



Dancers and MSI: Prevention and treatment

There are many things you can do to help prevent and treat musculoskeletal injury (MSI). An MSI can be painful and can interfere with both your professional and personal life, so it's important to use prevention strategies. If you already have an MSI, there are treatment options that will help you stop the injury from getting worse and speed up the healing process.

To find out more about symptoms, see the information sheet “Dancers and MSI — Symptoms, Contributing Factors, and Types of Injuries.”

Prevention

Although it is important for dancers to take responsibility for their own health and safety, choreographers, instructors, stage managers, and other individuals who work with dancers should also strive to ensure that dancers are adequately protected against injury. The prevention strategies described here are not only for dancers but also for those who work with them.

Warm up before dancing

Warming up before dancing helps reduce the risk of injury by:

- increasing the temperature of muscle and connective tissue, which is associated with a decreased risk of soft tissue injury
- stimulating the cardiovascular system to adjust blood flow from the body's core to the active muscles, where the need for oxygen increases in response to exercise
- stimulating joint lubrication and preparing the joints for full range of movement

An adequate warm-up should accomplish each of these three goals.

Correct improper technique

Researchers have identified improper technique as a major contributor to injury. Injuries resulting from improper technique tend to recur even after successful treatment because dancers tend to resume dancing with the same technique that first led to the injury. This illustrates the importance of long-term dance training that includes a focus on correcting improper technique.

Dance in warmer studios

Warmer studios help increase blood flow and prevent injury. Cold environments are associated with decreased blood flow to the extremities. When blood flow is decreased, the affected body parts are more prone to injury.

Dance on sprung floors

According to Newton's third law, for every action there is an equal and opposite reaction. When jumping and completing high-impact manoeuvres, a dancer exerts a force on the floor, while the floor exerts an equal force on the dancer. These forces can have a strong impact on the dancer's feet and joints. Sprung floors absorb some of the force, decreasing the acute impact on the body.

Remain aware of limitations

When instructors and choreographers are aware of dancers' physical and mental limitations and requirements, dancers are less likely to feel pressure (whether real or interpreted) to push themselves beyond their capabilities. Dancers who become fatigued and push themselves beyond their physical capacity are more likely to adopt sloppy technique or make unsafe movements, increasing their risk of injury. Dancers should remain aware of their own limitations and know when to stop.



Maintain communication

Maintaining communication between dancers and artistic instructors, choreographers, and directors helps maintain the health of dancers. Brief conversations in class or rehearsal help those involved monitor the physical and mental status of dancers. Identifying problems early may help reduce the likelihood of injury. Open communication provides both an opportunity and permission to identify symptoms of developing soft tissue injuries before they become problematic.

In addition, showing a genuine interest in the well-being of dancers can have a positive effect on their level of stress and state of mind. A dancer's status can provide valuable information regarding the balance between the intensity of the workout and the adequacy of rest and recovery.

Rest between workouts

Any type of fitness training, including dancing, is based on the overload principle. To see an improvement in fitness, the body must work harder than it is accustomed to working. This principle works well as long as the muscles get adequate rest between workouts. Without rest, muscles become fatigued and can no longer do the same amount of work. Stress then shifts from the muscles to other soft tissue such as tendons and ligaments. Most soft tissue injuries occur when the muscles are fatigued.

With adequate rest between workouts, muscles become increasingly strong and able to sustain more force, and thus do more work. Adequate rest breaks allow dancers to feel refreshed and ready to continue working near their physical limitations without progressively increasing their levels of pain, discomfort, or fatigue.

Rest when injured

Deal with acute MSI immediately to prevent further damage — care during the first 72 hours of an acute injury is critical to its outcome. The RICE treatment protocol (see “Treatment”) is an effective treatment for acute soft tissue injury.

Most soft tissue injuries require rest in the form of modified activity to allow the damaged tissue to heal. Modified activity may range from reducing the intensity of activities that stress the damaged tissue to completely stopping all activities that affect the injured region. Consult with a medical professional who is familiar with sports or occupational injuries and the dance industry. Knowing the difference between delayed-onset muscle soreness and pain resulting from injury is important for determining when to rest and when to continue physical activity.

Get proper nutrition

Maintaining the body in a strong, resilient state requires enough balanced nourishment to support the caloric and metabolic demands of high-level physical activity and to develop a strong structural foundation in the musculoskeletal system. Bone density and muscle mass depend on an adequate supply of nutrients to support constant tissue remodelling.

Avoid strain when carrying equipment

Carrying equipment, clothing, costumes, and other items can place a significant amount of stress on the neck, shoulders, arms, and hands. Select appropriate containers for your gear, preferably lightweight containers with padded handles or shoulder straps. Avoid using bags with narrow straps or handles because these increase the effects of contact stress. If possible, use wheeled carts or bags (such as overnight travel suitcases) with handles that allow you to pull them while in a full standing posture.

Treatment

The first level of injury management is recognizing early warning symptoms and administering simple self-help techniques such as the RICE treatment protocol. Ideally, dancers should learn to identify symptoms and use self-help techniques at an early age. The second level is recognizing symptoms that are persistent or unusual and seeking professional medical assistance.

Early warning symptoms

Learn to recognize MSI symptoms. Early warning symptoms include:

- discomfort, pain, tingling, or numbness while dancing
- weakness or difficulty with fine control of movement
- stiffness or limited range of motion
- postural changes (for example, shoulders elevated or rounded forward)
- local swelling or redness

If you notice discomfort or pain while dancing and circumstances allow it, take a break until the symptom subsides. Avoid working through the pain. In most cases it will only get worse if you continue to dance.

Early self-help techniques

If you experience early symptoms of MSI, try the following techniques:

- Identify aspects of your training habits or dance technique that may be contributing to the symptom. Correct bad habits or improper technique.
- Increase the amount of rest and decrease the duration of continuous dance time until you can dance without symptoms. This may mean allocating more rehearsal hours with more frequent breaks to obtain the same amount of daily dance time.
- Perform a thorough warm-up at the beginning of your rehearsal or performance sessions.

- Determine which movements contribute to the symptoms, and reduce your intensity and level of repetition while rehearsing those movements.
- Alternate physical rehearsal with mental rehearsal (visualization or imagery) to balance your physical demands with adequate rest, while maintaining a focus on performance.

RICE treatment protocol

Use the RICE treatment protocol (rest, ice, compression, and elevation) during the immediate stages of injury (the first few days) to help reduce the amount of damage to your body. The protocol helps decrease swelling, discomfort, and muscle spasm as well as prevent further injury. Although the protocol will help manage your injury, seek guidance from a health-care professional to manage persistent or worsening symptoms.

Rest

Rest the injured area to avoid further aggravation. You can continue with a normal workout routine but should avoid any activity that results in discomfort or stress to the injured tissue.

Ice

Apply ice or cold packs to the injured area for 15–20 minutes to help reduce swelling and manage pain. Never place ice directly on your skin because this can result in frostbite. Place crushed or cubed ice in a wetted towel and then place the towel on the affected area. If ice is not available, a pack of frozen vegetables works just as well.

Do not use alternative methods of icing (creams, balms, or rubs) because they only cool the first layers of skin and not deeper into the injured area. Never use ice to numb an area so you can keep performing through pain. This only masks the symptoms and you may make the injury worse.

Compression

Wrap the injury in a tensor bandage, using a criss-cross method. Compression reduces the swelling of the injured body part by forcing fluid away from the injured tissue. Compression and ice often can be combined by wrapping the ice in the tensor bandage.

Elevation

Elevate the injured area above the level of the heart to help move fluid away from the injury.

Other treatment methods

An injury that persists or becomes worse and begins to affect your ability to continue dancing should be addressed first using conservative (non-surgical) treatment methods. Involving sports-medicine specialists in the treatment program has been shown to result in a high success rate.

Conservative treatment methods may include:

- activity modification
- correction of dance technique
- physical therapies
- nutrition advice
- medication
- splints
- orthotics
- taping
- ultrasound
- acupuncture

If you are unable to dance during rehabilitation, consider keeping fit by using other strength and fitness programs such as the Pilates Method.

When conservative treatment methods are ineffective or the initial injury is particularly severe, more aggressive (surgical) approaches may be necessary. Dance injuries

that require surgical intervention are likely to benefit from dance-specific rehabilitation that includes a focus on maintaining and re-establishing joint mobility, flexibility, and strength.

Rest and proprioception

Rest after injury, particularly lower limb injury, plays an important role in maintaining or restoring proprioception. *Proprioception* is the sense of perception, usually on a subconscious level, of the movements and position of the body. Sense organs in the joints provide awareness of the positions of the joints, which is critical for posture, balance, and coordinated movements.

Proprioception is important for dancers who are trying to coordinate difficult choreography and to balance in difficult positions. Postural stability requires adequate proprioception from the ankle joint.

Proprioception is decreased for several weeks in dancers who have sprained their ankles but will gradually improve as the injury heals. Dancers with ankle injuries have decreased postural stability and are more likely to suffer reinjury if they return to dancing before regaining full proprioception.

When to seek medical assistance

If symptoms continue to occur each time you dance, continue to get worse, or are unusual for you, seek medical assistance. If symptoms continue to persist after you have stopped dancing or if they appear at times other than when you are dancing (for example, during sleep), seek immediate help from a health-care professional who is experienced in treating dancers' injuries.

For a list of health-care professionals who have experience treating MSI for dancers, contact SHAPE.

