



Internal Memo

Background Factors effecting SpO2 Accuracy

1) **Placement on patient**

- a) The Emitters and receivers should always be optically aligned (across an arteriolar bed) especially when using Y probes
- b) The emitter should always be on the nail
- c) The light should pass through the nail: differences of +/- 4% can be obtained just by manipulating the position especially on small patients.
- d) Errors will be observed if large finger probes are used on small children Most manufacturers recommend a minimum weight of around 20Kg
- e) Nail varnish and artificial finger nails should be removed
- f) The site should be well perfused
- g) Ideally the site should be at heart level
- h) Oedematous tissue (an excessive accumulation of fluid in the intercellular spaces of the tissue) should be avoided as this can cause the light to scatter
- i) Toes can be used as an alternative site
- j) Place the probe so that the cable runs back along the hand

2) **Environment**

- a) Extraneous light can effect the receivers. Some manufacturers recommend covering the site in the presence of sunlight, phototherapy lights, surgical lamps, bright bedside lights or infrared warmers.
- b) Adhesive tape can cause restrictions to blood flow.
- c) The probe site should be changed at least every 24 hours but examined regularly every 4 hrs to ensure the integrity of the skin, correct alignment, an no adverse effects on circulation.
- d) The patient should not be mobile as movement can effect the light path and therefore the value displayed
- e) Electrosurgery may cause burns particularly if the sensor is wet
- f) Non Invasive BP cuffs on the same limb can cause erroneous readings
- g) Catheters inserted into the same limb can cause errors
- h) Tourniquets and restrictive bandages will effect accuracy
- i) Contamination on the windows can reduce and scatter the light beams.
- j) Probes should not be used in MRI environment

3) **Fractional and Functional**

The difference in readings between fractional and functional is around 2%

The original manufacturer sometimes automatically adjusts the software to take into account these differences

Some manufacturers have changed from one to the other between series or software upgrades

Other manufacturers leave the user to decide sometimes by using a switch.

This should be taken into account if two manufacturers or even two monitors from one manufacturer give different readings on the same patient.

4) **General Mathematical Accuracy**

The best being claimed at present is +/- 2 digits on adults and +/- 3 digits on neonates.

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