

## Injury Prevention Presentation - Maryann Johnson PT

Prevent injuries by knowing what causes them!

Studies show injuries occur to 75-97% of professional dancers in one year.

An injury is usually a combination of Factors.

### Environmental Factors

1. Improper Warm-up: cold muscles are less flexible, decrease ability for the muscle to contract. To warm up properly you need to raise heart rate, increase blood flow, increase body temp which then facilitates muscle elasticity, decreases friction in the joints and improves the nerve impulses to the muscle. To warm-up you need to move, prance, jump, run, and do jumping jacks.
2. Cold Studio or Theater
3. Hard Floors: They are unforgiving and do not have shock absorption which then increases the stress on bones and joints.
4. Fatigue: Studies show a direct relationship between fatigue and injury. Injuries usually occur at the end of a long day of class or rehearsal.
5. Change in training schedule: i.e. a sudden increase in training or rehearsing. Increase in training needs to be gradual in nature.
6. Poor Nutrition and Hydration Need to fuel body properly to allow it function efficiently.
7. Choreography: Understand the movement.
8. Improper Shoe Wear: Pointes improperly fitted or too soft or hard. High heels.

## Biomechanical Factors: Limitation and weakness cause compensation

1. Limited Turnout. Turnout is a combination of rotation at the hip joints, slight rotation at knee and abduction of foot. It is mostly limited by the strong Y ligament in the front of the hip but also by tight muscles around the joint. Dancers compensate with tilting pelvis, twisting at knee and rolling in on feet.
2. Limited Plantar Flexion or pointing foot at ankle. Inability to stack oneself over foot creates strain thru tendons in ankle and incorrect pelvis position.
3. Limited 1<sup>st</sup> toe flexion. This limits ability to achieve full releve .
4. Tight Heelcords. Tightness in heelcords or calf muscles is caused by poor posture, overuse with pointing foot, pointe work and jumping. A dancer then will compensate with rolling in or out on ankle.
5. Foot Type. Planus foot is a flat foot that can pronate and roll in at arch. Studies show that the stress fracture rate increases 70-80% in dancers with pronated feet and hyperextended knees. Cavus foot is a high arched and rigid foot that does not allow for shock absorption.
6. Tight back and Inability to Breathe. Tightness in back puts ribs out of position , tilts pelvis and decreases the dancers ability to rotate in hips. Poor rib position makes it difficult for a dancer to exhale completely and stabilize the pelvis.
7. Decrease core and pelvic stability. Dancers tend to over stretch which then weakens muscles stabilizing pelvis. Muscle imbalances and asymmetries can occur which causes a loss of control in the

pelvis. Dancers and gymnasts tend to strengthen the superficial abdominals and they need the deep stabilizing transverse abdominus and internal obliques.

8. Growth Spurts. Discoordination and muscle tightness is very common with growth spurts which then may cause strain to the tissues.

### Technical Problems

1. Over Turnout at feet.
2. Improper releve
3. Anterior Tilted pelvis- causes hip impingement and increase stress on lumbar spine. Limits turnout.
4. Poor arabesque
5. Poor en pointe position
6. Poor control with landing jumps

### Psychological Factors

1. Competition. A dancer pushes self too far in order to be better.
2. Stress. Tension. Muscles become very tight when stressed. Body breathes poorly when stressed. Stress may come from performance anxiety, life changing events, perfectionist personality, and pressure from parents.

### Prevention

1. Correct Warmup; Raise body temperature and sweat which then increases blood flow, tissue elasticity, decreases friction on joints, facilitates the transmission of nerve impulses and reflexes improve.
2. Proper conditioning, rest, diet, shoes and floors.

3. Correct Technique. Speak with your teacher about what you may be doing to cause strain.
4. Correct muscle imbalances
  - \*\*Breath
  - \*\*Release back
  - \*\* Correct posture, tightness, weakness, balance and coordination
5. Understand Choreography. Know how to perform the movement.
6. Decrease Stress.
  - Realistic goals
  - Change negative thoughts
  - Relaxation

When something hurts ask WHY????

Look at technique, imbalances and misalignments.

What do you do when something hurts?