

Oximetry

What is it?

An oximeter is a device that measures the amount of oxygen, or oxygen saturation, in your arterial blood. It does this by passing two beams of light through your skin, one red and one infrared. The color of blood varies depending on how much oxygen it contains. Oxygenated blood absorbs more infrared light and allows more red light to pass through, and deoxygenated blood absorbs more red light and allows more infrared light to pass through. How much light is absorbed at these two different wavelengths allows the oximeter to calculate the amount oxygen in your blood. Most often an oximeter is a hand-held device with a probe that clips onto one of your fingers or possibly onto an earlobe. Arterial blood in the measuring site pulses and fades with your heartbeat and this allows a pulse oximeter to measure both your pulse rate and your oxygen saturation level.

What you should expect?

Oximetry can be performed while you are sitting quietly or when you are exercising. In either case, an oximeter probe will be clipped onto one of your fingers or possibly an earlobe. If only a resting level is needed then the oximeter should get a reading in only a couple of seconds.

If an exercise oximetry measurement is needed, you will probably be asked to walk up and down a hallway or possibly the stairs while holding the oximeter. It is important that you not hold the oximeter in the same hand that the clip is attached to because this may restrict blood flow and give a falsely low reading. If you are using supplemental oxygen and need help walking with it you should be able to ask for assistance. If you have balance problems or any other issues that make walking unsafe or unduly strenuous you should be able to ask for assistance.

The oximeter probe should be cleaned with an alcohol swab before it is placed on your finger.

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What is a normal measurement?

An oximeter measures the percent of oxygen saturation is in your blood. It can never be over 100%. A normal value is 95% or above and this is true both at rest and during exercise.

If your oxygen levels are below 90% either at rest or when you exercise then you probably need supplemental oxygen. Medicare and most insurers will pay for your supplemental oxygen only if your oxygen level is 89% at rest or if it drops to 88% or less when you exercise, but the oxygen level also has to improve above 90% when you are getting supplemental oxygen. If your doctor does decide you need supplemental oxygen then you may need to repeat oximetry several times with different oxygen flow rates in order to find the flow rate that is best for you.

What affects test quality?

Oxygen levels are most often underestimated due to poor circulation. If your hands are always cold you may have poor peripheral circulation and an oximeter may not be able to get an accurate reading. If this is the case it may help to warm your hand before the oximeter is attached. Similarly, you should not hold anything in the hand the oximeter is attached to as this can reduce circulation to the fingers. Oximeters can also be sensitive to motion, so you should not swing the arm with the hand the probe is attached to.

Oximeters can be sensitive to skin color and sometimes skin pigmentation can cause results to be underestimated. This is unusual however and when it does occur it is usually due to an underlying medical condition and not to ethnicity.

A hand-held oximeter does not differentiate carbon monoxide from oxygen and it will overestimate your oxygen levels if there is carbon monoxide in your blood. If you smoke cigarettes then you may have anywhere from a few percent (light smoker) to over 10% (very heavy smoker) of your blood taken up by carbon monoxide. An oximeter will detect this carbon monoxide as oxygen and will falsely boost your oxygen measurements. If you smoke cigarettes you may need to have an arterial blood sample

What you need to know about

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taken and measured in a laboratory instrument called a co-oximeter in order to get an accurate measurement.