



# Nurse Advise-ERR®

Educating the healthcare community about safe medication practices

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## Preventing accidental IV infusion of breast milk in neonates

Several years ago, we received a letter from the mother of a hospitalized infant named Zoey who accidentally received breast milk intravenously (IV) instead of through a nasogastric (NG) feeding tube. The primary underlying cause of this event was the use of a parenteral syringe and an IV syringe pump to deliver enteral breast milk. From our observations in hospitals as well as current chatter on numerous nursing discussion boards and email listservs, there is ample evidence that this risky practice is still occurring, despite the availability of much safer equipment with which to deliver breast milk to neonates. Zoey's mother asked us to frequently share the story of how her child almost died after receiving breast milk IV to draw attention to this unnecessary risk. Read her story and evaluate whether your organization is at risk for the same type of error, which can be deadly.

### Zoey's event

Zoey was born with duodenal atresia—complete absence of the duodenal lumen—so surgery was necessary soon after birth. The procedure was successful, after which a NG tube was inserted to provide nutrition with regular 30 mL feedings of fortified breast milk administered over 2 hours. At the time of the event, an IV syringe pump for medications was located on the left side of the baby's isolette, and an identical IV syringe pump used to deliver breast milk via the NG tube was on the right. The pumps used the same IV administration tubing. The IV tubing used to deliver the breast milk was connected to the NG tube. A nurse mistakenly connected an IV syringe containing breast milk to the IV syringe pump and tubing used for IV medications. About 10 mL of milk was infused IV before the problem was recognized.

The baby developed respiratory distress and seizures. She was treated supportively and fortunately recovered. The infant does not have any lasting adverse effects. However, the infusion of non-sterile, particulate-filled fluid such as enteral feedings or breast milk can be fatal, as it carries the risk of sepsis, diffuse intravascular coagulation (DIC), or emboli.

### More cases of breast milk given IV

Review of the literature reveals cases of inadvertent IV administration of breast milk reported as early as 1972.<sup>1</sup> In 2006, Ryan et al.<sup>2</sup> reported a case of IV administration of breast milk similar to what happened to Zoey. The authors also noted that neonatal health professionals identified eight other cases which were unknown to the authors after responding to a question posted about accidental breast milk infusion on an online, email discussion group, which suggests that these events may be underreported.

### Widespread use of IV pumps for neonatal enteral feedings

The system used to provide enteral feedings to nearly all neonatal patients (and some pediatric patients) differs from the typical enteral feeding system used for adults. For infants, low-volume feedings require slower rates, and the enteral pumps used for adults often cannot deliver feedings in such small amounts or at such slow rates. Thus, as in Zoey's case, it is common for staff in pediatric and neonatal intensive care units to use IV syringe pumps to administer enteral feedings, although infusion rates may vary slightly from the programmed rate if the syringe pump is only calibrated for use with parenteral syringes.<sup>4,5</sup> This practice increases the risk of inadvertent IV administration of enteral feedings/solutions, either due to mix-ups between a

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## checkitout! ✓✓✓✓

Follow these recommendations to prevent accidental administration of neonatal enteral feedings via the IV route.

✓ **Use the right equipment.** Use a feeding tube with ports that only accept oral syringes, an administration set without any IV ports, an oral syringe to hold the enteral feeding, and an enteral feeding pump designed specifically for neonates. Examples of vendors with devices meeting these requirements can be found in Table 1 on page 3. Some use color to help distinguish them from IV sets or IV devices.

✓ **Maximize safety with existing equipment.** If an IV syringe pump must be used to deliver neonatal enteral feedings until the enteral-only equipment can be purchased, use an oral syringe if the pump will accept it, and work with your biomedical department staff to recalibrate the flow rates to ensure accuracy.<sup>5</sup>

✓ **Label properly.** Label the syringe pump administering an enteral product as "Enteral" and the IV syringe pump as "Intravenous." Mark the syringes containing enteral products as "Enteral Only" using a bold, colorful label. Be sure the syringe label can be read once the syringe is in the pump. Also clearly label the enteral feeding tube and administration set.

✓ **Prohibit makeshift or forced fittings.** Educate nurses about the dangers of makeshift or forced fittings with enteral feeding system components, and to be alert to a possible error if connections don't fit easily and securely.

✓ **Verify attachment.** Trace the tubing to the point of origin before making and finalizing any connections or reconnections when administering IV or enteral products.

## Patch cover applied without the medicated patch underneath

CATAPRES-TTS (transdermal therapeutic system) is a square, tan, reservoir-type adhesive patch that contains cloNIDine, which is used to treat hypertension. These patches, manufactured by Boehringer Ingelheim, come with an optional white, round, adhesive cover that can be placed over the drug patch to prevent it from coming loose. Each patch—the tan patch containing cloNIDine and the white cover patch—come in separate pouches. So, each “dose” typically has two pouches: one pouch with the tan medication patch and one pouch with the optional cover.

The pouch for the cover has a warning stating it does not contain active medication. However, the white patch cover itself does not. We have received several reports in which just the cover was applied without the actual medication patch, leaving the patient untreated.

The most recent report involves a float nurse in a long-term care facility who applied just the optional patch cover to her patient’s arm for several weeks in a row. Nurses who worked at the long-term care facility typically checked all medication patches each shift to monitor placement and adherence. However, the patch cover is larger than the medication patch, so it is difficult to tell whether the medication patch is underneath the cover. (Note: even if the medication patch can be visualized, it is not labeled with the drug name. It is lightly imprinted with BI-31, BI-32, or BI-03, which correspond with a 0.1, 0.2, or 0.3 mg dose, respectively.) Also, no mark-

ings are visible through the cover. The error was discovered when a different nurse went to replace the patch and found three medication patches with only one cover patch left in the patient’s medication drawer. When she removed the patch cover she confirmed there was no medication patch underneath.

In our May 2008 newsletter, we wrote about the issue of not being able to identify exactly what medication and dose is contained in the patch. At that time, we spoke to the manufacturer regarding our concerns. The company has no plans to change the labeling of the product. The company also advised not to write directly on the patch itself because it might affect the delivery of the medication.

**Here’s what you can do:** Label the patch cover before application. If the patch cover is used over the medication patch, it is best to label it with the drug name and strength before applying it. Also, leave a small edge of the medication patch uncovered so others can see the cover was not applied without the medication patch underneath. Finally, have pharmacy package each patch/cover pair into an individual plastic bag and seal the bag with a label reminding practitioners to apply the medication patch as well as the adhesive cover. Consider adding education regarding the Catapres-TTS patch to the orientation checklist for new hires and, also review the application and monitoring of these patches with current staff.

## Message in our mailbox



### A nurse’s perspective on IV pole issues and electric beds.

After publishing the *Safety Wire, Injury from dislodged wall-mounted IV pole*, in our May 2011 newsletter, we received a message from one of our readers, **Margaret Mills**, RN, of Gulfcoast Healthcare Consultants in Sarasota, FL. She described other alarming issues with IV poles and electric beds that she wanted to share with others.

Ms. Mills noted that, during the past 30 years, she had periodically found as many as four IV pumps, PCA pumps, and/or feeding pumps mounted on a single IV pole. Rarely was the base wide enough to safely distribute the load and balance the center of gravity. IV poles that were older and clearly designed for only gravity infusions often had one or more pumps attached to the upper half of the pole, making them dangerously top-heavy. Ms. Mills witnessed one patient who narrowly escaped injury as he walked in the hallway with his IV pole to “support” him (which is yet another issue). One of the wheels on the IV pole stopped rolling, causing the pole to fall over, taking the patient down with it. The pump was fixed on the adjustable top portion of the IV pole above the adjustment screw, and it crashed to the floor right next to the patient’s head. The IV pole had a smaller, four-wheel base and two prongs at the top, designed for gravity infusions.

Ms. Mills also addressed an issue with electric hospital beds. She had raised a bed in the ICU to help position a pump after starting a patient’s IV. The bed was a recent addition to the hospital. At the head of the bed was a central power and equipment column to accommodate all the monitoring equipment that critical patients need. Nothing happened when she raised the bed, but on the way down, the

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**Broselow tape for chemical warfare.** Did you know there is a Broselow Pediatric Antidotes for Chemical Warfare Tape ([www.ismp.org/sc?k=broselow](http://www.ismp.org/sc?k=broselow))? It resembles the Broselow Pediatric Emergency Tape, a tool commonly used to quickly calculate pediatric doses of emergency drugs during codes. Because of the similarities, the chemical warfare antidote tape may be

confused with the emergency tape. Make staff aware that both tapes exist, and guard against potential confusion. Store the warfare tape only in the emergency department and highlight the words “Chemical Warfare” to make it stand out. Let’s hope it will never need to be used!



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syringe pump used for IV administration and a syringe pump used for enteral administration, misconnections with look-alike tubing, or mistaking the syringe containing enteral solution as a syringe containing IV medication.

Although IV administration of breast milk is not frequently reported, the risk of such events is unacceptably high in hospitals that use parenteral syringes and IV syringe pumps for enteral feedings. See the recommendations listed in the **check/out!** column to the right, on page 1, for ways to prevent this potentially fatal error. Prevention is within the reach of all hospitals and healthcare providers. So, if your organization has not addressed the risk of misconnections between enteral and

parenteral products, put it on your safety agenda now! Zoey's mother wants us to advocate for action before another child is injured from this potentially fatal but preventable error.

#### References:

- 1) Wallace JR, Payne RW, Mack AJ. Inadvertent IV infusion of milk. *Lancet*. 1972;1264-6.
- 2) Ryan CA, Mohammed I, Murphy B. Normal neurological and developmental outcome after an accidental IV infusion of expressed breast milk in a neonate. *Pediatrics*. 2006;117(1):236-8.
- 3) Page L. Finding the wrong fit: Diligence, technology prevent IV and feeding tube mix-ups. *Materials Management in Health Care*. April 2006:24-28.
- 4) Copeland D, Appel J. Implementation of an enteral nutrition and medication administration system utilizing oral syringes in the NICU. *Neonatal Network*. January/February 2006;25(1):21-24.
- 5) Guenter P, Hicks RW, Simmons D, Crowley J, et al. Enteral feeding misconnections: a consortium position statement. *The Jt Comm J on Qual and Patient Safety*. 2008;34(5):285-92.

Table 1. Examples of Enteral-Only Feeding Systems

Vendor	Device
Baxa	NeoThrive Enteral Feeding System <a href="http://www.baxa.com/neothrive/features.html">www.baxa.com/neothrive/features.html</a>
Caesarea Medical Electronics	NeoFeed Enteral Feeding Syringe Pump <a href="http://www.cme-infusion.com/Dynamic.asp?cid=19697">www.cme-infusion.com/Dynamic.asp?cid=19697</a>
CORPAK Medsystems	CORFLO Anti-IV Feeding Tube and Extension Set <a href="http://www.corpakmedsystems.com/product_main/enteral_main.html">www.corpakmedsystems.com/product_main/enteral_main.html</a>
NeoChild	The SafeChild System <a href="http://neochild.com/enteral.html">http://neochild.com/enteral.html</a>
NeoMed	Enteral Safety System <a href="http://www.neomedinc.com/sales-sheets/Enteral-Safety.pdf">www.neomedinc.com/sales-sheets/Enteral-Safety.pdf</a>
Philips	Enteral Only Extension Sets <a href="http://www.healthcare.philips.com/main/products/mother_and_child_care/post_natal_care/nicu/feeding_and_safety/entemalexensionsets/index.wpd">www.healthcare.philips.com/main/products/mother_and_child_care/post_natal_care/nicu/feeding_and_safety/entemalexensionsets/index.wpd</a>
Smiths Medical	Medfusion 3500 syringe pumps <a href="http://www.smiths-medical.com/plugins/news/2009/nov/medfusion-recognized-syringes.html">www.smiths-medical.com/plugins/news/2009/nov/medfusion-recognized-syringes.html</a>

### ► Special Announcements

**ISMP Webinar:** On **July 26**, ISMP will present *Exploring Medication Safety Off the Beaten Path: Unique Medication Safety Challenges in Diagnostic and Procedural Areas*. Have medication safety improvements been made in areas such as invasive radiology, GI suites, perioperative areas, or ambulatory clinics? Take a tour of these distinct locations with ISMP consulting staff to learn what unique medication safety risks have been uncovered "off the beaten path." For details, visit: [www.ismp.org/educational/webinars.asp](http://www.ismp.org/educational/webinars.asp).

**Unique 2-day program:** Attend ISMP's **Medication Safety INTENSIVE** workshop, a one-of-a-kind, interactive program that will teach you how to approach medication safety "through the eyes of ISMP." The next workshop will be held in **San Francisco, CA**, on **September 22-23**. For details, visit: [www.ismp.org/educational/MSI](http://www.ismp.org/educational/MSI).

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**Report medication errors to ISMP by going to [www.ismp.org/MERP](http://www.ismp.org/MERP).**

### Message in our mailbox

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lower edge of the headboard sliced off a heavy grounded power cord to the patient's mechanical ventilator. Fortunately, a respiratory therapist was in the room and was able to provide manual resuscitation while a new ventilator was attached.

When using standing IV poles, follow the manufacturer's recommendations regarding the number, position, and weight of devices and fluids that can be mounted on the pole. Some poles are not equipped to hold even a single infusion pump; most cannot safely accommodate more than one pump at a time. Pumps should be positioned in a manner that maintains a balanced center of gravity (not too high on the pole). Ms. Mills also suggests that devices should not be mounted above the adjustment screw or fixation device on an adjustable pole. Finally, Ms. Mills commented on the location of power outlets in hospital rooms. Because bending is such an issue for workplace-associated injuries, Ms. Mills wondered why power switches and receptacles were not installed at waist level. She notes that the practice of hiding power outlets near the floor behind furniture for aesthetic purposes is unsafe and outdated. We need to accept the fact that hospital rooms cannot look like our living rooms; they need to be functional and safe.

### ISMP errata.

In our May 2011 issue, we published an article entitled, *Final Acute Care Guidelines for Timely Administration of Scheduled Medications posted on ISMP website*. Unfortunately, we referred to the **Infusion Nurses Society** as the Intravenous Nurses Society. We apologize for this error. We want to thank our reader for alerting us to this mistake and properly thank our colleagues at the *Infusion Nurses Society (INS)* for their comments and support of the guidelines.

