

THE PERFECT WORKOUT™

20 MINUTES | TWICE A WEEK | GUARANTEED RESULTS

HIGH INTENSITY EXERCISE

The Fast Explanation
of Slow Motion
Strength Training

**PHILIP
ALEXANDER, M.D.**



HIGH INTENSITY EXERCISE

For Mark

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FOREWORD

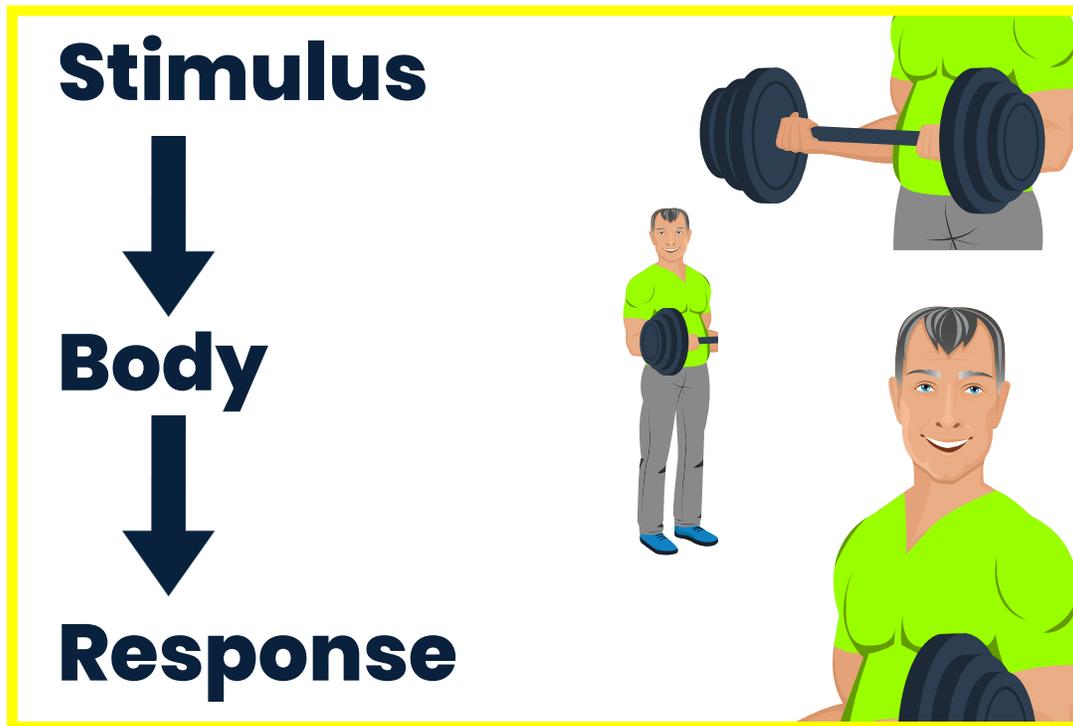
One question I'm often asked in the gym is "Why are you doing it that way?" I hope this book answers that question for you, simply and clearly. It is a condensed version of the countless diagrams I have drawn on paper napkins, and slide presentations I have given, on the "why" and "how" of SuperSlow high-intensity exercise.

I didn't discover high-intensity exercise, and I didn't invent SuperSlow. These came from the minds of Arthur Jones and Ken Hutchins, and the many others who have contributed to this effective, rational, and safe way to improve our physical well-being. This is only my translation of their work, condensed into an understandable and usable form that I hope will give you a practical approach to physical training for the rest of your life.

This book is written for the person who doesn't know a pushup from a pulldown. Before you go to the gym, you need to know what you're going to do, how much you're going to do, and why you're doing it. I hope this book will tell you these, and will enable you to answer that recurring question, "Why are you doing it that way?".

Philip Alexander, M.D.
College Station, Texas
February, 2001

THE BASIS OF EXERCISE



This is as basic as it gets, but unfortunately is often overlooked.

A stimulus (exercise) acts upon the body to make the body itself produce a response (growth and improvement).

It's just like we get a suntan from the sun. The sun didn't make the suntan - the body did. The sun was only the stimulus.

Makes sense, doesn't it?

...

Exercise is a stimulus that acts on the _____ to make the body grow.

body

THE DEFINITION OF EXERCISE

Exercise is performing a demanding and meaningful activity, anatomically and safely, of a sufficient intensity to stimulate the body to make anatomic and metabolic adaptive growth changes within a minimum period of time.

Think about each underlined word in this definition of exercise for a moment. Exercise needs to be of a sufficient intensity to make the body initiate its own growth and improvement. And exercise should certainly be safe. No part of the body should improve at the expense of another part (i.e., don't trash your knees!)

...

Exercise should be of a sufficient _____ to stimulate the body to _____.

intensity
grow

REQUIREMENTS OF EFFECTIVE EXERCISE

- **Sufficient Stimulation**
- **Sufficient Recovery**

For exercise to be effective, you need a sufficient stimulus to the body, and then you need to give the body a sufficient recovery time to allow growth. Again, makes sense, doesn't it?

...

Effective exercise requires a sufficient _____ and a sufficient recovery time

stimulus

THRESHOLD

**The level of exercise intensity
needed to stimulate the body's
adaptive changes
(“*Physiologic Inertia*”)**

There appears to be an exercise threshold, which is a minimum level of intensity needed to stimulate the body to make its growth changes.

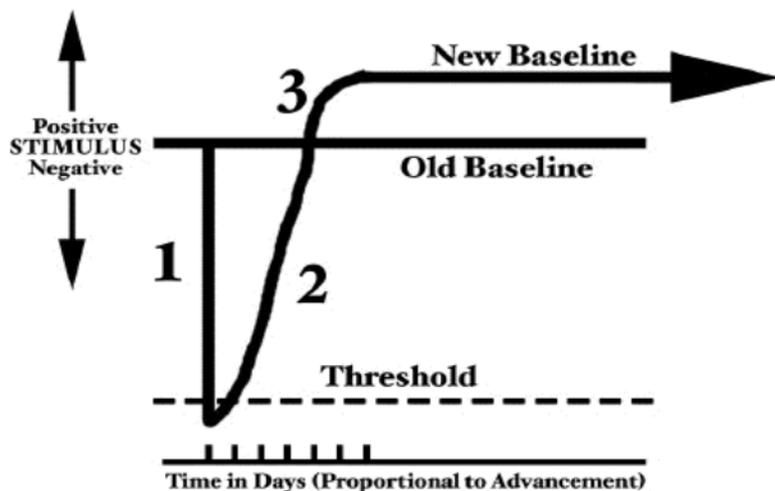
If your exercise intensity is too little, you won't reach the threshold, and the body won't be stimulated to grow. It's like partially turning on a light switch – you make an effort, but not enough to click the switch. But once the light is on, you don't need to flip the switch again and again.

...

The threshold is the minimum level of _____ needed to stimulate the body to grow.

intensity

EFFECTIVE EXERCISE



- 1. Exercise Stimulus**
- 2. Recovery**
- 3. Overcompensation (Growth)**

Here's how effective exercise works.

Your exercise is of sufficient intensity to reach the threshold (1), and then you stop and give your body time to recover (2). If the stimulus was intense enough, and if you allowed enough recovery time, the body will then overcompensate (grow).

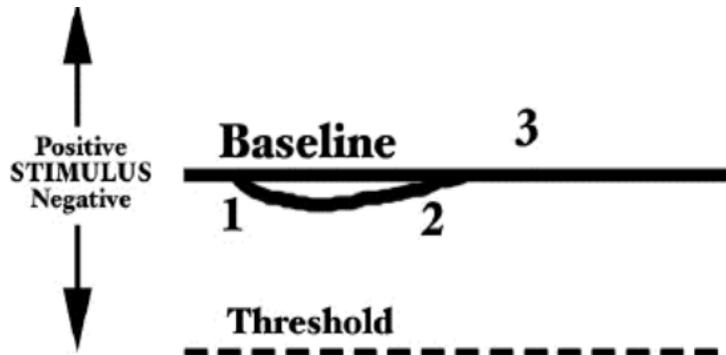
You then have a higher starting baseline the next time you work out. That's the way you want your investments to do, so why not for your body as well?

...

Ideally, you should have a higher physical _____ for each succeeding exercise session.

baseline

INEFFECTIVE EXERCISE



- 1. Low Intensity=Low Stimulus**
- 2. Only Recovery**
- 3. No Overcompensation=No Growth**

In this example, only a low-intensity activity was done, short of the threshold and short of producing any meaningful stimulus on the body.

The only result is that that body simply recovers, with no incentive to grow to a higher physical baseline.

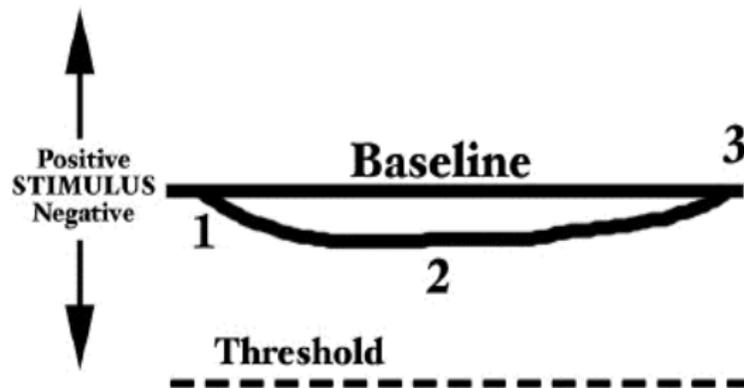
Your savings account is just keeping up with inflation.

...

Low-intensity exercise, which fails to stimulate the body to grow, is largely_____.

ineffective

LOW INTENSITY/HIGH WORK



- 1. Low Intensity=Low Stimulus**
- 2. All Body's Resources Used
Only for Recovery**
- 3. No Overcompensation
(=No Growth)**

This is another example of ineffective exercise, except that the amount of work has increased without an increase in the intensity.

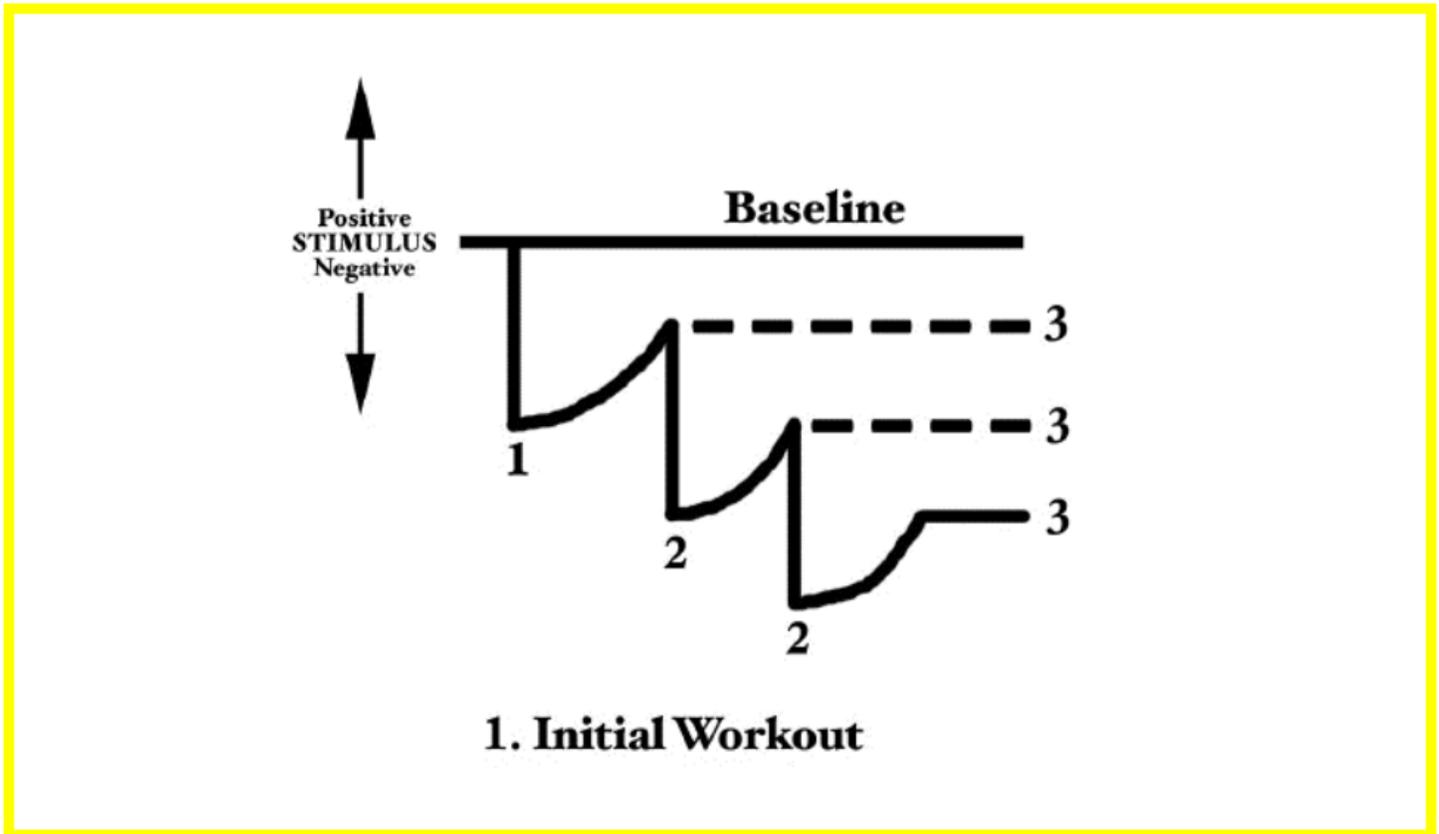
The stimulus was insufficient, and it took the body more time and resources to recover back to where it started. But still no growth.

You're depositing a lot of money, but you're not making a profit.

...

If your investment banker got you similar results, you'd _____ him.

OVER-TRAINING



This is over-training, which is worse than just spinning your wheels with ineffective exercise.

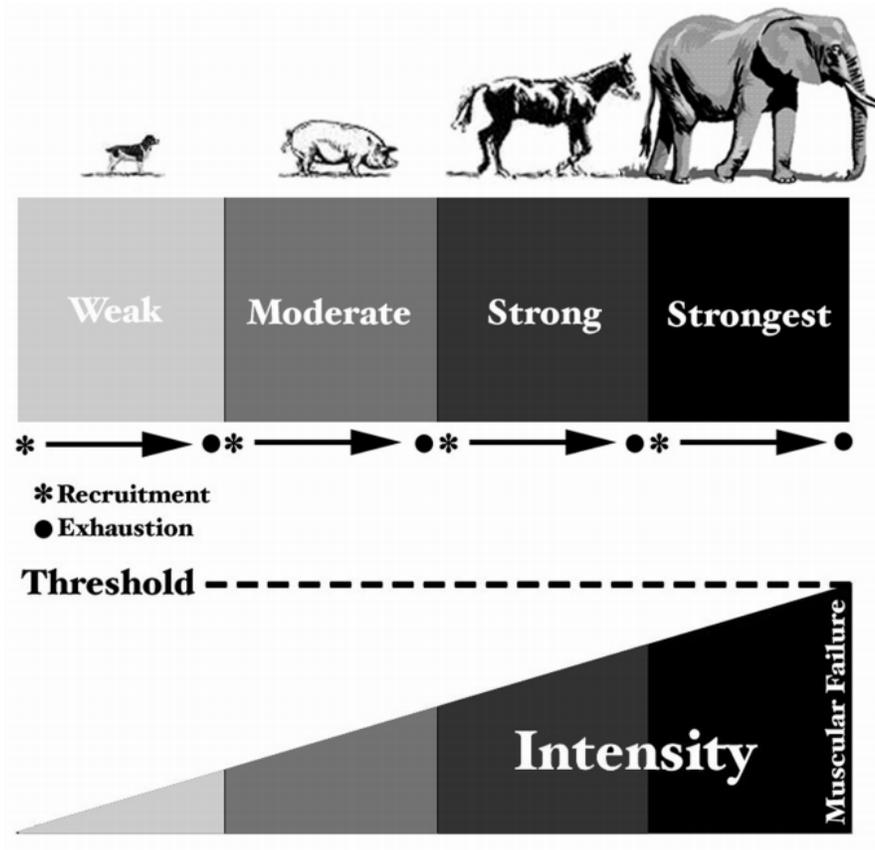
Whether or not your exercise was of sufficient intensity, the problem here is that you returned to the gym before you have fully recovered. This means that you have a progressively lower starting baseline each session.

This time, your investment banker is losing your money.

...

Not allowing enough recovery time results in _____.

over-training



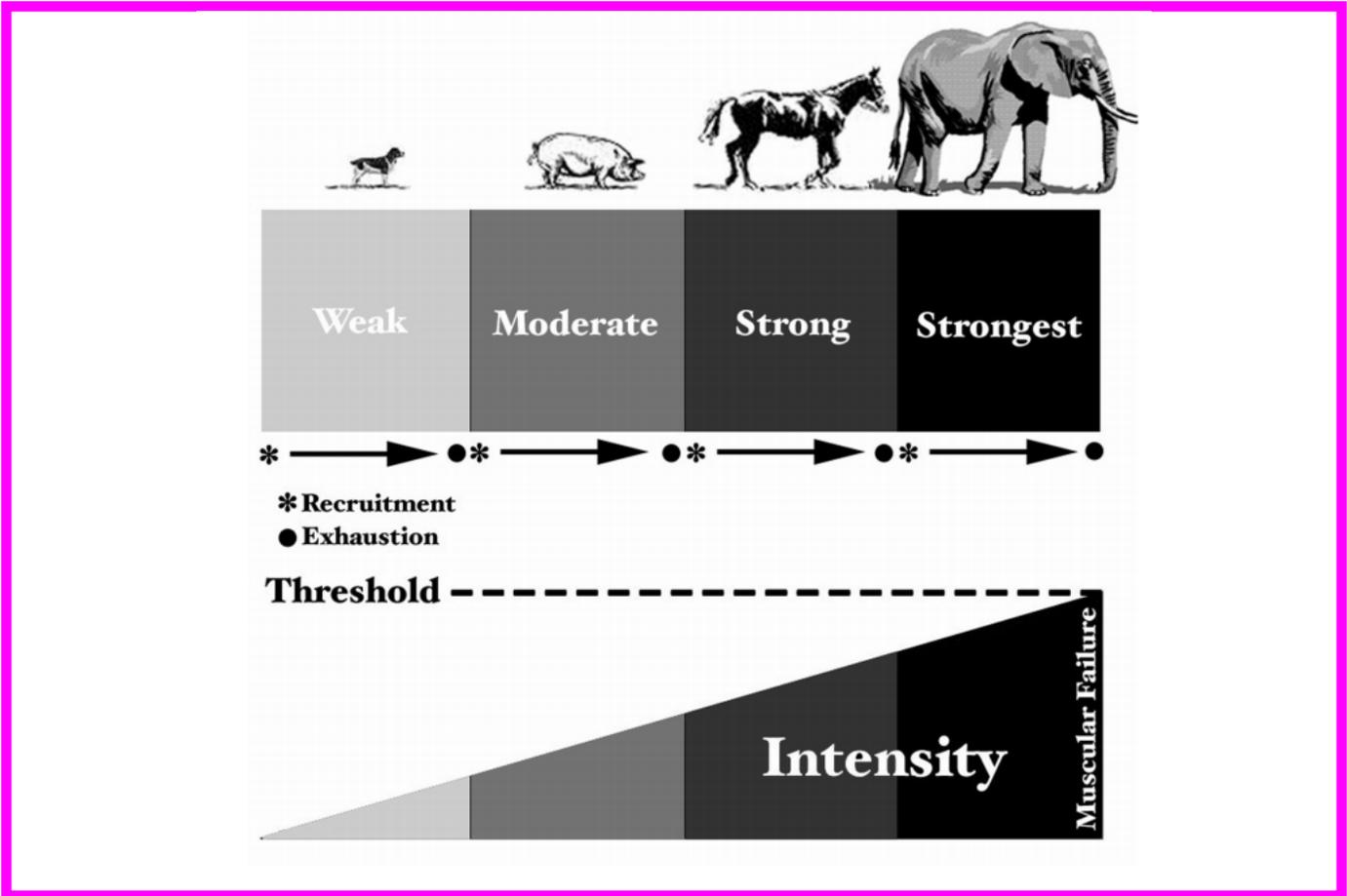
As you do an exercise, you begin to tire out the muscles. Since the stress on the muscles continues, the body recruits stronger and stronger parts of the muscles to meet the need. When the strongest parts of the muscle are exhausted, you have reached temporary muscular failure.

...

Muscular failure is when the _____ parts of the muscle have been exhausted. If an _____ stepped on your foot, it would really hurt.

strongest

elephant



Another comment on those animals (i.e., your muscles! - those things that let you get up from a low, soft couch) - The weaker ones can contract longer, and they recuperate quickly. The stronger ones can't contract as long, and they take longer to recuperate. (Isn't Nature logical?)

Therefore, you must never relax during an exercise, because your weaker muscles will recuperate and you will not get complete temporary muscular failure.

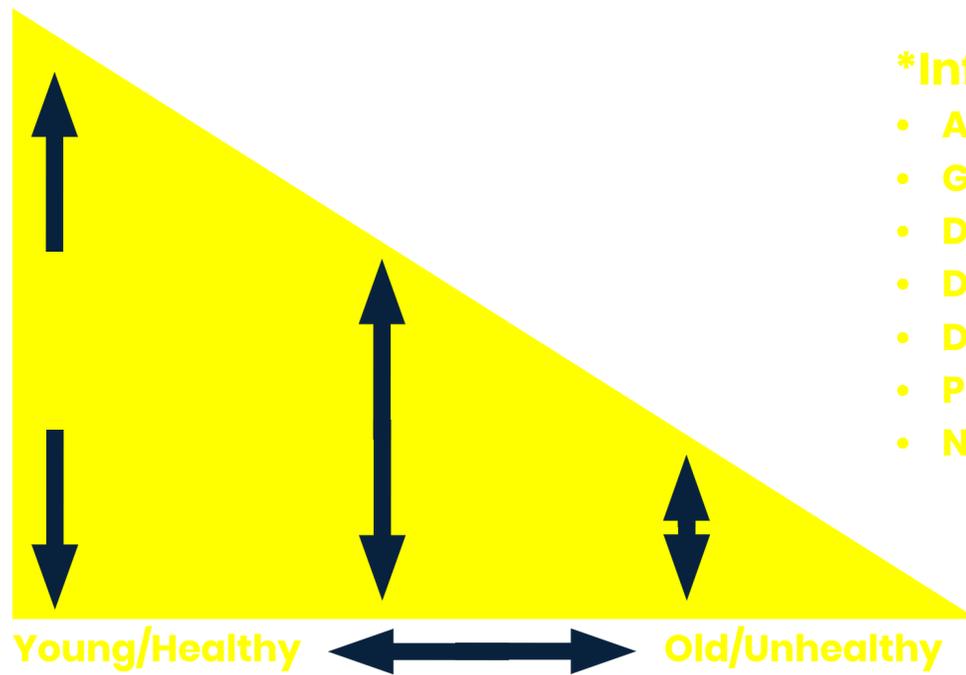
...

Temporary muscular _____ is a strong stimulus on the body to grow.

failure

THE BODY'S RECOVERY RESOURCES

(Its Ability to Recover and Grow)



***Influenced by**

- Age
- Genetics
- Diseases
- Diabetes
- Drugs
- Physical Conditioning
- Nutritional Status

Your body has only a finite amount of recovery resources. The older (and sicker) we get, the less recovery ability the body has.

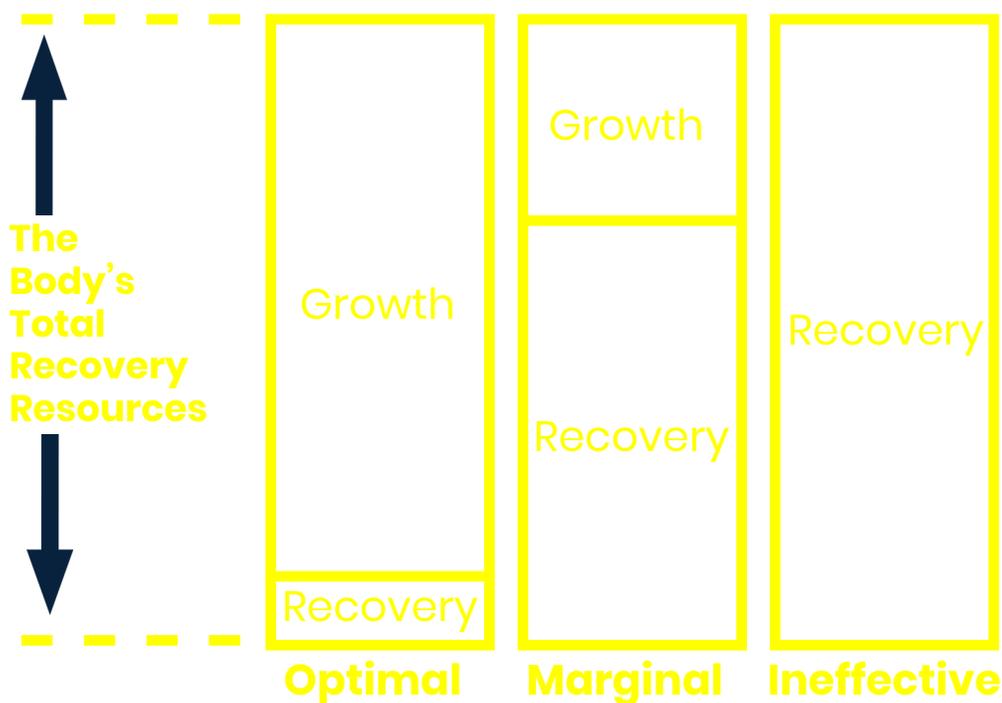
...

The body has only a finite ability to _____.

Recover

RECOVERY & GROWTH

The Body's Total Recovery Resources



Since the body does not have an unlimited ability to recover, it stands to reason that the most efficient type of exercise would be the one where most of your resources are used for growth, and not just to recover back to the point where you started.

Likewise, it's logical that the least efficient exercise would be where most of your recovery ability is used only to recover from the exercise, with little or none left for_____.

growth

**IT'S NOT HOW MUCH EXERCISE
YOUR BODY CAN WITHSTAND.
IT'S HOW LITTLE IT ACTUALLY
REQUIRES.**

This one was always hard for me to grasp. What this really means is – here it comes – you need to do a really intense exercise session without doing much work. Doesn't sound right, does it?

Remember, you want a strong stimulus to the body, and then the body will do its thing. That's delivered by the temporary muscle failure (remember the light switch?) Hopefully, that will require little recovery and result mostly in growth.

When we do hours of low-intensity work in the gym, we use up those finite recovery resources just to recover from all that work.

...

High-intensity exercise need not involve a lot of _____. It's not how much exercise your body can withstand. It's how little it actually requires.

HINDRANCES TO RECOVERY

- **Too much work**
- **Too little time off**

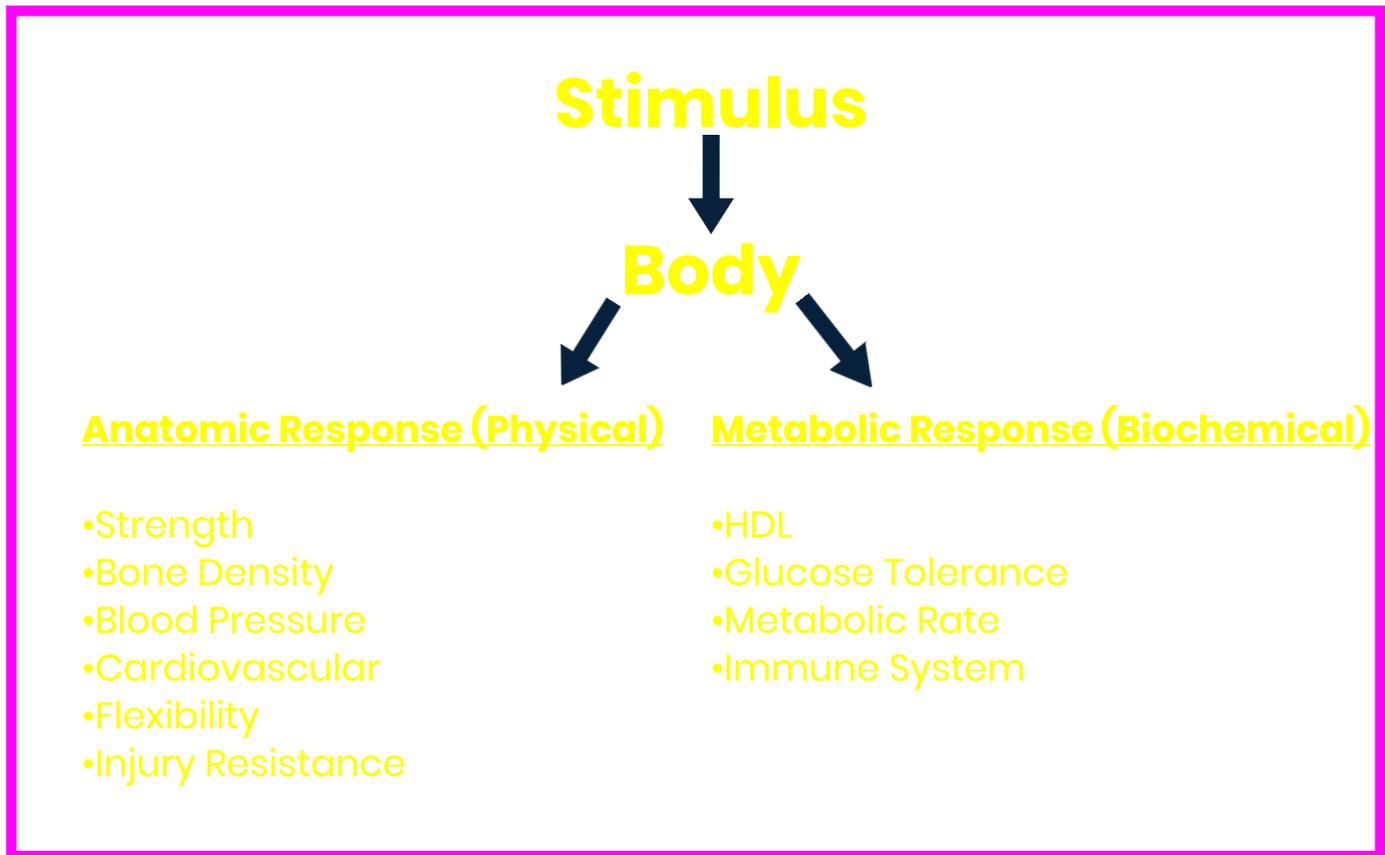
At least two things can hinder your recovery -

- doing too much _____, and allowing too little _____ to recover.

work

time

THE BODY'S RESPONSE



If you provide a sufficient stimulus to the body that results in growth, the body will respond with both anatomic and metabolic changes.

It's probably not an all-or-none phenomenon, but it is certainly maximal when the stimulus is maximal (i.e., temporary muscular failure).

...

In response to exercise, the body can respond with physical growth (_____ change) and biochemical improvement (_____ change)

anatomic

metabolic

BENEFITS OF HIGH INTENSITY EXERCISE

- **Decreased Body Fat***
- **Increased Basal Metabolic Rate***
- **Increased Strength***
- **Increased Bone Density***
- **Increased Cardiovascular Efficiency***
- **Increased Glucose Tolerance***
- **Increased HDL Cholesterol***
- **Decreased Blood Pressure***
- **Increased Resistance to Injury**
- **Improved Flexibility**
- **Improved Immune System**

***Biomarkers of Aging**

(Loss of muscle mass worsens all these)

Notice the * items above. Those are the famous Biomarkers of Aging. The more of them that worsen, the “older” you are medically. The common denominator to them all is the amount of muscle mass we have, or don’t have. As we get older, we steadily lose muscle. Without strength-building exercise, all of those get worse as we age.

...

The common denominator of our aging factors is the amount of _____ mass. The best way to improve our aging factors (Biomarkers of Aging) is _____ - building exercise.

muscle

strength

CALORIES

**It's not the calories burned
DURING exercise
It's the calories burned
AS A RESULT OF exercise**

This is an important concept. If you walk or run a mile, that's about 100 calories. And there are about 3500 calories in a pound of fat. So, if you're planning to "burn off" a pound of fat, get ready to walk 35 miles.

The more efficient way is to add muscle. If you add 3 lbs. of muscle, that takes an extra 300 calories a day just to keep alive. You do the math, but that's 9000 calories a month. That's a lot of walking. And, you have just defined raising your metabolic rate.

...

It's not the calories burned during exercise, it's the calories burned
----- exercise.

as a result of

CALORIES

**It's not the calories burned
DURING exercise
It's the calories burned
AS A RESULT OF exercise**

(This is my way of making you read that again.)

Another comment about calories. When we talk about calories, most of us are really talking about fat (but “calories” is a much nicer word!) And when we talk about weight loss, we really mean fat loss. When you lose weight without strength-building exercise, you lose fat and muscle (and other goodies, too).

Take another peek at those Biomarkers of Aging. Go figure.

So don't use your bathroom scales. Use your bathroom mirror instead – it's a much more sensitive scientific instrument.

...

When we say we want to lose weight, we really mean we want to lose

-----.

fat

EXERCISE VS. RECREATION

- Logical
- Universal
- Physical
- Not Fun

- Instinctive
- Personal
- Mental
- Fun

Exercise is not recreation, and recreation is not exercise. High-intensity exercise will help everybody, but what's an enjoyable recreation for me may not be fun for you.

So just don't confuse the two. Use good exercise to stay healthy, and use that good health to enjoy your recreation.

...

Exercise is universal for everybody, but recreation is _____.

personal

$F=MA$

force = mass x acceleration

In this equation, as either mass or acceleration increases, so does force. If an 18-wheeler bumps into you at 1 mph, no big deal. But if it bumps into you at 80 mph, big deal.

That's $f=ma$.

...

If either mass or acceleration increase, so does _____

force

F=MA

force = mass x acceleration

(Translated for Exercise)
force = weight x speed

“Why do you do your exercises so slowly?”

Here’s the answer, and this is why high intensity exercise is so safe and effective.

In the “translated” $f=ma$ above, if either weight or speed approach zero, so does force. So, if the weight is almost zero, so is the force, but unfortunately so is the intensity (i.e., effectiveness).

But, if the speed approaches zero, so does the force (and chance of injury), but the effectiveness (intensity) increases. Voilà!

...

As speed is lowered, so is _____. As force is lowered, so is your chance for an_____.

force

injury

GUIDELINES FOR HIGH INTENSITY EXERCISE

- **10 seconds to lift, 5 seconds to lower (10-10 for low friction machines)**
- **Do one set of each exercise, using a weight that results in muscle failure (positive => static => negative) between 6-8 repetitions, or between 80-160 seconds**
- **Perform both upper and lower body in the same workout**
- **Do no more than 6-8 exercises per session**
- **Move quickly between exercise, ideally taking no more than 15 seconds**
- **Allow sufficient recovery time (usually 3-4 days)**
- **Workouts should last less than 30 minutes**
- **Always breathe - don't hold your breath (Val Salva)**
- **If you get a headache, stop your workout.**
- **Keep accurate records (exercises performed, reps)**
- **Make your workouts brief, intense, and infrequent.**

These are the general guidelines for effective, high-intensity exercise.

They are self-explanatory, and important.

...

Always _____ ! Never hold your breath.

breathe

WHICH EXERCISES TO DO

- **Leg Press**
- **Leg Curl**
- **Bench Press/Chest Press**
- **Pulldown/Row**
- **Shoulder Press**
- **Others**

Most body muscles can be exercised using very few exercises, usually five or six.

The leg press uses the low back/buttock muscles and the large muscles on the front of the leg. The leg curl uses the flexor muscles on the back of the leg.

The bench (or chest) press (pushing away) uses the triceps and chest muscles. The pulldown or row (pulling toward) uses the biceps and back muscles. The shoulder (upward) press uses the deltoid muscles.

You could consider adding a few others, such as the calf raise, lower back, biceps curl, or abdominals. But avoid adding too many, so you don't work the same muscle group more than once.

THE THREE PHASES OF A REPETITION

- **Positive The “Lifting” Phase**
- **Static The “Holding” Phase**
- **Negative The “Lowering” Phase**

These are the three parts of every repetition. You will get to a point in a set (ideally after 6-8 repetitions) when you can't lift it any more. That's fine. But you can't quit then - you're just 1/3 through.

When you've "used up" the Positive phase, hold the weight motionless as long as you can. That's the Static phase, and you're 2/3 through. When gravity then begins to win, you resist it all the way to the end. Every inch. With all you've got. That's the Negative phase, and then you're through.

Many authorities feel that the Negative phase is the most important of the three, providing the greatest stimulus to the body.

THE THREE PHASES OF A REPETITION

- **Positive** The “Lifting” Phase
- **Static** The “Holding” Phase
- **Negative** The “Lowering” Phase

If you can't do even 4 repetitions, lighten the weight until you can.

If you can do more than 8 honest repetitions, increase the weight by 5%.

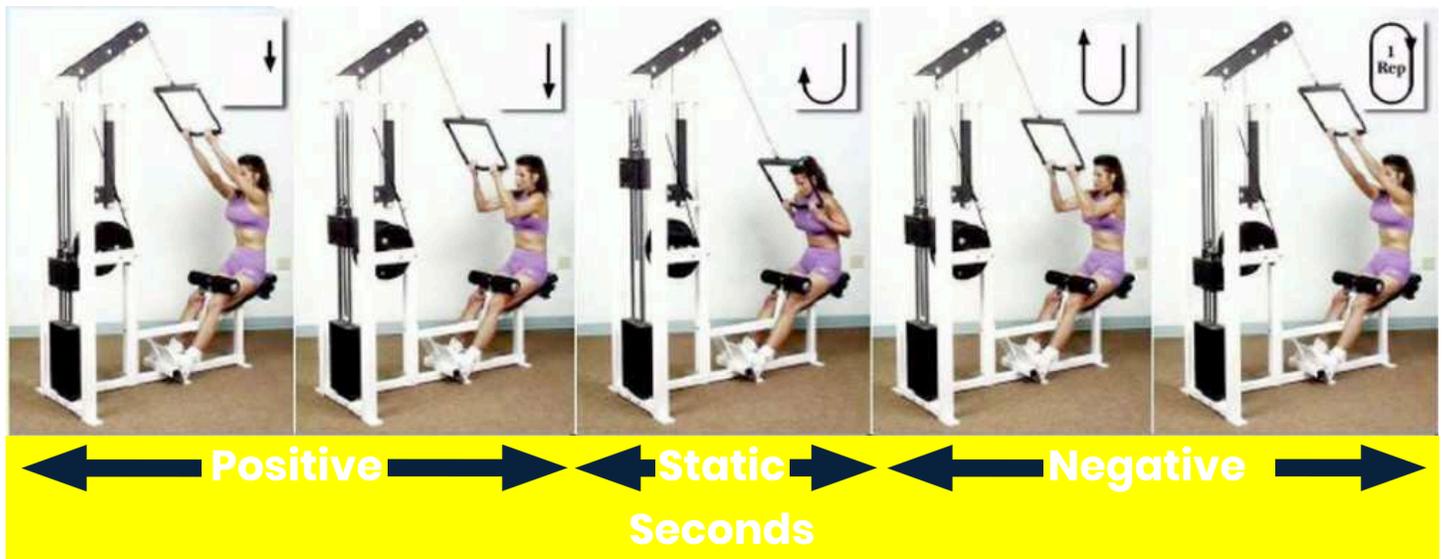
Remember, it's not how much you can lift, but the quality of stimulus the exercise delivers to your body.

...

The 3 phases of a repetition are the positive, static, and the _____

negative

THE COMPLETE REPETITION



Here is a lovely young lady doing a pulldown in good form. Remember, it's 10 seconds pulling down and 5-10 seconds (depending on the exercise and the quality of the machine) going back up.

She's doing it very smoothly, with no jerking or resting, and with no stopping at the end of a repetition.

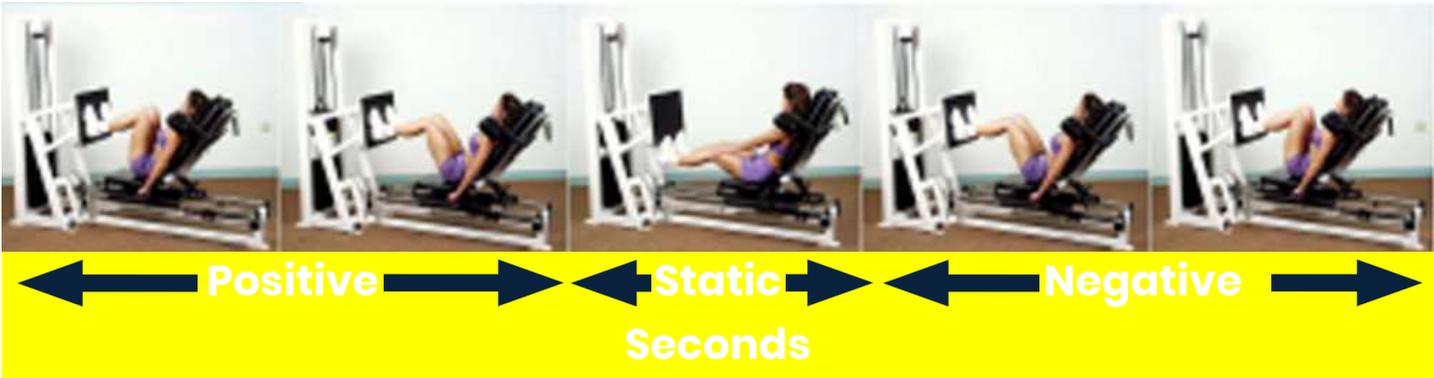
And I'm sure she will fully go through the Positive, Static, and Negative phases before stopping. That's probably why she looks like she does!

...

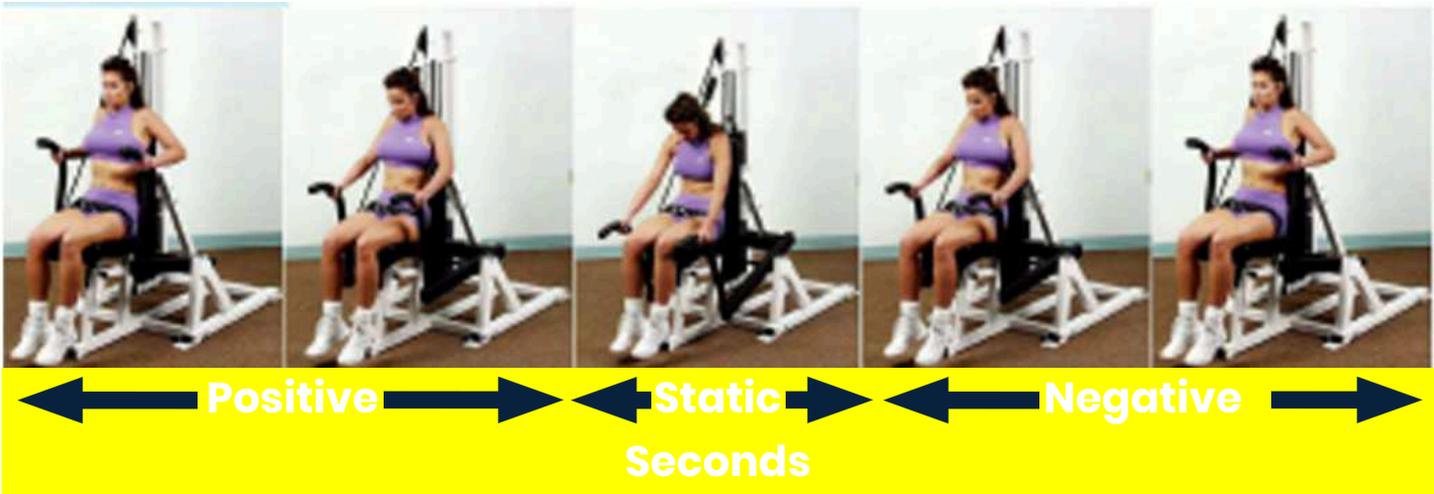
Be sure not to _____ at the end of a repetition.

stop

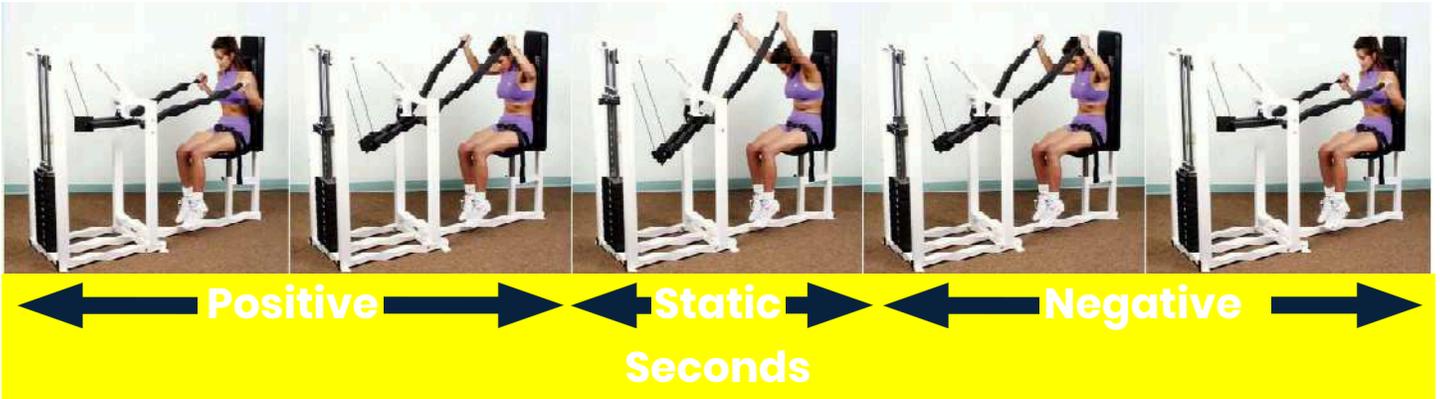
THE LEG PRESS



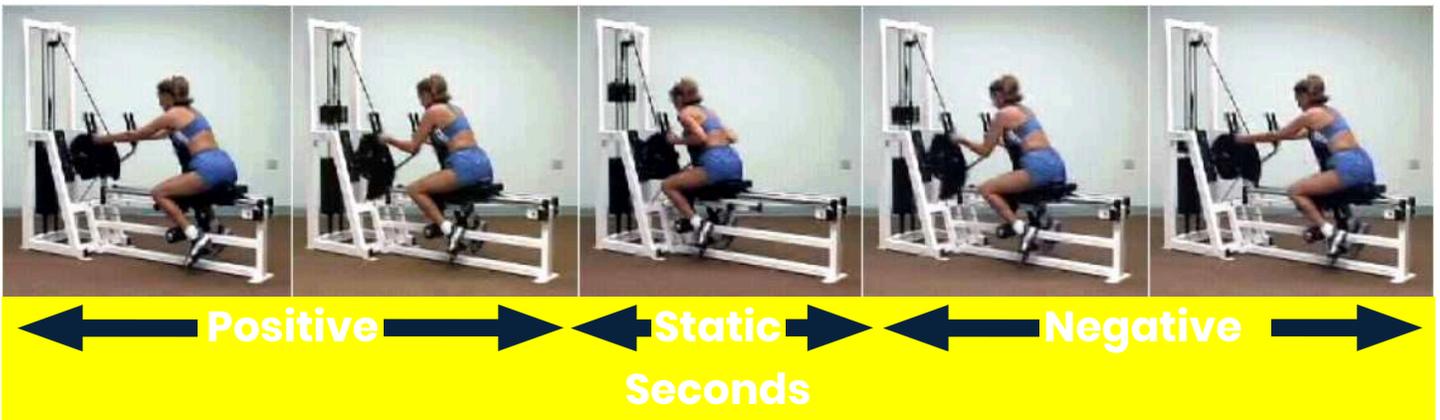
THE CHEST PRESS



THE UPRIGHT (SHOULDER) PRESS



THE ROW



SUMMARY

- **Fatigue each muscle group to failure – once – then stop and allow the body to recover and grow**
- **More is not better**
- **Strength training delays aging factors**
- **It can, and should be, injury-free**
- **Make your workouts intense, brief, and infrequent**
- **One should expect:**
 - **30–50% strength gain in 2–3 months**
 - **Improvements in blood pressure, cardiovascular status, injury resistance, flexibility, metabolic rate, and body fat**
 - **Increases in HDL, Bone Mineral Density, and Glucose Tolerance**
 - **It can be done in a very short period of time, usually about 15–20 minutes 1–2 times a week**

I hope you now have a clearer understanding of high-intensity exercise, and how this type of high-intensity training can help you.

And what a great return on your investment for just 0.2% of your time (20 minutes a week)!

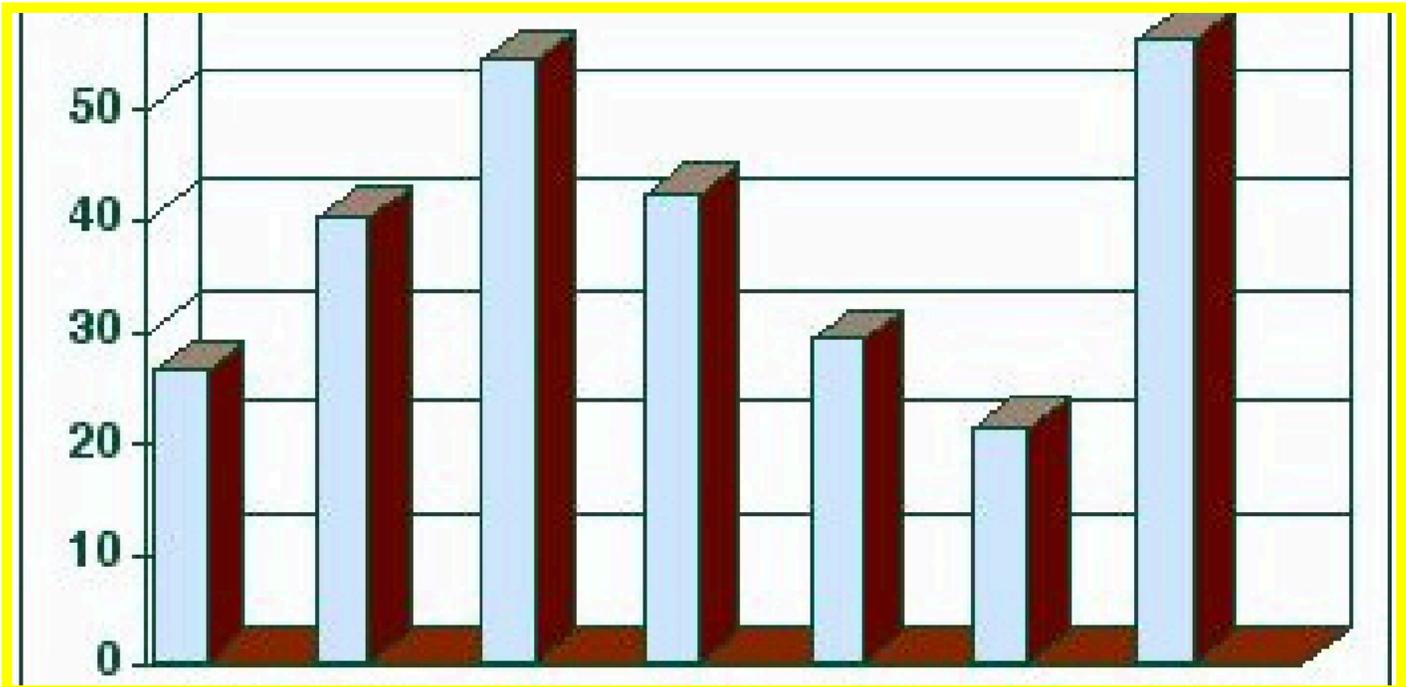
The body is a marvelous machine, and it has healing and growing powers far beyond what we can now imagine.

Exercise well, be well, and live well.

ECCENTRIC EXERCISE

***Addition by:
Mark Alexander***

EFFECTS OF HIGH INTENSITY TRAINING ON HDL



How often should I do high intensity exercise?

The rule of thumb is that the more advanced you are, the longer the recovery period you need. In the beginning, then every 3-4 days should be sufficient. As the intensity of your workouts increase, you may start requiring as many as 7 days to recover.

If you are doing your exercises correctly, but failing to make any gains, the first thing you should do is to add an extra day of recovery time between workouts.

