
Ivan Koh, dancer, Singapore Dance Theatre
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Turning Out in Dance

Charmaine Tay, December 2020

In hopes of increasing the range of turn out from the hips, many dancers have tried various stretching positions but to no avail. This is because the turn out comprises of several components - some you can make changes to with proper training, while others are just anatomically impossible to alter due to the fact that we are not all born structurally identical. Let's look at the components that make up your turn out to further understand what can and can't be changed to improve your turn out.

Components of a turn out

In dance, a turn out is an external rotation of the hip, knee and ankle. 60-70° from hip and 10-15° from distal joints[4]. The total turn out comprises of hip external rotation and non-hip components of the turn out.

1. **Depth & Direction of Acetabulum:** The hip is a ball-and-socket joint. The acetabulum is also known as the socket of your hip joint. However, the hip socket can vary in depth and the placement angle of the acetabulum can vary from being more front facing or more side facing. This will determine how much range is available for movement. Front facing gives you less turn out, lateral (side) facing gives you more turn out.

2. **Length of femoral neck:** The bone between the femoral head (ball of the ball-and-socket joint) and the femur (thigh bone) is known as the femoral neck. The longer the femoral neck, the more range there is to perform a turn out.

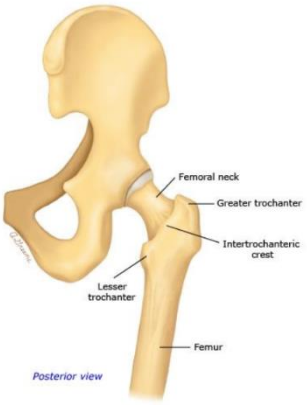

Diagram 1. Femoral neck[9]

3. **Femoral version:** *Femoral version* is defined as the rotation of the femoral neck axis around the femoral shaft in the transverse plane (how inwardly or outwardly rotated your thigh bone structure is in relation to the ball of the ball-and-socket joint.)

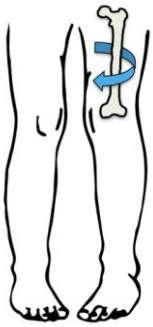

Diagram 2. Femoral version[11]

4. Tibial version: Tibial version (or torsion) is the degree of rotation of the tibia along its long axis from the knee to the ankle.

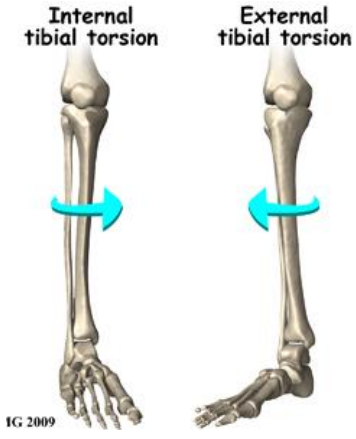

Diagram 3. Tibial version[21]

5. Ligament laxity/tautness: Also known as the Y ligament, the iliofemoral ligament is the strongest ligament in the body connecting the pelvis to the femur. How lax or taut the Iliofemoral ligament will determine the amount of range achievable.

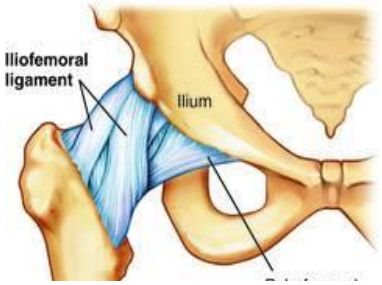

Diagram 4. Illiofemoral ligament

6. **Weak external hip rotators:** The turn out comes from 6 deep rotator muscles, namely external obturator, internal obturator, inferior gellemus, quadratus femoris and piriformis. The muscles are activated in different ways and ranges: for example, your quadratus femoris controls your turn out in standing position, however, the piriformis assist in holding your turn out en fondu.

Although dancers commonly grip on their gluteal muscles (muscles that make up the butt) to hold the turn out, the gluteals are only able to perform one function at a time and they are better designed for moving and stability rather than to maintain turn out. That means that once you begin to move, the gluteal muscles are used for moving rather than maintaining the turn out.

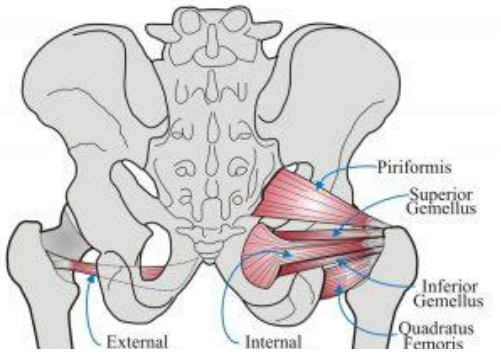

Diagram 5. Deep rotator muscles[7]

7. **Tight muscles (adductors) and tendons:** When your inner thigh muscle, as known as your adductor muscles, are tight, they prevent external rotation at the hip from happening.

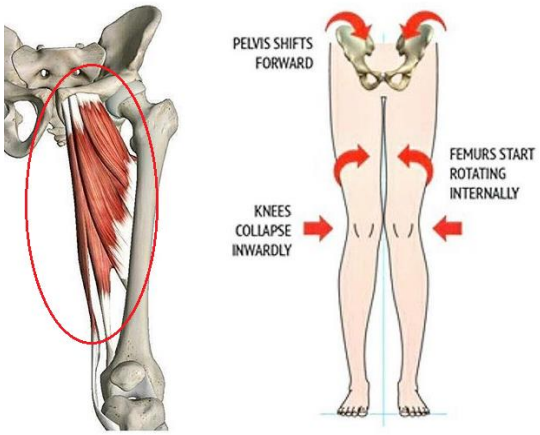

Diagram 6. Tight adductors

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Compensation

Ivan Koh, dancer and choreographer, Singapore Dance Theatre
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A compensated turn out occurs when dancers are not able to attain their desired turn out due to the lack of external hip rotational range, but still attempt to achieve the aesthetic of a turn out by forcing a turn out. This can be seen when dancers dance with an anterior pelvic tilt (an arched back with a swayed back pelvis to allow more "sideward" range) or when they start to pronate the foot and ankle (rolling in when standing in turn out), especially when they fix their foot to the floor using rosin.

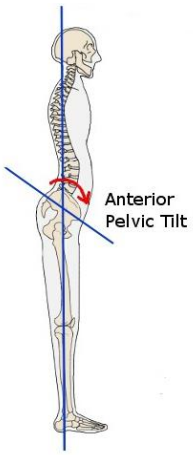

Diagram 7. Anterior Pelvic Tilt

The compensated turn out is calculated by the difference in hip external rotation range and total turn out range (including the angle of the knee and ankle). Studies have found discrepancies between these two ranges as high as 58-90° combined right and left leg[12]. They have also found an increase in injury rates among dancers with higher values of compensated turn out[23].

Diagram 8. Rolling in the foot

Injuries associated with turn out

Due to the change in weight bearing in a turn out, especially a forced one, some injuries may begin to set in if dancers do not execute the turn out position safely, especially when training intensively:

1. **Hallux Valgus/Bunion:** A growth of a bunion associated with "rolling in" or starting pointe work too early. It is the body's way of readjusting to an unusual weight placement. Strengthening the Tibialis posterior and anterior muscles can help to lift the arch and support the foot, protecting it from pronation.

Diagram 9. Bunions[3]

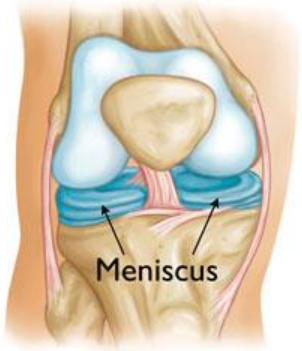

Diagram 10. The meniscus of the knee[20]

2. **Meniscal damage**: The meniscus (shock absorber of the knee) gets damaged when dancers rotate their lower leg on a bent knee[22]. (Think about how you go into a plie position to achieve a wider turn out before straightening the knee). This comes with long term consequences as most meniscal damage take a long time to heal, while others may not heal by itself at all.

3. **ACL injury:** The anterior cruciate ligament (ACL) is one of the key ligaments that stabilises your knee joint, connecting the femur (thigh bone) to the tibia (shin bone). Injuries occur due to faulty landings from jumps, caused by stress placed on the knee in tibial torsion (bones of the leg twisting in opposite direction under full body weight)[17]. Think about when you are landing your jump in a forced turn out range. This can be prevented by strengthening hip abductors and external rotators to assist in stabilising the knee on landings.

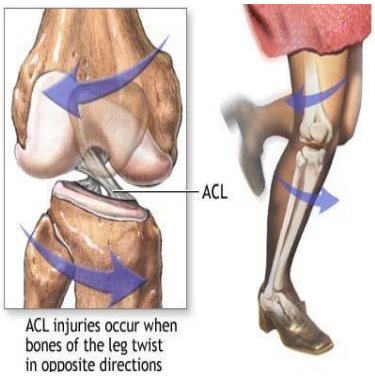

Diagram 11. ACL injury[2]

4. **Achilles injury:** Tendonitis (inflammation) and tendonosis (degeneration of tendon due to overuse) can occur when the ankle and foot is constantly pronated (rolling in) and a lack of lower leg warm up due to the forces acting on the tendon[8]. This can be prevented by strengthening muscles that supinate the foot (opposite from rolling in), performing eccentric calve contractions, and wearing medial arch support.

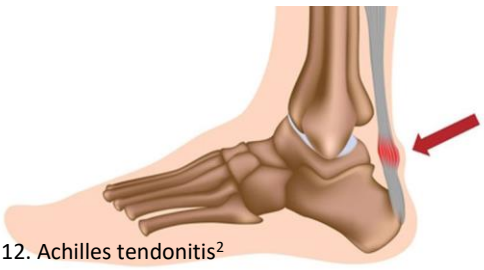

Diagram 12. Achilles tendonitis[2]

5. **Plantar fasciitis:** The plantar fascia is a thick web-like ligament that connects your heel to the ball of your foot. It acts as a shock absorber and supports the arch of your foot. However, when dancers force their turn out, have tight calves or lack proper lower leg warm up, an inflammation on the plantar fascia occurs[14].

Diagram 13. Plantar fasciitis[19]

6. **Shin splint:** A shin splint is a tibial stress syndrome commonly caused by over pronation (rolling in) and poor landing mechanics[10]. Untreated shin splints can lead to stress fractures.

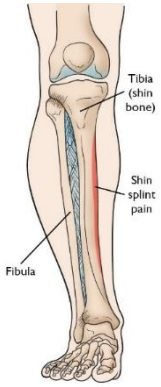

Diagram 14. Shin splints

Working safely to achieve your turn out

If you are experiencing any of these injuries or are having trouble figuring out what is holding you back from achieving the best possible turn out range you, consider getting a dance specific health screening to assist you to pinpoint the issue so you can work safely and effectively towards it. Safe dance practice protects the longevity of your dance career so it is important to treat your body with utmost care, especially with intensive training!

End

Currently a dance science and anatomy lecturer at the dance department, as well as a body conditioning, advance ballet and jazz at the musical theatre department of LASALLE College of The Arts. Charmaine also provides private coaching for dancers from the Elite programme for local and international dance competitions. Charmaine is the first Singaporean to graduate with a MSc in Dance Science from Trinity Laban Conservatoire of Music and Dance in 2013.

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