

Order Sets in the Electronic Health Record

Situation

- Order sets are a common feature in the electronic health record (EHR) and represent one clinical decision support (CDS) tool within computerized provider order entry systems.¹
- Order sets intend to help clinicians more effectively access appropriate items compared with individual ‘al a carte’ order entry, thereby reducing undesirable variability and improving adherence to evidence-based practices.^{2, 3, 4, 5}
- Poorly designed CDS may hinder care delivery by creating new unintended downstream hazards due to factors such as poor user interface design and introduction of new complexities in workflows (e.g., alert fatigue with high override rates or automation bias where clinicians over-accept computer-generated output in EHRs).^{6,7,8}
- Difficulty in anticipating how the complex environment of clinical medicine affects clinical workflow can hamper the effectiveness of CDS.⁹
- Consequences of sub-optimally designed order sets may remain unnoticed until an adverse event serious enough to warrant institutional attention occurs.¹⁰

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Background

- Order sets are collections of orders or steps aggregated in a single location and typically for a given condition, process, or clinical situation.¹
- Order sets can save time in ordering, promote adherence to best practices by integrating guideline information, reduce variation in care and offer other types of embedded decision support (i.e., dose calculators).¹
- The CDS Five “Rights” of Clinical Decision Support Tools include^{11,12}:
 - **Right Information** – relevant and supported by best evidence available.
 - **Right Person** – targeted to the correct individuals and supportive of their workflow
 - **Right Format** – presented in such a way that is useful to the task at hand (e.g., alerts, order sets, or info buttons, depending on the application)
 - **Right Channel** – delivered through the most appropriate medium for its goal
 - **Right time** – available to the user when it is needed
- The extent to which order sets actually support clinical workflow is not well understood.⁹

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Assessment

- The large number of order sets that healthcare institutions must build and manage make it difficult to systematically evaluate whether the content and design for each order set optimally aligns with clinician needs.¹³
- Poorly built order sets with outdated content can clutter the ordering interface, create distractions or even prompt clinicians to order unnecessary items due to automation bias.¹⁴
- One study found⁹:
 - ✓ Half of order sets were rarely ordered (less than 4% of the time).
 - ✓ Automation bias was suggested by the identification of multiple medications more likely to be retracted from order sets than when they were ordered a la carte.
 - ✓ Frequent a la carte ordering of at least one additional a la carte item suggesting the order set authoring committee did not identify the item's relevance (these items were ordered more frequently than half of the items included in the order set).

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Assessment

- To meet regulatory requirements that require regularly scheduled order set reviews, many institutions rely on a “top down” approach of employing small groups of clinicians to curate order sets based on clinical guidelines, institutional policies and expert opinion with limited quantitative insight into how the order sets are being used by clinicians in practice.¹⁵
- Purposeful and safer CDS design requires understanding the gaps between the expectations and realities of how CDS impacts clinician workflow in the real-world setting.⁹
- The Computerized Provider Order Entry with Decision Support SAFER Guide (**S**afety **A**ssurance **F**actors for **EHR R**esilience) identifies recommended safety practices associated with computerized provider order entry (CPOE) and clinical decision support (CDS) so that safety and the safe use of CDS is optimized.¹⁶

Recommendation	Order Sets in the Electronic Health Record	Yes	No	What action is needed?
	<p>Does your organization assign responsibility for selecting, testing, monitoring, and maintaining clinical decision support (CDS) performance and safety?</p> <p>Are a sufficient number of the following items, or similar such items, a part of your organization's processes to ensure safe Health Information Technology practice?</p> <ul style="list-style-type: none"> ➤ A rigorous process for testing new CDS is in place. ➤ Risk assessments conducted prior to go-live with new CDS. ➤ Clinical content is developed or modified by a multi-disciplinary group, including clinical specialists when appropriate. <p><i>See SAFER Self-Assessment Guide Organizational Responsibilities Recommended Practice 1.3</i></p>			

Recommendation	Order Sets in the Electronic Health Record	Yes	No	What action is needed?
	<p>Does your organization have staff members assigned the responsibility for the management of CDS content?</p> <p>Are a sufficient number of the following items, or similar such items, a part of their processes to ensure safe health IT practice?</p> <ul style="list-style-type: none"> ➤ A decision making structure exists for making decisions about clinical content. ➤ Responsibility for management of content, from selection to maintenance, is clear. ➤ Committees or other collaboration mechanisms are in place to approve order sets and documentation templates. ➤ There is a routine review of the CDS content embedded in the EHR and feedback is given to their EHR provider about local standards. ➤ There is clear responsibility for review of new CDS that become available from developers and other sources (e.g., professional organizations). ➤ Developers provide clear documentation of CDS content and the evidence-base to support that content. ➤ Developers routinely review and update CDS content they provide. ➤ Personnel are available, either internally or externally, to ensure that CDS is tailored to the workflows of professional roles and specialties. <p><i>See SAFER Self-Assessment Guide Organizational Responsibilities Recommended Practice 2.3</i></p>			

Recommendation	Order Sets in the Electronic Health Record	Yes	No	What action is needed?
	<p>Does your organization include practicing clinicians in all levels of EHR safety-related decision making that impacts clinical use?</p> <p>Do you have a sufficient number of the following items, or similar such items, as a part of your processes to ensure safe health IT practice?</p> <ul style="list-style-type: none"> ➤ Clinicians (including physicians, nurses, pharmacist, and others) are included on the EHR safety oversight committee of a large organization. ➤ Clinicians are involved in decision making about proposed changes to the EHR that affect clinical care (e.g., changes to screen design, content of order sets, charting templates, clinical alerts, role-based access to system resources, placement of workstations). <p><i>See SAFER Self-Assessment Guide Organizational Responsibilities Recommended Practice 2.4</i></p>			

Recommendation	Order Sets in the Electronic Health Record	Yes	No	What action is needed?
	<p>Does your organization have clinical staff assigned the responsibility for ensuring that CDS content, such as alerts and protocols, support effective clinical workflow in all practice settings?</p> <p>Do you have a sufficient number of the following items, or similar such items, as a part of your processes to ensure safe health IT practice?</p> <ul style="list-style-type: none"> ➤ A process exists for the review and modification of any locally developed, commercial, or freely available CDS so that it is appropriate for a particular setting. ➤ A clinical rules committee has a defined process for evaluating and overseeing the testing and monitoring of CDS. ➤ The unique needs of the pediatric population are taken into account when reviewing and modifying CDS. <p><i>See SAFER Self-Assessment Guide Organizational Responsibilities Recommended Practice 2.10</i></p>			

Recommendation	Order Sets in the Electronic Health Record	Yes	No	What action is needed?
	<p>Does your organization have staff members assigned the responsibility, adequately funded, and given appropriate oversight for the maintenance of the EHR-related hardware, software, CDS, and network/ISP performance?</p> <ul style="list-style-type: none"> ➤ Is regular maintenance of hardware, software, CDS, and the network/ISP organized and funded? <p><i>See SAFER Self-Assessment Guide Organizational Responsibilities Recommended Practice 3.1</i></p>			
	<p>Do staff members regularly monitor maintenance of the EHR-related hardware, software, CDS, and network/ISP performance and Safety? Do you have a sufficient number of the following items, or similar such items, as a part of your processes to ensure safe health IT practice?</p> <ul style="list-style-type: none"> ➤ When maintenance for these components is provided from outside the organization, oversight is conducted by an internal staff member to assure the competence and performance of the contractors. ➤ When maintenance is provided internally, regular schedules exist for it. ➤ EHR developers provide recommendations and timelines for routine maintenance procedures to local healthcare staff members. ➤ Assessments, using EHR developer-supplied checklists based on the best available evidence, are conducted regularly to ensure adequate maintenance. <i>See SAFER Self-Assessment Guide Organizational Responsibilities Recommended Practice 3.2</i> 			

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Additional Resources

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2. The Joint Commission. Sentinel Event Alert 54: Safe use of health information technology. March 31, 2015
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