



Cardiovascular Block

Physiology Team 430

3rd Lecture

Measurement of arterial blood pressure

Practical

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Normal blood pressure :

Systolic Blood Pressure = 100 – 140 mmHg

Diastolic Blood Pressure = 60 – 90 mmHg

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The Pulse pressure (PP):

Is the difference between systolic and diastolic pressure.

$$PP = \text{Systolic P} - \text{Diastolic P}$$

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Mean Arterial Blood Pressure = Diastolic BP + 1/3 Pulse Pressure

If a person's blood pressure = 130/70 mmHg, What is his mean arterial BP?

Diastolic = 70 mmHg

Pulse Pressure = Systolic – Diastolic = 130 – 70 = 60 mmHg

MABP = 70 + 1/3 x 60 = 70 + 20 = 90 mmHg

Effect of exercise on blood pressure:

1- Exercise increases Systolic Blood Pressure, but either no effect on diastolic BP if mild to moderate or decrease in diastolic BP if severe (heavy) exercise is performed.

Mechanism :

Exercise → Sympathetic stimulation → ↑ HR, ↑ CO → ↑ Systolic BP

Active muscles → Production of local metabolites (histamine + Bradykinin etc) → Vasodilatation → decrease TPR → decrease diastolic BP (In case of heavy exercise)

Exercise intensity	Systolic Pressure	Diastolic pressure
Mild	↑	No change
Moderate	↑↑	No change
severe	↑↑↑	↓

2- Effects of Exercise on Blood Gases and pH:

— Exercise → Metabolic (lactic) Acidosis (↓ pH)

Mechanism:

— Exercise → ↑ oxygen demands by muscles → stimulation of anaerobic metabolism → ↑ production of lactic acid → ↑ [H⁺] → ↓ pH ↓ HCO₃⁻

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The above equation will be shifted to the left because of more H⁺ will combine with HCO₃⁻ and HCO₃⁻ will be decreased and will result in metabolic acidosis.