training to appropriately ask for help is also a component of basic education.

Although a reasonable level of competence could be possibly achieved with an abbreviated training program with reduced supervision, it may still be insufficient to make a proficient examiner. In this study, the trainees were able to diagnose common pathologic states. A proficient examiner should also be able to provide exclusionary information and rule out potential diagnoses as well. Since the consequences of "missing" a diagnosis can be catastrophic in critical care settings, more supervised exposure may be required to achieve this level. Furthermore, the training model suggested by See et al (3) may allow for the detection of the more prevalent pathologies affecting intensive care patients, but it may not be adequate for the trainees to detect infrequent pathologies that may also affect outcome.

In conclusion, the study described by See et al (3) is an innovative approach to introduce basic echocardiography skills in a rigorous training program. They have set the standard to be tested with future studies. It is a commendable effort to motivate trainees to get involved in a voluntary educational initiative without significant attrition. As significant as these results are, we should be careful not to overstate them. Acquisition of proficiency in echocardiography is a complex process. It is a composite of cognitive understanding and manual dexterity. Furthermore, the boundaries of a "basic level" echocardiographer are difficult to define and enforce, as the patient presentations do not abide by these definitions.

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Ventilator-Associated Pneumonia: We Cannot Wish It Away*

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Ventilator-associated pneumonia (VAP) remains a challenging conundrum for the clinician. No consensus exists regarding the diagnostic criteria for this syndrome. Despite this, multiple studies using differing diagnostic criteria document that VAP leads to excess morbidity (1, 2). VAP increases the duration of mechanical ventilation (MV) and the length of stay in the ICU (1, 2). More recent analyses reveal that VAP results in excess attributable mortality (3, 4). For these reasons, VAP remains a focus of quality initiatives in the ICU. Although not classified as "never events" the way catheter-associated bloodstream infection are, intensivists face substantial pressure to drive down rates of VAP.

In this issue of *Critical Care Medicine*, Kollef et al (5) report the results of an international prospective observational study focusing on the incidence of VAP and the microbiology of this syndrome. Using a rigorous definition of VAP that required a combination of clinical signs and symptoms along with specific radiographic changes and microbiology findings, these authors report that approximately 15% of patients requiring MV develop VAP. Strikingly, the crude rate of VAP varied little across international boundaries (5). This important observation suggests that VAP represents a global challenge in the ICU. These investigators, more significantly, only defined VAP as occurring if the chest imaging revealed a new or evolving infiltrate on multiple days. Given the day-to-day variability in chest radiographs in ventilated patients, this nuance in their diagnostic criteria helps ensure that the data they report truly reflects the incidence of VAP. In other words, since the definition used was relatively specific, the estimates of Kollef et al (5) likely represent a lower bound with respect to the incidence of VAP. Furthermore, most of their patients underwent lower

*See also p. 2178.

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airway cultures to document the evidence of a pathogen. This obviates concerns about contamination from the upper airway, and coupled with the radiology requirements noted above, truly underscores the accuracy of their results.

Nearly all of the institutions in the study by Kollef et al (5) used multifaceted prevention strategies in order to limit VAP. Nonetheless, VAP arose in nearly one of seven patients requiring MV. This fact underscores that current efforts to reduce rates of VAP and to eliminate this disease are, to some extent, misdirected. In other words, we may be able to reduce the incidence of VAP, but it seems absurd to think that we can eliminate this disease. As a corollary, holding institutions to a standard that requires a VAP rate of zero is unrealistic and will require an excessive amount of investment and resources that might otherwise be spent better elsewhere.

Additionally, Kollef et al (5) compared their clinical criteria for the diagnosis of VAP with the criteria developed by the Centers for Disease Control (CDC). Currently, most public reporting requires use of the CDC criteria, and infection control practitioners regularly use these factors in their assessments (6). As others have revealed, the CDC criteria are notoriously insensitive and subject to significant interrater variability (7, 8). If one were only to use the CDC criteria, they would severely underestimate the true burden of VAP and misclassify some non-VAP conditions as VAP. This concern with the CDC criteria indicates why one must be cautious when reviewing analyses that rely on this definition for epidemiology, prevention, or outcomes studies. Perhaps use of the flawed CDC definition explains why prevention trials using this approach have not shown that VAP prevention necessarily, and in turn, leads to better patient outcomes—such as either fewer days of MV or reduced mortality. In other words, not everything that is counted truly counts.

Recognizing the limitations of the CDC criteria, some promote reliance on the concept of the ventilator-associated complication (VAC) (9). However, it is unclear how tracking VACs, which can arise from a number of conditions ranging from atelectasis and pulmonary edema to VAP, will enhance quality. Within VACs, infectious complications are classified as infectious ventilator-associated complications (iVACs), and this notion is meant to capture VAPs. Recent studies, however, reveal that there is only some overlap between true VAP and iVACs (10, 11). Furthermore, many VACs appear related to conditions that occur routinely in the course of care of the critically ill ventilated patients (e.g., atelectasis), and it is not at all clear if these are preventable events (11). Therefore, the findings by Kollef et al (5) suggest that all the current effort focused on VACs again may be misdirected and may make us as clinicians emphasize issues that are not as important for our patients as are true VAPs.

Finally, Kollef et al (5) document that *Pseudomonas aeruginosa* represents the leading pathogen in VAP. As with the consistency in the rate of VAP across the globe, the frequency of *P. aeruginosa* as the etiology of VAP was also relatively consistent. This pathogen was the most common Gram-negative pathogen in all instances. This result underscores the need for ICU practitioners to target this organism as part of their initial treatment strategy (12). Which specific antibiotics will be required to insure initially appropriate antibiotic will vary based on local susceptibility patterns. Thus, physicians must look to their antibiograms to help develop the most appropriate empiric regimens to treat VAP. Conversely, although *P. aeruginosa* remains fairly prevalent, it was by no means the only organism of concern. Other potentially multidrug resistant (MDR) organisms were frequently reported to cause VAP in this analysis. As a consequence, one cannot solely focus on *P. aeruginosa* (5). Using targeted *P. aeruginosa*, therapies for initial treatment will likely lead to the over treatment of many patients, especially as many of the risk factors for *P. aeruginosa* that Kollef et al (5) explored are also risk factors for other MDR Gram-negative bacteria. To truly improve outcomes, the study by Kollef et al (5) illustrates that we will need to continue to practice de-escalation as the key treatment paradigm and further highlights the need for newer antimicrobial agents and rapid diagnostic technologies. Most importantly, the stable incidence of VAP across the globe, despite efforts at its prevention, makes one realize that we still do not understand whether this common condition is related mostly to the patient, and his/her illness, or to our processes of care. If the former, then increasing the emphasis on "getting to zero" amounts to nothing more than wishful thinking.

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