



Warm-Ups in Youth Sports

MYTH: Youth teams do not need to warm up.

FACT: Warm-up serves two functions:

1. Improvement of muscle dynamics so that the muscle is less inclined to injury
2. Prepare the athlete for the demands of the exercise.

RESEARCH: A 1 degree Celsius rise in muscle temperature has been shown to increase the length-to-failure of rabbit hind-limb muscles (*Garrett et al. Am J Sports Med. 1996*)

“A 1 degree Celsius rise in muscle temperature (with warm-up) increases the muscle length to failure. It probably is impossible to prevent muscle strain injury; however, preventative measures can make muscle more resistant to stretch-induced (strain) injuries.” (*Kirkendall et al. Clin Ortho & Rel. 2002*)

MYTH: Warm-up will wear players out.

FACT: Warm-up should produce light to mild sweating without fatigue. Ideally, warm-up should increase muscle temperature but not decrease energy stores.

RESEARCH: Other proposed physiological effects of warm-up include the following:

- Increase speed and force of muscle contractions
- Provide more oxygen to working muscles
- Increase contraction speed and reduce reaction time
- Increase blood flow through active muscles

MYTH: Stretching puts kids at more risk for injury because they're so flexible.

FACTS: Research shows no increase in injury and is thought to perhaps decrease incidence of overuse injuries long-term.

RESEARCH: “Given proper supervision and appropriate program design, children can increase muscle strength and do not appear to be at any greater risk of injury than other young athletes who have not undergone such training.” (*Gay & Micheli, JAAOS, 2001*)

ADDITIONAL RESEARCH:

- Children with high isometric extensor muscle endurance were less likely to report back pain. (*Anderson et al, Spine 2006*)
- Features that predicted symptoms in patellar tendinopathy (“jumper's knee”) were low thigh flexibility and strength (*Crossley et al, J Orthop Res. 2007*)
- Soccer players with lower preseason flexibility in hip flexors and hamstrings had higher risk for muscle strain in those muscle groups during the competitive season – irregardless of age, body size, limb dominance, playing position (*Bradley, J Strength Cond Res. 2007*)
- Soccer players with increased tightness of hamstrings or quads have statistically higher risk for subsequent musculoskeletal lesion (*Witvrouw et al, Am J Sports Med. 2003*)



Stretching in Youth Sports

MY EXPERIENCE

- Kids who come into the clinic with apophysitis of various joints (Osgood-Schlatters, Severs, etc) are most often very inflexible AND very weak in the hips/core.
- Adolescents who grow >6 inches in a year often present with back pain, which may be caused in part by tight lower extremity musculature.
- Seeking treatment earlier (rather than waiting until sitting out of sport because of pain) helps in outcomes.

RECOMMENDATIONS:

- Warm-up and dynamic stretching should be implemented prior to physical activity – ideally 15 minutes immediately prior to the activity.
- Warm-up should produce mild sweating but not fatigue.
- Static stretching should be part of a long-term fitness routine in order to benefit from the long-term plastic changes but should NOT be done before workouts, as it may decrease muscle strength for up to 30 minutes following static stretch.
- Stretches of long duration and low force are most effective (20-30 seconds) for showing improved flexibility long-term.

STRETCHING (see attachments)

*** Hamstrings ***

Quadriceps

Piriformis

Hip Flexors

Groin

IT Band

Gastrocnemius-Soleus