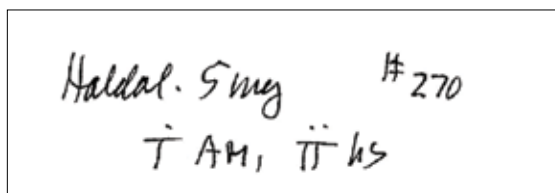




Avoiding Decimal Errors

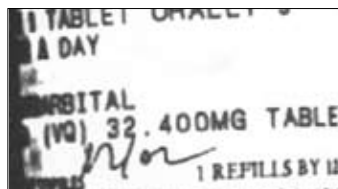
Numbers containing decimal points are a major source of error and when misplaced, can lead to misinterpretation of prescriptions. Decimal points can be easily overlooked, especially on prescriptions that have been faxed, prepared on lined order sheets or prescription pads, or written or typed on carbon and no-carbon-required (NCR) forms. If a decimal point is missed, an overdose may occur. The importance of proper decimal point placement and prominence cannot be overstated.

A decimal point should always be preceded by a whole number and never be left “naked.” Decimal expressions of numbers less than one should always be preceded by a zero (0) to enhance the visibility of the decimal. For example,



without a leading zero, a prescription for “Haldol .5 mg” (see graphic above) was misinterpreted and dispensed as “Haldol 5 mg.”

Additionally, a whole number should never be followed with a decimal point and a zero. These “trailing zeros” (such as “3.0”) are a frequent cause of 10-fold overdoses and should never be used. For example, when prescriptions have been written for “Coumadin 1.0 mg” patients have received 10 mg in error. Similarly, a prescription for “Synthroid 25.0 mcg” could be misread as “Synthroid 250 mcg.”



Dangerous use of decimals can also be problematic if they appear in electronic order entry systems or

on computer generated labels. A newly admitted hospital patient told her physician that she took phenobarbital 400 mg three times daily. Subsequently, the physician wrote an order for the drug in the dose relayed by the patient. A nurse saw the prescription vial and verified that this was the correct dose. However, prior to dispensing, a hospital pharmacist investigated the unusually high dose. When he checked the prescription vial, he found that it was labeled as “PHENO-BARBITAL 32.400MG TABLET” (see graphic).

To avoid misinterpretations due to decimal point placement, health care practitioners should consider the following:

- Always include a leading zero for dosage strengths or concentrations less than one.
- Never follow a whole number with a decimal point and a zero or multiple zeroes (trailing zero).
- Eliminate dangerous decimal dose expressions from pharmacy and prescriber electronic order entry screens, computer-generated labels, and preprinted prescriptions.
- Eliminate the lines on the back copy of NCR forms so that a person can clearly see decimal points or other marks that were made on the top copy.
- Avoid using decimals whenever a satisfactory alternative exists. For example, use 500 mg in place of 0.5 gram, or 125 mcg instead of 0.125 mg.
- Identify drugs with known 10-fold differences in dosage strength (such as Coumadin 1 mg and 10 mg, levothyroxine 25 mcg and 250 mcg) and place reminders in electronic order entry systems to alert practitioners to double check the dosage strength.
- When sending and receiving prescriptions via fax, health care practitioners should keep in mind that decimal points can be easily missed due to “fax noise.” Prescribers should give the original prescription to the patient to take to the pharmacy for verification. Pharmacists should clarify prescriptions that contain fax noise.
- Educate staff about the dangers involved with expressing doses using trailing zeros and naked decimal points. **ap**

This article has been provided by the Institute for Safe Medication Practices (ISMP). Contact them at 215-947-7797.