



Ministry of Higher Education and Scientific Research
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Practical Medical Physics

Lecture 2

Oximeter

By

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Oximeter

The oximeter measures the amount of oxygen saturation of blood in the arteries by calculating the light absorption of the vascular tissue pulse in two successive wavelengths. It measures the amount of oxygen in the blood without withdrawing any drop of blood from the patient. It is used to take readings in the following cases:

- Hospital operating room.
- Monitor the patient's condition outside the operating room.
- Monitor oxygen levels while giving the patient a strong anesthetic and analgesic.
- Knowing the patient's situation inside the house with the use of oxygen as a treatment.
- Routine monitoring to ensure that the patient is not at risk of developing



Figure (1) Oxygen Meter.

Properties of Oximeter

- Easy to use and read.
- The settings on the device are not complicated.
- It is safe and does not pose a risk to the patient.



Figure (2) Oximeter information.

Types of Oximeter

There are two types of devices that you know as follows:

- Physician-prescribed devices that require approval, must also be ensured that they work before they are prescribed to sectors such as: hospitals, doctors offices, and sometimes to patients in their homes.
- Non-prescription devices can be found in the market without the need for any previous approvals, as they were developed to estimate the level of oxygen saturation in the blood, and people's need for these devices increased during the period of the Corona virus epidemic.

Oximeter readings

The oxygen meter shows two or three readings as follows:

- Most importantly, blood oxygen saturation levels, which appear as a percentage of the acronym SpO₂.
- Heart rate and acronym PR.
- The device's signal strength may or may not be shown.

The percentage of oxygen should be higher than 90-92% measured by SpO₂, and any number lower than this indicates a lack of oxygen that needs medical intervention.

Another abbreviation, PO₂, may appear, which refers to the partial pressure of oxygen, and its percentage must be higher than 60-65%.

Therefore, attention should be paid to the percentages that appear in addition to the specific readings.

Specifications for the use of an Oximeter

There are some limitations that prevent certain groups from using the device, as incorrect and accurate readings may appear to determine the health status.

Here are the most important determinants of the following:

- Poor Blood circulation.
- Skin pigmentation for people with dark skin.
- Permanent low body temperature.
- Use a darker color of nail polish.
- Use long false nails.
- Finger contamination.

How is the Oximeter used?

- Get rid of any accessories or polish on your nails.
- Warm your hands if they are cold.
- Relax before taking the readings for at least 5 minutes. Place your hand on your chest along the place of the heart and then clamp it.
- Turn the device on and place it on your finger preferably the middle or index finger of any hand you want.
- Hold the device in your finger for a minute or more if the reading is not yet visible.
- Record the highest result that appeared if no further reading appears within 5 seconds.
- Make sure you differentiate between your oxygen level reading and your heart rate reading that appears on the device's screen.

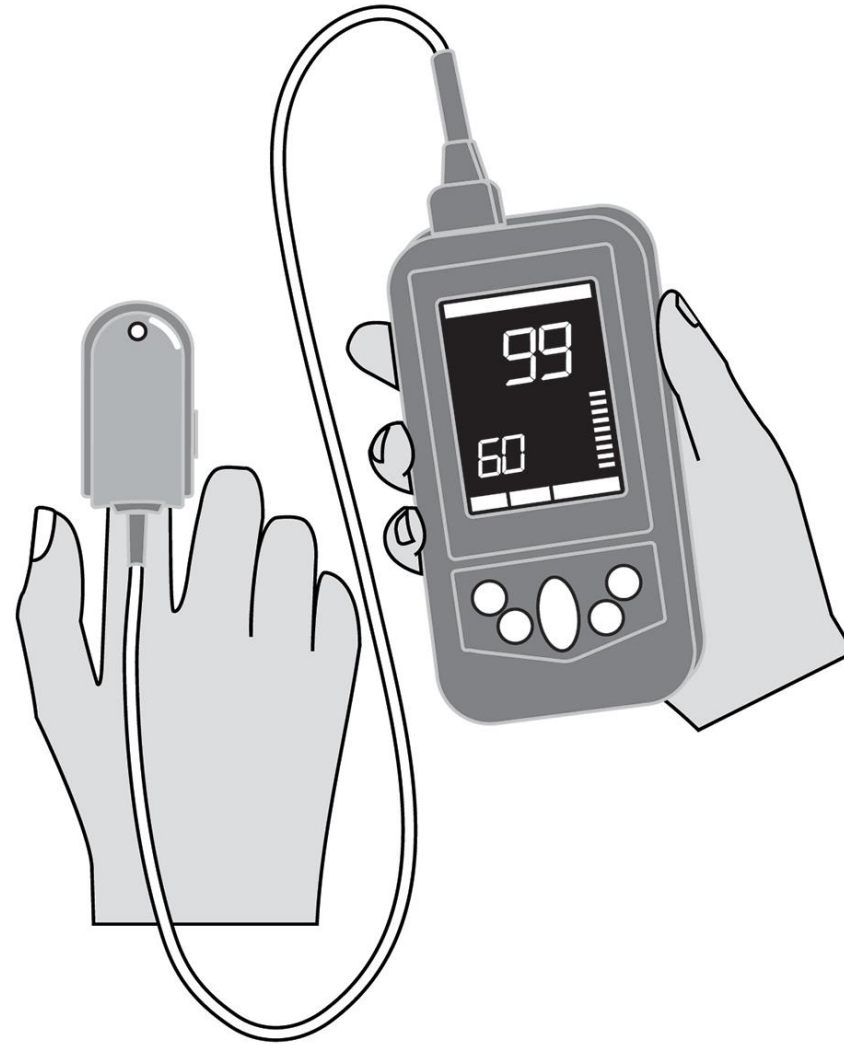


Figure (3) Oximeter reading.

Important information when using an oxygen meter

- Pay attention to any changes in the readings, especially when they change downward over time, as this change means something.
- See a doctor if you doubt your health, as you cannot rely on the device to fully assess your health condition.

Watch your reading at home, and if you notice these symptoms, see a doctor:

- The face, lips, or nails appear blue.
- Difficulty breathing or shortness of breath.
- Cough that increases with time.
- Feeling of restlessness and restlessness.
- chest pain or tightness;
- Increased heart rate.

*Thanks for
listening*