

Evidence-Based Approach to Management of Chronic Low Back Pain

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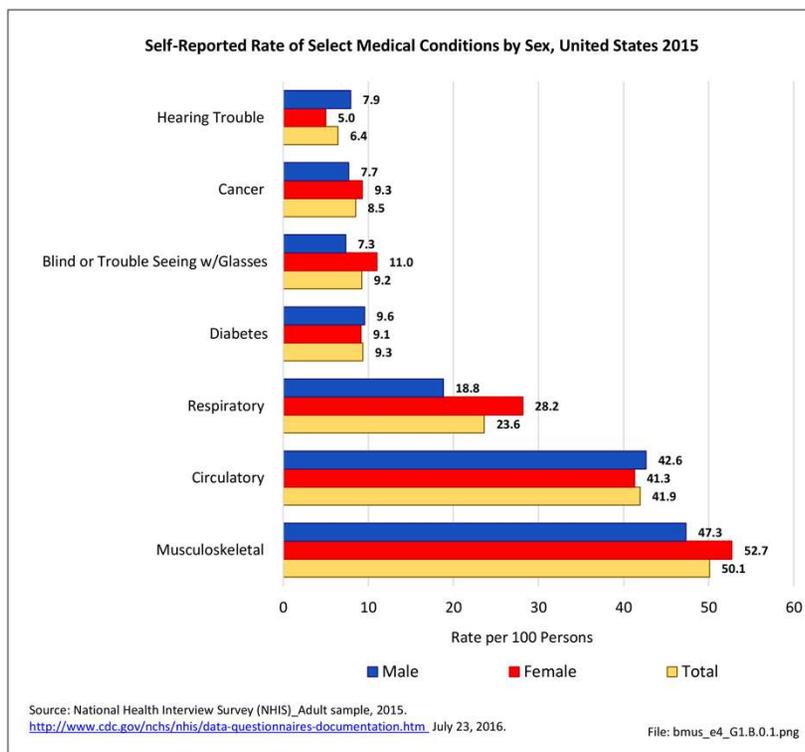
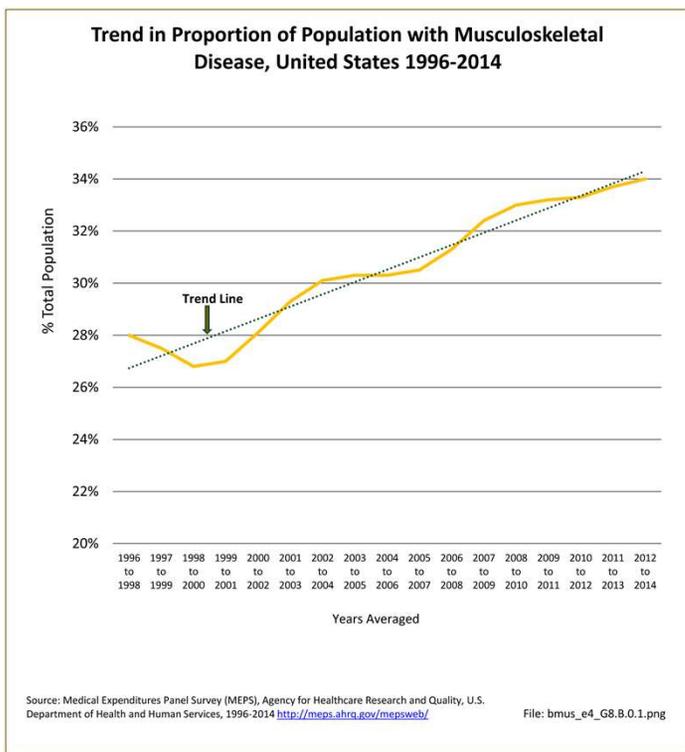
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Dr. Cohen has disclosed that he serves on an advisory board for Pfizer.

The remaining activity faculty or planners have no financial relationships to disclose.

Burden of Musculoskeletal (MSK) Conditions in U.S.



Burden of MSK Conditions in U.S.

Table 1. Total Estimated Spending and Aggregated Health Categories for 2016

Aggregated Health Category	Category Code	Health Care Spending, 2016 \$Billion (95% CI)	Estimate, % ^a												Government Administration and Net Cost of Insurance Programs
			Aggregated Age Group, y			Type of Payer			Type of Care						
			<20	20-64	≥65	Public Insurance	Private Insurance	Out-of-Pocket Payments	Ambulatory	Inpatient	Prescribed Pharmaceuticals	Nursing Care Facility	ED	Dental	
Musculoskeletal disorders	A	380.9 (360.0-405.4)	3.6	61.3	35.2	37.3	54.0	8.7	49.0	21.5	13.1	4.0	2.4	0	10.0
Diabetes, urogenital, blood, and endocrine diseases	B	309.1 (292.4-328.4)	4.5	57.5	38.0	45.8	47.0	7.1	35.5	18.6	25.7	4.9	5.4	0	10.0
Cardiovascular diseases	C	255.1 (233.4-282.6)	1.7	38.8	59.5	56.5	37.7	5.8	19.0	49.2	6.0	11.7	4.1	0	10.0

Table 2. Health Care Estimated Spending in 2016 for the 100 Most Expensive Health Conditions of the 154 Health Conditions Analyzed

Health Care Spending Rank (High to Low)	Health Condition	Category Code ^b	Health Care Spending, 2016 \$Billion (95% CI)	Estimate, % ^a												Government Administration and Net Cost of Insurance Programs
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3	Diabetes	B	111.2 (105.7-115.9)	2.5	57.4	40.1	49.8	44.2	6.0	27.1	8.6	46.3	5.8	2.1	0	10.1
4	Ischemic heart disease	C	89.3 (81.1-95.5)	0.4	42.7	56.9	54.0	42.4	3.5	23.8	49.5	7.5	3.8	5.1	0	10.3
5	Falls	F	87.4 (75-100.1)	5.2	38.4	56.4	46.7	39.7	13.6	27.7	31.1	1.1	21.1	9.7	0	9.2

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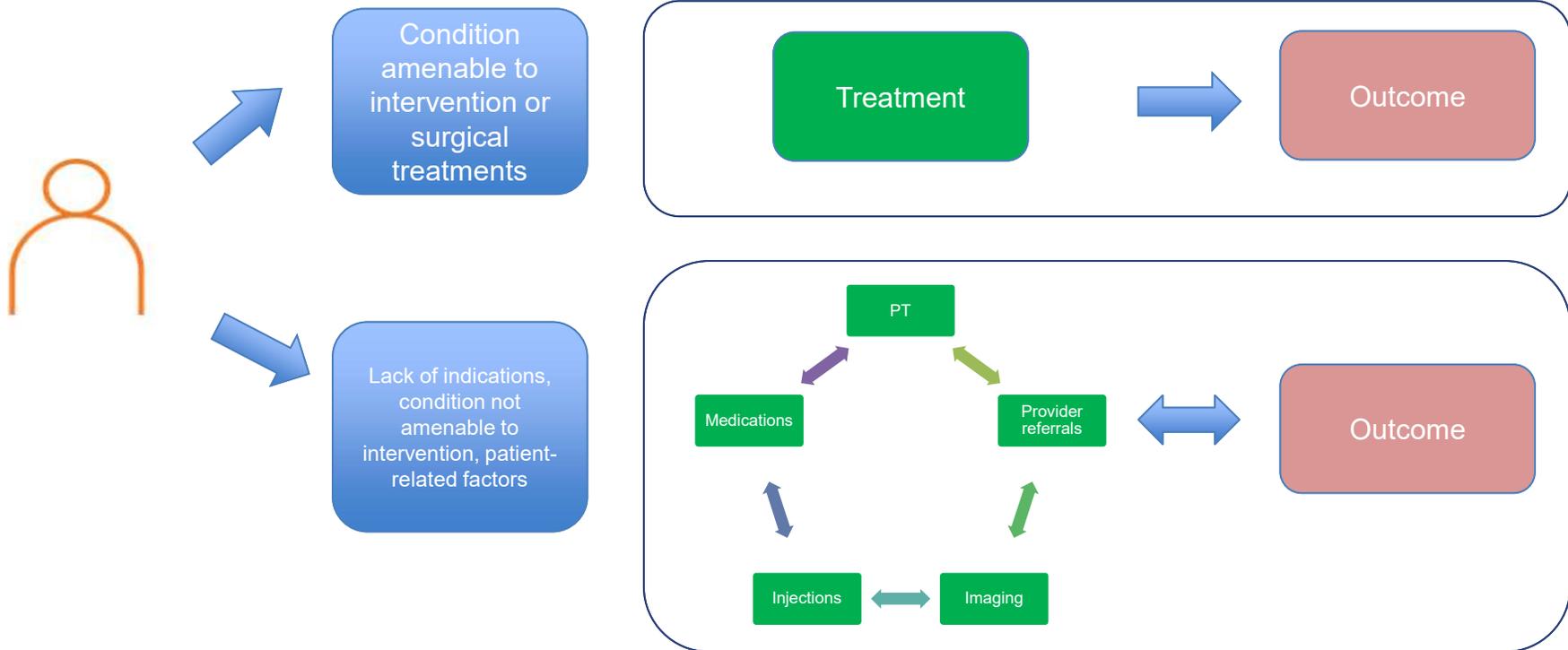
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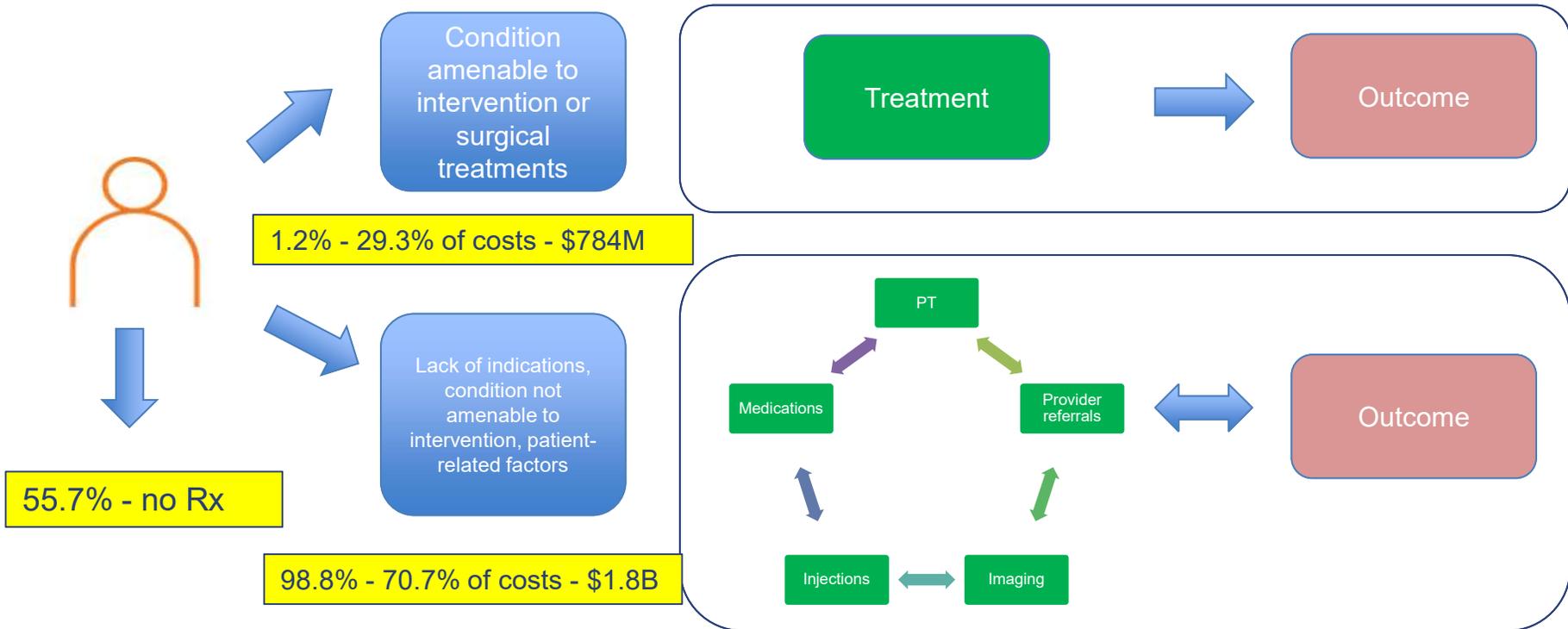
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Current State of MSK Care



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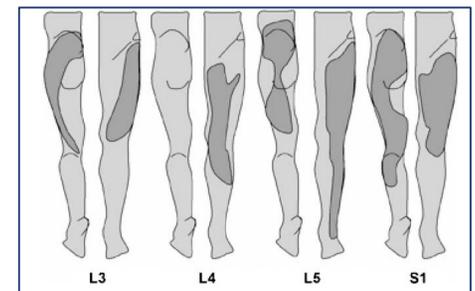
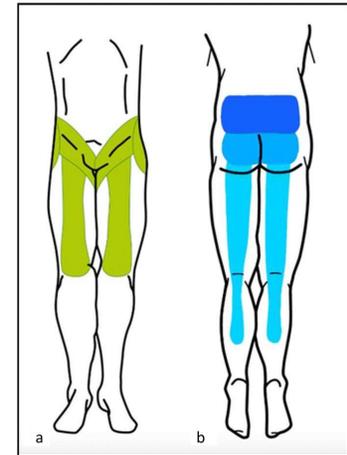
Table 2 Mean 12-Month Costs Based on Guideline Adherence Among 2 467 389 Patients Who Did Not Receive Surgery

Service Use Discouraged by Guidelines	Patients, No. (%)		Unadjusted Mean 12-mo Cost per Patient, \$			Regression-Adjusted Mean 12-mo Cost per Patient, \$		
	Adherent ^a	Nonadherent ^a	Adherent ^a	Nonadherent ^a	P Value	Adherent ^a	Nonadherent ^a	P Value
Imaging within 30 d of diagnosis								
Any imaging	1 671 419 (67.7)	795 970 (32.3)	561 (1803)	1204 (2546)	<.001	566 (1.6)	1194 (2.3)	<.001
Lumbar computed tomography	2 450 225 (99.3)	17 164 (0.7)	758 (2064)	2300 (4412)	<.001	758 (1.3)	2244 (16.0)	<.001
Lumbar magnetic resonance imaging	2 267 341 (91.9)	200 048 (8.1)	624 (1835)	2413 (3597)	<.001	625 (1.4)	2399 (4.6)	<.001
Lumbar radiograph	1 808 694 (73.3)	658 695 (26.7)	683 (2027)	1004 (2249)	<.001	687 (1.6)	992 (2.6)	<.001
Imaging without or before physical therapy								
Any imaging	1 597 129 (64.7)	870 260 (35.3)	505 (1623)	1253 (2689)	<.001	509 (1.6)	1245 (2.2)	<.001
Lumbar computed tomography	2 444 400 (99.1)	22 989 (0.9)	750 (2006)	2803 (6199)	<.001	750 (1.3)	2751 (13.8)	<.001
Lumbar magnetic resonance imaging	2 201 890 (89.2)	265 499 (10.8)	563 (1693)	2472 (3700)	<.001	565 (1.4)	2463 (3.9)	<.001
Lumbar radiograph	1 751 666 (71.0)	715 723 (29.0)	649 (1884)	1063 (2509)	<.001	653 (1.6)	1052 (2.5)	<.001
Imaging within 30 d of diagnosis or imaging without or before physical therapy	Neither: 1 611 983 (64.5)	Either: 886 025 (35.5)	Neither: 964 (5587)	Either: 1272 (2713)	<.001	980 (3.8)	1244 (5.1)	<.001

^a Patients whose treatment was adherent did not receive the services listed; those whose treatment was nonadherent did receive the services.

Low back pain challenges

- Complex spectrum of pain and sources
 - Symptoms NOT disease
 - Low specificity of diagnostic imaging
 - Referred vs. radicular patterns
 - Complex interactions between biopsychosocial factors
 - Perpetuated by patient and HC provider



Low back pain challenges

- Clinical practice guidelines gaps exist
 - Target Trial - 4 sites in US – 77 primary care practices
 - 32% transitioned to CLBP
 - Obesity, baseline pain, anxiety/depression
 - Exposed to non-concordant pathways 2.16x more likely

Key Points

Question Is the transition from acute to chronic low back pain (LBP) associated with risk strata, defined by a standardized prognostic tool, and/or with early exposure to guideline nonconcordant care?

Findings In this cohort study of 5233 patients with acute LBP from 77 primary care practices, nearly half the patients were exposed to at least 1 guideline nonconcordant recommendation within the first 21 days after the index visit. Patients were significantly more likely to transition to chronic LBP as their risk on the prognostic tool increased and as they were exposed to more nonconcordant recommendations.

Meaning In this study, the transition rate to chronic LBP was substantial and increased correspondingly with risk strata and early exposure to guideline nonconcordant care.

Diagnostic work up and pain generator?



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Can we use pain description to identify source?

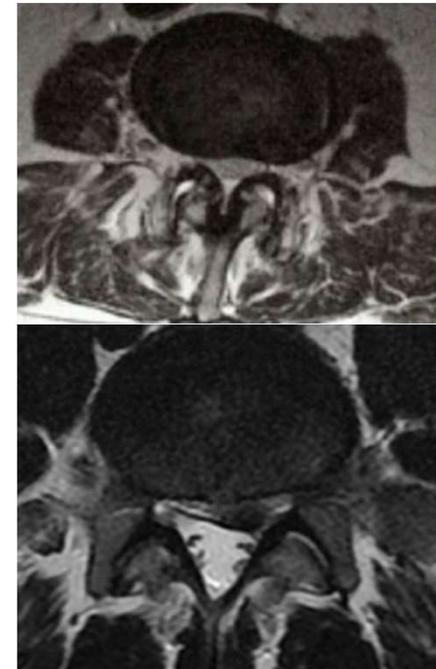
Discogenic



Facetogenic / Myofascial



Claudication/Radiculopathy

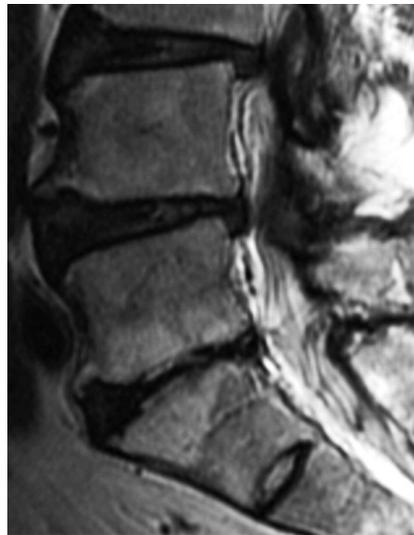


Can we identify pain source to guide treatment?

Sacroiliac joint



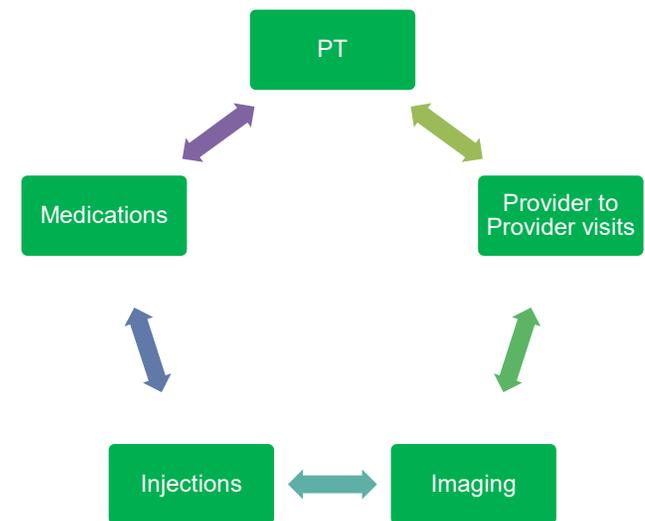
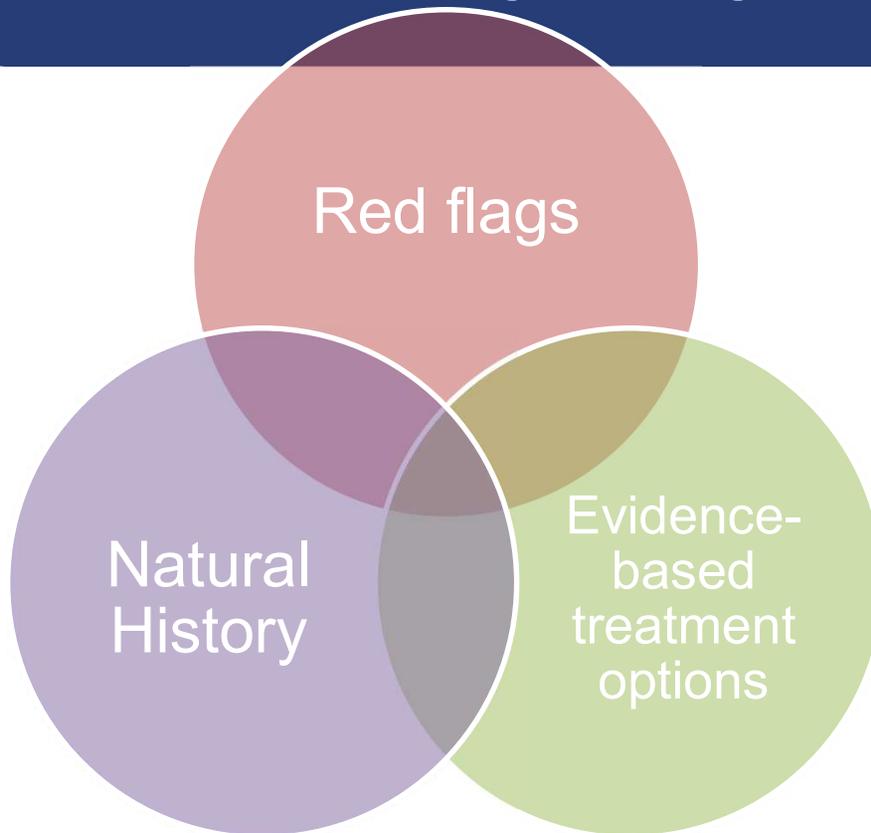
Vertebrogenic



Non-Specific

- ❖ Multifocal and widespread
- ❖ Fatigue, sleep, mood alterations
- ❖ Misinterpretation of symptoms
- ❖ Fear and anticipation

Principles for guiding treatments



Evidence-based approach to care

- Applying principles
 - Screening
 - “Red flags” → Surgical referral
 - Risk assessment for chronicity

Red Flag associated conditions

- Cancer
- Unexplained weight loss
- Immunosuppression
- IVDA
- Urinary tract infection
- Fever
- Significant trauma relative to age
- Bladder/ Bowel incontinence
- Urinary retention (overflow incontinence)

Red Flag examination findings

- Saddle anesthesia
- Loss of anal sphincter tone
- Major motor weakness
- Progressive neurologic findings

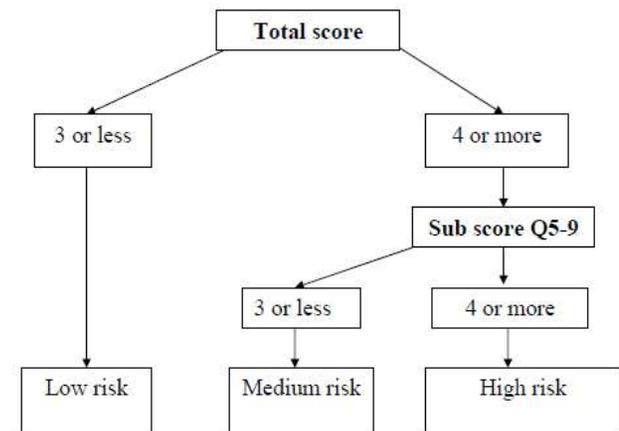
Principles for guiding treatments



Satisfaction & Outcome Acquisition Program

Score	Category	Prognosis/Characteristics	Approach
3 or less	Low Risk 40% (26-42)	<ul style="list-style-type: none"> • Low risk of chronicity • Favorable prognosis • Able to maintain most usual daily activities • Can manage pain pretty well on their own 	<ul style="list-style-type: none"> • Reassurance • Self-management • Advice sheet • Brief educational video
4 or more with distress score of 3 or less	Medium Risk (40%) (25-48)	<ul style="list-style-type: none"> • Physical obstacles to recovery • Less favorable prognosis/moderate risk of chronicity • Likely experiencing noticeable challenges in ADLs • Optimal recovery achieved using treatments that control pain and/or target physical limitations (manipulation, exercise, OTC) 	<ul style="list-style-type: none"> • Low risk treatment AND • Exercises • Manual therapy • Return to work advice • Medication compliance
4 or more with distress score of 4 or more	High Risk 20% (8-27)	<ul style="list-style-type: none"> • Psychological obstacles to recovery • Unfavorable prognosis for normal recovery • Combination of physical challenges AND negative psychological response • Treatments target combination of physical and behavioral approaches 	<ul style="list-style-type: none"> • Medium risk treatment AND • Cognitive behavioral treatment (CBT) approach: – to reduce disability and pain, improve psychological functioning (coping skills) to manage ongoing/future episodes

The STarT Back Tool Scoring System



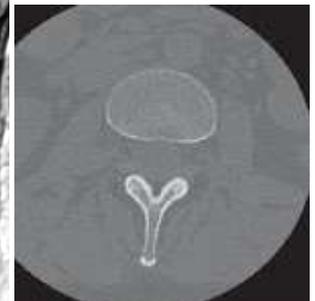
Evidence-based approach to care

- Applying principles
 - Communication with patient
 - 90% recover within 6 weeks
 - Pain mitigation within 1-2 weeks with residual 1-3 months
 - Recurrence common
 - Symptom validation
 - Reassurance
 - Non-pharmacologic approach
 - Referral management
 - Physiatry vs. surgery

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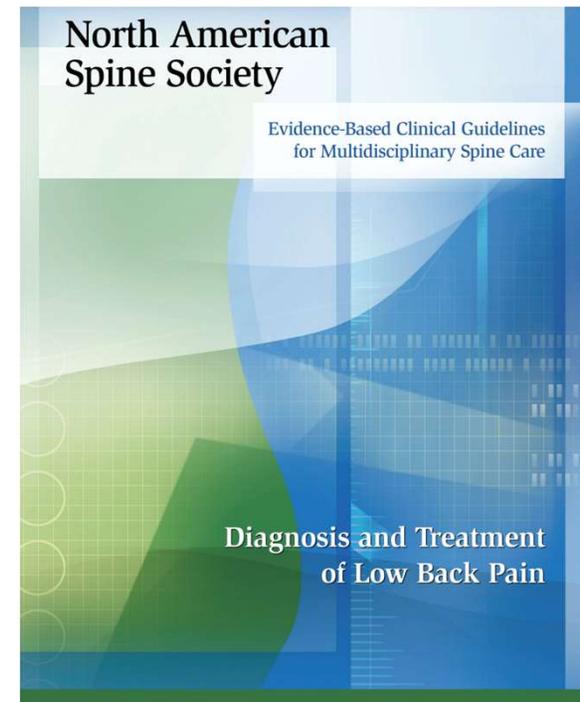
- Applying principles
 - Diagnostic imaging studies
 - False positives
 - >6 weeks – plain radiographs
 - Advanced imaging



Evidence-based approach to care

Treatment options

- Patient education/self directed exercise
- Medications
- Physical agents (heat/cold, US, TENS)
- Traction, dry needling, estim
- Acupuncture
- Bracing
- Physical therapy
- Spinal manipulation
- Interventional pain procedures
- Surgery



Clinical Practice Guidelines

Summary of the American College of Physicians Guideline on Noninvasive Treatments for Acute, Subacute, or Chronic Low Back Pain

Disease/Condition	Low back pain
Target Audience	All clinicians
Target Patient Population	Adults with acute, subacute, or chronic low back pain
Interventions Evaluated	<p>Pharmacologic interventions: NSAIDs, nonopioid analgesics, opioid analgesics, tramadol and tapentadol, antidepressants, SMRs, benzodiazepines, corticosteroids, antiepileptic drugs</p> <p>Nonpharmacologic interventions: interdisciplinary or multicomponent rehabilitation; psychological therapies; exercise and related interventions, such as yoga or tai chi; complementary and alternative medicine therapies, including spinal manipulation, acupuncture, and massage; passive physical modalities, such as heat, cold, ultrasound, transcutaneous electrical nerve stimulation, electrical muscle stimulation, interferential therapy, short-wave diathermy, traction, LLLT, lumbar supports/braces</p>
Outcomes Evaluated	Pain, function, health-related quality of life, work disability/return to work, global improvement, number of back pain episodes or time between episodes, patient satisfaction, adverse effects

- Low Back Pain Work Group of the North American Spine Society's Evidence-Based Guideline Development Committee (2020)
- U.S. Department of Veterans Affairs and the U.S. Department of Defense (2019)
- American College of Physicians CPG (2017)

Clinical Practice Guidelines

Recommendations	<p><i>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)</i></p> <p><i>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)</i></p> <p><i>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)</i></p>
High-Value Care	<p>Clinicians should reassure patients that acute or subacute low back pain usually improves over time regardless of treatment and should avoid prescribing costly and potentially harmful treatments. Systemic steroids were not shown to provide benefit and should not be prescribed for patients with acute or subacute low back pain, even with radicular symptoms. For treatment of chronic low back pain, clinicians should select therapies that have the fewest harms and lowest costs. Clinicians should avoid prescribing costly therapies and those with substantial potential harms, such as long-term opioids, and pharmacologic therapies that were not shown to be effective, such as tricyclic antidepressants and selective serotonin reuptake inhibitors.</p>

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Evidence-based approach to care

Interventional Treatment

Interventional Question 1. In patients with low back pain, do fluoroscopically-guided epidural steroid injections decrease the duration of pain, decrease the intensity of pain, increase the functional outcomes of treatment and improve the return-to-work rate?

There is insufficient evidence to make a recommendation for or against the use of caudal epidural steroid injections in patients with low back pain.

Grade of Recommendation: I

There is insufficient evidence to make a recommendation for or against the use of interlaminar epidural steroid injections in patients with low back pain.

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Interventional Question 2. When evaluating fluoroscopically-guided intra-articular lumbar facet joint injections in patients with acute or chronic low back pain:

There is insufficient evidence to make a recommendation for or against the use of patient-reported reproduction of pain during a zygapophyseal joint injection as a predictor of response to dual diagnostic blocks.

Grade of Recommendation: I

a. What is the diagnostic utility of this procedure?

b. From a therapeutic standpoint, does this procedure decrease the duration of pain, decrease the intensity of pain, increase the functional outcomes of treatment and improve the return-to-work rate?

In patients selected for facet joint procedures using diagnostic criteria of physical exam and a response to a single diagnostic intra-articular injection with 50% relief, it is suggested that intra-articular injection of steroids provides no clinically meaningful improvement at 6 months.

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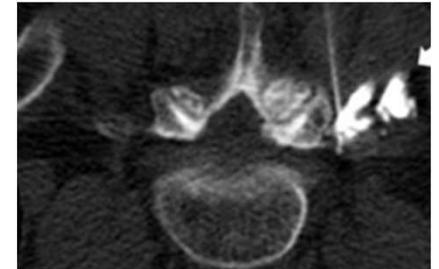
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Evidence-based approach to care

Surgical treatment

- Radiculopathy
 - Herniated disc, foraminal stenosis, etc.
 - 8-12 weeks
 - Recalcitrant pain
 - Progressive motor deficit
- Neurogenic claudication (spinal stenosis)
- *Anatomical cause of CLBP*
 - *Instability, scoliosis, kyphosis*
- *Non-specific CLBP*



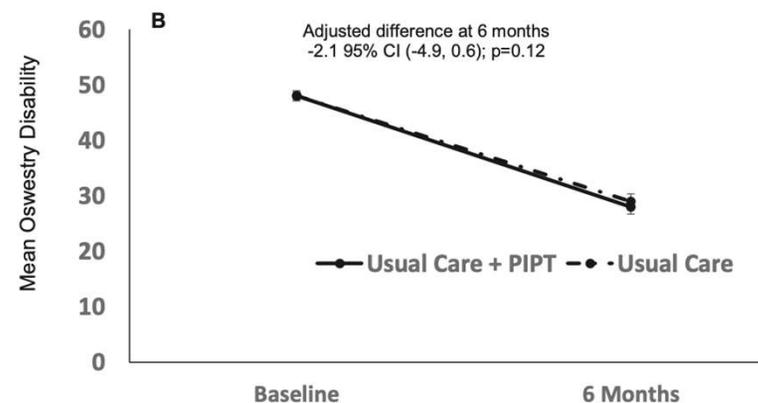
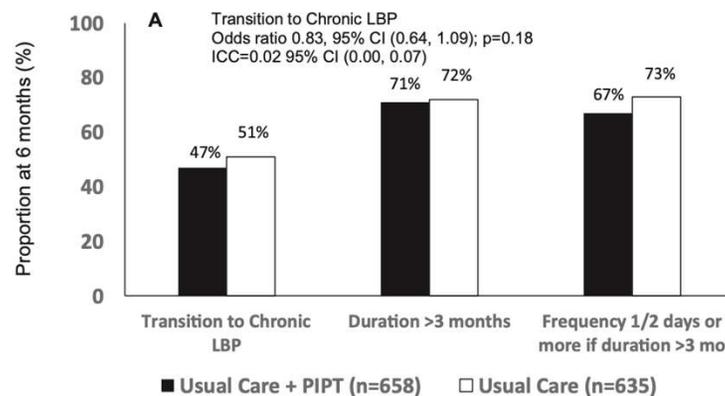
Behavioral Approaches to CLBP

- Biopsychosocial framework
 - Goals of improving function, decrease pain catastrophizing, coping skills
 - Pain reprocessing theory
 - Cognitive behavioral interventional therapy
 - Acceptance and commitment theory
 - Mindfulness-based treatments
 - Exposure therapy
 - Pain neuroscience education
 - Emotion-focused treatments
 - Combined with focus on risk factors
 - Weight and nutritional management, smoking cessation, sleep optimization

Physical therapists delivering CB interventions?

➤ Target Trial

- Four centers in US - Risk of transition from acute to CLBP
- STarTBack screening tool
 - High-risk patients - psychologically-informed PT (PIPT) vs. usual care



Physical therapists delivering CB interventions?

Table 2. Summary of findings table.

Physiotherapist-led cognitive-behavioural interventions for low back pain conditions

Population: Patients with low back pain

Settings: Community- or hospital-based outpatient physiotherapy settings

Intervention: Physiotherapist-led cognitive-behavioural interventions

Comparison: Guideline-based conservative non-pharmacological interventions

Outcome	Standardised mean difference (95% CI)	Participants (studies)	Quality of evidence (GRADE)
Short term (≤ 3 -week post-randomisation)			
Pain	SMD -0.26 ($-0.41, -0.11$)	766 (2)	+++ Moderate ^a
Disability	SMD -0.14 ($-0.29, 0.01$)	738 (2)	+++ Moderate ^a
Quality of life	SMD -0.10 ($-0.26, 0.05$)	693 (2)	+++ Moderate ^a
Long term (≥ 52 -week post-randomisation)			
Pain	SMD -0.21 ($-0.33, -0.09$)	1179 (4)	+++ High
Disability	SMD -0.19 ($-0.32, -0.07$)	1089 (4)	+++ High
Quality of life	SMD -0.06 ($-0.18, 0.07$)	1128 (4)	+++ Moderate ^b

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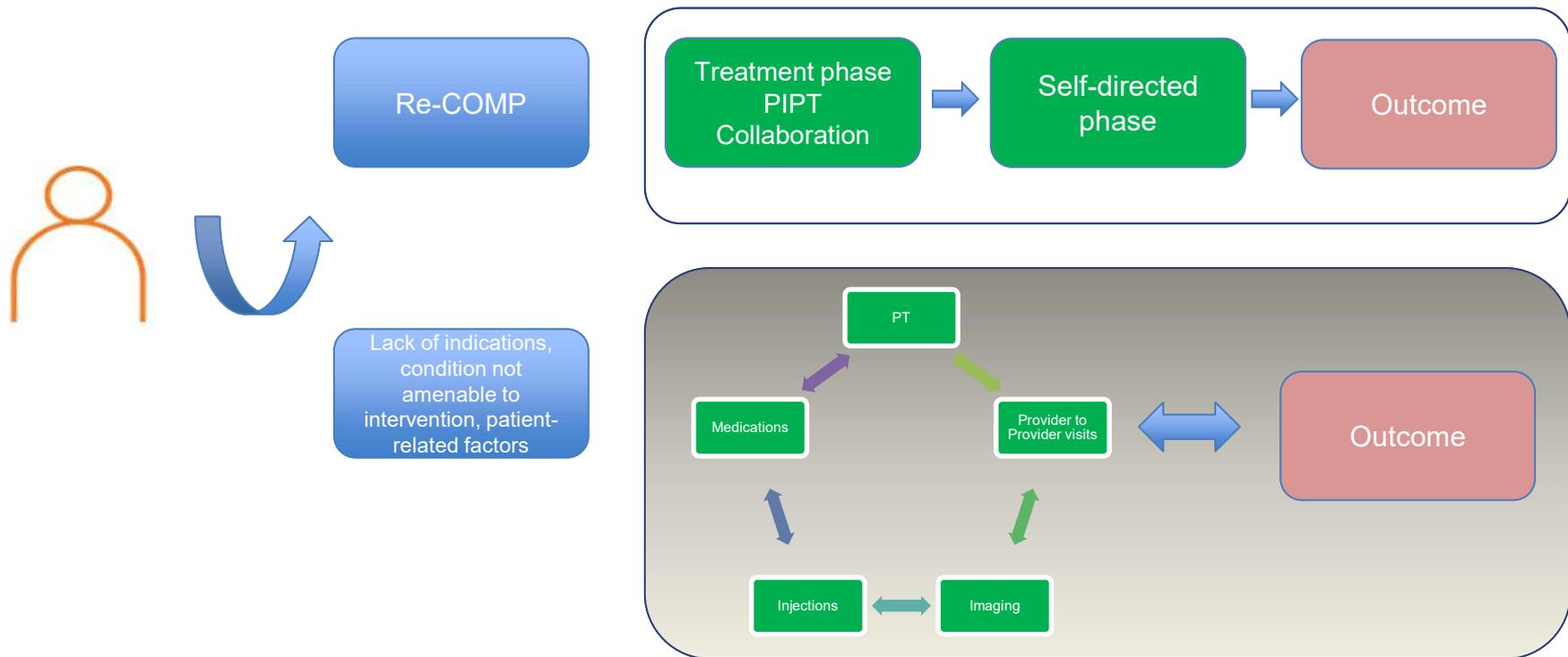
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Alternative Pathway for MSK Care



Summary

Acute Low Back Pain

- ✓ Risk assessment
- ✓ Education
- ✓ NSAIDs
- ✓ Modalities
- ✓ Spinal manipulation
- ✓ Time
- ✓ Pilates, Yoga, Tai Chi
- ✓ Physical therapy

Subacute/ Chronic Low Back Pain

- ✓ Education
- ✓ NSAIDs
- ✓ Duloxetine
- ✓ Modalities
- ✓ Multidisciplinary rehab
- ✓ CBT / mindfulness

Radiculopathy

- ✓ Education
- ✓ NSAIDs
- ✓ Consider interventional approaches
- ✓ Time
- ✓ Physical therapy
- ✓ Surgery

Spinal stenosis

- ✓ Education
- ✓ NSAIDs
- ✓ Time
- ✓ Physical therapy
- ✓ Surgery