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INSIDE THIS ISSUE:

- From the Desk of the President
- 101st Annual Training Conference Registration Information
- New Jersey State Parole Board—Myths and Realities About Parole

The Four-Minute Workout?

By Matt Brzycki, Assistant Director of Campus Recreation, Fitness, Princeton University

You may have spotted advertisements for the ROM (Range of Motion) Machine (aka The Time Machine) in one or more magazines such as *Discover*, *Forbes*, *Popular Mechanics*, *Scientific American*, *The Atlantic*, *Time* and *Vanity Fair*. Advertisements for the device also appear regularly in *Skymall*, a complimentary magazine/catalog that's available on airplanes.

According to the advertisements, exercising "exactly four minutes per day" on the ROM Machine will produce the "combined results" of 20 to 45 minutes of aerobic training, 45 minutes of strength training and 15 to 20 minutes of stretching. In other words, four minutes on the ROM Machine is supposedly the equivalent of 80 to 110 minutes of physical activity.

That's very difficult to believe but the one claim that's sure to raise an eyebrow is that as a result of exercising four minutes on the machines, a 180-pound person will use—no typo—465 calories. According to the manufacturer, the person would use 40 calories during the four minutes of exercise, 150 calories in the two hour period after exercise and another 275 calories in the remaining time of a 24-hour period.

No scientific evidence is given to support this fuzzy math but let's do some figuring of our own. First of all, using 40 calories in four minutes is far from impressive. That rate of caloric expenditure—10 calories per minute—would be produced by a 180-pound individual who jogged at a pace of about 3.91 miles per hour. That's a mile in about 15:22 ... yes, 15 minutes and 22 seconds. Actually, that speed is more akin to a brisk walk than a jog. So using 40 calories in four minutes of exercise isn't such a big deal.

What about the claim that 150 calories are used during the two hours after exercising on the machine? Well, simple math shows that this works out to 75 calories per hour, which, again is very difficult to believe. Most studies that investigate caloric expenditure after exercise report much less than that and even less during the subsequent hours. In one study, for example, the subjects used about 190 calories above resting levels in the 14.2 hours that followed 45 minutes of vigorous cycling or about 13.4 calories per hour. (By the way, the 45 minutes of cycling used about 519 calories). There's no reason—or proof—to believe that the ROM Machine can produce the degree of "afterburn" as claimed during the two-hour period post-exercise (or nearly 24 hours post-exercise, for that matter).

In support of its product, the manufacturer cites eight studies. But five of the studies have absolutely nothing to do with the ROM Machine; rather, the studies investigated the effects of intense efforts of short duration. Of the remaining three studies, two are actually the same study. So, there are really only two studies that have investigated the ROM Machine. It's worth taking a quick look at these studies.

The first study was conducted at the University of Southern California way back in 1995. In the study, 18 "untrained" subjects used the ROM Machine five days per week for eight weeks. Each session involved four to eight minutes of training. The subjects increased their oxygen intake by about 6%. This isn't much of a surprise since the subjects were "untrained" - meaning that they were sedentary—and *any* amount of exercise would produce at least some improvement. In a later interview, the individual who orchestrated the study appeared to distance himself from his research, stating that it "wasn't anything [he] could scientifically publish." In fact, the study was never published in a scientific journal or anywhere else.

The second study was conducted in The Netherlands and carved into two poster presentations that were shown at the 2007 Annual Meeting of the American College of Sports Medicine in New Orleans. That same year, the presentations were published as two brief abstracts in a peer-reviewed journal. In the study, 16 "untrained" subjects used the ROM Machine three times a week for eight weeks. Each session involved eight minutes of training, four minutes with the upper body followed by four minutes with the lower body. Over the course of eight weeks, each subject trained for a total of 3.2 hours. The subjects increased their isometric strength by 5.2%, decreased their body fat by 5.2%, increased their maximum oxygen intake by 3.5% and increased their maximum power output by 9.7%.

Once again, these results are no real surprise considering the fact that the subjects were "untrained" (sedentary). The real head-scratcher, though, is that in a cycling test to exhaustion, the subjects increased their endurance by 72%, from 14:51 to 25:31. This improvement is so astounding that it must be interpreted with extreme caution. It should be noted, too, that the latter study was funded by a fitness center that utilizes the ROM Machine.

Bottom Line: There's no scientific proof that the ROM Machine lives up to it's billing ... or the \$14,615 price tag.