

### Introduction

Oximetry measures oxygen saturation by detecting a pulse and then comparing the relative light absorption of oxygenated and de-oxygenated haemoglobin. It therefore requires adequate peripheral circulation and is not reliable in any cause of low peripheral perfusion. It may also be inaccurate in the presence of nail varnish.

*Unlike arterial gas estimation oximetry may be unreliable as a diagnostic test - a modest drop in the partial pressure of oxygen in arterial blood does not alter saturation.  
Oximetry gives no indication of carbon dioxide levels.*

Where these limitations are understood, pulse oximetry has become an integral component of patient monitoring in the hospital setting. It is recommended that pulse oximetry be used in primary care as part of the assessment of breathless patients. Users of oximeters should be aware of the uses and limitations of their models.

### Reliability

Commercially available oximeters are generally reliable and usually only require checking on a normal individual before use. Some manufacturers do provide calibration devices. Further detail on this can be obtained from Mark Prentice in Medical Physics at the Southern General Hospital - 0141 201 1895.

### Use in Chronic Lung Disease

**Non smoking patients with chronic hypoxia**, particularly if associated with evidence of cor pulmonale, are candidates for long term oxygen therapy. The GGC Guideline on COPD suggests respiratory specialist assessment in severe COPD or if there is clinical evidence of cor pulmonale. A useful guide is to refer for further assessment a non smoking patient with chronic lung disease who has an oxygen saturation of 92% or less measured on two separate occasions in a stable clinical state at rest. Patients with other chronic lung diseases, such as interstitial lung disease or pulmonary vascular disease, may initially have relatively preserved oxygen saturation at rest, but desaturate significantly on exertion.

### Oximetry in Acute Respiratory Illness

Oximetry should only be used as an adjunct to full clinical assessment.

**Pneumonia/respiratory infection:** A saturation of less than 92% in a previously fit patient is a marker of severity particularly in the presence of other clinical markers - (confusion, respiratory rate more than 30, hypotension) and suggests a need for hospital admission.

**Asthma:** Hypoxia sufficient to cause saturations to fall below 92% is a late marker for severity, so although a pulse oximeter is a useful additional assessment tool in acute asthma, it should only be used in conjunction with the other markers of severity.

<http://www.brit-thoracic.org.uk/library-guidelines.aspx>  
<http://www.sign.ac.uk/guidelines/published/index.html#Respiratory>

Exacerbation of *COPD*: Oximetry may be helpful in exacerbations of *COPD* if normal saturation for the individual is known. However it is not a diagnostic test and there can be a risk of inappropriately aggressive supplemental oxygen delivery in response to low saturations. In patients with chronic hypoxia a saturation between 88 and 92% is an appropriate aim during an exacerbation.

#### Palliative Care

Breathlessness in terminally ill patients is seldom due to inadequate oxygenation - supplemental oxygen will not be of benefit if saturation is above 92%.

Respiratory MCN website: [www.nhs.gov.uk/respmcn](http://www.nhs.gov.uk/respmcn)

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