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## Recommendations/Considerations

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The following are recommendations from available research, guidance statements, and shared experiences from hospitals/providers to establish procedures consistent with patient and employee safety while conserving personal protective equipment.

### Medication Administration & Safety

#### 1. IV Pumps Outside of the Patient Rooms

IV pumps for COVID-19 patients are kept outside of the patient room utilizing extension tubing to minimize use of PPE and room entry for non-direct patient care activities.

- Reason: Minimize use of PPE and room entry for non-direct patient care activities
- Method: Utilize extended tubing (e.g., 105" tubing, MRI tubing, regular length tubing connected in sequence); Considering short supplies of extended tubing reserve those for intubated/critical patient areas while using regular tubing with connectors for other patient areas (A4, etc.)
- Implementation: If WOWs are unavailable, a scanner on a computer outside of the patient room or at the nurses' station would allow administration documentation.
- Risks: Kinks within the IV line, patient falls if ambulatory, staff falls from increased cord length, possible increased infections due to increased length/connections

*NonICU patients fall risk due to ambulatory capability – Ambulatory patients will need education to seek a nurse for assistance while an infusion is occurring.*

#### 2. Barcode Scanning

For medication administration scanning, each COVID-19 patient is provided with two patient wrist bands. Oral medications are documented as administered within the room if a computer is available. IV medications are documented as administered outside the room utilizing the second arm band.

(If a computer is not available inside the room or a scanner is not on the computer inside the patient room, a WOW would be used in the hallway to document all medication administration. This would keep all WOWs and scanners outside of the patient rooms. If a patient denies taking a medication after it has been shown as administered, the nurse would remove the medication from the MAR as administered and mark refused.)

- Reason: Minimize use of PPE and room entry for non-direct patient care activities
- Method:
  - A. Patient* - Each patient would have the normal patient wrist band to verify their identity and for oral medication administration within the room.
  - B. IV Pump* - The second wrist band would be connected to the IV pump for the patient (such as on the handle or taped to the pump). This wrist band would allow for a WOW to be utilized outside the room without PPE needed to document IV administration for patients. The pump outside the room will also allow double check for high risk medications without having another nurse enter the room. This also allows alarms to be

# Medication Administration and Safety During the COVID-19 Response

silenced or other non-direct patient care with the pump without reentering the room to use more PPE.

*C. NonICU areas* – The patient’s second wrist band could be on the door to use for patient administration scanning since these patients generally do not have continuous infusions. All scanners need to remain *outside* the room to document medication administration. (Currently scanners are being taken into the room for documentation and returned to the charging base at the nurses’ station. Keeping the scanners outside the room will eliminate potential contamination in the nursing station.) If the patient refuses a drug that has already been scanned as administered, it should be wasted within the sharps container and documented on the patient’s MAR upon leaving the room.

*D. Insulin or other medications needing point-of-care testing* - For high-risk medications such as insulin that are administered based on a point of care (POC) test, the insulin vial should be kept outside of the room at all times. The nurse in the room with PPE does the POC test and determine the insulin amount needed. The POC result and the amount of insulin needed is told to the outside nurse and/or shown the result through the patient room window. The outside nurse draws up the insulin and passes it through the doorway to the nurse gowned in PPE. Both can check the dose and sign for verification on the outside computer. The double check remains intact for high-risk medications and the co-signing nurse can witness administration of the high-risk medication through the room window (if possible).

- Risks:

*Safety check* - At the beginning of every shift, the verification of the patient band on the IV pump would be cross-checked with the patient’s wrist band during normal assessment activities.

### 3. IV Infusion Tube Change Frequency

IV tubing should be changed according to current recommendations with the standard being every 96 hours for continuous infusions and every 24 hours for intermittent infusions. Medications requiring more frequent changes are noted below.

Notable medication exceptions are listed below (*also refer to UAMS Parenteral Medication Administration Guide*):

- propofol – Every 12 hours
- Hespan - Every 72 hours
- nitroglycerin - Every 72 hours
- epoprostenol/treprostinil - Every 72 hours
- lorazepam - Every 48 hours
- amiodarone - Every 24 hours (if in Excel bag)

### 4. Flush Volume for Tubing Considerations

For non-continuous infusions, a saline flush should be used to administer to the patient the remaining medication volume in the extended tubing. This may be accomplished by slow flush utilizing normal saline (NS) 10mL syringes and the volume equal to the volume contained in the extended tubing.

This is NOT necessary for ICU patients who are on continuous infusions as other medications act as a flush and the saline KVO (keep vein open) line is utilized. Flushing medications in the ICU setting should utilize the pump to administer the volume equal to that lost in the tubing at the same rate as the medication infusion.

- Reason: Minimize drug loss in extended tubing

## Medication Administration and Safety During the COVID-19 Response

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- **Method:** 105” tubing has 14mL of volume in the tubing before reaching the patient so a slow flush with 14mL, or at least 10mL of a NS syringe, would be needed; NS liter, 50mL, and 100mL should be reserved for IV’s or ICU administration. (Example: with propofol would be when it comes upon 12 hours to change tubing, a NS bag already in use for the patient could have a drip rate and volume equal to the amount needed to flush the tubing line. The bottle of propofol could remain in use until it is empty or the expiration of the bottle.
- **Risks:** Do NOT need flushing at rates greater than the infusion for ICU patients due to “dose dumping” concerns.

*NonICU patients* – Flush needs to be slow. If a 10mL syringe is used to flush and the total volume lost to tubing is 14mL, this may be considered negligible due to potential shortages of NS flush syringes. Consider “dose dumping” concerns if applicable to the medication.

### 5. Patient Information and HIPAA

Ensure all patient information is not clearly visible in the hallway to individuals not involved in the patient’s care.

- **Reason:** Retain HIPAA
- **Method:**
  - A. *IV Medication* - With IV pumps outside of the room, the bags need to be facing the patient door and away from the walkway to minimize non-essential viewing. As visitors are very limited/no visitors the risk for HIPAA information on the pump is minimal under these circumstances.
  - B. *Patient ID band on pump/door* – Covered or other method making it not clearly visible to non-pertinent personnel. (Example: piece of paper with tape on one end that can be lifted to scan the patient barcode for administration but is hidden with the paper otherwise.)

### 6. Medication administration timing

Coordinate dosing administrations for each patient to maximize productivity while in the patient room.

- **Reason:** Minimize use of PPE
  - **Method:**

Coordinate dosing times if possible to minimize number of entries into the patient room allowing minimal PPE usage for the same task.
  - **Risks:** Medication administration should not vary greatly from the directed administration time to minimize drug interactions, dosing considerations, etc.
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# Medication Administration and Safety During the COVID-19 Response

## Steps Needed to Accomplish Recommendations

1. Print secondary arm band for all COVID patients to be used on the IV pump or door to be utilized in barcode scanning.
2. Evaluate availability of WOWs or portable scanners (to be kept outside the room)
3. Determine if ICU will keep WOWs in the room, anteroom, or common WOW for scanning in the hallway for all rooms or those without anterooms
4. Watch supply levels/availability of these items. May need to prioritize locations for limited availability options: <ul style="list-style-type: none"><li>• Long tubing (<math>\geq 105</math>", etc.)</li><li>• "Small bore" tubing (for NonICU patients or shortage of long tubing)</li><li>• Tubing connectors (to connect small bore tubing to make extended tubing)</li><li>• NS flush syringes</li><li>• Essential drug shortages (pharmacy monitoring)</li></ul>

## Considerations

1. Supply chain increase in tubing sets for extended tubing and regular tubing + connectors in areas for COVID-19 patients.
2. Length of tubing increases risks for falls
3. E4 mentioned they will have to move their clean supply once part of their unit is closed to accommodate patients in rooms without ante-rooms/negative pressure.
4. Occlusion alarms on the pumps can be overridden without verifying patient/pump, increasing risk of harm to patient.

## SUPPORTING RESOURCES:

### ISMP Supporting Statements

Information directly from NurseEdviseERR April 2020- Volume 18 Issue 4

**Vascular access.** All patients with pumps in the hallway have a central line; midline or peripherally inserted central catheters are not being used. The nurse noted that peripheral intravenous (IV) lines may not work well due to flow rate issues.

**Pump set-up.** “Small bore” extension tubing is attached to the pump’s primary administration set and run under the door. Macrobore tubing did not fit as well under the door. Also, with the “small bore” extension tubing, there is less volume in the tubing between the infusion and patient. Thus, the solution from small-volume infusions appears to reach the patient more quickly, although resistance to flow is possible with very high infusion rates. Three “small bore” extension sets totaling about 15 feet in length are added to the primary pump tubing to reach from the pump in the hallway to the patient. In some hospitals, a triport connector is attached to tubing for patients with more than one medication infusion. At this hospital, Y-site connectors are used, much as they would be with secondary infusions, and all are covered with port protectors. Compatible medications can be run together, and up to three may be administered via the same line, including neuromuscular blocking agents, vasopressors, sedatives, and antibiotics. To prevent the risk of tripping on the tubing or potentially dislodging it, nurses secure disposable Chux pads over the tubing on the floor and at each connection, which serves as a visual reminder and protects the tubing. There are no Y-site connectors on the floor. Infusions are managed the same way in both positive- and negative-pressure patient rooms.

**Site assessments and independent double checks.** Each patient’s IV site is checked every 2 hours when a nurse enters the room to reposition a patient. Nurses are still conducting parts of an independent double check for certain high-alert medications, requiring a second practitioner to verify the medication/solution, concentration/ dose, and pump settings. While nurses still scan the barcode on a medication or solution for verification against the patient’s medication administration record (MAR) on a workstation on wheels (WOW) outside the room, they are unable to scan the barcode on the patient’s identification band. To work around this, a patient barcode is located outside the room for scanning. While recognizing this is not ideal, the hospital has carefully weighed the risk versus benefit and decided that this workaround is necessary at this time.

**Responding to pump alarms.** One unexpected result of locating pumps in the hallway is that pump alarm issues have been reduced. Nurses can hear and see when pumps are alarming in the hallway, making it easier to respond quickly and without entering the patient’s room.

**Barcode scanning and patient administration band.** At another hospital, the process of positioning infusion pumps in the hallway is similar, but the doors and front walls of patient rooms are glass, and nurses perform a dual verification of the patient’s barcoded identification band during initial set-up of the pump in the hallway. An isolation nurse inside the room scans the patient’s identification band, which is verified through the glass wall by a nurse outside of the room. This nurse then prints a second barcoded identification band, verifies the band again with the isolation nurse in the room, and then attaches the second identification band securely around the IV pole for subsequent scanning outside of the room. Some hospitals also require the patient’s name and date of birth on the pump to reduce the risk of making changes to the wrong pump or administering medications or solutions to the wrong patient.

## Medication Administration and Safety During the COVID-19 Response

### **Weighing the pros and cons**

Many hospitals have considered using extension sets to locate pumps in the hallway to conserve PPE and reduce staff exposure, but have decided against it for various reasons.

### **Shortage of extension sets.**

As expected, the use of extension sets has skyrocketed. Product vendors could not have known that pumps would be moved to hallways and that 3 or more extension sets would be needed to do this. We spoke with some vendors who told us that extension sets were either on backorder or allocated for previous customers. They have stepped up manufacturing to meet the demand, though, and some vendors are producing longer extension sets (e.g., 12 feet). Check with your pump vendor about availability.

If a decision is made to locate pumps in the hallway, ECRI notes that any brand of luerlock extension tubing can be attached to a pump manufacturer's proprietary primary administration set. Also, manufacturers may offer long primary administration sets suitable for use. Check with the pump manufacturer for any additional pump-specific considerations, and conduct a small pilot test of the process before wide scale use.

### **Other considerations.**

Examples of other issues to consider when deciding whether to locate pumps in the hallway include the following:

- Barcode scanning at the bedside may not be possible.
- Fewer trips into the patient's room will result in fewer opportunities to directly monitor and interact with the patient.
- Certain components of independent double checks will become more difficult or impossible in some situations.
- The length and inner diameter of long extension tubing can impact flow rates and the time medications and solutions take to reach a patient without flushing.
- Occlusion alarms may be delayed at low flow rates and become excessive at high flow rates.
- Inadvertent bolus doses may be administered when the tubing is flushed.
- Electrical cords and extension tubing can become a tripping hazard. (Some hospitals extend the tubing above or through the side of the door to keep it off the floor. One hospital made an airtight hole in the wall, with engineering staff oversight, to put tubing and equipment wires through to reduce the risk of tripping, disconnection, and power issues.)
- There may not be adequate outlets in the hallway to keep pumps charged.
- Pumps in the hallway should not be used for two patients in a single room.

## Other Supporting Statements

### **ECRI**

**HIGH PRIORITY - S0392 : COVID-19 – ECRI Exclusive Hazard Report: Large-Volume Infusion Pumps—Considerations: When Used with Long Extension Sets outside Patient Rooms to Help Reduce Staff PPE Use** (Medical Device Special Report - Published 4/1/2020)

<https://assets.ecri.org/PDF/COVID-19-Resource-Center/COVID-19-Clinical-Care/COVID-Alert-Large-Vol-Infusion-Pumps.pdf>

### **Infusion Nurses Society**

**Frequently Asked Questions Related to COVID-19 Health Care Challenges**

<https://www.ins1.org/wp-content/uploads/2020/04/Frequently-Asked-Questions-Related-to-COVID-19-Health-Care-Challenges-Amended-on-04.01.2020.pdf>