## S#CAPE dance



## Understanding the process of recovery: Proprioception

### Charmaine Tay, September 2020

We all have that one injury that keeps recurring over and over again, no matter how many times we get it "treated". We call that a chronic injury and it happens because we return to dance training before we really should, mostly when we do not feel the pain anymore. But does no pain equate to us being ready to full swing ourselves back into training? Possibly not.

### **Injury Consequences**

As a result of acquiring an injury, the damage to the joint goes beyond physical destruction of the surrounding tissues. However, dancers have the tendency to get right back into training once pain is not felt anymore, leaving out on the most important part of rehabilitation process, that is, working on the residual effects of an injury, such as:

- Impaired proprioceptive deficits (loss of balance and joint position sense)<sup>5</sup>
- Altered muscle spindle activity (muscle spindles are sensory receptors found on muscles that detect changes in muscle contractions contributing to fine motor control providing

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information on limb positions to the central nervous system) and slower muscle reaction  $\mathsf{times}^2$ 

- Increased joint laxity (joints becomes loose and unstable)<sup>8</sup>
- Impaired joint alignment due to laxity<sup>7</sup>
- Loss of balance / postural control<sup>7</sup>
- Decreased movement confidence<sup>4</sup>

Understanding the consequences will help us plan a better rehabilitation program with our healthcare professionals, so we can safely return to the dance training while preventing injuries from recurring (chronic injuries).

### **Preventing chronic injury**

When we get injured, say we sprain an ankle, the injured tissue (eg. a stretched ligament) fails to provide afferent neural feedback to our central nervous system<sup>3</sup>. With a lack of appropriate input from peripheral nerves, the central map of 'kinaesthetic self' is altered<sup>1</sup>. In other words, your body "forgets" what the appropriate range of motion for that particular joint is, and allows it to move beyond a safe range. This means that the joint is prone to a chronic injury even when the pain is gone. In order to prevent injuries from returning when we get back to training, we need to stabilize the injured joint by retraining the proprioception of the joint (joint position sense)<sup>6</sup>.



### **Retraining proprioception**

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There are 3 levels of the central nervous system (CNS) involved in proprioception that needs to be retrained

#### 1. Reflex spinal level

In the early stages of rehabilitation, the use of sports joint guards such as ankle guards, knee guards and braces can assist in preventing excessive movement in the injured joint. The tissue level of proprioception restoration should be addressed through physical modalities, eg. manual therapy, electrotherapy<sup>1</sup>.

2. Brain Stem level

For early to intermediate stages of rehabilitation, augmentation of joint position sense and muscular co-activation is needed for joint stabilisation<sup>1</sup>. This includes exercises such as static single legged standing for ankle injuries and static press-up hold for upper limb injuries and

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joint position matching.

#### 3. Cortical level

At a late to pre-discharged stage of rehabilitation, dancers should focus on increasing the speed and duration of reflex stabilisation of the affected joint. This is achieved by employing sudden directional and speed changes such as agility drills. This increases the number and speed of mechanoreceptor recruitment<sup>1</sup>, preparing dancers for weight shifts in varying choreographic demands.

Dance consists of repetitive practice of movements that requires a flexibility, strength and endurance, making dancers prime candidates for chronic injuries<sup>6</sup>. Dancers should ensure that the joint is adequately stabilized instead of rushing to go back in full swing for training once the pain is gone. A complete rehabilitation process should be considered a natural part of a dancer's life as their body is their only instrument and it requires proper care for a prolonged career-life.

End.



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