

Listen to Your "Heart" – Learning about Exercise Intensity

Exercise intensity refers to how strenuous an exercise is, and is directly related to the change in our heart rate during the exercise. You may utilise some reliable and accurate formulas to determine your target heart rate zone during exercise, or use a heart rate monitoring device (e.g. a heart rate monitor watch) to measure your heart rate during exercise more accurately. In addition, you may also use the “talk test” to determine your exercise intensity in a simple yet subjective manner.

Why is it important to monitor your heart rate?

Heart rate not only reflects your health status, but also serves as an indicator of your exercise efficiency. Knowing your average heart rate during running can help you improve your performance. This is particularly important to beginners, who tend to run faster and faster in pursuit of speed, resulting in a heart rate that is higher than the average and thus a low exercise efficiency. Therefore, it is vital to find out your heart rate and do a corresponding amount of exercise.

Determination method	Exercise intensity		Factor for consideration
	Moderate	Vigorous	
Physiological signs (talk test)	Able to talk as usual during an activity	Out of breath and unable to talk as usual during an activity	Simple and easy to use
The maximum target heart rate formula	50%-70%	70%-85%	Easy to use, but the results may not be accurate for younger or physically fit adults
The Heart Rate Reserve (HRR) formula	50%-70%	70%-85%	More complicated, but the results are more personalised and accurate

The maximum target heart rate formula

$$\text{Target heart rate} = (220 - \text{age}) \times \text{Intensity \%}$$

Example: A 40-year-old male is performing a running drill. His target heart rate zone for moderate-intensity exercise can be calculated as follows:

$$\begin{aligned} \text{Lower limit of target heart rate zone} &= (220 - 40) \times 50\% \\ &= 90 \text{ beats/minute} \end{aligned}$$

$$\begin{aligned} \text{Upper limit of target heart rate zone} &= (220 - 40) \times 70\% \\ &= 126 \text{ beats/minute} \end{aligned}$$

Therefore, if this male wishes to perform the running drill at a moderate exercise intensity, he should maintain his heart rate at the level of 90 to 126 beats per minute during running. If his heart rate exceeds the upper limit of 126 beats per minute, he has to lower his running speed.

The HRR formula

Target heart rate = $[(220 - \text{age} - \text{resting heart rate}) \times \text{intensity \%}] + \text{resting heart rate}$

Example: If the male in the example above has a resting heart rate of 60 beats per minute, his target heart rate zone for moderate-intensity exercise can be calculated as follows:

Lower limit of target heart rate zone = $(220 - 40 - 60) \times 50\% + 60$
= 120 beats/minute

Upper limit of target heart rate zone = $(220 - 40 - 60) \times 70\% + 60$
= 144 beats/minute

Since the HRR formula takes both the age and the resting heart rate of the person who engages in the exercise into account, the results can be applied to personalised training.

Definitions of related heart rate values:

Resting heart rate

Refers to the number of heart beats per minute when you are awake and in an inactive and quiet state. In general, the lower the resting heart rate you have, the better your cardiorespiratory fitness is. To find out your resting heart rate, you may wear a sports watch to bed and check the data concerned when you wake up.

Maximum heart rate

Refers to the upper limit of the average number of heart beats per minute. The commonly used formula: Maximum heart rate = $220 - \text{age}$