

Effectiveness and safety of nonpharmacological and nonsurgical treatments for chronic pain conditions

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Conflict of Interest Disclosure

- Dr. Chou has received research funding on this topic from the Agency for Healthcare Research and Quality, the American Pain Society, and the Centers for Disease Control and Prevention

Session Objectives

- Understand the evidence on the effectiveness and safety of nonpharmacological and nonsurgical treatments for chronic pain conditions
- Understand current treatment guidelines for common pain conditions, focusing on nonpharmacological and nonsurgical therapies
- Understand current knowledge on the effectiveness of treatments in specific populations (indigent, older adults, racial/ethnic groups)

Background

- Chronic noncancer pain is highly prevalent, with substantial burdens
- Many pharmacological and nonpharmacological treatments are available to treat chronic pain
 - Opioids commonly prescribed, but short-term benefits are limited, data lacking on long-term benefits, and serious harms
 - Other pharmacological treatments associated with relatively modest benefits and potential harms
 - Increased interest in and shift towards use of nonpharmacological treatments

Special Communication

CDC Guideline for Prescribing Opioids for Chronic Pain— United States, 2016

Deborah Dowell, MD, MPH; Tamara M. Haegerich, PhD; Roger Chou, MD

Recommendation #1

- Nonpharmacological therapy and nonopioid pharmacologic therapy are preferred for chronic pain
- Consider opioid therapy only if expected benefits are anticipated to outweigh risks to the patient
- If opioids are used, combine with appropriate nonpharmacologic therapy and nonopioid pharmacologic therapy

Biopsychosocial Approach and Chronic Pain

- Psychosocial factors are stronger predictors of transition to chronic pain and severity
- Biological factors (e.g., imaging findings, lab tests) poorly correlate with transition to chronic pain or severity
- Treatment approaches for chronic pain must address psychosocial contributors to pain and improvement in function to be most effective
 - A number of nonpharmacological therapies explicitly focus on function, movement, maladaptive coping behaviors
- Targeting of therapies based on presence and severity of psychosocial factors: STarT Back approach

Nonpharmacological Interventions

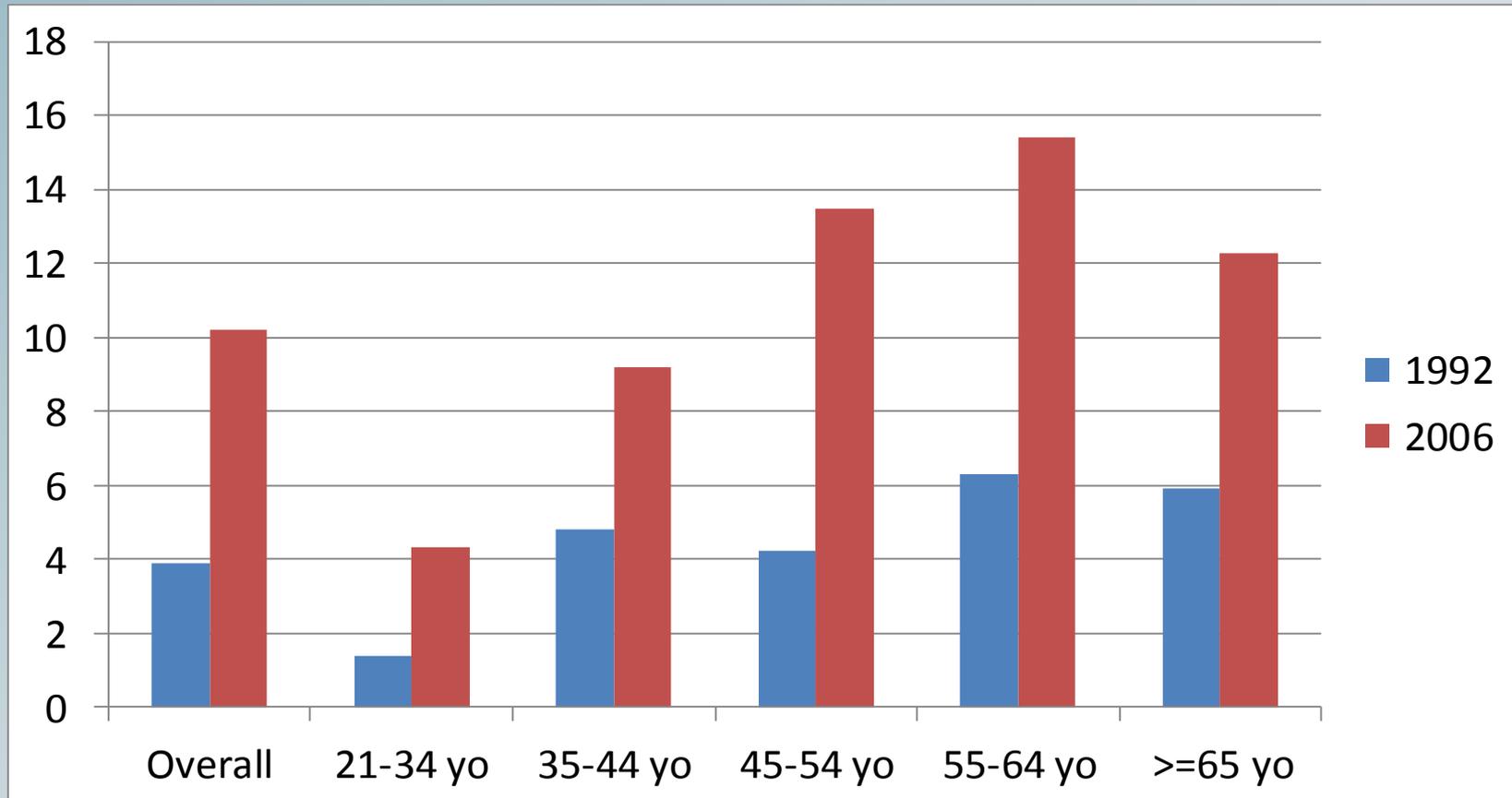
- Cognitive-behavioral therapy (CBT)
 - Restructures maladaptive thinking patterns and replaces undesirable with healthier behaviors
- Biofeedback
 - Helps achieve greater control over usually involuntary processes
- Mind-body interventions
 - Meditation/relaxation techniques and movement-based therapies
- Exercise: Many different types; ideally CBT-informed
- Interdisciplinary rehabilitations
 - Combines physical and biopsychosocial components at a minimum
- Manipulation, acupuncture, massage
- Physical modalities
 - Ultrasound, TENS, low-level laser therapy, traction, lumbar supports

Low Back Pain

- 5th most common reason for U.S. office visits, 2nd most common symptomatic reason
 - 5% of PCP visits are for LBP
- Up to 84% of adults have LBP at some point, >1/4 report LBP in prior 3 months
- Affects all ages, peaks at 55 to 64 years
- Most common cause of activity limitations in persons under 45 years
- >\$100 billion dollars in total health care expenditures
 - Increased use of advanced imaging, surgery, interventional procedures, opioids

Trends in prevalence of chronic LBP

Percentage of North Carolina adults with chronic low back pain



Issues in evaluating effectiveness of non-pharmacological therapies

- Can be difficult to mask treatments
 - Cannot fully control for attentional and placebo effects
- Variability in techniques and intensity of treatments
 - Limited evidence on optimal frequency and duration
 - Effects may also be provider-dependent
- Interindividual variability in responses
 - Patient expectations/beliefs
 - Other factors: psychological comorbidities, maladaptive coping behaviors, central sensitization, ?opioids
- Magnitude of effects generally small and short-term
 - ≤ 1 point on 1 to 10 point pain scale
 - Data on functional effects often more limited
- Methodological limitations in trials
- Potential conflicts related to profession, proprietary interests

2007 APS/ACP LBP review

Intervention	Magnitude of benefit	Quality
Acupuncture	Moderate	Fair
Exercise	Small-moderate	Good
Interdisciplinary rehabilitation	Moderate	Good
Massage	Moderate	Fair
Psychological interventions	Moderate-substantial	Good
Spinal manipulation	Moderate	Good
Yoga	Moderate	Fair
Physical modalities	Unable to estimate	Poor

2007 ACP/APS guideline

CLINICAL GUIDELINES

Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society

Roger Chou, MD; Amir Qaseem, MD, PhD, MHA; Vincenza Snow, MD; Donald Casey, MD, MPH, MBA; J. Thomas Cross Jr., MD, MPH; Paul Shekelle, MD, PhD; and Douglas K. Owens, MD, MS, for the Clinical Efficacy Assessment Subcommittee of the American College of Physicians and the American College of Physicians/American Pain Society Low Back Pain Guidelines Panel*

- First national guideline to recommend spinal manipulation, massage, yoga, acupuncture, progressive relaxation as treatment options for LBP
- Little guidance on selection of therapies
 - Individualization of therapy?
 - Active vs. passive approaches?
- Little guidance on optimal techniques, intensity, duration, timing of therapy

2017 AHRQ review on non-invasive treatments for LBP

- More evidence to support:
 - Yoga: More effective than usual care, education; similar to exercise
 - Tai Chi: More effective than waitlist, no Tai Chi (limited evidence)
 - Mindfulness-based Stress Reduction: Similar to CBT and more effective than usual care
- Physical modalities: Evidence generally remains insufficient

2017 American College of Physicians guideline

CLINICAL GUIDELINE



Noninvasive Treatments for Acute, Subacute, and Chronic Low Back Pain: A Clinical Practice Guideline From the American College of Physicians

Amir Qaseem, MD, PhD, MHA; Timothy J. Wilt, MD, MPH; Robert M. McLean, MD; and Mary Ann Forciea, MD; for the Clinical Guidelines Committee of the American College of Physicians*

- Emphasis on nonpharmacologic therapies, particularly for chronic LBP
- Stronger evidence/recommendations for mind-body interventions (yoga, Tai Chi, mindfulness-based stress reduction)
- Stronger cautions regarding opioids

2018 Comparative Effectiveness Review

Comparative Effectiveness Review

Number 209

Noninvasive Nonpharmacological Treatment for Chronic Pain: A Systematic Review

- Focus on durability of treatment effects (>1 month after completing treatment)
- Five common chronic pain conditions
 - LBP, neck pain, OA, fibromyalgia, tension HA
- Identified a standard comparator for head-to-head comparisons
 - Exercise for all conditions except for HA (biofeedback)
- Challenges in conveying large volume of information

Chronic LBP, vs. usual care, sham, attention control, or waitlist

Intervention	Function <i>Short-Term</i>	Function <i>Intermediate-Term</i>	Function <i>Long-Term</i>	Pain <i>Short-Term</i>	Pain <i>Intermediate-Term</i>	Pain <i>Long-Term</i>
	Effect Size SOE	Effect Size SOE	Effect Size SOE	Effect Size SOE	Effect Size SOE	Effect Size SOE
Exercise	slight +	none +	none +	slight ++	moderate +	moderate +
Psychological Therapies: CBT primarily	slight ++	slight ++	slight ++	slight ++	slight ++	slight ++
Physical Modalities: Ultrasound	insufficient evidence	no evidence	no evidence	none +	no evidence	no evidence
Physical Modalities: Low-Level Laser Therapy	slight +	none +	no evidence	moderate +	none +	no evidence
Manual Therapies: Spinal Manipulation	slight +	slight +	no evidence	none +	slight ++	no evidence
Manual Therapies: Massage	slight ++	none +	no evidence	slight ++	none +	no evidence
Manual Therapies: Traction	none +	no evidence	no evidence	none +	no evidence	no evidence
Mindfulness Practices: MBSR	none +	none +	none +	slight ++	slight +	none +
Mind-Body Practices: Yoga	slight ++	slight +	no evidence	moderate +	moderate ++	no evidence
Acupuncture	slight +	none +	none +	slight ++	none +	slight +
Multidisciplinary Rehabilitation	slight +	slight +	none +	slight ++	slight ++	none +

2018 Comparative Effectiveness Review

- Some evidence of persistent beneficial effects of multidisciplinary rehabilitation over exercise for chronic LBP
- Evidence on other chronic pain conditions limited
 - Neck pain: Exercise, psychological therapies, acupuncture
 - Osteoarthritis: Exercise, psychological therapies, acupuncture
 - Fibromyalgia: Exercise, psychological therapies, massage, mindfulness, mind-body, acupuncture, multidisciplinary rehabilitation
 - Tension HA: Spinal manipulation (limited)
- Little evidence to assess specific techniques, duration/intensity of treatment, sequencing of therapies
- Little evidence on impacts of nonpharmacological therapies on opioid use and associated harms

Harms of Nonpharmacological Treatments

- Generally, few harms reported in trials of nonpharmacological treatments and serious harms rare
 - Spinal manipulation: Serious harms rare with lumbar manipulation; more common with cervical manipulation
 - Serious harms rarely reported with traction, acupuncture
 - Prolotherapy: Inflammation/pain an expected short-term effect
 - Short-term soreness/discomfort reported with a number of therapies

Effects in subpopulations

- Indigent populations
 - Some trials focused on low-income populations, but insufficient evidence to determine whether treatment effectiveness varies in this population
 - Access and comorbidities may be issues
- Age
 - Evidence to determine how effectiveness varies by age limited
 - Some data indicate that mindfulness, CBT, exercise, effective in older populations
- Race/ethnicity
 - No clear evidence of race/ethnicity effects; data limited
 - Patient expectations/beliefs may impact effectiveness and may be impacted by culture/locale (e.g., acupuncture)

MAGICapp Evidence Summary

Structured Abstract

References

Evidence



Introduction

Methods

Results

Key Question 1: Low back pain

Key Question 2: Chronic Neck Pain

Key Question 3: Osteoarthritis

Key Question 4: Fibromyalgia

Key Question 5: Chronic Tension Headache

Key Question 6: Differential Efficacy

5.5 Mindfulness Practices

View section text

5.5.1

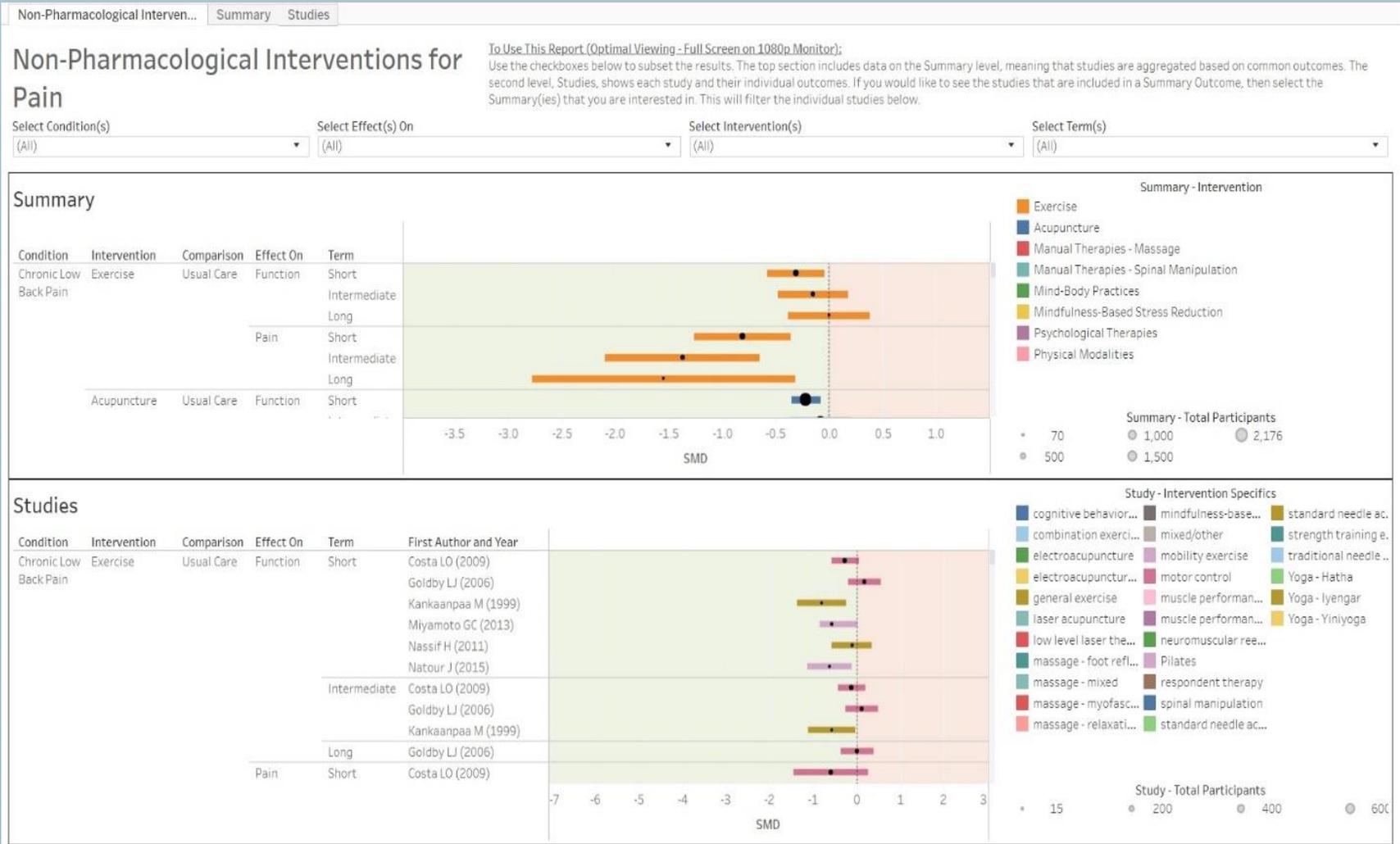
POPULATION	INTERVENTION	COMPARATOR
Individuals with low back pain	Mindfulness-based stress reduction	Usual care or attention control
OUTCOMES		
Under development	Function (Short-term)	Pain (Short-term)
	Function (Intermediate-term)	Function (Long-term)
	Pain (Intermediate-term)	Pain (Long-term)
	Harms	
VIEW LESS DETAILS		

Literature search Evidence profile Summary References PICO codes Evidence Matrix

Outcome Timeframe	Study results and measurements	Absolute effect estimates		Certainty in effect estimates (Quality of evidence)	Plain text summary
		Usual care or attention	Mindfulness-based stress reduction		
Function (Short-term)	Based on data from 694 patients in 4 studies		Difference: 0.25 lower (SMD) (CI 95% 0.53 lower - 0.04 higher)	Low Due to serious risk of bias, Due to serious inconsistency, Due to serious imprecision	MBSR was associated with no statistically significant differences in short-term function compared with usual care or an attention control.
Pain (Short-term)	Scale: 0-10 Based on data from 694 patients in 4 studies		Difference: 0.76 lower (MD) (CI 95% 1.13 lower - 0.39 lower)	Moderate Due to serious risk of bias	MBSR was associated with slightly greater effects than usual care or an attention control on short-term pain.
Function (Intermediate-term)	Based on data from 225 patients in 1 studies. Follow up: .		SMD -0.20 (95% CI -0.47 to 0.06)	Low Due to serious risk of bias, Due to serious imprecision	One trial found no difference between MBSR versus an attention control in intermediate-term function.
Function (Long-term)	Based on data from 228 patients in 1 studies. Follow up: .		SMD -0.20 (95% CI -0.47 to 0.06)	Low Due to serious risk of bias, Due to serious imprecision	One trial found no difference between MBSR versus an attention control in long-term function.



Tableau dashboard

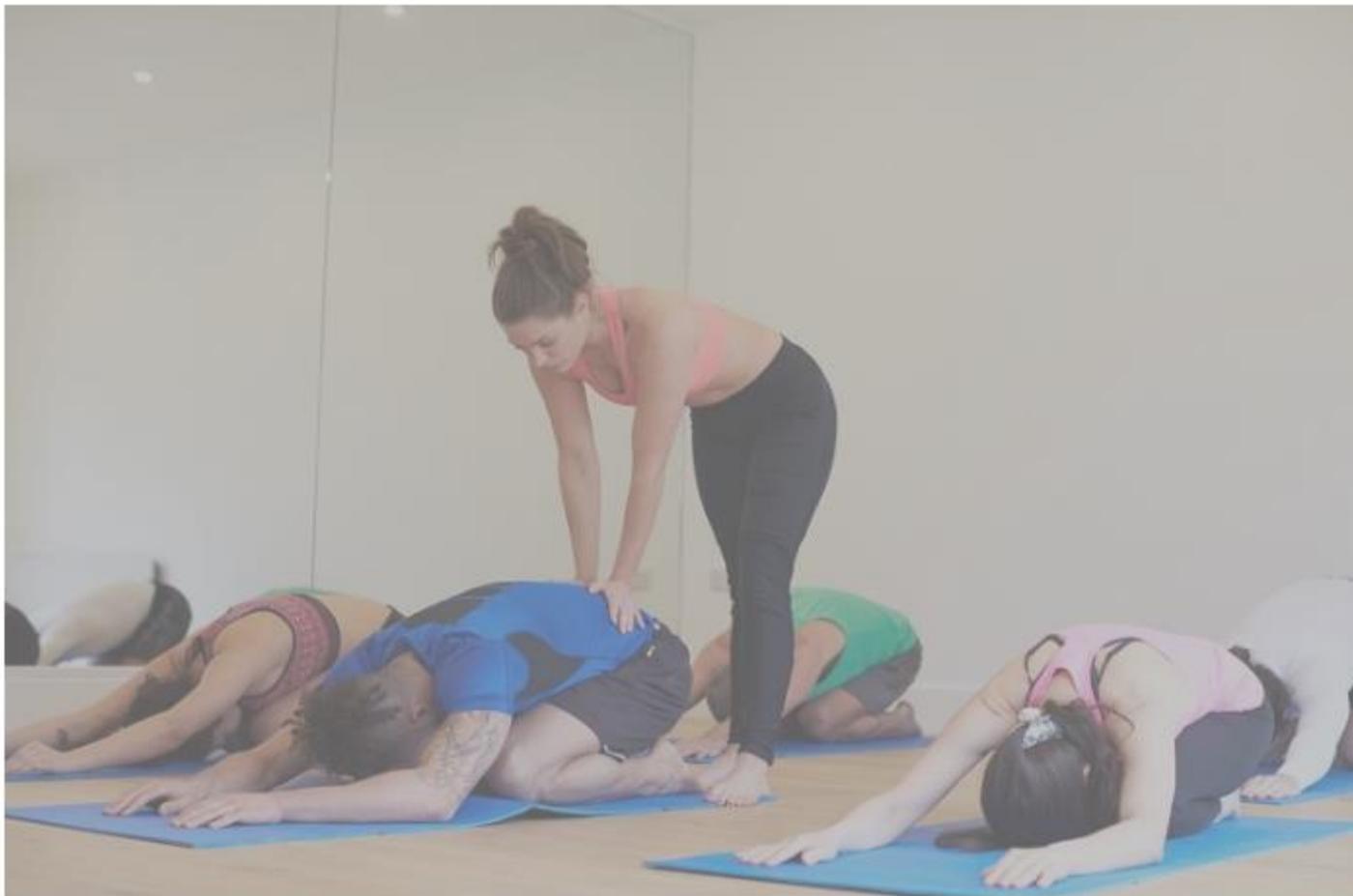


The data from this report was extracted from a systematic review of Non-Pharmacological Interventions for Pain, funded by AHRQ. This report was generated during a T01 Methods Pilot funded by AHRQ.

Amid Opioid Crisis, States Start Embracing Alternative Medicine

Some aren't just covering yoga and acupuncture but recommending it *before* prescription drugs.

BY MATTIE QUINN | NOVEMBER 2017



(Shutterstock)

Emerging areas

- Living systematic reviews
 - Machine learning, crowdsourcing
- Network meta-analysis
- Individual patient data meta-analysis
- Open access to data
- Evaluation of complex interventions
 - TIDieR checklist

Conclusions

- Many nonpharmacological interventions are available for chronic pain
- A number of nonpharmacological treatments are associated with effects on pain and function that are similar to pharmacological therapies
- Harms of nonpharmacological treatments are generally minimal
- Some evidence of persistent/sustained effects
- Use of “active” nonpharmacological treatments is consistent with a biopsychosocial approach to chronic pain
 - Exercise, mind-body interventions, psychological therapies, interdisciplinary rehabilitation



Questions?

