

## FAST FACTS AND CONCEPTS #230 USING NON-INVASIVE VENTILATION AT THE END OF LIFE

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**Background** Non-invasive positive pressure ventilation (NPPV, often called 'BiPAP') is commonly used in patients with respiratory failure from COPD, CHF, and other disorders. NPPV decreases the work of breathing and allows respiratory muscle rest during inspiration. This *Fast Fact* discusses medical decision making around its use at the end of life. *Fast Fact* #231 discusses practical aspects of applying NPPV in dying patients, as well as how to discontinue it safely.

**Goals of NPPV at the end of life** NPPV is used in 3 general circumstances in patients close to death, all of which are likely to be encountered by palliative specialists (1):

1. *Patients who desire full, life-prolonging interventions, regardless of prognosis.* If the patient's respiratory status deteriorates, intubation and ventilation are initiated.
2. *Patients who want life-prolonging therapy but with limitations* (e.g., patients with a 'Do Not Intubate' order but otherwise want all attempts at life prolongation). Ideally, NPPV is used only if the etiology for the respiratory failure is thought to be reversible and is stopped if it is not producing the desired response or the patient is not tolerating NPPV. In practice, this may not be the case.
3. *Dying patients with respiratory failure or dyspnea for palliative purposes.* This category includes dying patients who have decided to forego life-prolonging therapies and wish to focus on comfort measures. NPPV can be used with the intention to reduce the work of breathing, to ease dyspnea, and to help maintain wakefulness by reducing the amount of opioids a patient needs to be comfortable. NPPV can also be used to prolong life for a short period to meet a patient's goals while otherwise providing a comfortable death (e.g., to allow time for family to visit). Unlike #2, the goal is not to bridge a patient through a reversible illness, but to forestall death to meet a specific goal.

### Research Findings

- In several trials NPPV has been shown to reduce mortality, intubation rates, and hospital length of stay in patients with COPD, as well as reduce intubation rates in patients with respiratory failure from heart failure and in immunocompromised patients (2-4).
- For the second category of patients, there are no high-quality trials. Some observational studies suggest that NPPV can reverse acute respiratory failure and decrease hospital mortality in patients with COPD or CHF who have 'Do Not Intubate' orders (5,6). Apart from ALS (see *Fast Fact* #73, #300) there are no data to affirm its use in other patient populations.
- There is a small body of research about the use of NPPV to alleviate dyspnea in dying patients. In a survey, a majority of pulmonologists endorsed a belief that NPPV relieves dyspnea in dying patients in addition to anxiolytics and analgesics (7). In multiple controlled studies of hospitalized cancer patients with acute respiratory failure and life expectancy less than 6 months, NPPV was shown to improve dyspnea much faster and have an opioid sparing effect in the first 48 hours compared with passive oxygen therapy (8,9). However, it is unclear what effect NPPV had on the overall quality of dying and death, a much more complex and subjective dimension, seeing that the use of NPPV in these studies was restricted to intensive care settings.
- With wider availability of new interfaces and ventilators (e.g. nasal NPPV), the rate of discontinuation due to poor tolerance is estimated to be <15% when used for acute respiratory failure (10).

**Drawbacks of NPPV** NPPV is noisy and can be uncomfortable and frightening. It may interfere with sleep and family intimacy and could confuse care goals if not discussed carefully. Initiating NPPV outside of acute care environments (e.g. at home, nursing home, or hospice facility – see *Fast Fact* #231) may be challenging if not impossible. Some experts have published concerns that NPPV may complicate end of life decision-making for the bereaved and by consequence increase the risk of associated anxiety (11).

### Medical Decision Making and Counseling

- Patients in categories #1 & 2, as with all patients nearing the end of life, need ongoing discussions about their realistic prognosis, goals, and options (see *Fast Facts* # 164, 165, 222-7).
- For dying patients with distressing dyspnea and comfort-only goals of care, opioids are first line agents (see *Fast Fact* #27). For patients who need sedating doses of opioids to be comfortable, and who articulate a strong preference to be as awake as possible, it is reasonable to offer NPPV if the patient is in an environment which can accommodate it and the risks are acceptable to the patient, *including the possibility that the dying process will be prolonged*. Reassure patients that you can alleviate their symptoms even if NPPV is unhelpful or intolerable.
- For dying patients who wish to forestall death briefly for a specific goal, it is reasonable to start a trial of NPPV. Before initiating NPPV, it is important to discuss withdrawal of NPPV after the above goal has been achieved, and to caution the patient/family that NPPV might not be able to forestall death long enough as hoped.

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