

تقنيات اجهزة تخدير الكورس الاول

NON INVASIVE BLOOD PRESSURE MONITORING

Sawa University

جامعة ساوة الاهلية

College of health and medical techniques

كلية التقنيات الصحية والطبية

Department of Anesthesia

قسم تقنيات التخدير

Four Stage

المرحلة الرابعة

محاضرة رقم 1

الجانب النظري

Lecture No 1.

Theoretical

استاذ المادة :م.د سامي رحيم حسن

(INTRODUCTION)

- ❑ Blood pressure monitoring is the most commonly used method of assessing the cardiovascular system.
- ❑ The magnitude of BP is directly related to the **Cardiac Output** and the **Systemic vascular resistance**.

$$\text{BP} = (\text{HR} \times \text{TPR}) \times \text{SV}$$

- ❑ It can be used for diagnosis and treatment of the patient. This can be achieved by **non-invasive or invasive methods**, continuously or intermittently depending on the requirements of the patient.



MEAN ARTERIAL PRESSURE

Time-weighted average of arterial pressures during a pulse cycle.

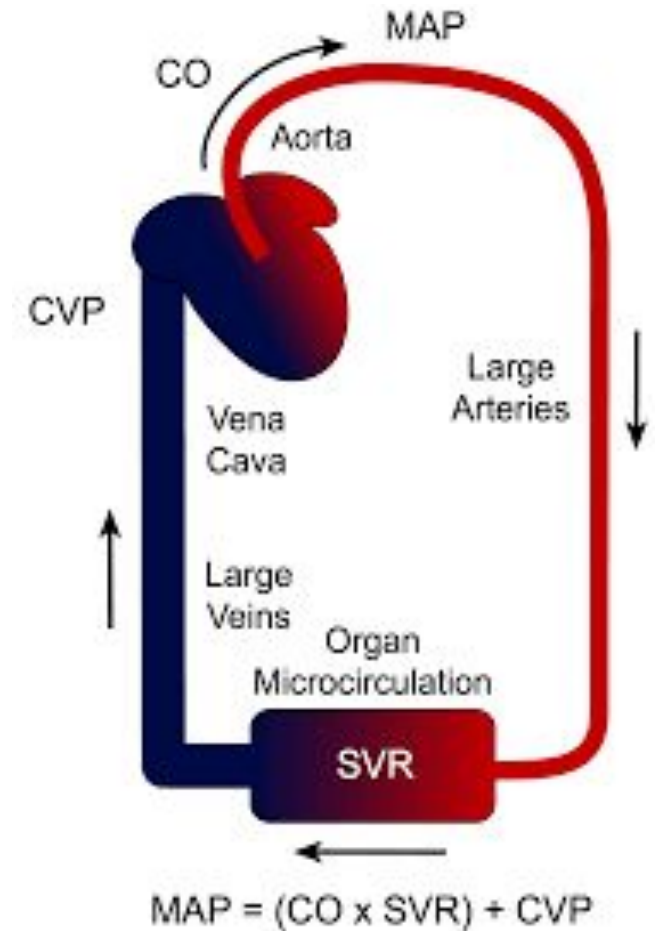
$$\text{MAP} = \text{DBP} + (\text{SBP} - \text{DBP})/3$$

or

$$\text{MAP} = [\text{SBP} + (\text{DBP} \times 2)] / 3.$$

or

$$\text{MAP} = \text{CO} \times \text{TPR}$$



FACTORS AFFECTING MEAN ARTERIAL PRESSURE (MAP)

1. **CARDIAC OUTPUT:** THE AMOUNT OF BLOOD THE HEART PUMPS PER MINUTE.
2. **TOTAL PERIPHERAL RESISTANCE:** THE RESISTANCE OF THE BLOOD VESSELS TO BLOOD FLOW.
3. **BLOOD VESSEL ELASTICITY:** THE ABILITY OF BLOOD VESSELS TO STRETCH AND RECOIL.

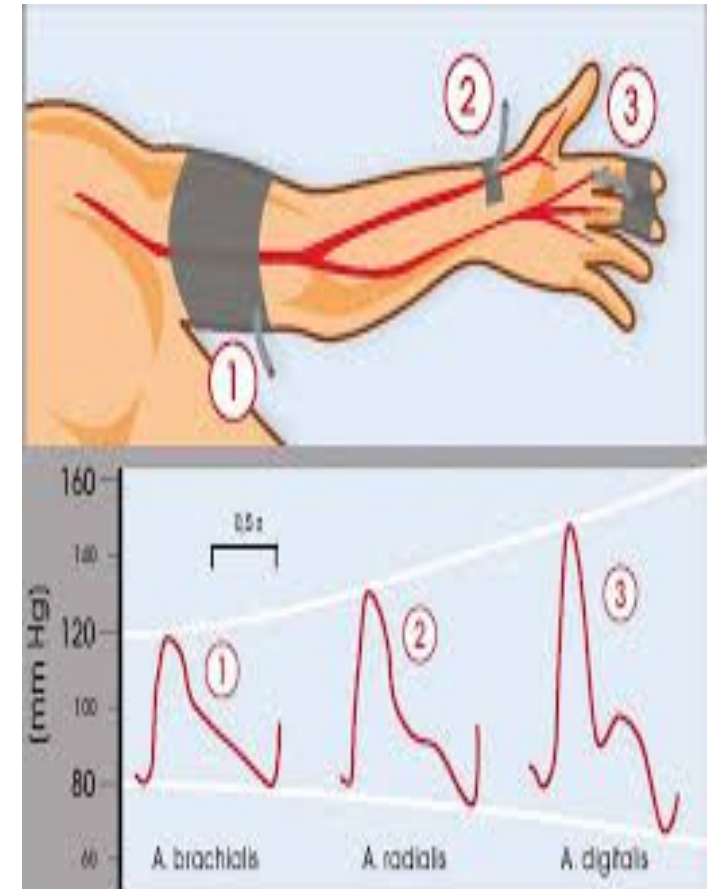


NON INVASIVE INTERMITTENT BP MONITORING

Requirements:

Three key components:

1. an inflatable **cuff** for occluding the arterial supply to the distal limb;
2. a **method** for determining the point of **systolic and diastolic blood pressures**;
3. a **method** for measuring pressure.



Types of mean arterial blood pressure

■ NON INVASIVE

Palpation

Doppler

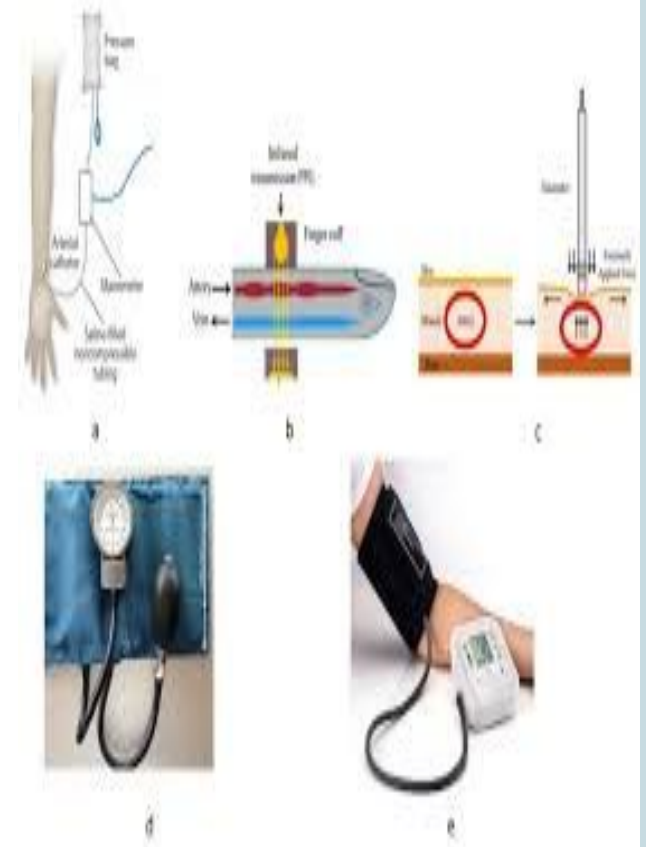
Auscultation

Oscillometry

Plethysmography

■ INVASIVE

Arterial cannulation
and pressure
transduction



TECHNIQUES:

1. PALPATION

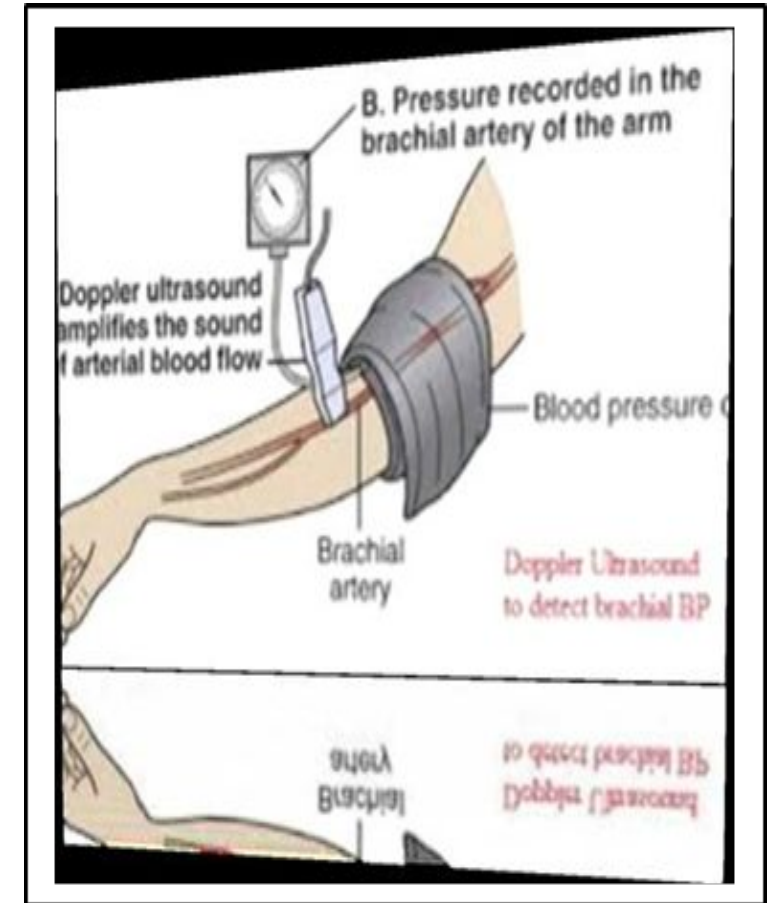
Inflate the cuff rapidly to 70 mmHg, and increase by 10 mm Hg increments while palpating the radial pulse. Note the level of pressure at which the pulse disappears and subsequently reappears during deflation; will be **systolic blood pressure**.

- ❑ While being easy to perform, this technique has been shown to underestimate a systolic pressure of **120** mm Hg by **25%.** **Diastolic** and mean pressures cannot be determined.



2. DOPPLER

- ❖ Systolic pressure can also be determined using the Doppler principle. Blood flow towards or away from the Doppler probe, reflects sound waves causing a change in frequency that is detected using the same Doppler probe.
- ❖ As Doppler is so sensitive, this technique is usually reserved for the measurement of low pressures, e.g. vascular insufficiency.



3. AUSCULTATION

The cuff should be 20% wider than the diameter of the part of the limb being used (or cover two-third its length).



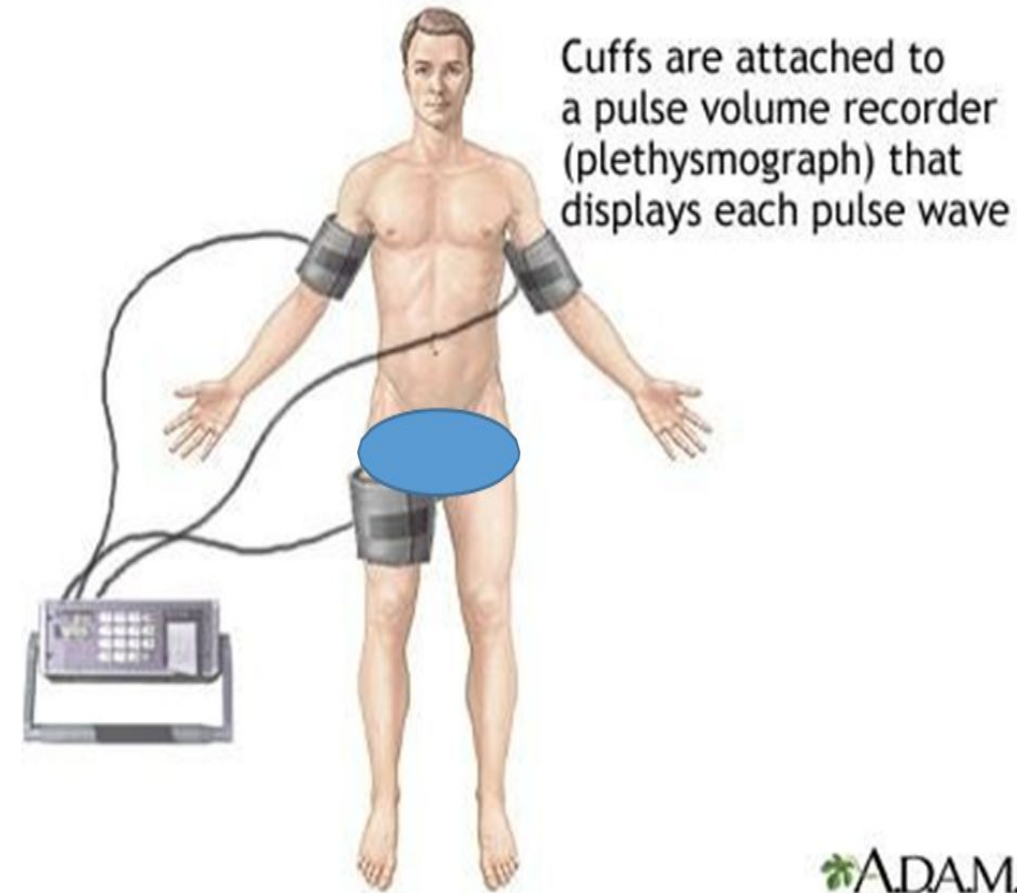
4. OSCILLOMETRY

- ❖ Oscillotonometer uses two cuffs and two bellows connected to a measurement gauge.
- ❖ The two cuffs overlap, one occludes the artery (occluding cuff) and the other senses the arterial signal (sensing cuff). Pressure from both cuffs is transmitted to the two bellows which is in turn displayed via a single gauge, alternating between the two bellows using a lever.
- ❖ With the lever in the sensing position, the occlusive cuff is inflated above systolic pressure. The cuff is then deflated using a bleed valve until the needle suddenly.



5. PLETHYSMOGRAPHY

- ❑ Blood pressure cuffs or other sensors are placed at **different locations on the arms, legs, fingers, and/or toes**. The sensors record the pulse waves that occur with each heartbeat. (This data is translated into a graphic recording for later review.)
- ❑ The test usually takes **less than 20 to 30 minutes**.



Any questions?

*Thank
You*