

Wave Loading Manifesto

by Ian King | Mon, Mar 07, 2005

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King, I., 2005, The wave loading manifesto, t-mag.com 7 March 2005

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You could say there are two main schools of thought when it comes to getting bigger: the school of volume and the school of intensity. Volume refers to the sets and reps in the training process, whilst intensity refers to how much load is lifted.

Most agree that volume and intensity are inverse. If you raise the volume, you'll lower the intensity. Conversely, to raise the intensity, you need to lower the volume. I'd say that in the reality of general bodybuilding/strength training literature as influenced by North America, the volume group is probably "winning." In other words, that school of thought is dominating.

Why Volume? Historical Influences

Let's look briefly at some potential historical influences concerning the dominance of volume training for muscle size.

The most promoted "scientific" conclusions of significance in American were those that came about around the time of De Lorme, circa 1950-1960's. As I understand it, he was an army surgeon, and to his credit, sought to quantify optimal loading as part of his role in the rehabilitation of soldiers. His conclusions, and those of his era, initially focused on the magic number of 10 reps.

Over time, there was some substance of claim for the need of multiple sets, which ultimately focused around the number 3. There you have it: 3 sets of 10! That was some 40+ years ago, but you wouldn't know it by looking at even the most recent mainstream program designs. The influence of 3 x 10 is still very strong.

Sure, in the ten years following De Lorme's work, there was "scientific" evidence showing support for lower reps, as low as 6! Still, multiple sets, of course, of the same reps.

Cultural Influences

Now, the next two points I make require an open mind. I'm not taking shots at America; these are just my observations and conclusions.

Firstly, North America is typical of a country caught in the struggle to dominate and control all processes of life and nature. The conditioning I find is that if science doesn't support it now, it can't be. The concept of intuition is not only discouraged, it's definitely not taught as a means to reach a conclusion in any individual's life.

In fact, strong penalties such as varying forms of social ostracizing are on hand for those who reach conclusions lacking in "science" and different from what "everyone" believes in. Let's just say, one of the quickest ways to apply pressure and gain compliance is to add the three magical words, "The research states..."

I'm not saying everyone runs from their intuition towards science. Those squatting during the decades after Klein's 1960 studies where "the research showed" that squats were bad must have been relying on their intuition.

There were even some athletes before and during the 1970's participating in strength training in the absence of scientific evidence that it would do them any good. After all, in those days, it may have been considered all right for a shot putter or footballer to lift weights, but not a baseball player, a basketball player or a swimmer! God forbid! There was "no way" a swimmer needed external loading! (If any of you are old enough to remember those days, you'll get my sarcasm!)

Those taking protein powder before and during the 1980's where "research" told us that we needed no more protein than the average 70kg person in the 'burbs (0.7gm/kg) were trusting their intuition. (Yes, I know, researcher Lemon and others came up with some great scientific support for higher protein intake, but it wasn't exactly embraced and adopted by the masses quoting "research" as their justification.)

Now, for those familiar with more Eastern influences, the idea of intuition has much greater respect. The Taoists, for example, have a large emphasis on intuition. Or read the writings of the Dalai Lama, or perhaps the Indian influence through the writings of Deepak Chopra. Whilst I refer to more spiritual influences, don't underestimate the West and East differences in how we judge, value and trust our intuition — and the cost or benefit of this.

Secondly, in the US, domestic research is given precedence. That's putting it nicely. For the most part, research done in distant countries is simply not recognized!

Now, before you think I'm being anti-America, give me a second chance. I have a lot of respect and appreciation for what America has brought to the table. The influence of this great country on cultures around the world is evident. It's not a matter of *if* another country will copy the trends, rather a matter of how long it will take.

My aim here is to help this country stay the great country it is. What I'm teaching is my theory that what makes us strong also makes us weak. This is an incontrovertible reality and one that simply needs respecting. A simple question such as, "How can we benefit from the strength and minimize the damage of the weakness?" is all that's needed to counter this.

At the end of the day, the world is simply a global village. Whilst North American literature dominates the world in the iron game, specifically through major hard copy magazines and more recently online magazines, exposure to dominant training methods in other countries and sports has given everyone more opportunities. Instead of being limited to multiple sets

such as 3 x 10, if you look around you can benefit from various methods, and in some cases, more effective methods.

Cultures that have been noted for their provision of alternatives in training include the former Soviet and East Germans. Generally speaking, Eastern Europe has been a great provider of alternative training methods. If a country is isolated and develops its own solutions to strength training in the absence of influences from North America, we can expect a different approach.

In other words, if coaches and athletes have to find solutions *before* they read copies of a Weider mag, they may be better off!

Is Volume Dominance Justifiable?

"Come on, Ian," some may be saying, "is volume training really that dominant?" Well, let me say this — work out the average rep of any program. If it's over 6, I call that volume dominance. Work out the number of sets of any program, and if it's over 15, I call that volume dominance. Now we're on the same page.

I don't support this volume dominance. I accept that it's been an historical trend reinforced by a cultural trend, but this doesn't give me reason to support it. The fact that person "X" was able to grow on high reps and sets also doesn't do it for me. Nor that the potential of steroids to grow anyone using strength training irrespective of which sets and reps they use. Don't tell me what was achieved by training method "X". Ask yourself — how could you get an even better result!

Without even getting into strength training, size training alone needs intensity to optimize potential. And to get strong, the needs for intensity or lower reps is even more evident. (When I say intensity, I'm referring to high load, low volume. I'm not referring to the high intensity definition used by some that measure muscle discomfort.) Even if you had no interest in the ability to display strength, you'll experience added benefit in size training by learning to manipulate load.

My take on volume and intensity includes the following philosophies:

1) Intensity is more important than load.

Generally speaking, I'll sacrifice sets before I sacrifice how much I lift. I'll reduce volume on any given day by cutting from the end of the sets and end of the workout, not by going lighter.

2) The importance of load increases with training age.

The longer you've been lifting, the lower the average optimal rep will become for you. In your early years of training, an average of 8 reps may have given you the best results. A few years later, providing you're training in a manner that's causing physiological improvements, you may find 5 or 6 is the optimal average rep.

3) Inefficient training has a price.

Sure, you may finally get there, but if you could get there in a shorter period of time and with less training volume, wouldn't that be smarter? Some seek to find how much they can do. I seek to find how little I need to do to get the results. Inefficient training methods (and in this discussion, I refer to higher reps than needed) accelerate muscle imbalances and drain recovery mechanisms.

4) Loading under 80% of your 1 RM is not strength training.

Sets involving reps higher than, say, your 5-8 RM (reps max) aren't considered strength training in the purist definition. This is very much a weightlifting/intensification approach, but worthy being aware of.

Bodybuilders influenced by the North American methods are more likely to dominate in the 60-80% 1RM range, and in some cases the 40-80% 1RM range. This doesn't mean that sets below 80% 1RM aren't of value, just that they have limited value to specific strength training.

Perhaps by now you're asking yourself, "Is there a way I can get to where I want to go with greater ease and lower volume?" Probably! For your consideration, I share the following. Then you have to make your mind up, because no matter what you've been led to believe, you should be making decisions for yourself. There's no one better than you!

The uncertainty you face in making these decisions is far superior than the "alleged certainty" you may believe others have for you through generalized conclusions.

Considering the Alternatives in Intensification of Load

In this article, you're going to learn how to use lower reps (higher intensity) loading to accelerate your size and strength. But I'm going to go one step further and again state another of my training philosophies: Exposure to the same load for more than two sets has limited value.

Sure, it can work, but if used more than sparingly or at the right time, it's inefficient. "Right" times include technical rehearsal (e.g. learning how to do a more complex lift) and where you want volume for volume sake (e.g. 10 x 10 method.)

Before I expand on this philosophy, I'll clarify rep/set options. Put simply, repetition/set schemes can be categorized as three types: standard sets, step loading and wave loading.

Standard Sets: Involves using the same load and the same rep numbers in subsequent sets, most commonly for three to five sets. For example, 3 sets of 10 reps, each set at the same loading. I find this method inefficient. It could be argued that it has a role in the training of less experienced trainees. I accept this, but only as a small part of their training. Even with relative beginners I don't subject them to this training method very often.

Step Loading: Involves raising or lowering the load, even slightly, from set to set. Raising the load is the more common application of this method. This method recognizes the increased strength expression potential from set to set, until fatigue overrides.

This method is particularly useful when using a protocol that involves the same rep numbers for two or more sets. This has excellent application for technically difficult exercises such as the Olympic lifts. I'll use this method quite often in program design when I wish to see two sets of the same reps. Remember, I rarely recommend more than two sets at the same reps!)

Wave Loading: Involves moving the load up and/or down within subsequent sets of the same exercise. This method recognizes the implications of neuromuscular adaptations within a multiple set exercise arising from exposure from higher load.

The above is a simple division into three rep/set methods. You could say that variations in loading parameters on the above three involve a combination of them. You'll also have detected my leaning towards intensification of the training process, so let's explore the option of wave loading.

The "Secret" Weapon: Wave Loading

I say "secret" above with tongue in cheek. I'm not sure if there's such a thing as a secret in information, but it helps market it!

My definition of wave loading is when the load lifted rises and/or falls from set to set. The purpose of wave loading varies, but in essence it involves changing the stimulus more quickly (from set to set.)

Benefits of Wave Loading

There are three main purposes or benefits of wave loading. Potentially, you can accelerate your strength development, increase your explosiveness, or increase your work capacity.

Accelerate your strength development: If your goal is to get stronger (and this goal may result in you getting bigger), you'll move towards this goal more efficiently and quickly by exposure to wave loading.

Standard sets as a strength training method have even less application than they do as a size training method. Step loading and wave loading are the two methods a strength athlete is more likely to dominate and alternate. Wave loading will give you more regular exposure to higher load, more specific to your goal.

Increase your explosiveness: If your goal is to improve the speed at which you displace the load, there's no better training method than some form of wave loading. Provided you select load appropriately and then focus on speed of movement when it counts, wave loading will be very beneficial. Keys to optimizing wave loading for explosiveness are provided below.

Increase your work capacity: If your goal is muscle size, and load as measured by reps x load has a correlation with your success, you'll see accelerated results from the use of wave loading. For example, you might be able to do 10 reps at 80 kgs normally, but after doing 1 rep at 120 kgs, you come back and do 15 reps at 80 kgs. This example shows you the potential training effect on muscle size from wave loading.

Perhaps the single dominant and common purpose of all wave loading is to exploit the principle of neural dis-inhibition. Put simply, this means to trick the mind and body into lifting heavier loads, or being able to perform more reps at any give load, or being able to lift faster at any given load.

The mind-body connection has numerous automatic protective mechanisms intended to prevent you from hurting yourself—which translates in strength training as putting the brakes on how much you can lift! Wave loading, used wisely and appropriately, helps peel back these inhibitions and opens you up to a whole new world of opportunities.

Types of Wave Loading

There are three main types of wave loading: single wave, rapid wave and multiple wave.

1. Single Wave: Here are some guidelines about this type of wave loading:

- A single wave will typically involve 3 or more sets, rarely exceeding 4 or 5 sets.
- The most typical wave is downwards but understand the difference—waves from high rep to low rep favor muscle size; waves from low to high favor muscle strength. This distinction is subtle, but worth sharing.
- Wave loading above 6 reps usually jumps 2 reps from set to set.
- Wave loading below 6 reps will more likely jump 1 rep from set to set.

Examples: (The loading shown is for illustration only. There's no message as to percentage changes from set to set!)

Beginner/low level single waves:

Size based single wave:

1 x 10 @ 60kg
1 x 8 @ 70kg
1 x 6 @ 80 kg (descending)

Strength based single wave:

1 x 6 @ 80kg
1 x 8 @ 70kg
1 x 10 @ 60 kg (ascending)

Intermediate/medium level single waves:

Size based single wave:

1 x 8 @ 80kg
1 x 6 @ 85kg
1 x 4 @ 90 kg (descending)

Strength based single wave:

1 x 4 @ 90kg
1 x 6 @ 85kg
1 x 8 @ 80 kg (ascending)

Advanced/high level single waves:

Size based single wave:

1 x 6 @ 85kg
1 x 4 @ 90kg
1 x 2 @ 95 kg (descending)

Strength based single wave:

1 x 2 @ 95kg
1 x 4 @ 90kg
1 x 6 @ 85 kg (ascending)

Don't assume from the above examples that there are limits to the combination of reps and sets used in single wave loading. For example, in very advanced trainees, my single wave is more likely to look like the below (or it can even be lower):

Size based single wave:

1 x 4 @ 90kg
1 x 3 @ 95kg
1 x 2 @ 100 kg (descending)

Strength based single wave:

1 x 2 @ 100kg
1 x 4 @ 95kg
1 x 6 @ 90 kg (ascending)

2. Rapid Wave: Here are some guidelines about this type of wave loading:

- Rapid waves will typically involve 4 or more sets.
- The most typical wave is progressively downwards.
- Jumps in loading from set to set in rapid wave loading may be more aggressive than single or multiple wave loading, e.g. can involve differences up to 5 reps.

- Multiple wave loading is more likely to be applied to the intermediate or advanced trainee.
- Rapid wave loading is more commonly conducted at or below 6 reps.

Examples:

Intermediate/medium level single waves:

1 x 6 @ 85.0 kg
1 x 1 @ 100.0 kg
1 x 6 @ 90.0 kg
1 x 1 @ 105.0 kg
1 x 15 @ 60.0 kg

Advanced/high level single waves:

1 x 4 @ 92.5 kg
1 x 1 @ 107.5 kg
1 x 4 @ 95.0 kg
1 x 1 @ 110.0 kg
1 x 10 @ 70.0 kg

Again, don't assume from the examples that there are limits to the combination of reps and sets used in rapid wave loading. In more advanced trainees, you may see something like this:

1 x 5 @ 92.5 kg
1 x 1 @ 107.0 kg
1 x 4 @ 95.0 kg
1 x 1 @ 110.0 kg
1 x 3 @ 97.5 kg
1 x 10 @ 70.0 kg
1 x 15 @ 55.0 kg

3. Multiple Wave: Here are some guidelines:

- A multiple wave will typically involve 2 waves, but rarely exceeds 3 waves.
- The most typical wave is downwards.
- Multiple wave loading is usually done under 6 reps. If used in reps over 6, be mindful of the impact of volume.
- Multiple wave loading can involve jumps of 1-3 reps from set to set, most typically 1-2.
- The less the change in reps between sets, the less the change in load.
- Second and subsequent waves are typically done (and this is generally the intent) at higher loads than the load used in the corresponding sets in the first wave.

- Multiple wave loading is more likely to be applied to the intermediate or advanced trainee.
- The second wave doesn't have to mirror the first wave, but most commonly does.

Examples:

Intermediate/medium level double wave:

1 x 5 @ 87.5kg
1 x 4 @ 92.5kg
1 x 3 @ 97.5 kg
1 x 5 @ 90.0kg
1 x 4 @ 95.0kg
1 x 3 @ 100 kg

Advanced/high level single waves:

1 x 3 @ 97.5kg
1 x 2 @ 100.0kg
1 x 1 @ 102.5 kg
1 x 3 @ 100kg
1 x 2 @ 102.5kg
1 x 1 @ 105.0 kg

In advanced trainees, you may see the following:

1 x 4 @ 95.0kg
1 x 3 @ 100.0kg
1 x 2 @ 105.0 kg
1 x 3 @ 100kg
1 x 2 @ 105.0kg
1 x 1 @ 107.5 kg

Tips to Optimize Results from Wave Loading Methods

As foreign as some of these wave methods are to you, so will be the psychology needed to optimize them. Take the 5/1/5/1 method. From the time this method was introduced into America by the former Romanian weightlifting coach (brought to the US by US Weightlifting to train their athletes) in the early 1990's, it was evident that the loading parameters needed a user guide! The following is aimed at being that "user guide!"

Tip #1: You can use low reps most of the time, provided you respect them.

I didn't realize this would've been needed in this "guide" until I was exposed to frequent expressions from North Americans along the lines of, "But you can't go heavy too often or you'll overtrain." When I asked for an explanation, I learned that many believed you can't train under 6 reps for extended periods of time. Or, that if you go low rep for upper body, you can't also go low rep for lower body in the same week.

I was stunned by these paradigms, but in case you too have been conditioned to this, I've given this priority in the guide book. Let me assure you it's okay to use low reps for extended periods of time and even on all workouts in a given week! You just need to be aware of a number of guidelines, which I share with you below.

Tip #2: You don't have to go maximum every set. In fact, you shouldn't!

That "balls to the wall" psyche evident in North American strength training is damaging enough with higher reps, but may be even more insidious with lower reps/higher load.

Depression of the nervous system from more neural-oriented training may have more serious side-effects. Now this could be achieved from higher reps also, but possibly achieved more quickly with lower reps. Understandably, perhaps this is where the belief arose that you can't use low reps for extended periods of time. You can, just understand that you can't afford to go max effort every set, every workout, every week.

Commonly used ergogenics may have more ability to protect you and assist recovery from more metabolic based training (higher reps), but there are less options that will effectively protect/recover you from neural fatigue.

Tip #3: Understand what the purpose of the wave is and protect it.

Each wave has a unique or specific purpose. These include the following:

- Descending waves allow you to bring together neural strength and rehearsal. This is best when you're still gaining the skills needed. Don't go max on the early sets as the fatigue will inhibit the loading on subsequent sets.
- Ascending waves allow you to gain exposure to maximal loading without the prior fatigue of higher rep sets. So, in using your warm-up sets, make sure you progress to the loading of the first work set so that it isn't too much of a shock to the body, but consider keeping the warm-up reps low.
- Rapid wave sets are for the most part intended for the lower rep sets to enhance the work capacity of the higher rep sets. For example, in a 5/1/5/1, the aim of the 1 rep set is to help you lift heavier than you normally would in the second set of 5 reps. Going too close to max in your 1 rep sets will limit this.

It'll also limit your ability to raise the load in any subsequent lower rep sets. Going too heavy in any of the original sets (in this case the first 5 and the first 1) will damage your ability to benefit from the neural dis-inhibition of the second respective exposures (in this case, the second 5 and second 1.)

- Multiple wave sets are intended for the exposure of the first wave to enhance the second wave, and if there's a third wave, the second wave to enhance the third wave. Therefore it's critical that you limit the residual fatigue in any wave prior to the final wave.
- When using wave loading to increase the speed of movement, the same overall principle as discussed in the 5/1/1/5 example above should be applied—if you go too heavy in a prior set, it may limit the transfer of improved speed of movement through to subsequent sets.

Additionally, during sets specifically focused on improved speed, make sure this is your focus and it occurs. These guidelines have important application to Olympic weightlifting and other explosive oriented lifts.

Tip #4: Longer rest periods should be used.

As most wave loading involves lower reps (lower than 6), you should be using longer rest periods (3 minutes or more). There's an inverse relationship between reps and rest period, where the lower the reps the longer the rest period should be. The additional benefit that rest period manipulation offers is in the event that your prior load selection has been higher than ideal. You can take a longer than planned rest period in an attempt to compensate or make up for this error.

Tip #5: You're going to need a spotter more often than with other training methods.

Because of the higher exposure to low rep sets, be prepared to engage a spotter more often. This has implications for those who are training by themselves or where experienced spotters are lacking. Modify your load selection in respect of these limitations.

Tip #6: When using multiple waves, use a lesser number of exercises.

Be very aware that once you add a second or more waves, you're significantly raising the volume of the workout. Provided you have a volume limit you adhere to, you'll need to use fewer exercises.

For example, if I'm using the rapid wave method involving 5 sets, I prefer to limit it to 2 exercises. When using a double wave, I choose not to use a double wave on a second exercise if I were to include it. When using a third wave, I'd only use one exercise for the workout. These examples are based on a volume cap of about 10-12 work sets for the workout. I apply an inverse relationship between the number of sets per exercise and the number of exercises in the workout.

Conclusion

Once you've experienced wave loading, preferably along the guidelines I've provided, you may appreciate the benefit and value they add to your training. Remember, when using these methods you may benefit from adjusting your psychology compared to when you use more conventional, standard set training. Wave loading can provide impressive results, so look for these. If you aren't getting them, review your approach.

On the flip side, if you're getting the impressive results that I believe wave loading offers, you may benefit from being cautioned on the trap of "killing the goose that laid the golden egg." I often see when a specific training method has been productive, this method is applied excessively. Don't do that.

Remember, you're playing with typically lower reps and they require more respect. Consider applying my key training question: "What will I do today to improve my ability to do this session next time?"

Remember, you don't create the training effect (size or strength or whatever) in the session. You create the training effect as a *result* of the session, and this can only be confirmed by improved ability in the next corresponding session!

Give wave loading a shot and tell us how it worked for you!