



**American Radiology: Tips From the Training Room
October, 2009 – Delayed Onset Muscle Soreness (DOMS)**

What is Delayed Onset Muscle Soreness (DOMS)?

- Delayed Onset Muscle Soreness (DOMS) is caused by microscopic tearing of muscle fibers which results in muscle soreness and stiffness . The pain is typically felt 24-48 hours after strenuous eccentric exercise
- Athletes usually experience this pain at the beginning of a new exercise routine, after a change in sport seasons, or after a significant increase in the duration or intensity of the exercise
- DOMS typically subsides 2-3 days after peak discomfort
- This muscle pain is a normal response to unusual exertion and leads to greater muscle stamina and hypertrophy

What causes DOMS

- Any stress that one's muscles is not accustomed to can cause DOMS
- Eccentric muscle contractions (tension on the muscle while lengthening) seems to cause the most soreness.
- Examples include: going down stairs, running downhill, lowering weights and the downward motion of squats and push-ups.

What can be done to alleviate DOMS?

- Rest -- soreness will go away in 3 to 7 days with no special treatment. Avoid any vigorous activity that increases pain, and allow the soreness to decrease significantly before returning to an established exercise program
- Ice or ice bath for 15 to 20 minutes duration. This will help to reduce the pain and swelling associated with DOMS
- Active recovery techniques such as low-impact aerobic exercise to increase blood flow.
- Gentle stretching of the affected muscle groups.
- Massage the affected muscles. Massage helps to increase blood flow to the affected area and decrease point tenderness.
- Temporary use of an anti-inflammatory such as Ibuprofen, Advil, or Aleve
- If the pain persists longer than about 7 days or increases despite these measures or the athlete experiences severe cramping or change in urine color, consult a physician

What can be done to prevent DOMS?

- Warm up thoroughly before activity and cool down completely afterward. Recommended time for warm up and cool down is 10-15 minutes apiece.
- When beginning a new activity, start gradually and build up your time and intensity. One should not increase the workload by more than ten percent per week.
- Take time to recover. It is important to incorporate some rest days into your training regimen. Working out too much for too long can lead to overtraining syndrome, and can increase the amount of time it takes to recover from DOMS
- When starting a new exercise program, avoid movements that involve strenuous eccentric muscle contractions
- Avoid making sudden major changes in the type and amount of exercising

What muscle groups does DOMS affect the most?

- Large muscle groups, such as the quadriceps, hamstrings, and the pectoral muscles seem to be the most commonly affected
- These muscle groups are affected because during new bouts of exercise, major muscle groups are targeted before smaller muscle groups are refined

Who is affected by DOMS?

- Delayed Onset Muscle Soreness can affect anyone if the proper precautions have not been followed
- Those who are beginning a new intense exercise program are more likely to be affected by DOMS than those who follow a more gradual routine