



# NATIONAL CLINICAL GUIDELINE FOR OXYGEN THERAPY FOR ACUTELY ILL ADULT PATIENTS

## Quick guide

**Do not use oxygen therapy routinely for acutely ill adult patients with normal oxygen saturation, as there are no definite benefits of treatment, and oxygen therapy may increase the risk of death.**

Weak recommendation **Against**

Normal oxygen saturation is defined as oxygen saturation measured peripherally using pulse oximetry ( $SpO_2$ ) > 94% at rest and when breathing atmospheric air with an oxygen content of 21%.

Oxygen therapy is defined as treatment with a supplement of medical oxygen in the inhaled air, to reach an oxygen content >21%.

In acutely ill adult patients who can maintain normal oxygen saturation without oxygen therapy, the lungs' ability to take up oxygen from atmospheric air is sufficient. Importantly, a normal oxygen saturation can be maintained with 1/3 of the lung capacity, and this means that acutely ill adult patients with normal oxygen saturation may have severe respiratory failure. Thus, all acutely ill adult patients should have their  $SpO_2$  measured as part of the triaging and observation. If the  $SpO_2$  is or drops below 94%, patients should be treated with oxygen.

The recommendation includes all acutely ill adult patients with normal oxygen saturation in the prehospital setting and during hospitalisation. Exceptions are:

- patients with Horton's headache,
- patients with carbon monoxide (CO) poisoning,
- patients in need of hyperbaric oxygen therapy,
- haemodynamically unstable patients until their state of health is stable, including ongoing cardiopulmonary resuscitation,
- trauma patients in the initial phase, until their state of health is stable,
- neurointensive patients with regional oxygen saturation measurement in the brain tissue,
- patients receiving preoxygenation prior to invasive respiratory-tract management.

In patients at increased risk of hypercapnia, e.g. patients with chronic obstructive pulmonary disease (COPD) and patients with a high body-mass index (BMI), i.e. > 40, a low oxygen saturation is defined differently. These patients should not be treated with oxygen until the  $SpO_2$  is lower than 88-92%, depending on the severity of the disease.



**Consider restrictive, targeted oxygen therapy for acutely ill adult patients with impaired oxygen saturation.**

**Weak recommendation**

Low oxygen saturation is defined as oxygen saturation measured peripherally using pulse oximetry ( $\text{SpO}_2$ )  $< 94\%$  at rest.

Restrictive, targeted oxygen therapy is defined as treatment whereby the supplemental oxygen is titrated in such a way that the  $\text{SpO}_2$  is 94-98%.

In acutely ill adult patients with reduced oxygen saturation, the lungs' ability to absorb oxygen from atmospheric air is not sufficient, and there is a risk of life-threatening oxygen deficiency in the body's cells. These acutely ill adult patients have significant respiratory failure, and oxygen therapy is a life-saving treatment. Thus, all acutely ill adult patients with reduced oxygen saturation must have their  $\text{SpO}_2$  measured as part of the triaging and observation. It is important to continuously assess the need for supplementary arterial blood-gas analyses with measurement of oxygen saturation ( $\text{SaO}_2$ ) and of partial oxygen pressure in arterial blood ( $\text{PaO}_2$ ).

The recommendation covers all acutely ill adult patients with low oxygen saturation undergoing pre-hospital treatment and during hospitalisation. Exceptions are:

- patients hospitalised for the treatment of Horton's headache,
- patients with carbon monoxide (CO) poisoning,
- patients in need of hyperbaric oxygen therapy,
- patients with fulminant respiratory failure and oxygen therapy using a heart/lung machine (extracorporeal membrane oxygenation (ECMO)),
- haemodynamically unstable patients until their state of health is stable, including ongoing cardiopulmonary resuscitation,
- trauma patients in the initial phase and until their state of health is stable,
- neurointensive patients with regional oxygen saturation measurement in brain tissue,
- patients receiving pre-oxygenation prior to invasive respiratory tract management.

In patients at increased risk of hypercapnia, e.g. patients with chronic obstructive pulmonary disease (COPD) and patients with a high body-mass index (BMI), i.e.  $> 40$ , the recommended  $\text{SpO}_2$  target is defined differently. These patients should be offered oxygen therapy at  $\text{SpO}_2$  88-90%, and the target for oxygen therapy should be a  $\text{SpO}_2$  of 88-92%.



### About the quick guide

This quick guide contains the key recommendations from the national clinical guideline for oxygen therapy for acutely ill adult patients.

The guideline was prepared under the auspices of the Danish Health Authority.

The focus of the national clinical guideline is the treatment with oxygen of the acutely ill adult patient and distinguishes between patients with normal oxygen saturation and those with reduced oxygen saturation.

The guideline includes recommendations not to treat acutely ill adult patients with normal oxygen saturation with oxygen, while acutely ill patients with low oxygen saturation should continue to be treated with oxygen.

The oxygen treatment should always be adjusted to avoid high concentrations of oxygen in the blood.

Thus, this guideline contains recommendations for selected parts of the field only and therefore must be seen alongside other guidelines, course descriptions, etc. in the field.

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### Further information at [sundhedsstyrelsen.dk](http://sundhedsstyrelsen.dk)

At [www.sst.dk](http://www.sst.dk) a full-length version of the national clinical guideline is available, including a detailed review of the underlying evidence for the recommendations.

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### About the national clinical guidelines

This national clinical guideline is one of the national clinical guidelines to be prepared by the Danish National Board of Health DHA during the period 2017-2020.

Further information about the choice of subjects, method and process is available at [www.sst.dk](http://www.sst.dk)

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