

The Evidence for Complementary & Integrative Medicine for Low Back Pain

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Disclosures

- No relevant financial conflicts of interest to disclose

Main Points

- Morbidity, disability, and cost of LBP is enormous
- Patient-centered biopsychosocial model is essential
- Risk stratification for prognosis and treatment
- Recommend self-care and nonpharmacologic therapies first
- Opioids only after careful consideration of risks and benefits

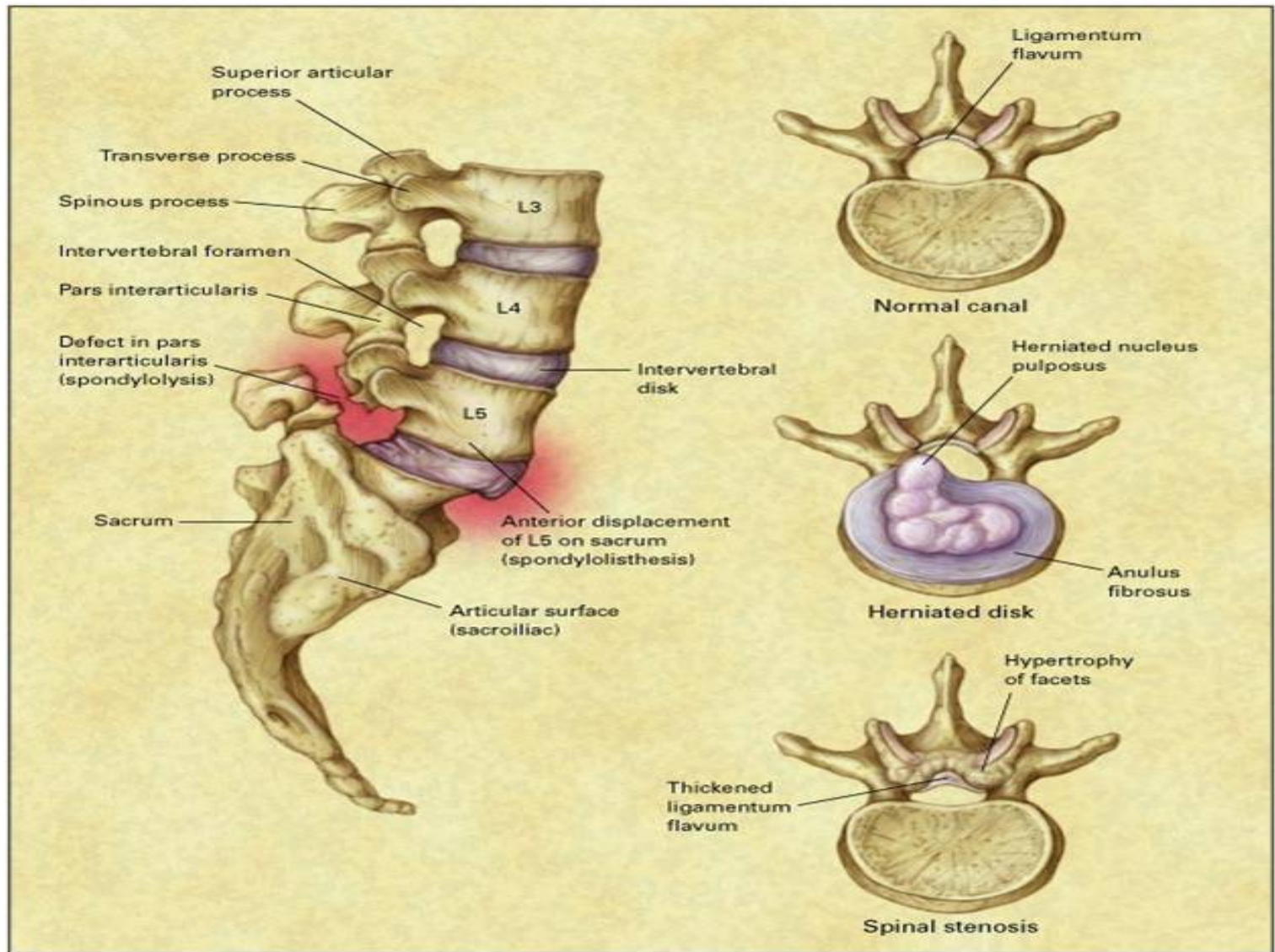
The Burden of Low Back Pain

- Lifetime incidence approaching 90%
- 43-60% of Americans report spine pain in the past 3 months
- \$100 billion annual direct costs
- Total annual costs >\$500 billion
- Common cause for office visit
- Most common and most expensive cause of worker's compensation claims
- Leading cause of global disability

Effect on Lives Can Be Profound

- Impact on function: work, physical, psychosocial, ADLs & IADLs
- Loss of activities that bring joy and meaning to life
- A sense of suffering, often in isolation
- Feelings of anger, depression, and guilt
- Impact on family
 - Emotional and physical energy caring for person in chronic pain
 - They experience the same anger, depression, and guilt
 - Pain controls their lives as well

Specific Causes of Back Pain



Acute (<4 weeks) and Subacute (4-12 weeks) Nonspecific Low Back Pain

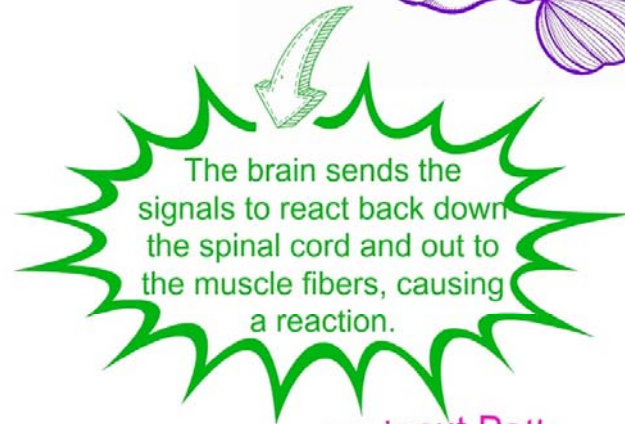
- Common
- Mechanism: Injury to ligaments, facet joints, muscle, fascia, nerve roots, or disc
- 75-90% resolve spontaneously

Acute Pain Loop

Cerebral Cortex:
identifies location,
assesses severity,
determines reaction



Limbic System:
process the
memory and
emotional aspects

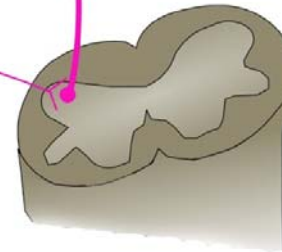


Sensory signals
travel first to the
spine, and then up
the spinal cord to
the brain.



Nociceptors in the
tissue pick up the
sensory input.

Sensory input Path



Nonspecific Chronic Low Back Pain (>12 weeks)

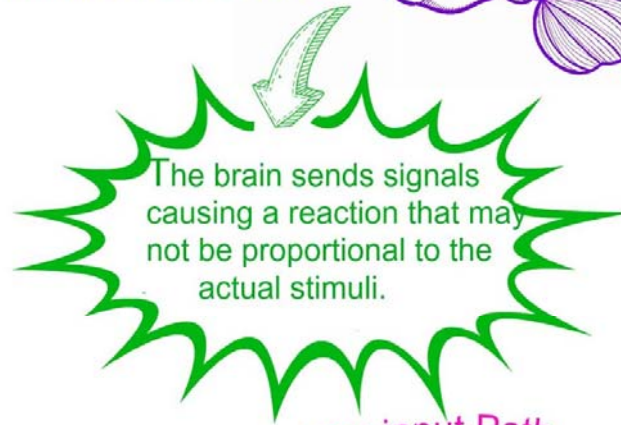
- Complex poorly understood condition
- Different CNS patterns than acute LBP
- Contributes to most suffering and cost
- Pharmaceuticals can help but often not fully satisfactory

Chronic Pain

Cerebral cortex may overgeneralize location, interpret higher severity, and cause more of a reaction.



A stronger response from the limbic system may lead to more intense pain

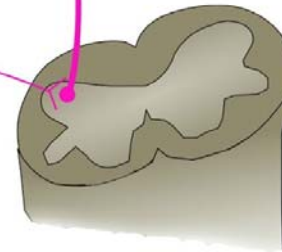


The brain sends signals causing a reaction that may not be proportional to the actual stimuli.

Sensory signals may be amplified.



Sensory input Path



Actual or perceived tissue damage may cause nociceptors to pick up more input.

Red Flags

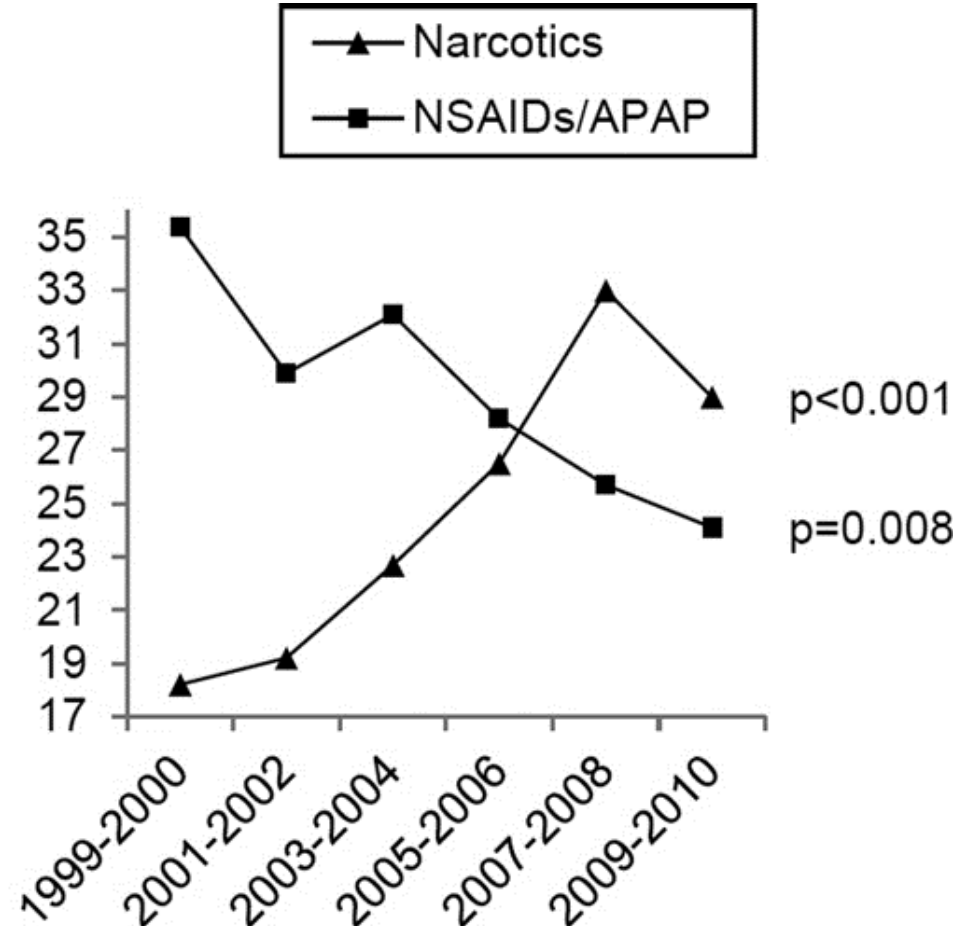
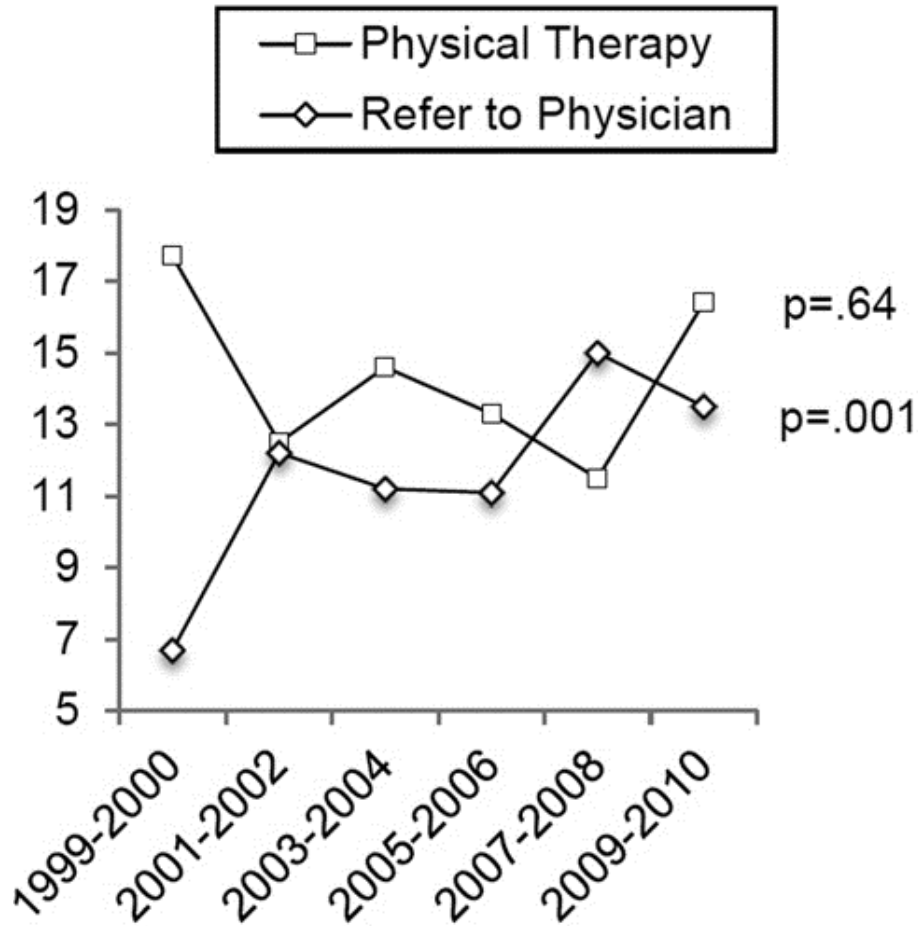
- Malignancy
- Infection
- Fracture
- non-MSK cause
- Systemic inflammatory condition
- Progressive weakness, bowel or bladder changes, saddle anesthesia



Standard Therapies

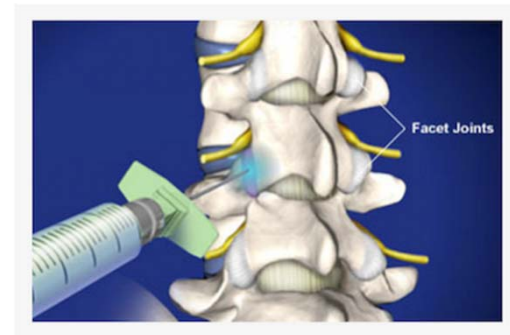
- Acetaminophen
- NSAIDs
- Skeletal Muscle Relaxants
- Opioids
- TCAs
- SSRIs
- Anti-convulsants
- Duloxetine
- Topical analgesics
- Physical Therapy
- Epidural Steroid Injections
- Surgery

Trends in Treatment of Back Pain

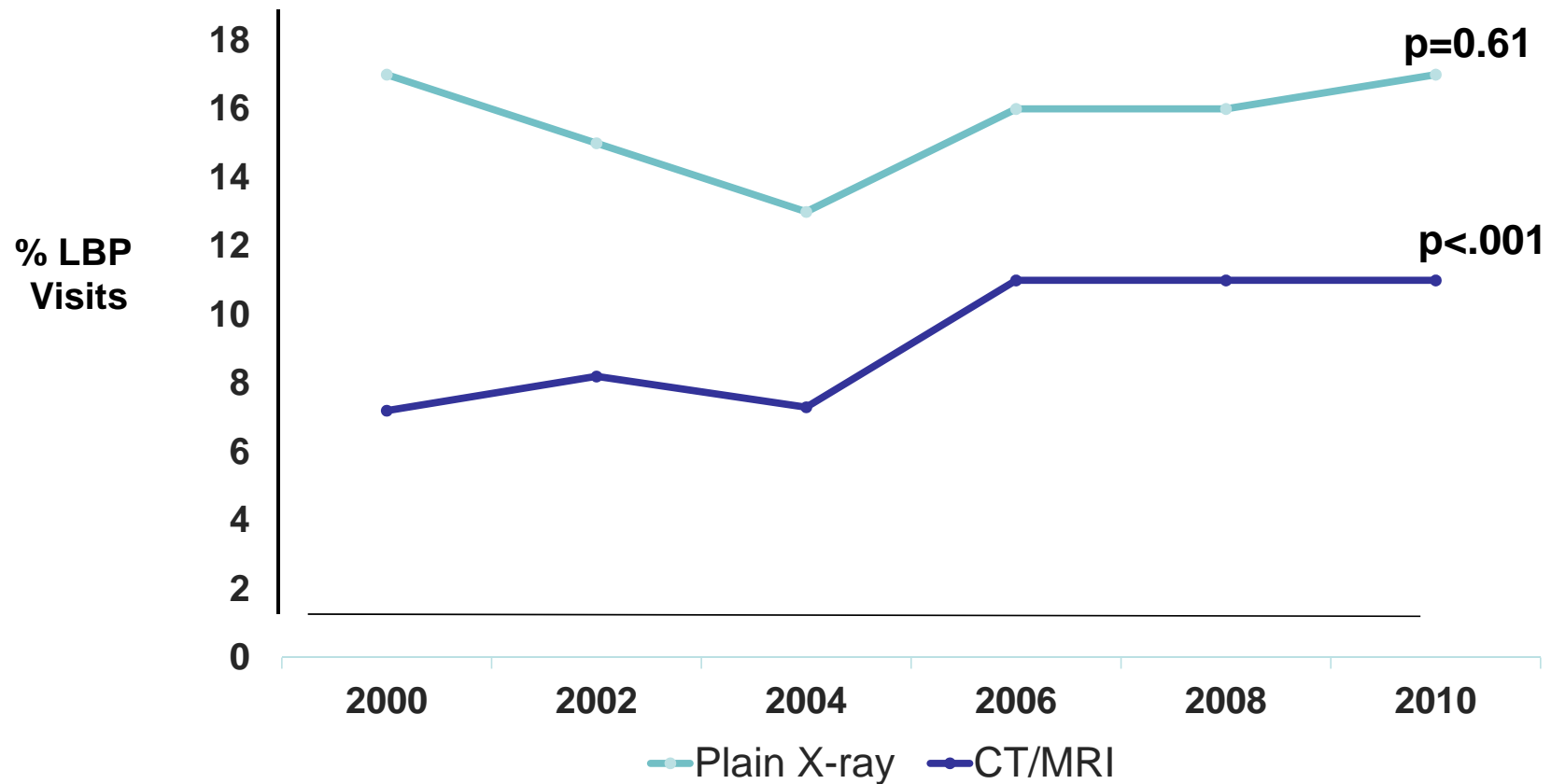


Imaging

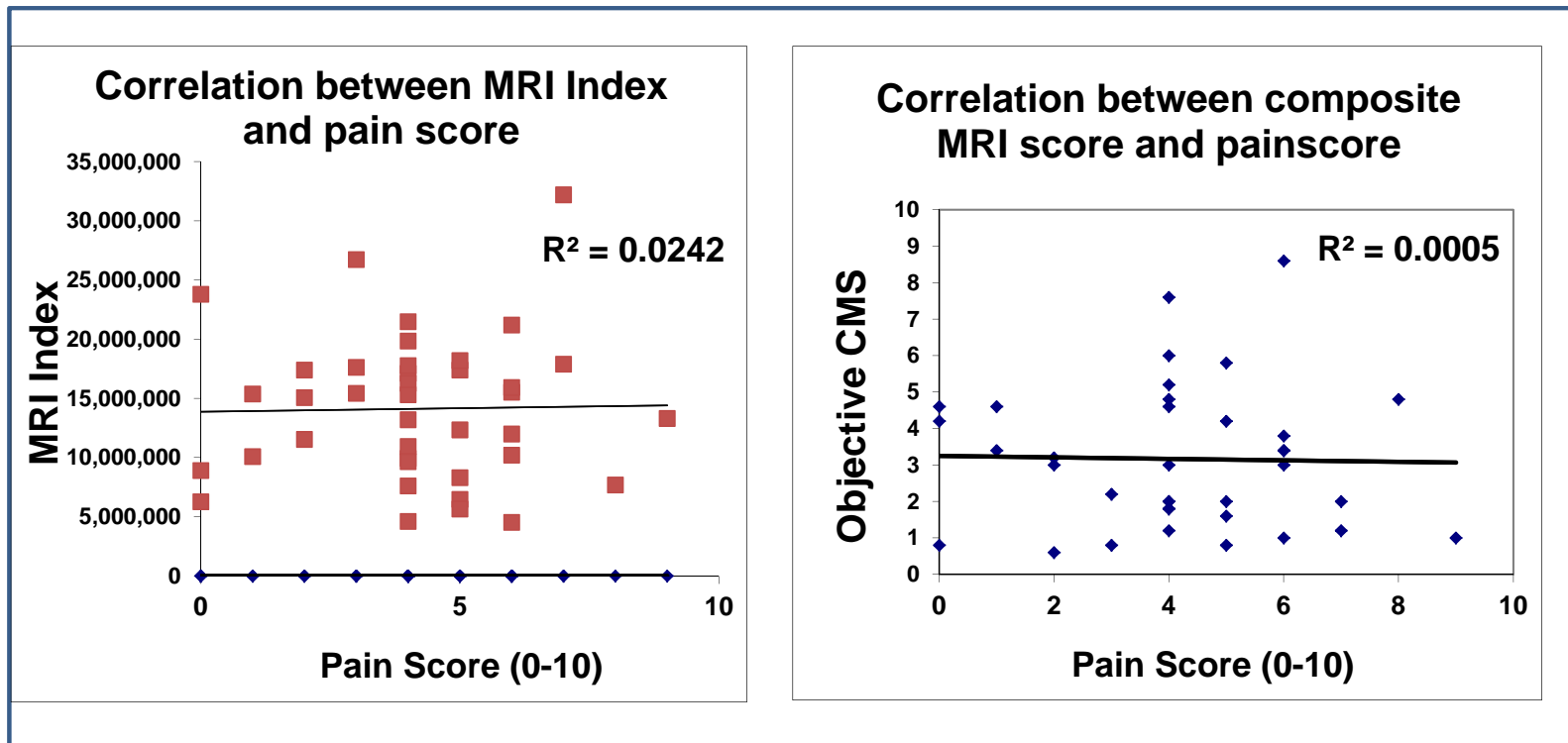
Lumbar imaging in patients without indications of serious underlying conditions does not improve clinical outcomes



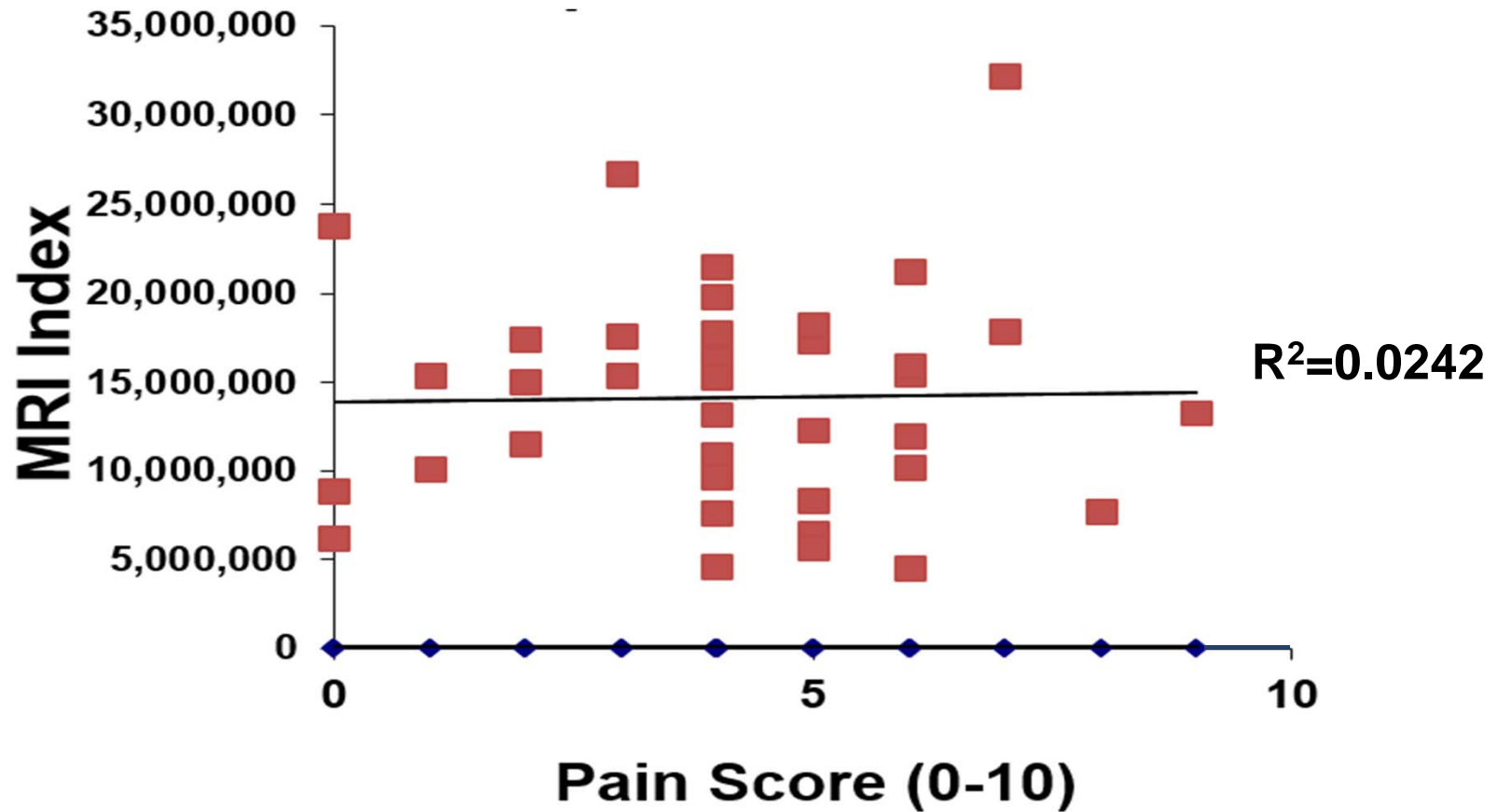
Imaging for Low Back Pain over Time



MRI does not correlate with pain



MRI Does Not Correlate with Pain

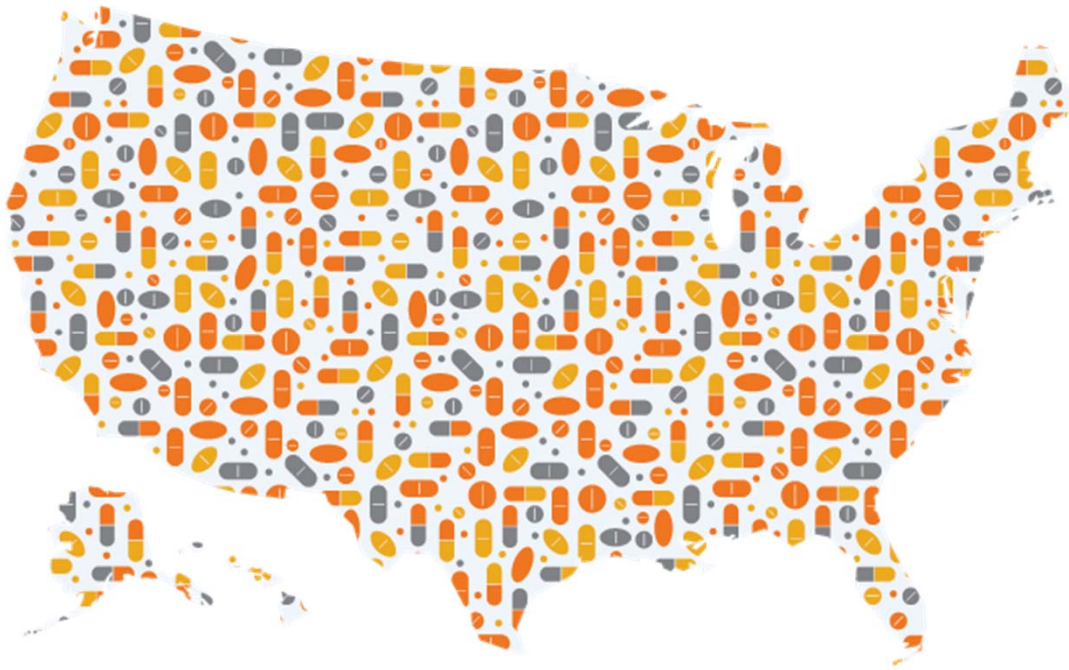


Iatrogenic Imaging Disability

“An increase in pain, disability and suffering that directly results from the communication, from a respected health care practitioner, of benign imaging findings as if they were significant pathological conditions.”

– Donald Murphy, DC

A National Health Crisis



Every 13 minutes
there is a death from opioid
overdose¹

2.1M Americans
suffer from an opioid use disorder²

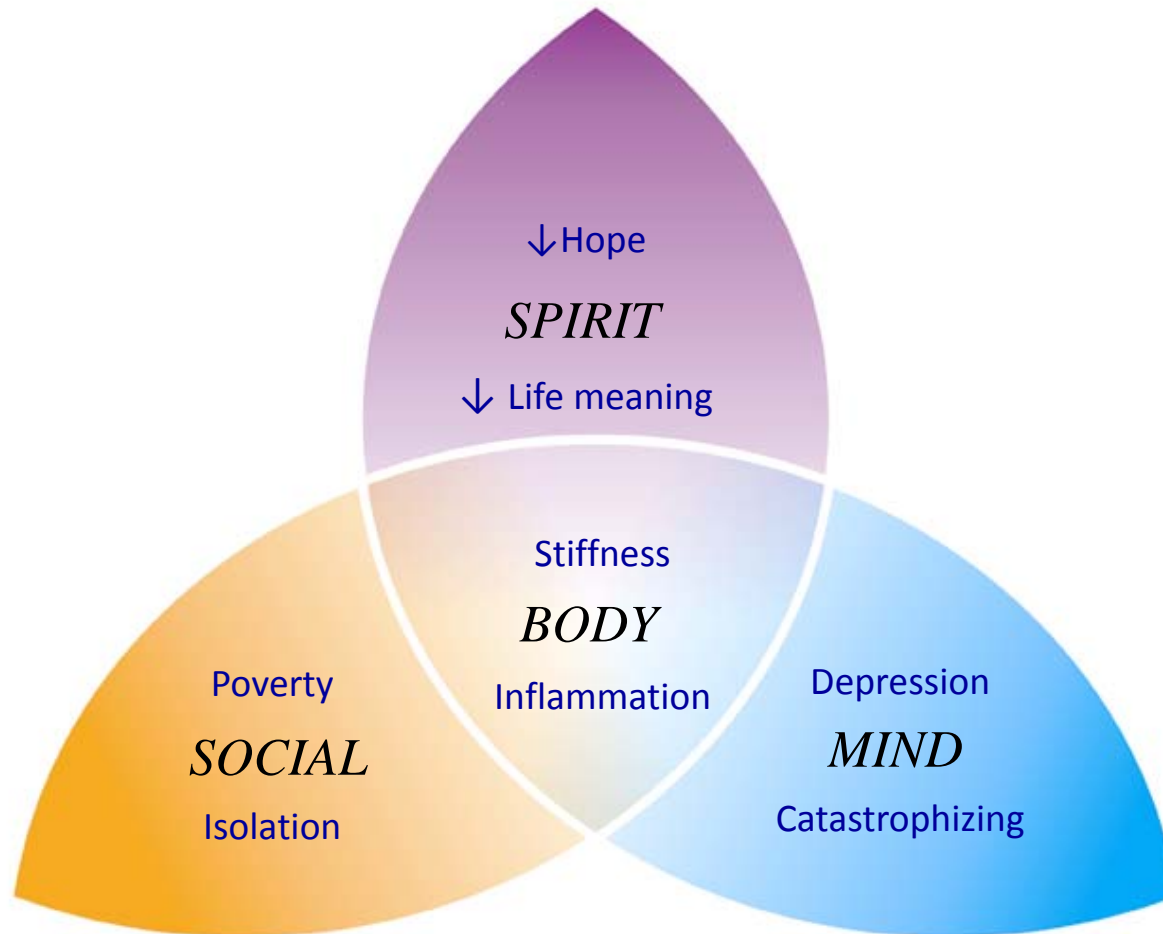
\$504B
estimated annual costs of
U.S. opioid epidemic³

1. Hedegaard H, Warner M, Miniño AM. Drug overdose deaths in the United States, 1999–2016. NCHS Data Brief, no 294. Hyattsville, MD: National Center for Health Statistics. 2017/ CDC. Wide-ranging online data for epidemiologic research (WONDER). Atlanta, GA: CDC, National Center for Health Statistics; 2016. (Calculation based on stat: Overdoses involving opioids killed 42,249 people in 2016, or 116 deaths a day. 40% of those deaths were from prescription opioids.) 2. Substance Abuse and Mental Health Services Administration. (2017). Key substance use and mental health indicators in the United States: Results from the 2016 National Survey on Drug Use and Health (HHS Publication No. SMA 17-5044, NSDUH Series H-52). Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. 3. The Underestimated Cost of the Opioid Crisis. The Council of Economic Advisors. November 2017; Accessed at <https://www.whitehouse.gov>

From pain to overdose and death



Biopsychosocial Model of Chronic Pain



Yellow Flags



- Fear Avoidance Beliefs
- Maladaptive Coping, eg Catastrophizing
- Depression
- Anxiety
- Work dissatisfaction
- Substance Use Disorder

Effect of Stratified Care for Low Back Pain in Family Practice (IMPACT Back): A Prospective Population-Based Sequential Comparison

CONCLUSIONS Stratified care for back pain implemented in family practice leads to significant improvements in patient disability outcomes and a halving in time off work, without increasing health care costs. Wider implementation is recommended.

STarT Back

	Disagree 0	Agree 1		
1 My back pain has spread down my leg(s) at some time in the last 2 weeks	<input type="checkbox"/>	<input type="checkbox"/>		
2 I have had pain in the shoulder or neck at some time in the last 2 weeks	<input type="checkbox"/>	<input type="checkbox"/>		
3 I have only walked short distances because of my back pain	<input type="checkbox"/>	<input type="checkbox"/>		
4 In the last 2 weeks, I have dressed more slowly than usual because of back pain	<input type="checkbox"/>	<input type="checkbox"/>		
5 It's not really safe for a person with a condition like mine to be physically active	<input type="checkbox"/>	<input type="checkbox"/>		
6 Worrying thoughts have been going through my mind a lot of the time	<input type="checkbox"/>	<input type="checkbox"/>		
7 I feel that my back pain is terrible and it's never going to get any better	<input type="checkbox"/>	<input type="checkbox"/>		
8 In general I have not enjoyed all the things I used to enjoy	<input type="checkbox"/>	<input type="checkbox"/>		
9. Overall, how bothersome has your back pain been in the last 2 weeks?				
Not at all	Slightly	Moderately	Very much	Extremely
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0	0	0	1	1

Psychologically Informed Physical Therapy (PIPT)



**Improve physical function
through tailored stretching,
strengthening, and aerobic
exercises**



**Address psychosocial
obstacles to recovery
through education, coaching,
graded exercise**

Fear Avoidance Behaviors and Beliefs
Catastrophizing



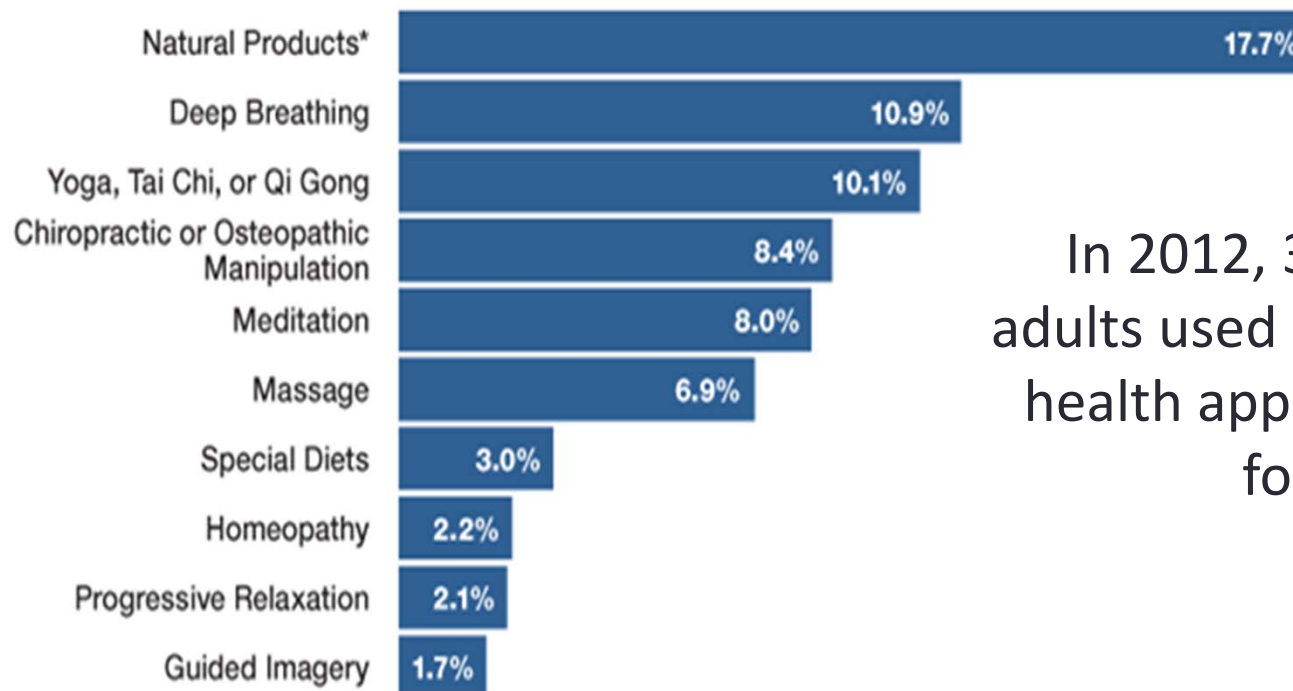
**“You’ve been
fooling around
with alternative
medicines,
haven’t you?”**

Definitions

- Alternative Medicine: in lieu of conventional care
- Complementary Medicine: as adjunct to conventional care
- CAM: “A group of diverse medical and healthcare systems, practices, and products that are not presently considered to be part of conventional medicine.”
- Integrative Medicine: Combines evidence-based CAM with evidence-based conventional care in a patient- and relationship-centered approach

2012 National Health Interview Survey CAM Supplement

10 most common complementary
health approaches among adults



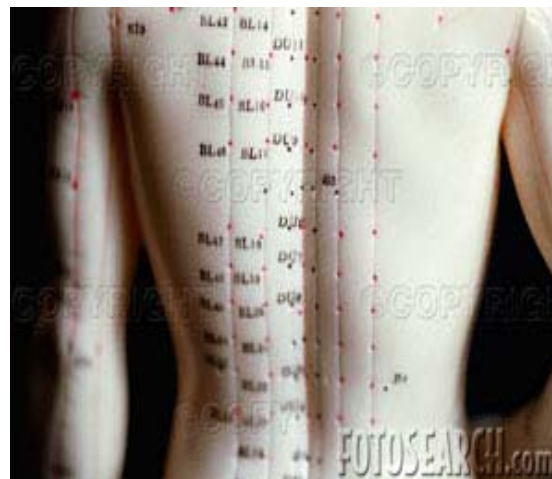
In 2012, 33.2% of U.S.
adults used complementary
health approaches, many
for pain

Use of CAM by U.S. Adults for Back Pain – 2012

	Any CAM n=3892	Acupuncture n=261	Chiropractic Manipulation n=1363	Massage n=1017	Yoga/Qigong/Tai chi n=905
Used for back pain, %	21.1	19.5	40.7	22.2	8.1
Perceived benefit (of those who used CAM for back pain), %					
Great	58.1	64.6	62.0	54.7	53.2
Some	29.1	16.4	27.2	30.8	36.8
Only a little	8.0	11.8	6.1	9.4	8.1
Not at all	4.8	7.2	4.8	5.2	1.9

^a Data from NHIS Sample Adult, Alternative Health Supplement file 2012.

Acupuncture



Acupuncture

49 Trials (n=7,958; range 16-2831)

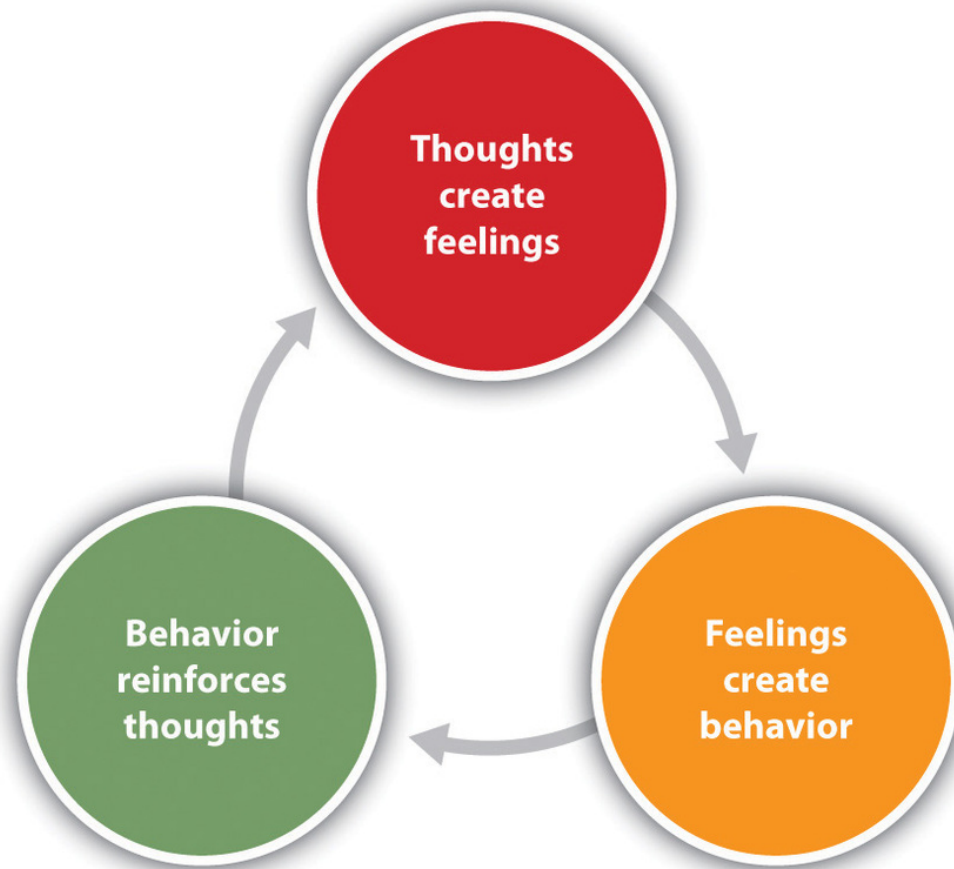
Acute low back pain

- ↓ pain intensity cf: sham
- Greater likelihood of overall improvement cf: NSAIDs (5 trials: RR 1.11 [CI, 1.06 to 1.16])

Chronic low back pain

- ↓ pain intensity and ↑ function cf: sham
- Greater pain relief (−10.6 on a 0-100-point scale [CI, −20.34 to −0.78]) and better function (WMD −0.36 [CI, −0.67 to −0.04]) cf: NSAIDs, muscle relaxants

Cognitive Behavioral Therapy (CBT)



Mindfulness

Definition: Purposeful attention to your experience in the moment without judgement

Mindfulness Based Stress Reduction (MBSR)

- Developed by Jon Kabat-Zin at the UMASS Medical Center
- Standardized 8 week program
- Teacher certification
- Studied widely
- Weekly 2 hour session, daily homework, and daylong retreat
- Sitting meditation, walking meditation, & yoga

Mindfulness-Based Stress Reduction (MBSR) vs. Cognitive Behavioral Therapy (CBT) vs. Usual Care for Chronic Low Back Pain

Follow-up Week	Usual Care	Mindfulness-Based Stress Reduction	Cognitive Behavioral Therapy	P Value for Omnibus ^c
Roland Disability Questionnaire Results				
4	27.3 (20.3-36.6)	34.5 (26.8-44.3)	24.7 (18.1-33.8)	.23
8	35.4 (27.6-45.2)	47.4 (38.9-57.6)	51.9 (43.6-61.7)	.04 ^d
26	44.1 (35.9-54.2)	60.5 (52.0-70.3)	57.7 (49.2-67.6)	.04 ^d
52	48.6 (40.3-58.6)	68.6 (60.3-78.1)	58.8 (50.6-68.4)	.01 ^d
Pain Bothersomeness Results				
4	20.6 (14.6-28.9)	19.1 (13.3-27.4)	21.7 (15.3-30.6)	.88
8	24.7 (18.1-33.6)	36.1 (28.3-46.0)	33.8 (26.5-43.2)	.15
26	26.6 (19.8-35.9)	43.6 (35.6-53.3)	44.9 (36.7-55.1)	.01 ^d
52	31.0 (23.8-40.3)	48.5 (40.3-58.3)	39.6 (31.7-49.5)	.02 ^d

Economic Evaluation of MBSR vs. CBT vs. Usual Care for Chronic LBP

301 patients

Society: Compared with Usual Care, mean incremental cost per participant to society of CBT was \$125 and MBSR -\$724

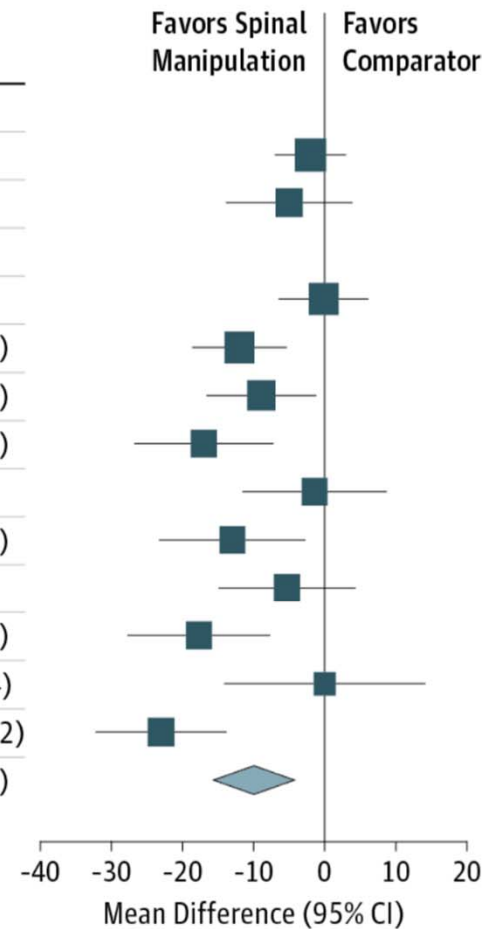
Payer: Incremental costs per participant to the health plan were \$495 for CBT over UC and -\$982 for MBSR

Participant: Incremental back-related costs per participant were \$984 for CBT over UC and -\$127 for MBSR. Statistically significant gains in QALYs over UC: 0.041 for CBT and 0.034 for MBSR



Spinal Manipulative Therapy for Acute Low Back Pain: Pain Intensity

Study	Quality Score	Outcome Measure	Spinal Manipulation		Comparator		Mean Difference (95% CI)
			Sample Size	Mean (95% CI)	Sample Size	Mean (95% CI)	
Comparison group, sham							
Hancock et al, ¹² 2007	9	ONRS	119	NR ^a	120	NR ^a	-2.00 (-7.00 to 3.00)
Hoiriis et al, ⁵⁰ 2004	3	VAS	34	17 (11 to 23)	40	22 (16 to 28)	-5.00 (-13.89 to 3.89)
Comparison group, all other therapies							
Skargren et al, ⁵¹ 1998	2	VAS	172	NR ^a	139	NR ^a	-0.16 (-6.47 to 6.15)
Cherkin et al, ¹⁶ 1998	6	ONRS	118	19 (16 to 22)	60	31 (25 to 37)	-12.00 (-18.65 to -5.35)
Grunnesjö et al, ³⁵ 2004	7	ONRS	89	21 (16 to 26)	71	30 (24 to 36)	-8.90 (-16.61 to -1.19)
Blomberg et al, ^{31, 34, 59-61} 1994	6	ONRS	53	17 (10 to 24)	48	34 (27 to 41)	-17.00 (-26.76 to -7.24)
Bergquist-Ullman et al, ³⁸ 1977	2	ONRS	50	30 (23 to 37)	44	31 (24 to 38)	-1.43 (-11.57 to 8.71)
Goertz et al, ¹⁰ 2013	7	NRS	45	39 (32 to 46)	46	52 (45 to 59)	-13.00 (-23.27 to -2.73)
Hoiriis et al, ⁵⁰ 2004	3	VAS	34	17 (11 to 23)	36	22 (15 to 29)	-5.30 (-14.94 to 4.34)
Cruser et al, ⁸ 2012	7	VAS	30	20 (15 to 25)	30	37 (28 to 46)	-17.70 (-27.74 to -7.66)
Farrell et al, ⁴⁸ 1982	3	ONRS	24	3 (-7 to 13)	24	3 (-7 to 13)	0 (-14.14 to 14.14)
Morton et al, ⁴⁶ 1999	3	VAS	15	2 (0 to 4)	14	25 (16 to 34)	-23.03 (-32.24 to -13.82)
Random-effects model							-9.95 (-15.63 to -4.27)



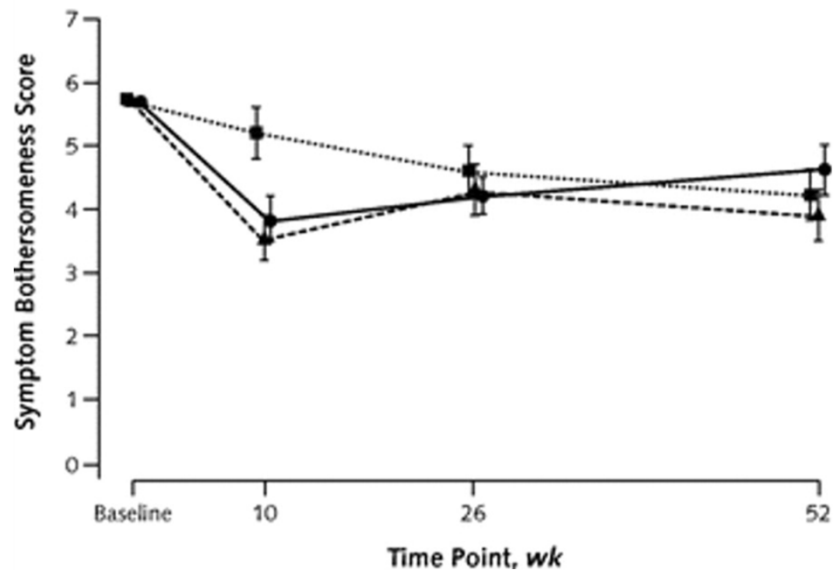
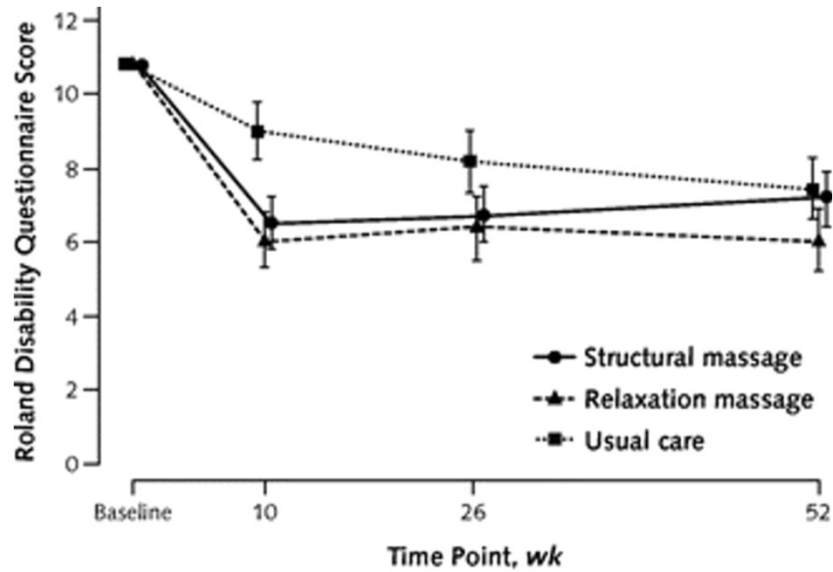
Massage Therapy



- 26 trials ($n = 3239$, range 15-579)
- Massage had better effects on short-term pain in 8 of 9 trials and function in 4 of 5 trials cf: to manipulation, exercise, relaxation therapy, acupuncture, PT, and TENS

Chou R et al. Nonpharmacologic therapies for low back pain: a systematic review for an American College of Physicians clinical practice guideline. *Ann Intern Med.* 2017; 166(7):493-505

Two Forms of Massage vs. Usual Care for Chronic LBP



Yoga



Postures
Asanas



Breathing
Pranayama

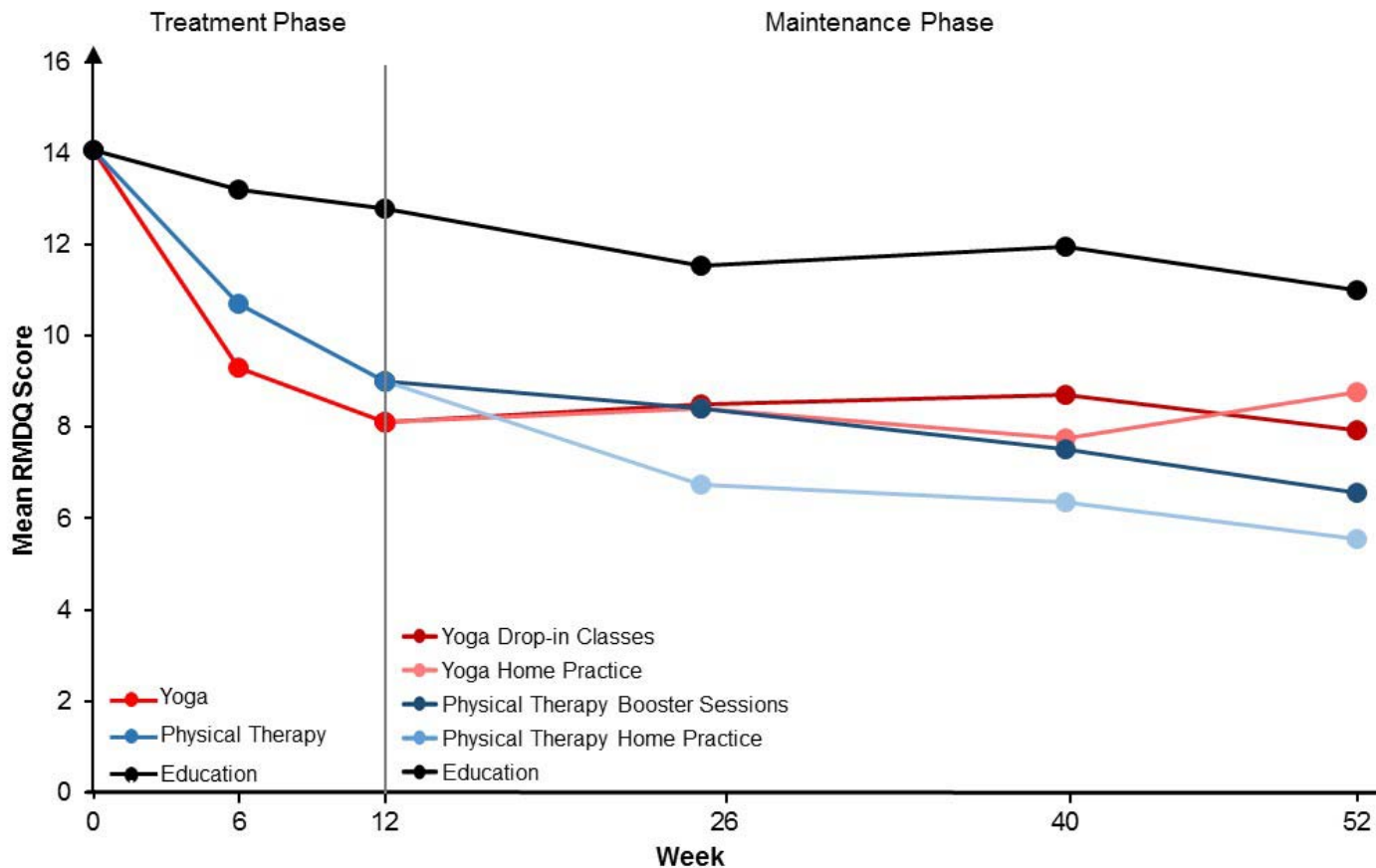


Meditation

Meta-analysis of Yoga for LBP

Follow-up duration	Outcomes	Number of trials (n)	Standardized mean difference (95% CI)
Short-term	Pain	6 (584)	-0.48 (-0.65 to -0.31)
	Back-specific disability	8 (689)	-0.59 (-0.87 to -0.30)
Long-term	Pain	5 (564)	-0.33 (-0.59 to -0.07)
	Back-specific disability	5 (574)	-0.35 (-0.55 to -0.15)

Yoga, PT, or Education for Chronic Low Back Pain: a randomized noninferiority trial



I felt good because I was doing something, not sitting around waiting for a diagnosis, not taking another pill. I was involved in my treatment.

It's going to have to be something that's part of my life... I'm looking at it as a medical treatment—it's not just a yoga class.

People can push those buttons as they used to, they can't make you angry, because now you have something that keeps you calm regardless.

ACP Recommendations

Qaseem et al, Ann Int Med 2017

Acute/subacute LBP

Use nonpharmacologic treatment first

- Heat
- Massage
- Acupuncture
- Spinal manipulation

If pharmacologic treatment desired,
select NSAIDS and/or muscle relaxants

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*

Description: The American College of Physicians (ACP) developed this guideline to present the evidence and provide clinical recommendations on noninvasive treatment of low back pain.

Methods: Using the ACP grading system, the committee based these recommendations on a systematic review of randomized, controlled trials and systematic reviews published through April 2015 on noninvasive pharmacologic and nonpharmacologic treatments for low back pain. Updated searches were performed through November 2016. Clinical outcomes evaluated included reduction or elimination of low back pain, improvement in back-specific and overall function, improvement in health-related quality of life, reduction in work disability and return to work, global improvement, number of back pain episodes or time between episodes, patient satisfaction, and adverse effects.

Target Audience and Patient Population: The target audience for this guideline includes all clinicians, and the target patient population includes adults with acute, subacute, or chronic low back pain.

Recommendation 1: Given that most patients with acute or subacute low back pain improve over time regardless of treatment, clinicians and patients should select nonpharmacologic treatment with superficial heat (moderate-quality evidence), massage, acupuncture, or spinal manipulation (low-quality evidence). If pharmacologic treatment is desired, clinicians and patients should select nonsteroidal anti-inflammatory drugs or skeletal

muscle relaxants (moderate-quality evidence). (Grade: strong recommendation)

Recommendation 2: For patients with chronic low back pain, clinicians and patients should initially select nonpharmacologic treatment with exercise, multidisciplinary rehabilitation, acupuncture, mindfulness-based stress reduction (moderate-quality evidence), tai chi, yoga, motor control exercise, progressive relaxation, electromyography biofeedback, low-level laser therapy, operant therapy, cognitive behavioral therapy, or spinal manipulation (low-quality evidence). (Grade: strong recommendation)

Recommendation 3: In patients with chronic low back pain who have had an inadequate response to nonpharmacologic therapy, clinicians and patients should consider pharmacologic treatment with nonsteroidal anti-inflammatory drugs as first-line therapy, or tramadol or duloxetine as second-line therapy. Clinicians should only consider opioids as an option in patients who have failed the aforementioned treatments and only if the potential benefits outweigh the risks for individual patients and after a discussion of known risks and realistic benefits with patients. (Grade: weak recommendation, moderate-quality evidence)

ACP Recommendations

Qaseem et al, Ann Int Med 2017

Chronic LBP

Use nonpharmacologic treatment first

- Exercise (self-care or PT)
- Spinal manipulation (Chiro or PT)
- Acupuncture
- Yoga
- MBSR
- CBT
- Tai chi

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Ann Intern Med. doi:10.7326/M16-2367

For author affiliations, see end of text.

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Annals.org

ACP Recommendations

Qaseem et al, Ann Int Med 2017

Chronic LBP (continued)

If inadequate response, consider pharmacologic treatment

1. NSAIDS
2. Tramadol or duloxetine
3. Opioids only for patients who have failed above, not at high risk for substance use disorder, potential benefits outweigh risks, and discussion with patient of known risks and realistic benefits.

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ACP Recommendations

- Reassure patients that acute or subacute LBP usually improves over time
- Advise patients to remain as active as tolerated
- Avoid prescribing costly and potentially harmful imaging and treatments
- Avoid ineffective treatments, such as acetaminophen, systemic steroids, TCAs and SSRIs
- Base treatment recommendations on patient preferences that also minimize harms and costs

Opioid Risk Tool (ORT)

Mark each box that applies		Female	Male
1.	Family Hx of substance abuse		
	Alcohol	<input type="checkbox"/> 1	<input type="checkbox"/> 3
	Illegal drugs	<input type="checkbox"/> 2	<input type="checkbox"/> 3
	Prescription drugs	<input type="checkbox"/> 4	<input type="checkbox"/> 4
2.	Personal Hx of substance abuse		
	Alcohol	<input type="checkbox"/> 3	<input type="checkbox"/> 3
	Illegal drugs	<input type="checkbox"/> 4	<input type="checkbox"/> 4
	Prescription drugs	<input type="checkbox"/> 5	<input type="checkbox"/> 5
3.	Age between 16 & 45 yrs	<input type="checkbox"/> 1	<input type="checkbox"/> 1
4.	Hx of preadolescent sexual abuse	<input type="checkbox"/> 3	<input type="checkbox"/> 0
5.	Psychologic disease		
	ADD, OCD, bipolar, schizophrenia	<input type="checkbox"/> 2	<input type="checkbox"/> 2
	Depression	<input type="checkbox"/> 1	<input type="checkbox"/> 1

Scoring Totals:

Scoring (risk)

0-3: low

4-7: moderate

≥8: high

The Stanford Five--Ask about each of these:

1. Patient's belief about **the cause of pain**
2. **Meaning of pain** - from patient's perspective
3. **Impact of pain on life** - from patient's perspective
4. Patient's **goals**
5. Patients perception of **appropriate treatment**

Counseling the Patient: Adopting a Helpful Lexicon

- Avoid medical jargon
- Use easily understood language
- Verbalize you have ruled out serious pathology
- Be calm, confident, positive and empathetic
 - Physician attitudes and beliefs correlate with patient attitudes, beliefs, and clinical outcomes.
- Emphasize pain does not mean they are doing more damage
- Encourage staying active

Final Comments

- Understand the impact of LBP on the patient
- A patho-anatomic model is helpful only in a small minority of cases
- Use risk stratification to guide treatment
- Imaging, opioids, specialty referrals should be the exception, not the rule
- Self-management, nonpharmacologic therapies, and nonopioid medications should be the mainstay of treatment

Thank you

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