MEDICATION DOSING SAFETY

BACKGROUND/PURPOSE

Prehospital medication dosing errors are a common occurrence. Dosing errors are the result of multiple causes that can include infrequent exposure to certain medications, complex calculations for weight-based dosing performed in a stressful environment, and challenges with medication preparation and administration. Evidence-informed best practices for medication dosing exist to reduce medication errors. This policy aims to reduce medication dosing errors by implementing best practices across all patient populations.

CLINICAL GUIDELINE

1. **Confirm patient weight at the time care is delivered.**

   For pediatric patients, determine and record weight in kilograms as part of the initial assessment. When estimation is necessary, preferentially use a length-based tape or the Antevy age-based formula. A weight reported by a parent or caregiver may also be used.

2. **Use kilograms as the standard of weight used**.

   Use kilograms (kg) as the standard unit for patient weight. When weight is reported in pounds, use a precalculated conversion tool or electronic reference to convert to kilograms without manual calculation.

3. **Use a volume-based dosing reference.**

   Use a volume-based dosing reference that provides the volume in mL to administer for the indicated dose and medication concentration. The reference should reflect medications and concentrations currently stocked and be updated promptly when either one changes.

4. **Perform independent medication cross-checks before administration**.

   Scan the medication, when available, to verify the product and concentration before preparing the dose.

   Perform an independent medication cross-check before administration. When a second clinician is available, that clinician should independently use the dosing reference to determine the expected dose and volume, then compare these with the prepared medication. Confirm the medication, concentration, patient weight when applicable, dose, volume, and route.

   When a second clinician is unavailable, the administering clinician should verify these elements against the dosing reference or with the patient before administration.

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5. **Use equipment that will reduce risk of delivery error.**
    - Use appropriately sized syringes with clear graduations to measure the intended volume accurately. Transfer small doses from larger prefilled syringes into a smaller syringe before administration to reduce the risk of overdose.
    - Prefer Luer-lock connections over slip-tip connections and larger-bore draw-up needles when withdrawing medication from vials to reduce inadvertent air entry into the syringe.
    - Use a dedicated syringe-to-syringe transfer device rather than a three-way stopcock. Stopcocks introduce additional steps and opportunities for error, including drawing air from an open port or failing to clear air from the device.
    - Standardize equipment and test medication preparation and delivery processes in simulation using the supplies stocked in the field.

6. **Regularly train and observe EMS clinician practice of weight-based medication administration to assure competency.**

    Regularly assess EMS clinician competency in weight-based medication preparation and administration. Training and competency assessment should use the same dosing references, equipment, and medication cross-check processes used in the field. Simulated patient encounters should include determining patient weight, selecting the dose and volume, preparing the medication, and administering it with field equipment.

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