



Clinical Practice Procedures: Assessment/Oximetry – pulse

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Date	September, 2024
Purpose	To ensure a consistent procedural approach to undertaking oximetry – pulse.
Scope	Applies to Queensland Ambulance Service (QAS) clinical staff.
Health care setting	Pre-hospital assessment and treatment.
Population	Applies to all ages unless stated otherwise.
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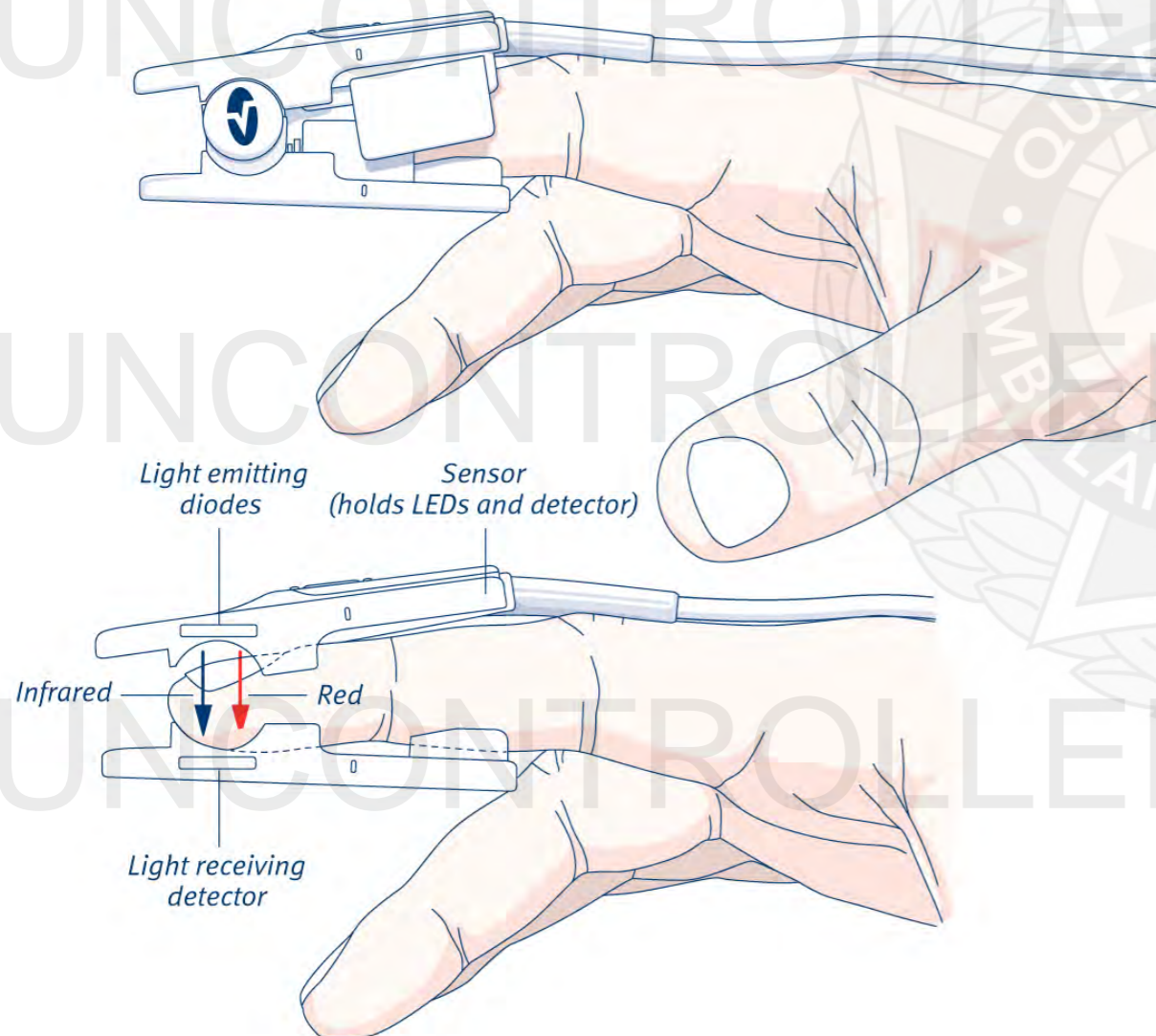
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Oximetry – pulse

September, 2024

Pulse oximetry estimates the oxygen saturation in arterial blood (SaO_2), by directing both red and infrared light from two LEDs through a patient's translucent fleshy body site (usually a finger, toe or earlobe). The absorption of the two wavelengths differs significantly dependant on the level of haemoglobin oxygenation and the pulse oximeter translates this ratio into a percentage (SpO_2).^[1]

It is important to consider the relationship between blood oxygenation and measurable haemoglobin saturation when interpreting pulse oximetry.^[2]



Indications

- To determine patient oxygen saturation
- Assessment of the newborn

Contraindications

- Nil in this setting

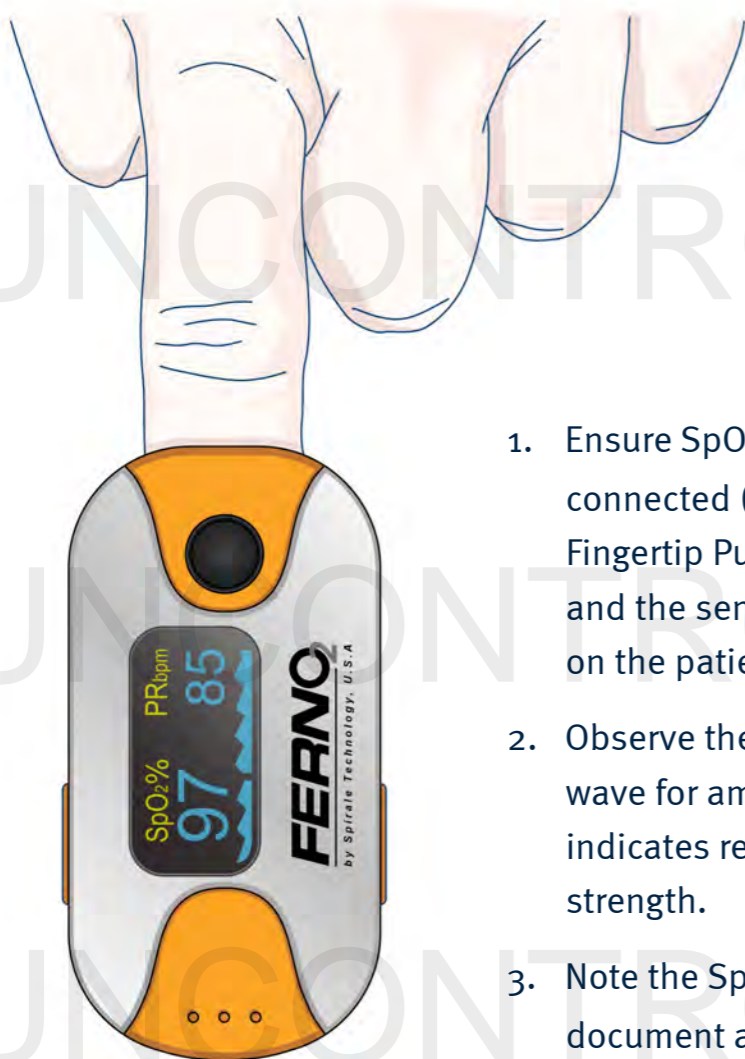
Complications

The reliability of SpO_2 readings depends on the following factors:

- correct sensor size and placement
- adequate arterial blood pulsation through the sensor site

Inaccurate pulse oximetry readings may occur when the following factors are present:

- excessive patient movement
- exposure to ambient light
- dirt or nail polish under the sensor site
- methaemoglobinaemia
- carbon monoxide
- insufficient amplitude on the pulsing pleth wave



1. Ensure SpO₂ cable is connected (excludes FERNO Fingertip Pulse Oximeter) and the sensor is placed on the patient.
2. Observe the pulse bar/pleth wave for amplitude; this indicates relative signal strength.
3. Note the SpO₂ reading and document accordingly.



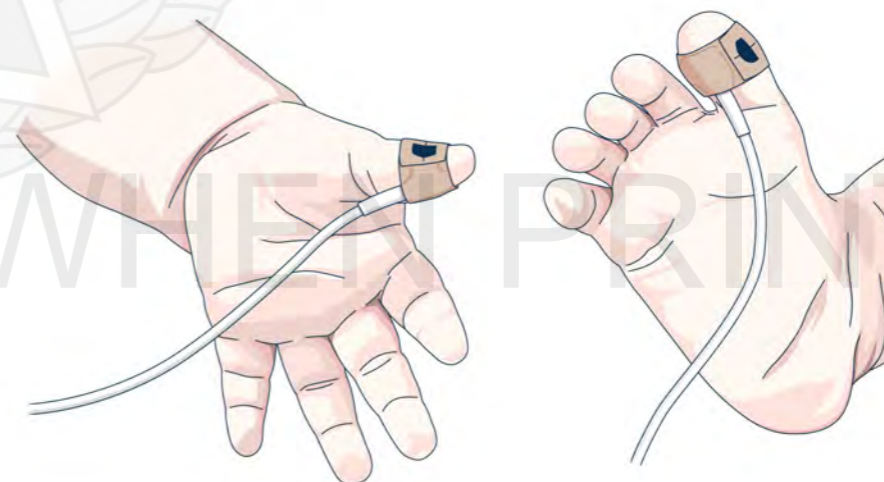
Additional information

- Any digit (finger or toe) may be used to obtain an SpO₂ reading.
- The SpO₂ of arterial blood is usually 94–100%.

Masimo M-LNCS Infant Adhesive Sensor



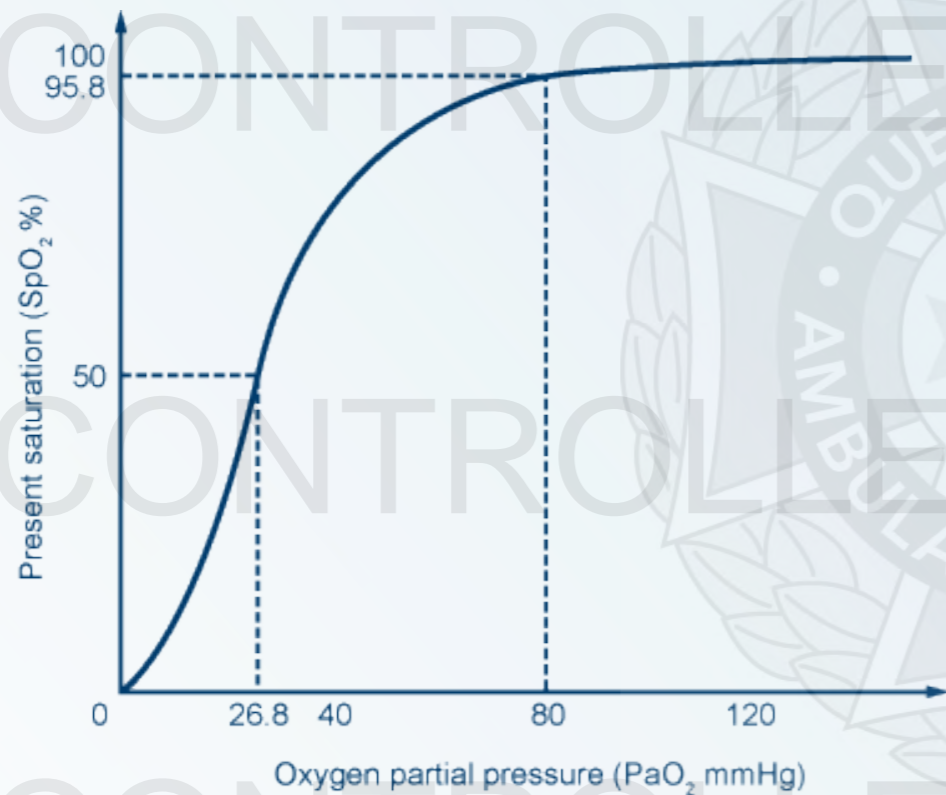
1. The Masimo M-LNCS Infant Adhesive Sensor is a single use, self-adhering wrap-around sensor suitable for use on infants and young children from 3 to 20 kg.
2. The sensor should be fitted to the infant's thumb or large toe, ensuring it is wrapped firmly but not tightly around the digit to achieve good skin contact. If a good quality reading is not achieved with first application, it may be removed and re-applied to a slightly higher or lower position.
3. Masimo M-LNCS Adhesive Sensors must not be used on patients for whom the standard clip-on finger sensor is a suitable fit.





Additional information (cont.)

- QAS oxygen saturation monitors are unable to differentiate between carboxyhaemoglobin and oxyhaemoglobin^[1] therefore patients with carbon monoxide poisoning must be administered the maximum oxygen dose irrespective of SpO₂ (refer to *DTP: Oxygen*).
- Pulse oximetry is not a complete measure of respiratory or circulatory sufficiency.
- A small change in saturations (e.g. a drop in SpO₂ 97% to 90%) represents a large change in blood oxygenation (PaO₂ 100 to 60 mmHg).



Oxygen dissociation curve^[2,3]

- During newborn resuscitation pulse oximetry should be placed on the right hand.

- Ambulance clinicians should note that SpO₂ readings may be lower than normal immediately following birth. The following table gives the expected SpO₂ reading in full term newborns during the first ten minutes following birth.^[4]

Targeted pre-ductal SpO ₂ after birth	
1 minute	60 – 70%
2 minutes	65 – 85%
3 minutes	70 – 90%
4 minutes	75 – 90%
5 minutes	80 – 90%
10 minutes	85 – 90%

- An SpO₂ reading below those expected is a good indication that resuscitation of the newborn is required.
- While pulse oxymeter sensor injuries are uncommon, injuries to infants have been reported in the literature, including cuts/lacerations, skin discoloration, blanched pressure areas/necrosis, induration, burns, and blisters.^[5-7]

Care should be taken to ensure that circulation is not impeded by the adhesive sensor. The digit should periodically be checked to ensure the integrity of the skin is not compromised, especially in infants. If oximetry is to be measured for a prolonged period, the sensor should periodically be moved to a different location.