

What Causes Muscle Soreness After Exercise?

Understanding Delayed Onset Muscle Soreness (DOMS)

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Delayed onset muscle soreness (DOMS) is a phenomenon in which muscle pain or stiffness develops a day or two after exercise. While it is most common in people who have just started exercising, it can happen to anyone who has dramatically increased the duration or intensity of a workout routine.

DOMS is considered a normal response to unusual exertion and is part of an adaptation process by which the muscles recover and undergo [hypertrophy](#) (an increase in muscle size).

Causes of DOMS

DOMS is not the same thing as muscle pain experienced during exercise or one caused by an injury such as a [strain or sprain](#). Rather, it is related to microscopic tears that develop in muscle fibers as you exert them excessively. These microtears can also occur if you engage in movements your muscles are not accustomed to, such as new exercise.

[Eccentric muscle contractions](#), in which a muscle contracts as it lengthens, are the type most associated with DOMS. Examples of this including descending stairs, running downhill, lowering weights, doing deep squats, and lowering yourself during push-ups.

Treating Muscle Soreness After Exercise

There is no one, simple way to treat delayed onset muscle soreness. While gentle stretching, vibration therapy, and even ice-water immersion have all been suggested as reasonable options, most studies have been contradictory as to whether these actually work or not.

In the end, personal experience will dictate which works best for as an individual. Some of the methods commonly used by athletes include:

- [Active recovery](#) is a technique that involves using low-impact aerobic exercise immediately after a workout to increase the blood flow to overworked muscles. The increased blood supply may also help alleviate swelling.
- [An ice or contrast water bath](#) is something many professional athletes swear by and employs a "quick-fix" cooldown of inflamed or overexerted muscles.
- [Sports massage](#) is also believed to increase blood flow to the muscles and may lessen the severity of stiffness and swelling.
- [RICE \(rest/ice/compression/elevation\)](#) is a technique used to treat acute injuries but may be appropriate if you feel you have seriously overdone it.

- [Nonsteroidal anti-inflammatory drugs \(NSAIDs\)](#), like aspirin, ibuprofen, and naproxen, can significantly relieve inflammation and speed healing.

If all else fails, simple [rest and recovery](#) will allow the body to heal itself in its own time. However, if the pain worsens or persists more than seven days, call your doctor and have it checked out.

How to Avoid DOMS

As simple as it may sound, the best way to avoid DOMS is to prevent it in the first place. It demands that you [listen to your body](#) and take cues if even an exercise moves from stress into pain.

It also requires that you start your workout correctly. One of the reasons why microtears occur is because the muscles are tight before you start training. If they are not properly [warmed up](#) and you move straight into exercise, your muscles are less able to stretch and will more likely tear, sometimes seriously.

There are several other ways to avoid this whether you're a new to exercise or an experienced athlete:

- [Progress reasonably](#). While you may want to get bigger fast, taking the slow and steady route not only prevents injury, it can lead you to your goal faster. If you push too hard or use too-heavy weights, you will more likely than not do the exercise incorrectly.
- [Follow the 10 percent rule](#) whereby you increase your activity no more than 10 percent per week. This includes the distance, intensity, and time of your exercise routine.
- [Cooling down](#) is just as important as warming up. By doing so, you prevent blood from pooling in the large muscles and help relieve both inflammation and the buildup of lactic acid.

If in doubt about how to exercise safely and effectively, invest in your health by [hiring a personal trainer](#). Even persons who exercise regularly can benefit from interacting with a trained professional, improving their form while reaping greater benefits from their workout.

Sources:

Zimmerman, K.; Leidl, K.; Kashka, C. et al. "Central Projection of Pain Arising from Delayed Onset Muscle Soreness (DOMS) in Human Subjects." *PLoS One*. 2012; 7(10):e47230. DOI: [10.1371/journal.pone.0047230](https://doi.org/10.1371/journal.pone.0047230).