Injectable Opioid Shortages
Suggestions for Management and Conservation

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Introduction

This fact sheet provides an outline of potential actions for organizations to consider in managing the acute shortages of injectable hydromorphone, morphine, and fentanyl. Healthcare professionals should use their professional judgment in deciding how to use the information in this document, taking into account the needs and resources of their individual organizations.

Critical importance

Shortages of injectable opioids can be particularly challenging due to the range of uses in various healthcare settings, including emergency response, ambulatory surgery centers, and hospitals. Injectable opioids are used for acute, acute-on-chronic, or chronic pain that cannot be controlled by other pain management options. Some injectable opioids are used for sedation or anesthesia. Intermittent shortages of specific injectable opioids may require institutions to convert temporarily to a more available product. Not all injectable opioids are interchangeable for all indications. Improper conversion between morphine and hydromorphone caused two deaths during a similar shortage in 2010.[1]

ISMP Medication Error Reporting

ASHP encourages the reporting of any medication errors related to drug shortages to the Medication Error Reporting page on the Institute for Safe Medication Practices (ISMP) website.

What can clinicians do to mitigate the impact?

- Switch therapy to a clinically appropriate oral or enteral opioid whenever possible.
    - The Pharmacy and Therapeutics (P&T) committee should review current IV-to-oral policies; there may be an opportunity to expand policies to include drug classes affected by shortages.
- Provide multimodal pain management by using parenteral and enteral alternatives to opioids. Consider nonpharmacologic treatments, local nerve blocks, or other pharmacologic adjuncts, as appropriate.

- Engage the institution's experts in anesthesia and pain and palliative medicine to further develop guidance and formulate strategies for dealing with intermittent shortages.
- Ensure relevant institutional pain medication guidelines are up to date.
    - To reduce the risk of conversion errors, use a uniform opioid conversion tool that is approved by the anesthesia team and the P&T committee and distributed throughout the entire health system.
    - Resources like the ASHP Demystifying Opioid Conversion Calculations reference may be helpful in establishing guidelines.
- Product availability can vary by wholesaler and may change from week to week. Guiding prescribers to choose between the available injectable opioids can help institutions reserve certain opioids for specific populations or indications (for example, reserve fentanyl for operating-room use).
    - Use systemwide communications to alert all clinicians who prescribe, dispense, or administer injectable opioids.
- Ensure the electronic health record (EHR) displays opioid options that match the products currently in stock. Do not underestimate the informatics resources that will be needed during this shortage.

Inventory control strategies

- Consider reserving supplies of specific injectable opioids for specific indications and limiting the placement of those injectable opioids to locations primarily associated with those indications (for example, limiting the placement of injectable fentanyl to operating rooms, emergency departments, and intensive care units).
- Optimize the quantities of injectable opioids kept in automated dispensing cabinets after checking the usage patterns at specific locations.

Pharmacy operational strategies

- Explore all legal options for purchasing product from other wholesalers or manufacturers. There may be product available off-contract or in strengths other than normally purchased.
    - Consider the patient-controlled analgesia (PCA) pump library and syringe compatibility when making purchasing decisions.
- Limit waste by considering the doses commonly given on patient care units and then supplying those units with appropriately sized syringes or vials.
- If repackaging opioids from large vials into syringes
    - Follow the guidance in Repackaging of Certain Human Drug Products by Pharmacies and Outsourcing Facilities, issued in January 2017 by the FDA.
    - Assign beyond-use dates as dictated by USP Chapter <797> and state rules and regulations.
    - Search the primary literature and tertiary sources for information about stability of the opioid when repackaged in specific syringes.

Infusion pumps / Informatics strategies

- Review drug records, order sets, and treatment protocols for needed changes.

    - Some examples are postoperative pain management, sedation, PCA, and epidural order sets.
    - Include equivalent opioid doses in order sets so that prescribers do not need to calculate opioid conversions without assistance.
    - Make drug information easily accessible through the medication administration record for nurses to double check dosing before administration.
- If the products available for purchase are not already on the formulary or configured in the EHR system, validate product barcodes and ensure there is information technology (IT) support to configure the products' drug files correctly.

Clinical pearls

- Morphine has an active, renally excreted metabolite.[2] In patients with renal impairment, reduce the morphine dose and extend the dosing interval on the basis of renal function.
- Morphine has a slower onset and longer duration of action than other injectable opioids commonly used in the post-anesthesia care unit (PACU). Administering morphine doses every five minutes to patients in the PACU may lead to severe sedation and respiratory depression.
- Use caution if considering meperidine as an injectable alternative for pain management. The metabolite normeperidine is neurotoxic in renally and hepatically impaired patients, including the elderly.[3]
- Avoid fentanyl in patients receiving extracorporeal therapy because the drug will bind to tubing and oxygenators.[4] If there is no alternative available, infuse fentanyl directly into an IV line through a port close to the patient. Increased dosing may be required.
- Use injectable opioids to treat pain, not to sedate patients.

Caveats / Safety information

- Use established communication channels, such as daily huddles, flyers, and product labeling, to educate staff about changes within the hospital or health system.
    - Be sure that the IT team is aware of the emergent need to make priority changes in drug files, charge description masters, and infusion pump libraries.
    - Consider having physician and nursing champions in addition to the pharmacy lead who can assist with routine communication, practice changes, and supply updates.
- Conversions between injectable opioids should be done in accordance with institutional guidelines and with input from anesthesia and pain and palliative medicine specialists, including physicians, nurse practitioners, and pharmacists.
- Most injectable opioids are available in a variety of concentrations and package sizes. Exercise extreme caution when purchasing products that are not regularly stocked in the pharmacy or automated dispensing cabinets. Do not assume that all packages of a specific opioid contain the same total dose. For example:
    - Fentanyl is available at a consistent concentration (0.05 mg/mL) but in different package sizes.
    - Hydromorphone is available as different concentrations in the same package size (1 mL).

Please contact ASHP's Center for Medication Safety and Quality at quality@ashp.org with questions.

References

1. Institute for Safe Medication Practices (ISMP). Drug Shortages: national survey reveals high level of frustration, low level of safety. ISMP Medication Safety Alert – Acute Care. Sept 2010. Accessed 2018 Mar 20 at http://www.ismp.org/Newsletters/acutecare/articles/20100923.asp
2. Osborne R, Joel S, Grebenik K, et al. The pharmacokinetics of morphine and morphine glucuronides in kidney failure. Clin Pharmacol Ther. 1993; 54(2):158-67.
3. Latta KS, Ginsberg B, Barkin RL. Meperidine: a critical review. Am J Ther. 2002; 9(1):53-68.
4. Shekar K, Roberts JA, Mcdonald CI, et al. Sequestration of drugs in the circuit may lead to therapeutic failure during extracorporeal membrane oxygenation. Crit Care. 2012; 16(5):R194.