



## Blood Pressure and Exercise

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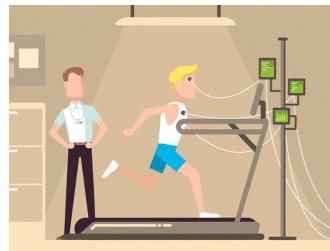
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### Aim of the experiment:

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



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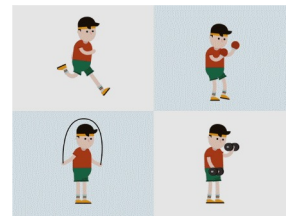
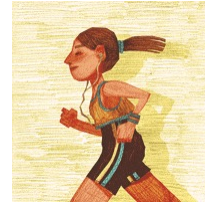
### The physiologic events which change during exercise:

↑ Muscular activity

↑ Sympathetic discharge and

↓ 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:

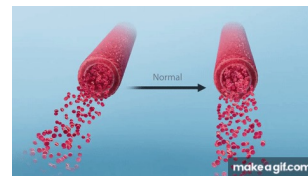
↑ Metabolism.

↑ Formation of vasodilator substances.

#### ■ An initial small extent of vasodilatation:

↑ blood flow through muscle

(↑ Cardiac Output)

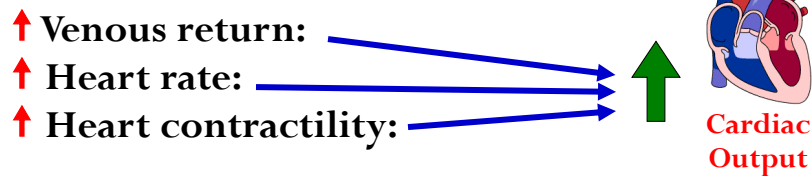


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### The physiologic events which change during exercise:

- ↑ Sympathetic discharge and
- ↓ Parasympathetic activity to the heart.

- Release of **adrenaline** that stimulates vasodilator ( $\beta$ ) receptors in muscle:
- Peripheral vasoconstriction:



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### The physiologic events which change during exercise:

$$\text{BP} = \text{Cardiac output} \times \text{Peripheral resistance}$$

$$\text{BP} = \text{C.O} \times \text{P.R}$$

$$\uparrow \text{C.O or P.R} \rightarrow \uparrow \text{BP}$$

$$\downarrow \text{C.O or P.R} \rightarrow \downarrow \text{BP}$$

- 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:

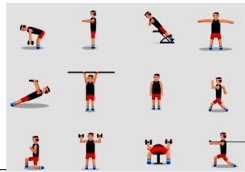
  

Effect of exercise on BP				
Procedure	Pulse (beat/min)	SBP (mm.Hg)	DBP (mm.Hg)	Pulse pressure (mm.Hg)
Before exercise				
After exercise				

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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 O<sub>2</sub> extraction).
- **↑ the size of skeletal muscles** along with work capacity.
- **promote better mental functions.**
  - The ‘feel good’ effect and busting of stress of modern life can work as a powerful treatment of depression.



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## Questions/Comments



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