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Advanced Lumbar Injuries and Return to Work

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Background

Total recordable cases: 2,834,500 in 2018 **BLS.gov**

Back injuries of more than 1 million workers account for nearly 20 percent of all injuries and illnesses in the workplace.

** BLR.com**

Cases involving injuries to the back: 142,230 in 2018 **BLS.gov**

Median days away from work – 8 **BLS.gov**





Provider Responsibilities

- Provide appropriate and effective treatment
- Treat all effects of the injury
- Possibly psychological
- Set reasonable RTW and recovery goals
- Inform employer of work status and physical abilities
- Work with employer for appropriate RTW opportunities



Acute Back Pain (Less than 4 weeks)

- A. History
 - 1. Recent Trauma/Injury
 - i. Fall, lifting injury
- B. Physical Exam
 - 1. Decreased ROM
 - 2. (+/-) Tenderness
 - 3. Absence of nerve complaints
 - i. Sciatica, N/T/W
- C. Diagnostic Studies
 - 1. Xray, AP/Lateral
 - i. Fracture/Malalignment
 - 2. MRI
 - i. (+) Nerve complaints/deficits
- D. Diagnosis
 - 1. Lumbar sprain/strain

E. Treatment

- 1. OTC NSAID'S +/- Steroid Dose Pack
 - i. Ibuprofen, Naproxen, Medrol
- 2. Home Exercise Handout?
- 3. Work Restrictions if needed
- 4. F/U in 2 weeks
- 5. Physical Therapy
 - i. If no improvement after 2 weeks
- F. Return to Work
 - 1. Light Duties
 - i. No L/P/P 10 lbs., NRBT
 - ii. 1-2 weeks
 - 2. Moderate Duties
 - i. L/P/P 30 lbs. NRBT
 - ii. 1-2 weeks
 - 3. Full Duties
 - i. Within 4 weeks

Subacute Back Pain (1-3 Months)

- A. History (same as acute)
- B. Physical Exam (same as acute)
- C. Diagnostic Studies
 - 1. Xray, AP/Lateral
 - a. Fracture/Malalignment
 - 2. MRI
 - a. failed treatment for back pain
 - b. eval for disc injury w/o nerve impingement
 - c. occult fracture
 - d. aggravation of pre-existing condition

D. Treatment

- 1. OTC NSAID'S +/- Steroid Dose Pack
 - i. Ibuprofen, Naproxen, Medrol
- 2. Physical Therapy (Spine Trained)
- 3. Work Restrictions if needed
- 4. F/U in 3 weeks
 - i. Time for approval
- E. Return to Work
 - 1. Light Duties
 - i. L/P/P 10 lbs., NRBT
 - ii. 3 weeks
 - 2. Moderate Duties
 - i. L/P/P 30 lbs. NRBT
 - ii. 3 weeks
 - 3. Full Duties
 - i. Within 6 weeks



Chronic Back Pain (1-3 Months)

- A. History (same as acute)
 - B. Physical Exam (same as acute)
- C. Diagnostic Studies
 - 1. Xray, AP/Lateral
 - i. Fracture/Malalignment
 - 2. MRI
 - i. failed treatment for back pain
 - ii. eval for disc injury w/o nerve impingement
 - iii. occult fracture
 - iv. aggravation of pre-existing condition
- > D. Treatment
 - OTC NSAID'S +/- Steroid Dose Pack Ibuprofen, Naproxen, Medrol

- 1. Consider referral to physiatrist/pain management
 - . ESI
 - ii. Facet Injection
 - iii. RFA
- 2. Work Restrictions if needed
- E. Return to Work
 - 1. Light Duties
 - i. L/P/P 10 lbs., NRBT
 - ii. 3 weeks
 - 2. Moderate Duties
 - i. L/P/P 30 lbs. NRBT
 - ii. 3 weeks
 - 3. Full Duties
 - i. Within 6 weeks



Chronic Back Pain (> 3 Months)

- A. History (same as acute)
- B. Physical Exam (same as acute)
- C. Diagnostic Studies
 - 1. Xray, AP/Lateral
 - a. Fracture/Malalignment
 - 2. MRI
 - i. failed treatment for back pain
 - ii. eval for disc injury w/o nerve impingement
 - i. occult fracture
 - ii. aggravation of pre-existing condition
- > D. Treatment
 - OTC NSAID'S +/- Steroid Dose Pack
 - Ibuprofen, Naproxen, Medrol

- E. FCE may be indicated
 - 1. Permanent restrictions
 - i. No LPP > 20 lbs., No prolonged sitting/standing, no BLT
 - 2. Malingering/symptom magnification?
 - 3. Spinal cord stimulator (very rare)
 - i. Last ditch effort if all other measures fail
 - ii. Must pass psych Eval
- F. Return to Work
 - 1. Same as previous unless FCE demonstrates functional limitations
 - 2. Spinal cord stimulator is approved



Lumbar Radiculopathy (< 4 wks) 1

- A. History (same as acute)
- B. Physical Exam (same as acute)
- C. Diagnostic Studies
 - 1. Xray, AP/Lateral
 - i. Fracture/Malalignment
 - 2. MRI
 - i. Disc protrusion/HNP
 - ii. Nerve entrapment
 - iii. Usually paracentral disc HNP causing lateral recess stenosis
 - D. Findings must correlate with pt complaints D. Treatment
 - OTC NSAID'S +/- Steroid Dose Pack
 - Ibuprofen, Naproxen, Medrol

E. Neurologic/Opioids

- 1. Gabapentin/Neurontin/Lyrica
- 2. Tramadol/Norco/Percocet for breakthrough pain.
- 3. Flexeril/Zanaflex/Valium

F. Physical Therapy

- 1. Spinal specialized therapist
- 2. Modalities may reduce pain
- 3. Therapy should not increase pain
- 4. If no improvement in 3-4 sessions ESI may be recommended



Lumbar Radiculopathy (< 4 wks) 2

G. Epidural injection (often indicated)

- 1. Reduce inflammation around nerve root
- 2. First injection helps, then consider therapy vs. additional ESI
- 3. No benefit, no additional ESI
- 4. Surgical consult
- H. Return to Work
 - 1. Same as previous unless neurologic deficits are present
 - 2. No use of affected extremity, driving may be restricted,
 - 3. Employer may consider providing transportation to/from work
 - 4. If deficits are present may need to be placed off work to limit further damage to affected nerve
 - 5. Surgery most likely indicated if deficits



Lumbar Radiculopathy (1-3 Months) 1

- A. History (same as acute)
- B. Physical Exam (same as acute)
- C. Diagnostic Studies
 - A. Xray, AP/Latera B. MRI (same as acute)
- D. Treatment
 - Medication: (same as acute)
 Physical Therapy (same as acute)
 Physical Therapy (same as acute)
 Epidural Injection (same as acute)
- E. Surgical consult/options 1. Micro-discectomy i. Outpatient ii. Less Expensive iii. RTW (light duties) in 2-3 weeks 2. Fusion i. TLIF/ILIF a. Shorter recovery b. Smaller incision/less tissue damage
 - ii. Pedicle Screw Instrumentation
 - a. Stronger fixation
 - b. Larger incision

Polling Question – 1 of 3

>When someone complains of low back pain, the first thing the provider should do is order an MRI or CT scan.

True or False?





>When a worker complains of low back pain, the first thing the provider should do is order and MRI or CT scan to prevent doing any un-needed treatments.

True or **False**?



MRI: the Gold Standard of Diagnostic Testing

- There is currently no better way to evaluate for lumbar soft tissue pathology
- Size of the Magnet .5 Tesla vs. 2.0 Tesla will affect the quality of the image
- Closed MRI will generally give the best quality MRI rather than an open field



MRI: the Gold Standard of Diagnostic Testing

- Damadian was the first to perform a full body scan of a human being in 1977 to diagnose cancer. Damadian invented an apparatus and method to use NMR safely and accurately to scan the human body, a method now well known as magnetic resonance imaging (MRI).
- Source: Wikipedia





- Electricity is ran through a superconductive magnetic coils to create a powerful magnetic field
- Superconductivity is created by reducing resistance to almost zero
- Requires electric wires to be continually bathed in liquid helium at 452.4 degrees below zero Fahrenheit







How the image is produced

- Hydrogen atoms have a strong magnetic moment, so in a magnetic field, they line up in the direction of the field.
- Approx 1/2 protons point cephalad, 1/2 point caudal and cancel each other out
- A few protons per million don't match up or cancel out
- These unpaired hydrogen atoms are what creates the image we see on film



What's that loud "hammering" sound?

- Rising electrical current in the wires of the gradient magnets being opposed by the main magnetic field cause the noise you hear in the MRI
- More power = More noise



When To Order MRI

- Evaluate Soft Tissues
 - •Neurologic deficit
 - •Soft tissue injury (ligamentous disruption)
 - •Disc herniation that has not improved with conservative care
- Fractures
 - •Old vs New (bone marrow edema)
- Infection
 - •Typically with and without contrast



Contrast

• Gadolinium

• Most common contrast agent used

• Administered intravenously

•Enhances or shows areas with increased blood flow

- Differentiate scar tissue vs herniation
 - •Scar tissue has blood supply
 - Disc herniation avascular
- Infection

• Highly increased blood flow compared to surrounding tissues





T1

T2







Not all MRI'S ARE CREATED EQUAL

Example: Closed MRI 1.5 Tesla/Large magnet





MRI: Not all MRI's are created equal.

Example: open MRI, small magnet





CT Scan: If MRI is contraindicated

- Essentially a spinning x-ray machine which takes hundreds of individual x-rays which are then interpolated with complex computer algorithms to create black and white images
- Best for evaluating acute fractures including compression fractures, broken hardware (pedicle screws), and evaluation for pseudoarthrosis
- Not the best diagnostic choice for lumbar soft tissue evaluation
 - Disc bulge protrusion
 - Lumbar sprain/strain
 - Nerve entrapment/compression
 - Difficult to determine chronicity of injury (acute vs. chronic fracture)
 - **Significant amount of radiation**





CT Scan: If MRI is contraindicated







Therapeutic Injections 1

- Clearly defined diagnosis for Tx
- Follow up to 2wks post
- Trigger points
 - Myofascial pain/ may help speed up recovery
- Facet blocks
 - Back pain from facet joints
 - About 3 months relief
 - Rarely work related unless aggravation of pre-existing condition



Therapeutic Injections 2

- Radiofrequency ablation
 - 1. Back pain usually from facet arthritis
 - 2. Rarely work related
 - 3. MBB required first
 - 4. About 1-2 years relief

• Epidural

- 1. Radicular pain/Discogenic pain
- 2. F/u after each
- 3. Law of diminishing returns
- 4. No more than three in a year
- 5. Usually not indicated beyond 2nd injection





Surgical Options

- Lumbar Disc Replacement
 - 1. Most patients are not a candidate
 - 2. Higher mortality rate vs. fusion
 - 3. Limited outcome data, currently not significantly better than fusion (Cervical Disc Replacement has greater efficacy and better results)





Surgical Options: Micro-Discectomy

- Indications:
 - 1. Minimally invasive, outpatient
 - 2. Documented nerve compression on MRI
 - 3. Failed conservative treatment (therapy, ESI)
 - 4. Severe radiculopathy and/or neurologic deficits (foot drop, EHL weakness, etc)
 - 5. Full recovery in 3-4 months







•When was the MRI invented? •1975 1954 1977





•When was the MRI invented?

- •1975
- •1954

•1977



Postop Plan (Discectomy/Decompression)

- Off work for 2 weeks
- Light Duty for 4 weeks (usually starting after first post op visit)
 - No LPP > 10 lbs., no bending or twisting, avoid sitting > 20-30 minutes w/o changing positions
- Start PT at 2-4 weeks postop (if needed)
- 1. Depending on the therapist experience/education with post op spinal treatment, therapy can often cause more problems than it helps. Choose Wisely, often avoid post op discectomy
- 2. Moderate Duty at 6-8 weeks
- 3. Full duty at 8-12 weeks (full maturation of scar tissue takes up to 4 months, heavy occupations often need more time to get back to full duties
- 4. MMI at 4-6 months



Lumbar Fusion

- Indications:
- Unstable Fracture
- Unstable Pars defect
- 2nd or 3rd disc reherniation
- Intractable back pain
 - •Chronic discogenic pain
 - Failed 6 months of conservative management
 - Concordant discogram
 - •Segmental Instability
 - •Spondylolisthesis





Lumbar fusion surgical options - TLIF/ILIF

•TLIF/ILIF (minimally invasive)

- •Limited to single level lumbar fusion
 - multiple level fusion is rarely indicated
- •Outpatient fusion surgery at surgery centers now a reality
 - save on hospital costs
- Minimally invasive, posterior approach
 - - Decreased tissue trauma via smaller surgical incision
 - - Decreased surgical time
 - - Less expensive than pedicle screw based lumbar fusion

Lumbar Fusion TLIF/ILIF with expandable cage





Lumbar fusion surgical options: Pedicle Screw Fixation

- Pedicle screw and rod-based fusion
 - 1. More invasive, requires larger incision
 - 2. Additional OR time
 - 3. Minimum of 4 screws will need to be used for a single level fusion
 - 4. Increased expense, each screw can cost up to \$1500. Minimum of 4 screws will need to be used for a single level fusion
 - 5. Avoid anterior lumbar fusion when ever possible due to increased surgical risks and post op abdominal problems







Postop Plan: Lumbar Fusion

- No work for 4 weeks
- Light Duty for 4 6weeks
 - No LPP > 10 lbs., no bending/twisting, sit and stand as tolerated. Must accommodate wearing a hard-shell lumbar brace.
- Start PT at 4 -6 weeks postop for gentle ROM, gait training, modalities.
- Moderate Duty at 8 12 weeks if fusion is healing as planned
 No LPP > 30 lbs., no avoid bending/twisting
- Full duty at 12 weeks for sedentary occupation, 6 months for medium to heavy labor occupations.
 - Work conditioning/hardening may be required for manual labor occupations: fire, police, EMT, Nursing, CNA, iron worker, etc.
- MMI at 6-12 months (most single level lumbar fusions can be placed at MMI at 6 8 months if the fusion is solid.
- Fusion outcomes
- Opioid use: limited to first three months, but d/c after 3 months and begin use of NSAIDS
- Days off work: we can try to minimize days off work to help the injured employee get back to a normal life, but employers must be willing to accommodate work restrictions.

Polling Question – 3 of 3:

What is the best modality to image the lumbar spine for soft tissue injury?

- •XRAY
- •MRI
- •Ultrasound
- •CT Scan





What is the best modality to image the lumbar spine for soft tissue injury?

•XRAY

•MRI

•Ultrasound

•CT Scan



Key Points

Get them to Treatment ASAP

Choose the best doctor, not the least expensive.

Back to work ASAP

Avoid keeping them off work, use work restrictions and encourage employers to abide by them.

• PT is important, but if the IW is not improving after 4-6 sessions or if he is regressing, then PT may be to aggressive or the injury may be worse than initially thought and a specialist may need to be recommended.

Utilize McKenzie or Maitland Certified therapist when available for back injuries.

Therapy for back pain should not produce more pain, it should provide exercises that avoid painful movements and restore normal function.



Key Points

- Pain management should be utilized sparingly and with caution. If injections (ESI) does not provide significant relief after 1-2 injections, the surgeon may need to re-evaluate the treatment plan.
- Differentiate between work related and normal aging, arthritic changes are not work related, but in most states an aggravation of pre-existing conditions requires the pre-existing injury to be treated to reach MMI.
- Imaging at 4-6 weeks only, unless the patient exhibits neurologic deficits (severe radicular pain, weakness in a nerve root distribution, ankle, EHL weakness are most common in lumbar spine injuries.



Key Points

- Surgery as a LAST resort, unless significant neurologic deficits are present:
 - 1. 3/5 weakness
 - 2. muscle atrophy
 - 3. dysfunction
- Normal course of most WC injuries should be less than 8 weeks, unfortunately many obstacles can draw this out usually relating to severity of the injury or delays in treatment approvals.
- ODG guidelines is only a "guideline" it should not be used as a treatment manual, every patient, every injury, every job is different.







