

Risk of harm from inappropriate placement of pulse oximeter probes



SAFETY INFORMATION 002/25

Issue date:	3 March 2025
Content reviewed by:	Representatives from HealthShare NSW, ACI Anaesthetics Network, ECI, Intensive Care, Surgical Care, State Preparedness and Response Unit, Clinical Excellence Commission
Distributed to:	Chief Executives; Directors of Clinical Governance; Director, Regulation and Compliance Unit
KEY MESSAGE:	The measurement of oxygen saturation using a pulse oximeter probe requires placement on the intended body part. Pulse oximeter probes should not be used interchangeably. For example, a finger sensor should not be applied to the ear or forehead.
ACTION REQUIRED BY:	Chief Executives, Directors Clinical Governance
REQUIRED ACTION:	<ol style="list-style-type: none"> 1. Distribute this Safety Information to all relevant clinicians and clinical departments. 2. Ensure that all clinical departments have the range of oxygen saturation monitors available to meet their clinical requirements. 3. Ensure clinical staff have the skills and knowledge to implement clinical recommendations. 4. Include this Safety Information in relevant handovers and safety huddles
We recommend you also inform:	Directors, Managers and Staff of: All clinical areas Nursing/Midwifery Medical Services Allied Health
Website:	https://www.health.nsw.gov.au/sabs/Pages/default.aspx http://internal.health.nsw.gov.au/quality/sabs/index.html
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Situation

Potential safety issues with inappropriate placement of oxygen probes have been identified following a recent incident. The placement of an oxygen probe on the patient's forehead, rather than the intended for use on fingers, resulted in the delayed recognition and management of decrease in oxygen saturation.

Background

Measurement of oxygen saturation, using a pulse oximeter probe, is routinely undertaken as part of patients' vital sign observations during diagnosis and ongoing monitoring¹. Oxygen saturation readings are a component of the mandatory requirement for completing a full set of vital sign observations as described in the NSW Policy Directive Recognition and management of patient who are deteriorating PD2020_018².

The recognition and management of patients who are deteriorating requires a comprehensive systematic physical and mental examination³. Monitoring and tracking changes in vital sign observations and other observations over time plays a significant role in detecting acute deterioration.

Assessment

Oximeter probes can be single or multiple use and are designed to attach to specific parts of the body. There are adult oximeter probes that can be attached to a finger, an ear, or use a forehead sensor, but are not interchangeable between these sites. Probes for babies and children are selected according to the patient's weight and may be attached to the finger, toe, or foot, depending on manufacturer instructions.

If an oximeter probe intended for the finger is attached to the ear (or vice versa), it can produce a reading up to 50% lower or 30% higher than the real value.^{4,5,6}

The clinical implication of an inaccurately high reading is that staff may be falsely reassured about a patient's condition, when in reality the patient is deteriorating, or may make an inappropriate intervention when in fact a patient is stable or improving. When oximeter probes are removed from their packaging, there is no easily identifiable prompt about which body part they should be used on.

Failure to obtain an oxygen saturation trace may be due to signal artefact, however, a poor or absent oximetry trace may also indicate circulatory compromise or severe arterial hypoxemia. Hence a correctly positioned probe at its intended anatomical site, and appropriate clinical review, is essential for reliable monitoring.

Recommendations

1. Ensure the position of the oximeter probe is correctly placed on the patient and appropriate for the device used as per manufacturer's instructions:

Oximeter probes should only be used on the intended body part as described in the instructions for use e.g. fingers probes should only be used on fingers and forehead probes should only be used on foreheads.
2. If unable to obtain a peripheral oxygen saturation reading, conduct an A-G assessment, identify any signs of deterioration, consult with the nurse-in-charge to determine if escalation of care via local CERS is required.
3. Ensure that all clinical departments have the range of oxygen saturation monitors available to meet their clinical requirements.

Further information

1. Barnett A, Beasley R, Buchan C, Chien J, Farah CS, King G, McDonald CF, Miller B, Munsif M, Psirides A, Reid L, Roberts M, Smallwood N, Smith S. (2022) Thoracic Society of Australia and New Zealand Position Statement on Acute Oxygen Use in Adults: 'Swimming between the flags'. *Respirology* 2022 Apr;27(4):262-276.
<https://onlinelibrary.wiley.com/doi/10.1111/resp.14218>
2. Between the Flags
<https://www.cec.health.nsw.gov.au/keep-patients-safe/between-the-flags>
3. PD2020_018 Recognition and management of patients who are deteriorating
https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2020_018.pdf
4. Haynes JM (2007). The ear as an alternative site for a pulse oximeter finger clip sensor. *Respiratory Care*. 52(6):727-9. <http://rc.rcjournal.com/content/52/6/727>
5. Mannheimer PD (2007) The Light-Tissue Interaction of Pulse Oximetry. *Anesthesia & Analgesia*. December 2007 - Volume 105 - Issue 6 - p S10-S17
https://journals.lww.com/anesthesia-analgesia/fulltext/2007/12001/The_Light_Tissue_Interaction_of_Pulse_Oximetry.3.aspx
6. Walters TP (2007). Pulse oximetry knowledge and its effects on clinical practice. *British Journal of Nursing* 16(21):1332-40. <https://www.ncbi.nlm.nih.gov/pubmed/18073672>