Dance Medicine: When Hypermobility Causes Instability and Injury
• Host physician 2010 Vancouver Olympics

• Team physician Canadian Alpine Ski Team 2004-9

• Team physician Canada Basketball 2005-7

• Canadian team physician to World Aquatic Championship
  Barcelona July 2003

• Canadian medical team to 2000 Sydney Olympics
• No Disclosures to report
OBJECTIVES

1. Discuss hyper mobility associated w dancer - what does the art select for
2. Look at the alignment of ballet and potential injuries that occur
3. Discuss injury patterns of dance injuries in different ages and levels

INTRODUCTION

https://www.sfballt.org/

https://sfballt.blog/2019/02/27/the-sleeping-beauty-trailer/

https://sfballt.blog/2019/02/06/hurry-up-were-dreaming-trailer/
Contributors to hyper mobility

- Bone shape (e.g., acetabular dysplasia)
- Collagen
- Muscle weakness/wasting
- Proprioception (impaired proprioception may increase hypermobility)
- Hormonal?
Beighton scale

- conventional simple medical screen for the detection of joint laxity
  - is the Beighton scoring system: 9 point score to detect hyper mobility syndrome and ehlers danlos
- But is all or none test and only tests a few joints
- Not specific to ballet
- Ballet selects for this type of ROM, so is it a problem?
- How do we assess contributions of joint shape, muscle flexibility to generalized hyper mobility - beighton doesn’t address this well (except #5)
• Depending on the criteria used, epidemiological studies suggest that hypermobility among dancers can be as high as 44%, especially in students.

• The Beighton score used most in dance related studies may not be an appropriate measure of hypermobility in these populations.
Turn out

• Excessive hip ER is related to increased mobility of capsule-ligamentous restraints and is indicative of hyper mobility (with normal osseous structures)

• Many dancers also have mild dysplasia which contributes to excess motion

• As turnout increases, stress on anterior hip structures increases

• Dancers ER>>> IR. ER is “supernormal” and IR is limited
Ballet positions

First Position

Second Position

Fourth Position
• Extreme hip external rotation
• Genu recurvatum
Injuries in Ballet

• Different age and levels of dancers get different injuries

• Often overuse, weakness causative factors

• As dancer move up the chain, we see more degenerative and chronic conditions that need to be managed and often contribute to other overuse injuries

• Eg knees, glut/hips, ankles (chronic laxity, sprains)
Life of a Dancer

• 1. School

• 2. Company - corps de ballet

• 3. Soloist

• Corps dancer less likely to complain until later as they don’t want to lose their spot due to injury/time off as they strive to move up the ladder - they may be at higher risk for injuries

• Soloists better at taking care of themselves and knowing their injuries - have made it that far, do more bargaining with their bodies…. but also likely to push through a lot for certain roles/opportunities eg CXR in female soloist found multiple healed rib fx’s
Common injuries I see in young dancers

- Tendonitis (hip flexor, achilles)
- Apophysitis (knee, heel)
- Patello-femoral pain
- Back pain, spondy’s
- Hip flexors (ballet dancers - iliopsoas and sartorius)
Causes

- WEAKNESS with hyper mobility
- Overtraining (eg, summer intensives, winter season)
- Growth and loss of core control
- Forcing turnout to keep up
Injuries in professional dancers

- Male vs female
- Overuse vs acute
- Acute: ankle sprains, shoulder subluxations, muscles strains, knee injuries, contusions...
- Overuse: stress fractures, ankle impingement, achilles and patellar tendinosis, chondromalacia patella, hip flexor tendinitis, muscles strains, hip pain/labral tears, foot/ankle DJD
• Systematic review on incidence and prevalence of msk injuries (pub. 2015) in 1365 amateur (mean age 16.2) and 900 professional ballet dancers (mean age 27)

• Incidence 1.06 and 1.46 injuries /1000 dance hours in males and female professional dancers

• 75% overuse, but 64% overuse in females vs 50% in males

• LE injuries 66-91%, foot and ankle 14-57%

• Lack of prevalence noted but LBP, painful snapping hip and PFPS common

• Orthop J Sports Med. 2015 Jul 6;3(7)
More injury data…

• A Spanish study found that PFPS, base of 2nd met stress fractures and os trigonum syndrome common in “junior professional dancers” but chondral knee injuries more common in senior dancers, and cervical disc disease most common in intermediate age and level dancers.

• Jr profession = up to age 21, intermediate ages 22-31 and senior professional ages 32+

• This study included many types of dance, including Spanish, classical, neoclassical etc, but found highest prevalence of injuries amongst ballet dancers at the junior level.

Orthop J Sports Med

Francisco José Sobrino
Pedro Guillén
• Lots of injury data but none really addressing hypermobility as causative factor

• Difficult to assess/study - we see it in clinic and have to address it to rehabilitate the dancers and keep them performing.... Just means a very thorough rehab program and strict return to dance assessments and clearance
Summary

• Injuries are common in dancers, and preprofessional seem most at risk

• Overuse injuries more common

• Ballet selects for hyper mobility and some maneuvers (turnout) put stress on anatomic structures over time (eg hip joint)

• Weakness seen in young dancers at times of growth or increased training seems to lead to overuse injuries and hyper mobility may play a role (eg PFPS, snapping hip)
Questions?