

My First Half-Century in the Iron Game

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For many years I believed, wrongly as it turned out, that I could sometimes use muscular soreness as one means of determining the effects of an exercise: I believed that both the location and the degree of soreness provided me with information that was valuable for evaluating an exercise. But I was wrong, as usual. As it happens, some exercises can make you very sore, while some equally hard exercises never produce the slightest degree of muscular soreness. Why? I don't know; but the observation raises some interesting questions.

But it should be clearly understood that my being confused on the subject of muscular soreness does not make me the Lone Ranger; as it happens, nobody really knows anything about muscular soreness apart from the fact that it is misnamed. The working part of a muscle, the contractile tissues, do not have the type of nerves required to either record or transmit pain; so, in a very real sense, it is not the "muscle" that feels pain. But, as we all know, "something" damned sure can get sore as a result of exercise. It has been suggested that it is the connective tissues that experience such pain, but that is pure guesswork at best.

It has also been suggested that such soreness results from damage to the muscle fibers; but that suggestion is wrong for two obvious reasons: one, muscle fibers cannot feel pain; two, while it is true that a hard exercise performed after a long layoff usually will produce muscular soreness, it is also true that an equally hard exercise performed the following day will reduce the degree of soreness. So, if one hard exercise produced "damage," then two hard exercises should produce more damage and thereby make the soreness worse. But that does not happen.

If, after a long layoff from exercise, you perform a hard first workout on a Monday, then 24 hours later you will have "some," but not much, muscular soreness; and 48 hours after the workout it will be a lot worse; and the degree of soreness will increase day by day for a period of five to six days, eventually reach a peak, and then gradually go away. Assuming, that is, that you perform only one exercise and then quit. The soreness from that one hard workout will not be entirely gone for at least a week, and may last for ten days.

But if, instead, you perform a hard workout every day for three or four days in a row, then the resulting soreness will not be as bad as it would have been from only one workout, and it will go away faster. Thus it is obvious that the first workout causes the soreness but that following workouts tend to reduce and remove the soreness. So I believe we can scrap the theory about damage to the muscle.

Twenty-odd years ago, having just completed the first prototype of a new exercise machine designed to exercise the pectoral muscles, I conducted a testing procedure that I believed would tell me a lot about the effects of the new exercise machine: then not having trained at all for about two years, and thus being out of shape, I performed six hard sets on the new pectoral machine, continuing each of the six sets to a point of failure. I did not believe that performing so many sets was a proper way of training, quite the contrary, I knew that it was gross overtraining. I did that much exercise for another reason: I wanted to get my pectoral muscles as sore as possible, believing that the resulting degree of soreness and location of the soreness would tell me how well the machine was working.

But, surprise, surprise! There was no resulting soreness, not any, nada, zilch; even though my chest was still swollen a week later, was swollen to the degree that I had so-called edema, a condition where a depression in the tissue returns to normal only very slowly.

Having experienced extreme soreness in my pectoral muscles from other exercises, I was almost stunned by the results. That experience, together with similar experience with some other exercises, taught me that some exercises do not cause muscular soreness, while many other exercises do. But please don't ask me to explain it; twenty-odd years later I still do not understand the cause and effect situation involved in such cases.

If, after a long layoff from training of any kind, you start training again, and train very hard from day one, then you will usually experience somewhat delayed muscular soreness. But if, instead, you resume training gradually, devote several workouts over a period of a couple of weeks to relatively easy exercise, slowly increasing the intensity of the exercise

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from workout to workout, then you will experience little or no soreness of any kind. A couple of weeks of such “break-in” exercise will prepare your muscles for the much harder exercises that are to follow, and you will thus avoid any meaningful degree of muscular soreness.

But, once having started truly hard exercises on a regular basis, the initial muscular soreness, if any, should be gone entirely so long as you continue to train regularly. Once having suffered through, and recovered from, the initial soreness, it should then be a thing of the past so long as you do not make any meaningful changes in the pattern of your workouts; that is, so long as you perform the same exercises in the same order, and so long as you continue to exercise within the same range of repetitions that you used at the start of training hard. But adding new exercises to your workout, changing the order of the exercises or the number of repetitions that you perform may produce a relatively low degree of muscular soreness. So it appears that muscular soreness, whatever it is, results primarily from a change in your accustomed pattern of activity; in effect, the body is reacting to something “new.”

It has been pointed out by several people that the negative (eccentric) part of exercise is responsible for most muscular soreness, and Cybex, at a time when their exercise machines provided no negative resistance, used to claim that pure positive (concentric) exercise would never cause muscular soreness. Which statement, of course, was just as true as every other statement made by the Cybex people: pure bullshit.

Negative-only exercise, where positive work of any kind is avoided, does initially cause severe muscular soreness, but this result is not an indication that negative work is “bad” in any sense of the word; it happens only because negative-only exercise enables you to work much harder than would be possible if positive work was also involved. Thus negative-only exercise, if continued to a point of momentary failure, produces a much higher level of fatigue than most exercises ever do. So it should not be surprising that such hard exercise would produce more muscular soreness than would have been produced by a much easier exercise.

Most exercises, where both positive and negative resistance is involved, force you to stop when you can no longer lift the weight (the positive part of the work), but if somebody else will lift the weight for you then you can continue with the negative part of the exercise.

A point of “failure” is properly reached in a negative-only exercise when you can no longer control the downward movement of the weight, when the weight is dropping faster and you are unable to prevent this increase in downwards speed of movement. Having continued the exercise to that point you have then produced a degree of momentary muscular fatigue that is very difficult to equal with any exercise where positive work is involved, a degree of fatigue that is seldom experienced as a result of any other activity. Thus it is a much “harder” exercise. Provides the highest level of intensity that is possible to reach in exercise; and, for that reason, it provides more stimulation for following muscular growth; but it also makes deep inroads into your recovery ability, and if you perform too much negative-only exercise, or perform it too frequently, then you can easily fall into the trap of overtraining: constantly stimulating growth but never providing enough rest between workouts to permit such growth to occur. So some is very good, but more may be a disaster.

But even with negative-only training, you can avoid initial muscular soreness if you start training gradually, avoiding truly hard exercise during the first two weeks of training.

In May of 1975, while we were conducting strength-training research at the West Point Military Academy, the Cincinnati Bengals Professional Football Team sent us one of their new players, a lineman who weighed almost 300 pounds. This man had been signed to a contract and had been paid \$80,000.00 as a bonus for signing the contract; but it appeared that they were about to lose both the man and their money, because he was far too weak to pass a required strength test.

The required strength test that preceded the start of Spring training was scheduled for only twelve days after the player arrived in West Point, and among other things he would be required to chin himself more than once in order to pass the test and then go on to play on the team; but, when he arrived in West Point, he could not even perform a “negative chin;” that is, having stood on a tall stool in order to get his chin over the bar, when the stool was removed from beneath his feet he dropped like a stone, was not strong enough to even slow the downwards movement.

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We could, of course, have trained him with “pull down” type exercises using a weight light enough for him to handle; but, instead, we trained him in a negative-only chinning movement. Because of his initial weakness we had to assist him during every repetition of the exercise, holding our hands beneath his buttocks and exerting enough force to permit him to perform the movements.

Twelve days later he returned to the Spring-training camp and was tested: and he was then able to chin himself four and three quarters times, pulling himself up all of the way and then back down slowly under his own power. This man was trained every second day, using only one set of seven to eight repetitions in each set, at first with our help and then as he rapidly became much stronger without any help.

So don't let any of today's crop of fools try to convince you that negative-only training will not increase your positive strength; you would, in fact, be well advised to avoid all of their half-baked ideas.