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Combining Strength and Endurance Training

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THE STRENGTH AND CONDITIONING field is full of contradictory opinions concerning training methods. The idea of combining strength and endurance training into one program has been the focus of much research.

Time for exercise is always at a premium for the nonathletes that we train. With such limited time, we need to provide training programs that fill all of the client's needs as efficiently and effectively as possible. Research into combining strength and endurance training has not presented a clear conclusion on how to achieve this goal. Some of the research shows that combining training styles results in either a reduction in strength gains or a reduction in endurance gains compared with training for each separately. Bell et al. (1) reported that strength gains during concurrent training leveled off during the final 3 weeks of a 12-week program, whereas the strength training–only group continued to improve throughout the entire 12 weeks. In contrast, Nelson et al. (2) found that $\dot{V}o_2max$ was increased in both endurance-trained and concurrent endurance- and strength-trained groups, but the increase in $\dot{V}o_2max$ of the concurrent group leveled off after 11 weeks of the 20-week study, whereas the endurance-only group continued to increase $\dot{V}o_2max$. Still other research by Sale et al. (3) found that you could combine strength and endurance training styles and improve on both scales.

The most common method of combining strength and endurance training into a single workout is circuit training. A typical circuit training workout involves moving between a resistance exercise and a cardiovascular exercise every minute. For instance, you would perform 1 minute of chest presses followed by 1 minute of jogging, then 1 minute of leg curls followed by 1 minute of jumping jacks, continuing in this fashion for a specified amount of time. The idea was to increase your heart rate into your target training zone, effectively burning calories by keeping your heart rate up and increasing strength by covering several sets of different exercises.

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Unfortunately, what was found after circuit training was popularized was that increasing heart rate was not the major factor that determined increased endurance. In order to increase endurance, the amount of oxygen taken in and used ($\dot{V}o_2max$) had to increase, which was not happening. Also, performing a resistance exercise for 1 complete minute required a very submaximal intensity that did little to increase strength. People did improve their fitness, but the amount of strength they gained was less than a typical resistance program, and the amount of endurance they gained was less than a typical cardiovascular program.

A little manipulation of the typical circuit training method can solve these problems and give your clients the ability to reach all of their goals. This adjusted method involves combining circuit

Table 1
Example
45-minute Workout

5 minutes stationary bike (increasing intensity each minute)

1 set each (in order):

Chest press, leg press, lat pulldown, hamstring curl, bicep curl, tricep press, crunches, leg extension, shoulder press, calf raises, seated row

5 minutes Stairmaster

1 set each (in order):

Crunches, lunges, bench press, bicep curl, calf raises, lat pulldown, tricep press, squat, seated row, leg extension

5 minutes rowing

1 set each (in order):

Chest press, hamstring curl, tricep press, leg extension, bicep curl, calf raises, shoulder press, squat, lat pulldown, crunches

5 minutes treadmill

5 minutes cooldown (any cardio machine)

training with interval training. You should have the client perform one set of 10–12 different resistance exercises followed by 5–7 minutes of a cardiovascular exercise. Repeat this process over 45–60 minutes of time and you will have completed 3–4 sets of each resistance exercise and 20–25 minutes of cardiovascular exercise. The key here is to keep moving. Instead of resting between several sets of one exercise, move from exercise to exercise and keep your heart rate up. You can alternate upper- and lower-body exercises or alternately work opposing muscle groups so that one muscle group is always resting.

Now you have the ability to increase the intensity of each resistance exercise to a level that will produce gains in strength. The cardiovascular system will also be trained because completing 5–7 minutes of an exercise allows you to move out of an anaerobic state and into an aerobic state and thus burn more calories. Your clients will achieve more in a small amount of time and will reach both their strength and endurance goals. An example 45-minute workout is shown (Table 1). ▲

References

1. Bell, G.J., S.R. Petersen, J. Wessel, K. Bagnall, and H.A. Quinney. Physiological adaptations to concurrent endurance training and low-velocity resistance training. Int. J. Sports Med. 12:384–390. 1991.
2. Nelson, A.G., D.A. Arnall, S.F. Loy, L.J. Silvester, and R.K. Conlee. Consequences of combining strength and endurance training regimens. Phys. Ther. 70:287–294. 1990.
3. Sale, D.G., J.D. MacDougall, I. Jacobs, and S. Garner. Interaction between concurrent strength and endurance training. J. Appl. Physiol. 68:260–270. 1990.

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