

On the role of non-invasive ventilation (NIV) to treat patients during the H1N1 influenza pandemic

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ABSTRACT

Guidelines were written on behalf of 2 International Societies (European Respiratory Society and European Society of Intensive Care Medicine) in order to clarify the use and limitation of non-invasive mechanical ventilation (NIV) in patients confirmed to have H1N1 infection and are presumed to be still shedding virus.

NIV must not be considered in the case of pneumonia sustained by H1N1, with hypoxemic acute respiratory failure, likely to progress to ARDS, and in general as an alternative to endotracheal intubation.

NIV may be considered to prevent further deterioration and need for intubation in patients with mild to moderate hypercapnic acute respiratory failure, acute respiratory failure and/or distress due to cardiogenic pulmonary edema, in the absence of pneumonia, multiple organ failure, and refractory hypoxemia. It may be also used to prevent post-extubation respiratory failure in patients with resolving ARDS secondary to H1N1 infection, preferentially when the patient is no longer contaminated.

In general, prudent isolation of the patient coupled to protective measures for care providers and other patients are the keys to limit disease transmission

Several reports call for “clear and practiced” plans to respond to a surge in hospital and intensive care unit utilization related to the H1N1 pandemic. This plan should consider all elements of hospital and critical care services, including interventions such as NIV. Accordingly the following guidelines are suggested for cases in which patients are confirmed to have H1N1 infection and are presumed to be still shedding virus, or have a clinical picture strongly suggestive of H1N1 infection but confirmatory testing is pending:

The document was written by designated people on behalf of the following Societies: European Respiratory Society and European Society of Intensive Care Medicine

When NIV MUST NOT be considered:

- In the case of pneumonia sustained by H1N1, with severe hypoxaemic acute respiratory failure. These cases, in fact, have been shown to be associated to rapid development of ARDS, with often very severe hypoxemia and large intrapulmonary shunts. In particular, in those patients with H1N1 infection admitted to ICU with multiple organ failure and/or refractory hypoxaemia, an NIV trial may forestall necessary intubation and exhaust physiologic reserve, making the patient a higher risk for intubation and stabilisation on the ventilator. **As a general rule, NIV is not recommended as an alternative to invasive ventilation for patients affected by H1N1.**

When NIV MAY be considered:

- To prevent further deterioration and need for intubation in patients with mild to moderate hypercapnic acute respiratory failure due to exacerbation of a chronic respiratory disorder

secondary to H1N1 infection, in absence of pneumonia, multiple organ failure, and refractory hypoxemia.

- To prevent further deterioration and need for intubation in patients with H1N1 infection and acute respiratory failure and/or distress due to cardiogenic pulmonary oedema, in the absence of pneumonia, multiple organ failure, and refractory hypoxaemia.
- To prevent post-extubation respiratory failure in patients with resolving ARDS secondary to H1N1 infection, preferentially when the patient is no longer contaminated.

How NIV should be applied

There is appropriate concern about droplet dispersion during NIV, especially in light of two recent studies (1,2). It is important to note that similar exposures may occur during routine oxygen therapy by mask or other device when patients are not receiving positive pressure assistance.

Recommendations:

- **In general, prudent isolation of the patient coupled to protective measures for care providers and other patients are the keys to limit disease transmission**
- Use double circuit tubes (or special filters for non-rebreathing devices)
- Minimise leaks
- Use full face masks or helmets
- Avoid heated humidification

- Protect hospital personnel with standard measures (i.e. wearing gloves, washing hands, use of masks, “negative pressure” rooms).
- Discard all masks, circuits, filters and headsets immediately and safely after use according to routine infection control procedures. The routine exterior cleaning of ventilators and replacement of external filters should be sufficient to stop the spread of infection if ventilators are used on other NIV patients with H1N1. Complete decontamination may be considered before ventilators are used for patients without H1N1.

REFERENCES

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