

JCAHO Issues Alert on Dangerous Tubing Misconnections

By Greg Stett, MD Buyline Clinical Analyst

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) issued a *Sentinel Event Alert* on April 3, 2006 that urges healthcare organizations to pay special attention to how tubes and catheters are connected to patients and challenges the manufacturers of these devices to redesign them in ways that will make dangerous misconnections much less possible. Tubing and catheter misconnection errors occur frequently and lead to deadly consequences in many instances.

To date, nine cases involving tubing misconnections have been reported to JCAHO's Sentinel Event Database. These resulted in eight deaths and one instance of permanent loss of function, and affected seven adults and two infants. The types of tubes and catheters involved in the cases reported to JCAHO included central intravenous catheters, peripheral intravenous catheters, nasogastric feeding tubes, percutaneous enteric feeding tubes, peritoneal dialysis catheters, tracheostomy cuff inflation tubes, and automatic blood pressure cuff insufflation tubes. The specific misconnections involved an enteric tube feeding into an intravenous catheter (four cases); injection of barium sulfate (GI contrast medium) into a central venous catheter (one case); an enteric tube feeding into a peritoneal dialysis catheter (one case); a blood pressure insufflator tube connected to an intravenous catheter (two cases); and injection of intravenous fluid into a tracheostomy cuff inflation tube (one case).

Tubing and catheter misconnection errors are an important and underreported problem in healthcare organizations. However, these errors are often caught and corrected before any injury to the patient occurs. Given the potential for life threatening consequences, increased awareness and analysis of these errors -- including averted errors -- can lead to dramatic improvement in patient safety. Important warning signs of a possible misconnection, according to the *Alert*, include having to force-fit tubes together or having to use an adaptor. Using a tube or catheter for something other than its intended purpose also may signal, or cause, a misconnection.

Many of the misconnection cases involved luer connectors -- small devices used in the connection of many medical components and accessories. There are two types of luer connectors -- slips and locks. A luer slip connector consist of a tapered "male" fitting that slips into a wider "female" fitting to create a secure connection. The luer lock connector has a threaded collar on the male fitting and a flange on the female fitting that screw together to create a more secure connection. Examples of misconnections involving luer connectors include:

- Capnography sampling tube to an intravenous cannula.
- Enteral feeding set to a central venous catheter.
- Enteral feeding set to a hemodialysis line.
- Non-invasive blood pressure (NIBP) insufflation tube to a needleless IV port.
- Oxygen tubing to a needleless IV port.
- Sequential compression device (SCD) hose to needleless "piggy-back" port of an IV administration set.

To reduce the risk of errors related to tubing misconnections, JCAHO's *Sentinel Event Alert* newsletter recommends that health care organizations take the following specific steps:

- Avoid purchasing non-intravenous equipment with tubing connectors that permit connection with intravenous (IV) connectors.
- Conduct tests on and assess risks of new tubing and catheter purchases to identify the potential for misconnections and take appropriate preventive measures before using.
- Always trace a tube or catheter from the patient to the point of origin before connecting any new device or infusion.
- Route tubes and catheters having different purposes in different, standardized directions, e.g., IV

- lines are routed toward the head; enteric lines are routed toward the feet.
- Re-check connections and trace all patient tubes and catheters to their sources as a standard of care when a patient arrives in a new care setting.
 - Emphasize the risk of tubing misconnections in clinician orientation and training programs.
 - Inform patients and their families of the importance of getting help from nurses or doctors whenever there is a real or perceived need to connect or disconnect devices or infusions.

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Greg Stett

1-800-928-1000, Ext. 6882

Greg.Stett@mdbuyline.com