

# Back Injury and Gymnastics: What Parents Need to Know

## Prevalence

In a 1993 study of elite female gymnasts, there was an *80% rate of chronic injury* per year and 44/74 had low back pain at one time or another.

**Risk Factors** for childhood back pain have been identified as the following:

- |                           |                                          |
|---------------------------|------------------------------------------|
| -Increased age            | -High levels of physical activity        |
| -History of spinal trauma | -Depression or emotional/ stress factors |
| -Family history           | -Female                                  |
| -Trunk asymmetry          | -Competitive sports                      |
| -Increased height         | -High levels of physical activity        |
| -Competitive sports       | -Depression or emotional/ stress factors |

•Overall injury has also been correlated with practice time (> 20h/wk).

## Why Gymnasts?

- Gymnastics involves movements at extreme ranges of motion of the spine with additional pressure at these end ranges (ie, backhandsprings—the back is arched when hands contact the ground)
- Many gymnasts see nagging pain as common in the sport
- Pain may be seen as weakness in competitive or practice situations
- Ignoring the warning signs often leads to more severe injuries

## Common Spine Injuries and Symptoms

*Spondylolysis* (stress fracture of pars interarticularis)

- Low back pain, sometimes into buttock or thigh
- Usually gradual onset
- Lumbar flexion and extension are limited
- Hypertextension (back bends) are especially painful
- Single leg hyperextension (arch) test (Stork test) usually positive for same-side back pain
- Tenderness to palpation around area of pain

*Baastrup's disease/ interspinous ligament:*

- “Kissing spines”—sclerosis and flattening of bone
- Midline lumbar pain in extension
- Decreased pain with flexion
- Extreme flexion may be painful
- Tenderness between and over spinous processes of vertebrae

*Disc herniations:*

- Acute onset
- Midline or lower back region pain

- Pain ↑ with sitting, driving, coughing, sneezing, pelvic rocks, and sustained hip flexion
- Pain ↓ with changing position or lying down

*Apophyseal ring (end plate) fractures:*

- Occurs due to compressive loads in flexion
- Low back and/ or radiating pain
- Pain ↑ with sitting, coughing, sneezing, or activity
- Straight leg tests increase pain

### **What are the deficits?**

- There are often deficits along with back pain that need to be addressed:
- Flexibility leads to increased lumbar curve, forward tilted pelvis, long abs
- Tight hip flexors
- Weak deep abdominal stabilizers
- Weak paraspinal (low back) muscles
- Tight back muscles
- Tight hamstrings
- Weak gluts
- Poor trunk control

*All of these factors lead to increased lumbar stress.*

•Note: Large abdominals normally trained in gymnastics give trunk support but little segmental effect

### **What this means functionally**

- If a gymnast needs hip extension (back walkover, leap) tightness in hip flexor transfers stress to low back
- If a muscle is tight, it inhibits the opposing muscle force (ie hip flexor limits glut max)
- This means jumping, shock absorption, and controlled lower extremity motion are decreased
- Tight low back inhibits deep abdominals useful to stabilize lumbar spine

In summary, low back pain in children usually means the body is trying to relay a message of dysfunction and future injury. It is wise to take your child to an orthopedist or physical therapist immediately upon the onset of any low back pain that lasts for more than 1 week. Often early detection and simple retraining of deep abdominal musculature and stretching of key core muscles can mean the difference between a great season and being sidelined for months.

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