Limits to ‘no pain, no gain’

By Gretchen Reynolds, New York Times

Exercise makes us tired. A new study helps to elucidate why and also suggests that while it is possible to push through fatigue to reach new levels of physical performance, it is not necessarily wise.

On the surface, exercise-related fatigue seems simple and easy to understand. We exert ourselves and, eventually, grow weary, with leaden, sore muscles, at which point most of us slow or stop exercising. Rarely, if ever, do we push on to the point of total physical collapse.

But scientists have long been puzzled about just how muscles know that they’re about to run out of steam and need to convey that message to the brain, which has the job of actually telling the body that now would be a good time to drop off the pace and seek out a bench.

So, a few years ago, scientists at the University of Utah in Salt Lake City began studying nerve cells isolated from mouse muscle tissue. Other research had established that contracting muscles release a number of substances, including lactate, certain acids and adenosine triphosphate, or ATP, a chemical involved in the creation of energy. The levels of each of those substances were shown to rise substantially when muscles were working hard.

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