

The short- and long-term effects of exercise



UNTAMED
EDUCATION

1.1.4 Applied anatomy and physiology

Vasodilate

Cardiac Output

Heart Rate

Temperature

Respiratory Change

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DOMS

Hypertrophy

Stroke Volume

Bradycardia

Vasoconstrict



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1. Heart rate

- ▶ When you start to exercise the **heart rate** _____.
- ▶ This coupled with an **increased stroke** _____ increases the **cardiac** _____ resulting in an increased **blood flow** and better **oxygen** _____.
- ▶ The increase in heart rate depends on the intensity of the exercise. _____ **exercise results** in a _____ **increase** in the heart rate.



2. Respiratory changes

- ▶ **Breathing frequency** _____.
- ▶ _____ of **breathing increases**, resulting in an **increase in** _____ **volume**.
- ▶ Minute ventilation = tidal volume x breathing frequency.
- ▶ _____ **ventilation increases**.

3. Blood Shunted to Working Muscles

- ▶ To increase oxygen delivery to the muscles.
- ▶ The arteries **widen** (_____) at the muscles to increase blood flow.
- ▶ The arteries **narrow** (_____) to other organs that have lower energy demands i.e. stomach and intestines.





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4. Other changes

- ▶ During prolonged performance and _____ respiration **lactic acid** is produced. This makes the **muscles fatigue** and you will feel tired.
- ▶ Performers must eventually **stop** due to _____.
- ▶ Feel **light** _____.
- ▶ Experience _____.

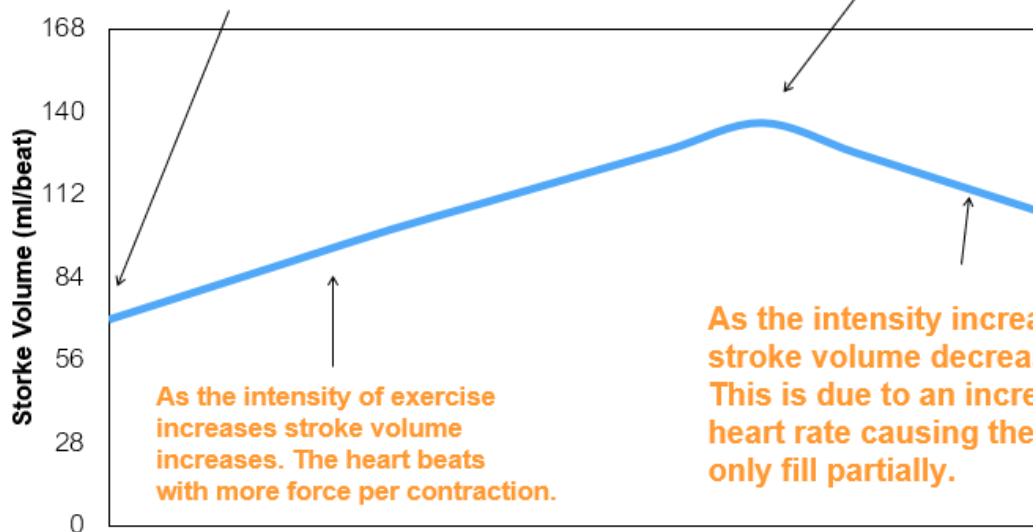
5. Recovery

- ▶ **Cardiovascular** and **respiratory systems** continue to work hard to repay the **oxygen** _____ and remove **lactic acid**.
- ▶ During the recovery phase the breathing rate and heart rate remains _____.
- ▶ When the body has recovered breathing rate and heart rate return to **resting levels**.

6. The short-term effects of exercise on stroke volume (SV)

The average resting stroke volume is 70 milliliters per heartbeat (ml/beat), depending on the fitness of the individual.

Stroke volume peaks during sub maximal exercise.



As the intensity of exercise increases stroke volume increases. The heart beats with more force per contraction.

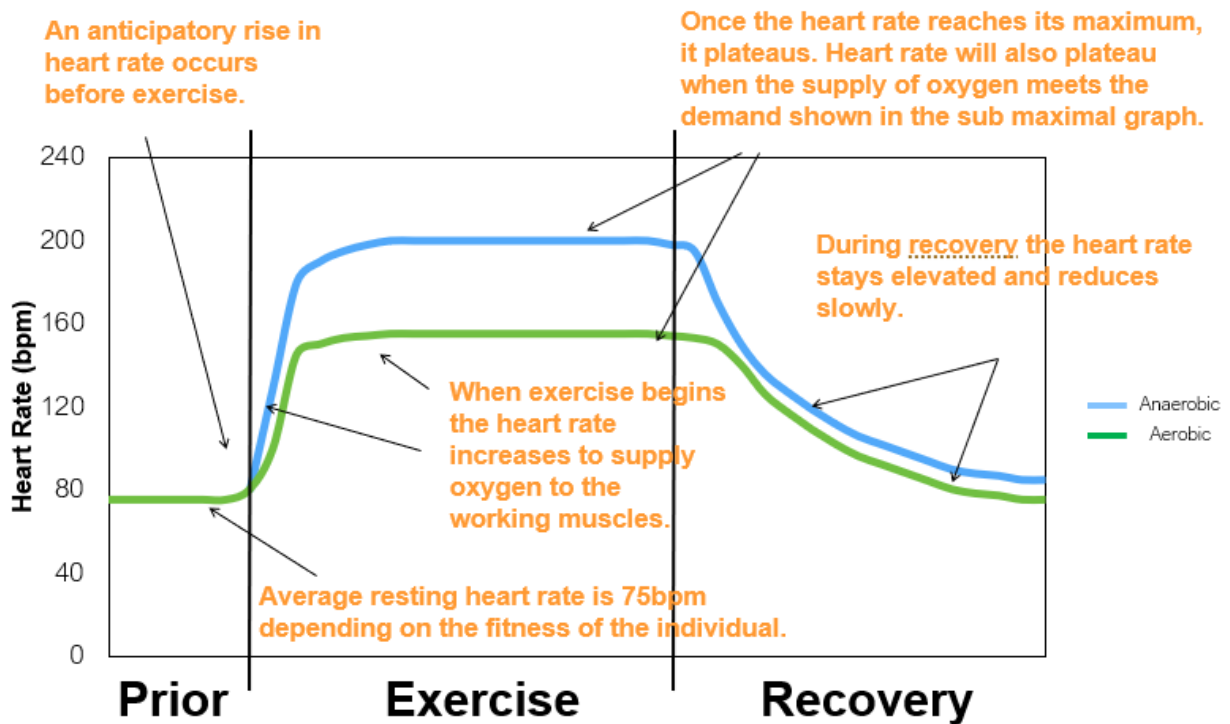
As the intensity increases the stroke volume decreases slightly. This is due to an increased heart rate causing the heart to only fill partially.

Exercise Intensity

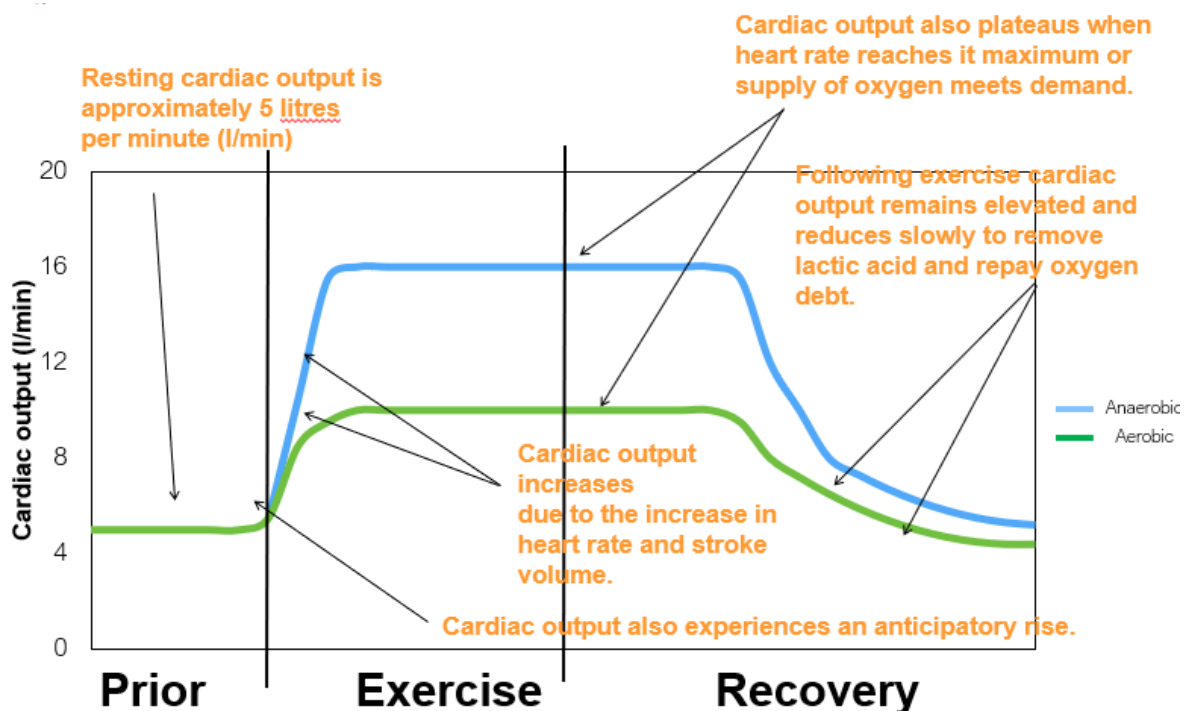


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7. The short-term effects of exercise on heart rate (HR)



8. The short-term effects of exercise on cardiac output (Q)





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9. Long term effects of exercise

- ▶ **Resting heart rate decreases** (_____). 60 beats per minute in an adult is considered bradycardia.
- ▶ Change in body shape and an **increased** _____ **body mass**.
- ▶ **Improvements in specific** _____ **of fitness** such as muscular endurance, cardiovascular endurance, speed, suppleness (flexibility) and strength. These improvements depend on the type of exercise you perform.
- ▶ **Increase in** _____ so you can exercise for longer.
- ▶ **Muscles** increase in **size** and **strength** (_____ **v**).