

Blood Pressure

Fourth Stage

Supervised by

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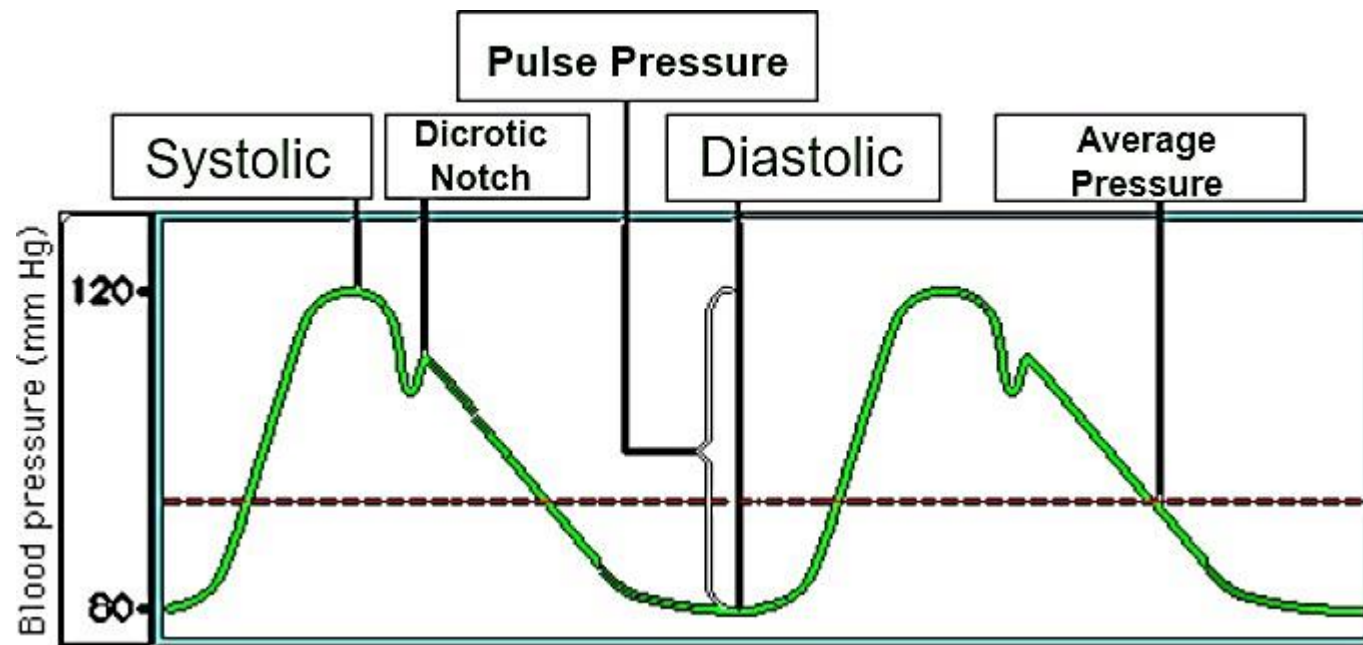
What is blood pressure?

Is the pressure exerted by blood on the walls of the circulatory system. Due to the structure and function of the system, pressure measurements vary both over time and from one location in the system to another. The circulatory system is under the influence of gravity, so pressure tends to be lower in the highest parts of the body.



Blood Pressure

- **Due to the cyclic pumping of the heart:**
- Blood pressure varies correspondingly, with its **highest (systolic)** value at the point of maximal cardiac output.
- Falling to a **low (diastolic)** value between contractions.
- A shoulder, called the **dicrotic notch**, occurs when the aortic valve closes. Both systolic and diastolic values, as well as the mean cycle pressure, can provide valuable information about the state of the individual.



Blood Pressure

- Blood vessels have a degree of elasticity as well as mechanical resistance to flow. This means that pressure waveforms are reduced at points farther away from the heart; both systolic and diastolic values are lower, as is the difference between the two. At the capillaries, pressure is almost constant.
- Pressure in the venous portion of the circulatory system is also relatively constant at any given point, dropping in response to gravity at higher points in the body. Pressure must be adequate to allow blood to return to the heart.

Blood Pressure

- Blood pressure in general is modified by various normal and abnormal physiological conditions.
- **Value depends on 3 factors:**
 - cardiac output
 - diameter of arteries
 - the quantity of blood
- The normal value of BP is (SP 120/DP 80) mmHg/L

Types of Blood Pressure

- **Hypertension**
- Physical exertion increases pressure as the heart pumps harder and more rapidly in order to maintain adequate blood supply to muscles.
- When deposits build up in blood vessel walls (arteriosclerosis), the vessel walls become thicker and less elastic, and the interior diameter of the vessels is reduced. Arteriosclerosis can be caused by prolonged periods of hypertension or by excess amounts of cholesterol in the blood, or a combination of these factors, and others.
- The changes of elasticity seen in arteriosclerosis also have an effect on blood pressure waveforms, with a greater difference between systolic and diastolic values. This, combined with the reduced blood flow resulting from narrowed arteries, means that cardiac muscle perfusion is reduced significantly, Persistent hypertension can also cause strokes, aneurisms, and kidney failure.

Types of Blood Pressure

- **Hypotension**
- Low blood pressure, or hypotension, can also be caused by faulty autonomic nervous system responses, or by blood loss. Some individuals are able to function normally with lower than “normal” blood pressure, and actually may see some health benefits from this situation.
- Abnormally low blood pressure leads to reduced perfusion of all organs, but most significantly, the brain. Reduced cognitive function, dizziness, unconsciousness, and eventually death can result.

Blood Pressure Monitoring

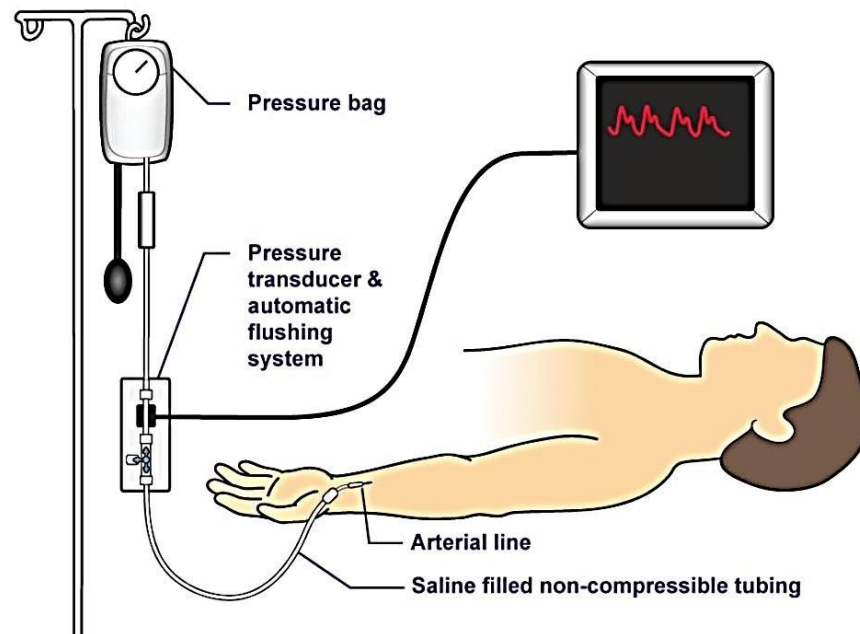
- **There are two types of blood pressure monitoring:**
- **Invasive:** Involving entry into the living body (as by incision or by insertion of an instrument)
- **Non-invasive:** Not tending to infiltrate and destroy healthy tissue (out of the body).

Blood Pressure Monitoring

- **Invasive Blood Pressure Monitors**
- 1.Fluid-filled transducer
- 2.Microtip pressure catheter
- The most accurate and timely method of measuring blood pressure is to insert a fine, **saline-filled cannula (tube)** into the blood vessel or structure of interest. The cannula is connected to a pressure transducer.
- Alternatively, a small pressure transducer can be mounted on the **tip of a catheter**, which is then inserted into the target area. This provides better response than the saline-filled cannula because the transducer is immediately at the site of the pressure being measured, but because it is a somewhat larger diameter, it cannot be used in the very small vessels that are accessible to a cannula.

Blood Pressure Monitoring

- In either case, the pressure transducer produces a signal that can be analyzed to provide a value for pressure. The pressure value can be given numerically, or charted on a recorder or video display.



Blood Pressure Monitoring

- **Disadvantages**
- It is invasive and thus somewhat difficult to set up and also uncomfortable for the patient.
- There is a possibility of infection developing at the insertion site.
- Some bleeding may occur at the site.
- A blood clot, or thrombus, may form in the vicinity of the cannula. If this breaks free, it can cause a blockage in a smaller vessel. The cannula must be flushed regularly if used for an extended time, in order to reduce the formation of clots.

Blood Pressure Monitoring

- **Non-invasive:**
- 1.Palpatory
- 2.Auscultatory
- 3.Ultrasonic
- 4.Oscillometric



Thank You