DANCERS' HEALTH CORNER

Pointing you in the right direction

BY KATHERINE EWALT

Note: The "Dancers' Health Corner" is a regular column for *DSD* written by Katherine Ewalt from Performing Arts and Athletic Restorative Training Specialists (PAARTS) here in San Diego. The column presents information and/or advice about dance-related injury and injury prevention. The information is provided as a resource and should not be used to self diagnose or treat. Dancers who experience ongoing pain should seek the advice of a physician or clinician to avoid aggravating current symptoms or potentially causing other more serious injury. Due to legal limitations, no individual diagnosis or treatment plans will be provided through this forum. If you have questions, e-mail them to info@PAARTSsandiego.com.

Q: What is spondylolysis, and what can be done for this particular injury?

A: Spondylolysis is a defect of the pars interarticularis of a vertebra. This defect may have various causes including congenital (defective from birth), infection, disease, or as a result of a traumatic or repetitive-use injury. This injury usually affects the fifth lumbar vertebra, although in ballet dancers it may present in the upper lumbar region.[1]

Figure 1

The majority of injuries in dance are caused by repetitive microtrauma, and spondylolysis is no exception. This injury is often the result of repeated hyperextension of the back (backward bending of the trunk). Repetitive movements, such as cambre back (figure 1), place a great deal of stress on the bones of the lumbar spine, which may lead to a stress fracture to one or both sides of the vertebras pars interarticularis (figure 2). When both sides of the pars interarticularis fracture, the vertebra may become unstable and begin to shift out of place. When this happens, the condition is referred to as spondylolisthesis. If too much slippage occurs, the vertebra may press on the spinal nerves causing increased pain.

Spondylolysis is the most common cause of low back pain in adolescent athletes, particularly in those sports that require movements that arch the back (i.e., dance, gymnastics, blocking in football, weight lifting, serving in tennis, the butterfly stroke in swimming and serving in volleyball). Spondylolysis has been found to have a higher rate of occurrence in dancers and gymnasts secondary to the physical demands and high repetitions of activities requiring an arched back. Additionally, in dancers spondylolysis occurs more frequently in females given that they usually begin their dance training earlier than males and prior to bone in this area solidifying (i.e., during adolescence the area of the vertebra that is injured is more fibrous and vulnerable to injury).

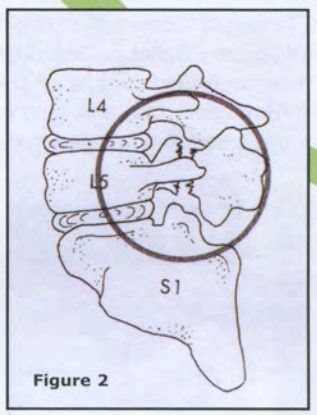

Figure 2

For dancers, one of the primary contributing factors related to spondylolysis is hyperlordosis (increased curvature of the low back. See figure 3 - normal lumbar curvature, and figure 4 - hyperlordosis.) Hyperlordosis is often the result of the dancer forcing turn out at the hip. To achieve greater turn out, the dancer may unconsciously compensate by increasing the curvature of the low back, making this area more susceptible to injury. In addition to altered mechanics, a young dancer may also experience an increase in lordosis secondary to a growth spurt. During adolescent growth spurts, the bones often grow faster than the muscles and tendons can keep up with resulting in tightness in the musculature of the lower extremities and back, which contributes to increased hyperlordosis.

Figure 3

Figure 4

A final consideration is the dancer's level of nutrition, specifically the intake and digestion of calcium and vitamin D as these micronutrients play an essential role in bone development and maintenance during the growth years. It has been found that dancers with low bone mineral density are at an increased risk for developing stress fractures.[2]

Many people who have either a spondylolysis or spondylolisthesis may not experience any obvious symptoms. However, dancers with symptomatic spondylolysis

may complain of a "pinching" pain in the low back, particularly during arabesque and/or cambre back. It is important to have the correct diagnosis as soon as possible to appropriately address the source of the dancer's low back pain. Dancers with low back pain, particularly adolescent dancers, should be evaluated by a physician who specializes in musculoskeletal injuries (i.e., sports medicine or orthopedic physician) to obtain diagnosis.

If the dancer should have a spondylolysis, the physician will determine the best course of action, which may consist of conservative treatment including a period of rest from aggravating activity, a core stabilization program to address muscular support of the lumbar spine, a flexibility program to decrease muscular tension on the low back, and/or possibly the use of an anti-lordodic brace to improve bony alignment during healing. It is important for the dancer to work with a clinician well versed in dance/dance medicine as dance activity is resumed. A specialist in this area will be able to facilitate proper technique and alignment to prevent further injury.

It is important, especially for young dancers, to participate in activities that will help minimize factors that may lead to spondylolysis. Specifically, young dancers should work on flexibility, core stability and proper dance technique to decrease lumbar hyperlordosis. In addition to general lower extremity and low back stretching, following are a few preventative core stability exercises to be included in the daily dance routine (figures 5-7):

Figure 5

Figure 6

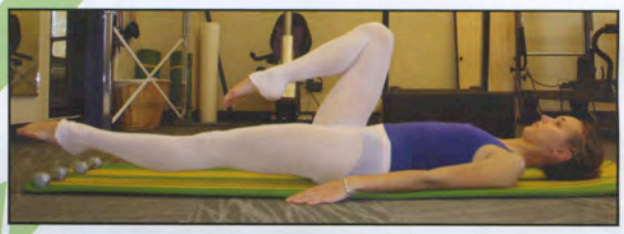

Figure 7

Figure 5
Abdominal Isometrics: Lying on back with knees bent, tighten stomach by drawing belly button to the spine and pressing elbows into the floor.

Figure 6
Bridging: Begin with an abdominal isometric, then slowly raise buttocks from the floor while keeping the stomach tight.

Figures 7
Bicycle: Begin with abdominal isometric, then lift knees. Slowly straighten one leg then alternate while keeping stomach tight.

Model for cambre back:
Corinne Emmenegger, San Diego Ballet

Model for hyperlordosis and preventative exercises:
Abby Avery, San Diego Ballet

References:

[1]*Garrick J. Lecture given at Harkness Center for Dance Injuries "Principles of Dance Medicine" Jan 2007.*

[2]*Frusztajer N, et at. Nutrition and in the incidence of stress fractures in ballet dancers. The American Journal of Clinical Nutrition 1990; 51: 779-83.* DSD

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