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# DEATH, TAXES, AND BACK PAIN

- A FAMILY PRACTICE GUIDE TO EFFECTIVE MANAGEMENT AND REFERRALS FOR NECK AND BACK PAIN

- I have no relevant relationships with ineligible companies to disclose within the past 24 months.

# OBJECTIVES

Participants will engage in discussions to understand the evaluation, diagnosis, and management strategies for neck and back pain in a family practice setting.

Attendees will gain insight into the utilization of non-pharmacological interventions such as physical therapy, exercise, and ergonomic modifications, which play a crucial role in comprehensive care.

Participants will develop a comprehensive understanding of the pharmacological options available for pain management, including indications, contraindications, and potential adverse effects.

Participants will learn to identify the criteria and appropriate circumstances for referring patients with neck and back pain to specialists, ensuring timely and appropriate care when necessary.

By the conclusion of this session, attendees will be equipped with the necessary tools to provide effective, evidence-based care for patients experiencing neck and back pain, promoting improved patient satisfaction and treatment outcomes.

# OVERVIEW

- What we are (and are not) reviewing
- Can't miss
- Low back
- Neck
- Radiology
- Treatment
- Referrals

# ORTHOPEDIC FOCUS

- This block reviews only the orthopedic aspect of spinal conditions
- We are not reviewing trauma
- The focus is on adults with acute or chronic spinal conditions

# RED FLAGS AND DON'T MISS

- Loss of grip strength
- Dropping things
- Bursting sensation
- "worst HA ever"
- Dizziness
- Shingles
- Kidney pain
- Pregnancy

**Table 1 – Clues in the history that raise a "red flag" in the evaluation of low back pain**

| Red flags | Possible cause |
|---|---|
| Duration > 6 wk | Tumor, infection, rheumatologic disorder |
| Age < 18 y | Congenital defect, tumor, infection, spondylolysis, spondylolisthesis |
| Age > 50 y | Tumor, intra-abdominal processes (such as an abdominal aortic aneurysm), infection |
| Major trauma, or minor trauma in elderly | Fracture |
| Cancer | Tumor |
| Fever, chills, night sweats | Tumor, infection |
| Weight loss | Tumor, infection |
| Injection drug use | Infection |
| Immunocompromised status | Infection |
| Recent genitourinary or gastrointestinal procedure | Infection |
| Night pain | Tumor, infection |
| Unremitting pain, even when supine | Tumor, infection, abdominal aortic aneurysm, nephrolithiasis |
| Pain worsened by coughing, sitting, or Valsalva maneuver | Herniated disc |
| Pain radiating below knee | Herniated disc or nerve root compression below the L3 nerve root |
| Incontinence | Cauda equina syndrome, spinal cord compression |
| Saddle anesthesia | Cauda equina syndrome, spinal cord compression |
| Severe or rapidly progressive neurologic deficit | Cauda equina syndrome, spinal cord compression |

DAVID DELLA-GIUSTINA M. Acute Low Back Pain: Recognizing the "Red Flags" in the Workup. *Consultant360*. 2013;53(6)

# COMMON NECK AND BACK CONDITIONS

- Strain/Sprain: A strain or sprain can occur when the muscles or ligaments in the back are stretched too far or torn.
- Spondylosis: This is a degenerative disorder that may cause loss of normal spinal structure and function.
- Disc Degeneration: Aging can cause the discs in the spine to break down, lose fluid, or become damaged, leading to pain and stiffness.
- Facet Joint Syndrome: This is a disorder where the facet joints in the spine become swollen and painful.
- Scoliosis: This condition is characterized by an abnormal curvature of the spine in the lower back.
- Ankylosing Spondylitis: This is a type of arthritis that primarily affects the spine, causing inflammation and pain in the lower back.
- Spondylolisthesis: This condition occurs when one vertebra slips forward over the one below it.
- Disc Herniation with Radiculopathy: This occurs when a herniated disc in the spine compresses a nerve root, causing symptoms such as pain, numbness, or weakness that radiates down the arms or legs.
- Foraminal Stenosis with Radiculopathy: Narrowing of the openings where nerve roots exit the spine can lead to radiculopathy.
- Spondylosis with Radiculopathy: This condition involves degenerative changes in the cervical spine that lead to nerve root compression and radicular symptoms.
- Stenosis with Radiculopathy: Narrowing of the spinal canal can put pressure on the nerve roots, causing radiculopathy.
- Disc Degeneration with Radiculopathy: As discs degenerate, they can compress nearby nerve roots, causing radicular symptoms.
- Synovial Cyst with Radiculopathy: A fluid-filled sac in the spinal column can press on nerve roots, causing radiculopathy.

# …OR

- Low back pain without radiculopathy
- Neck pain without radiculopathy

- Low back pain with radiculopathy
- Neck pain with radiculopathy

# LOW BACK PAIN

- LBP is the second most common symptom-related reason for seeing a physician in the United States.
- Of the US population, 85% will experience an episode of mechanical LBP at some point during their lifetime.
- LBP resolves for the vast majority within 2-4 weeks.

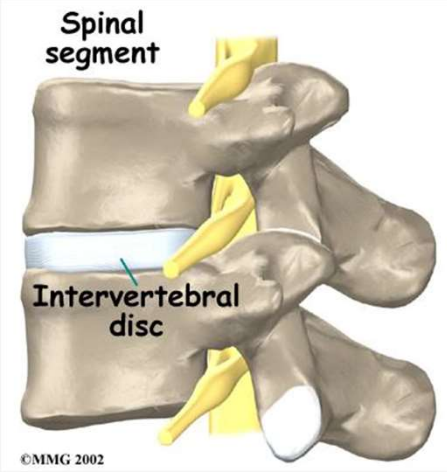
Manfre L, Van Goethem J, Hodler J, Kubik-Huch RA, von Schulthess GK. Low Back Pain. *Diseases of the Brain, Head and Neck, Spine 2020–2023: Diagnostic Imaging*. 2020.

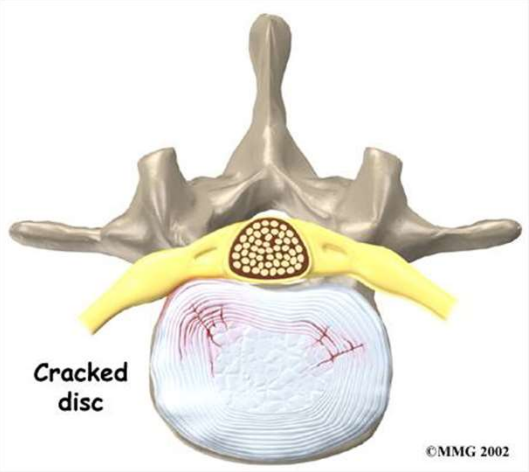
# PATIENT

- A 46-year-old male presents with lower back pain after attempting to lift a heavy load from his truck one day ago. He denies any falls, trauma, or any prior history of back pain. He reports the pain is in the lumbar region and travels up his back, it is worse with lumbar flexion/extension or walking and improved when laying or standing still. There is no loss of urinary or bowel control. He denies any history of back surgeries or known malignancies. Pt denies any history of intravenous drug abuse, alcohol, or tobacco use.

# LOW BACK STRAIN

- By strict definition, a low back strain is an injury to the paravertebral spinal muscles
- Term also is used to describe ligamentous injuries of the facet joints or annulus fibrosus
- In annular tears, the disk does not herniate into the spinal canal, but substances can leak from the nucleus pulposus that induce inflammation and cause irritation of the lumbosacral nerve roots



# LOW BACK STRAIN

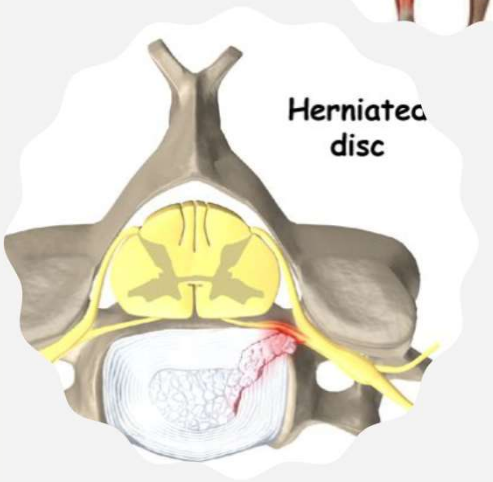
- Repeated lifting and twisting or operating vibrating equipment most often precipitates a back sprain
- Other risk factors include poor fitness, poor work satisfaction, and smoking
- Episodes are separated by months or years; more frequent recurrences suggest degenerative disc disease
- The pain may be brought on by a trivial event, such as leaning over to pick up a piece of paper
- Patients may have difficulty standing erect and may need to change position frequently for comfort

# PATIENT

- A 46-year-old male with no known prior past medical history presents with lower back pain after attempting to lift a heavy load from his truck one day ago. He denies any falls, trauma, or any prior history of back pain. He reports the pain is in lumbar region and travels to his left leg and foot, it is worse with lumbar flexion/extension or walking, and improved when laying or standing still. There is no urinary or bowel incontinence. He denies any history back surgeries, or known malignancies. Pt denies any history of intravenous drug abuse, alcohol or tobacco use.

# SCIATICA

- Herniation occurs over time from lifting and twisting
- Fissures or cracks allow the disc to herniate into the lumbar canal adjacent to the exiting lumbar nerve root
- Causes numbness pain and/or weakness in one or both LE's
- Symptoms may be abrupt or insidious
- Worsens with sitting, standing, walking, coughing…
- Relief with lying on back with pillow under knees or fetal position



# SCIATICA

- L4 – S2 nerve roots
- Pain passes the knee
- Most cases of sciatica result from an inflammatory condition leading to an irritation of the sciatic nerve.
- Direct compression of the nerve leads to more severe motor dysfunction, which is often not seen, and if present, would warrant a more meticulous and expedited workup.

# SCIATICA

- No gender predominance
- Peak incidence in 30s
- Lifetime incidence reported between 10% to 40%
- No association with body height has been established except in the age 50 to 60 group.
- It rarely occurs before age 20 unless secondary to trauma
- Some studies do suggest a genetic predisposition.
- Physical activity increases incidence in those with prior sciatic symptoms and decreases in those with no prior symptoms.
- Occupational predisposition has been shown in machine operators, truck drivers, and jobs where workers are subject to physically awkward positions.

# SCIATICA

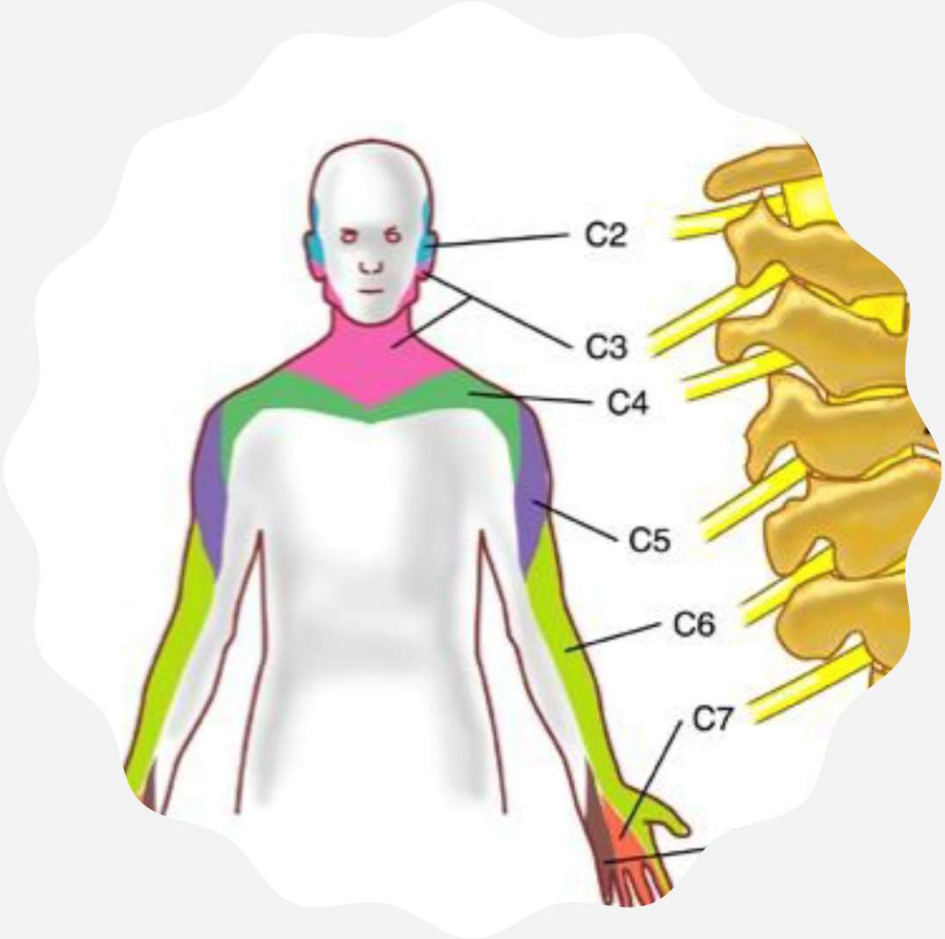
- Most cases of sciatica resolve in less than 4 to 6 weeks with no long-term complications even if no medical therapy is sought.
- If a neurologic deficit is present, the patient may have a more prolonged course of recovery. However, recovery is still excellent.
- Some studies have shown that poor occupational mechanics, psychological depression, and poor socioeconomic situations lead to an increased chance of chronic, recurrent sciatica.

# PATIENT

- A 42-year-old female presents with pain in the shoulder and posterior lateral aspect of the right upper extremity that began spontaneously 2 weeks prior to evaluation. The pain is associated with a tingling sensation radiating into the thumb and index finger of the right hand. She denies any falls, trauma, or any prior history of neck pain. There is no urinary or bowel incontinence. She denies any history of spine surgeries or known malignancies. Pt denies any history of intravenous drug abuse, alcohol, or tobacco use.

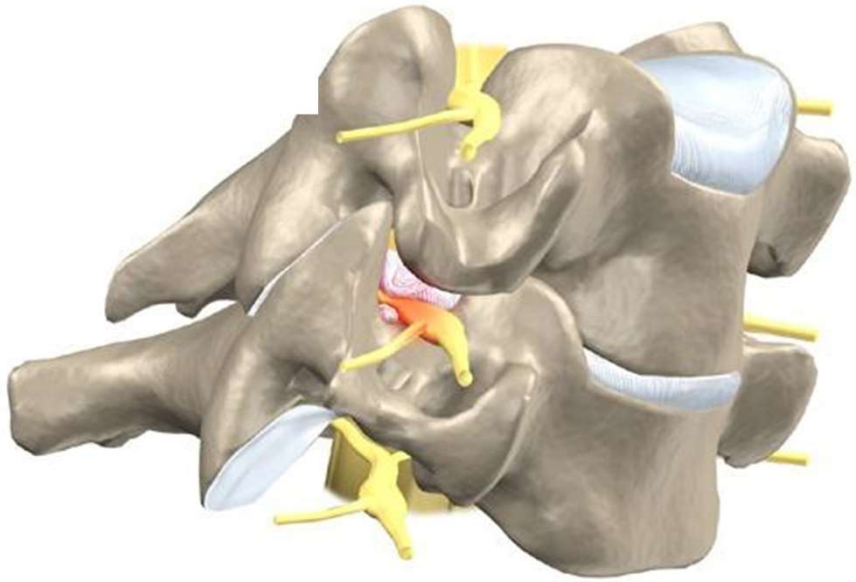
# CERVICAL RADICULOPATHY

- Neurogenic pain in the distribution of a cervical nerve root or roots, with or without associated numbness, weakness, or loss of reflexes



# CERVICAL RADICULOPATHY

- The usual cause in young adults (< 40 years of age) is herniation of a cervical disk, which entraps the root as it enters the foramen
- In older patients, a combination of foraminal narrowing, degenerative disc disease, and arthritic changes especially in the facet and the costovertebral joint is the most common cause of lateral nerve root entrapment



# CERVICAL RADICULOPATHY

- Neck pain and radicular pain with associated numbness and paresthesia in the upper extremity in the distribution of the involved root
- Careful examination for signs of shoulder pathology, vascular disturbances, and peripheral nerve entrapment also is necessary
- Requires more immediate referral and imaging: Weakness, lack of coordination, changes in handwriting, diminished grip strength, dropping objects difficulty with fine manipulative tasks

# PATIENT

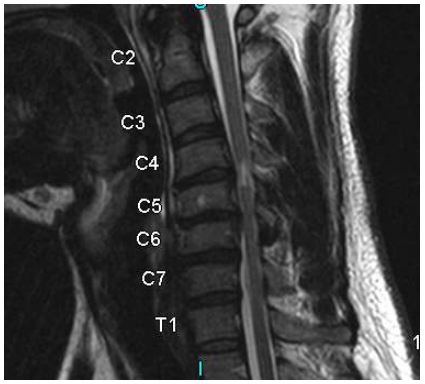
- A 42-year-old female presents with pain in her neck after sleeping at a hotel for 3 days. The pain is no associated with any upper or lower radicular symptoms or weakness. She denies any falls, trauma, or any prior history of neck pain. There is no urinary or bowel incontinence. She denies any history of spine surgeries or known malignancies. Pt denies any history of intravenous drug abuse, alcohol, or tobacco use.

# NECK STRAIN

- By strict definition, an acute cervical sprain is a muscle injury in the neck
- This term also is used to describe ligamentous injuries of the facet joints or intervertebral disks
- Paraspinous muscle spasms may occur, as may headaches that seem to originate somewhere in the neck

# NECK STRAIN

- Non-radicular, non-focal neck pain is the most common, noted anywhere from the base of the skull to the cervicothoracic junction
- Pain is often worse with ROM, possible paraspinal spasm, and discomfort around the trapezius muscle
- Occipital headaches are common
- Patients may report increased irritability, fatigue, sleep disturbances, and difficulty concentrating

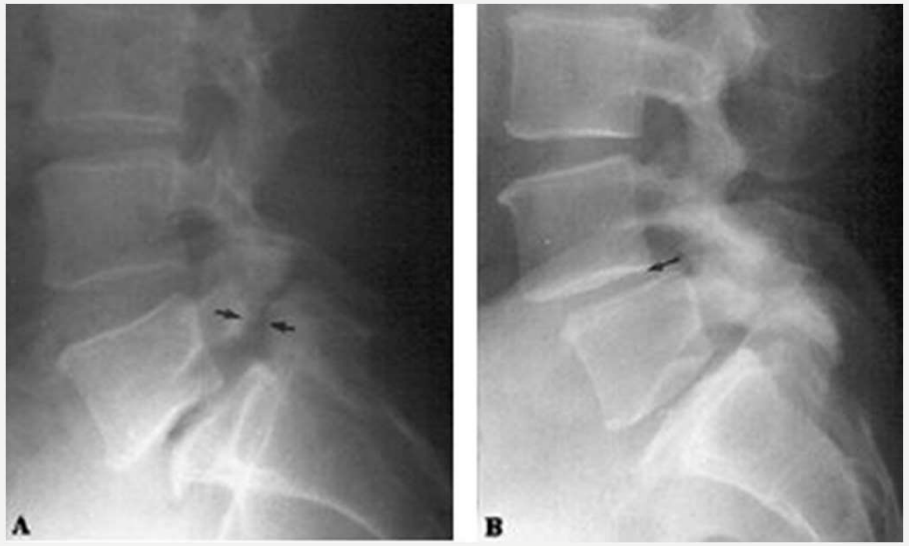




# IMAGING

# LOW BACK

- Radiology – Not needed
- Not helpful for patients with acute low back strain, as they typically show changes appropriate for their age
- AP, lateral, and Spot L5-S1 radiographs are necessary for patients with atypical symptoms, such as pain at rest or at night, a history of cancer, or a history of significant trauma
- If you believe that they will need future imaging. Insurance may ask for X-ray before approving MRI




Lemmers GPG, van Lankveld W, Westert GP, van der Wees PJ, Staal JB. Imaging versus no imaging for low back pain: a systematic review, measuring costs, healthcare utilization and absence from work. *Eur Spine J*. 2019;28(5):937-950. doi:10.1007/s00586-019-05918-1

# LOW BACK

- 6 weeks of optimal medical management (MRI lumbar spine)
- History of prior lumbar surgery with new or worsening symptoms (x-ray, MRI, CT)
- Low-velocity trauma, osteoporosis, elderly, or chronic steroid use (x-ray, MRI, CT)
- Suspicion of cancer, infection, or immunosuppression. (MRI)

American College of Radiology ACR Appropriateness Criteria®
Low Back Pain

# CERVICAL

- New or increasing nontraumatic cervical or neck pain. No "red flags." (Xray)
- New or increasing nontraumatic cervical radiculopathy. No "red flags." (MRI (w/out))
- Prior cervical spine surgery. New or increasing nontraumatic cervical or neck pain or radiculopathy. Initial imaging. (Xray or CT (w/out))
- Known malignancy. New or increasing nontraumatic cervical or neck pain or radiculopathy. Initial imaging. (MRI (with and w/out))

American College of Radiology ACR Appropriateness Criteria®
Low Back Pain

# TREATMENTS

- NSAIDs and non-benzo muscle relaxants appear to offer the best harm-benefit balance
- Tylenol shows very limited improvement
- Avoid Opioids
- Keep Moving!

## Figure 1: Safety Comparison of Some of the Most Commonly Used NSAIDs*

| NSAID | COX-2 Selectivity† | Gastrointestinal Risk | Cardiovascular Risk§ | Clinical Use |
|---|---|---|---|---|
| **aspirin** | Low | Moderate | Low | Prevention of cardiovascular events, mild pain, and inflammation |
| **ibuprofen** | Moderate | Low | Moderate to High | Rheumatoid arthritis, osteoarthritis, fever, mild to moderate pain, dysmenorrhea, headache, migraine, myalgia |
| **diclofenac** | High | Moderate | High | Rheumatoid arthritis, osteoarthritis, fever, mild to moderate pain, dysmenorrhea, migraine |
| **indomethacin** | Low | Moderate to High | Moderate | Rheumatoid arthritis, osteoarthritis, bursitis, tendinitis, mild, moderate, or severe pain |
| **naproxen** | Low | Moderate to High | Low | Gouty arthritis, mild to moderate pain, tendonitis, fever, rheumatoid disorders, osteoarthritis, dysmenorrhea, migraine prevention |
| **meloxicam** | High | Low | Moderate | Rheumatoid arthritis, osteoarthritis |
| **celecoxib** | High | Low | Moderate to High | Osteoarthritis, ankylosing spondylitis, rheumatoid arthritis, acute pain, dysmenorrhea |

*Only generic names provided. List not all inclusive; keep in mind NSAIDs carry varying risks of rare liver toxicity and renal injury.

†Selectivity is based on *in vitro* assay studies and should be interpreted with caution as different assay methods give different results. Moreover, no assay method can predict what will happen when the drug is given to patients. Clinical studies are the best way to determine the effects of NSAIDs in patients.

§ For patients with CV disease or risk factors for ischemic heart disease, the American Heart Association recommends for the following agents for pain (in order listed): acetaminophen, aspirin, tramadol, opioids (short-term), nonacetylated salicylates (e.g., diflunisal), NSAIDs with low COX-2 selectivity, NSAIDs with some COX-2 selectivity, and COX-2 selective agents.

Gianola S, Bargeri S, Del Castillo G, et al. Effectiveness of treatments for acute and subacute mechanical non-specific low back pain: a systematic review with network meta-analysis. *Br J Sports Med*. 2022;56(1):41-50. doi:10.1136/bjsports-2020-103596

## Key Differences Between Antispasmodic and Antispastic Agents

| Drug Category | Mechanism of Action | Condition Treated | Disease States |
|---|---|---|---|
| Antispasmodics | Block nerves from signaling brain | Spasms secondary to peripheral musculoskeletal conditions | Injury, trauma |
| Antispastics/ spasmolytics | Block nerve signaling from spinal cord; act directly on skeletal muscle to relax spasm | Spasticity secondary to upper motor neuron lesions | Multiple sclerosis, spinal cord injury, stroke, cerebral palsy, infection |

Caressa Trueman P, RPh; Shana Castillo, PharmD, RPh; Karen K. O'Brien, BS Pharm, PharmD, RPh; Eric Hoie, PharmD, RPh. Inappropriate Use of Skeletal Muscle Relaxants in Geriatric Patients. *US Pharmacist*. January 21, 2020 2020;45(1):25-29.

| Agent | Indications | Usual Oral Adult Dosage | On Beers Criteria List | Considerations in Geriatric Patients | Clinical Pearls | Approved Duration |
|---|---|---|---|---|---|---|
| **Antispasmodics** | | | | | | |
| Carisoprodol Soma | Acute musculoskeletal pain | 250 mg-350 mg tid + hs[a] | Yes | Efficacy and safety not established in patients aged >65 y | If used long-term, must taper off owing to risk of withdrawal effect | 2-3 wk |
| Chlorzoxazone Lorzone | Acute musculoskeletal pain | Initial: 250 mg tid; max: 500 mg qid | Yes | Decrease dose as symptoms improve | Rare but serious hepatotoxicity | No duration given |
| Cyclobenzaprine (immediate-release) Flexeril | Muscle spasm | 5 mg-10 mg tid | Yes | Extended-release formulation not recommended; consider decreased frequency | Potential for serotonin syndrome; strong anticholinergic properties | 2-3 wk |
| Metaxalone Skelaxin | Acute musculoskeletal pain | 800 mg tid or qid[a] | Yes | Caution in patients with hepatic impairment | Potential for serotonin syndrome, strong anti-cholinergic properties | No duration given |
| Methocarbamol Robaxin | Acute musculoskeletal pain; tetanus | Initial: 1,500 mg qid for 2-3 days, then decrease dosage to 4 g-4.5 g/day divided into 3-6 doses[a] | Yes | Start at lower dose and titrate to tolerance in geriatric patients and those with hepatic or renal impairment | Mechanism of action is due to sedative properties; no direct effect on muscles | Chronic use |
| Orphenadrine Norflex | Acute musculoskeletal pain | 100 mg bid | Yes | Contraindicated in patients with glaucoma | Strong anticholinergic properties | No duration given |

| Agent | Indications | Usual Oral Adult Dosage | On Beers Criteria List | Considerations in Geriatric Patients | Clinical Pearls | Approved Duration |
|---|---|---|---|---|---|---|
| **Antispastics** | | | | | | |
| Baclofen Gablofen | Spasticity resulting from MS (flexor spasms) or spinal cord injuries and diseases | Initial: 5 mg tid for ≥3 days, then titrate up by 5 mg q3d; max: 80 mg | No | Little/no evidence for use in chronic lower back pain | Potential for large number of CNS and cardiovascular side effects | 1-2 mo |
| Dantrolene Dantrium | Chronic spasticity | Initial: 25 mg qd for 7 days, then 25 mg tid titrated to effect by increasing dose q7d, not frequency; max: 400 mg (100 mg qid) | No | Drowsiness may persist for 48 h post dose | Black box warning for hepatotoxicity | 45 days, if no benefit seen |
| **Antispasmodic and Antispastic With Geriatric Dosage** | | | | | | |
| Diazepam Valium | Muscle spasm caused by local pathology; spasticity | 2 mg-10 mg po tid or qid Geriatric dosage: 2 mg-2.5 mg qd or bid; increase as tolerated | Yes | Increased risk of death with use | Associated with falls and traumatic injuries | No duration given |
| Tizanidine Zanaflex | Spasticity | 2 mg-12 mg qd to tid Geriatric dosage: 2 mg qd to qid; titrate as needed; max: 36 mg | Yes[b] | Calculate creatinine clearance prior to dosing | Reserve treatment for time of day when control of spasticity is most important | No duration given |

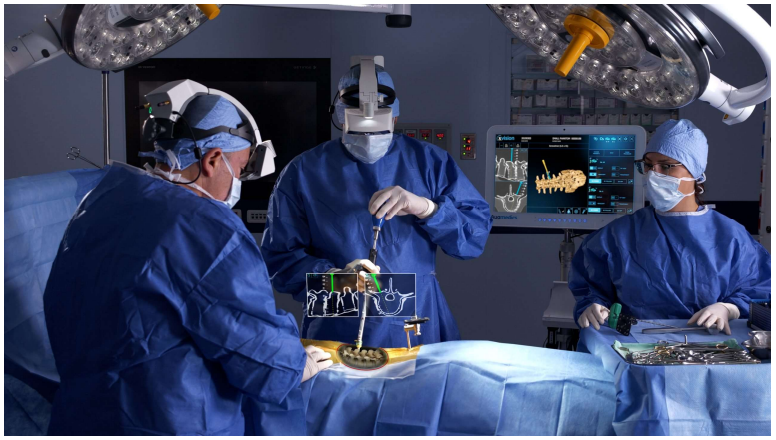
[a] *A dose decrease is recommended in renal impairment.*
[b] *Tizanidine appears on the Beers Criteria list secondary to its potential to reduce urinary flow in men. There is no listed concern for sedation or potential fall risk.*

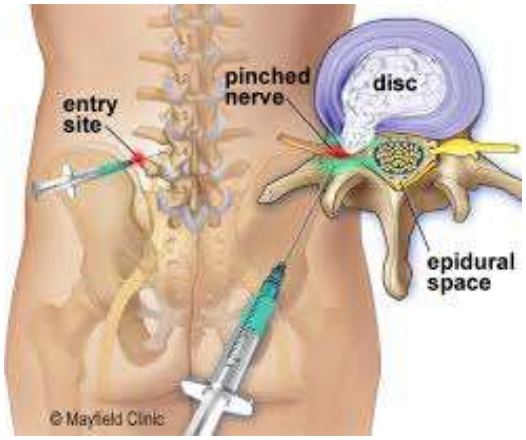
| Sidebar 3: Management of Low Back Pain | | | |
|---|---|---|---|
| **Category** | **Intervention (listed alphabetically by category)** | **Low Back Pain Duration** | |
| | | **Acute <4 Weeks** | **Subacute or Chronic ≥4 Weeks** |
| **Self-care** | Advice to remain active | X | X |
| **Non-pharmacologic treatment** | Acupuncture | | X Recommendation 34 |
| | CBT and/or MBSR | | X Recommendation 8 and Recommendation 12 |
| | Clinician-directed exercise program | | X Recommendation 9 |
| | Spinal mobilization/manipulation | | X Recommendation 10 |
| **Pharmacologic treatment** | Duloxetine | | X Recommendation 18 |
| | NSAIDs | X Recommendation 19 | X Recommendation 19 |
| **Other treatment** | Multidisciplinary or interdisciplinary program | | X Recommendation 39 |

Abbreviations: CBT: cognitive behavioral therapy; MBSR: mindfulness-based stress reduction; NSAIDs: nonsteroidal anti-inflammatory drugs

# PHYSICAL THERAPY

- Karlsson M, Bergenheim A, Larsson MEH, Nordeman L, van Tulder M, Bernhardsson S. Effects of exercise therapy in patients with acute low back pain: a systematic review of systematic reviews. *Syst Rev*. 2020;9(1):182. Published 2020 Aug 14. doi:10.1186/s13643-020-01412-8
  - No difference for acute low back pain
- Fritz JM, Lane E, McFadden M, et al. Physical Therapy Referral From Primary Care for Acute Back Pain With Sciatica : A Randomized Controlled Trial. *Ann Intern Med*. 2021;174(1):8-17. doi:10.7326/M20-4187
  - Patient-reported improvement, no difference in missed workdays
- IJzelenberg W, Oosterhuis T, Hayden JA, et al. Exercise therapy for treatment of acute non-specific low back pain. *Cochrane Database Syst Rev*. 2023;8(8):CD009365. Published 2023 Aug 30. doi:10.1002/14651858.CD009365.pub2
  - No significant improvement for acute low back pain




entry site
pinched nerve
disc
epidural space
© Mayfield Clinic

# REFERRALS

# EMERGENT REFERRAL TO SPINE SURGEON

- Unexplained neurologic deficit
- Loss of normal bowel or bladder control
- Increasing pain not controlled by analgesics
- Increasing neurologic deficit
- Weakness
- Myelopathy

# ROUTINE REFERRAL TO SPINE SURGEON

- No improvement within 4-6 weeks of conservative therapy

# REFERRAL TO PAIN MANAGEMENT

- Nonsurgical spine
- The surgeon requires ESI before surgery.

# SUMMARY

- Red flags
- Low back
- Neck
- Radiology
- Treatment
- Referrals

# THANK YOU!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