In this era of reform, healthcare organizations are at no loss for assigned targets. Whether it is the achievement of Meaningful Use, the advancement of evidence-based medicine, the delivery of quality care at reduced costs or any of the many other established mandates and goals, today’s providers need tools that help them hit the mark.

Increasingly, both reform requirements and the search for solutions are leading many healthcare facilities to the same conclusion: The integration of standardized, evidence-based order sets, accessible through a computerized physician order entry (CPOE) system integrated with the electronic medical record (EMR), can create a strong core for success on a number of levels.

Such standardized order sets are taking center stage as an invaluable clinical decision support (CDS) tool with wide-ranging benefits for both patients and healthcare organizations (HCOs). Unfortunately, the revision or creation of an HCO’s body of order sets can be difficult and time consuming if not planned and carried out correctly.

In fact, without integrated systems in place to support an efficient order set process, it can take hospitals and health systems months to create or update a single order set. Without understanding and streamlining the communications among multiple authors, reviewers and approvers, insufficient order set projects can languish and fail despite the best efforts of the contributors.¹

This process can be particularly daunting for large organizations with programs that have been instituted, but not maintained, according to James Nolin, M.D., who has led order set development for a number of facilities. In these situations, there can be thousands of order sets that are current with the literature, he explained, as well as redundancies, incorrect information and sets that are not being used because they are flawed or difficult to find. There also may be versions of order sets that exist only on paper, added Dr. Nolin, now editor-in-chief, order sets, for Elsevier.

Summary

Standardized, evidence-based order sets have been shown to be a key driver in meeting the mandates of healthcare reform. The maintenance, revision and creation of order sets, however, can be arduous without integrated systems and a carefully laid-out process.

In this whitepaper, Dr. Jim Nolin, who has led order set development for several facilities and now serves as editor-in-chief, order sets, for Elsevier, breaks down the steps of effective order set management.

Dr. Kevin W. Hatton, clinical decision support medical director at University of Kentucky HealthCare®, then discusses how his organization used the four steps to improve and manage its order set program.

This white paper looks at what can be an overwhelming task, discussing the challenges of getting an effective system in place, providing guidance in overcoming them, laying out a clear path to the creation or invigoration of an order set management program and then providing a real-world example of the process in action.

BACKGROUND: THE PURPOSE OF ORDER SET MANAGEMENT

An order set is a grouping of orders used to standardize and expedite the ordering process for a particular clinical scenario. Standardized, up-to-date order sets promote application of CDS at point of care. “Order sets have the potential to be among the most impactful forms of clinical decision support (CDS). Ideally, they are deeply embedded in the EMR and have the opportunity to influence point-of-care decision,” KLAS, Clinical Decision Support 2012. With an effective review and management system in place, institutions can ensure their clinicians are remaining current with best practices and medical evidence.

Providing clinicians with agreed-upon, standardized orders can help them select appropriate doses, routes and other parameters when prescribing medications. These order sets, integrated into an EMR with a CDS system, may reduce the risk of errors that can lead to adverse drug events and can help nurses and pharmacists when they initiate therapies.2

In the context of compliance, such a process is integral to achieving Meaningful Use and meeting Centers for Medicare & Medicaid Services (CMS) and Joint Commission requirements. Order sets also are crucial to providers who wish to qualify for incentive payments under the Health Information Technology for Economic and Clinical Health (HITECH) Act, which offers payments to medical facilities and practices that utilize the EMR in meaningful ways. Proof of such Meaningful Use lay in the achievement of specific goals tied to the practice of evidenced-based medicine – including the use of order sets.

CMS CONDITIONS OF PARTICIPATION

“... allow a hospital to use pre-printed and electronic standing orders, order sets, and protocols for patient orders only if the hospital:

1) Established that such orders and protocols had been reviewed and approved by the medical staff in consultation with the hospital’s nursing and pharmacy leadership;

2) demonstrated that such orders and protocols are consistent with nationally recognized and evidence-based guidelines;

3) ensured that the periodic and regular review of such orders and protocols was conducted by the medical staff, in consultation with the hospital’s nursing and pharmacy leadership, to determine the continuing usefulness and safety of the orders and protocols...”

“Order sets reduce two types of errors. The more common ‘rule-based’ errors are decreased by the use of a checklist for ordering, which helps clinicians remember to do something or to select the right doses. ‘Knowledge-based’ errors decrease due to current medical information embedded into the order set.”

- Dr. Jim Nolin

PART I: THE PROCESS

There are four essential steps to order set management. They are:

1) Establishing a functioning governing body and a structure for order set management that is tied to key organizational objectives.

2) Planning/tracking the workflow of order set maintenance.

3) Developing and applying a style guide that focuses on consistency and ease of use.

4) Implementing methods to encourage and streamline clinician involvement.

Governance

A governance body must be established to support communication and decision-making for order set project coordination, customization and integration.

This group may be an existing committee, such as Quality, or a new charter-based entity. It should be multi-disciplinary, incorporating pharmacy and nursing, but led by a physician, preferably a program champion. High-level administration also should be represented to show the importance of the project and assure proper resources are assigned. Ideally, the group should meet weekly.

Drawing on his experience, Dr. Nolin advised the recruitment of medical staff leaders as participants, even if they are not fully invested in the process, as participation will bring them on board.

“It’s important to impress upon [recruits] that this is not simply a process committee, but a healthcare quality project,” he noted. “They have to keep in mind that effective order set management will allow them more time to do better quality work while ensuring compliance and promoting financial incentives.”

Among the committee’s duties are:

• Making decisions around priority, coordination, customization and integration of order sets.

• Establishing communications with stakeholders, clinical staff and IT.

• Assuring clinical workflow optimization.

• Providing oversight over the schedule.

• Establishing use and performance metrics.

• Tying the order set project to organizational goals, especially on quality.

“Order sets... have the potential to be among the most impactful forms of clinical decision support (CDS). Ideally, they are deeply embedded in the EMR and have the opportunity to influence point-of-care decisions....”

In an article, "Overcoming Barriers to Implementation of Order Sets," for *Advance Healthcare Network Executive Insight,* Dr. Nolin focused in on prioritization, which he said requires insight into the answers of key questions such as:

- Does the order set cover a common condition?
- Does the condition pose outcome problems or challenges?
- How do regulatory, compliance or accreditation issues play a role?

By weighing which conditions are common, reflect organizational quality challenges and have reportable measures, he noted, committee members can decide which order sets merit development or review and eliminate unnecessary or duplicative order sets that can take them off task.

The prioritization of order sets is more essential than ever, Dr. Nolin added, with the emergence of pay-for-performance models that tie remuneration to better management of a list of chronic conditions that is bound to expand.

Overall, however, quality of content and ease of access will be key drivers in continued and effective use of order sets, as physicians will be encouraged to implement easily accessible, quality information at point of care.

**Project Planning**

A clear plan is, of course, essential, as are clearly stated expectations, deadlines and goals. The committee also must apply project management principles such as tracking and monitoring while conducting development and deployment testing.

If order sets already exist, the committee must review, edit and integrate them into the EMR’s CPOE module. If new order sets are on the agenda, the committee must add build-and-test phases.

A project manager – a person with strong organizational skills – is vital to the order set management process. This person should understand existing workflow and guide advancement throughout the stages of this project with that workflow in mind. Often, it is important to note, one of the first steps is the establishment of a new, more efficient workflow.

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Style Guide

The next step involves the creation of a style guide that ensures consistency in areas such as naming, layout, formatting and types of evidence, sequencing of order set sections, size thresholds and guiding principles. Especially important are principles such as criteria for pre-checking an order. For example, one criterion might state that providers (must) use an order 95 percent of the time if it is to be pre-checked. Some organizations also have included a link for feedback, so physicians can make comments at point-of-use to promote ongoing improvement of order sets.

Consistency in naming and layout facilitates easy search and information retrieval, boosts provider adoption and use, promotes standardization and ensures alignment with an organization’s medical best practices and culture.

Style Guide Sample Component: Order of Contents based on ADC VANDIMLS

- Admit
- Diagnosis
- Condition
- Vital signs
  - Monitors
- Activity
- Nursing
- Respiratory
- Diet
- IVs
- Medications
- Laboratory
- Special studies
  - Radiology
  - Cardiology, GI, respiratory studies
- Consults

The style guide should ensure that order sets are comprehensive, but useable, facilitate clinical workflow, answer point-of-care questions, specify core measures and zero in on improving outcomes. It also will reflect constraints put on order set design by the limitations of the EMR.

The guide also must cover use of evidence since peer-reviewed medical literature dictates best practices and outcomes.

Unfortunately, hyperlinks to journal articles offer little point-of-care guidance, as providers may not have the luxury of time to peruse lengthy original sources. That’s why the best order set systems offer an alternative, with a process in which providers identify key questions in advance of point-of-care decision-making, ensuring brief, actionable answers when and where they are needed most.

Also important to the style guide are core, or reportable, performance measures. Providers eager to receive 100 percent pay-for-performance compensation must report these measures to the government while those that seek accreditation...
must report them to bodies such as the Joint Commission.

The most effective CPOE systems allow providers to place a performance measure icon adjacent to an order or insert a line of text before or after an order to call attention to performance measurement status.

**Physician Engagement**

Clinicians are more likely to adopt and use a process or technology if they've invested time and energy in its development, review and testing. Healthcare organizations should identify one or two project champions backed by additional champions in departments or service lines. This approach will enhance quality of content, improve adoption and create super users.

The order set committee then should invite all interested parties to join in order set review. Multiple approaches to review are used, such as webinars or lunch meetings, but, historically, asynchronous, technology-enhanced collaboration has worked best in Dr. Nolin’s experience. Meetings always can be called when online discussions are not sufficient to reach a conclusion, he noted.

Physician participation is vital. For example, the style guide might include a proviso that clinicians use an order on 15 percent of patients with a certain condition before the committee decides to include it in an order set; therefore, the committee may want to measure how often providers use a particular order. With this feedback, the committee can deliver an explanation if it chooses to include or omit an order from order sets.

To spur participation in the review process, the committee should encourage competition and celebrate success through public recognition, such as small gifts for order set generation or number of conditions reviewed. Healthcare organizations also can provide clinicians with CME credit.

However, while organizations should build collaboration and camaraderie around order set development, they also must stress timetables and deadlines. Those who resist or lack adequate time for order set review must realize that non-involvement could result in having to use order sets with which they don’t agree. Even if clinicians fail to join in order set reviews, they may need to participate in approval; however, the point of approval is not the time for review.

With the appropriate governance, planning, guidance and participation, healthcare organizations can minimize the stress of order set management and position themselves to reap the benefits, which can have profound impact on their efficiency, financial well-being and, most important, delivery of consistent, quality care.
PART II: PRACTICAL IMPLEMENTATION

University of Kentucky HealthCare® (UK HealthCare) is a large academic medical center located in Lexington. It is comprised of two adult hospitals, a children’s hospital and a freestanding surgery center. With active medical, nursing and allied health colleges, it also has a large graduate medical education program.

UK HealthCare has had active EMR and CPOE systems since 2006. Unfortunately, however, there was not a clear, consistent management program in place for order set creation and revision. As a result, the thousands of order sets that had accumulated in the EMR highlighted a number of issues, including:

- Significant redundancy.
- Unclear ownership among physicians, some of whom no longer were affiliated with the organization.
- Lack of specific guidance on creating an order set.
- Minimal guidance in the proper use of order sets.
- Wide variances in format and layout of individual order sets.
- A lack of a regular schedule for review and revision.
- Few links to online medical literature.
- Multiple methods for clinicians to request new, or changes to, order sets.
- No link between order set creation and the healthcare enterprise goals.
- No method for end user feedback or suggestions.

The task of correcting these issues fell to the organization’s CDS Committee, which was established in 2011 and is led by Kevin W. Hatton, CDS medical director and chief of the Division of Anesthesiology and Surgery, Critical Care Medicine, with Cecilia Page, director of clinical informatics.

In March 2013, the organization became an early customer of Elsevier’s new InOrder cloud-based order set creation and management system, using Dr. Nolin’s four recommended four steps for implementation.

UK HealthCare CDS Committee members include representatives of the institution’s medical, pharmacy, nursing and allied health sectors.
Governance

In establishing its order set management program, the CDS Committee worked with administrative leaders Dr. Carol Steltenkemp, chief medical informatics officer, and Bernie Boulanger, chief medical officer, to determine the most effective reporting structure and oversight system for the initiative. The team ultimately decided that the best course was direct, periodic reporting to the medical staff via the Medical Staff Executive Committee.

From there, the CDS group established goals, the rules and process for new work requests and a communication plan. Important to the project was that its management remain centered on UK HealthCare’s dual interests of optimal patient care quality and safety. A charter was drafted to define the ongoing project management goals involved in cleaning up the entire order set catalog and establishing an objective of annual review for each order set.

Project Planning

The CDS Committee created three different pathways for all future order set requests:

- **Routine** – for new order sets or changes to existing ones.
- **Urgent** – for changes that must be addressed in the near future, such as the introduction of a new drug that could drastically change treatment.
- **Emergent** – for those changes that must be made immediately, such as a drug or implant recall.

Each path was assigned defined metrics, such as time to completion. Important to changing the culture was the creation of a single, online request portal for order sets, with the URL widely circulated. To develop a queue of outstanding and new requests, the Committee created an objective scoring system based on:

- Safety impact (i.e. a patient injury)
- Clinical efficiency impact
- Financial impact
- Administrative prioritization
- Time in queue (to ensure all order sets eventually were addressed)

The organization then ran a few pilot projects to validate the pathways for order set creation, the objective scoring system and physician-led teams for new order sets.

When the order set management project started, UK HealthCare had nine order sets related to stroke care across its main hospital, the adjacent children’s hospital and a community-based facility. “We have now condensed that to two order sets,” reported Dr. Carol Steltenkemp, the organization’s chief medical informatics officer, “and we have evidence behind it.”
Style Guide

To ensure consistency in the writing of order sets, the Committee charged a small group of CDS members with revising UK HealthCare’s existing style guide, with final approval resting with the full group.

Structured around the ADC VANDIMLS mnemonic, the revamped style guide defined consistent nomenclature based on patient location, team specialty and disease state, for instance: Emergency Room, Medical, heart failure. It also defined appearance, implementing a grid layout with orders aligning at the left of the screen and grouped in a consistent and predictable fashion.

Also incorporated were goals for additional user information, such as links to recently published research and references and instructions for order set usage. Administrative details also were included, such as the “owner” of each set, that person’s contact information and a Change Log showing what was revised and why.

Physician Engagement

To promote physician participation, the Committee knew it would need an online tool that would allow end users to create orders and order sets without significant programming experience, engaging medical leaders with defined non-clinical administrative time and responsibilities and with minimal time involvement for other clinicians.

In the early stages of its system revamp, UK HealthCare has enlisted clinical teams to identify and address duplicate order sets and augment the resulting orders to ensure they are supported by appropriate medical evidence.

Small groups also were tasked with creating a specific solution for a specific problem. Designed around healthcare enterprise goals, the system calls for a physician leader, aided by a small group of content experts from other areas, to address each order set project. This methodology has proven successful as it allows physicians to tackle issues that are interesting to them and to feel engaged without being overwhelmed.

As the project continues, Dr. Hatton sees it contributing greatly to overall CDS principles of improving clinician effectiveness throughout the enterprise. Embellishing on the four basic steps of order set management project creation, he urges those tackling a similar goal to: redesign CDS processes to align with administrative goals for safety and efficiency, define governance issues early in the project, design the style guide with clinicians in mind and engage physician end users throughout the process.
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ABOUT ORDER SETS BY ELSEVIER

Order Sets by Elsevier is an intuitive, cloud-based solution that enables physicians, clinicians and informaticists to manage, author and review order sets in a collaborative environment.

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THE FOUR ESSENTIAL STEPS TO EFFECTIVE ORDER SET MANAGEMENT AND THEIR IMPLEMENTATION AT UNIVERSITY OF KENTUCKY HEALTHCARE

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