

Carlson: Abstract of Fluck article

Pulse oximetry measures the oxygen saturation in arterial blood by comparing the differences in two frequencies of light passed through flesh. This non-invasive technique is widely used in various settings. The range of values is 70% to 100%. Manufacturers claim an accuracy of between 2% and 3% in a 68% confidence limit. Although previous research showed that pulse oximeters produced clinically acceptable results, several factors have an influence on accuracy, including ambient light. The aim of the study was to see whether ambient light affects accuracy. The method involved changing the ambient light using five different light sources: bilirubin, fluorescent, incandescent, infrared, and quartz-halogen. The ratio of energy in the two frequencies of light was characterized for each source. The ratio for bilirubin and fluorescent sources was much higher (>100) than the other sources (<1). Measurements were made on 45 medical student volunteers (29 women and 16 men) in a controlled environment, including a control measurement in a darkroom. No difference greater than 0.5% was found between mean readings for any light source and the control reading, which was 98%. The findings showed there was no statistically significant difference in measured oxygen saturation for different types of ambient light. This study did not support the claim of several anecdotal reports that had suggested ambient light does affect the reading. The results of this study can be explained by the principles of pulse oximetry which accounts for an offset in light level. Future research should include subjects with darker skin color and subjects whose oxygen saturation is below normal (95%).

The abstract written by Peter Carlson applies to this article: Fluck, R., Schroeder, C., Frani, G., Kropf, B., & Engbretson, B. (2003). Does ambient light affect the accuracy of pulse oximetry? *Respiratory Care*, 48, 677-680.