

The Basics of Strength Training

-- Incorporating strength training exercises into an exercise routine --

Important Note: Before implementing any changes to your exercise regime, it is important to speak with a medical professional to ensure it is safe for you to engage in strength training, as there cases where strength training may be unsafe, even when following the guidelines below.

4 Pillars of a successful exercise routine

1. **Safe:** Although there is a measure of risk with any exercise program, the program must not cause injury or exacerbate existing injuries.
2. **Efficient:** The program must respect the commitment of time that is available for exercise.
3. **Enjoyable:** The program must have a measure of enjoyment, leaving you looking forward to repeating the routine in the future (or at the very least not dreading doing the exercise routine).
4. **Effective:** The program must deliver the results it was intended to deliver, otherwise there will be a divide between your expectations and what you actually achieve, which lowers motivation and belief in the program.

The Valsalva Manoeuvre

- The Valsalva maneuver is forced expiration against a closed opening.
 - Ex: Straining during defecation, blowing up a balloon or playing the saxophone
- The Valsalva maneuver causes an increase in intrathoracic pressure, which results in cardiovascular changes. This places individuals with cardiovascular disease at a high risk of experiencing a cardiac event.
- When lifting heavy loads, the body unconsciously uses this technique to achieve the lift. When engaging in strength training or activities of daily life, it is important to keep the intensity of the resistance low-moderate to avoid breath holding.
- Tip: Exhale when you contract your muscle, inhale when you relax the muscle.

Training variables

- **Intensity** = The effort required to complete the exercise (the amount of weight being lifted).
- **Repetitions** = The number of times an individual performs a complete movement of a given exercise.
- **Set** = A group of repetitions completed before pausing to rest.
- **Tempo** = The speed at which the exercise is performed.

Training variable guidelines:

- **Intensity** = The effort required to complete the exercise (the amount of weight being lifted). Keep the intensity level **low-moderate**. Remember the RPE scale used for aerobic exercise (~11-14). Ideally for strength training, we also want to work in the low-moderate intensity range.
- **Repetitions:** Aim to achieve a repetition range of 12-20 repetitions. If you are unable to reach 12 repetitions at a low-moderate intensity level, you can either 1) lower the weight or 2) start with less repetitions and work to progress each week aiming to eventually achieve 12-20 repetitions.
- **Set:** 1-3 sets. Know that the more strength fitness you have, the more sets you will be able to complete.

Rating	Perceived Exertion
6	No exertion
7	Extremely light
8	
9	Very light
10	
11	Light
12	
13	Somewhat hard
14	
15	Hard
16	
17	Very hard
18	
19	Extremely hard
20	Maximal exertion

Table 1. The Borg Rating of Perceived Exertion Scale

- **Tempo** = Remember, you do not want to be holding your breath when strength training. Use a tempo that allows you to continue to breathe. Example: Lift the weight for a count of 4, pause for a count of 2, release the weight for a count of 4, pause for a count of 2. Repeat for the required number of repetitions.

When and how to increase the difficulty?

- Before increasing the difficulty, first check that you can complete the exercise with proper form for the maximum number of repetitions. For example: Are you able to keep your core engaged with a neutral spine and breathe through the movement? Are you using momentum to help lift the weight, or are you using your own strength?
- If you are accomplishing the maximum number of repetitions (20) and your RPE is <11, it would be worth exploring increasing the difficulty of one training variables, such as the resistance/weight.
- Note: Only increase the difficulty of one variable at a time. It is important to remember that when you increase the difficulty of one variable, you may need to DECREASE the difficulty of another variable. See example below, where the individual increased the number of sets.
 - Week 1: 1 Set x 20 repetitions = **20 repetitions**
 - Week 2: 2 Sets x 13 repetitions = **26 repetitions**

What types of exercise equipment should I use?

This is up to you! However, remember that low-moderate intensities are the goal! Select equipment that will help you achieve results with minimal risk. Below are 5 different equipment options:

1. Isokinetic Exercise Therapy (IET) equipment
 - Pro: Great for beginners, controls the speed and resistance, used for rehabilitative purposes
 - Con: Expensive, take up more space (1 machine for each exercise)
2. Weight training machines (non-IET equipment)
 - Pro: Great for beginners because they position you so that you can focus more on the active muscle and not on stabilizing your body, change weight by only using a pin (rather than lifting heavy plates)
 - Con: Expensive, take up more space (1 machine for each exercise)
3. Free weights
 - Pro: Simulates real-world loads, less expensive than machines, versatile applications
 - Con: Requires activation of stabilizer and balance control muscles (so proper technique is very important!), there are no safety mechanisms in place if you drop the weight.
4. Resistance bands – various levels of resistance (elasticity)
 - Pro: Versatile application (works small stabilizer muscles and big muscle groups!), less expensive than machines, takes up less space in the home
 - Con: Resistance increases throughout the motion, so be mindful of how intense the exercise feels. Always remember to **breathe!**
5. Body weight exercises
 - Pro: No cost, can be performed anywhere, highly applicable to daily life, easily adapted into a muscular endurance strength training regime
 - Con: May be more challenging if body-to-strength ratio is very low. This means you may need to adapt the exercise so that you can perform the exercise appropriately (Ex. A wall push-out rather than a push-up from the floor)

What do I use if I can't get access to weightlifting equipment?

Many household items can be used in place of free weights! Always be mindful of keeping the intensity level of the exercise **low-moderate**, but you can get creative and use what you have! See some examples below:

- Milk jug (with a handle) or plastic water bottles
- Canned goods
- Packets of rice or beans
- Bags of fruit or vegetables
- Laundry detergent bottles
- Soap dispensers
- Gardening pails
- Paint cans
- Books
- Ankle weights secured with an elastic
- Cutlery secured together with an elastic band



The table below is an example of how to incorporate strength training into a weekly exercise regime, with weekly options between 2-5x/wk. Core = abdominal strength.

Split/Day	Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
2 days / wk	Walk	Bike	Walk + Whole Body	Bike	Walk + Whole Body	Row	Elliptical
3 days / wk	Walk	Whole Body + Walk	Bike	Whole Body	Hike	Whole Body + Walk	Bike
4 days / wk	Bike	Upper Body & Core + Row	Lower Body & Core + Bike	Skipping + Walk	Upper Body & Core	Lower Body & Core + Hike	Dancing
5 days / wk	Hike	Chest Triceps & Core + Elliptical	Legs Back Biceps + Walk	-	Chest Back & Core	Shoulders Triceps + Walk	Legs Biceps & Core + Bike