



Conditioning Fundamentals

How Intense Are Your Weight Training Workouts?

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It is generally accepted that training should be intense in order to produce optimum results, and that training which is not intense enough will not result in any improvement at all. So the questions that every trainee must ask themselves (or their coach for that matter) are: “How intense does my training have to be?” and “How can I measure intensity?”

For your cardiovascular workouts this question can be answered quite easily. As long as your pulse rate stays within your target heart rate (THR) your training intensity is just right (3). A good rule of thumb is to stay within 60 to 80% of your maximum heart rate (subtract your age from 220 to find out your maximum heart rate and multiply that number by 0.6 and 0.8 and you have found your THR).

Finding the appropriate level of intensity is quite easy for your cardiovascular workouts. But how can you measure the intensity of your weight training workouts? The following definitions will give an overview that helps answer this question. But first, it is important to

distinguish between relative intensity and training intensity.

Relative Intensity

The term relative intensity defines a weight that you work out with as the percentage of your maximum resistance for that particular exercise. In order to calculate relative intensity you must know your repetition maximum (RM) for a single repetition (1RM) for that particular exercise (i.e. the maximum weight that you can lift once). If your 1RM for the bench press is 240 pounds and you use 120 pounds for repetitions in your training sets, you work out at a relative intensity of 50%. 180 pounds at a relative intensity of 75% and so on.

Choosing an appropriate relative intensity for your workouts depends on your goals. If you want to increase maximal strength, relative intensity should be close to 100% whereas lower intensities of 60 to 80% are usually recommended for increasing muscle mass. A lot of research has been done concerning which relative intensity is best for which

purpose and there is plenty of information available for trainees and coaches.

Training Intensity

Training intensity, however, is a completely different story. Until recently the term was not even defined properly. After completing a set, a trainee usually knows whether or not this set felt intense but how does that rate on a scale? How can you be sure that this set was more intense than the one in your previous workout? How can you write that down in your training log so that at the end of the current training cycle you will be able to evaluate the training intensity of your past workouts?

There is a discussion going on for more than twenty years now as to which training method is superior for building muscle mass and strength. Some trainees and scholars recommend low volume or even single-set training and training to failure. Whereas others recommend not taking sets to failure and apply a higher training volume (i.e. perform multiple sets per exercise). The basic problem here is that there is a whole bunch of

different interpretations of what training to failure actually means.

Sometimes training to failure is described as doing as many repetitions as one can possibly do with a given resistance. Others define training to failure as taking a set to a point where you actually fail to complete the last repetition. Still others speak of training to failure if you cannot move the weight at all any more and require a spotter who helps you re-rack the weight. Fleck and Kraemer listed even more synonyms for training to failure, such as: carrying sets to volitional fatigue, sets to concentric failure, repetition maximums, and sets carried to exhaustion (2).

With all these different terms and definitions, how is a trainee to determine and record the intensity of their workouts? The following system is a suggested method to help better track and define training intensity.

More than half a century ago, Dr A.L. Watkins and Dr Thomas DeLorme of the Harvard Medical School set an important foundation of modern sports science by defining and coining the term repetition maximum (RM) as a criteria for rating training intensity (1). If someone does ten repetitions with a certain weight and these ten repetitions are all he or she can do with such a resistance without compromising good form, then these ten repetitions represent this person's repetition maximum (RM).

Based on this definition by DeLorme and Watkins and the commonly applied strategies of training to failure, four different degrees of training intensity can

be distinguished. These four different methods are listed in table 1.

To record intensity of a set, the number of repetitions that have been completed before the set was terminated can be added to the respective degree of training intensity. Let us say you do three warm up sets (not taken to failure) with eight, ten and twelve repetitions, then this can be written down as: 8nRM, 10nRM, 12nRM.

If you then increase the weight and do your first working set which you finish at your repetition maximum of nine repetitions, this can be written down as 9RM. A set in which you reach the point of momentary muscular failure at the tenth repetition is written down as 9PMF (the failed rep is not counted since it could not be completed). When actually taking a set beyond the point of momentary muscular failure after seven repetitions (e.g. by having a spotter help you complete two forced repetitions), this can be written down as 7PMF+2. Table 2 provides an example of this would be written out.

Instead of just writing down how many repetitions you completed of a certain exercise with a certain resistance you can now include which degree of training intensity you applied in each one of those sets. This information will give you an important feedback which will definitively help you plan and evaluate your training even more effectively.

References

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About the Author

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Table 1. The four degrees of training intensity (4)

The Four Degrees of Training Intensity		
nRM	Non Repetition Maximum	Terminating a set at a fixed number of repetitions or a certain rate of perceived exertion although additional repetitions could be done.
RM	Repetition Maximum	Terminating a set after the final repetition that can be completed in proper form.
PMF	Point of Momentary Muscular Failure	Terminating a set when concentric failure has been reached (i.e. the final repetition cannot be fully completed due to fatigue).
PMF+	Point of Momentary Muscular Failure Plus HITM	Training beyond the point of momentary muscular failure by applying high intensity training methods (HITM) like forced repetitions, drop sets, cheating, etc.

Table 2. Sample Workout Record

1st Set (Warm-Up)	80 pounds	8nRM
2nd Set (Warm-Up)	80 pounds	10nRM
3rd Set (Warm-Up)	90 pounds	12nRM
4th Set	160 pounds	9RM
5th Set	180 pounds	9PMF
6th Set	185 pounds	7PMF+2