

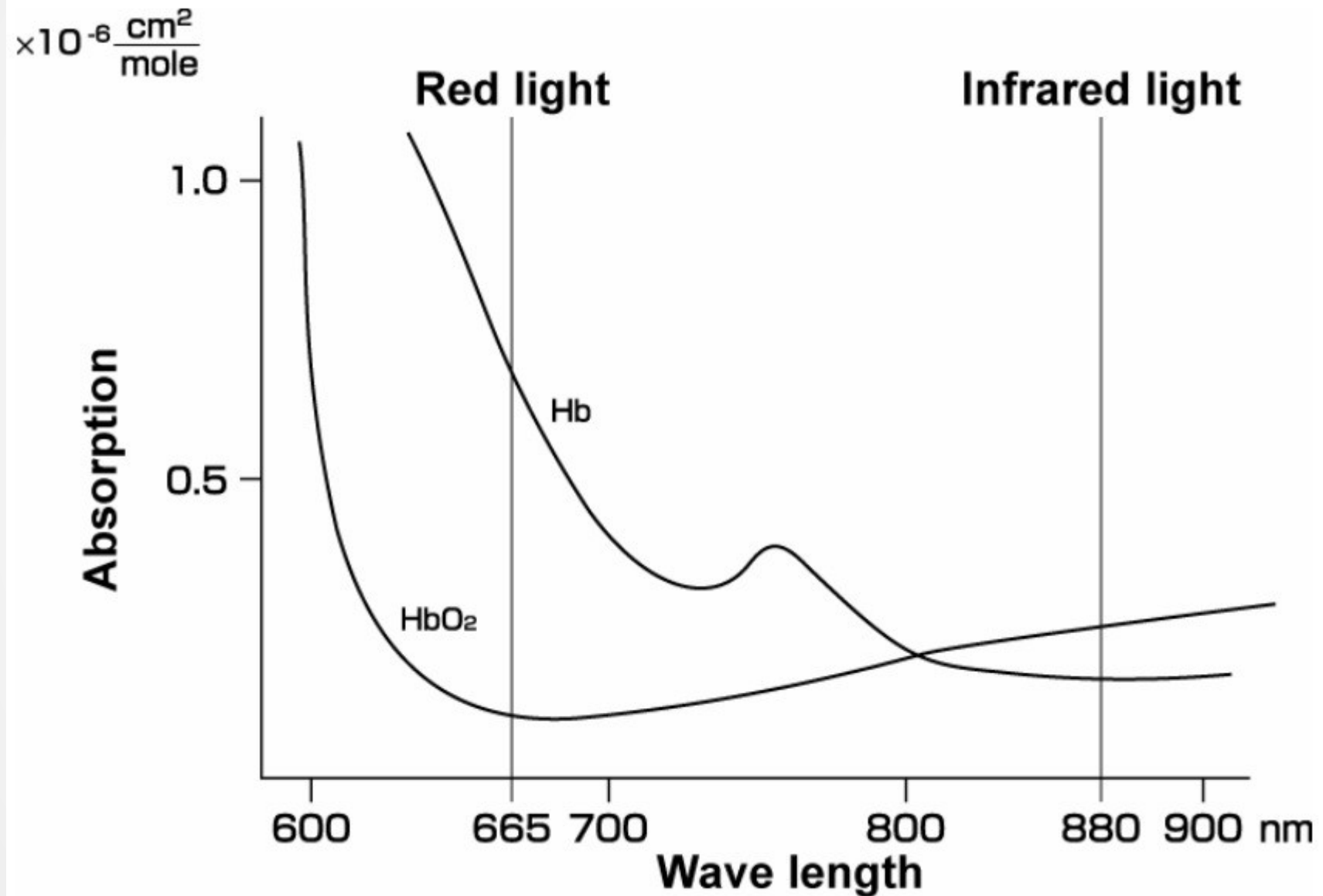
Pulse Oximetry by BMETWiki



What is a pulse oximeter?

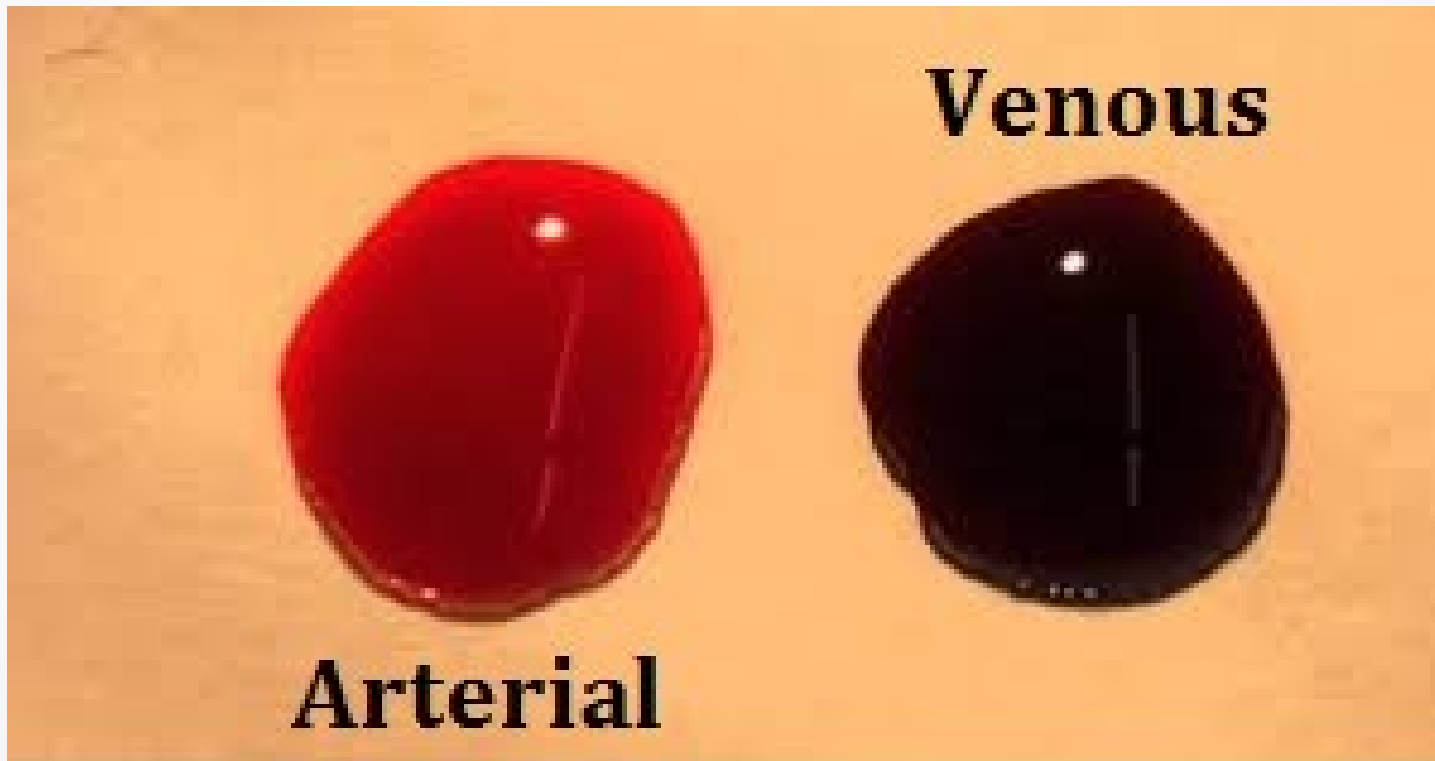
- Uses two frequencies of light (i.e. red and infrared) to determine “%” of hemoglobin in the saturated blood with O₂.
- The “%” is called SpO₂.
- Measured translucently through either:
 - Fingers without nail polish, dirt, or artificial nails
 - Toes without nail polish, dirt, or artificial nails
 - Earlobe

Wavelength



Arterial vs Venous Blood

Color of Blood



Hemoglobin

- An iron protein that carries oxygen from the lungs to body tissues and organs.
- Its the red pigment that makes up a red blood cell.
- Transports CO₂ from body tissues and organs back to the lungs.
- Arterial blood is bright red
- Venous blood is dark red



Clinical Applications

- 95% is for a normal adult.
- <92% indicates difficulty breathing (e.g. patients with acute respiratory pneumonia, COPD, asthma) and requires patient to supplement O₂ treatments.

What is O2 saturation?

- Hb O2 - concentrated oxygenated hemoglobin
- Hb - concentrated deoxygenated hemoglobin
- Formula (may bind 1:4 O2 molecules)
 - $\text{Saturation} = (\text{Hb O}_2 / (\text{Hb O}_2 + \text{Hb})) \times 100\%$

Purpose

- Pulse oximeter are mostly used for:
- Determining severity of disease through screening, diagnosis, followup, and self-monitoring.
- Home oxygen therapy
- Vital sign monitoring
- Screening patients with sleep apnea and dysphagia

Do pulse oximeters require calibration?

- No! pulse oximeters do not require “zero” and “gain” calibrations because of their design. Today’s devices “zero” calibration is continuous as well as automatic thus no need to re-zero the device and “gain” accuracy calibration is not required nor is it measured with these devices.
- Why pulse oximeters don't need calibrated?

Questions

