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*The author responds:*

Thanks to Dr Hillsman for his comments. The basic forced expiratory technique maneuvers described initially by Thompson and Thompson<sup>1</sup> and later by Pryor et al<sup>2</sup> did not include instruction to whisper “huff.” I agree that modifications to techniques previously established from a research base might add or detract from their efficacy. In retrospect, the readers might have been better served had I distinguished the role of the “whispered huff” as a teaching technique independent of the basic steps of the maneuver.

That said, I disagree that this vocalization interferes with the huff maneuver. Vocalization of the soft “huff” actually promotes an open mouth and open glottis, up to the formation of the “ff” sound, which is more of a motion of the upper teeth meeting the lower lip at the end of the expiratory maneuver.

The whisper is intended to be adjunctive to the maneuver, not to replace it. As the patient starts by initially whispering “huff,” the basic pattern is established, and the clinician builds on that effort, encouraging a stronger, more effective huff maneuver.

The suggestion to whisper “huff” has been used for over 20 years in teaching huff technique to young children with cystic fibrosis and older patients with chronic obstructive pulmonary disease. I adopted this technique from clinicians who were successfully using it with children as young as 2 years old.<sup>3,4</sup>

During my work with older patients in the Veterans Affairs hospital and clinic system I found that instructing the patient to whisper “huff” was useful during initial sessions. These patients were so used to coughing (which starts with a closed glottis), often in uncontrolled paroxysmal spasms, that whispering “huff” helped them to control their breathing pattern and transition to the new open-glottis huff paradigm. As the tech-

nique is mastered, the “whisper” can (and possibly should) be dropped.

Interestingly, I find huff and forced expiratory technique of great benefit specifically because the maneuvers do not require great concentration once learned, compared to other secretion-mobilization techniques, and I have had great success with both small children and geriatric patients with chronic obstructive pulmonary disease during severe exacerbations, when they can concentrate the least and need it the most.

On a humorous note, with the really small children we used to call it the chicken cough and had them move their arms like wings, bringing them down to their sides during the huff maneuver, which made early instruction of the huff a part of their play activity. It certainly distracted the adults in the room, if not the children.

Although it was not described in the early definitive studies, I believe that the adjunctive whisper of “huff” is a valuable aid in training the patient to differentiate the huff maneuver from a closed-glottis cough.

My recommendation to use the whisper “huff” technique was based on training, experience, and anecdotal observations in instruction of a wide range of patients. To date, this teaching technique has not been rigorously studied in young children. Until such research is done I recommend an *n*-of-1 approach<sup>5</sup> to determine whether an individual patient who has difficulty learning the huff maneuver benefits from whispering “huff” while learning the maneuver.

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The author works for Nektar Therapeutics, which manufactures medical aerosol devices. He reports no other conflicts of interest related to the content of this letter.

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### Obstacles to Implementing Evidence-Based Guidelines

In the December 2007 issue of the *Journal*, Kaynar et al reported on the practice patterns of respiratory therapists and intensive care (ICU) nurses in preventing ventilator-associated pneumonia (VAP) based on evidence-supported guidelines.<sup>1</sup> Given our own investigations in the field of evidence-based recommendations for infection prevention,<sup>2–4</sup> we read their paper and the related editorial<sup>5</sup> with great interest. Kaynar et al describe a relatively high rate of adherence to ineffective VAP-prevention measures and suggest that this might be related to the poor translation of evidence into bedside practice, or to other barriers to this process.<sup>1</sup> We wish to draw your attention to some of our findings, which, at least to some extent, may help explain poor adherence to VAP guidelines.

We had 638 Flemish ICU nurses take a multiple-choice test on evidence-based VAP-prevention guidelines<sup>3,6</sup> and found the mean test score to be a disappointing 41.2%.<sup>2</sup> Strikingly, although Kaynar et al used a different research design, our results strongly support theirs, and reveal important misconceptions about the effectiveness of VAP-prevention strategies. For example, 60% of the nurses in our study thought that both the oral and nasal route are recommended for intubation, 45% believed that it is recommended to change the suction system daily, and 59% thought that humidifiers should be changed every 48 hours.<sup>2</sup> Accordingly, ICU nurses' adherence to ineffective VAP-prevention measures seems to be, at least in part, simply associated with a lack of knowledge about which measures are effective and which are not.

The data provided by Kaynar et al<sup>1</sup> are important because they clearly demonstrate that the road from guideline-development to evidence-based practice is long and full of obstacles. The main reasons for nonadherence to guidelines are disagreement with the interpretation of clinical trials, unavailability of resources, and patient discomfort.<sup>7</sup> High guideline compliance does not just happen; it requires education tailored to the

learning preferences of the target group and a vigorous and multidisciplinary approach.<sup>8</sup> A recent European survey on oral care practices found that a majority of ICU nurses explicitly called for more targeted training and education on that topic.<sup>9</sup> ICU nurses play a pivotal role in the care of the critically ill. Taking up a leading part in guideline dissemination and implementation provides them with an outstanding opportunity to present themselves as responsible professionals who contribute substantially to high-quality patient care provided by the multidisciplinary team. The challenge is clear. Now it's time to act.

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The authors report no conflict of interest related to the content of this letter.

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#### *The author responds:*

Labeau et al address surprisingly similar problems in guideline dissemination and implementation. We also believe that defining the problems and providing possible preventive and therapeutic measures are not enough to improve outcomes unless they are accepted by the larger body of care providers beyond the opinion leaders and researchers.

One of the reasons we focused our survey study on nurses and respiratory therapists was that they are the practitioners who

spend a majority of their time at the bedside of mechanically ventilated patients, and we are interested in understanding the barriers that prevent nurses and respiratory therapists from performing evidence-based practice.

Obviously, it is not a simple task to study and understand these barriers, but we at least have good clinical evidence in certain aspects of intensive care that we can use as benchmarks.<sup>1,2</sup> The “buy-in” process of even seemingly “low-cost” interventions, such as low-tidal-volume ventilation or daily interruption of sedation, still faces barriers, such as traditional care biases (eg, the practitioner believes the patient will be uncomfortable with a low tidal volume or being woken up on a regular basis). Some clinicians also believe the protocol approach, though based on evidence, places “rigid” boundaries on their practice.

We propose to Dr Labeau and her associates a collaborative effort toward understanding the barriers against the diffusion of evidence in the prevention and treatment of ventilator-associated pneumonia. Possibly we should get input from economists or industrial engineers, who work on similar problems from a different perspective, and use mathematical modeling tools along with the tools of qualitative research.<sup>3</sup>

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

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