

Setting A Course To Marathon Recovery

By ACSH Staff — November 2, 2015



[1] **Marathon runners. Credit:**
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With a 45-year history, the New York City Marathon has grown beyond a simple annual opportunity for bragging rights just for finishing. A true test of endurance, the 26.2-mile run can truly wreak havoc on the body of even the most experienced runner.

But what happens after the race ends gets much less attention.

After experiencing the well-known endorphin high, there are three major changes the body undergoes: **skeletal muscle damage**, **cellular damage** and **alterations in the immune system**.

Much of the post-marathon soreness and fatigue is secondary to skeletal muscle inflammation. One [study](#) [3] of the effects looked at biopsies of calf muscles of marathon runners, comparing pre-marathon samples during the period of intensive training to post-marathon samples taken at various intervals over the course of a week. Researchers found significant evidence of muscle fiber necrosis (cell death) and inflammation in both pre- and post-marathon calf samples.

The abnormal findings persisted up to seven days after having run the race, but were most prevalent at one and three days. These findings were correlated to symptoms of rhabdomyolysis and myoglobinuria. Rhabdomyolysis refers to the death of muscle fibers, leading to (sometimes irreversible) kidney injury. Myoglobinuria refers to the presence of myoglobin in the urine, giving it a dark appearance (a common complaint of many post strenuous exercise). It is usually associated with destruction of muscle.

The damage that occurs to the body post-marathon on a cellular level is indicated by a number of markers within the blood. Elevated levels of creatinine kinase, lactate dehydrogenase and myoglobin can be found. These intracellular substances which can be leaked from blood cells under stress can give a quantitative indication of the level of damage to muscle and cardiac tissue. Adding to this, during periods of intense and strenuous physical activity the body produces reactive oxygen species. These species contribute towards cellular damage, specifically DNA damage. One [study](#) [4] found that these markers of cellular damage lasted for more than a week in

runners who engaged in a 42-km marathon.

After running a marathon, there appears to be a shift in immune function. Notably, there's an increased incidence of upper respiratory tract infections within three to 72 hours post excessive exercise.

Researchers from one [study](#) [5] hypothesized that exercise related immunosuppression is due to tissue trauma sustained during intense exercise. This tissue trauma was the inciting factor for the release of cytokines, increased circulating stress hormones (cortisol and catecholamines) and other regulators of immune function. The researchers concluded that in cases of excessive exercise, much like in marathon runners, there wasn't immunosuppression, but rather an altered focus of immune function which rendered our runners susceptible to infection.

All that said, here are a few [tips](#) [6] for those runners hitting the road to post-marathon recovery:

The biggest immediate concerns are dehydration and exhaustion. Many runners aren't able to stomach a meal (no pun intended) just after the race. That's okay. Use this time to rehydrate.

Water, as always is best, however, energy drinks are also acceptable during this period, as they help with electrolyte replacement. Electrolytes address salts, commonly found within cells, that are important for normal functioning of the body (sodium, potassium, chloride).

Bananas (as well as fruit, in general) are good alternatives as your appetite improves and you work your up to a meal. The bonus of fruits are the antioxidants that help with the oxidant stress caused by the reactive oxygen species.

Central to the repair of cellular and muscle damage is protein, so make sure you're eating a healthy portion with each meal.

Finally, as most studies highlight, the effects of marathon running go well beyond one week. So when you return to running, it's advisable to start slow and gradually ease back into your regimen.

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