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Happy Holidays

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Protocols, Progressions and Pyramids

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

In 1945, Dr. Thomas DeLorme, a physician in the US Army who was assigned to the Gardiner General Army Hospital in Chicago, developed a protocol of “heavy resistance exercise” that called for 7 to 10 sets of 10 reps per exercise. DeLorme used this protocol to strengthen the muscles of soldiers who were wounded and/or injured during World War II. After the war ended, he left the Army and worked at the Massachusetts General Hospital where, in 1948, he and Dr. Arthur Watkins revised the original protocol, scaling it back to three sets of 10 reps and referring to it as “progressive resistance exercise.” (Trivia: At least one researcher credits DeLorme’s wife, Eleanor, as the one who actually coined that particular term.)

The sets that are done in the DeLorme-Watkins protocol are based on a 10-rep maximum (10-RM) which is the most weight that can be lifted for 10 reps. The first set is done with 50% of a 10-RM and the second set is done with 75% of a 10-RM. After these two “warm-up sets,” the “work set” is done with 100% of a 10-RM.

For example, suppose that the most weight that you can lift for 10 reps is 200 pounds or 10 x 200. In this case, you’d do a set of 10 x 100 followed by a set of 10 x 150 then a set of 10 x 200.

In 1951, Dr. Andrew Zinovieff, a physician at the United Oxford Hospitals in England, developed a variation of the DeLorme-Watkins protocol with a radical twist. Zinovieff felt that the protocol as outlined by DeLorme and Watkins produced so much fatigue that other than “in exceptional cases,” it would be very difficult to perform a work set with 100% of a 10-RM after doing warm-up sets with 50% of a 10-RM and 75% of a 10-RM.

Like the DeLorme-Watkins protocol, the three sets in the Zinovieff protocol are based on a 10-RM. Unlike the DeLorme-Watkins protocol—and here’s the twist—the three sets are done in the reverse order. With the Zinovieff protocol, the first set is done with 100% of a 10-RM. After this work set, the second set is done with 75% of a 10-RM and the third set is done with 50% of a 10-RM.

For example, suppose that the most weight that you can lift for 10 reps is 10 x 200. In this case you’d do a set of 10 x 200 followed by a set of 10 x 150 then a set of 10 x 100.

As you can see, the Zinovieff protocol is literally the exact opposite of the DeLorme-Watkins protocol. The basic idea is to use as much weight as possible during the first set and then systematically reduce the weight in the sets that follow to offset the fatigue that was created during the previous efforts.

Which protocol works better? In a 2003 study, researchers randomly assigned 50 subjects to perform the leg extension using either the DeLorme-Watkins protocol or the Zinovieff protocol three times per week for nine weeks. The study found that both protocols produced roughly the same improvements in strength. A 2010 study that randomly assigned 32 subjects to perform the half squat using either the DeLorme-Watkins protocol or the Zinovieff protocol two times per week for four weeks found the same results: There was no significant difference between the two protocols.

So why the history lesson? Well, the DeLorme-Watkins protocol—or reasonable facsimiles of the protocol—remains fairly popular nearly 70 years after it was first introduced. In fact, “three sets of 10” has probably been prescribed and performed more than any other single protocol in history. (More trivia: DeLorme has enjoyed a great deal of fame—among other things being dubbed the father of progressive resistance exercise—while Watkins has remained largely unknown.)

In addition, certain elements of the DeLorme-Watkins protocol are found in other multiple-set protocols, most notably those that are done in a traditional “pyramid” style. At the base of the pyramid, the first set is done with a relatively heavy weight for low reps. This type of system is sometimes referred to as an ascending pyramid or pyramiding up.

An example of an ascending pyramid is 10 x 135, 8 x 185, 6 x 205 and 4 x 215.

But let’s not forget about Zinovieff. Essentially, his protocol is a reverse of the ascending pyramid—think of an upside-down pyramid—and certain elements of it are found in some multiple-set protocols. At the top of the

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pyramid, the first set is done with a relatively heavy weight—the most weight that can be handled for a designated number of reps (which can range anywhere from 8 to as many as 20, depending on the exercise). In descending the pyramid, each subsequent set is done with a decreased amount of weight and number of reps. At the bottom of the pyramid, the last set is done with a relatively light weight for low reps. Usually, all sets are done to the point of muscular fatigue. This type of system is sometimes referred to as a descending pyramid or pyramiding down.

An example of a descending pyramid is 10 x 205, 8 x 165, 6 x 135 and 4 x 115.

A popular application of this system is to use a minimal amount of recovery between sets thereby making it a very time-efficient method of training. When done in this manner, it's known as drop sets, strip sets, break-downs or burnouts.

Bottom Line: Using either ascending or descending pyramids is an effective way of increasing strength.

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Newark Police Chief Speaks at Rider University

In November, Chief Anthony Campos of the Newark Police Department visited Rider University in Lawrenceville, NJ to speak to Professor Ben Dworkin's "Urban Politics" class. Professor Dworkin, who runs the Rebovich Institute for NJ Politics at Rider, described it as "a fascinating conversation that offered insights beyond what any textbook or standard lecture could provide.

