

Who Should Manage the Airway?

In a recent special issue of *RESPIRATORY CARE*, Daniel Talmor presented a very nice review of airway management during a mass-casualty event.¹ He rightly pointed out that only experienced clinicians should perform intubation in these circumstances, and that training clinicians for the sole purpose of providing intubation during a mass-casualty event is unwise. He also listed anesthesiologists, certified registered nurse anesthetists, intensivists, and emergency medicine physicians as clinicians who the literature shows are able to "successfully manage the airway." However, the literature also shows that respiratory therapists (RTs) can be trained to perform emergency endotracheal intubation efficiently and safely.

In a small study of 50 consecutive intubations, McLaughlin and Scott² found that the RTs involved successfully intubated all patients. The mean number of attempts was 1.48, and most patients were successfully intubated in less than 1 min. In a larger study, with over 800 intubations, at Duke Medical Center,³ Thalman and colleagues found a 95% intubation success rate among RTs. Ninety-two percent of the intubations were accomplished with fewer than 3 attempts. Moreover, well-trained RTs at Butterworth Hospital in Grand Rapids, Michigan, had a 90% intubation success rate when physicians failed.⁴ At my community hospital, RTs in my department have provided intubation since 1992, with a group success rate always around 90%, and with a very low incidence of complications.

In addition, the American Association for Respiratory Care Clinical Practice Guideline for Management of Airway Emergencies⁵ recognizes registered RTs as clinicians capable of being trained to be primary providers of endotracheal intubation. The key, of course, is training. With good initial training and periodic recertification, including book study, RTs can perform emergency intubation with good proficiency.⁶ Community hospitals are not immune from mass-casualty events and may not be staffed with anesthesiologists and intensivists at all times of the day and night. In that setting, RTs may prove particularly valuable when di-

saster strikes and multitudes of patients require intubation in a short period of time.

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The author reports no conflict of interest in the content of this letter.

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The author responds:

Jeffrey Haynes correctly points out my omission of respiratory therapists (RTs) from the potential pool of providers able to manage the airway in a disaster.¹ This is particularly embarrassing, as *RESPIRATORY CARE* is, of course, the official journal of the American Association for Respiratory Care. There is, as he points out, substantial literature that supports the ability of RTs to safely manage the airway. This practice pattern is prevalent in many parts of the country, and in particular in smaller hospitals and other areas that lack 24-hour physician coverage. Also, the American Association for Respiratory Care encourages and supports this

practice with its Clinical Practice Guideline for Management of Airway Emergencies.²

It should be pointed out that, though widespread, RT airway management is inconsistently practiced. Many RTs, and in particular those who practice in larger, urban centers, do not have the opportunity to practice these skills after their initial training. An emergency mass-casualty event is not the time for these providers to be refreshing their skills. In other words, only those who have intubation as a part of their daily practice should perform intubation in an emergency.

Also, RTs will be a scarce resource in an emergency. Their unique expertise will be required for managing patients in respiratory failure, long after the acute event of intubation. In a scenario where there are other clinicians with intubation expertise available for intubation, I would suggest that RTs' efforts would be better spent on the more complex issues of managing the ventilated patient.

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Noninvasive Ventilation During a Mass-Casualty Event

The January 2008 issue of *RESPIRATORY CARE* published an article by Branson et al,¹ which included a recommendation to forgo noninvasive ventilation (NIV) during an event of mass-casualty respiratory failure (a "surge" event). Moreover, they propose that bi-level positive airway pressure (BiPAP)

machines be excluded from surge-capacity stockpiles, and that BiPAP machines already on hand should be re-purposed for invasive ventilation in the event of a large-scale epidemic. I would like to challenge that position and instead argue that we should plan to use NIV as much as possible during an epidemic.

Branson et al¹ acknowledge that under normal circumstances NIV is the standard of care for patients with chronic obstructive pulmonary disease in respiratory failure. Then they tell us that, "The literature that details the success of NIV in chronic obstructive pulmonary disease clearly demonstrates a substantial time commitment (1–2 h) spent by the RT at the bedside at initiation, which is an impracticality in mass-casualty respiratory failure." The evidence they cite to justify that statement is in an article from 1995.

With so many dedicated BiPAP machines in use,¹ haven't we come a long way with NIV since 1995? In my experience, patients who are dyspneic often express relief within a minute of having the mask applied, and if BiPAP is not working for the patient, then it becomes apparent in much less time than an hour. If we take the suggestion of Branson et al and abandon NIV during an epidemic, and intubate these patients instead, then why would we expect that this practice would reduce our time commitment to them?

The next pandemic could be much worse than the Spanish flu of 1918, which killed 50 million mostly young, healthy people.² Or it may be a disease like severe acute respiratory syndrome (SARS), that puts older adults with pre-existing illnesses at most risk of dying.³ We don't know the nature of the next epidemic, but if it is on a scale for which our best-laid plans could remain feasible, then most of its victims would not develop full-blown acute respiratory distress syndrome (ARDS). There would be a spectrum of severity and a mix of complaints. While Branson et al are correct in saying that NIV would not help patients with severe ARDS, we are now seeing evidence that the early application of NIV can be used to support patients with less severe hypoxic illness,^{4,5} so some of those who are infected could probably get by with BiPAP.

Branson et al suggest that BiPAP machines be re-purposed for invasive ventilation, to address a concern that NIV is a high-risk "aerosol producing procedure." It is surprising that they even raise this as an

issue, since they concede that evidence for the "high-risk" theory is weak and unsupported by the Asian experience. They even cite articles that describe how NIV was used safely and effectively with SARS patients in China. Why then would a concern about occupational risk, which is overblown according to empirical evidence, justify intubating a patient when that is not in the patient's best interest?

There is a great deal of evidence that hospitalization time and mortality are reduced whenever patients can be ventilated noninvasively rather than intubated.⁶ During a mass-casualty event we would still aim to give each patient his best chance of recovery, so how could we subject anyone to the risks associated with being intubated in a case where intubation could be avoided?

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The author reports no conflict of interest in the content of this letter.

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The authors respond:

We appreciate John McCracken's assessment of our paper.¹ First, we want to clarify

that we never intended to promulgate our recommendations as gospel. Currently, there is insufficient direct evidence to conclusively determine optimal strategies for oxygenation and ventilation during a mass-respiratory-failure surge event. We believe, though, that the various available positive-pressure ventilation (PPV) strategies will not all be equally effective for such events, and strong indirect evidence even suggests that some PPV strategies may be nearly useless (eg, automatic resuscitator to ventilate a patient with severe respiratory failure over numerous days). McCracken argues that "we should plan to use noninvasive ventilation (NIV) as much as possible during an epidemic." We respectfully disagree. For an event when the number of patients with severe respiratory failure will far exceed the usual capability of appropriate staff and PPV equipment, we strongly recommend against planning for widespread use of NIV when considering (1) optimal use of existing PPV devices, and (2) stockpiling additional PPV equipment.

The United States Department of Homeland Security National Planning Guidelines are intended to coordinate and prioritize emergency preparedness efforts at all response levels. Those guidelines contain 15 National Planning Scenarios, and at least two thirds of those may include catastrophic numbers of patients in acute respiratory failure.² A successful PPV strategy for such a catastrophe must be grounded in accurate predictions of patients' needs and health-care systems' and communities' capabilities for these events. There is wide variability in the predicted distribution of types and severity of respiratory failure and the characteristics of the affected populations (eg underlying chronic obstructive pulmonary disease [COPD] or previously healthy). This is where the direct evidence base is thinnest.

When an event occurs, the newly available data may suggest a better PPV strategy than ours for that event. Unfortunately, waiting for the disaster to occur to develop the evidence-based strategy "just-in-time" will probably prove to be "just too late," and many patients may not have access to a life-sustaining intervention. Our surge-event PPV recommendations were developed to apply across the broad range of mass-respiratory-failure scenarios. The extensive investment for equipment procurement and maintenance, logistics planning, and end-user training requires surge PPV concepts