Peer review comments – Awake prone positioning and non-invasive respiratory support

Managing COVID-19 rapid guideline (NG191)

Peer review organisations

For a list of stakeholders invited to comment on COVID-19 guidance as part of the targeted peer review, please see the targeted peer review stakeholder list on the NICE website.

For this topic, the following stakeholder organisations were also invited to comment:

- Association of Anaesthetists
- British Association of Critical Care Nurses (BACCN)
- British Thoracic Society
- Chartered Society of Physiotherapy
- Faculty of Intensive Care Medicine
- ICUsteps
- Royal College of Anaethetists

Date of completion: 24/02/2022

Peer review comments

Overarching category	Guideline section	Theme of comments	Action taken
Info box: Definitions	Non-invasive ventilation (NIV)	Two reviewers suggested some minor amendments to improve clarity of the definition.	The definition was amended.
Info box: deciding when to escalate and de-escalate treatment	List of factors to consider	One reviewer suggested the presence of raised carbon dioxide levels and body acidosis should be added as an additional factor to consider.	We did not include this because although arterial blood gas testing may be useful, the panel did not wish to mandate a painful invasive procedure.
Info box: deciding when to escalate and de-escalate treatment	List of factors to consider	One reviewer suggested that consideration of the patients co-morbid status/frailty be added to the following factor: • the person's overall clinical trajectory	We have left the wording “the person's overall clinical trajectory” as it is because it requires obtaining a history to capture the timing of past events. Co-morbid status/frailty do not necessary capture chronology.
Info box: deciding when to escalate and de-escalate treatment	List of factors to consider	One reviewer suggested we modify the factor on how well the person can tolerate treatment to take account of how they have tolerated treatments so far.	The factor to consider was amended.
Info box: deciding when to escalate and de-escalate treatment	Remark	One reviewer noted that it would be helpful to link directly to the non-invasive respiratory support content in the RCPH and RCOG guidelines.	We investigated whether this would be possible. The RCPCH webpage that is currently linked to is the only COVID-19 specific advice from the RCPCH and the section on respiratory support does not have a separate hyperlink. The hyperlink to the RCOG webpage is a permanent hyperlink. The guidelines on this webpage are updated regularly and so a hyperlink

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			to a guideline document could go out of date.
Recommendation: Optimise pharmacological and non-pharmacological management strategies in people who need non-invasive respiratory support.	Recommendation	One reviewer suggested that this recommendation should say optimise management strategies for all patients with COVID-19 – particularly if they have progressed to requiring non-invasive respiratory support.	No action taken. Rephasing the recommendation in this way would not significantly change the meaning of the recommendation.
Recommendation: Optimise pharmacological and non-pharmacological management strategies in people who need non-invasive respiratory support.	Remark	One reviewer suggested adding a link to the British Thoracic Society guidelines.	We have now included a link to the British Thoracic Society COVID-19 guidance.
Recommendation: Optimise pharmacological and non-pharmacological management strategies in people who need non-invasive respiratory support.	Evidence to decision: Summary	One reviewer suggested that pharmacological and non-pharmacological treatment should be optimised before considering further respiratory support.	No action taken. This recommendation is about people who need non-invasive respiratory support rather than people who may need further respiratory support (e.g. an escalation of respiratory support). The panel felt that it was important to provide respiratory support as quickly as possible for people who need it.

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Recommendation: Consider a trial of awake prone positioning for people in hospital with COVID-19 who are not intubated and have higher oxygen needs. Discuss this with the person to reach a shared decision.	Recommendation	One reviewer queried whether the recommendation should specify adults only.	No action taken. If the recommendation was to specify 'adults' some people may interpret this as implying that prone positioning does not work for children. However, there is no evidence to suggest that prone positioning does not work for children. Therefore, we have used the word 'people' so healthcare professionals can make a decision about considering a trial of prone positioning based on their own judgement.
Recommendation: Consider a trial of awake prone positioning for people in hospital with COVID-19 who are not intubated and have higher oxygen needs. Discuss this with the person to reach a shared decision.	Remark	One reviewer suggested we change 'may' to 'should' in this sentence: • Factors to consider as part of a trial of awake prone positioning may include:	No action taken. The panel requested the expression "may include" to be used and not "should include". This is because the panel wanted their advice to be supportive for healthcare professionals rather than be used in a clinical audit that might be used in a punitive way – especially during a major incident or during the height of a pandemic.
Recommendation: Consider a trial of awake prone positioning for people in hospital with COVID-19 who are not intubated and have higher oxygen needs. Discuss this with the	Remark	One reviewer suggested we add the following to the list of factors to consider as part of a trial of awake prone positioning: • the person should not have any contraindications to prone positioning (for example, people with an inability to communicate and co-operate with the procedure, respiratory distress, a potential need for invasive ventilation, untreated pneumothorax, or recent abdominal or thoracic surgery/trauma/facial/pelvic/spine fractures)	We have added this advice.

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person to reach a shared decision.			
Recommendation: Consider a trial of awake prone positioning for people in hospital with COVID-19 who are not intubated and have higher oxygen needs. Discuss this with the person to reach a shared decision.	Remark	One reviewer suggested we add the following information: • Record length of time in prone position, whether there is side lying or not, and direction.	No action taken. We believe that the current wording is sufficient. The panel did not want to be too prescriptive because there is insufficient evidence with regards to how prone positioning should be conducted.
Recommendation: Consider a trial of awake prone positioning for people in hospital with COVID-19 who are not intubated and have higher oxygen needs. Discuss this with the person to reach a shared decision.	Remark	One reviewer suggested that we expand the following factor to consider: • using a suitable trial duration to measure response to prone positioning (for example, by monitoring need for oxygen support or effort of breathing) To this: • using a suitable trial duration to measure response to prone positioning (for example, by monitoring oxygen saturation, need for supplemental oxygen, respiratory rate, and sensation of breathlessness)	This change has been made.
Recommendation: Consider a trial of awake prone positioning for people in hospital with COVID-19 who are not intubated and have	Remark	One reviewer suggested we emphaise the importance of regular review.	This change has been made.

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higher oxygen needs. Discuss this with the person to reach a shared decision.			
Recommendation: Consider a trial of awake prone positioning for people in hospital with COVID-19 who are not intubated and have higher oxygen needs. Discuss this with the person to reach a shared decision.	Remark	One reviewer suggested adding a link to the British Thoracic Society guidance on management of coronovirus infection.	This change has been made.
Recommendation: Consider a trial of awake prone positioning for people in hospital with COVID-19 who are not intubated and have higher oxygen needs. Discuss this with the person to reach a shared decision.	Rationale	One reviewer queried whether the rationale should include an answer to the question: Why prone positioning may help physiologically?"	No action taken. The rationale should only include what the panel discussed and the reasoning behind the recommendation. For this recommendation, the panel did not discuss the physiological basis of prone positioning.
Recommendation: Consider a trial of awake prone positioning for people in hospital with COVID-19 who are not intubated and have higher oxygen needs. Discuss this with the	Rationale and evidence to decision - preference and values	Two reviewers wote that median time to intubation is cited as a benefit of prone positioning. However, many people have concerns about poor outcomes when intubation is delayed especially in patients on CPAP/HFNO due in part to concerns about high spontaneous tidal volumes in COVID-19.	We have now removed "increases the median time to intubation."

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Recommendation: Consider a trial of awake prone positioning for people in hospital with COVID-19 who are not intubated and have higher oxygen needs. Discuss this with the person to reach a shared decision.	Rationale	One reviewer noted it would be helpful to highlight that: • there are many uncertainties regarding optimal delivery of self proning. • 5 hours was the average duration in the largest RCT to show an effect. • Self-proning was combined with HFNO in the largest trial and HFNO or NIV in other trials and it is unknown whether this is an important part of the treatment. • most clinicians would combine self proning with HFNO or CPAP. There are practical/patient comfort reasons why self proning is easier to deliver with HFNO than CPAP.	No action taken. The rationale section provides the reason why the panel made the recommendation. We appreciate that there is insufficient evidence to state how prone positioning should be done for people with different characteristics and with access to different equipment. The uncertainties in the evidence have been described in the evidence to decision section that underpins the recommendation.
Recommendation: Consider a trial of awake prone positioning for people in hospital with COVID-19 who are not intubated and have higher oxygen needs. Discuss this with the person to reach a shared decision.	Evidence to decision – benefits and harms	One reviewer suggested we change the word “proning” to “prone postioning” to make the summary more understandable.	We have made this change as requested.
Recommendation: Consider a trial of awake prone positioning for people in hospital with COVID-19 who are not intubated and have	Evidence to decision – resources and other considerations	One reviewer suggested that prone positioning could also reduce oxygen usage in a hospital and it is difficult for people who have CPAP to self-prone.	No action taken. Thank you for raising the point. As this particular point was not raised by the panel, we have not made any changes to text.

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higher oxygen needs. Discuss this with the person to reach a shared decision.			
Recommendation: Consider a trial of awake prone positioning for people in hospital with COVID-19 who are not intubated and have higher oxygen needs. Discuss this with the person to reach a shared decision.	Evidence to decision – equity	One reviewer suggested it could be useful to mention that the trial included adult men and women.	No action taken. This section begins "All trials were in adults…" Additionally, full details of proportion of men and women in the trials is stated in the evidence summary. Therefore, we have not added anything further.
Recommendation: Do not routinely offer high-flow nasal oxygen as the main form of respiratory support for people with COVID-19 and respiratory failure in whom escalation to invasive mechanical ventilation would be appropriate.	Recommendation	One reviewer suggested that HFNO may be combined with self-proning. Only 50% of the patients in Recovery RS trial had self proning so it is uncertain if self-proning with CPAP or self-proning with HFNO is optimal.	No action taken. The panel agreed that high-flow nasal oxygen has a role to play in management. However, the evidence does not support it as the main form of respiratory support. The panel created recommendations so high-flow nasal oxygen may be used in certain circumstances. However, the evidence for its use for people with COVID-19 is limited.
Recommendation: Do not routinely offer high-flow nasal oxygen as the main form of respiratory support for people with COVID-19 and respiratory failure in	Rationale and evidence to decision – acceptability	Two reviewers suggested we added information about when HFNO may be used.	We have now included a hyperlink as a remark to the recommendation that has the situations where high-flow nasal oxygen may be used.

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whom escalation to invasive mechanical ventilation would be appropriate.			
Recommendation: Consider continuous positive airway pressure (CPAP) for people with COVID-19 when:…	Recommendation	One reviewer suggested we define hypoxaemia and a different reviewer asked whether it was worth using a PF ratio.	We have added the definition of hypoxemia to the rationale by providing the oxygen saturation using pulse oximetry that was provided in the largest study.
Recommendation: Consider continuous positive airway pressure (CPAP) for people with COVID-19 when:…	Recommendation	Two reviewers suggested that there might not be any difference between CPAP and conventional oxygen because these were the findings from Bradley 2021, which is a retrospective UK study. Bradley 2021 found that there is a high failure rate in patients not for intubation and also a high intolerance rate. The reviewers suggested that because of these findings we should explain why CPAP is recommendated.	No action taken. We checked the applicability of Bradley 2021 against our review protocol but could not include Bradley 2021 because it is a retrospective study but we are only accepting RCTs for this review. We have discussed the findings of Perkins 2022 in the evidence to decision section.
Recommendation: Consider continuous positive airway pressure (CPAP) for people with COVID-19 when:…	Remarks	One reviewer suggested we add a link to the British Thoracic Society guidance on management of coronovirus infection. in the remark.	This change has been made.
Recommendation: Consider continuous positive airway pressure (CPAP) for people with COVID-19 when:…	Evidence to decision – benefits and harms	One reviewer queried why the oxygen range was limited to a maximum of 60% oxygen in the following senstence: The panel agreed that these uncertainties warranted a recommendation to consider offering CPAP to people with COVID-19 when they:	We have now changed this from “to 60%” to “or more” so that the wording is more consistent with the recommendation.

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		• have hypoxaemia that is not responding to supplemental oxygen with a fraction of inspired oxygen of 40% to 60%, and	
Recommendation: Consider continuous positive airway pressure (CPAP) for people with COVID-19 when:…	Evidence to decision – benefits and harms	One review believed that reviewing people having CPAP every 12 hours approximately was too long. They suggested that we should aim for hourly observations and regular clinician assessment should be mandated.	No action taken. The panel provided this advice to aid healthcare professionals. The panel were mindful of the need to create recommendations that would support moments of high demand, such as after a major incident or during the height of a pandemic.
Recommendation: Consider continuous positive airway pressure (CPAP) for people with COVID-19 when:…	Evidence to decision – benefits and harms	One reviewer agreed with this sentence: The panel agreed not to define treatment failure to allow for individual clinical decision making.	No action taken.
Recommendation: Consider continuous positive airway pressure (CPAP) for people with COVID-19 when:…	Evidence to decision – benefits and harms	One reviewer felt that the word “before” in the following sentence should be changed to “with”: • The panel also made a consensus recommendation to optimise medical management (including pharmacological and non-pharmacological treatment) before starting non-invasive respiratory support.	This change has been made.
Recommendation: Consider continuous positive airway pressure (CPAP) for people with COVID-19 when:…	Evidence to decision – preference and values	For this sentence: For example, the panel noted that some people tolerate high flow nasal oxygen better than continuous positive airway pressure (CPAP). One reviewer wrote that numerous devices for the delivery of CPAP should be available and those struggling with one route should be offered another with which they may have greater level of comfort.	No action taken. The panel did discuss the numerous devices for the delivery of continuous positive airways pressure. However, they decided to keep this wording because some people find that continuous positive airways pressure is uncomfortable compared to high-flow nasal oxygen

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			(which does not have a sizable positive pressure). Also, the panel mentioned that high-flow nasal oxygen is the only intervention that may provide high volume oxygen with humidified air over a period of days to potentially weeks.
Recommendation: Consider continuous positive airway pressure (CPAP) for people with COVID-19 when:…	Evidence to decision – resources	For this sentence: However, the panel were mindful that CPAP must be given by staff who have skills and competencies in CPAP, be accompanied by careful review, prompt recognition of when treatment has failed, and have a management plan should the CPAP fail. One reviewer wrote that we could reference the recent HSIB investigation into a CPAP death in a COVID-19 patient.	No action taken. The panel concluded that the wording as it is should be sufficient.
Recommendation: For people with COVID-19 having continuous positive airway pressure (CPAP), ensure:…	Recommendation	For the sentence: regular review by an appropriate senior clinician (such as every 12 hours) and more frequent review if needed, in line with the British Thoracic Society guidance on respiratory support units and the Faculty of Intensive Care Medicine guidelines on the provision of intensive care services One reviewer wrote that there should be someone immediately available to be called to review these patients if deteriorating.	No action taken. These recommendations have been written to supplement existing advice and guidance on life support. They have not been written to replace mainstream life support guidance. The fundamental practices of life support would still apply.
Recommendation: Consider using high-flow nasal oxygen for people having continuous positive airway pressure (CPAP) when:…	Recommendation	For the sentence: they cannot tolerate CPAP but need humidified oxygen at high flow rates One reviewer wrote that they agreed but there should be a clear escalation plans/guidance and ceillings of treatment.	We have now included a link to the British Thoracic Society guidance in a remark underneath this recommendation. The BTS guidance includes advice on providing management plans.