



Physiology
OF THE CARDIOVASCULAR SYSTEM

Arterial Blood Pressure

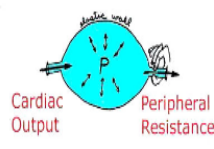
Arterial Blood Pressure

the concept of mean BP
 is the force exerted on the lateral wall of the arteries while blood is flowing through them
 In normal adult = 120/80 mmHg
 Max Systolic Max Diastolic

Calculate mean BP
 = diastolic + 1/3 pulse pressure
 Systolic P - Diastolic P

normal variations in ABP
 Adult BP range
 110 - 130 / 70 - 85 mmHg

the relationship between CO, BP and total peripheral resistance
 $MABP = \text{Cardiac Output} \times \text{Peripheral Resistance}$
 $SV \times HR$ $\Delta P / Q$



factors determining BP

Cardiac output
 $CO = SV \times HR$
 (av 5-6 L/min) (av 70-80 ml/beat) (N 60-100 beats/min)

Velocity and Cross Sectional Area
 $V = Q / A$
 As diameter of vessels ↓, the total cross-sectional area ↑ & velocity of blood flow ↓

Compliance of Blood Vessels
 $C = \text{Volume} \setminus P$

Total peripheral resistance

mechanisms for promoting continuous flow of blood to the capillaries:

- Elastic recoil
- Smooth m
- regulation of diameter Sphincters
- Valves

NOTICE - R Influenced by: Length of the tube (L), radius of the tube (r) & viscosity of the blood (η)

Poiseuille's Law
 $R = \frac{8nl}{\pi r^4}$

Ohm's Law
 $Q = \frac{\Delta P}{R}$

Q = $\frac{\Delta P \pi r^4}{8nl}$

NOTICE - #Flow ↓ when R↑; #Flow, and R↓ when vessel diameter ↑.

NOTICE - #P directly proportional to F; #Blood flows down a pressure gradient; #Absolute value of pressure is not important to flow, but the difference in pressure (DP or gradient) is important to determining flow.

FOR THE CLEAR VERSION:
<https://www.gliffy.com/go/publish/image/10192663/L.png>