Strategies to Prevent Ventilator-Associated Pneumonia

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In a decision model, use of the Institute for Healthcare Improvement VAP prevention bundle plus subglottic endotracheal suction and probiotics had the best cost-benefit ratio.

Mortality from ventilator-associated pneumonia (VAP) exceeds 10%. Many strategies to prevent this infection have been evaluated, but little is known about their comparative effectiveness. Such strategies include use of the Institute for Healthcare Improvement (IHI) VAP prevention bundle, oral care with and without chlorhexidine, subglottic suction endotracheal tubes (ETs), silver-coated ETs, probiotics, and selective oral and gut decontamination.

Seeking to determine the most cost-effective VAP-prevention package from the points of view of the hospital and society, investigators developed a comparative effectiveness model: a decision tree that included 120 unique prevention-strategy combinations and simulated a 28-day period in the intensive care unit with a theoretical cohort of 10,000,000 patients. They obtained effectiveness and cost estimates for prevention strategies mainly from the medical literature and the U.S. Department of Labor Statistics.

The strategy with the best cost-benefit ratio, and hence the preferred strategy from the hospital perspective, involved a suction endotracheal tube, the IHI bundle without oral care, and probiotics. The preferred strategy from the societal perspective, which assumed a willingness-to-pay threshold of $50,000 for each case of VAP prevented, involved a suction endotracheal tube, probiotics, the IHI bundle including oral care, and selective oral decontamination.

Comment: This model suggests that a combination of several strategies is most cost-effective in preventing VAP. An editorialist points out limitations of the authors' approach and suggests other strategies that may be worth considering, despite higher cost, in hospitals with high rates of VAP (especially VAP caused by multidrug-resistant organisms).

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