



Massage Today

September, 2001, Vol. 01, Issue 09

Miles, Myths and Musings

By Keith Eric Grant, PhD, NCTMB

"Every morning in Africa a gazelle wakes up. It knows it must move faster than the lion or it will not survive. Every morning a lion wakes up and it knows it must move faster than the slowest gazelle or it will starve.

It doesn't matter if you are the lion or the gazelle, when the sun comes up, you better be moving."

- Maurice Greene (100m Olympic gold medalist)

Last Sunday was one of those idyllic summer days on which the inland temperatures were moderated by a gentle inflow over the hills from the San Francisco Bay. I found myself sitting with friends at a table outside of a coffeehouse in the early afternoon, pouring over maps and charts spread out before us. What had brought us together was the common purpose of running a 199-mile relay from Calistoga to Santa Cruz.

The preamble to this meeting for me has been a spring and summer reckoned by a week-to-week increase in my running. It has meant a return to some familiar places and routes, after several years of letting my distances dwindle amid the pulls of professional and parental responsibilities. In an interesting synchronicity, I had started increasing my running about six weeks before I was asked to join the relay team. It was a reminder for me that, when we set ourselves to a goal, things often occur around us to aid and further motivate us. As I've spent time running up ridges and over hills, I've had opportunities to muse on the physiology and psychology of training.

Challenging Our Lactate Threshold

There is a persistent myth that massage relieves muscle soreness by flushing out lactic acid. In truth, lactic acid, which dissociates in solution into lactate and hydrogen ions, is only present in excess during and immediately following high-intensity exercise. It is metabolized within 30-60 minutes after such exercise

ceases. Moreover, lactate is not a toxic end-product; it is an efficient energy-storage and transportation medium.

As we increase the pace of exercise, our bodies produce pyruvate, the end product of glycolysis, faster than it can be processed. To keep us moving, our bodies perform a metabolic "trick" of sorts, shuttling the pyruvate to lactate. The lactate formed from pyruvate can slip quickly and quietly out of cells and into surrounding tissues and blood, where it can be picked up and used as an energy source by less active muscles. As long as our exercise intensity is only producing lactate within our body's ability to process it, blood lactate levels will only rise slightly, then stabilize. If we exceed this level of exercise intensity, the lactate levels in our blood will increase dramatically - we have passed through our lactate threshold (LT). The good news is that by designing our training to regularly challenge our LT for short intervals, our LT will increase. In running, LT is one of the best predictors of race performance.

Delayed Onset Muscle Soreness (DOMS)

Soreness occurring 24-72 hours after exercise is termed Delayed Onset Muscle Soreness (DOMS). The exact mechanisms involved in DOMS are uncertain, but researchers believe they involve micro-trauma to individual muscle fibers resulting in calcium ion leakage and a cycle of inflammation response. Most DOMS is experienced following suddenly increased workouts, particularly those resulting in eccentric contractions - muscles being lengthened while resisting against the lengthening, as in walking down stairs or running downhill. Increasing eccentric exercise gradually conditions our muscles and avoids the soreness.

Musings on Exercise and Massage

Eliminating lactic acid removal as the focus of post-exercise massage, we are left with a therapy that sports experience shows to be effective, yet lacks a clear mechanism for such effectiveness. Research indicates that the simple post-exercise administration of effleurage does not result in an increase in local blood flow or in accelerated recovery. Other research indicates that massage, combined with an active cool-down, increases the rate of recovery during short breaks between maximal efforts.

One difficulty in interpreting such results comes from the early 20th century tendency to view the body as a simple machine. We mistakenly look for massage to have direct mechanical effects. What seems more likely is that massage acts as a new input to a system with a memory. In my observation, fatigued muscles tend to remain hypertonic and shortened. When we cajole specific muscles to relax and lengthen via mechanical

and neurological input, we reduce their metabolic activity and the compression they exert on surrounding tissue. In my opinion, it is not the direct action of massage, but the action of massage to create a new homeostasis, that allows the natural process of recovery to occur more efficiently.

When I run intensely, I notice results beyond the obvious. Running involves not just my legs, but the core muscles of my trunk, the stabilizers of my hips and ankles, and the coordinated movement of my arms. It requires training my determination and mental focus to challenge my muscles and breath when going up hills, and the speed and efficiency of my neuromuscular motion patterns when going down hills. At times, the fatigue and soreness bring an increased sense of vulnerability and the need for nurturing human contact - another role that massage can fill for athletes.

As I finish writing this article, I'm preparing for a backpack trip into the eastern escarpment of the Sierras -- a journey with a loaded pack along a creek, from the sagebrush-covered hillsides of the trailhead, through the miles and several thousand feet of climbing, to a high alpine lake nestled at the foot of an even higher pass. It strikes me as the perfect preamble for a massage.

"The woods are lovely dark and deep, but I have promises to keep, and miles to go before I sleep, and miles to go before I sleep."

- *Robert Frost*

References

1. The Providian Relay (<http://www.therelay.com>)
 2. Owen Anderson, 1998: *Lactate Lift-Off*, SSS Publishing Inc., Lansing MI, ISBN 0?9663?7260?3.
 3. P.M. Tiidus and J.K. Shoemaker, 1995: Effleurage massage, muscle blood flow and long-term post-exercise strength recovery, *Int J. Sports Med*, 16(7), 478-483.
 4. J. Monedero, and B. Donne, 2000: Effect of recovery interventions on lactate removal and subsequent performance, *Int J sports Med*, 21(8), 593-597.
-

Click [here](#) for more information about Keith Eric Grant, PhD, NCTMB.



Page printed from:

http://www.massagetoday.com/archives/2001/09/11.html?no_b=true