## London Asthma Leadership and Implementation Group (LALIG)

The use of Oximetry for people with brown or black skin tones

**Statement**

There is evidence that pulse oximetry in people with brown or black skin tones may underestimate the level of hypoxia; the oximeter companies are aware of this and working on possible solutions. Therefore, clinicians should not rely on oximetry alone and assessments of people with asthma should include a thorough assessment including respiratory and pulse rate and lung function.

**Background**

Pulse oximetry is used as part of vital sign monitoring. Research shows that pulse oximetry is inaccurate in patients with brown or black skin tones[[1]](#footnote-2)[[2]](#footnote-3), particularly in the clinically important range of 85% to 89% where decisions on treatment escalation are often made. The effect size is significant, with pulse oximetry overreading by approximately 5%, compared to arterial blood gas-derived saturations in individuals with a recorded Black, Asian or mixed ethnicity.[[3]](#footnote-4)

It is important to raise awareness of this possible overestimation of oxygen saturations in people with brown or black skin tones and to bear it in mind when assessing severity of illness in this cohort.

In essence what this means is that clinicians should not rely ONLY on oximetry when assessing the severity of an asthma flare-up/exacerbation/attack. It is also important to check pulse and respiratory rate, presence of cyanosis, exhaustion, hypotension when examining the patient.[[4]](#footnote-5)[[5]](#footnote-6)

**Next steps**

Please can you ensure this information is disseminated to all those involved in the clinical care of people with asthma.

**Further information**

[**Primary Care Respiratory Society Update on oximetry**](https://www.pcrs-uk.org/sites/default/files/2021-July-Issue-22-PulseOximetry.pdf)

[Pulse oximeter accuracy in different ethnic groups | Respiratory Futures](https://www.respiratoryfutures.org.uk/whats-new/pulse-oximeter-accuracy-in-different-ethnic-groups/)

[FDA Executive Summary, Review of Pulse Oximeters and Factors that can Impact their Accuracy](https://www.fda.gov/media/162709/download)

[Global Initiative on Asthma Strategy 2023](https://ginasthma.org/2023-gina-main-report/), pp152

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1. Sjoding MW, Dickson RP, Iwashyna TJ, et al. Racial Bias in Pulse Oximetry Measurement. N Engl J Med 2020;383:2477–8. [↑](#footnote-ref-2)
2. Valbuena VSM, Seelye S, Sjoding MW, et al. Racial bias and reproducibility in pulse oximetry among medical and surgical inpatients in general care in the Veterans Health Administration 2013-19: multicenter, retrospective cohort study. BMJ 2022;378:e069775. [↑](#footnote-ref-3)
3. Crooks CJ, West J, Morling JR, et al. Pulse oximeter measurements vary across ethnic groups: an observational study in patients with COVID-19. Eur Respir J 2022;59. doi:10.1183/13993003.03246-2021 [↑](#footnote-ref-4)
4. BTS/SIGN 158. British guideline on the management of asthma, table 17 [↑](#footnote-ref-5)
5. [FDA Warnings](https://www.fda.gov/news-events/fda-brief/fda-brief-fda-warns-about-limitations-and-accuracy-pulse-oximeters), particularly bullet 2: *The safety communication identifies several factors that can affect the accuracy of a pulse oximeter reading, including poor circulation, skin pigmentation, skin thickness, skin temperature, current tobacco use and fingernail polish*. [↑](#footnote-ref-6)