

Covid-19

----- Guidance for practices



Updated: 16.1.2021

Please be aware that this is a rapidly evolving situation.

Guide to using pulse oximetry during Covid-19 pandemic

Role of pulse oximetry during Covid-19 pandemic

- Covid-19 is a new condition and we are still learning the best ways of assessing its severity in the community.
- Evidence-based guidelines, that are useful to us in our usual practice, are not currently available.
- We know that pulse oximetry can be a useful aid to clinical decision making but it is not a substitute for a clinical assessment, nor sufficient for diagnosis by itself.
- Pulse oximetry is valuable in triaging potentially hypoxic patients in the home or GP surgeries/assessment centres, to help determine which patients require further assessment or treatment.
- Anecdotally we are being told by clinicians that they are detecting people with symptoms of Covid-19 infection but not experiencing shortness of breath, who then on performing pulse oximetry are found to be hypoxic.

Use of pulse oximetry in patients with acute respiratory infection including Covid-19

- Pulse oximetry is useful in evaluating the severity of the illness and, in conjunction with other criteria, determining whether to refer patients for further assessment and/or treatment.
- *There are other causes of hypoxia which need to be considered in the differential diagnosis apart from Covid-19 infection.*
- It may be useful to aid the monitoring of patients who have been discharged from hospital having been diagnosed with Covid-19 infection but now deemed well enough to return home.

Use of pulse oximetry in patients with severe Chronic obstructive pulmonary disease (COPD):

- Monitoring patients with severe disease ($FEV_1 < 50\%$ predicted).
- In conjunction with other observations to help detect worsening symptoms or other signs of an acute exacerbation.
- A tool for patients to use at home to assist with their management and help them to know when they require further medical assistance.

It is important to note that pulse oximetry provides a method for rapid assessment especially of short-term respiratory compromise. Spirometry remains the gold standard for diagnosing and staging COPD.

Use of pulse oximetry in patients with severe asthma:

- Pulse oximetry complements peak flow meters in assessing the severity of asthma attacks/exacerbations and response to a treatment.
- Should not be used in an acute asthma attack with raised respiratory rate as this can keep the SpO₂ elevated until fatigue sets in.

Covid-19

----- Guidance for practices



Evaluation of SpO2 measurements in patients with acute respiratory illness

- SpO2>96% = normal.
- SpO2≤92% = hypoxia and the need for oxygen. (This is unless they have stable severe COPD, other chronic lung disease or another condition that causes hypoxia and on long term oxygen where maintaining SpO2 at 88-92% is needed to maintain respiratory drive).
- SpO2 93-96% = consider, if safe to do so, asking the patient to briefly exercise (walk up flight of stairs, march on spot for a minute) to assess if they desaturate with exercise.
 - This would require a further clinical discussion to determine if closer monitoring is required or a hospital referral.
 - The clinical significance of desaturation on exercise and how this should influence the patient management is still under discussion.

Limitations of pulse oximetry

- Nail polish, dirt, artificial nails can cause false low readings or no readings. Ask patient to remove prior to monitoring.
- Poor perfusion (due to hypotension, hypovolemic shock or cold environment), movement including shivering, heart arrhythmias or cardiac failure may result in the pulse oximeters not providing a reading as they are unable to identify an adequate pulse signal.
- Bright artificial light (as in an operating room or bright sunlight) can cause false low readings
- If SpO2 values <80%, pulse oximeters can overestimate oxygen saturation, particularly in those with darkly pigmented skin.
- CO poisoning false reading.
- Shock unreliable or no reading/low signal.
- Low output cardiac failure gives unreliable or no reading.
- Patients with anaemia can have normal SpO2 but inadequate oxygen delivery to tissues.

Population pulse oximetry monitoring

To maximise the use of pulse oximetry in patients with suspected Covid-19 infection we would suggest considering whether the patient requires:

1. Initial assessment or as part of the community review process (24, 48 or 72 hours) and, if so, whether the patient is:
 - a. Mobile.
 - b. House bound.
2. Ongoing home monitoring due to the severity of the Covid-19 infection or due to co-morbidities for the duration of the patient's infection. Local systems will need to ensure that monitoring systems are in place to include outside of GP core hours. This is now being termed Covid oximetry@home and further details can be found [here](#).
3. Covid Virtual Wards (CVW) are being set up across the country. These are for patients who have required hospitalisation for Covid infection. Included in this group will be patients with oxygen saturations of 93-94% but improving trajectories and patients with oxygen saturation >95% and NEWS2<3. These patients will remain under the care of the hospital teams. Further details can be found [here](#).

Covid-19

----- Guidance for practices



- Mobile patients - set up a 'drive through' testing centre(s):
 - This can be done at the practice/PCN/Federation level depending on demand and local resources.
 - The patient is asked to arrive at the centre and remain in their vehicle.
 - By placing their hand out the car window the assessor can give them some hand sanitiser to rub into their hands.
 - The patient is then given examination gloves to put on.
 - The patient extends their arm through the vehicle window and the assessor places the pulse oximeter on the patient's finger in order to gain a SpO2 and Pulse reading.
 - The patient is advised to ensure that their finger is not held in bright sunlight.
 - If the SpO2 is 93-96% and the assessor believes it to be appropriate, the patient is asked to get out of the car and either march/jog on the spot for one minute. The patient then gets back into the vehicle to have a repeat pulse oximetry measurement taken.
 - The assessor will wear appropriate PPE throughout the assessment and keep appropriate distance from the patient if they are required to get out of the car to exercise. A Bluetooth pulse oximeter may enable pulse oximetry readings without close proximity to patients.
 - As the pulse oximeter has not been touched by the patient directly it can be cleaned (for example with a Clenill wipe) and then used for the next patient.
 - We have been advised by one of the pulse oximeter manufacturers that they can be used with a normal examination glove although clear gloves would be ideal.
- Housebound patients - home monitoring for diagnosis (single measurement):
 - The process will be the same as the 'drive through' process above.
 - A team will be required to attend the patient's home to do this.
 - It will need a two-person team as correctly donning PPE outside is difficult to do alone.
 - The assessor will monitor the patient at the door of the home and will not enter unless essential.
- Ongoing home assessment
 - This is to enable patients to perform ongoing home monitoring whilst they have suspected Covid-19 infection.
 - They will require a pulse oximeter for the duration of their acute illness.
 - The patient should sign for the oximeter, acknowledging that it is being 'loaned' to them and that they are required to return it in good condition when no longer required.
 - The patient will perform daily measurement.
 - The practice will need to agree the method of how the patient communicates their daily readings with them. Ideally this should be an electronic form of communication (AccuRx, eConsult, email).
 - The patient will need to have a patient action plan so that they are aware of how to titrate any medication and when to seek urgent medical advice for possible escalation.
 - Patients should be made aware that if their oxygen saturation is 93-94% they should contact their GP (during core hours) or 111 for advice and that if their oxygen saturation is $\leq 92\%$ they should seek urgent medical attention either by calling 999 or attending AE.

Covid-19

----- Guidance for practices



Ethical Consideration on deciding which patients require pulse oximetry

As per any test the reason for requesting the test should be to aid diagnosis, monitor response to treatment or be required to determine the best management for the patient. When considering whether to perform this test we need to consider how this will affect the patient's management and care. Pulse oximetry can be a very useful tool in helping to monitor and assess patients with suspected Covid-19.

As the Covid-19 pandemic progresses, we will need to consider the available hospital capacity. NICE have currently provided some guidance on the [management of critical care in adults](#) which suggests utilizing the clinical frailty score to aid the decision on whether a patient should be admitted to critical care or management on the ward. On an individual patient basis, GPs and community clinicians will need to make decisions on whether to admit patients to hospital for consideration of treatment.

Any patient being monitored requires a clear escalation plan in the event that they deteriorated; this could be for either active treatment in the community or hospital admission. We should not be monitoring pulse oximetry in patients who are on an end of life/palliative care pathway as the information gained will not affect their management but could further stress the patient, their families and the supporting clinical/social teams.

References

- [Clinical use of pulse oximetry pocket reference 2010 International COPD alliance and WONCA.](#)
- [Physiology, Respiratory Drive, Joshua E. Brinkman; Sandeep Sharma.](#)
- [NICE: Covid-19 rapid guideline: critical care in adults.](#)
- [BTS Guidelines for the management of Community Acquired Pneumonia in Adults 2009 update and 2015 annotated update.](#)
- [NHS England guidance Supporting remote monitoring using pulse oximetry](#) (published 16 June 2020)

Covid-19

----- Guidance for practices



[Download this letter as a Word template.](#)

Patient Action Plan for Oxygen Saturation monitoring

Dear <<Patient>>,

You have been given a pulse oximeter to monitor your blood oxygen levels during your Covid-19 infection.

Pulse Oximetry information for patient:

- Simply attach the oximeter to your finger and wait until the screen indicates your SpO₂ and pulse.
- SpO₂ reflects the amount of oxygen available in your blood to deliver to your heart, brain, lungs, and other muscles and organs.
- The pulse oximeter will also indicate your pulse rate on the screen.
- Your doctor may ask you to keep a record of your home oximetry measurements on a chart.
- Your doctor will advise you on what levels are normal and when to seek medical attention if the readings are low.
- You can use your oximeter at rest or during activities, such as walking or other exercise. DO NOT submerge in water.
- Trouble shooting:
 - Nail polish (especially dark shades) and/or artificial nails may affect the oximeter's performance.
 - When your fingers are cold, the blood flow is reduced, and poor or abnormal readings are possible. Warming the hands by rubbing together or with warm water helps improve blood flow.

Do not smoke! Smoking reduces the amount of oxygen reaching your tissues, but the oximeter will falsely suggest that oxygen level is satisfactory.

Personal Management Plan (to be completed by patient with clinician)

Patient Name: _____

DOB: __/__/____

Name of clinician assisting completion: _____

Date Completed: __/__/2020

Covid-19

----- Guidance for practices



Observation	*Oxygen saturation (SpO2) %	Pulse rate (bpm)	*Temp (°C)	**Respiratory Rate	**PEFR
Normal readings	>96%	40-100	36.5-37.5	10-16	‡
Patient Baseline					
Acceptable to continue home monitoring	≥95	≤100	≤38	≤21	
Seek GP advice	93-94%	100-110	38.1-39	22-24	
Need urgent medical advice	≤92%	≥111	≥39	≥25 or unable to talk in sentences	

*These values will need amending if the patient has underlying lung disease that causes stable low-term hypoxia (low oxygen saturation)

**If available and indicated

‡To use baseline PEFR as 'normal reading'

During a severe breathing attack, it is possible to have a normal oxygen level. Seek medical help if you have severe shortness of breath, wheezing, or increased pulse rate, even if your oxygen saturation is normal.