

Pediatric Safety Study Newsletter : Medication Errors



The PECARN Pediatric Patient Safety Study is a multi-phase study aimed at identifying and improving safety practices in the PECARN network. Phase I, completed in 2007 involved ED Staff and HEDA Surveys to assess the climate of safety in PECARN EDs-The manuscript evaluating this phase was published in [Pediatrics](#) (2009). Phase II involves transmitting incident reports (IRs) from 19 PECARN hospitals and classifying safety events using a consensus process. This phase is ongoing and has collected over 3,000 incident reports in the first year. Among the major findings are a number of examples of medication errors. These errors have been classified by subtype, severity and contributing factors. Ordered according to their classified subtype, the examples below illustrate some common types of medication events, as well as their severity and contributing factors. Also included are recommended actions for prevention.

Wrong drug: Look-alike/Sound-alike

A nurse administered hydroxyzine rather than hydralazine for a patient with hypertension. In this incident, the patient required further treatment in the ICU as a result of the error (Severity E). The primary factor found contributing to this human error was look-alike/sound-alike medication. This event highlights the importance of teaching **shared mental model** and **critical thinking**. For example, an RN must understand the reason a medication is ordered as well as the expected action.

Wrong dose: Decimal Point Error

A physician ordered 0.5 mg/kg of Dilaudid, a 10-fold overdose of a narcotic, which could have been fatal. This order was co-signed by another physician. The error was identified by a nurse who actively intervened (Severity B2). This near-miss was caused in part by having no CPOE with decision-support and could have been prevented if the second physician had done an independent calculation of the medication dose. Recommendations include: **designing a paper chart to require mg/kg calculation AND independent dose cross check OR CPOE**.

Wrong dose: Failure to Divide Daily Dose

A physician failed to divide the total daily dose in ordering ampicillin and ordered 200 mg/kg. While the patient was not harmed (Severity C), it demonstrates the need for close supervision of trainees as well as the importance of reinforcing nursing dose checks. Recommendations include: **designing a paper chart to require mg/kg calculation AND independent dose cross check OR CPOE**.

Wrong dose: Pounds Versus Kilogram Error

A 4 year old being prepared for sedation was weighed by a nurse who, after weighing the child, was asked the child's weight by the child's parents. The nurse reported the child's weight to the parents in pounds and then entered the weight in pounds instead of kilograms in CPOE. As a direct result, the child was given twice the intended dose of ketamine for sedation. The error was noted and no adverse reaction was reported but the child did require increased monitoring as a result (Severity D). The recommendations for this event highlight the importance of teaching safety behavior that includes **always using kilograms when discussing weight**.

Failure to Heed Noted Allergy

A nurse failed to confirm known allergy status before administering ibuprofen to a patient with a known ibuprofen allergy. The patient required treatment to prevent harm (Severity D). "Alert fatigue" in CPOE was a contributing factor in this case of human error. Recommendations include teaching safety behavior that include reinforcing the practice of **Stop, Think, Act and Review (STAR)** before any medical action.

SEVERITY RATING

A= Unsafe conditions
B1= Near miss, by chance
B2= Near-miss, by active intervention
C= Reached the patient, no harm
D= No harm but increased treatment or treatment to prevent harm
E= Reached the patient/required treatment

F= Temporary harm that required hospitalization or prolonged hospitalization
G= Permanent harm
H= Near death
I= Death
O= Unknown Impact

At a Glance

Types of errors

- Wrong drug: look alike/sound alike
- Wrong dose: decimal point error; failure to account for total daily dose, pounds versus kilograms error
- Failure to heed allergies

Contributing Factors

- Human error: no dosage recalculation by co-signing MD; poor supervision of trainees; no dose check by nursing, failure to transcribe weight into kg in CPOE; failure to confirm known medication allergies
- No CPOE with decision-support
- "Alert fatigue" in CPOE
- Look-alike/sound-alike medications
- Lack of safety training

Recommended Actions

- Shared mental model and critical thinking should be taught so that the reason for ordering a medication and expected action are well understood by the entire medical team
- To avoid wrong dose errors a paper chart should require mg/kg calculation AND there should be an independent dose cross check OR CPOE
- Teach and reinforce safety behavior in discussing medication dosage-always use kilograms in discussing weight
- Teach and reinforce safety behavior: Stop, Think, Act and Review (STAR) before performing any medical action