcare Research and Quality AHRQ

- Effective for cLBP (compared to placebo, sham, no tx, usual care, wait list)
  - Acupuncture therapy
  - Massage therapy
  - Tai chi
- As effective as active comparators
  - Spinal manipulation

NIH Recommends (2016)

- cLBP: Acupuncture and yoga (massage therapy, spinal manipulation, osteopathic manipulation)
- Knee OA: Acupuncture and Tai chi
- Neck pain: Massage
- Severe headaches and migraine: relaxation techniques
- Fibromyalgia: Relaxation approaches and Tai chi

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Comprehensive Pain Care

- Multimodal approach to acute pain care
- Question opioids as cornerstone of acute pain care
- Frequency, dosage and timing of nonpharmacologic interventions for inpatient and acute pain care
- Need for ongoing research on comprehensive pain strategies

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Effective nonpharm modalities per White Paper

- Acupuncture therapy
- Massage therapy
- Spinal manipulation
- Mind body approaches
  - MBSR, meditation, relaxation
  - (CBT) Biofeedback
  - Movement therapies, (PT) Tai chi and Yoga
    - Alexander Technique, Pilates, Feldenkrais
- Lifestyle and self-efficacy
  - Nutrition

Economics

Economic benefits of nonpharmacologic therapies in the tx of pain

- Course of treatment and cost for inpatient acute care
  - Options for daily tx while hospitalized
- Course of treatment and costs for outpatient chronic pain
  - SysRevMeta: benefit acup persisted at 12 months following a course of tx of 8-15 sessions over 12 weeks
    - Chronic pain of head, neck, shoulder, low back and knee
    - Most patients do not access full course of tx due to lack of insurance coverage