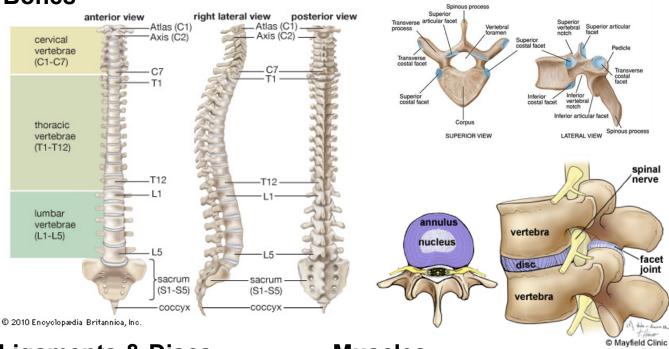
Common Low Back Injuries in Dancers

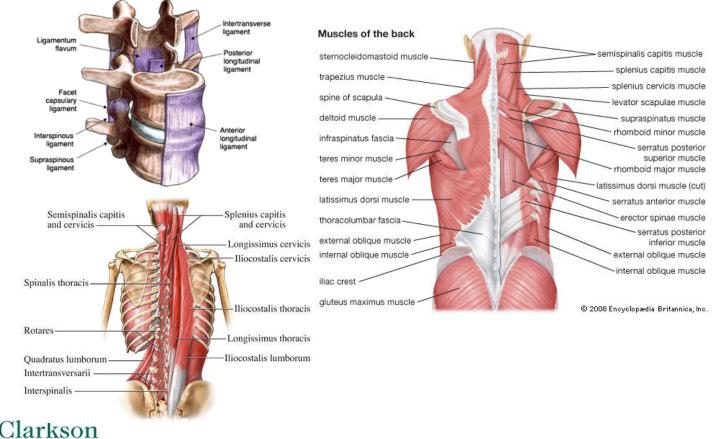
Anatomy of the Spine

Bones



Ligaments & Discs

Muscles



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This information is intended to be general advice; always consult with your healthcare provider

Quadratus Lumborum (QL) Muscle Strain or Trigger Point

- The QL originates from the posterior iliac crest and inserts on the 12th rib and transverse process of the lumbar vertebrae.
- QL strain produces local tenderness and sometimes bruising around the iliac crest.
- The QL is a muscle that lifts the hips, side flexes and extends the spine.
- This muscle is used during an arabesque.

Signs of a QL Strain:

- > Tenderness along the 12th rib and/or iliac crest.
- > Can be injured on one side of the back or both.
- Associated with muscle spasm.
- Symptoms reproduced in certain positions.
- Trigger point referral as shown in picture, below.

What puts me at risk?

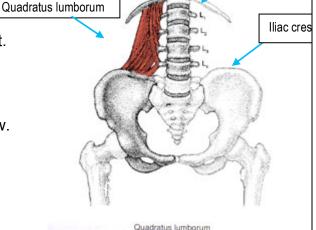
- Overuse or single traumatic activity
- Lack of trunk stability
- Core musculature weakness
- Scoliosis
- Poor Posture
- Tight hip flexors, tight external rotators, tight hamstrings

Injury Prevention:

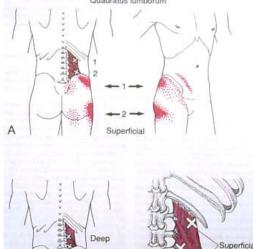
- Stretch the Quadratus Lumborum before use.
- Strengthen the Quadratus Lumborum
- Stretch the hip flexors to prevent Hyper-Lordotic posture
- Strengthen your core and work on trunk stabilization.
- Manage quadratus lumborum trigger points

Management of quadratus lumborum muscle strain:

- Avoid repetitions of the exercises that caused the damage.
- RICE for 2-3 days to reduce swelling and inflammation.
 - o *Refer back to Basic Principles of Injury & First Aid Handout: RICE, NSAIDS
- KT tape can be used to inhibit muscle activity.
- Do not use heat or massage the area for the first 2-3 days! This can increase blood flow to the area making inflammation even worse.
- After 2-3 days heat, Quadratus Lumborum Release and self-massage can be used to increase the blood flow and relieve the musculature.



12th rib





Interspinous Ligament Damage

- Interspinous ligaments lie between the spinous process of the vertebrae.
- These ligaments can be sprained or crushed by uncontrolled back movements.
- Hyper-flexion can sprain or even tear the ligaments between the spinous processes in the in the spine.
- Hyper-extension can cause impingement of the spinous process with crushing of the interspinous ligament.
- Usually injured at L4-L5 L5-S1

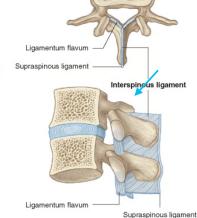
Signs of Interspinous Ligament Damage:

- Sudden onset of pain
- > Pain increased during flexion
- Localized tenderness
- Associated with muscle spasms

What puts me at risk?

- Weakness of the back muscles may fail to control flexion.
- Poor alignment during a back bend causing hyper-extension at one level (Failing to pull up the trunk before a back bend)
- Rapid uncontrolled, and repeated movements of the spine





Injury Prevention:

- Improving trunk muscle control
- Pulling up and spreading the extension over the whole lumbar spine instead of bending at one level of the spine.

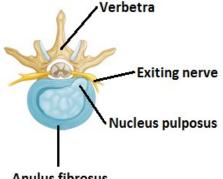
Management of interspinous ligament sprain:

- Avoid repetitions of the exercises that caused the damage.
- RICE for 2-3 days to reduce swelling and inflammation.
 - o *Refer back to Basic Principles of Injury & First Aid Handout: RICE, NSAIDS
- Do not use heat or massage the area for the first 2-3 days! This can increase blood flow to the area making inflammation even worse.
- After 2-3 days heat and self-massage can be used to increase the blood flow.
- PT Management:
 - O Ultrasound can be used to help improve circulation to the ligaments.



Lumbar Disk Prolapse/Herniation (disk bulge)

- Between the bony vertebraa of the spine are cushion-like discs made up of cartilage.
- Discs distribute the forces on the spine.
- The outsides of the discs are ringed layers of fibrous cartilage [annulus fibrosus] while the inside is a gelatinous cartilage material [nucleus pulposus] that allows flexibility.
- When large shear and/or twisting forces are applied to the spine, the outside layers of the disc can tear.



- This can occur due to repetitive lifting especially with poor posture or can occur due to movements of combined rotation and forward flexion from the spine.
- When a disc is torn and strong forces continue to act on the spine, the center gelatinous portion of the discs can protrude through the tear in the outer rings.
 - ✓ This is called disc prolapse or disc herniation.
- A herniated disc can put pressure on nearby nerves exiting the spine causing pain in lower back, buttock and legs.

Signs of a Disk Prolapse:

- Pain into the leg that radiates/expands with flexion of the spine and decreases with extension of the spine
- Pain with flexion and rotation
- Associated wide spread muscle spasm

What puts me at risk?

- Poor posture
- Lack of core stabilization
- Movements of forward flexion and/or rotation, prolonged spine flexion (e.g. sitting)
- Improper lifting

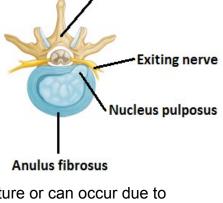
Injury Prevention:

- Strengthen your core and work on trunk stabilization.
- Proper posture and body mechanics when lifting.

Management:

- Avoid repetitions of the exercises that caused the damage.
- RICE for 2-3 days to reduce swelling and inflammation.
 - o *Refer back to Basic Principles of Injury & First Aid Handout: RICE, NSAIDS
- Do not use heat or massage the area for the first 2-3 days! This can increase blood flow to the area making inflammation even worse.
- After 2-3 days heat and self-massage can be used to relieve pain.
- Avoid forward flexion of the spine as this pushes the disk posterior.
- PT Management: Extension exercise to relieve pressure on the nerve root
 - Medical Management: Epidural Injections can be used to relieve pain





Stress Fractures of the Lumbar Vertebrae

- Stress fractures result from repeated local stress on one area of the bone.
- The healing process may be unable to keep up with the rate of injury.
- If damage outpaces healing, pain will go from only occurring during dancing to continuous pain.
 - ✓ Constant load on a stress fracture increases the time it will take to heal.
- Generally occur at the pars interarticularis(spondylolysis), at L4 and L5.
- If a fracture of the pars interarticularis (spodylolysis) is not allowed to heal the fracture can widen and allow the vertebra to slip forward. This is called spondylolisthesis.

Interarticularis

Spondylolysis

Spondylolisthesis

✓ At this point the fracture will not heal properly.

Signs of a stress fracture:

- Persistent, localized pain with activity, particularly extension of the spine.
- Local area of warmth, well localized tenderness.
- > Associated with muscle spasm
- > X-ray often do not show signs of stress fracture until one to two months after symptoms begin.

What puts me at risk?

- Poor nutrition/ The Athletic Triad
- Lack of trunk stabilization and abdominal activation
- Hyper lordotic posture (often used to force turn out)
- Over turning
- Hard flooring that does not cushion impact

Injury Prevention:

- Abdominal strengthening
- Controlling your turnout
- Pulling up and spreading the extension over the whole lumbar spine instead of bending or extending at one level of the spine.

Management

- Avoid activities that caused the damage (spinal extension and high impact activities)
- RICE for 2-3 days to reduce swelling and inflammation.
 - *Refer back to Basic Principles of Injury & First Aid Handout: RICE, NSAIDS



Facet Joint Sprains

- Facet joints are small synovial joints between the vertebra.
- Generally sprained do to uncontrolled movements.
- Commonly injured landing from a jump.

Signs of a Facet Joint Strain

- Deep tenderness at one or both sides of a lumbar vertebra
- > Can be injured on one side of the back or both.
- > Pain on hyper-extension with a tilt to one side and backwards or pain on flexion with a combined tilt to the other side.

What puts me at risk?

- Depending on the friction of your feet on the floor to hold the turn-out.
- · Landing with an uncontrolled turn out.

Injury Prevention:

- Strengthening the trunk musculature
- · Correcting any asymmetries in posture
- Strengthening turn out control especially while in the air

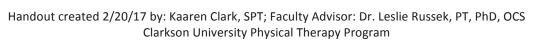
Management of facet joint sprain:

- Avoid repetitions of the exercises that caused the damage.
- RICE for 2-3 days to reduce swelling and inflammation.
 - *Refer back to Basic Principles of Injury & First Aid Handout: RICE, NSAIDS
- Do not use heat or massage the area for the first 2-3 days! This can increase blood flow to the area making inflammation even worse.
- After 2-3 days heat and self-massage can be used to increase the blood flow and relieve the musculature.
- Medical Treatment: Steroid injection

Resources used in this handout:

- 1. Howse J, McCormack M. Anatomy, Dance Technique & Injury Prevention. London: Methuen Drama; 2009.
- 2. Solomon R, Solomon J, Minton SC. Preventing Dance Injuries. 2nd ed. Champaign, IL: Human Kinetics; 2005.
- 3. American Academy of Orthopedic Surgeons at www.orthoinfo.aaos.org
- 4. Safety and Health in Arts Production and Entertainment. Preventing Musculoskeletal Injury (MSI) for Musicians and Dancers: A Resource Guide. 2002. Available at http://www.actsafe.ca/wp-content/uploads/resources/pdf/msi.pdf
- 5. Russell J. Preventing dance injuries: current perspectives. Open Access Journal of Sports Medicine. 2013:199.





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