Discontinuing the use of the Anti-Siphon Valve

Safety Huddle Tool

Clinical Examples

1. A Massive Blood Transfusion protocol has been called for your patient, Blood must be rapidly infused by gravity, however you are unable to remove the ASV even with significant force. The patient deteriorates significantly.
2. A Code Blue has been called. Rapid fluid resuscitation is required via gravity. The ASV is unable to be manually removed from the IV line thus a pressure bag is used to try and open the valve. The valve or connection ports bursts apart.
3. The patient is in the OR and their condition starts to deteriorate. The Anesthesiologist attempts to infuse fluids rapidly by gravity however the fluid will not infuse. As the patient continues to deteriorate, it is determined that there is an ASV present under the sterile dressing. The OR team was unaware that the ASV was in place and it was not removed before the surgery began. This delay resulted in further deterioration of the patient and compromised patient care.

These are just some examples of the themes in safety events that are happening across the Province. Serious patient deteriorations prompted a safety review and review of the purpose and function of the Anti-Siphon Valve (ASV).

Additional factors taken under consideration:

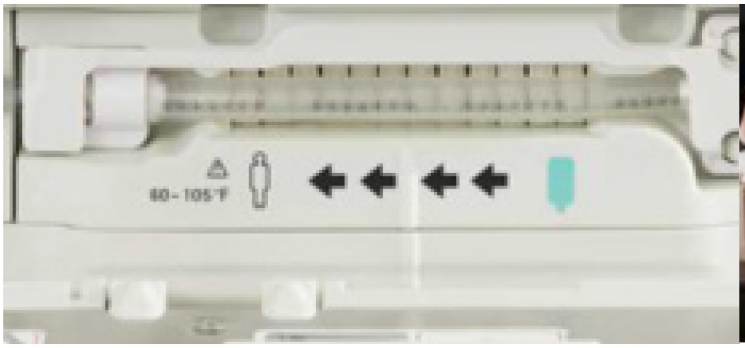
- Not all sites or Regional Health Authorities have experienced safety issues with ASVs.
- Some sites and regions that experienced problems have stopped using ASVs without observing an increase in safety occurrences.
- During the IV tubing field correction notice, the vendor recommended the use of the ASV to reduce air in line (AIL) alarms. The vendor has been unable to provided evidence to show how the ASV reduces AIL alarms.
- A significant reduction in AIL alarms occurred once defective tubing was replaced by the manufacturer following the field correction notice below.
- Practice comparison with other Canadian Health centres that use B Braun did not identify a pattern or rationale for the use of ASV based on patient or care areas (E.g. critical care vs inpatient units).

About the B Braun Field Correction Notice:

The IV sets manufactured during a specific time frame had differences in the outer diameter of the tubing (too large or small) and/or the tubing section between the clamp and the sensor was too short. These quality issues resulted in the air in line sensor misreading the defects as air, result in an alarm and interrupting IV therapy for our patients.

Not all tubing was affected and it was difficult to identify the quality issues visually. It took many months for the new product to be received due to manufacturing timelines for the new improved IV tubing design. The majority of our IV tubing sets are no longer affected.

How Does the pump work to move fluid through the pump?



Behind the tubing are mechanical fingers (Peristaltic Fingers) that move in and out against the door plate at different rates or rhythms to move fluid forward. At least one finger is touching the door plate at any given time and this is one of the features that prevent free flow.

- Assumption – the fluid motion mechanism of the pump exerts enough pressure to open up the valve of the ASV
- How can the backpressure traverse up the IV tubing, through the peristaltic fingers and create enough pressure to prevent formation of microbubbles? - No scientific evidence was found to indicate the ASV plays a role in preventing microbubbles

Priming via Pump or Gravity

Priming by pump was mandatory with the use of the ASV and the driver of this clinical practice change. The vendor did recommend priming by pump to reduce AIL and in reviewing their documents this was the rationale found:

- Avoid turbulence during priming
- Provides a consistent rate of priming when compared to gravity priming where rates may vary based on user technique

Consideration for priming via gravity include:

- Use the roller clamp to slow down flow to minimize turbulence and manage tapping air forward at inverted ports and tubing glue joints

Recommended Actions:

- Discard the ASV upon opening the IV tubing package and add blue cap on tubing end until the new IV sets without ASVs arrive
- Team huddles to review the Safer Practice Notice and potential patient care implications
- Review practice reminders and the use of the roller clamp
- Prime by pump or gravity, the option you choose may be one you wish to reflect upon as a team. What are the benefits of either option?
- Reminder of upcoming priming volume change, tubing vol is increasing from 23 to 26 mls. If you prime by pump, you may need to repeat prime. New tubing will have yellow tint, see Supply Chain Product Alert for more details.
- **Inverting the needleless access ports while priming and tapping the air forward is the most important step in reducing air in line at initiation of infusion.**
- Review steps in managing safety events involving medical equipment and/or supplies

How will we know it was a safe practice decision to stop using the ASV?

- Monitor safety event submissions. Continue to encourage staff to complete safety event reports and follow the product complaint process if issues arise.
- Communicate and escalating concerns/observations to your site leads
- DoseTrac data can tell us what type of air in line alarms we are experiencing.

NOTE: Sites who have already stopped the use of ASVs have not experienced an increase in accumulated AIL alarms

Principles in Managing Equipment and Supplies involved in a Safety Event

IV pump:

- Sequester and Isolate the IV pump, label **"Do Not Use**" and tag for clinical engineering to assess per hospital policies
- Do not change or adjust the settings
- Take note of IV tubing or equipment setup and/or
- Use hospital approved camera or cell phone to take pictures of tubing set up if allowable per your sites policies for managing PHIA concerns.

Supplies such as IV tubing:

All supplies used in a clinical environment are considered biohazard for the purposes of the Product Complaint Process

- Complete vendor complaint form
- Double or triple bag the affected tubing in biohazard bags and seal with biohazard sticker
- Fluid/Med/Blood Product bags can be removed unless we suspect they are part of the concern
- If available, send packaging along with sample and product complaint form

IV Pump and consumables with packaging should be isolated so a thorough analysis can be performed. The pump needs to be tested and verified as safe for use to minimize risk of similar events reoccurring.

Supply lot number and unique pump number are important to document for the investigation/review