

Hydromorphone Intended for an Adult Patient Inadvertently Administered to an Infant

In many hospitals, infants and children receive care alongside adults in a variety of patient care areas, including the emergency department (ED). Whenever pediatric and adult patient populations are treated in the same location, there is a high risk of harm from an “incorrect patient” error, particularly when a high-alert medication is involved. This bulletin highlights an incident in which an infant was inadvertently given a dose of hydromorphone intended for an adult patient. The system-based vulnerabilities underlying this incident are likely to be present in many healthcare settings and are shared for the purposes of communicating the learning and preventing a similar recurrence.

Medication Incident

A mother brought her infant, who was about 9 months of age, to the ED of a community hospital because the baby had a fever and symptoms of ear pain. Shortly after registration, a nurse assessed the infant and recorded the assessment in the patient’s chart. The chart was then placed in the chart rack for review by the attending physician.

The same day, an adult patient who was receiving palliative care, whose surname was similar to that of the infant, presented to the ED with uncontrolled pain. She was a patient of the attending physician on duty, who was also a family practitioner in the community. After assessment by the nurse, this patient’s chart was also placed in the chart rack for review by the attending physician.

After examining the palliative care patient, the physician inadvertently picked up the infant’s chart from the rack, instead of the adult patient’s chart as intended. The physician wrote an order for hydromorphone (Dilaudid) 4 mg to be given orally and placed the chart in the appropriate slot for follow-up by nursing staff. Shortly after, the infant’s nurse picked up the chart and reviewed the order. She immediately conferred with another nurse about the appropriateness of the order for an infant. She then approached the physician to ask if he had intended to order the hydromorphone 4 mg. The physician verbally confirmed the order as

written; however, neither healthcare provider used any patient identifiers during the conversation.

The nurse retrieved the hydromorphone from the recently installed automated dispensing cabinet and performed a double check of the drug and dose with another nurse. She verified with the mother the infant’s identification, age, and allergies as recorded in the chart before administering the hydromorphone. The mother questioned the reason for the medication, and the nurse informed her that it was “for pain.” After administering the hydromorphone, the nurse asked the mother what other directions the physician had given her, at which point the mother informed the nurse that her child had not yet been examined by a doctor.

The nurse realized that an error had probably occurred and immediately informed the physician, who disclosed the error to the mother. Several remedial steps were taken, including contacting the poison control centre and the on-call pediatrician and arranging transfer to a regional pediatric referral centre. Intravenous access was initiated, several doses of naloxone were administered intravenously, a nasogastric tube was inserted, and charcoal was administered. Fortunately, the infant recovered completely and was discharged the next day.

Contributing Factors

The facility undertook a root cause analysis of the incident and identified the following possible contributing factors:

- The fact that the adult palliative care patient was known to the physician led the physician to deviate from the usual practice of taking the chart to the bedside and verifying the patient’s identification before writing the medication order. In addition, the physician wrote the medication order without an accompanying medical assessment note.
- When the nurse requested confirmation of the order from the doctor, the communication was incomplete because neither the nurse nor the doctor explicitly identified the patient. As a result, both parties believed that the communication had been about the same patient.

- The 2 patients had similar surnames.
- Recent transition to use of an automated dispensing cabinet in the ED for both ward stock and night cupboard stock led to ready accessibility of the hydromorphone. (Previously, hydromorphone had not been stocked in the ED, and the nursing staff had not had direct access to this drug; a prescription for hydromorphone would have necessitated a call to the pharmacy or the nursing shift supervisor [if the pharmacy had been closed].)
- Nursing staff in the ED lacked familiarity with and understanding of the potency of hydromorphone, a drug that the ED staff did not routinely use and had not previously been able to access without involvement of pharmacy staff.
- Neither published drug information references nor a pharmacist were consulted to determine the appropriateness of administering hydromorphone to an infant and the appropriateness of the dose.
- Both pediatric and adult unit dose ward stock were available together in the patient care area, and children and adults were being treated in the same location, without specified differentiation of processes.

Recommendations

The hospital's analysis identified several themes, all of which present opportunities to enhance safety including availability of medications, communication, education, and the care processes for pediatric and adult patients. In consultation with the hospital, ISMP Canada has developed the following recommendations for consideration:

- Use 2 patient identifiers (e.g., patient name, date of birth, hospital identification number) at every stage of the medication use process, including the point at which medication orders are documented in the health record.
- Ensure that all communications about any patient include patient identifiers. Consider implementing a standardized approach to facilitate clear communication of concerns. An example is the SBAR process, "SBAR" being a mnemonic that can help to frame the discussion:
 - **Situation:** Describe your concern about the safety of the medication order.
 - **Background:** Provide pertinent information about the patient and about the medication to further explain the basis for your concern.
 - **Assessment:** Offer your assessment of the potential harm to the patient that could occur if the medication is administered as prescribed and the likelihood of the harm.
 - **Recommendation:** Suggest the action you believe would make the medication order safe, or request cancellation or discontinuation of the order.

Healthcare professionals can also encourage clear and accurate communication of concerns among themselves, such as rephrasing and repeating back the information heard, along with patient identifiers, to ensure that concerns have been clearly understood.

- Require that all medications ordered for pediatric patients include the calculated dose (e.g., dose per kilogram). Include this information in the verification process to ensure that the dose (e.g., milligrams per kilogram) is appropriate and in accordance with a facility-approved pediatric reference such as the pediatric formulary.
- Ensure that pertinent and up-to-date pediatric drug information is readily available, along with a process for "just in time" education for medications not typically provided or administered.
- Implement distinct processes for adult and pediatric patients. For example, the hospital where the incident occurred has now changed the appearance of the pediatric ED charts to make it easier for practitioners to identify this patient's age group. In addition, in its longer-term renovation plans, the hospital is exploring the possibility of creating a separate area in the ED for the treatment of pediatric patients.
- When implementing new technology such as automated dispensing cabinets, assign a multidisciplinary team to conduct a proactive risk assessment process (such as failure mode and effects analysis), to ensure that safeguards previously incorporated into practice (e.g., restricted access, double checks, pharmacy review) are integrated and that no new opportunities for error have been created.
- If hydromorphone must be stocked in the ED because of the particular patient population served (e.g., palliative care), ensure that access is restricted. Include an independent double check and an on-screen alert for automated dispensing cabinets; e.g., "Hydromorphone (Dilaudid) is a highly potent opioid. Do you still want to proceed?"
- In non-emergency situations, require that the medical assessment of patients be charted before administration of any medication. This step will provide an opportunity to verify the clinical appropriateness of the medications prescribed.
- Implement or work toward a longer-term strategy of computerized prescriber order entry, which would generate an automated alert to the prescriber when a medication is prescribed that is inappropriate for the patient's age or weight.

This incident exemplifies the value of engaging patients and families at all stages of the medication use process. It also highlights the need for careful consideration of the potential for error in the treatment of pediatric patients in mixed-care environments, particularly in areas such as the ED, where the patient population and level of acuity are

diverse and unpredictable and where patient turnover is high. Nurses and pharmacists traditionally provide important safety checks for treatment orders; however, this

incident illustrates the need for multiple system-based strategies to enhance processes and communication.

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