

The case for continuing community NIV and CPAP during the COVID-19 epidemic.

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Dear Editor,

Recent clinical guidelines regarding the use of home Non-Invasive Ventilation (NIV) and Continuous Positive Airway Pressure (CPAP) during the COVID-19 epidemic have tried to balance the risks of stopping NIV or CPAP against the unknown potential risk of increased aerosol related transmission to family and carers [1,2]. We read with interest views put forward by Barker et al., in this edition of Thorax [3] but feel that wider aspects need consideration, and for NIV and CPAP separately.

NIV Use: NIV is primarily used for those with previous, or at risk from, hypercapnic respiratory failure (neuromuscular disorders, chest wall deformity, obesity or underlying lung disease e.g. COPD). Stopping home NIV risks the return of symptoms (lethargy, headache, dyspnoea and confusion), increased patient and family anxiety, and precipitating life-threatening acute hypercapnia, which is likely to result in hospital admission, patient exposure to COVID-19 and other infections, as well as causing increased (and preventable) pressure on ventilator beds. Home NIV patients often have limited mobility or are housebound. They have been advised to self-isolate and, in our experience, most patients are following the advice. There is therefore a higher risk of a carer to patient transmission. NIV does generate droplets, but using a non vented mask with a viral filter reduces the spread significantly [4]. We however recognise that should patient get infected then there is a risk to carers.

Continuing home NIV, with increased family member care, backed up with remote assistance from specialist carers, is an option. When direct carer input cannot be avoided, simple measures e.g. hand washing and opening windows and doors before a visit to reduce airborne viral load (a single change of room air reduces viral load by 63%, 5 changes to less than 1%, [5]) and PPE will be required. For patients in care facilities or requiring hospital admission, a side room and pre-emptive change of mask and circuit with a viral filter in combination with precautions listed above should minimise risk.

CPAP Use: CPAP is primarily used for those with OSA. Whilst CPAP treatment improves symptoms (sleepiness, headaches, concentration, memory and mood) it is rarely life-preserving. However, stopping home CPAP may cause a deterioration in physical and mental health, in addition to social distancing and home isolation. Increased sleepiness will affect driving and safety critical jobs and work productivity may fall. The return of snoring may reduce family members' sleep, affecting household temperaments and compounding frustration from being confined to the home.

Stopping CPAP for the entire epidemic duration cannot be recommended, especially for keyworkers, those with safety-critical jobs and those with increased workload during the pandemic. If a CPAP-user develops symptoms (or has asymptomatic proven COVID-19) then self-isolation and stopping CPAP for two weeks might be sensible. To minimise any in hospital transmission, we are asking patients not to bring home CPAPs, masks or equipment into hospital (assuming contamination) and are not treating straightforward OSA with CPAP in hospital during the epidemic. Patients with decompensated obesity hypoventilation or COPD/OSA

overlap will be provided with a non-vented mask, viral filter and vented circuit in a side room with a hospital CPAP machine.

Thus, whilst we fully accept there is an unknown, potentially increased, risk of viral transmission for other household members and carers, should the NIV or CPAP-user be COVID-19 positive, we believe that blanket advice to withhold home NIV and CPAP for all users, for what may be a substantial period (maybe 12 weeks or even longer), will cause significant, and measurable, patient harm.

[1] Guidance regarding coronavirus (COVID-19) and Obstructive Sleep Apnoea (OSA): for people who routinely use continuous positive airway pressure (CPAP), their families and health care workers, 20 March 2020. <https://www.brit-thoracic.org.uk/media/455098/osa-alliance-cpap-covid-19-advice-20-3-20-v10.pdf>

[2] NHS. Clinical guide for the use of acute non-invasive ventilation in adult patients hospitalised with suspected or confirmed coronavirus during the coronavirus pandemic. <https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/03/clinical-guide-acute-niv-ventilation-v1-19-march-2020.pdf>

[3] Barter et al., Thorax this edition

[4] Evaluation of droplet dispersion during non-invasive ventilation, oxygen therapy, nebuliser treatment and chest physiotherapy in clinical practice: implications for management of pandemic influenza and other airborne infections. Simonds AK, Hanak A, Chatwin M et al. Health Technol Assess. 2010;14:131–72.

[5] Public Health England. COVID-19: Guidance for infection prevention and control in healthcare settings. Version 1.0. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/872745/Infection_prevention_and_control_guidance_for_pandemic_coronavirus.pdf

Conflicts of interest

JGB provides molecular pharmacology advice for CuraSen Therapeutics.

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