

A review on some of the main points made from Peter Rana seminar talk.

Q. Should we use higher resistance at the expense of form?

A. Never.

When you approach a point of complete muscle fatigue, the muscles and other support systems of the body sense the pick-up of intensity and respond predictably: "Let's move a little faster to reduce the burden."

It's a natural instinct to reduce the effort level by changing how you lift the weight, and by doing so you start to 'cheat' to make the weight-load less of a burden to move. The end result - your muscles get a free ride and are let off the hook. The message you send to your muscles: "Keep the status quo because there's nothing going on here that's outside of what you can already do?" Hence no gain in muscle strength or size!

Good form ensures that no other influences from other muscle groups are contributing to the effort put forth, and speed of movement is kept in check to eliminate the advantages afforded by momentum. So, if form suffers due to the weight being too heavy, it's better to reduce it just enough to reach momentary muscular failure under the following conditions:

- that proper position is maintained to isolate the targeted muscle(s) being exercised. It is not desirable to have other muscles influence the performance of the set;
- that a controlled (slow) speed of movement eliminates momentum that would otherwise make the exercise less effective and safe. Momentum takes away the burden of effort imposed on the muscles you're trying to stimulate to change;
- that you take each repetition through the muscle's greatest possible range of motion;
- that the muscle can be taken to complete fatigue (momentary muscle failure) in between 48 and 90 seconds (anaerobic threshold).

Q. What is the most important factor when it comes to making your muscles stronger?

A. Evidence in the field from some of the most respected researchers supports that the stimulus for increasing strength is the degree of effort you put into the workout, not the weight-load being used.

Intensity of effort and weight-load (resistance) are independent of each other. To fully appreciate the difference, a distinction between strength training and weightlifting should be made.

Weightlifting is a sport that tests a person's maximum strength with a barbell. Weightlifting is actually misnamed. It should be called weight-throwing as the weights are hoisted vertically in such a manner that momentum allows the weightlifter to jump under it which is typically what you see at Olympic weightlifting competitions. Therefore the goal of weightlifting is more about increasing both the skill and weight you can lift rather than building strength, although having more strength is important too.

On the other hand, strength training is about the degree of effort you put into lifting a weight and less about how much weight you can lift. This is a real paradigm change as heavier is not necessarily better. This goes against the tenets of powerlifting and Olympic lifting.

High intensity of effort and confidence

Effort therefore defines intensity and, apart from intensity, confidence may well be the most important factor for realising meaningful strength gains from strength training.

Effort must be all-out and learned. You can't show up one day determined to fail on every exercise because we told you it's a good thing. If you're new to this style of training, you must gradually increase effort until you have learned and gain confidence in contracting a muscle intensely, until a complete repetition becomes impossible, and until you realise that no amount of submaximal efforts will give you the results that a full out maximal will deliver.

Q. Why is muscle being looked at by the medical community as one of the most important variables for your health and wellbeing?

A. In the Journal of Obesity, a review paper done in 2011 titled Evidence for Resistance Training as a Treatment Therapy in Obesity by Strasser and Schobersberger has determined that muscle mass is inversely associated with all cause of mortality and prevalence of metabolic syndrome (obesity, diabetes or insulin resistance, elevated fats in the blood, high blood pressure, and increase silent inflammation) independent of cardio respiratory fitness levels.

The authors concluded:

- resistance training may prevent an age related decline in skeletal muscle mass, better known as sarcopenia, the Greek word for 'poverty of flesh'. The rate of loss is approximately a half kilo of muscle mass per year after the fifth decade of life. This is twice the loss rate of younger adults between the ages of 30 and 50;
- resistance training is as at least as effective as aerobic training in reducing some major cardiovascular disease factors; and
- resistance training is recommended in the management of metabolic risk factors – namely obesity, reduced capacity for fat burning and type 2 diabetes – associated with cardiovascular disease.

What's important for younger people in reserving their muscle mass is doubly important for people over the age of fifty. The most overlooked factor when it comes to fitness is strength. Strength is produced by the muscles. Muscle provides the locomotive ability to move, do work and perform. The skeleton, heart and lungs are the support systems. The brain and nervous system is the ignition to stimulate the muscles to produce locomotion. It is ultimately the muscles that make the demands on the heart and lungs, so the better you are at maintaining the quality and quantity of your muscles, the better you'll be able to maintain a higher state of health and wellbeing.

One way of thinking about your strength training programme is investing in your 'Sarcopenia Kiwi Saver'. And there's no better investment scheme than BodyTech's Supervised HIT Circuit because it's proven to provide the most bang for your buck.

Q. If intensity of effort is the most important variable when it comes to increasing strength, how relevant is the number of repetitions and weight-load you use?

A. Research consistently shows that if you're training to momentary muscular failure (high intensity of effort) it doesn't make any difference to achieving muscular growth and strength. However, that said, people who fall at either ends of the muscle fibre type spectrum (those that have a higher percentage of muscle fibres that fatigue fast verses those that have more that take longer to tire), do better with higher weightloads and lower

repetition and lighter weight-loads and higher repetition ranges respectfully. These people, however are far and few between. For the rest of us it really comes down to personal preference. Every person should self-select a weight they want to take to momentary muscular failure for each exercise. The rule of thumb – the lower the repetition range (3 to 8 reps) the higher weight-load use, the higher the repetition range (15 or more) the lower the weight load to be expected.

Q. Is high Intensity strength training dangerous?

A. Difficult yes, dangerous no.

High Intensity Training (HIT) and momentary muscular failure are both mistakenly perceived as difficult and dangerous.

If you accept exercise for what it is, WORK, not fun, then things will really start to happen in the way of achieving worthwhile results. And there's no doubt that HIT is hard work. If you're not willing to work hard, then there simply isn't any other way to achieve anything close to meaningful strength gains. But approached properly, high intensity strength training is the safest way to train where the intensity of effort can be high but any possible forces that can injure you are kept at bay.

Danger exists –and injury occurs – when a muscle produces a force that exceeds its joint structural limits. Injury prevention requires strengthening muscles and exposing them to low force. Both are possible during high intensity training. With every repetition performed, you're increasing the intensity during the exercise, albeit ever so slightly because your strength level is diminishing to the point that it is no longer capable of producing a force high enough to lift the weight-load. At the same time, the muscle is momentarily incapable of producing a force to exceed its joint structural limits, which makes the final repetition of a set the LEAST likely to cause injury.

In summary, regardless of the number of repetitions involved in a set, the first repetition is ALWAYS the most dangerous repetition (because it's the freshest and strongest) - and the last repetition is ALWAYS the safest; and the higher your intensity of effort becomes (a direct result with every repetition performed), the harder it feels – and the more dangerous it appears, the safer it is.

Q. Which is better Supervised HIT Circuit versus Bravo HIIT Series?

A. Both have their own unique attributes for developing strength and endurance, but the difference really comes down to the productivity between the strength exercises each programme has to offer. In order to help you appreciate the difference, please allow me to offer you additional insight behind the MedX Machines used in the supervised HIT Circuit.

Back in the early 70s the founder of Nautilus full range exercise machines (and later the MedX), Arthur Jones, introduced his first prototype machine - the Super Pullover. Back then the barbell was the preferred tool to build strength and Jones often referred to it as a "miracle tool", but he said it left a lot to be desired. He wasn't trying to mock or ditch the barbell, but rather trying to produce a more efficient barbell. Nautilus was the first logical approach to identifying the limitations of the barbell. Unlike barbells and body-weight exercise, Nautilus and MedX machines are capable of strengthening your muscles throughout all positions in a full contraction. In doing so they allow the trainee to better achieve more strength and flexibility faster than any alternative.

The philosophy behind Nautilus and MedX training was based on the simple premise that no matter what activity you do - sport, recreation, manual labour or scaling Mt Everest - when it comes to exercise you must prepare the primary muscles mainly used in your activity and strengthen them through their full range of motion based on their function (i.e. to flex the hip, bend an arm, or lift an arm overhead). These are the tools Jones had built, full range strength training machines. If you're seeking to reach the limits of your

individual potential for strength, speed, flexibility and metabolic conditioning (the ability to work at high intensities of effort for prolonged period of time) then using MedX under the supervision of highly trained and skilled instructors in HIT principles, is for you. Go to the website www.bodytech.co.nz for more information on the research behind the Supervised HIT circuit.

On the other hand Bravo (high intensity interval training series) was designed to put your strength and stamina through the test, by throwing more complex movement patterns at you. By design, Bravo workouts aren't too concerned with the 'ultimate' way to strengthen the body, but more geared to engage the larger muscles groups which tax your cardiovascular and metabolic energy systems. The high intensity nature of the workout means that you suck in more oxygen that in turn burns more calories. The more oxygen you use per minute, the more calories you burn. It also uses movement patterns that many of us simply don't do as we get older, like deep squatting or lifting from floor to overhead. So the Supervised HIT Circuit will prepare your primary muscle movers and metabolic conditioning to take on anything that Bravo throws at you.

Q. What is full range strength and flexibility?

The concepts behind flexibility are not complicated. Flexibility is the range and ease of movement of a limb around a joint. How well you're able to maintain good flexibility is largely dependent on the maintenance and safekeeping of joints, muscles, tendons and muscle fascia. Tendons are not meant to be stretched. Ligaments once stretched will not return to normal length, which is undesirable.

So what we end up with are the muscles and rest of the connective tissues. Through adaptation resulting from proper exercise, muscle and muscle fascia will stretch to become more flexible.

Full range strength and flexibility is afforded on most MedX full range exercise machines. Each machine was designed with the following in mind:

- if the joints are surrounded and supported by stronger muscles, then the chance of any trauma is reduced
- if a joint becomes more flexible but without a corresponding increase in muscular strength, injury probability is increased.

The simple fact remains, if strength training is properly done then almost any exercise device will simultaneously enhance flexibility. This occurs by virtue of the back pressure applied during the (lowering) portion of the exercise. Many members make the mistake of paying close attention to the lifting part of their MedX exercises but get careless during the lowering part by lowering the resistance in a random and undisciplined manner. Thus, they limit any chance of increasing flexibility.

When your strength exercise is properly performed it can be qualified as flexibility training. The efficiency of the Supervised HIT circuit makes it one of the best means for acquiring both a high degree of strength and flexibility throughout a muscle's full range of possible movement.