

## Briefing: Pulse oximetry for people with darker skin

There continue to be reports around the effectiveness of pulse oximeters for people with dark skin. The extent to which any inaccuracy may apply to COVID patients, and those on home oximetry programmes, is unknown. The Medicines and Healthcare products Regulatory Agency (MHRA) is not aware of any incidents where skin colour has had an adverse effect on the use of pulse oximeters when providing effective clinical care.

There may be some limitations to the existing reports:

- a. The reports involve old out of date oximeters and/or there is no detail on the specific models used.
- b. They involve relatively low numbers of patients who may already have been significantly unwell
- c. No studies have involved COVID patients
- d. They generally involve reading levels that are unrelated to the ranges set out by NHS @home i.e. significantly lower which would mean the patient would likely be hospitalised
- e. There are significant questions over the validity of testing based on commonly accepted methodology e.g. time delays between comparing oximetry readings

Current evidence appears to suggest the following factors are likely to reduce accuracy in the general population, including people with darker skin:

- i. low perfusion
- ii. movement
- iii. nail polish
- iv. henna dye
- v. tattoos
- vi. probe mispositioning
- vii. ambient lighting hitting the sensor

Given the potential for inaccuracy in all patients including those with darker skin, our advice is that:

- a. Wherever possible patients record a baseline oxygen saturation at onboarding and subsequent changes in saturation readings are then compared to this established baseline.
- b. Clinicians should remain vigilant for other signs of deterioration in all patients with COVID, use their clinical judgement and monitor trends of both oxygen saturation readings and symptoms.
- c. Patients should seek help if any of their symptoms get worse.
- d. Publicly available safety netting [guidance](#) which includes key messages above and a section for people with brown or black skin with advice to continue to use an oximeter has been published via NHS.uk.
- e. Through engagement and regular communications with healthcare professionals distributing pulse oximeters, people have been encouraged to actively report safety issues through NHS processes for reporting incidents e.g. through local incident reporting systems, directly to the National Reporting & Learning System or through the MHRA reporting portal for device concerns ([Yellow Card Scheme - MHRA](#))

There is a risk that some media messaging risks increasing numbers of people with darker skin who decline pulse oximetry services, thereby exacerbating inequalities. We have asked National Institute for Health Research (NIHR) to commission rapid further research to definitively understand the accuracy of pulse oximeters for people with different skin colours.