Medical News

EDITED BY GINA PUGLIESE, RN, MS; MARTIN S. FAVERO, PHD

Ventilator Circuit Changes Beyond 7 Days

According to the Guideline for the Prevention of Nosocomial Pneumonia, issued by the CDC's Hospital Infection Control Practices Advisory Committee (HICPAC) in 1994, breathing circuits of mechanical ventilators should not be changed routinely more often than every 48 hours. However, the maximum duration that breathing circuits can be left safely is categorized by CDC/HICPAC as an "unresolved issue."

In 1986, Donald Craven, MD, and colleagues of Boston City Hospital published the results of study showing increased risk of nosocomial pneumonia when circuits were changed every 24 hours compared to every 48 hours.[1] Since then, the results of 11 studies have been reported addressing the question of whether circuits for mechanical ventilation can be changed safely every 7 days.[2] The most recently published study, conducted by researchers at Edward Hines, Jr, Veterans' Affairs (VA) Hospital in Hines, Illinois, found that circuit-change intervals of 7 and 30 days have lower risks for ventilator-associated pneumonia (VAP), compared to changing at 2-day intervals, yielding substantial reductions in morbidity, as well labor and supply costs.[3]

A prospective 4-year review of mechanically ventilated patients was conducted in the respiratory and medical intensive-care units. All adult patients receiving mechanical ventilation from January 1991 through December 1994 were included in the study. Ventilator circuits with active, heated-water humidifiers were changed at 2-day intervals during a 2-year control period, followed by 7-day and 30-day intervals (for 1 year each). Heated-wire circuits were adopted with the 30-day interval. The rate of VAP per 1,000 ventilator days was calculated for each circuit-change interval group. Survival analysis was used to model VAP with ventilator circuit change to determine risk. During the study period, 637 patients received mechanical ventilation. During the 2 years with 2-day change intervals, the VAP per 1,000 ventilator days was 11.88 (n=343), compared with 3.34 (n=137) and 6.28 (n=157) for 7-day and 30-day change intervals, respectively. The risk of acquiring a VAP for those with a circuit change every 2 days was significantly greater (relative risk, 3.1; P=.0004; 95% confidence interval, 1.662-5.812) than those with the 7-day and 30-day circuit changes.

The researchers concluded that extending circuit-change intervals not only reduced morbidity but reduced supply and labor costs averaging $4,231 per year for each ventilator in use.

FROM: 1. Craven DE, Kunches LM, Kilinsky V, Lichtenberg DA, Make BJ, McCabe WE. Risk factors for pneumonia and fatality in patients receiving continuous mechanical ventilation. *Am Rev Respir Dis* 1986;133:792-796.

2. Stamm AM. Ventilator-associated pneumonia and frequency of circuit changes. *Am J Infect Control* 1998;26:71-73.

3. Fink JB, Krause SA, Barrett L, Schaaff D, Alex CG. Extending ventilator circuit change interval beyond 2 days reduces the likelihood of ventilator-associated pneumonia. *Chest* 1998;113:405-411.

TB Transmission From Medical Waste

The Washington State Department of Health in Olympia issued a news release dated March 4, 1998, regarding probable transmission of occupationally acquired tuberculosis at Stericyle Inc, a medical-waste processing facility in Morton, Washington. Transmission is believed to be related to aerosols being created during the processing of medical waste. According to the press release, three workers have been diagnosed with TB over the course of last year.

The first worker was diagnosed with TB in April 1997 and a second employee in June. Health officials initially believed TB was being spread person-to-person at the plant. They interviewed patients, family members, and coworkers, and reviewed medical records in an effort to track down a source.

When laboratory tests revealed that these two workers had different strains of TB, scientists began to suspect that the source could be the medical waste processed in the plant. A third worker was diagnosed with yet a different strain of TB last September. Scientists then began trying to find a match between a case in the plant and someone outside the plant who was treated in a facility that sends its waste to Stericycle. Laboratory tests confirmed that one of the workers has the same strain of TB as a person treated at a facility that sends waste to Stericycle.

Fifteen other workers have been found to have a positive tuberculin skin test; baseline data, however, apparently is not available for determination of timing of initial acquisition of TB infection. This is the first reported case of TB transmission from medical waste.

The medical-waste plant was inspected by the National Institute for Occupational Safety and Health, and preliminary findings identified lack of respiratory protection for workers. Short-term control measures will include respirators that have an independent clean-air source.

Stericycle is the second-largest provider of regulated

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