

UNIVERSITI TEKNOLOGI MARA

**PULSE OXIMETER METHOD AS AN
INDICATOR OF BLOOD PERFUSION IN
NEONATE PATIENTS**

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of the requirements for the degree of
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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulation the conduct of my study and research.

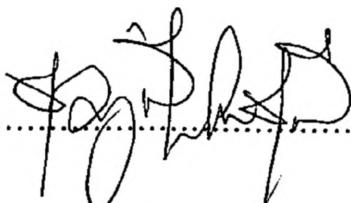
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ABSTRACT

Blood gas measurements normally provide critical information on oxygenation, ventilation and acid-base status. In critically ill neonates, where peripheral perfusion may drop below the minimums required for tissue oxygenation and cellular respiration, the risk associated with rapid changes in oxygen saturation is high. Thus, effective means of monitoring blood oxygen saturation is essential. Using pulse oximetry is appealing because it is non-invasive and correlates well with arterial gases. Optimal pulse oximetry monitoring accuracy is depending on the selection of a monitoring site characterized by good perfusion with oxygen saturation. The aim of this research is to investigate the use of pulse oximetry as a non-invasive indicator of blood perfusion of preterm newborns. One hundred and fifty (89 male and 61 female) preterm newborns, regardless of ethnic group and delivery norm, admitted in Special Care Nursery University Malaya Medical Centre were recruited for this observational study from 2006 to 2008. The inclusion criteria were neonates with a diagnosis of respiratory distress syndrome who required ventilatory support, gestational age between 28 weeks to 37 weeks, and weighing less than 2500g. Healthy preterm neonates weighing more than 2500g were excluded. Mathematical modeling was used to model the correlation between the oxygen saturation and blood perfusion. With the analysis made, perfusion index correlates positively with oxygen saturation for both palm and foot sensors ($r = 0.91$, $r = 0.92$) respectively with an accuracy of 96%. Hence, pulse oximetry technique is a useful tool to indicate the blood perfusion in neonate patients.

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