A fatal event was reported recently to the ISMP National Medication Errors Reporting Program in which a nurse confused two dosing scales that appear on a plastic oral liquid dosing cup. It has an archaic measure—drams—which the nurse confused as mL. This particular dosing cup is commonly used in US hospitals today (Figure 1).

Many healthcare professionals are familiar with mix-ups that have occurred when measuring doses of liquid medicine using dosing cups, sometimes causing serious medication errors. To prevent mix-ups between variable measurement systems, multiple national organizations have called for the adoption of the metric system (milliliter) as the standard for prescribing and measuring doses of liquid medications. These organizations include the American Academy of Pediatrics (AAP), the American Society of Health-System Pharmacists (ASHP), the Centers for Disease Control and Prevention (CDC), the Institute for Safe Medication Practices (ISMP), the US Food and Drug Administration (FDA), the Consumer Healthcare Products Association (CHPA), and the National Council for Prescription Drug Programs (NCPDP).

While progress is being made in hospitals in regards to prescribing liquids in mL, many hospitals still use dosing devices that have household measures (e.g., teaspoonful, dessertspoonful, tablespoonful) and, as above, even drams and ounces. This sets healthcare professionals up to fail because the dosage scales on embossed cups are difficult to read, have dangerous abbreviations that are easily confused (e.g., TBS and TSP), and measures that are no longer used (e.g., drams).

In the case referred to above, a nurse measured a dose of morphine sulfate oral solution 100 mg/5 mL incorrectly. For a 20 mg dose (1 mL), the nurse misread the scale marked drams as mL and administered 1 dram of the medication. One dram is equivalent to 3.7 mL, so the patient received close to 75 mg of morphine. In another similar case, a nurse gave a patient 5 drams of a formerly available acetaminophen liquid concentrate, 100 mg/mL, instead of 5 mL, a total of 18.45 mL, or 1.845 g of acetaminophen! Drams and ounces, which also appear on these cups, are from an apothecary system that is no longer in clinical use or taught to student healthcare professionals.

Healthcare providers should stop using dosing cups that include a scale that measures in drams. These are still available from major dosing cup vendors, so it’s possible these will be found in your hospital. In their place, available oral syringes that measure in mL only should be used to measure doses of oral liquid medications whenever possible. If a dosing cup must be used, ideally it should allow measurement in mL only. Unfortunately, these are not widely available at this time, although some suppliers can customize dosing cups to measure in mL only. If a customized cup is not available, you may need to rely on cups measuring in mL and household measures until mL-only cups can be supplied. Also, only purchase dosing cups that have printed, rather than embossed, measurement scales, so they are easier to read.
NATIONAL ALERT NETWORK (NAN)

This alert is based on information from the National Medication Errors Reporting Program operated by the Institute for Safe Medication Practices.

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NAN continued from page 1

References


4) ISMP Board of Trustees. ISMP statement on use of metric measurements to prevent errors with oral liquids. October 2011. Available at: www.ismp.org/pressroom/PR20110808.pdf.


The National Alert Network (NAN) is a coalition of members of the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP). The network, in cooperation with the Institute for Safe Medication Practices (ISMP) and the American Society of Health-System Pharmacists (ASHP), distributes NAN Alerts to warn healthcare providers of the risk for medication errors that have caused or may cause serious harm or death. NCC MERP, ISMP, and ASHP encourage the sharing and reporting of medication errors both nationally and locally, so that lessons learned can be used to increase the safety of the medication use system.