JCAHO Warns of Tubing Misconnects; Communication is Key

Andrea Hall

Although efforts to prevent tubing misconnections have focused primarily on nursing, biomedical equipment technicians (BMETs) and clinical engineers (CEs) have a role to play as well.

In a recent Sentinel Event Alert (SEA), JCAHO warns healthcare organizations about the dangers of tubing misconnections. These errors, which are frequent and can lead to serious injury or death, involve intravenous catheters, feeding tubes, peritoneal dialysis catheters, epidural lines, and automatic blood pressure cuff inflation lines, among other types of tubing. To reduce the possibility of misconnections, the SEA lists a number of recommendations for healthcare organizations, including conducting tests on and assessing the risks of new tubing and catheter purchases to identify the potential for misconnections, and never using a standard luer syringe for oral medications or enteric feedings.

A Role for Clinical Engineering

According to Anita Giuntoli and Jerry Gervais, associate directors in JCAHO's Standards Interpretations Group, the key to preventing these errors is communication, particularly between the clinical engineering and nursing staff. A facility's patient safety committee should include representatives from these two groups, as well as risk management and purchasing, and should conduct a risk assessment to determine what's at issue for that hospital. "These risks can look different at different facilities," according to Giuntoli. Nursing and clinical engineering should then work together on training and education to prevent errors.

Any team charged with assessing misconnection risks should be involved in pre-purchase evaluations of equipment "so that users (both clinicians and BMETs/CEs) have the opportunity to 'play' with devices and uncover any misconnection hazards before a device is acquired," says Stephanie Joseph, project engineer at ECRI and principal author of the guidance article "Preventing Misconnections of Lines and Cables" found in the March 2006 issue of ECRI's *Health Devices* journal.

Gervais believes that many of these risks "can be nipped in the bud during equipment acquisition," and adds that if both clinical engineering and nursing are not involved in this process, "it's a missed opportunity for that organization." Joseph also recommends that this team be involved in tracking misconnection reports, including near misses, throughout the hospital "to identify any concerning trends and/or areas in which solutions need to be developed."

Many tubing misconnections involve luer connectors, which enable functionally dissimilar tubes or catheters to be connected, according to JCAHO. The SEA warns healthcare organizations to avoid purchasing non-intravenous equipment that is equipped with connectors that can physically mate with a female luer IV line connector, but many have questioned the practicality of this, given the limited availability of alternative equipment. "That's an assessment a hospital has to make and use its own judgment," says Gervais. "JCAHO has identified the issue, but we've moved away from being prescriptive as to how to resolve it," he adds.

Where alternatives do not exist, "hospitals must be aware of the hazard and rely on the implementation of work practices (such as tracing lines back to their origin) to mitigate the risk," says Joseph. Until alternatives do become available, healthcare organizations should strive for an open relationship with medical device vendors so

Check Points

JCAHO has issued a sentinel event alert about the dangers of tubing misconnections.

- ✓ Misconnection risks should be evaluated during pre-purchase evaluations of equipment.
- ✓ Hospitals must be aware of the hazard and rely on the implementation of work practices to mitigate the risk.

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that the organization can provide feedback, make requests, and highlight issues of concern with the vendor, Giuntoli advises. Likewise, Joseph believes that a hospital's purchasing power "is an influencing factor driving the medical device market—if hospitals demand devices that are designed to prevent misconnections, manufacturers are more likely to incorporate such features into their products." According to Gervais, "Many forward-thinking and responsible vendors have a clinical advisory group. CEs and BMETs should support those types of vendors."

Currently, there are no published standards that restrict the use of luer connectors to certain medical devices. However, an international joint working group is slated to begin work on a standard that would prevent interchangeability of small-bore connectors in medical practice, according to Peter Carstensen of FDA's Center for Devices and Radiological Health.

Labeling Not Always a Panacea

Some organizations have attempted to deal with the misconnection problem through labeling, and certain high-risk catheters, such as epidural, intrathecal, and arterial lines, should always be labeled, the SEA states. "We see examples all the time of effective labeling," says Giuntoli. "There is no one best practice, but rather organizations should look at what issues need to be addressed at their facilities," she notes.

Giuntoli adds a word of caution, however, about the dangers of color coding, which are set out in the SEA: This practice can "lead users to rely on the color coding rather than assuring a clear understanding of which tubes and catheters are connected correctly to which body inlets." Reliance on labeling is fraught with other problems as well. Because color-coding schemes can vary between organizations, this can create additional risk when the hospital uses agency and travel staff, according to the SEA.

Joseph believes that labeling, by itself, is ineffective. "ECRI continues to receive reports of misconnections for products that are clearly labeled, but are designed such that they allow functionally incompatible devices to connect," she says.

Although JCAHO surveyors won't specifically score an organization on the tubing misconnections, surveyors are aware of the document, and there is a heightened awareness on the part of surveyors whenever new issues come up, explains Giuntoli. ■

JCAHO Connection

Testing Approaches

Editor's Note: AAMI members can pose questions to JCAHO standards experts and obtain official responses by e-mailing questions to scampbell@aami.org.

Q: What is the Joint Commission's standard for frequency of spore testing in autoclaves? Weekly? Monthly? Should we just follow the manufacturer's guidelines?

A: Generally speaking, the Joint Commission avoids issuing tightly prescriptive rules on clinical specifics. In the area of medical equipment management, our role is to make sure organizations design and implement adequate processes for ensuring the safety and effectiveness of medical devices. Therefore, the Joint Commission does not specifically address the frequency of spore testing for autoclaves. It is up to you to develop a reasonable and effective policy for this class of testing.

When determining testing intervals for medical equipment, healthcare organizations should take into account criteria such as manufacturer recommendations, risk level, and hospital experience (see EC.6.10, EP 5). You should also be aware that your state health department may have guidelines covering different kinds of equipment testing. In addition, we expect you to take serious note of any testing recommendations issued by relevant professional organizations—in this case, from the Association of periOperative Registered Nurses (AORN) or the Association for Professionals in Infection Control and Epidemiology (APIC). Any decision not to follow widely accepted recommendations should be underpinned by a risk assessment that justifies the departure.

With regard to sterilizer maintenance in general, it is a good practice to hold periodic meetings between all the parties involved to ensure the safe and effective use of the equipment. We recommend that hospital engineers, central sterile staff, clinical users, and representatives from infection control meet two to four times per year to discuss issues that affect sterilizer safety.