Guidelines for Standard Order Sets

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PROBLEM: The Institute for Safe Medication Practices (ISMP) has long been an advocate for the use of standard order sets to minimize incorrect or incomplete prescribing, to standardize patient care, and to ensure clarity when communicating medical orders. ¹⁻³ Whether in electronic or paper format, well-designed standard order sets have the potential to:

- integrate and coordinate care by communicating best practices through multiple disciplines, levels of care, and services.⁴
- modify practice through evidencebased care.⁴
- reduce variation and unintentional oversight through standardized formatting and clear presentation of orders.¹⁻⁴
- enhance workflow with pertinent instructions that are easily understood, intuitively organized, and suitable for direct application to current information-management systems and drug-administration devices.¹⁻⁴
- decrease the potential for medication errors through integrated safety alerts and reminders.¹⁻⁴
- reduce unnecessary calls to prescribers for clarifications and questions about orders.¹⁻⁴

If standard orders are not carefully designed, reviewed, and maintained to reflect best practices and ensure clear communication, they may actually contribute to errors. In fact, the ISMP consulting team has identified dozens of serious problems related to the content, format, and approval or maintenance of standard order sets in its visits to health care organizations of all sizes and types.

This article addresses the importance of paying careful attention to the design

and maintenance of standard order sets and provides examples of commonly observed problems that can lead to serious errors. The complete guidelines for standard order sets, which may help in preventing these problems, can be found on the ISMP's website.⁵

SAFE PRACTICE RECOMMENDATIONS: Clinicians can take several steps to avoid errors in medical prescribing.

Content

Careful attention to the content of standard order sets helps ensure that the sets (1) are complete, (2) include important orders beyond what the prescriber initially considers (e.g., specific monitoring requirements), (3) reflect current best practices, and (4) are standardized among various health care practitioners.¹⁻⁴ Examples of frequently observed problems with the content of standard order sets include:

- numerous practitioner-specific order sets for the same conditions, resulting in variability in the clinical management of these patients.
- content that is a compilation of multiple prescribers' preferences instead of a streamlined, consensus-based order set.
- outdated order sets that do not reflect current evidence-based or best practices.
- mistakes and inaccuracies, such as incorrect or missing doses (e.g., magnesium sulfate 16 g instead of 16 mEq), routes, frequencies of administration, and rates of infusion; and typographical and spelling errors, particularly drug names.
- an exhaustive variety of medications covering all possible scenarios (e.g., orders that include multiple analgesics by various routes, laxatives, antacids, a bedtime sedative, antidiarrheal agents, antiemetic drugs, and others). These are sometimes called "don't bother me" orders, which lead to crowded medication administration records (MARs) and



leave treatment decisions to nurses' subjective, variable judgment.

- orders prohibited by an organization or ambiguous blanket orders (e.g., "take home meds" or "resume preop orders")
- "if ... then" orders, which inappropriately shift responsibility from the prescriber to the nurse or pharmacist to determine whether an order should be activated (e.g., "give Rho-GAM if indicated").
- types or frequency of necessary patient assessments (e.g., pulse oximetry) and laboratory monitoring not specified.
- orders that address known potential emergencies not specified (e.g., rescue agent available, when to administer the rescue agent or call the prescriber).
- chemotherapy order sets that include the total dose in the course instead of the single, daily dose.
- titrated medications without a measurable description of the desired effects, rate of titration, and maximum doses that should not be exceeded, or the dose at which the prescriber should be called.

Format

An appropriate format can make standard order sets easier to read and comprehend. A clear format is also helpful in reminding the staff to document pertinent information about the patient and prescribed therapy, and it can draw attention to important information. Elements of format include font style and size; use of white space; adequate space for handwritten entries; arrangement of content; prompts for information; appropriate use of symbols, abbreviations, dose designations, punctuation, and capitalization; layout and design; and directions for using the standard orders.1-4 Commonly observed problems with the format of standard order sets include the following:

Font style and size. Elaborate serif fonts and font sizes smaller than 12 point are difficult to read.

MEDICATION ERRORS

Use of space

- Crowded order sets don't allow space for handwritten entries.
- When no space is inserted between the drug name and the dose (e.g., "propranolol20 mg"), this can be misread as "120 mg."
- If a space is omitted between the numerical dose/volume measure and the unit of measure (e.g., "3Units"), this can be misread as "30 units."

Symbols, abbreviations, dose designations, punctuation

- Brand names are often listed without generic names, or generic names for single brand products do not show the brand name.
- Commas are often omitted with whole numbers over 999 to express a dose. For example, heparin "1,000 units" is preferred to heparin "1000 units" for clarity.⁶
- Large doses are expressed using numerous zeros instead of word terminology (e.g., "1 million" is preferred to "1,000,000."
- Error-prone symbols, abbreviations, drug name abbreviations, drug name stems, undefined drug protocol acronyms, or coined names are used (e.g., "magic mouthwash").⁶
- Trailing zeros after a decimal point should be used with caution; they should not be used for doses expressed in whole numbers. For instance, "1.0 mg" can be mistaken for "10 mg" if the decimal point is not seen.⁶
- Look-alike drug names are sometimes listed without using standardized Tall Man letters to help differentiate one drug from one another.

Prompts for patient information

- Prompts for patient allergies with description of the reactions may be lacking.
- Examples of prompts that should be included: actual weight (in kilograms or grams only); body surface area for oncology patients; diagnosis and comorbid conditions (e.g., diabetes, liver or renal impairment, behavioral health disorders, hypertension); and pregnancy and lactation status

Layout and directions for use

• The numbering system for orders

- may be confusing; numbers may be misinterpreted as the drug dose.
- Randomly grouped orders for treatments, procedures, and medications may cause medications to be overlooked among other types of orders.
- Orders sometimes show the drug name and dose or strength on different lines.
- In alphabetized lists of drugs from which to choose, look-alike names may be near each other.
- Complex order sets (e.g., for total parenteral nutrition) may list additives in a sequence and doses in units (e.g., mg vs. mEq) and in concentrations (mg/mL vs. mg/ liter) that differ from those in the computerized prescriber order entry (CPOE) system.
- Orders for patient-controlled analgesia sometimes list doses and infusion rate parameters in a sequence and strength presentation that differs from those pertaining to infusion pumps used to deliver the medications.
- Important patient information (e.g., allergies, weight) appears at the bottom of the screen or form. The prescriber might not see this or might notice it only after the orders have been activated.
- Prompts are often lacking on neonatal, pediatric, and oncology order sets that require prescribers to include the dose in "mg/kg" or in "mg/m²" for drugs prescribed according to weight or body surface area, the calculated dose, the actual dates of administration, and the cycle number (for chemotherapy regimens).

Approval and Maintenance

Managing the initial approval of standard order sets and keeping them current present numerous challenges to organizations. Without a standard process to address the approval and revision of standard orders, unacceptable variations in care and errors are possible. Examples of frequently observed problems with the approval and maintenance of standard orders follow.

 The organization's P&T (or another appropriate) committee never approved the order set.

- Older or outdated order sets have not undergone a recent clinical review
- Old typed preprinted order sets might be copies of copies; information may be cut off, and stray marks may be present on the forms.
- Outdated order sets are still in use for months or years after new or revised order sets have been adopted.
- Doctors might bring in order sets from hospital "B" that were never reviewed or approved by hospital "A."

CONCLUSION

Ensuring the consistent use of well-designed order sets and maintaining the orders in accordance with best practices requires vigilance and a team approach. Because standard order sets are often an important component for implementing clinical protocols, algorithms, critical pathways, and guidelines, organizations should establish an interdisciplinary process with rules to help design, evaluate, use, and maintain these orders. The professional staff needs clear directions to follow if they encounter order sets that do not comply with these rules.

To assist with the evaluation of order sets, the ISMP has created guidelines in the form of a checklist.⁵ In addition, the Agency for Healthcare Research and Quality has published findings from a study that it conducted on preprinted orders and how these sets can be used to promote best practices.⁴ The authors include several tables and an appendix that can be used to guide the creation and review of standard order sets.⁴ With these two resources,^{4,5} hospitals can begin to establish an effective process for designing, evaluating, updating, and enforcing safe use of standard order sets.

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