

Evidence-Based Approach to Management of Acute and Chronic Low Back Pain

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Agenda

- 1 Welcome and Goals of Presentation
- 2 Burden of Spine Care
- 3 Understanding Pain and Sources
- 4 Clinical Approaches to Managing LBP and Current Innovative Models
- 5 Closing Remarks and Questions

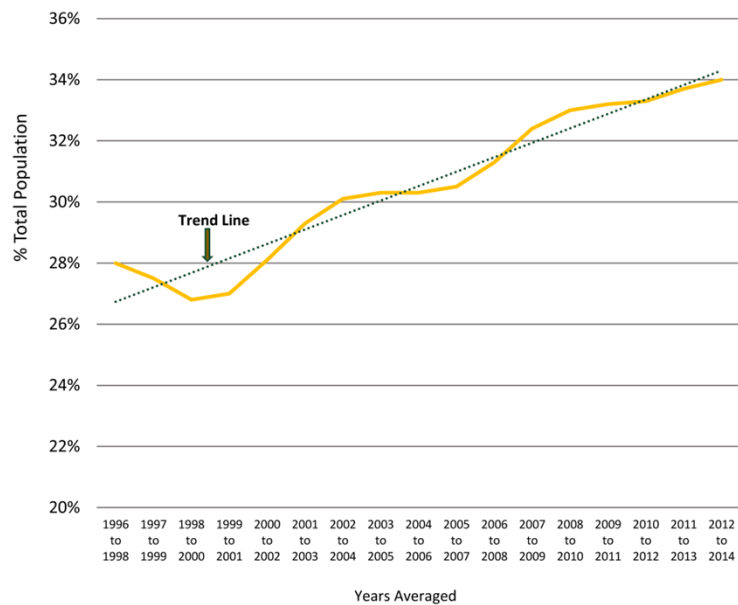
Goals

- Describe the economic impact, natural history and challenges of caring for acute and chronic low back pain.
- Evaluate diagnostic approaches and value-based multidisciplinary care pathways for patients with low back pain.
- Apply evidence-based pharmacologic and nonpharmacologic treatment strategies to support individualized management of acute and chronic low back pain

Burden of Musculoskeletal Care

Burden of MSK Care

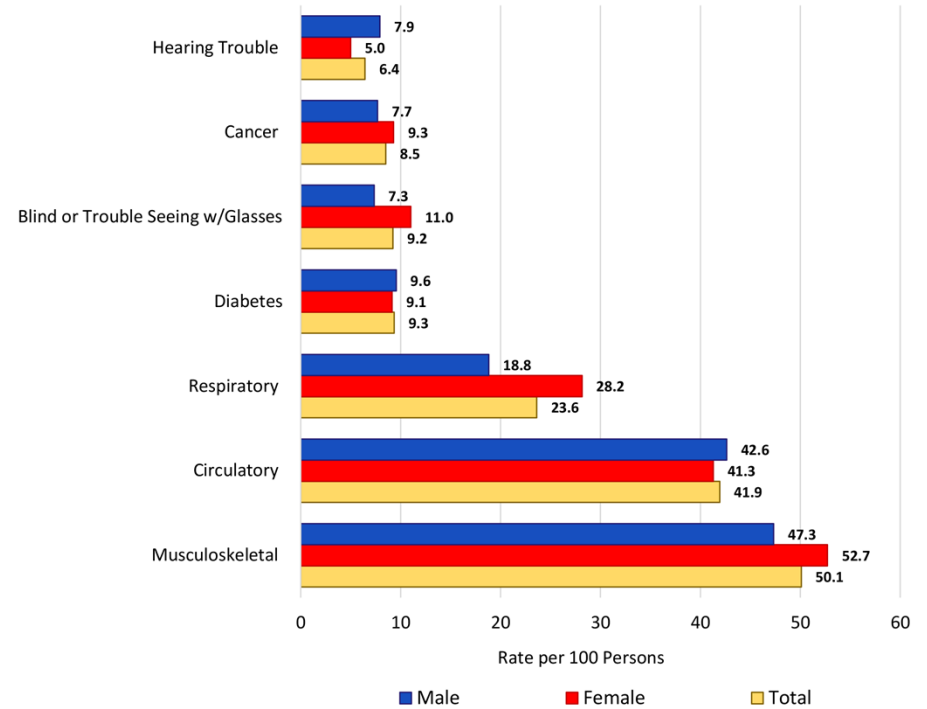
Trend in Proportion of Population with Musculoskeletal Disease, United States 1996-2014



Source: Medical Expenditures Panel Survey (MEPS), Agency for Healthcare Research and Quality, U.S. Department of Health and Human Services, 1996-2014 <http://meps.ahrq.gov/mepsweb/>

File: bmus_e4_G8.B.0.1.png

Self-Reported Rate of Select Medical Conditions by Sex, United States 2015



Source: National Health Interview Survey (NHIS)_Adult sample, 2015.

<http://www.cdc.gov/nchs/nhis/data-questionnaires-documentation.htm> July 23, 2016.

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Spend on MSK Conditions in US

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

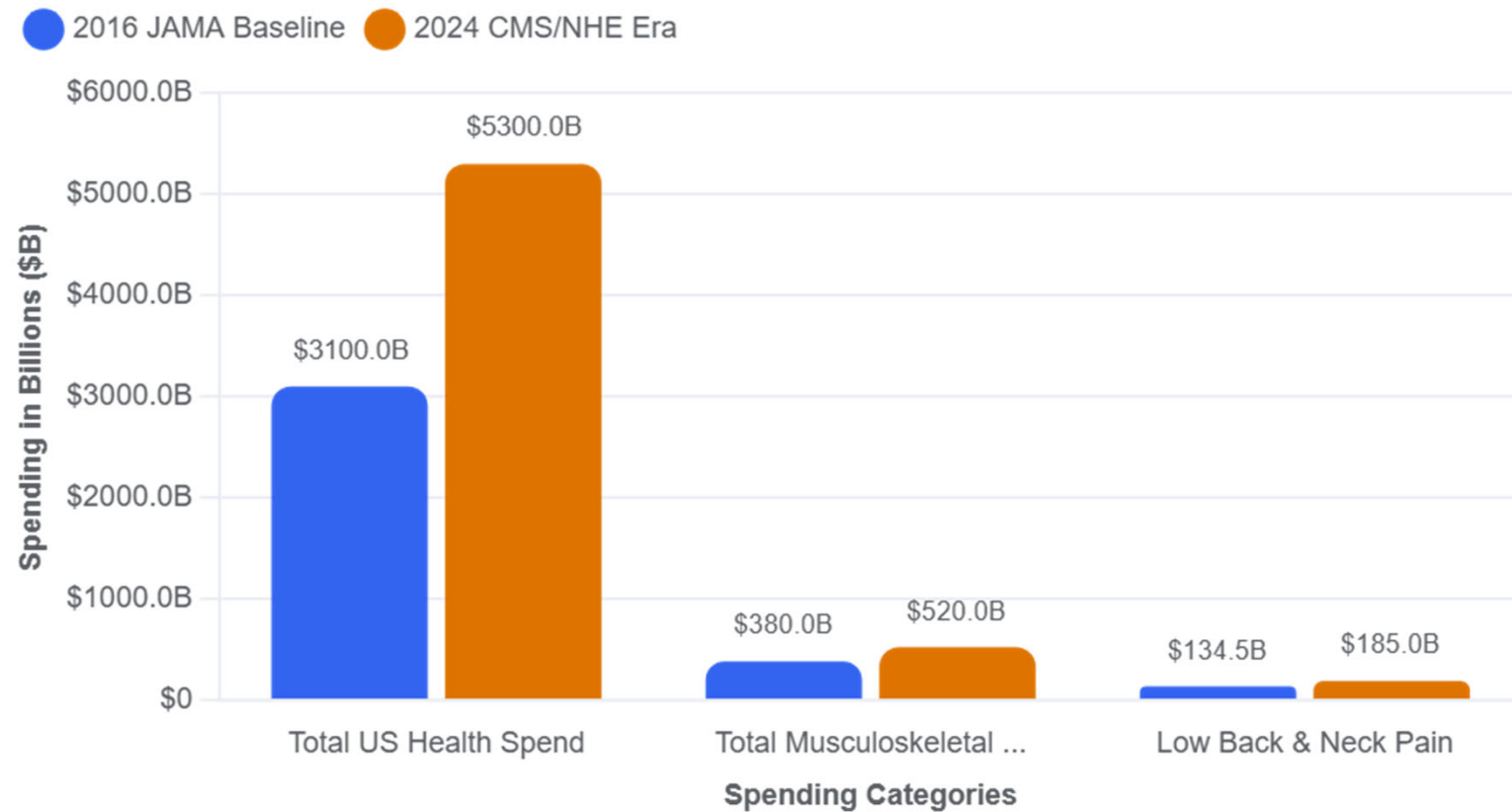
			Estimate, % ^a												Government Administration and Net Cost of Insurance Programs
Aggregated Health Category	Category Code	Health Care Spending, 2016 \$Billion (95% CI)	Aggregated Age Group, y			Type of Payer			Type of Care						
			<20	20-64	≥65	Public Insurance	Private Insurance	Out-of-Pocket 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	3.1	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
				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	
1	Low back and neck pain	A	134.5 (122.4-146.9)	1.9	67.9	30.3	33.7	57.2	9.2	58.7	22.4	3.5	1.4	3.9	0	10.0
2	Other musculoskeletal disorders ^c	A	129.8 (116.3-149.7)	3.9	60.7	35.4	36.2	56.4	7.5	64.5	8.6	8.7	5.5	2.5	0	10.2
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

JAMA. 2020;323(9):863-884

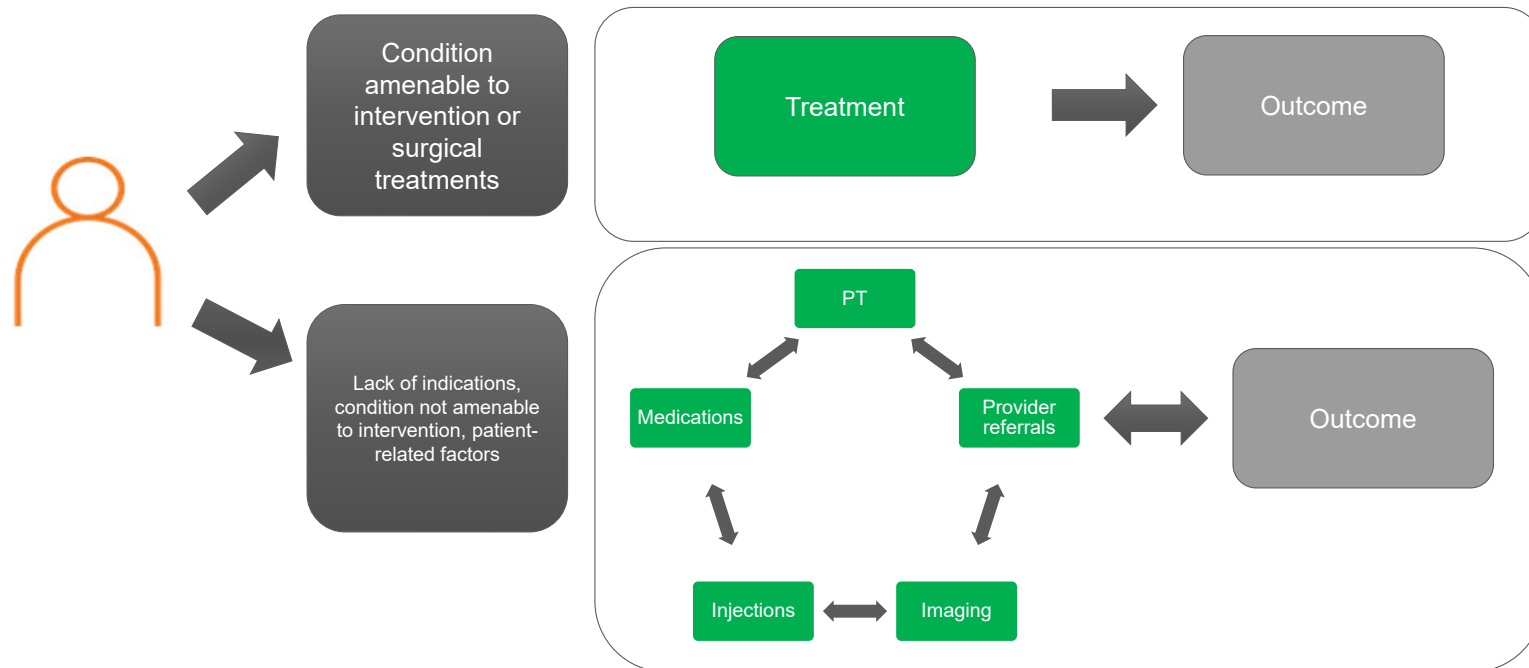
Spend on MSK Conditions in US



Unique Features of MSK and Specifically Low Back Care

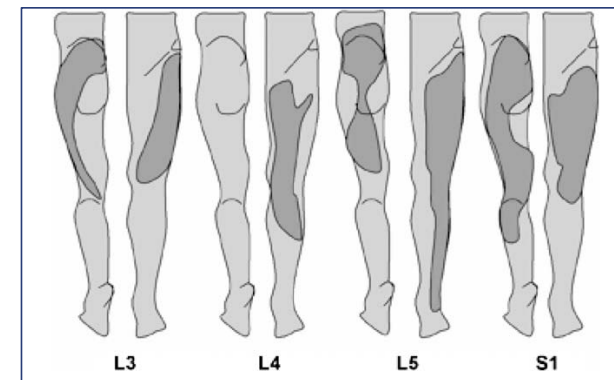
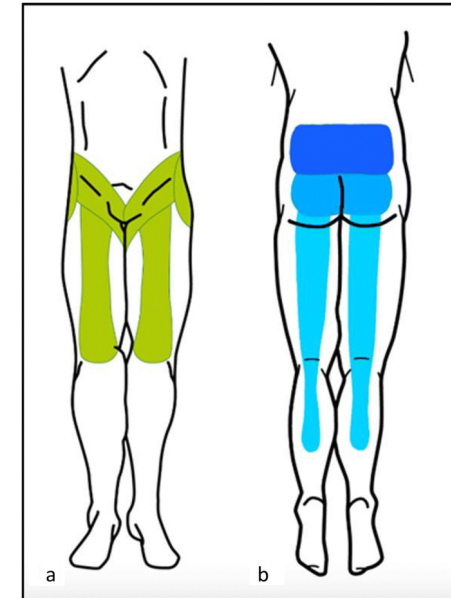
- ~85% of persons with MSK condition $\geq$ 1 ambulatory care visit
 - avg. $\geq$ 6 visits /year
- 2/3 MSK patients exhibit psychosocial distress
- 30% undergo low value treatments and referrals
- Complexity in providing effective, coordinated evidenced-based nonoperative treatment
 - Payment system not aligned with clinical care model

Prevalence and Variability of Low Back Pain Care



Why is LBP so Challenging to Manage?

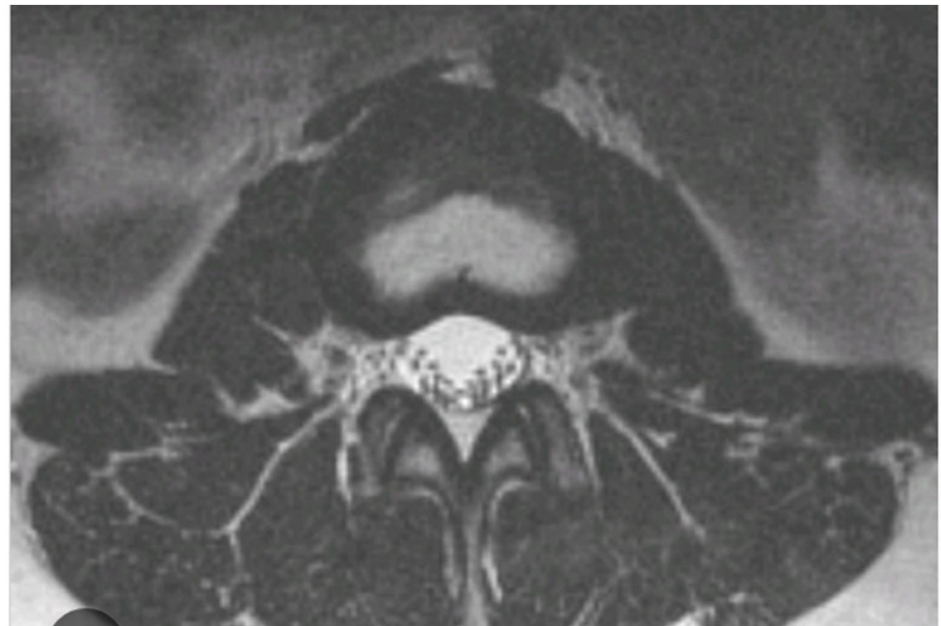
- Complex spectrum of pain and sources
 - Symptoms NOT disease
- Low specificity of diagnostic imaging
- Referred vs. radicular patterns
- Complex interactions between biopsychosocial factors
- Misperception is propagated by patient and HC provider
- Clinical practice guidelines gaps exist



(<https://www.bouncerehab.com.au/post/referred-pain-where-is-it>)

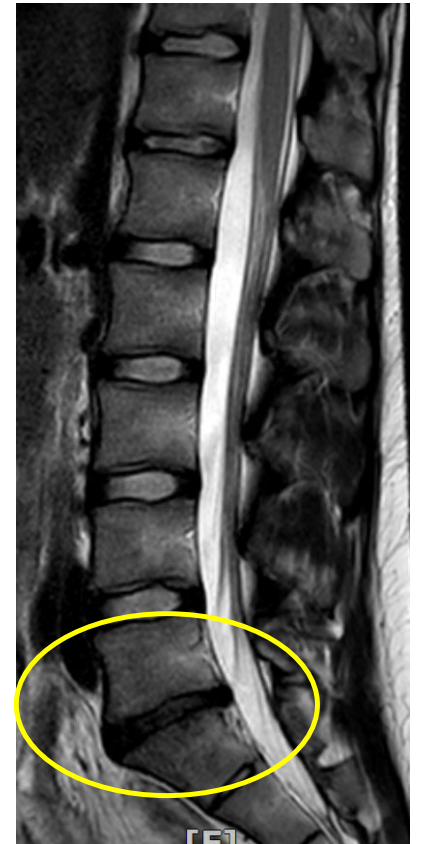
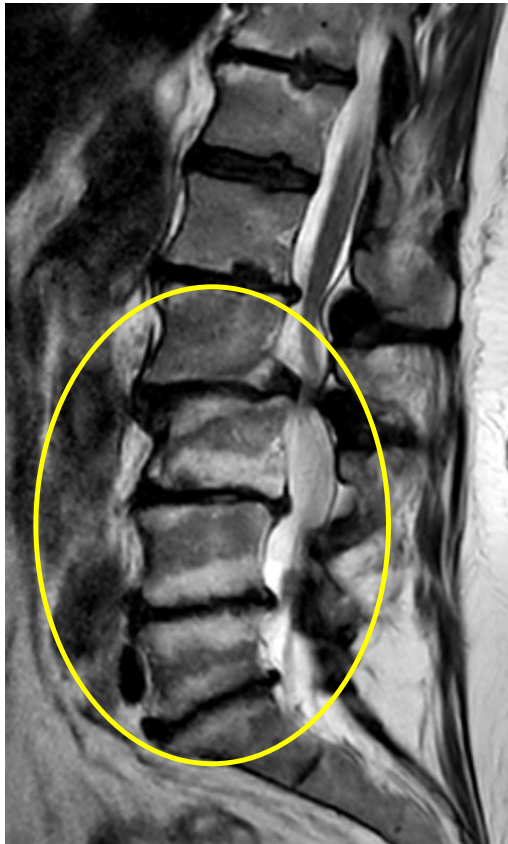
Basic Understanding of Pain

Interpreting Anatomy



Source: Author's de-identified teaching file

Interpreting Anatomy and Pain Generators



Source: Author's de-identified teaching file

Pain Description and Generator

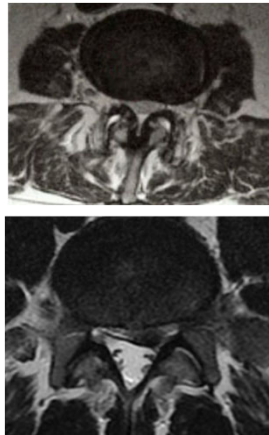
Discogenic



Facetogenic /
Myofascial



Claudication/Radiculopathy



Sacroiliac joint



Non-Specific LBP



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

Mechanisms, Clinical Features, Diagnosis, and Implications for MSK Pain

Nociceptive vs Neuropathic vs Nociplastic Pain

Three mechanistic constructs used to characterize pain

- **Nociceptive**: pain arising from actual or threatened non-neural tissue damage.
 - Examples: osteoarthritis, inflammatory arthritis, fracture, muscle/tendon injury, postoperative tissue injury.
- **Neuropathic**: pain caused by a lesion or disease of the somatosensory nervous system.
 - Examples: radiculopathy, diabetic neuropathy, postherpetic neuralgia, traumatic nerve injury.
- **Nociplastic**: pain arising from altered nociception without clear tissue injury or a qualifying nerve lesion/disease that adequately explains the pain.
 - Examples: fibromyalgia and selected chronic primary musculoskeletal pain presentations.

Clinical reality

- Mixed-mechanism pain is common, particularly in chronic spine and MSK disorders.

Nociplastic Pain: Altered Pain Processing

Potential features include increased central excitability, impaired endogenous pain inhibition, altered sensory integration, and changes in descending modulation.

Clinical clues may include:

- Pain disproportionate to identifiable pathology.
- Widespread or multifocal pain and/or sensory hypersensitivity.
- Pain that becomes less tightly coupled to movement or tissue loading.
- Fatigue, sleep disturbance, cognitive symptoms, or heightened sensitivity may coexist—but are not required.

Nociplastic pain is real neurobiological pain without a specific identifiable cause

- Not synonymous with psychogenic pain, malingering, or pain 'all in the head.'

Treatment Implications

- Nociceptive-predominant: **treat the tissue driver**
 - Graded activity/rehabilitation, anti-inflammatory strategies when appropriate, and condition-specific interventions.
- Neuropathic-predominant: **treat the underlying neurologic cause** when possible
 - Neuropathic-pain pharmacotherapy and targeted rehabilitation.
- Nociplastic-predominant
 - **Emphasize education, graded exercise/activity, sleep optimization, cognitive-behavioral strategies, pain coping, and reduction of fear/avoidance; medications and procedures should be selected cautiously based on evidence.**
- Key Take Away:
 - Treatment intensity should not be determined by imaging abnormalities alone.

Clinical Approaches to Managing LBP and Current Innovative Models

Acute Low Back Pain – 6-12 weeks

- **Specific vs. Non-specific Diagnosis**
- Red flags
- Imaging not indicated 6 weeks
- Maintain activity – “safe”
- Heat / ice modalities
- Pharmacotherapy
- Begin to address co-morbid conditions
- >4-6 weeks - PT

WORDS MATTER

- Approximately 90% of all low back pain (LBP) episodes are classified as **nonspecific**, meaning no clear patho-anatomical cause (such as an underlying disease, fracture, or tissue damage) can be confidently identified.
- Only about **10%** of cases are diagnosed with **specific** etiology.
- These specific diagnoses typically fall into recognized pathological or mechanical categories:
 - **Mechanical or Degenerative:** Herniated discs, spinal stenosis, and spondylolisthesis.
 - **Pathological:** Osteoporotic compression fractures.
 - **Systemic or Rare:** Tumors/metastases, infections (e.g., spondylodiscitis), and inflammatory arthropathies (e.g., ankylosing spondylitis)

How Words Matter

- Systematic review focused on perceptions of diagnostic labels for MSK pain
 - Patients strongly valued diagnoses to validate their pain and guide treatment.
 - Poor diagnostic explanations and use of medical jargon led to patient frustration and confusion.
 - Specific diagnostic labels were validating but promoted fear and a biomedical view of pain, whereas non-specific labels were associated with less fear but higher confusion
 - Non-specific labels led to more positive views towards prognosis and non-invasive management but led some patients to believe that further investigations were needed
- Patients have a strong desire for a diagnosis and may prefer specific diagnostic labels, but these can lead to patient harm.
- Non-specific labels, while less threatening, require clear explanations to avoid confusion

Journal of Physiotherapy 71:167–17

How Words Matter

- Randomized online study with 1375 blinded participants with and without LBP
 - Labelling effect on beliefs about imaging, surgery, seriousness, activities
 - 'lumbar sprain', 'non-specific LBP', 'episode of back pain'
 - 'disc bulge', 'disc degeneration', 'arthritis'
 - Higher need for imaging, lower recovery expectations, higher need for second opinion, surgery and perceived seriousness
 - Differences were greater amongst participants with LBP and seeking care

European J Pain 26:1532-1545, 2022

Acute Low Back Pain – 6-12 weeks

- Specific vs. Non-specific
- **Red flags**
- Imaging not indicated 6 weeks
- Maintain activity – “safe”
- Heat / ice modalities
- Pharmacotherapy
- Begin to address co-morbid conditions
- >4-6 weeks - PT

- **70–90%** of patients with acute low back pain have **at least one red flag** if a comprehensive checklist is used.
 - Most individual red flags have **poor specificity**, meaning they generate many false positives.
 - Having a single red flag rarely justifies immediate imaging unless it is one of the few highly predictive findings.
- **Red flags with the strongest diagnostic value**
 - Evidence suggests these findings are the most useful:
 - **History of cancer** → strongest predictor of spinal malignancy
 - **Major trauma or minor trauma in an osteoporotic older adult** → increases likelihood of fracture
 - **Urinary retention, saddle anesthesia**, or rapidly progressive neurological deficit → strongly suggest cauda equina syndrome
 - **Multiple signs of infection** (fever, IV drug use, immunosuppression, recent bloodstream infection) occurring together substantially increase the probability of spinal infection.
- Because red flags are so common but serious disease is rare:
 - A **single isolated red flag** (such as age >50 years or night pain alone) usually has a **low positive predictive value**.
- Current guidelines recommend considering the **entire clinical picture**, including combinations of red flags and physical examination findings, rather than obtaining imaging for every patient with one red flag.
 - This approach helps avoid unnecessary imaging while still identifying the small proportion of patients with serious disease.
- A practical estimate is:
 - **70–90%** of patients report **≥1 red flag**.
 - **<1%** ultimately have a serious spinal disorder.
 - **Only a handful of red flags (or combinations of red flags) meaningfully increase the probability of serious pathology.**

Acute Low Back Pain – 6-12 weeks

- Imaging not indicated 6 weeks - Favorable natural history
- Maintain activity – “safe” – pain education
- Heat / ice modalities, massage
- Pharmacotherapy - Tylenol, NSAID, muscle relaxant
- Avoid opioids, gabapentin, pregabalin, benzodiazepines
- Begin to address co-morbid conditions
- >4-6 weeks - PT



Source: Author's de-identified teaching file

Acute to Chronic Low Back Pain >12 weeks

Risk Factors

- 32% transition to CLBP at 6 months
 - Obesity
 - Smoking
 - Severe and very severe baseline disability
 - Depression / anxiety
- Exposure to non-concordant processes (opioids, imaging, subspecialty referral) within first 21 days increases risk:
 - 1 – 1.39x more likely to develop CLBP compared to no exposure
 - 2 – 1.88x
 - 3 - 2.16x

Managing Chronic Low Back Pain - Target Function

- Patient education and address risk factors – BMI, psychosocial, smoking
- Therapeutic exercise, Aerobic conditioning, Flexibility training
 - Activity Modification as needed – Tai Chi, Yoga, Pilates
- Spinal manipulative/massage therapy
- Pharmacologic options
- Chiropractic care / Acupuncture
- Cognitive Behavioral Therapy
 - Pain is real but influenced by emotions and behaviors
 - Goal to improve coping and function despite pain
 - Cognitive restructuring, relaxation, changing maladaptive thoughts
- Pain Reprocessing Therapy
 - Education on pain mechanism
 - Emotional regulation to decrease fear-based responses - “false danger signals”
 - Goal to decrease not eliminate pain

Innovative Model of Care

Illustrative Example: High-Risk/Complex Musculoskeletal Care Pathway

Patients coming to specialty clinic



Recognizable by some of their characteristics (shape), but perhaps not their others (color).

One size/pathway/treatment fits all

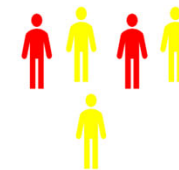
Look at the whole patient



Legacy clinic



IPU



High Risk/Complex

MSK IPU Risk Score in Epic



Green : 0-5

Yellow : 6-15

Red : >15

Behavioral Health Conditions	Points
• Anxiety	5
• Depression	5
• Hx of opioid abuse	6
• Personality disorder	6
• Hx of ETOH abuse	6
• Active opioid use	6
• PTSD	10
• Bipolar	10
• Somatic disorder	10
• Schizophrenia	10
• Active ETOH issues	10
• Active opioid abuse	10

Medical issues	Points
Obesity	
• BMI 35-39	4
• BMI 40-49	6
• BMI > 50	10
Diabetes	
• HgbA1c <7	0
• HgbA1c 7-8	6
• HgbA1c >8	8
Allergies to Medicines	
• 3-4	4
• 5-8	6
• >8	10
• Fibromyalgia	6
• Chronic Fatigue	6
ER/Urgent care/ReadyMed visits in last 12 months:	
• < 1	0
• 1-2	3
• 3-4	8
• 5 or more	10

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JENIS, LOUIS (All Depts)						Filter by Status	Appointments: 14
C...	Status	MSK IPU Risk	U...	T...	M...	Appt Ti...	Patient
	Scheduled	8	Yes			9:00 AM	
	Scheduled	9	Yes			9:30 AM	
	Scheduled	0	No			10:00 AM	
	Scheduled	24	No			10:15 AM	
	Scheduled	4	Yes			11:00 AM	
	Scheduled	0	No			11:30 AM	
	Scheduled	14	Yes			12:00 PM	
	Scheduled	30	Yes			12:30 PM	
	Scheduled	44	Yes			1:30 PM	
	Scheduled	12	Yes			2:00 PM	
	Scheduled	33	Yes			2:30 PM	
	Scheduled	36	Yes			3:00 PM	
	Scheduled	37	Yes			3:30 PM	



Clinic Visit

 12/03/2025
Project All Clinical Pathway
Provider Louis Jenis
Location WMC ORTHO SURGERY

ICD10 Diagnosis Codes -- [Add Diagnosis](#) --
ICD10 Procedure Codes -- [Add Performed Procedure](#) --
CPT Codes -- [Add Performed Procedure](#) --
Laterality -- [Add Laterality](#) --

3 DAYS Post
(3 days)

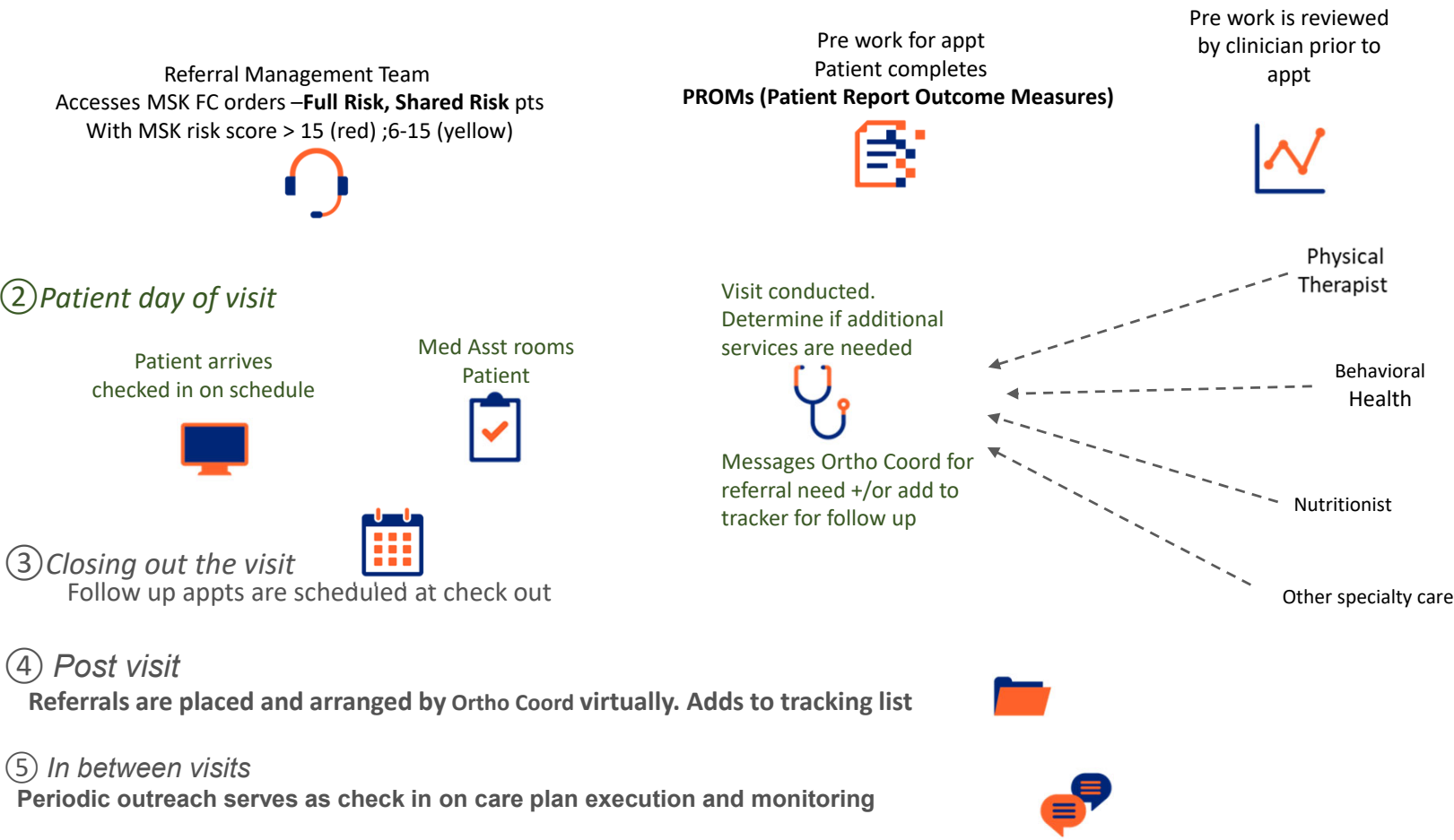
Edit

 Scores

Scores



Illustrative Example: High-Risk/Complex Musculoskeletal Care Pathway



10 Myths About Low Back Pain

Low back pain (LBP) is very common but often misunderstood. Common myths about back pain can delay recovery and keep you in pain longer. Most low back pain is not serious and is caused by everyday strain, movement, or lifestyle habits. In many cases, the best treatment includes staying active, exercising, and learning how to manage pain—not staying in bed, getting scans right away, or having surgery.



Before starting treatment, it's important to understand the facts:

1. Myth: Back pain usually means something is seriously wrong.

Reality: Serious medical problems, such as cancer or fractures, cause fewer than 5% of back pain cases. Most back pain comes from muscle strain, normal aging, or everyday activities.

2. Myth: Bed rest is the best way to heal back pain.

Reality: Staying in bed for too long can make your back stiffer and your muscles weaker. Moving as much as you comfortably can helps your body heal faster.

3. Myth: You always need an MRI or X-ray to find the cause.

Reality: Most people with back pain do not need imaging tests. Scans often show normal age-related changes that are not causing pain. Imaging is usually only needed when there are signs of a more serious problem.

4. Myth: Long-lasting pain means your spine is getting worse.

Reality: Pain that lasts longer than three months is not usually caused by ongoing damage. Things like stress, poor sleep, and fear of movement can make pain feel stronger and last longer.

5. Myth: If movement hurts, you are damaging your spine.

Reality: Some discomfort during movement is normal and does not mean you are causing harm. Gentle movement and exercise help keep joints healthy and can reduce the risk of future pain.

6. Myth: You must have perfect posture to prevent back pain.

Reality: There is no single "perfect" posture. The best posture is one that changes regularly. Your spine is built to bend, move, and flex. Staying in one position for too long can cause more strain than occasionally slouching.

7. Myth: A weak core causes back pain, and sit-ups will fix it.

Reality: A weak core is rarely the main cause of back pain. Sit-ups can often place high amounts of stress on your back. Activities such as walking, regular exercise, and overall conditioning are often more helpful than doing lots of sit-ups.

8. Myth: Every herniated disc needs surgery.

Reality: Many herniated discs improve on their own over time. The body can heal, and nerve irritation often settles down. Surgery is only needed in a small number of cases, usually when there is significant nerve damage or weakness.

9. Myth: Strong prescription pain medications work best.

Reality: Simple over-the-counter anti-inflammatory medicines are often recommended first. Strong pain medications, such as opioids, generally do not provide better long-term results and can lead to serious side effects, including dependence.

10. Myth: Back surgery will cure chronic back pain.

Reality: Surgery is not the right solution for most people with chronic back pain. Treatments such as physical therapy, staying active, making lifestyle changes, and addressing stress and sleep problems are often more effective and much safer first steps.

Key Takeaway

Most low back pain is not serious and gets better with time, movement, and the right approach. Staying active, exercising regularly, and understanding how pain works are some of the best ways to recover and prevent future back pain.



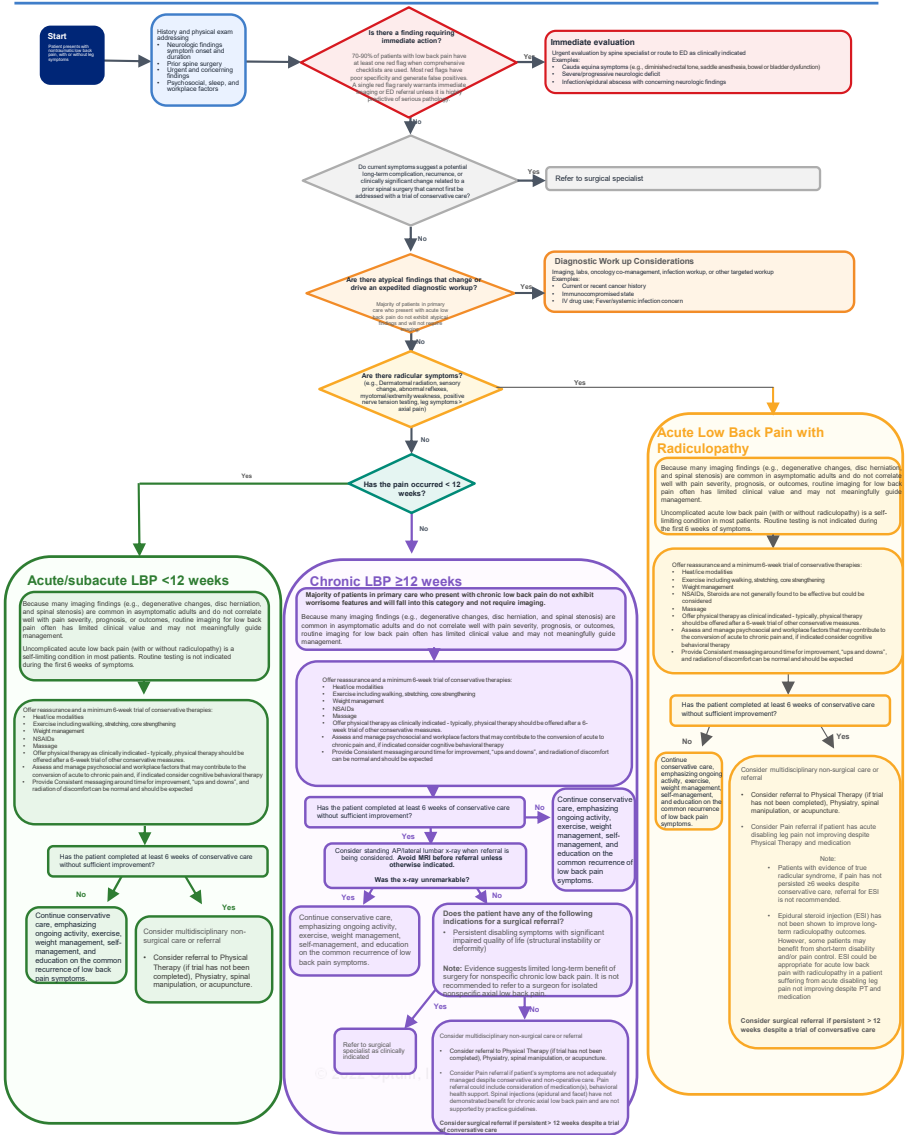
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(508) 964-5580

Summary

Nontraumatic Low Back Pain (Acute/Subacute, Chronic, Radiculopathy)



Approaches to Clinical Care

	Acute /subacute <12 weeks	Chronic > 12 weeks
LBP with radiculopathy	Patient education Home exercise program Medications – NSAIDs, Acetaminophen Massage therapy, chiropractic care, acupuncture If >4-6 weeks - MRI and PT then consider ESI if well defined recalcitrant radicular symptoms and signs with clinically correlated nerve root compression Surgical consult if debilitating pain, limited response to inj., or patient demand	Patient education Home exercise program Medications – NSAIDs, Acetaminophen Massage therapy, chiropractic care, acupuncture Behavioral health/pain management support Limited utilization of pain interventional techniques Surgical consult if debilitating pain, limited response to inj., or patient demand
LBP w/o radiculopathy	Patient education / begin to address risk factors for chronicity Home exercise program Medications – NSAIDs, Acetaminophen Massage therapy, chiropractic care, acupuncture If >4-6 weeks - consider MRI and PT Surgical consult if debilitating pain for patient education	Patient education Home exercise program Medications – NSAIDs, Acetaminophen Massage therapy, chiropractic care, acupuncture Behavioral health/pain management support Surgical consult if debilitating pain for patient education

Key Take Aways

- LBP is highly prevalent and costly
- Variability in outcomes and care pathways
- Natural history is favorable for acute LBP
- Poor correlation of chronic LBP with imaging
 - Persistent pain not consistently related to pathoanatomic etiology
- Address psychosocial risk factors
- Targeting function as opposed to pain