Managing Infusion Therapies in the Age of COVID-19

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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

Guidelines for Optimizing Safe Implementation and Use of Smart Infusion Pumps

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

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
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.

— 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
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

— CDC Guidelines https://www.cdc.gov/infectioncontrol/guidelines/bsi/recommendations.html

— https://journals.lww.com/nursing/Fulltext/2011/11000/Hypodermoclysis_An_alternative_to_I_V_infusion.6.aspx

— Infusion Nurse Society https://www.ins1.org/