

Risk of Significant Malnutrition in Hospitalised COVID-19 Patients Receiving CPAP
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Continuous positive airway pressure (CPAP) that is delivered by face mask or hood is increasingly used in patients with COVID-19 who have been admitted to hospital, often on general or respiratory wards. Oral intake of food and drink in patients with COVID-19 might have been and will often continue to be poor due to disease-associated anorexia, nausea, and impairment of taste. Full-face or hood CPAP also makes it impossible to eat and drink without mask removal,¹ which can be associated with decreased arterial oxygen saturation. Staff might also fear that the use of nasogastric feeding can cause mask air leaks or promote gastric distension and aspiration due to aerophagia.

Such issues are in fact readily managed, and the British Association for Parenteral and Enteral Nutrition has produced practical guidelines.² However, NHS England and NHS Improvement³ advocate opioid administration when CPAP is used to reduce the sensation of breathlessness and high tidal volumes, an intervention that can impair gut motility.

We received reports of three patients with COVID-19 who were treated with CPAP and developed starvation ketosis and other patients who have gone for extended periods (up to 25 days) without substantial oral intake or initiation of nutritional support. The negative effects of malnutrition can be worsened by the process of muscle wasting, which is common in patients with COVID-19 who are admitted to hospital, and by subsequent admission to an intensive care unit for mechanical ventilation, where gut function might be impaired (eg, by use of opioid analgesia), as dietitians have reported to the Critical Care Specialist Group of the British Dietetic Association.

We were also made aware of the use of 0.9% saline in some health-care centres as the routine (and sole) intravenous crystalloid. Such practice does not comply with the National Institute for Health and Care Excellence clinical guideline 174: although 0.9% saline can be used for replacement of gastrointestinal losses or as a bolus for acute resuscitation, its use is not recommended in terms of routine maintenance.⁴ Use as routine maintenance can increase sodium and chloride load in the body, potentially leading to bowel oedema and further impairment of gastrointestinal function.⁵

We recommend that health-care professionals with expertise in nutrition, especially dietitians, nutrition nurses, physicians, and pharmacists, should be engaged in the assessment and care of all patients with COVID-19 who receive CPAP and patients who are subsequently admitted to intensive care units for mechanical ventilation. Appropriate nutritional support—including the introduction of parenteral nutrition, if necessary—improves outcomes in analogous cases.⁶

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References

1. Energy and protein intakes of hospitalised patients with acute respiratory failure receiving non-invasive ventilation. *Clin Nutr.* 2014 Dec;33(6):1068-73. doi: 10.1016/j.clnu.2013.11.012
2. BAPEN / BDA. Route of nutrition support in patients requiring NIV & CPAP during the COVID-19 response. <https://www.bapen.org.uk/pdfs/covid-19/nutrition-in-niv-21-04-20.pdf>
3. Guidance for the role and use of non-invasive respiratory support in adult patients with coronavirus (confirmed or suspected). <https://www.nice.org.uk/Media/Default/About/COVID-19/Specialty-guides/specialty-guide-NIV-respiratory-support-and-coronavirus.pdf>
4. Heng et al 0.9% saline is neither normal nor physiological *J Zhejiang Univ Sci B.* 2016 Mar; 17(3): 181–187. doi: 10.1631/jzus.B1500201 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4794509/>
5. Faisy et al 2009: Impact of energy deficit calculated by a predictive method on outcome in medical patients requiring prolonged acute mechanical ventilation. *Br J Nutr.* 2009 Apr;101(7):1079-87.