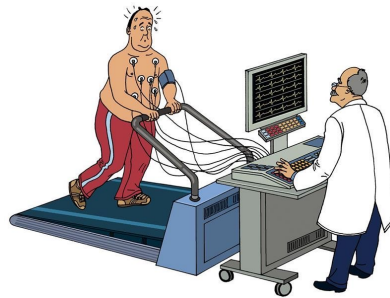




Blood Pressure and Exercise

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Aim of the experiment:

- To determine the effects of muscular activities on blood pressure (BP) and heart rate (HR).



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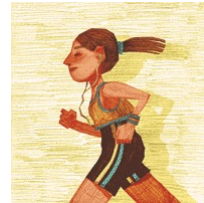
The physiologic events which change during exercise:

↑ Muscular activity

↑ Sympathetic discharge

↓ Parasympathetic activity

↑ Cardiac output.



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The physiologic events which change during exercise:

▪ Increased Muscular activity

↑ Vasodilatation →

↑ Blood flow through muscle

▪ Mainly due to:

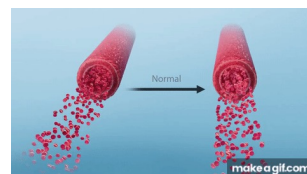
↑ Metabolism.

↑ Formation of vasodilator substances.

▪ An initial small extent of vasodilatation:

↑ blood flow through muscle

(↑ Cardiac Output)



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The physiologic events which change during exercise:

↑ Sympathetic discharge and
 ↓ Parasympathetic activity to the heart.

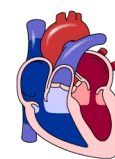
▪ Release of **adrenaline** that stimulates vasodilator (β) receptors in muscle:

▪ Peripheral vasoconstriction:

↑ Venous return:

↑ Heart rate:

↑ Heart contractility:



Cardiac Output

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The physiologic events which change during exercise:

BP = Cardiac output x Peripheral resistance

$$BP = C.O \times P.R$$

↑ C.O or P.R → ↑ BP

↓ C.O or P.R → ↓ BP

- The consequence of these events is increased SBP especially by **20–40 mm Hg**.

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The effect of muscular exercise on BP depends on:

1. The type of muscular exercise:

- aerobic or anaerobic
- isotonic or isometric



2. The intensity of exercise:

- Mild (light)
- Moderate
- Heavy (severe)



Inactivity



Light activity



Moderate/
high activity

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The effect of muscular exercise on BP depends on:

3. The duration of exercise



4. It also depends on whether the subject is:

- a trained athlete:
- an untrained individual



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▪ Name:	▪ Sex (Gender):
▪ Age:	▪ Occupation:

Effect of exercise on BP

Procedure	Pulse (beat/min)	SBP (mm.Hg)	DBP (mm.Hg)	Pulse pressure (mm.Hg)
Before exercise				
After exercise				

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What are the effects and benefits of regular exercise?

- The HR decreases due to increased vagal tone.
- The stroke volume increases due to **increased cardiac muscle mass (hypertrophy)**.

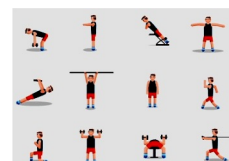
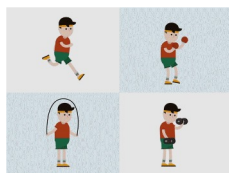
▪ Cardiac Output:

In trained athlete:

- CO achieves the target mainly by increasing CO.

In an untrained individual:

- CO increases mainly by increase in HR.

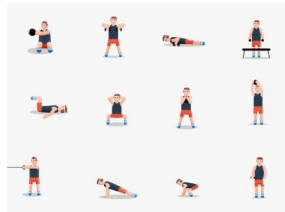
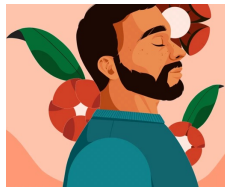


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What are the effects and benefits of regular exercise?

Regular Exercises:

- **↑ the breathing capacity** (maximal O₂ extraction)
- **↑ the size of skeletal muscles** along with work capacity
- **promote better mental functions.**
 - The **‘feel good’** effect and reducing or overcoming stress of modern life can work as a powerful treatment of depression.



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Questions/Comments



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