

**FAST FACTS AND CONCEPTS #231
PRACTICAL ASPECTS OF USING NPPV AT THE END OF LIFE**

Mei-Ean Yeow MD and Eytan Szmuiłowicz MD

Background Non-Invasive Positive Pressure Ventilation (NPPV) can be used to palliate dyspnea in dying patients. *Fast Fact #230* discusses medical decision making around using NPPV. This *Fast Fact* discusses practical aspects of using NPPV in dying patients. Little research has occurred on this topic; unless otherwise noted the following discussion is based on clinician opinion and common practice.

Location The cost and experience needed to initiate NPPV limit its use to the hospital setting, with some exceptions (see below). Most NPPV use occurs in ICUs or transitional care ('step-down') units, and at some institutions continuous NPPV is not allowed outside of these settings. While the use of NPPV for palliation can occur at home or a hospice facility, it requires adequate nursing, respiratory therapy, and physician support to employ it safely. This can be a practical barrier to its use, and NPPV should not be offered unless one is sure it can be provided appropriately. Ensuring adequate respiratory therapist support is particularly crucial, as they have unique expertise at initiating and trouble-shooting the machines. *Continuing* NPPV for palliation in patients and families who are already comfortable managing home NPPV (e.g. for COPD or ALS) can be practical in the home or hospice facility setting, as long as it is consistent with care goals. *Initiating* NPPV in the home setting for dying patients is impractical and, given how uncertain its real benefits are (see *Fast Fact #230*), is not advised.

Starting NPPV

- **Masks:** While full facemasks are commonly used in the in-patient setting, some patients find these claustrophobic. Nasal masks tend to be better-tolerated, but they do not work as well in patients who are mouth breathers. Patient preference and clinician familiarity should guide this decision.
- **Settings:** Two parameters need to be set: the inspiratory positive airway pressure (IPAP) and end-expiratory positive pressure (EPAP). The breaths are usually triggered by the patient. On many devices it is possible to set a back-up rate if the patient does not trigger a breath spontaneously—this is inappropriate in dying patients receiving NPPV for symptom relief.
- **Strategies:** There are two general approaches to initiating NPPV settings: a 'high to low' approach and a 'low to high' approach, referring to the initial IPAP settings. The EPAP is usually set at 3-5 cmH₂O. In order to maximize the tolerability of NPPV for symptom relief in dying patients, a 'low-high' approach is recommended. Start with a lower IPAP (8-10 cmH₂O), and gradually increase as tolerated to achieve alleviation of dyspnea, decreased respiratory rate, increased tidal volume, and patient-machine synchrony.

Monitoring Pulse oximetry and arterial blood gas monitoring are not needed for patients using NPPV only for symptom control. Rather, its effect should be based on subjective improvement of dyspnea and decrease in respiratory rate. It is important to reassess patients frequently (looking specifically for respiratory rate, use of accessory muscles, signs of anxiety, and facial skin integrity), and to inquire if they are comfortable with the NPPV and deriving any benefit from it. Breaks from NPPV to eat, drink, communicate, and alleviate skin shearing specifically on the nasal bridge should be encouraged. Transparent films or thin foams over the bridge of the nose are recommended to prevent facial pressure ulcers, as well as periodic repositioning of the mask and alternating between mask types as tolerated.

Contraindications Contraindications are facial surgery/trauma/deformities that limit placement of the NPPV mask and patients with active nausea and vomiting. Decreased mental status is also considered a contraindication it increases the risk of aspiration from NPPV.

Discontinuing NPPV NPPV should be discontinued if it does not provide relief from dyspnea within an hour of the maximally tolerated setting, once a patient is no longer alert, or at any point when it is no longer meeting a patient's goals. If the patient does not tolerate the mask, or feels claustrophobic, a small dose of a benzodiazepine can be administered to alleviate anxiety. If the patient is still uncomfortable, then NPPV should be stopped as it is then not adding to patient comfort. Opioids and benzodiazepines

should be used to decrease dyspnea once NPPV is stopped. Remember that NPPV provides ventilatory support to patients and the work of breathing can dramatically increase without it. Be prepared to rapidly control any distressing symptoms, *just as you would with discontinuing invasive mechanical ventilation* (see *Fast Facts* #27, 33, 34).

References

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Author Affiliations: Northwestern Memorial Hospital, Chicago, IL

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