# TUBING MISCONNECTIONS

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HPO KPSD MSA

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# THE PROBLEM

**Patient injuries and deaths** have occurred across the US when different device delivery systems are **mistakenly connected** to each other. These errors are often facilitated by fittings called Luer connectors, which can allow different systems to be easily, but erroneously, connected.

FDA 2009

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# WHAT CAN YOU DO?

1. Trace a tube from the patient to the point of origin prior to connecting any new devices
2. Recheck and trace connections to their source during a patient transfer or hand-off
3. Route tubes and catheters in different directions, depending on their purpose
4. Counsel non-clinical staff, patients and their families to get help should a tube ever become disconnected
5. Label high-risk lines
6. Avoid use of standard luer syringes for oral medications or enteric feedings

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# HOW MANY SYSTEMS
## HAVE UNIVERSALLY FITTING CONNECTORS?

- Intrathecal systems
- Gastrointestinal
- Genitourinary
- Drainage syst
- Car
  - modynamic
  - Venous
- Driving gases
  - Pneu
  - non-invasive
  - d pressure
- Intravenous systems
- Respiratory systems
  - Ventilators
  - Breathing treatments

What are some **Examples of Tubing Misconnections** – *that you can think of?*

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# TUBING MISCONNECTIONS Case Studies

EVENT: Feeding tube erroneously connected to trach tube

POTENTIAL FOR HARM: High


CASE STUDY: An infant in the pediatric
sive care unit had both a feeding tube and
h tube. The feeding tube was
ertently placed in the trach tube and milk
elivered into the infant's lungs.
he infant died

TJC SAFETY TIP: Always trace a tube or catheter from the patient to the point of origin before connecting any new device or infusion.

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# TUBING MISCONNECTIONS Case Studies

EVENT: Epidural tubing erroneously connected to IV tubing


POTENTIAL FOR HARM: High

CASE STUDY: An anesthetist and a midwife mistakenly connected an epidural set to the patient's IV tubing. The epidural medication was delivered to the IV.

The patient died

TJC SAFETY TIP: For certain high-risk catheters (e.g., epidural, intrathecal, arterial), label the catheter and do not use catheters that have injection ports.

# TUBING MISCONNECTIONS Case Studies

EVENT: IV tubing erroneously connected to trach cuff


POTENTIAL FOR HARM: High

CASE STUDY: A child in a pediatric intensive care unit had both an IV line and a trach tube. The IV tubing was inadvertently connected to the trach cuff port. The IV fluid over-expanded the trach cuff to the point of breaking and continuous IV fluids entered the child's lungs.

The child died

TJC SAFETY TIP: Emphasize the risk of tubing misconnections in orientation and training curricula.

# TUBING MISCONNECTIONS Case Studies

EVENT: IV tubing erroneously connected to nebulizer


DO NOT DO THIS!

POTENTIAL FOR HARM: High

CASE STUDY: During a nebulizer treatment, the patient's oxygen tubing fell off the nebulizer and the patient's IV tubing was inadvertently attached to the nebulizer. When the pt. inhaled a moderate amount of IV fluids was aspirated into the pt's lungs. RT identified the misconnection…

The patient survived

TJC SAFETY TIP: Do not purchase nonintravenous equipment that is equipped with connectors that can physically mate with a female luer IV line connector.

# TUBING MISCONNECTIONS Case Studies

EVENT: Oxygen tubing erroneously connected to needleless IV port


POTENTIAL FOR HARM: High

CASE STUDY: A patient's oxygen tubing became disconnected from his nebulizer and was accidentally reattached to his IV tubing Y-site by a staff member who was completing a double shift. The patient died from an air embolism, even though the connection was broken within seconds!

TJC SAFETY TIP: Identify and manage conditions and practices that may contribute to healthcare worker fatigue, and take appropriate action

# TUBING MISCONNECTIONS Case Studies

EVENT: Blood pressure tubing erroneously connected to IV catheter


POTENTIAL FOR HARM: High

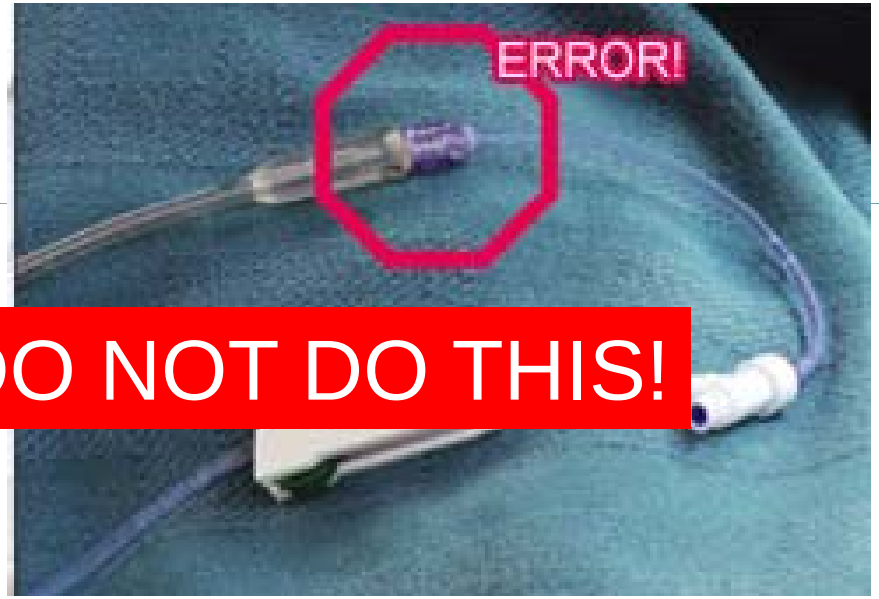
CASE STUDY: An ER patient had an IV heparin lock but no IV fluids had been started. The patient also had a noninvasive automatic BP cuff placed for continuous monitoring. The BP cuff tubing was disconnected when the pt. went to the bathroom. When she returned, her spouse mistakenly connected the BP cuf tubing to the IV catheter & approx. 15 mL of air was deliverd to the IV catheter.

The patient died of a fatal air embolism, despite resuscitation efforts.

TJC SAFETY TIP: Inform non-clinical staff, patients and their families that they must get help from clinical staff whenever there is a real or perceived need to connect or disconnect devices or infusions.

# TUBING MISCONNECTIONS Case Studies

EVENT: IV tubing erroneously connected to nasal cannula




POTENTIAL FOR HARM: High

CASE STUDY: A nurse's aide inadvertently connected a patient's IV tubing to the nasal oxygen cannula upon transfer to the step down unit. The misconnection was not noted until 4 hours later, when the pt. complained of chest tightness & difficulty breathing.

The pt. was treated for CHF & survived.

TJC SAFETY TIP: Recheck connections and trace all patient tubes and catheters to their sources upon the patient's arrival in a new setting or service as part of the handoff process. Standardize "line reconciliation" process.

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# TUBING MISCONNECTIONS Case Studies

EVENT: IV tubing erroneously connected to enteral feeding tube


NTIAL FOR HARM: Moderate

CASE STUDY: A child had both a gastric feeding tube for nutrition and an IV for medication and hydration. When the child's gown was changed, a family member inadvertently attached the IV tubing to the gastric feeding tube. The medication was delivered through the feeding tube into the stomach.

There was no pt. harm since the event was noted in a timely manner.

TJC SAFETY TIP: Inform non-clinical staff, patients and their families that they must get help from clinical staff whenever there is a real or perceived need to connect or disconnect devices or infusions.

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# TUBING MISCONNECTIONS Case Studies

EVENT: Syringe erroneously connected to trach cuff


DO NOT DO THIS!

POTENTIAL FOR HARM: High

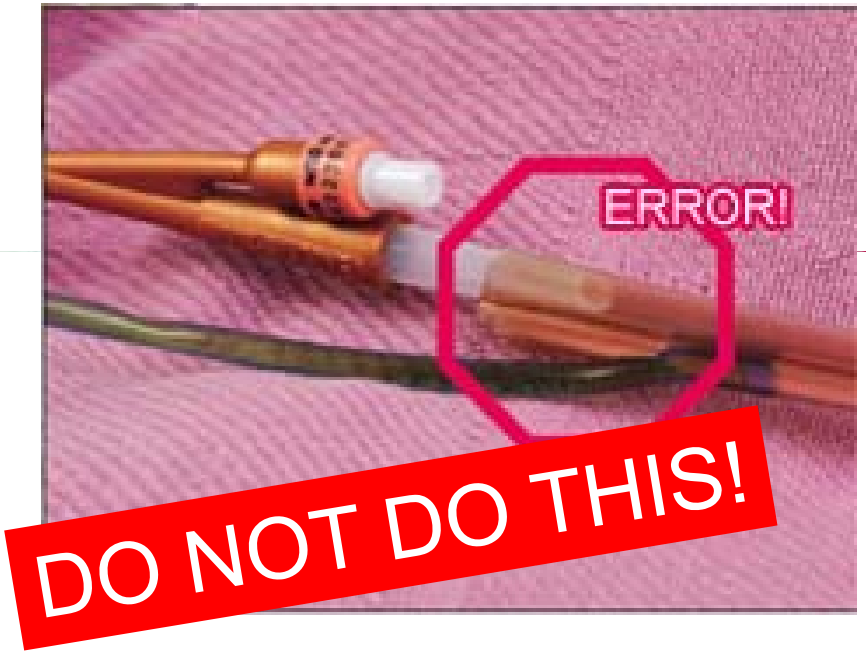
CASE STUDY: The patient had both a central line with 3 ports and a trach tube. Medication intended for the central line was inadvertently injected into the trach cuff. The trach cuff was damaged and the medication entered the patient's lungs.

A new trach tube was inserted & the patient survived.

TJC SAFETY TIP: Always trace a tube or catheter from the patient to the point of origin before connecting any new device or infusion.

# TUBING MISCONNECTIONS Case Studies

EVENT: Foley catheter erroneously connected to NG tube




POTENTIAL FOR HARM: Low

CASE STUDY: A patient was found with her Foley catheter disconnected from its drainage bag. One end of the catheter was still in her bladder and the other end was connected to her nasogastric (NG) tube. Urine was noted to be flowing into her NG tube. The NG tube was connected to the suction & more than 300 mL or urine drained.

The patient's vital signs were stable & her labs within normal limits.

TJC SAFETY TIP: Inform non-clinical staff, patients and their families that they must get help from clinical staff whenever there is a real or perceived need to connect or disconnect devices or infusions.

# TUBING MISCONNECTIONS Case Studies

EVENT: Enteral feeding tube erroneously connected to ventilator in-line suction catheter

POTENTIAL FOR HARM: High


STUDY: A patient's feeding tube was
ntly connected to the instillation port on the
ine suction catheter. Tube feeding was
patient's lungs.
ent

TJC SAFETY TIP: Emphasize the risk of tubing misconnections in orientation and training curricula.

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# DEAD-LINES
## to Fix This Situation…

CA. Assembly Bill #818:
- Epidurals, 1/2014
- IV & Enteral Feeding, 1/2013

**D**esign device connections that only fit into connection ports for which they are intended

**E**ducate clinicians, patients and their family members on the importance of tubing connections

Turn on lights, eliminate noise & clutter

**A**ssess all devices which have different functions & access the pt's body through different routes

**D**evelop tools to assist in mitigation strategies & to work with manufactures for long term solutions of elimination of tubing that can be connected to ports other than those for which it is intended

Trace tubes from pt. to place of origin

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