Research published in the November 2008 issue of the Journal of Strength & Conditioning Research shows that low-intensity resistance training (RT) can produce the same muscle strength, size and tone gains as traditional high-intensity RT (Tanimoto et al., 2008). For the purposes of this paper, we consider the benefits of low-intensity RT and how Octane Fitness’ “cross circuit training” program meets the criteria of low-intensity RT. However, it is essential to remember that with the “cross circuit training” program, both high and low RT conditions are possible.

Additionally, the “cross circuit training” program, along with the research that supports the effectiveness of low-intensity RT, can be applied to Octane's full line of equipment as the market demands.

**Resistance training intensity defined**

The intensity of RT is calculated by a percentage of one-repetition maximum (1RM) – it is the maximum amount of weight that a person can lift at one time. High-intensity RT is defined as a load or weight that exceeds 80% of 1RM. Low-intensity RT represents 65% or less of 1RM. Due to safety reasons, we rarely get an absolute measurement of the intensity of RT but instead estimate it based on the number of repetitions a person can complete with correct form and without assistance during one set, along with the reported feelings of exertion. The accepted industry standard for estimating 1RM is that the successful completion of twelve to twenty continuous repetitions generally equates to less than 70% of 1RM for most persons (ACE Personal Trainer Manual, 2003).

**Low-intensity resistance training lowers risk**

The primary benefit of low-intensity RT is that it minimizes the risks of RT to the exerciser. Risks associated with high-intensity RT include orthopedic injuries, an elevation in blood pressure, and aortic dissection. Low-intensity RT, as prescribed by the “cross circuit training” program, is the solution for persons that are medically advised against RT – it provides a way for the exerciser to include RT in his program while minimizing the associated risks. The “cross circuit training” program has broad applicability. It is suitable for healthy, active people as well as those persons that have cardiac disease, osteoarthritis, and degenerative joint disease. Additionally, the “cross circuit program” is an option for the aging and any person who prefers to exercise at a low intensity. The bottom line is that low-intensity RT as can be prescribed by Octane’s “cross circuit training” program is appropriate for any person that exercises.

**Choices in workout programs increase adherence and enjoyment**

Recent research shows that when people feel like they have choices during exercise, enjoyment of the activity increases (Wilson and Brookfield, 2009). When people perceive that they have choices relative to exercise, they enjoy it, and they are more likely to stay motivated and ultimately stick with a program to achieve results. During exercise they experience less tension or negativity – all of which increases program adherence and equipment use. One of the most common reasons that people do not adhere to an exercise program is because they do too much, too soon (ACE Personal Trainer Manual, 2003). People are simply more comfortable during low-intensity exercise. The “cross circuit training” program provides people with the freedom of choice – multiple exercise options, varied intensities and other personal comforts that increase enjoyment during exercise, improve adherence and create results.

**Low-intensity resistance training can be as effective as high-intensity resistance training**

Low-intensity RT can yield the same size, strength, and tone benefits as traditional high-intensity RT. Specifically, for low-intensity RT to be as effective as high-intensity RT, the speed per repetition must be three seconds for both the concentric (shortening) and eccentric (lengthening) muscle contraction phases with a one-second pause between the two phases. Doing each repetition at the speed defined above causes tonic or continuous force generation in the muscle. Tonic force generation is defined as “prolonged muscular contraction.” This is the catalyst that triggers the same cascade of events that occurs during high-intensity RT for the muscle to grow in size, strength, and tone.
Low-intensity resistance training guidelines
The results of the Tanimoto et al. study, along with additional supporting research, provide us with a way to show that Octane’s “cross circuit training” program under low-intensity RT can yield the same strength and tone benefits of traditional high-intensity RT. To create the same conditions and to get similar results as the researchers did, follow these guidelines (Ashmore, 2009):

- **Total work-out time** – To maintain program adherence, the goal is to keep each session under 60 minutes.

- **Frequency** – A minimum of two training sessions per week. Allow 13 weeks to see significant improvements in muscle size, strength, and tone.

- **Cardio and strength training intervals** – The “cross circuit training” program follows the traditional model of cardio and strength circuit training where sets of strength training are done between bouts of cardio exercise. The intervals include a three-minute warm-up followed by two minutes of cardio and one minute of strength training. However, these intervals can be changed without affecting the efficacy of program.

- **Intensity (40 – 65%)** – RT intensities as low as 40% of 1RM have been shown to cause the same physiological responses and can thus be assumed to be as effective as 80% 1RM training (Tanimoto, et al. 2009). However, an intensity that represents 65% 1RM is recommended where appropriate. In the real world, this means that, for each set, the last two or three repetitions should be difficult but still completed correctly.

- **Sets per work-out** – One warm-up set followed by three sets. The warm-up set is a light weight or resistance practice set that prepares the brain and muscles for the upcoming exercise.

- **Repetitions per set (eight to 15 reps)** – There is an inverse relationship between RT intensity and repetitions. The greater the number of repetitions per set, the lower the relative intensity of the workout. Remember, twelve or more repetitions generally represents 70% 1RM or below, while less than twelve repetitions per set reflects an intensity greater than 70% 1RM.

- **Active Recovery** – The two minutes of cardio work as prescribed by the cross circuit program are an active recovery period for the exerciser.

- **Rest intervals** – Where appropriate or desired, rest intervals of up to one minute may be incorporated. Again, there is an inverse relationship between RT intensity and rest periods. The higher the RT intensity, the longer the rest period. A rest period of 30 seconds is appropriate where the RT intensity is less than 70% of 1RM.

- **Speed of contraction** – Three seconds for the concentric (shortening) and eccentric (lengthening) phases, with a one-second pause between the two phases. The pause between the two phases can include a “peak contraction”. A “peak contraction” is an isometric muscle contraction at the midpoint of an exercise. It recruits more muscle fibers during the repetition, therefore increases the work and results.

  *Note*: More is not better: five seconds is too long and renders the exercise ineffective. Exercisers should not fully extend the arms or legs. A slight bend in the joint maintains continuous force generation.

- **Recommended exercises** – The researchers’ exercise routine included biceps curls, triceps overhead extension, lateral shoulder raises, squat, and chest press. However, any resistance training exercises can be used.

**Summary**
High-intensity RT is inherently more risky than low-intensity RT. For that reason, many persons do not use RT. However, new research finds that low risk, low-intensity RT can be as effective as high-intensity RT. This is significant because persons who were once advised not to incorporate RT now have the option to do so. Low-intensity RT is also an option for healthy, active persons and those persons that prefer not to exercise at a high intensity. Low-intensity RT, as prescribed by Octane’s Cross Circuit+, can provide a variety of exercises, increasing motivation and adherence to workout programs. It is an engaging way for users to gain strength and tone benefits.
REFERENCES


For more information, contact Octane Fitness at www.octanefitness.com or 888-OCTANE-4.

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