

Pulse oximetry and ethnicity – the time to act is now.

The pulse oximeter is an essential device used daily in intensive care units in both the diagnosis and management of hypoxaemia. Oxygen is a treatment administered to patients to maintain oxygen saturations (SpO₂) within narrow target ranges; the importance of this cannot be overstated as, in the critically unwell patient, both hypoxaemia and hyperoxaemia have been associated with harm (1,2). It is imperative that pulse oximeters maintain a high degree of accuracy, both within and between patients.

The problem

Thirty years ago, it was recognised that SpO₂ measurements were less accurate when pulse oximeters were used in patients with darker skin pigmentation (3), and research in the 2000s confirmed this (4,5). The most recent is a study in the New England Journal of Medicine, which shows a threefold increase in the incidence of occult hypoxaemia in Black patients compared to white patients (6). This has led to statements from the American Food and Drug Administration (FDA) and the Medicine and Healthcare Regulatory Authority (MHRA), calling for increased vigilance when pulse oximetry is used in these populations (7,8).

The potential damage

So far, these errors in pulse oximetry have not been directly associated with any increased harm, however, absence of evidence is not evidence of absence. The recent COVID-19 pandemic has demonstrated an increased mortality in people of Black origin (9) and erroneous pulse oximetry measurements cannot be ruled out as a contributory factor.

Potential Solutions

There have been calls for clinicians to be ‘aware’ and monitor trends in saturations rather than individual values. However, this adds an extra cognitive load to the already complex management of critically unwell patients. Furthermore, such calls to be ‘aware’ or ‘vigilant’ come with relatively little practical advice and are at risk of causing a systematic difference in the standard of care provided to Black patients. The use of arterial blood gases as an alternative method of assessing oxygenation has been suggested. However, this is an invasive procedure and not without risk, that adds to the overall burden of treatment for individual patients (10).