Common Dance Injuries and Rehabilitation

Presented by:
Mary Donahue, MEd, ATC, PT, PES
&
Marianne Johns, MS, AT
Dance Terminology

• Turnout
  • Commonly used term in dance describing Hip ER
  • Ideal turnout is when both LE’s are externally rotated so the feet are 180 degrees away from each other (Lin & Su, 2005)
Dance Terminology (cont’d)

• Plie
  – Bending of the knees
    • Demi or grande (small or large)
    • If performed UL termed fondu
Dance Terminology (cont’d)

• Tendu
  • To point or stretch the foot
Dance Terminology (cont’d)

• Releve: to rise
  • Demi-pointe
    • To rise onto ball of foot
    • Can be done on one or two feet
  • On Pointe
    • To wear pointe shoes and rise on top of the shoe  (Kadel et al, 2005)
Dance Terminology (cont’d)

• Extension
  • Standing on one leg while the “working leg” is flexed/abducted/ or extended over 90 degrees
Dance Injuries

Intrinsic
- Bony alignment
- Sex, height, weight
- Hx of Injury
- Body type
- Hyper/Hypo mobility
- Flexibility

Extrinsic
- Flooring
- Stage Rake
- Improper Training
- Stage Sets
- Choreography
- Lighting

Russell JA, 2013
Prevalence of Ankle Injuries in Dancers

- Most commonly injured joint among dancers
- Rate of foot/ankle injury said to be between 23%-62% (Werber, 2007)
- Causes may be due to acute and/or overuse
- Higher incidence due to performing at extreme ranges of Dorsi Flexion and Plantar Flexion motions
- Prone to injury due to bearing weight on very small base of support (Russell JA, 2013)
Common Ankle Injuries

- Inversion Sprains
  - Most common traumatic injury in dancers
  - MOI: Landing improperly from a jump, or inverting while on demi pointe
Ankle Sprains (cont’d)

- TX:
  - Early ROM, strengthening and proprioception exercises
  - Proprioception Progression
    - Parallel static
    - Parallel dynamic
    - Parallel releve
    - Turned out static
    - Turned out dynamic
    - Turned out releve (demi/en pointe)
Ankle Injuries (cont’d)

• Anterior Impingement
  • MOI:
    • Forced turn out
    • Repetitive demi-plie in normal or forced turnout (O’Kane & Kadel, 2008)
    • Previous trauma (lateral ankle sprain)
  • C/O
    • Pain with jump landing, decreased DF ROM (Kadel N, 2006)
Ankle Injuries (cont’d)

- Posterior Ankle Pain
  - Peroneal Tendon Subluxation
  - Posterior Impingement
    - Os Trigonum
    - Protruding lateral talar process (Russell JA, 2013)
    - 60-84% success rate with conservative tx
      - Rest, NSAIDS, injections, PT, altering pointe shoes (Giannini et al, 2013)
- FHL Tendonopathy
  - Deep Plies, releves
- Posterior OCD
- Posterior Tibial Tendonopathy
Ankle Injuries (cont’d)

• **Achilles Tendinosis**
  - Very common among dancers because this is one of the most used and relied on muscles in dance (Fernandez-Palazzi et al, 1990)

• **Risk factors:**
  - Forcing turnout (increased pronation)
  - Poor jump landing mechanics
  - Tight heel cord
  - Rearfoot valgus

• **Tx:**
  - Stretching, shoe changes, eccentric calf strengthening
Low Back Injuries in Dancers
Incidence of Low Back Injuries in Dancers

- Higher incidence of LBP in dancers than other types of athletics (Rickman AM et al, 2009)
- High rate of injury secondary to repetitive extension of the spine and high velocity twisting and bending (Rousse NA et al, 2012)
- Studies injuries in pre-professional and professional dancers show 9 – 23 % of all injuries are to the low back (Smith J, 2009)
Causes of Low Back Injuries

- Excessive anterior pelvic tilt and lumbar extension (Smith J 2009: and Swain C et al 2014)
- Weak and long Hamstrings (Kline JB et al 2013)
- Weak and/or lack of endurance in postural muscles (Swain C et al, 2014)
- Racked stage in musical theater (Gottschlich L et al 2011)
Causes of Low Back Injuries

- Dancers with decreased core muscle endurance and hypermobile spine are more prone to injury (Swain C, et al 2014)

- Male dancers have significant anterior shear forces of the lumbar spine during lifts, resulting in increased injury rate. (Alderson J, et al 2009)
Common Dance Injuries

- Spondylolysis/
  Spondylolistheses
- Facet Strain
- SI Strain
- Disc Injuries
- Muscle Spasm
- Piriformis Syndrome

(Gottschlich LM, 2011)
Spondylosis and Spondylolisthesis

- Spondylolysis - Pars defect
- Spondylolisthesis - Pars defect with anterior translation of one vertebrae on another
- 4 times more common in dancers vs non-dancers
- Secondary to repetitive micro trauma, poor mechanics, poor alignment, hyperextension, “forced” turnout (Gottschlich LM et al, 2011)
Facet strain

• Due to excessive
  • jumping, forcing turnout
  • hyperextension of the spine
  • abduction moves of the hip
• Shear forces from lifts in male dancers  (Gottschlich L, et al, 2011)
SI strain

• Due to the unilateral aspect of dance
• Dancers tend to have a strong stance leg and a have a preferred leg as the gesture leg
• Dance choreography often favors one side over the other
Disc injury

• Related to axial compression and flexion of the spine
• 40 % of LBP
• More common in male dancers
• Due to age, axial loading and smoking (Gottschlich L, et al.)
Muscle strains

- Caused by muscle imbalance, choreography, overuse or poor technique
- Diagnosis is by exclusion of other injuries
Piriformis Syndrome

- Peripheral neuritis of the sciatic nerve
- Often due to overusing the Piriformis muscle when performing frequent and repetitive hip external rotation  
  (Micheli LJ, et al, 1999)
Treatments

• Correct technique
• Muscle energy or joint mobilization for hypomobile spine, pelvic and SI segments
• Core strengthening/Motor control
• Range of motion/Flexibility
• Myofascial release
Correct Technique

- Work with dance teacher
  - Proper turnout
  - Maintaining a neutral pelvis
  - Incorporate conditioning into dance training
Core strengthening/
Motor control training

• S. A. I. D. Principles

• Developmental positions (Biondi B, 1993)
  • Hookling, Quadruped, Kneeling, Standing
  • Neutral spine, work to outer ranges

• Exercise Progressions/Variables (Clark M, et al, 2002)
  • No resistance - resistance; small movements - large movements; stable - unstable, bilateral - unilateral
  • Sets, repetitions, resistance and duration
Questions?
Ankle Injuries Bibliography


Low Back Injuries

Bibliography

Tallarico, RA; Madom, IA; Palumbo, MA  Sports Medicine and Arthroscopy Review  Issue: Volume 16 (1), March 2008, pp 32-38  Spondylolysis and Spondylolisthesis in the Athlete


Swain C and Redding E  Trunk Muscle Endurance and Low Back Pain in Female Dance Students, Journal of Dance Medicine & Science, Volume 18, Number 2, 62-66(5)

Smith J, Moving Beyond the Neutral Spine Stabilizing the Dancer with Lumbar Extension Dysfunction, Journal of Dance Medicine & Science Volume 13, Number 3, 2009  73-82


Kline, BJ; Krauss, JR, Maher, SF Qu, X. 2013. Core Strength Training Using a Combination of Home Exercises and a Dynamic Sling System for the Management of Low Back Pain in Pre-professional Ballet Dancers  A Case Series.  Journal of Dance Medicine & Science, 17(1), 24-33


Biondi, B, Trunk Functional Stabilization Training, Educational course, Detroit, MI  October, 1993.

Clark, M; Russell, A, Optimum Performance Training for the Performance Enhancement Specialist – Home Study Course, 2002