

BENEFITS OF HEART RATE TRAINING

The concept of maximum heart rate and zone training began in 1968, when physiologist William Haskell and cardiologist Sam Fox were on their way to a World Health Organisation conference and were charged with the task of coming up with a guideline for patient exercise intensities during cardiac rehabilitation. Armed with a few pages of research based on 80 subjects, they determined that maximum measured heart rates appeared similar among the subjects. It appeared that most 30-year-old subjects had a maximum measured heart rate of 190 beats on average, most 20-year-olds up to 200 beats and so on. And so, the '220 minus age' formula for maximum heart rate training was born. In 1971 these works were published, and it was concluded that '220 minus age' seemed to be a good overall fit for rehabilitation prescription. It made sense to the fitness industry that a percentage of this max HR could affect the type of training outcome we were looking to affect. Sixty-five per cent of max HR was declared the 'fat burning zone', and that's where the industry has stayed for over 30 years. In more recent times, the appropriateness of this formula has been questioned; however, what does remain steadfast is the knowledge that by varying the intensity in which we workout (i.e., training at particular heart rates in the zone), we can achieve different health and fitness goals.

How do I determine my heart rate?

The best way to measure your resting heart rate is to use a watch or a heart rate monitor before you get out of bed in the morning (and before your first cup of coffee, since caffeine stimulates the heart rate). Some athletes even sleep with their heart rate monitor strap on! As you get fitter, your resting heart rate should gradually reduce (unlike your maximum heart rate, which falls slowly with age but is not much affected by fitness). If you notice a blip up in your resting heart rate one morning, this is a sign of overtraining or impending illness.

What is my heart rate reserve or working heart rate? What is the Karvonen formula?

Your heart rate reserve is the gap between your resting heart rate and your maximum heart rate. For example, if your maximum heart rate is 190bpm and your resting heart rate is 48bpm, then your heart rate reserve is 142bpm. ($HRR = 190 - 48 = 142$ bpm).

To get the heart rate corresponding to the aerobic threshold, which is at around 85 per cent of my heart rate reserve, I have to add 85 per cent of my heart rate reserve rate to my resting heart rate. Therefore, the heart rate corresponding to my aerobic threshold is estimated to be 169 ($AT = 48 + (0.85 \times 142) = 169$). This way of calculating a heart rate zone is known as the Karvonen formula.

What are the heart rate zones?

Zone	What it does	% of Heart Rate Reserve (Karvonen formula)
Long, slow runs, easy or recovery runs	Training in this zone improves the ability of your heart to pump blood and improve the muscles' ability to utilise oxygen. The body becomes more efficient at feeding the working muscles, and learns to metabolise fat as a source of fuel.	60 to 70%
Aerobic zone or 'target heart rate zone'	Most effective for overall cardiovascular fitness. Increases your cardiorespiratory capacity (i.e., your ability to transport oxygenated blood to the muscle cells and carbon dioxide away from the cells). Also effective for increasing overall muscle strength.	70 to 80%
Anaerobic zone	The point at which the body cannot remove lactic acid as quickly as it is produced is called the lactate threshold or anaerobic threshold. It generally occurs at about 80 to 88 per cent of the Heart Rate Reserve. Training in this zone helps to increase the lactate threshold, which improves performance. Training in this zone is hard: your muscles are tired, your breathing is heavy.	80 to 90%
VO ₂ max: The 'red line zone'	You should only train in this zone if you are very fit, and only for very short periods of time. Lactic acid develops quickly as you are operating in oxygen debt to the muscles. The value of training in this zone is you can increase your fast twitch muscle fibres, which increase speed.	90 to 100%

Take your results to the next level by introducing heart rate training into your workouts. If you have any questions on how heart rate training can help you achieve your health and fitness goals, see a personal trainer.