

## Standardize the Dosing Designations on Prescription Container Labels for Oral Liquid Medications

Dosing errors involving oral liquid medications have been a source of concern for many years. To administer most oral liquid prescription medications, a patient or caregiver must rely on the prescription container label dosing designations to guide measurement of the proper dose with a dosing device. The use of multiple volumetric units (e.g., teaspoons, tablespoons, droppersful) and multiple abbreviations (e.g., mL, cc, mls; tsp, TSP, t) increase the likelihood of dosing errors by healthcare professionals, patients, and caregivers, which can cause patient harm. One of the most common dosing errors is a patient or caregiver confusing teaspoons and tablespoons, resulting in 3-fold dosing errors. The use of teaspoons and tablespoons on labels may encourage the use of non-calibrated household spoons for dosing medications.

### NCPDP Recommendations:

1. **mL (milliliter)** should be the standard unit of measure used on prescription container labels for oral liquid medications.
2. Dose amounts should always use **leading zeros before the decimal point for amounts less than one and should NOT use trailing zeros after a decimal point** on prescription container labels for oral liquid medications.
3. **Dosing devices with numeric graduations and units** that correspond to the container labeling should be made easily and universally available, such as **including a device each time oral liquid prescription medications are dispensed.**

#### Rationale for Recommendation 1

- The need to measure oral liquid medication volumes makes accurate dosing more challenging than solid medications
- The use of multiple volumetric measures contributes to oral liquid medication dosing errors
- According to a recent study, parents measure liquids more accurately using mL

#### Rationale for Recommendation 2

- How dose amounts are expressed can cause significant overdoses
- Existing healthcare standards suggest dose designations for decimal amounts should always use leading zeros and never use trailing zeros

#### Rationale for Recommendation 3

- How dosing designations are represented on dosing devices contributes to medication administration errors
- Use of household spoons or other utensils can cause administration errors
- Guidelines for oral liquid over-the-counter medications recommend that dosing devices should be provided with all products and that milliliter should be the preferred unit of measure for the dosing devices

### Milliliter Has Been Endorsed as the Standard Unit of Measure for Oral Liquid Medications by Many Professional Organizations

- **National Association of Boards of Pharmacy (NABP):** “All Drugs Dispensed to outpatients shall contain a label affixed to the container including...drug strength, expressed in the metric system whenever possible...”
- **United States Pharmacopeial Convention (USP):** “Use of metric units: Prescriptions shall be written to state the quantity and/or strength desired in metric units unless otherwise indicated...If an amount is prescribed by any other system of measurement, only an amount that is the metric equivalent of the prescribed amount shall be dispensed.”
- **American Pharmacists Association (APhA):** APhA “supports NCPDP recommendations for standardizing the dosing designations on prescription container labels of oral liquid medications.”
- **American Society of Health-System Pharmacists (ASHP):** “All prescription orders should be written in the metric system. [This] will help avoid misinterpretations and miscalculations when converting to metric, which is used in product labeling and package inserts.”

## Pharmacy Leadership Call to Action: Inform, Educate, and Empower Pharmacy Staff

- **Use mL as the standard unit of measure whenever possible on prescription container labels.** Avoid other abbreviations (cc, ml, ML) and the term milliliters spelled out.
  - When the prescription Sig contains dosing designations in mL, mL dosing instructions should be used on the prescription container label
  - When the prescription Sig contains dosing instructions in non-volumetric units (e.g., mg) or non-standard volumetric units (e.g., droppersful), convert the dosing instructions to mL, and use mL on the prescription container label
- **Always use leading zeros before a decimal point for amounts less than one, and never use trailing zeros after a decimal point on prescription container labels for oral liquid medications.**
  - Use leading zeros (e.g., “0.5” mL, NOT “.5” mL)
  - Do NOT use trailing zeros after a decimal point, including in the hundredths or thousandths position (e.g., “2.5” mL, not “2.50” mL)
  - Place adequate space between the dose and unit of measure (e.g., “5 mL,” NOT “5mL”)
- When dispensing an oral liquid medication, **include a dosing device with numeric graduations and units that correspond to the container labeling, or tell patients or caregivers where an appropriate device can be obtained.**
- Ensure that **point of dispensing verbal patient counseling, communication, and education use dosing designations that are consistent** with the prescription container label and the dosing device.
- **Educate patients or caregivers on how to use dosing devices correctly and ensure they have access** to an appropriate dosing device before they leave the pharmacy.
- **Educate other pharmacy staff** regarding importance of using **mL as the unit of measure for all oral liquid medications.**
- **Pharmacy leaders are encouraged to support patient counseling, communication, and education at point of dispensing.** Community pharmacies may also provide patients with brochures or other patient-centered materials that emphasize patient safety measures to ensure safe use of medication and proper dosing.

Download the NCPDP white paper at: <http://ncpdp.org/Education/Whitepaper>

