SCAPE dance

5 reasons why we need dance science in Singapore right now
(Staying at home? It's conditioning time)

Author: Farah Fadzali, May 2020
Co-authors: Charmaine Tay, Reina Teh

5 reasons why we need dance science in Singapore right now.

Dance science is a new area of research study where scientific principles are applied to enhance dance and movement performance, improve dance training, promote care, reduce injury, and safe post-rehabilitation return to dance[5]. Currently, dance science has a large number of following and an organisation that supports it, namely, The International Association of Dance Medicine and Science (IADMS). Formed in 1990, the IADMS is an organisation that was founded by an international group of dance medicine practitioners, dance educators, dance scientists and dancers. Today, the organisation has over 900 members worldwide, from 35 different countries.

However, despite a growing dance scene in Singapore, we currently do not have an organization over looking the well-being of dancers and dance educators, or a centralized space in which information on dancers' health can be accessed. Hence, it is important for us to start shifting our emphasis onto the healthcare of dancers for the following reasons:

1. High injury rate amongst dancers in Singapore

A 2017 study [3] conducted in Singapore reported a large population of dancers in dance companies (69.9%) with recurrent injuries. However, these high numbers are not inclusive of freelance and ad hoc dancers, which could potentially mean that the numbers might be higher than reported.

During the 2019 IADMS 29th annual conference in Montreal, a researcher (Nico Kolokythas, PhD) presented their study[4] in evaluating the effectiveness of strength and conditioning program for dancers. The program was modelled after the FIFA 11+ injury prevention regimen and was launched at the Elmhurst Ballet School, UK. The results showed that the number of injuries were reduced by 40%. Potentially something similar can be considered for the dancers here so that injury occurrence can be lowered in Singapore.

2. Increased demands placed on 21st century dancers

Due to an increase in physical demands placed on 21st century dancers, such as having to train and perform multiple genres, increased number of performance items per dancer, and increased length of dance pieces, it is important for dancers to increase their knowledge on the understanding of their bodies from a biomechanical and physiological point of view. This will help them understand how they can work with the body's potential and limitations better.

3. Better understanding between medical professionals and dancers in Singapore

For many dance practitioners, quitting is not an option at all. More often than not, injured dancers are often reluctant to seek treatment for their injuries, self-diagnose and are uncertain about which physiotherapist or doctor to consult. Therefore, it is imperative that dancers are aware of how to recognise, prevent and seek professional rehabilitation methods. On top of that, medical professionals too are highly encouraged to communicate effectively with their dance patients. By having a better understanding of the dancers, medical professionals will be able to help injured dancers to return back to training stronger than before.

4. Little research available on ethnic/cultural dances within our region

In the world of dance medicine and science research, there are far more research on western dance genres such as ballet, than there are on ethnic / cultural dances such as Malay, Chinese or Indian dance. In Singapore, the average amount of dancers are either traditionally dance trained, or a versatile dancer with training in more than one dance genre. Hence, it is important to identify the unreported injuries and the cause of them as these dancers' have received little attention in medical literature. Perhaps it is a good time to start looking into the underlying training methods in relation to ethnic dancers in our region.

5. The Covid-19 circuit breaker got us locked away from our studios, but we still need to keep up with training at home.

With the COVID-19 situation, we are all left to own devices to figure out how to maintain our bodies and keeping with training at home. Many of us are unable to resume our usual dance training and rehearsals in purpose-built facilities and have to work with what we have at home. We have to give attention to the amount of friction of the flooring so as to not slip and fall, and its ability to absorb shock so we do not put extra stress on our knees and ankles. Unlike sprung flooring we get with dance mats overlay, our homes might not be the most appropriate place to train. However, we can continue to keep up with strength and conditioning exercises that can be easily done with yoga mats and make-shift weights during this trying time.

This is also a great opportunity for dancers to rest, recover and rehabilitate from any injuries they might have. Rest is an integral part of training that us dancers tend to forgo due to time constraints. Rest allows our body to retain what we have trained for and recharge our bodies to do more when it returns to work.

During this time, we should practice injury prevention in every aspect - strength and conditioning, rest, recover and rehabilitate our recurring injuries. This is to ensure that we will be ready to start dancing again when we are allowed to return to the studios!

What can we expect from these articles?

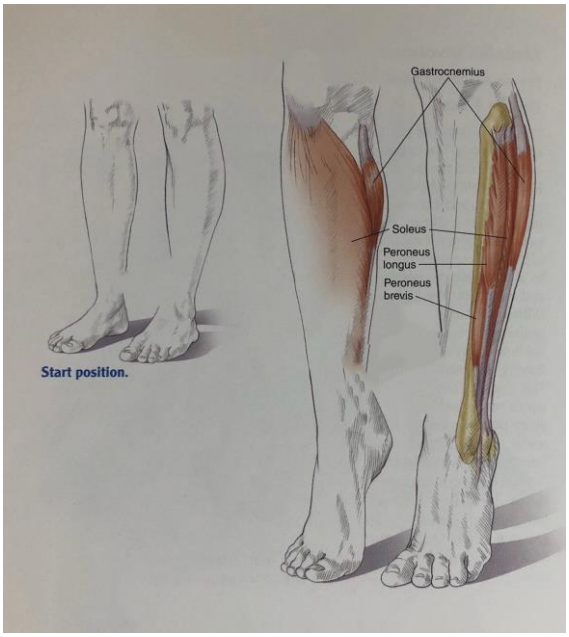
Through future *SCAPEdance Science articles, we will discuss on topics that will help enhance the performance and health of dancers in Singapore. These Topics pertain to anatomy, nutrition, physiology, biomechanics, injury prevention and many others, across multiple dance genres.

Our aim is to equip dancers and dance educators with a better understanding of how the body works, as well as bringing current research in bite-sized portions to keep you updated in the world of dance medicine and science. That being said, we can potentially enhance the health and well-being of dancers in Singapore by reducing the injury occurrences. We are excited to share with you more in the weeks ahead! While waiting for our next article, why not try out some of these strengthening exercises below?

Staying at home? It's conditioning time!

Getting bored of staying at home during this circuit breaker? Well it is time for conditioning! Here are 4 conditioning exercises for dancers with no equipment needed:

Calf Raises:



Jacqui Greene Haas, 2010

Muscles Involved:

Calf muscles

- Gastrocnemius
- Soleus
- Peroneus longus
- Peroneus brevis

Execution:

1. Stand in parallel with legs placed slightly hip distance apart. Keep your body in a neutral alignment. Align the shinbone over the second toe.
2. Begin to go onto a rise / tippy toes and imagine putting your weigh in between the second and third toe.
3. Hold for 2 to 4 counts before returning with control.

Extra Challenge:

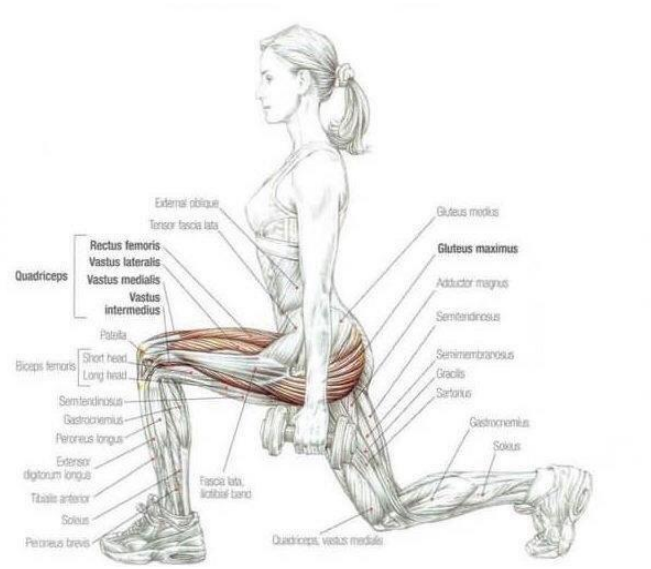
- Calf raises with in turnout / feet in a "V" formation with heels touching each other
- Add a soft ball in between your heels

Dance Focus:

The Australian Ballet has been conducting calf endurance exercises with their company dancers. Since then, they have witnessed a huge reduction in lower-leg injuries.

In addition to that, exercising against your body weight will give you more awareness and dynamic challenge. In dance, any travelling movement involving pivots require power in order to push off in a horizontal direction. For ballet dancers, the muscles along the outside of your lower leg also provide strength and the ability to wing your feet in a coupé-type position.

Curtsey Lunge:



Frederic Delavier, 2010

Execution:

1. Standing in parallel feet shoulders width apart.
2. Exhale and take a big step back bending both knees and cross the moving leg past your supporting leg.
3. Ensure that your back is straight, chest lifted.
4. Inhale and return to starting position.

Extra Challenge:

- Curtsey lunge with dumbbells in hands as shown in the image

Muscles Involved:

Gluteus

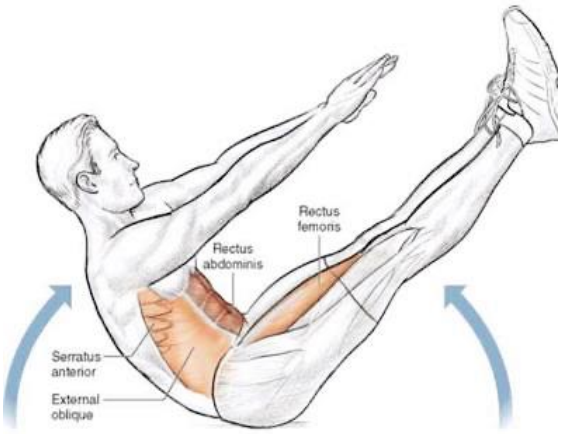
- Gluteus maximus

Thighs / Quadriceps

- Rectus femoris
- Vastus lateralis
- Vastus medialis
- Vastus intermedius

Dance Focus:
It is important that every dancer has the ability to hold any passive position actively and this requires a lot of strength and stability. The advantages of performing a curtsey lunge is to strengthen these major muscles which will help in holding active turn out, developpes (holding your legs in the air), posture as well as balance.

V Up:



Bret Contreras, 2013

Execution:

1. Start with lying on your back, bringing your arms over the head.
2. Inhale and exhale to V-up, touching the toes
3. Return to starting position with control on the next inhalation

Extra Challenge:

- Hold the V-up position for a longer duration before returning to the starting position.

Muscles Involved:

Abdominals

- Transverse abdominis
- Rectus abdominis
- External oblique
- Serratus anterior

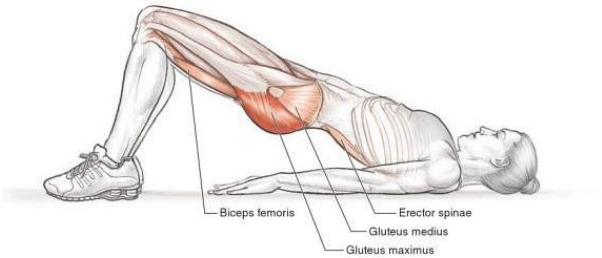
Quadriceps / thighs

- Rectus Femoris

Dance Focus:
Having a strong abdominal muscle plays a major role in injury prevention. The fundamental of a strong abdominal helps in maintaining and controlling of position and posture. A strong and well engaged abdominal can instill stability and enhance movement stability such as pirouette / turns, dynamic jumps.

The difference between the abdominals and core muscles is that the abdominals is a targeted group of muscles, whereas the core is a structure that involves the shoulders, abdominals, pelvis and hips.

Bridges:



Joe Puleo, Patrick Milroy, 2018

Muscles Involved:

Glutes

- Gluteus medius
- Gluteus maximus

Lower back

- Erector spinae

Execution:

1. Start with lying on your back, knees bent and feet flat on the ground. Keeping your arms by your side palms facing the floor.
2. Exhale and lift your hips off the ground until your knees, hips and shoulders from a straight line. Imagine peeling your back off the floor. Ensure that you keep your glutes and abdominals engaged to prevent overextension of the back throughout the exercise.
3. Hold the position for a few seconds.
4. As you inhale, slowly return to the floor, resisting gravity.

Extra Challenge:

- Bridges with resistance band placed on top of your hips or middle of your thighs , held down by your hands.
- Bridges with a soft ball in between the knees.
- Single leg bridges with one leg off the floor.

Dance Focus:
Hip bridges are particularly useful for activation of the glutes to hold your positions in turn out. Besides, hip bridges can also enhance core stability as well as hips extensions for movements such as arabesque.

An MSc in Dance Science graduate from Trinity Laban Conservatoire of Music and Dance, Farah has multiple experience in teaching movement therapy in various organisations in Singapore.

Farah is now a dance science researcher studying injury prevention and performer's health and safety practices. Together with her achievements and qualifications, Farah hopes to work towards the development of dance science research in Singapore.

Reference

1. Adam, M. U., Brassington, G. S., Steiner, H., & Matheson, G. O. (2004). *Psychological Factors Associated with Performance-Limiting Injuries in Professional Ballet Dancers*.

2. Bowling, A. (1989). Injuries to dancers: Prevalence, treatment, and perceptions of causes. *BMJ : British Medical Journal*, *298*(6675), 731–734.

3. Chia, J. K. (2017). Survey Study on the Injury Patterns, Dance Practices and Health Seeking Behaviour amongst Dancers in Singapore. *Annals of the Academy of Medicine, Singapore*, *46*(2), 76–78.

4. Fuller, M., Moyle, G. M., Hunt, A. P., & Minett, G. M. (2019). Ballet and Contemporary Dance Injuries When Transitioning to Full-Time Training or Professional Level Dance: A Systematic Review. *Journal of Dance Medicine & Science*, *23*(3), 112-125.

5. *International Association for Dance Medicine & Science*. https://www.iadms.org/

6. Jeffries, A. C., Wallace, L., & Coutts, A. J. (2017). Quantifying Training Loads in Contemporary Dance. International Journal of Sports Physiology and Performance, 12(6), 796–802.

7. Ojofeitimi, S., Bronner, S., & Woo, H. (2012). Injury incidence in hip hop dance: Injury incidence in hip hop dance. *Scandinavian Journal of Medicine & Science in Sports*, *22*(3), 347–355.

8. *One Dance UK*. https://www.onedanceuk.org/

9. Riding McCabe, T. (2014). Fit to Dance Survey: A Comparison with DanceSport Injuries. *Medical Problems of Performing Artists*, *29*(2), 102–110.

10. Teitz, C. C. (2000). *Hip and Knee Injuries in Dancers*.