Authors and Disclosures

Journalist

Laurie Barclay, MD

Freelance writer and reviewer, Medscape, LLC

Disclosure: Laurie Barclay, MD, has disclosed no relevant financial relationships.

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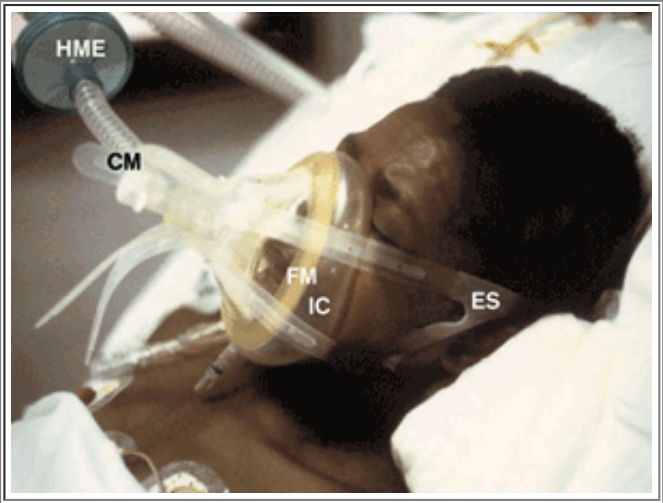
New Clinical Practice Guidelines Issued for Noninvasive Ventilation

Laurie Barclay, MD

February 14, 2011 — New clinical practice guidelines describe the use of noninvasive positive-pressure ventilation (NPPV) and noninvasive continuous positive airway pressure (CPAP) in the acute care setting, according to a report published online February 14 in the *Canadian Medical Association Journal.*



Patient undergoing noninvasive positive pressure ventilation. *National Institutes of Health*

The new recommendations, which are based on increasing evidence from the literature and variations in practice in recent years, describe the use of noninvasive ventilation in the postoperative setting, in immunocompromised patients, in patients being weaned from conventional mechanical ventilation, and in patients at high risk for respiratory failure after removal of the breathing tube.

"Noninvasive ventilation is an important option in the management of patients who are at risk of or have respiratory failure in the acute care setting," write Sean P. Keenan, MD, MSc, and colleagues from the Canadian Critical Care Trials Group/Canadian Critical Care Society Noninvasive Ventilation Guidelines Group.

"Over the past two decades, the use of ...NPPV and of noninvasive ...CPAP by mask has increased tremendously among acutely ill patients.... Both methods of ventilation have been used to avoid endotracheal intubation in different patient populations with variable success."

Specific Recommendations

Specific recommendations in the new clinical practice guidelines include the following:

- For patients with chronic obstructive pulmonary disease (COPD) or cardiogenic pulmonary edema, NPPV should be the first choice. It may also be used after surgery or in immunocompromised individuals.
- In the absence of shock or acute coronary syndrome requiring urgent coronary revascularization, patients with cardiogenic pulmonary edema and respiratory failure should receive either NPPV or CPAP.
- Patients with a severe exacerbation of COPD, defined as a pH of less than 7.35 and relative hypercarbia, should have NPPV in addition to usual care.
- For patients with cardiogenic pulmonary edema, CPAP delivered by mask appears to be as effective as NPPV.
- CPAP should not be used in patients who have acute lung injury.
- A trial of NPPV may be considered for patients with acute respiratory distress or hypoxemia, either postoperatively or in the presence

of immunosuppression.

- In centers with extensive experience in the use of NPPV, a trial of early extubation to NPPV may be considered for patients with COPD.
- Helium-oxygen (heliox) should not be routinely used in patients receiving NPPV in the setting of a severe exacerbation of COPD.
- In patients considered to be at low risk for respiratory failure, NPPV should not be used after planned extubation.
- NPPV should not be routinely used in patients who do not have COPD and in those who have postextubation respiratory failure.
- CPAP may be used in patients who have respiratory failure after abdominal surgery.
- NPPV may be used in patients who have respiratory failure after lung resection surgery.
- Patients with acute respiratory failure who are receiving NPPV should use an oronasal rather than a nasal mask.

"Implementation of these guidelines may require clinician education, additional health care personnel, organizational change or additional resources (equipment or beds with cardiopulmonary monitoring) to ensure safe and appropriate application of ...NPPV and ...CPAP," the guidelines authors write. "Strategies for the implementation of these guidelines should be developed for each relevant clinician group (physicians in different clinical areas and with different levels of training and expertise, respiratory therapists and nurses)."

Commentary: Patient Monitoring Needed

In an accompanying commentary, Andrew D. Bersten, MBBS, MD, from Flinders Medical Centre in Adelaide, Australia, notes that successful implementation of programs for noninvasive ventilation requires 24-hour availability of an experienced team and appropriate patient selection. Any program must include adequate patient monitoring to allow rapid intervention when noninvasive ventilation fails. Outcomes tend to be worse in patients in whom noninvasive ventilation fails, probably because of delayed definitive care.

"Given the increasing demand for critical care beds, not all patients receiving noninvasive ventilation may be cared for in intensive care units or emergency departments," Dr. Bersten writes. "Adequate monitoring is required wherever the patient is located. To facilitate the rescue of patients in whom noninvasive ventilation fails, and to maximize overall benefits of noninvasive ventilation programs, monitoring of patients is best done in partnership with the many services and specialties caring for acutely ill patients."

Development of the guidelines was funded by a grant from the Canadian Institutes of Health Research and an unrestricted grant from Philips/Respironics Inc. Dr. Keenan has received an honorarium from Philips/Respironics Inc. to give a talk based on these guidelines. The other guidelines authors have disclosed no relevant financial relationships. Dr. Bersten has received fees and travel assistance from ResMed Ltd. for a 1-day consultation regarding noninvasive ventilation.

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