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# Managing Infusion Therapies in the Age of COVID-19



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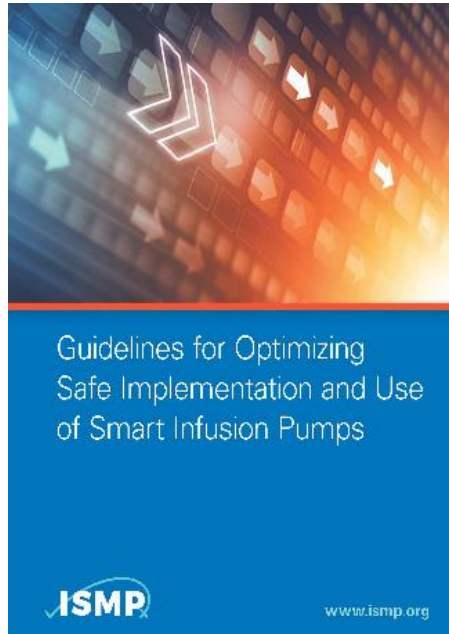
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# Objectives

- Identify key considerations when using infusion pumps with long extension sets
- Navigate consumable shortages or allocation situations and identify suitable alternatives
- Plan ahead to mitigate infusion therapy challenges

# Taking an Unexpected Detour



**COVID-19  
INFUSION  
PRACTICE  
CHALLENGES**

<https://www.ismp.org/guidelines/safe-implementation-and-use-smart-pumps>

# Infusion Pumps in the Hallway

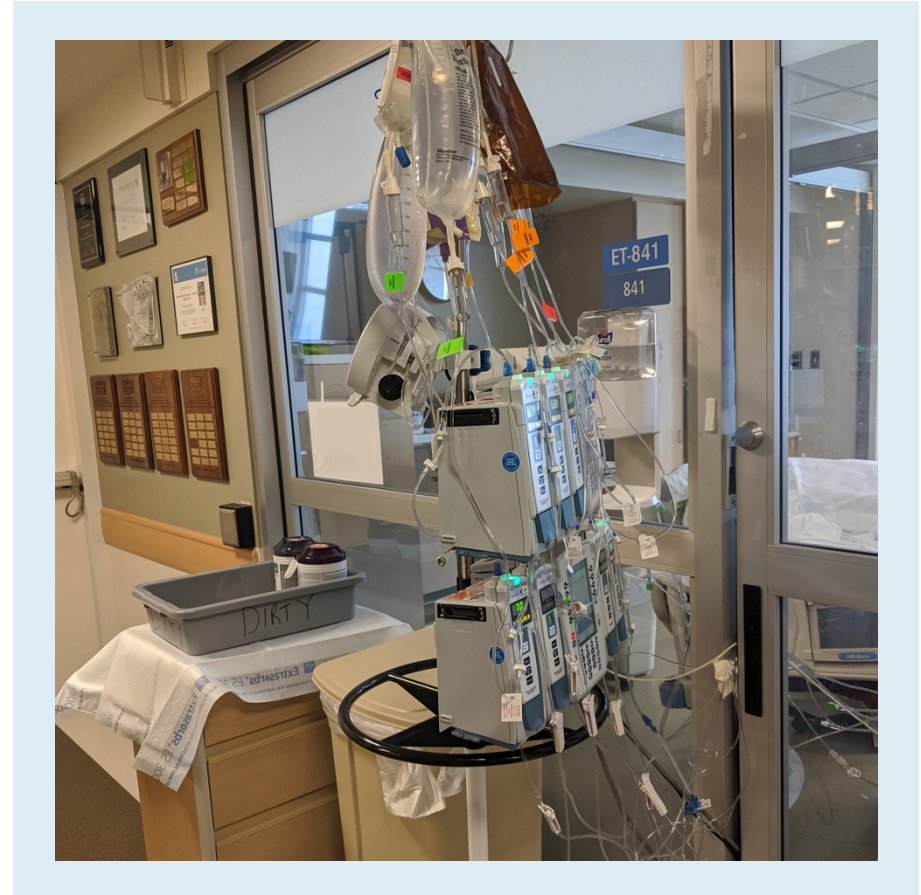
## — Physical set up

- Extension tubing attached to primary set
  - Macrobore versus small bore tubing
  - TriPort connectors/splitters
- Labeling tubing inside and outside the room
- Infusing compatible medications together
- Secure tubing to avoid disconnection and tripping hazard



# Infusion Pumps in the Hallway

- Organizing patient care
  - Cluster care around patient position changes every 2 hours
  - Isolation nurses inside patient room & “clean” nurses outside
- Independent double checks
  - Impact on barcode medication administration
    - Availability of patient ID band
  - Access to the EHR
    - Location of mobile computer carts versus mounted computer screens



# Weighing the Options

PUMPS IN THE  
**ROOM**

**VS**

PUMPS IN THE  
**HALLWAY**

# Purpose

**Reduce  
nursing staff  
exposure to  
COVID-19**

**Conserve  
Personal  
Protective  
Equipment  
(PPE)**

**Potential ease  
in responding to  
multiple pump  
alarms**

# Risks and Challenges



- Shortage of extensions sets
- Occlusion alarms
  - May be delayed at low flow rates (e.g., below 5 mL/hour)
  - More frequent alarms at high flow rates (e.g., 300 mL/hour)
- Flow rate accuracy (under infusion) due to downstream resistance with some pumps
- Increased priming volume necessary with multiple extension sets
  - Much/all of the volume of secondary infusions may remain in the tubing
  - Need to know total tubing volume
  - Carrier fluid lines and flushing procedures



# Risks and Challenges



- Impact on barcode scanning
  - Scanning of proxy patient ID band placed on the hallway pump
  - Labeling pumps with patient name and date of birth
- Independent double check considerations
  - Tracing of infusion lines
  - Dual signature in EHR
- Availability of power outlets in hallway
- Placing pumps in the hallway should be limited to single patient/room

# Organizational planning for anticipated shortage of smart pumps and dedicated infusion administration sets

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# Planning for anticipated shortage of pumps/infusion administration sets

- Develop list of medications that require use of smart infusion pumps
    - See ISMP list of High-Alert Medications for drugs most likely to cause harm with accidental over or underdose
      - Consider vasopressors, opioids, insulin, IV sedation/anesthetics, neuromuscular blockers, antithrombotics, “Highly Concentrated” potassium chloride injection (potassium riders), etc.
  - Use syringe pumps if available
    - Nursing familiarity, syringe brand, volume, priming, etc.
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- Use any pumps, even without a drug library
  - Use pumps from other manufacturers
  - Special considerations
    - Some pumps may be located “off the beaten track” (radiology, procedural areas, perioperative areas, etc.)

# Planning for anticipated shortage of pumps/infusion administration sets

- Switch patients from IV to oral as soon as possible following your facility's IV to oral protocol
  - PO rather than IV hydration when possible
  - Consider change in IV set duration policy (as per INS standards and CDC Guidelines)
- Use IV push medication administration when possible (use hospital guidelines)
    - Review ISMP Safe Practice Guidelines for Adult IV Push Medications
    - List time for IV push injection (give over x minutes) on pharmacy label and MAR; use prefilled/ready to administer/ready to use - dilution only if necessary
    - Consider issues when giving injections via Y-site connections when pumps are outside patient room (timing to patient, inadvertent bolus of drugs in extension set)

# Planning for anticipated shortage of pumps/infusion administration sets

- Potential role of gravity infusion:
  - Hydration, some IV antibiotics, non-high alert medications and others (may need to assess as need arises)
  - Return to drop counting (10, 15, 20, 60 drops per mL sets) and time taping?
    - Influence of bag height, IV access type, position of patient arm, etc. can influence gravity flow
  - Tubing with dial-calibrated IV flow rate regulators vs. flow control clamp (preset a dial to specific number to roughly equal the mL/hour flow rate)
    - Does not eliminate counting drops to ensure a flow rate as close to accurate as possible
    - Take into account patient age, morbidity, severity of illness
  
- Elastomeric devices
  
- Volumetric burette tubing (e.g., certain antibiotics via syringe then dilute)

# Planning for anticipated shortage of pumps/infusion administration sets

- Hypodermoclysis (subcutaneous gravity infusion)
  - Mainly for hydration (ER, Urgent Care, LTC, etc.)
  - Slow infusion 1,500 mL/24 hours x 2 sites (1 mL/min per site)
  - Thighs, upper arms, chest, abdomen
  - Can be done by non-medical personnel with minimal supervision
  - Saline or dextrose; KCl can be added
    - Can be used with hyaluronidase injected locally or via Y-connection
    - Medications have been administered via subcutaneous infusion
  - Can use more than one subcutaneous infusion at a time
  - Access Infusion Nurse Society standards

## Reference

Sasson M. et al. Hypodermoclysis: An Alternative Infusion Technique. American Family Physician <https://www.aafp.org/afp/2001/1101/p1575.html>

# Resources

- ISMP website: <https://ismp.org/covid-19-resources>
  - ISMP Newsletter Special Editions
  - Links to External Resources and External Organizations
  - High Alert Medications in Acute Care Settings <https://www.ismp.org/recommendations/high-alert-medications-acute-list>
  - Safe Practice Guidelines for Adult IV Push Medications <https://www.ismp.org/guidelines/iv-push>
  
- ECRI website
  - COVID-19 Resource Center: <https://www.ecri.org/coronavirus-covid-19-outbreak-preparedness-center>
  - Special report concerning use of long extension sets: <https://assets.ecri.org/PDF/COVID-19-Resource-Center/COVID-19-Clinical-Care/COVID-Alert-Large-Vol-Infusion-Pumps.pdf>
  
- CDC Guidelines <https://www.cdc.gov/infectioncontrol/guidelines/bsi/recommendations.html>
  
- [https://journals.lww.com/nursing/Fulltext/2011/11000/Hypodermoclysis\\_An\\_alternative\\_to\\_IV\\_infusion.6.aspx](https://journals.lww.com/nursing/Fulltext/2011/11000/Hypodermoclysis_An_alternative_to_IV_infusion.6.aspx)
  
- Infusion Nurse Society <https://www.ins1.org/>