

**ESCAPE OCTAGON  
LOAD TRAINING.**

**TRAINING  
VARIABLES.**



## ESCAPE OCTAGON LOAD TRAINING.

# TRAINING VARIABLES.

Training variables refer to the aspects of the exercise or programme the instructor can change to illicit a specific type of response. By employing various repetition-based protocols using the LOAD range, clients can expect to see significant adaptation and gains. Whether it is in hypertrophy, strength, or power goals, adjusting the training variables will see a greater chance of achieving the specific client goals.

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# TRAINING VARIABLES.

**WHAT ARE THE MAIN VARIABLES AN INSTRUCTOR CAN MANIPULATE TO ILLICIT A TRAINING RESPONSE DURING A SESSION?**

- Intensity
- Tempo
- Repetition
- Sets
- Rest

**IN ADDITION, THERE ARE OTHER VARIABLES THAT CONTRIBUTE TO THE SUCCESS OF THE CLIENTS' GOALS.**

- Volume
- Frequency
- Recovery

These should form part of any long-term programming for clients as they will impact the client's readiness to train; risk of overtraining and the results they achieve.

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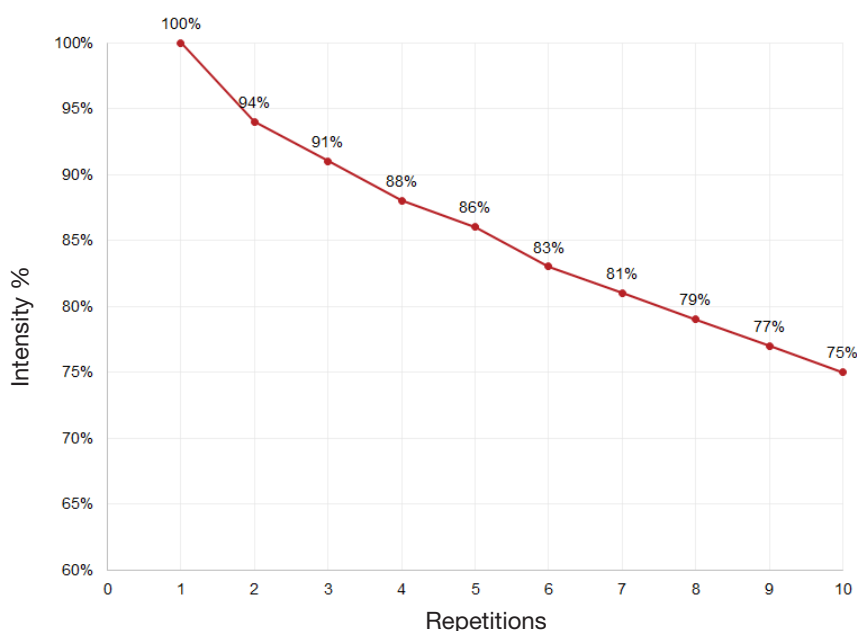
## INTENSITY.

### IN THIS SECTION:

- Best Intensities for Different Goals
- Finding your 1 Rep Max (RM)
- Using Intensity in Group Training

Intensity is essentially the load lifted in a repetition and is usually decided based on the session outcome and taking a % of 1 rep max (1RM). The intensity must be high enough to generate stress but not so high that the client cannot complete the desired repetitions or sets.

For example, to build strength it's widely accepted that intensity should be between 75% and 85% of 1RM.



### HOW TO FIND SOMEONE'S 1RM WITHOUT GOING TO THEIR MAX?

There are predictive models available to help instructors understand a client's 1RM without them testing it. But these usually involve a client performing a submaximal set to failure and this may not be appropriate for the client. Velocity based training apps and testing apparatus provide an accurate method of predicting 1RM and is also useful to predict 1RM across individual sessions when clients may not be at their peak.

### HOW TO USE INTENSITY IN A GROUP TRAINING SESSION?

In group training scenarios, using these methods will often become complicated and unnecessary. A simple and effective way to work percentages of 1RM into a group workout is to use the RPE 1 to 10 scale. Simply ask the clients to select a weight that feels like 8 out of 10 to achieve 80% of 1RM. This is not an exact science but when working with a large group of clients, it's often more important to provide an effective, fun session rather than getting drawn into detail.

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## TEMPO.

### IN THIS SECTION:

- Time Under Tension (TUT)
- Types of Muscular Contraction
- Understanding Tempo Formats in Programming
- Developing Hypertrophy Using Tempo
- The Use of Eccentrics in Hypertrophy Training
- Using Eccentrics for Rehabilitation
- Developing Speed and Power

Tempo refers to the speed at which a repetition is performed, specifically focusing on the duration of each phase of the movement. Tempo can range from high velocity speed for explosive power to more controlled slow repetition tempo that increases TUT. This has become increasingly popular in strength and hypertrophy training as it helps to increase muscle fiber recruitment and in turn an increase in muscle protein synthesis.

Because TUT combines all phases of muscular contraction, it's important to understand these phases before delivering the appropriate tempo-based protocol.

**ECCENTRIC** – The muscle lengthens under tension, like the lowering phase of a bicep curl. The eccentric phase is often focussed on for hypertrophy training as it has the greatest potential force production and is shown to increase muscle cross-sectional area.

**ISOMETRIC** – Muscle length remains constant under tension. There is no change in joint angle or muscle length during this type of contraction, just like a pause at the end of the lowering phase in a squat.

**CONCENTRIC** – The muscle shortens under tension, like the upward phase of a bicep curl. Adding a slow, controlled concentric phase will increase the TUT and therefore the hypertrophy gains.

### TOP TIP!

By varying the tempos across a long-term programme, the muscles are placed under more stress and experience more frequent shock. The subsequent benefits can be greater providing adequate rest, recovery and training volume is adhered to.

By chunking programmes into cycles of up to 3 weeks and using a specific phase of contraction to focus on in that cycle the physical adaptations can be enhanced greatly versus just following the same protocol for prolonged periods of time.

### Example:

3 weeks of eccentrics with a 5 second eccentric phase.

3 weeks of isometrics with a 5 second isometric phase.

3 weeks of concentrics with a powerful concentric phase.

*This example follows the Tri-phasic approach to training developed by Cal Dietz.*

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## UNDERSTANDING TEMPO FORMATS IN PROGRAMMING.

The tempo required in a session is written in numbers and always starts with the eccentric portion. Each number corresponds to the number of seconds spent in that phase.

**5 – 1 – 1**

### MEANS:

**ECCENTRIC:** 5 second phase

**ISOMETRIC:** 1 second pause

**CONCENTRIC:** 1 second phase

When there is a 1 second phase selected, this is essentially requesting the movement to be completed rapidly or in the case of an isometric phase, a quick transition.

## DEVELOPING HYPERTROPHY USING TEMPO.

Understanding the benefits of working in the eccentric phase, it's time to explore some examples of tempo's that could be used.

### EXAMPLE 1.

**4 – 1 – 2**

**ECCENTRIC:** 4 second phase

**ISOMETRIC:** 1 second pause

**CONCENTRIC:** 2 second phase

When there is a 1 second phase selected, this is essentially requesting the movement to be completed rapidly or in the case of an isometric phase, a quick transition.

### EXAMPLE 2.

**6-5-4-3-2-1 ECCENTRICS.**

This is a 6-repetition set with an eccentric phase that starts at 6 seconds long and reduces by 1 second each rep.

## USING ECCENTRICS FOR REHABILITATION.

The LOAD range provides an excellent solution for clients returning from injury due to the stabilization requirements across the moving joints. Allowing the client to increase load through the muscles without compromising joint stability. This can become even more effective when incorporating an eccentric focussed method. It provides the opportunity to stress muscular tissue in a controlled environment and build superior muscle strength.

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## REST.

The duration and quality of rest between sets are critical factors in the effectiveness of a strength training program. Rest periods allow the body to recover partially from the exertion of the previous set, influencing performance and training outcomes in subsequent sets.

### WHAT'S HAPPENING DURING RECOVERY?

#### POST-EXERCISE SET RECOVERY PROCESSES.

Understanding what happens to the body during rest periods helps trainers to select the right rest periods to ensure optimal growth, adaptation, and post session recovery.

##### 1. MUSCLE METABOLISM AND ENERGY SYSTEMS:

- **ATP Replenishment:** During exercise, adenosine triphosphate (ATP) is rapidly used for muscle contraction. After an exercise set, the body initiates processes to replenish ATP stores. The phosphocreatine system is the fastest way to regenerate ATP. Creatine phosphate donates a phosphate group to adenosine diphosphate (ADP) to form ATP.
- **Glycolysis and Oxidative Phosphorylation:** Glycolysis breaks down glucose to produce ATP, with pyruvate being either converted to lactate (anaerobic glycolysis) or further metabolized in the mitochondria (aerobic glycolysis). Post-exercise, oxidative phosphorylation in the mitochondria becomes more active, utilizing oxygen to produce ATP efficiently for sustained recovery.

##### 2. LACTATE CLEARANCE:

- **Cori Cycle:** Lactate produced during intense exercise is transported to the liver, where it is converted back to glucose through the Cori Cycle. This glucose can then be reused by the muscles or stored as glycogen.
- **Oxidation of Lactate:** Lactate can also be oxidized directly within the muscles and other tissues to produce ATP.



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## 3. OXYGEN DEBT AND EXCESS POST-EXERCISE OXYGEN CONSUMPTION (EPOC):

- **Oxygen Debt Repayment:** Post-exercise, the body consumes additional oxygen to repay the oxygen debt incurred during anaerobic exercise. This includes replenishing oxygen in the blood and muscle myoglobin, resynthesizing ATP, and phosphocreatine, and clearing accumulated lactate.
- **EPOC:** The elevated oxygen consumption post-exercise is known as EPOC, which helps restore the body to its pre-exercise state. It also contributes to an increased metabolic rate post-exercise, aiding in further calorie burn.

## 4. MUSCLE REPAIR AND PROTEIN SYNTHESIS:

- **Microtrauma Repair:** Exercise causes microtrauma to muscle fibers, particularly during eccentric contractions. Post-exercise, the body initiates repair processes involving satellite cells, which proliferate and fuse to damaged fibers, facilitating muscle repair and growth.
- **Protein Synthesis:** The repair process requires protein synthesis. Muscle protein synthesis (MPS) increases after exercise, facilitated by the availability of amino acids and the activation of anabolic pathways. Consuming protein-rich foods or supplements post-exercise can enhance this process.

## 5. REPLENISHMENT OF GLYCOGEN STORES:

- **Glycogenesis:** Post-exercise, the body works to replenish depleted glycogen stores in the muscles and liver. This process, known as glycogenesis, involves converting glucose into glycogen. Consuming carbohydrates post-exercise can accelerate glycogen resynthesis.

## 6. HORMONAL RESPONSES:

- **Insulin:** Insulin sensitivity increases post-exercise, enhancing glucose uptake and glycogen synthesis. Insulin also plays a role in protein synthesis by facilitating amino acid uptake into muscles.
- **Growth Hormone and Testosterone:** Both growth hormone and testosterone levels can be elevated post-exercise, promoting tissue growth and repair.
- **Cortisol:** Cortisol levels rise during exercise but gradually decline post-exercise. Cortisol helps mobilize energy substrates during exercise, but prolonged elevated levels post-exercise can inhibit recovery processes.
- **Lower rep ranges:** These typically promote higher anabolic hormone responses and lower cortisol responses, whilst higher volume work tends to produce a greater cortisol response.



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## REST PERIODS FOR DIFFERENT TRAINING GOALS.

Rest periods between sets are crucial for optimizing the specific training outcome. The optimal rest period varies depending on the desired training adaptation, the energy systems targeted, and the recovery needs of the muscles and nervous system.

Here's an overview of the recommended rest periods and why.

### 1. POWER TRAINING

**Objective:** Maximize explosive strength and power.

**Rest Period Durations:** 2 to 5 minutes

**Reasoning:** Power training involves high-intensity, explosive movements typically performed at a low rep range (1 to 5 reps). The primary goal is to generate maximum force in the shortest time possible. Adequate rest periods (2 to 5 minutes) are essential to fully replenish ATP and phosphocreatine stores, ensure neural recovery, and maintain high-quality, explosive performance in each set. Shorter rest periods may compromise the ability to perform subsequent sets at maximal power output.

### 2. STRENGTH TRAINING

**Objective:** Increase maximal muscle strength.

**Rest Period Durations:** 2 to 3 minutes

**Reasoning:** Strength training typically involves lifting heavy loads for low reps (1 to 6 reps). Rest periods of 2 to 3 minutes allow for sufficient recovery of the phosphocreatine system, moderate replenishment of muscle glycogen, and partial neural recovery. This duration is long enough to maintain high-intensity efforts across sets but short enough to keep the workout

### 3. HYPERTROPHY TRAINING.

**Objective:** Maximize muscle growth.

**Rest Period Durations:** 30 seconds to 1.5 minutes

**Reasoning:** Hypertrophy training involves moderate to heavy loads for a moderate rep range (6 to 12 reps). Shorter rest periods (30 seconds to 1.5 minutes) are effective in increasing metabolic stress, one of the key mechanisms for muscle growth. These rest periods allow for some recovery while maintaining an elevated level of muscle tension and creating a favourable hormonal environment (e.g., increased growth hormone levels). However, rest periods that are too short may lead to premature fatigue and decreased training volume.

### 4. MUSCULAR ENDURANCE TRAINING.

**Objective:** Enhance the ability to sustain repeated muscle contractions over time.

**Rest Period Durations:** 30 seconds or less

**Reasoning:** Muscular endurance training involves lighter loads for high reps (15+ reps). Short rest periods (30 seconds or less) are used to maintain an elevated level of cardiovascular and muscular endurance. These brief rest intervals prevent full recovery, keeping the muscles under prolonged stress and enhancing their ability to resist fatigue. This approach improves both local muscular endurance and cardiovascular efficiency.

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## CONSIDERATIONS FOR INDIVIDUAL VARIABILITY AND TRAINING CONTEXT.

- **Training Status:** Advanced athletes may require longer rest periods due to higher training loads and greater neuromuscular fatigue. Conversely, beginners might benefit from slightly shorter rest periods to maintain workout efficiency and adherence.
- **Exercise Type:** Compound exercises like squats and deadlifts generally require longer rest periods than isolation exercises like bicep curls due to their higher overall demand on the body.
- **Time Constraints:** In practical settings, rest periods might be adjusted based on available training time without compromising overall workout quality.

## ACTIVE REST STRATEGIES.

Active rest strategies can further enhance the effectiveness of rest periods. Instead of complete rest, individuals can engage in low-intensity activities.

- **Static Stretching:** Can be used to help release tension across joints involved in the current exercise to help prime movers work effectively and allow more efficient movement across working joints.
- **Activation Drills:** Can be used to help engage the target muscles more effectively during the next set. These are especially effective after a static stretch has been administered to the antagonist muscle.
- **Mobility:** Specific or non-specific mobility can be an effective way to maintain activity levels without fatiguing the muscles before the next set.
- **Cardiovascular Exercise:** Non-specific cardiovascular can also be used to maintain a higher heart rate for a more effective metabolic response in sessions without necessarily fatiguing the working muscles before the next set.



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## CREATING DIFFERENT SET AND REP TYPES.

Changing the structure of a set provides a different stimulus for the neuro-muscular system. Offering variety in set types offers greater adaptation, providing the Musculo-skeletal system is given the time to adapt.

### SET TYPES.

#### PYRAMID.

**WHAT IS IT:** - Increasing the weight whilst reducing the reps.

*Example:*

SETS.	REPS.	TEMPO.	LOAD/BANDS.
Set 1	12	1 - 1 - 1	20kg/44lb + 1 Band
Set 2	10	1 - 1 - 1	20kg/44lb + 2 Bands
Set 3	8	1 - 1 - 1	20kg/44lb + 3 Bands

#### DESCENDING.

**WHAT IS IT:** - A tempo-based set. Reducing the time under tension every rep. Time under tension focus can be in the eccentric, isometric or concentric portion.

*Example:*

SETS.	REPS.	TEMPO.	LOAD/BANDS.
Set 1	5	1 - 6 - 1	20kg/44lb + 1 Band
Set 2	5	1 - 5 - 1	20kg/44lb + 1 Band
Set 3	5	1 - 4 - 1	20kg/44lb + 1 Band
Set 4	5	1 - 3 - 1	20kg/44lb + 1 Band
Set 5	5	1 - 2 - 1	20kg/44lb + 1 Band
Set 6	5	1 - 1 - 1	20kg/44lb + 1 Band

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## DROP SET.

**WHAT IS IT:** - Performing an exercise to failure with a heavy load, then performing each subsequent set with a slightly lower weight to failure.

*Example:*

SETS.	REPS.	TEMPO.	LOAD/BANDS.
Set 1	To failure	3 - 1 - 1	60kg/132lb + 3 bands
Set 2	To failure	3 - 1 - 1	40kg/88lb + 3 bands
Set 3	To failure	3 - 1 - 1	30kg/66lb + 3 bands
Set 4	To failure	3 - 1 - 1	30kg/66lb + 2 bands
Set 5	To failure	3 - 1 - 1	30kg/66lb + 1 band

## SUPER SET.

**WHAT IS IT:** - Performing two exercises back-to-back with no rest in between. Targeting opposing muscle groups (antagonistic supersets) or the same muscle group (agonistic supersets) are excellent for increasing workout intensity and efficiency.

*Example:*

SET 1.	REPS.	TEMPO.	LOAD/BANDS.
Exercise 1 – 2 Arm Row	12	4 - 1 - 2	60kg/132lb + 3 bands
Exercise 2 – 2 Arm Push	12	4 - 1 - 2	60kg/132lb + 1 band
SET 2.	REPS.	TEMPO.	LOAD/BANDS.
Exercise 1 – 2 Arm Row	12	4 - 1 - 2	60kg/132lb + 3 bands
Exercise 2 – 2 Arm Push	12	4 - 1 - 2	60kg/132lb + 1 band
SET 3.	REPS.	TEMPO.	LOAD/BANDS.
Exercise 1 – 2 Arm Row	12	4 - 1 - 2	60kg/132lb + 3 bands
Exercise 2 – 2 Arm Push	12	4 - 1 - 2	60kg/132lb + 1 band

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## LINEAR SETS.

**WHAT IS IT:** - Completing a series of sets with the same repetitions every set and the same load, unless form is compromised towards the final sets.

*Example:*

SET 1.	REPS.	TEMPO.	LOAD/BANDS.
Set 1	5	3 - 1 - 1	40kg/88lb + 3 bands
Set 2	5	3 - 1 - 1	40kg/88lb + 3 bands
Set 3	5	3 - 1 - 1	40kg/88lb + 3 bands
Set 4	5	3 - 1 - 1	40kg/88lb + 3 bands
Set 5	5	3 - 1 - 1	40kg/88lb + 3 bands

## WAVES.

**WHAT IS IT:** - A series of 3 descending rep-based sets is performed, whilst the weight increases in each of the 3 sets in small increments. On completion of the 1<sup>st</sup> wave the 2<sup>nd</sup> wave starts with the same rep range but using the weight that was selected for set 2 of the first wave.

*Example:*

WAVE 1.	REPS.	TEMPO.	LOAD/BANDS.
Set 1	3	2 - 1 - 1	60kg/132lb + 1 band
Set 2	2	2 - 1 - 1	60kg/132lb + 2 bands
Set 3	1	2 - 1 - 1	60kg/132lb + 3 bands
WAVE 2.	REPS.	TEMPO.	LOAD/BANDS.
Set 1	3	2 - 1 - 1	65kg/143lb + 1 band
Set 2	2	2 - 1 - 1	65kg/143lb + 2 bands
Set 3	1	2 - 1 - 1	65kg/143lb + 3 bands
WAVE 3.	REPS.	TEMPO.	LOAD/BANDS.
Set 1	3	2 - 1 - 1	70kg/154lb + 1 band
Set 2	2	2 - 1 - 1	70kg/154lb + 2 bands
Set 3	1	2 - 1 - 1	70kg/154lb + 3 bands

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## SUPER SET.

**WHAT IS IT:** - Performing two exercises back-to-back with no rest in between. Targeting opposing muscle groups (antagonistic supersets) or the same muscle group (agonistic supersets) are excellent for increasing workout intensity and efficiency.

*Example:*

SETS.	LOAD STATION.	REPS.	TEMPO.	LOAD/BANDS.
Exercise 1	Row	12	3 - 1 - 2	40kg/88lb + 3 bands
Exercise 2	Drive	12	3 - 1 - 2	20kg/44lb + 3 bands
Exercise 3	Belt Squat	12	3 - 1 - 2	60kg/132lb
Exercise 4	Overhead	12	3 - 1 - 2	20kg/44lb + 3 bands
Exercise 5	Lift	12	3 - 1 - 2	80kg/176lb + 3 bands
Exercise 6	STACK	12	3 - 1 - 2	40kg/88lb

Circuits work particularly well for groups with the LOAD range as it's easy to change resistance quickly using the bands. If necessary, it is also relatively quick to strip or add plates onto the station.

In summary, the structure and organization of sets within a workout routine can significantly influence the effectiveness of a training program. Different set types can target various aspects of muscle development, offering diverse stimuli to keep the body challenged and progressing. Understanding and utilizing these different set types can help create comprehensive and dynamic workout programs.