B. Sc. (Hons) Part-II Practical
Course: Zool. H. 211
Experiment 4
Measurement of Blood Pressure (BP)

Introduction

- Blood pressure (BP) refers to the **arterial pressure** of the systemic circulation.
- In other words, BP means the lateral pressure created by the flowing blood on the wall of the blood vessels.
- BP is regulated by the nervous and endocrine systems, both of which are involuntary or autonomic in nature.
- During **contraction** of the heart, the pressure on the wall of the arteries is called **'systolic pressure'**, whereas during **expansion** of the heart, the pressure on the wall of the arteries is called **'diastolic pressure'**.
- In adults, the normal **systolic** pressure is **120 mm of Hg** and the **diastolic** pressure is **80 mm of Hg**.
- The **difference** between the systolic and diastolic pressure is called **'pulse pressure'** which is about **40 mm** of Hg in normal adults.

Significance of BP in man

- BP is one of the four vital signs routinely monitored by the medical professionals and healthcare providers.
- The other three signs are: body temperature (98.6 °F or 37 °C), pulse rate (72/m) and respiratory rate (18/m).
- Hypertension (HTN) is a condition where both systolic and diastolic pressures of a person are raised compared to a normal healthy person.
- White coat HTN: Difference in BP between a home and clinical measurement.

Diagnosis of hypertension (HTN) in man

Categories	Systolic (mm Hg)	Diastolic (mm Hg)
Hypotension	<90	<60
Desired (normal)	90-119	60-79
Pre HTN	120-139	80-89
Stage I HTN	140-159	90-99
Stage II HTN	160-179	100-109
Emergency HTN	≥180	≥110

Ref: American Heart Association, 2011; In the UK, however, a person is said to be hypertensive if he/she has a BP of 140/90.

Apparatus used for measuring BP in man

Commonly used apparatus:

1. Sphygmomanometer- for monitoring and measuring BP
2. Stethoscope- for auscultation (listening to the sounds) of internal organs like heart, lungs, intestine, arteries and veins

Types of sphygmomanometer:

1. Hg-column (manual, primitive but reliable)
2. Digital (automated and electronic device, but less reliable)
3. Aneroid (manual, modern and mostly used)

Fig. 1 Hg-column sphygmomanometers

Fig. 2 Digital sphygmomanometers

Fig. 3 Android sphygmomanometers

Aneroid sphygmomanometer

Components

1. Cuff
2. Aneroid manometer gauge
3. Inflation bulb (with air release valve)
4. A pair of tube or hose connectors

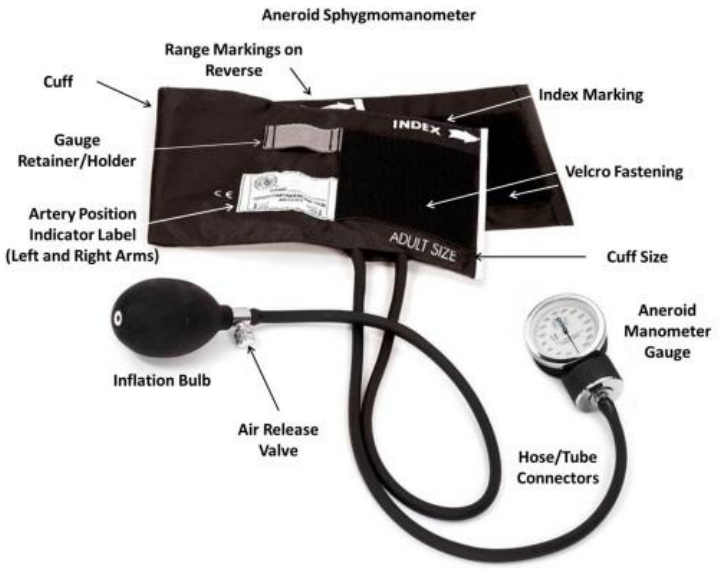
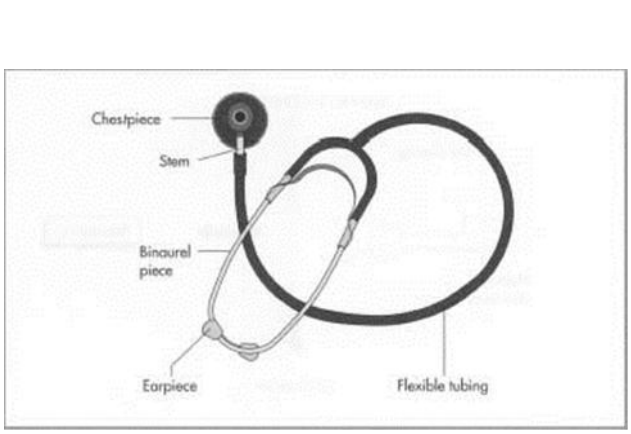


Fig. 4 Components of an android sphygmomanometer

Stethoscope

Components

1. A pair of ear tubes (with ear tips)
2. Chest piece (with tunable diaphragm)
3. A flexible tube (connected to the stem of the chest piece)



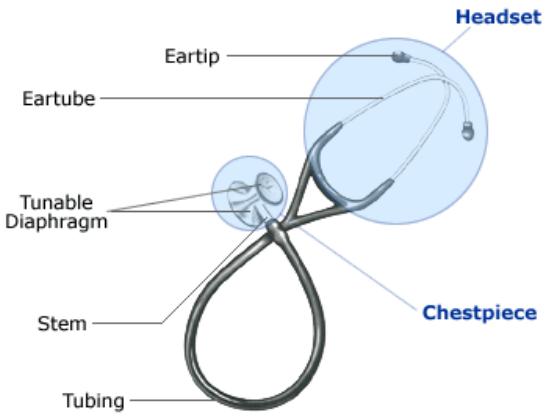


Fig. 5 Components of stethoscope

Measurements of BP in the lab

Subjects	Systolic pressure (mm Hg)	Diastolic pressure (mm Hg)
1		
2		
3		
Total=3		
Average		

Procedures

- Measure systolic and diastolic pressures (mm of Hg) from three randomly chosen subjects (classmates) and record them in a table;
- Then, calculate the average (mean) values;
- Finally, comment on your findings.

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