Building Evidence-Based Electronic Order Sets

Susan S. Cheeseman, DNP, APRN, NNP-BC
Clinical Information Analyst
St. Luke’s Health System, Boise, ID

The speaker has signed a disclosure form and indicated she has no significant financial interest or relationship with the companies or the manufacturer(s) of any commercial product and/or service that will be discussed as part of this presentation.

Session Summary

The use of evidence-based order sets within entry systems is expanding rapidly. This session explores strategies for development, deployment, and outcomes of evidence-based electronic order sets.

Session Objectives

Upon completion of this presentation, the participant will be able to:

- define Computer Provider Order Entry and Clinical Decision Support;
- identify three advantages of electronic order sets compared to paper order;
- outline seven steps in the development of evidence-based electronic order sets.

References


Session Outline

See presentation handout on the following pages.
Building Evidence-Based Electronic Order Sets

SUE SCHUBERT CHEESEMAN, DNP, APRN, NNP-BC
CLINICAL INFORMATICS ANALYST
ST LUKE’S HEALTH SYSTEM, BOISE, ID

Evidence-based Order Sets
- Computer Provider Order Entry
- Clinical Decision Support System
- Order Set as CDS Tool
- Types of Order Sets
- Advantages of Order Sets
- Stages in Electronic Order Set Development
- Glossary

Overview

Objectives
- Define Computer Provider Order Entry and Clinical Decision Support
- Identify 3 advantages of electronic order sets compared to paper order.
- Outline 7 steps in the development of evidence-based electronic order sets.

Medication Order: Example

Ordersing
- Clinician must select the appropriate medication, dose, frequency

Transcribing
- The clerk must read the order correctly and communicate correctly to the pharmacist

Dispensing
- The pharmacist must check for drug-drug interactions and allergies, then release the appropriate quantity of the medication in the correct form

Administration
- The nurse must receive the medication and supply it to the correct patient

Computer Provider Order Entry (CPOE)
- Refers to any system in which clinicians directly enter medication orders (as well as, tests, procedures, etc.) into a computer system, which then transmits the order directly to the pharmacy
- CPOE holds promise for safer, more effective and efficient patient care
- At a minimum, ensures standardized, legible, and complete orders thus reducing errors in ordering and transcribing stage
- 2009 American Recovery and Reinvestment Act incentivizing healthcare to implement information technology

CPOE and Clinical Decision Support System
- CPOE is generally paired with CDSS
  - Default values for drug doses, routes of administration, or frequency
  - Drug allergies or drug-drug or even drug-laboratory (e.g. warning a clinician before ordering a nephrotoxic medication in a patient with elevated creatinine)
  - Alert such as "you have ordered vancomycin; would you like to order serum vancomycin level after the third dose?"
  - Even more sophisticated, "the admitting diagnosis is hip fracture; would you like to order enoxaparin for DVT prophylaxis?"
Order Sets

- Provide straightforward clinical decision support within CPOE systems.
- Collections of orders designed to streamline and standardize the order entry process.
- Deliver real-time, evidence-based prompts at a given point in time for a particular condition or procedure.
- Make the “right thing” easier to do because they are faster than writing single orders.

Benefits: Paper Compared to Electronic Order Sets

<table>
<thead>
<tr>
<th>Paper Order Sets</th>
<th>Electronic Order Sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult to find</td>
<td>Readily accessible from anywhere</td>
</tr>
<tr>
<td>Clinician unaware the order set exists</td>
<td>Real time prompts when appropriate</td>
</tr>
<tr>
<td>Physical change to order set lags behind practice change</td>
<td>Order sets can be updated more easily when practice changes</td>
</tr>
<tr>
<td>Difficult to remove “old version” from patient care areas</td>
<td>Old version is replaced with the new version</td>
</tr>
<tr>
<td>Patient may need more than one order set</td>
<td>Ability to link or merge order sets for standardized elements of care</td>
</tr>
<tr>
<td>Possibly evidence-based</td>
<td>Can be linked to the evidence-based literature</td>
</tr>
</tbody>
</table>

Types of Order Sets

- Simple List
  - Laboratory Tests (Late-onset Sepsis evaluation)
- Complex
  - Condition (Necrotizing Enterocolitis)
- Phase of Care
  - Admission Order (Low birth weight, prematurity)

NICU Admission Order Sets

- General Admission Orders
- Birth Depression/Perinatal Asphyxia
- Multiple Congenital Anomalies
- Congenital Diaphragmatic Hernia
- Cyanotic Congenital Heart Disease
- Gastrochisis/Omphalocele
- Pre-op cardiac surgery orders
- Patent ductus arteriosus
- Myelomeningocele
- Necrotizing enterocolitis
- Persistent Pulmonary Hypertension
- Suspected sepsis
- Low birth weight (prematurity)

Advantages of Order Sets

- Improved patient care quality and safety
- Provide clinical decision support at the point of care
- Facilitate the development and deployment of the best evidence-based operational and clinical models
- Create a culture that fosters interdisciplinary collaboration
- Eliminate unnecessary variability in patient care
- Facilitate compliance with Joint Commission on Accreditation of Healthcare Organizations and Centers for Medicare and Medicaid Services performance measure sets
- Improve clinician efficiency
- Provide caregivers with the opportunity to spend more time with patients
- Encourage overall acceptance of provider order entry

Clinical Pathway Care Improves Outcomes among Patients Hospitalized For Community-Acquired Pneumonia (Hauck, Adler, & Mulla, 2004).

Purpose: To study six outcomes of community-acquired pneumonia patients comparing pathway-managed patients with non-pathway-managed patients.

Methods: A retrospective cohort study of 22,196 records of patients discharged from 31 Adventist Health System Hospitals between January 1999 and December 2001 was performed. Odds ratios for the outcomes were established, and a severity score from 1 to 5 was determined for each case, with 5 being the most severe.

Results: Pathway patients were significantly less likely to die in the hospital than non-pathway patients in 4 of the 5 severity strata. In all strata, pathway patients were twice as likely as non-pathway patients to receive blood cultures and appropriate antibiotic therapy. Pathway patients classified as severity 3 were 80% less likely to progress to respiratory failure requiring mechanical ventilation than non-pathway patients.

Conclusions: Patients who were placed on pneumonia clinical pathway care were much more likely to experience favorable outcomes.
Impact of Evidence-based practice and Decision making tools: Case Example

**Process:**
- Performance of blood cultures during hospital stay
- Use of recommended antibiotics (Infectious Disease Society of America Guidelines)

**Clinical Outcomes:**
- Respiratory failure requiring mechanical ventilation
- Hospital mortality

**Financial Outcomes:**
- Prolonged LOS
- Elevated total charges

“Standardize to Excellence”
- Don Berwick, MD, MPP, FRCP, president of the Institute for Healthcare Improvement (IHI), has challenged us with a different vision of how we should use order sets.
- He says we should “standardize to excellence.” This isn’t about average care or care we can all agree is not bad. It is about identifying excellence and holding our fellow providers to this standard. Done well, that’s exactly what order sets should accomplish.
- The next time you hear someone say, “I don’t believe in standardized practice,” perhaps the question you should ask is, “Do you believe in practicing to a standard?”

Where Are You on the Timeline?

Steps in Electronic Order Set Development

1. Secure administrative support and facility buy-in
2. Plan before you build
3. Enlist subject matter experts
4. Develop a communication plan
5. Apply the 80/20 rule
6. Allow for provider training
7. Conduct Annual Review and Change Control

1. Secure Administrative Support & Facility Buy-in

- Change management
  - Identify stakeholders
  - Transition from “our facility” to “our system”
- Governance

2. Plan before you build

- Standardize
- Scope and Prioritization
- Guiding principles
### Standardize
- Robust order catalog with appropriate synonyms
- Orders naming convention
- A single formulary
- Consolidated laboratory and nutritional systems
- Availability of evidence links within order sets
- Downtime plan
- System wide maintenance plan

### Scope and Prioritization of Order Sets
- Diagnosis related groups (DRG) data
  - Particularly patient volumes
- Institute of Medicine’s 20 Priority Areas
- Organization’s key quality initiatives
  - Conditions with mandated outcomes reporting
  - High impact on quality/safety
  - Benchmarking initiatives
- Previous paper order sets
- Individual service lines
- Pathways of care

### 3. Enlist Subject Matter Experts
- Physicians
- Nurses
- HIM Documentist or Specialist
- Coding
- Pharmacist
- Dietitian
- Quality and Safety expert

### 4. Develop a Communication Plan

### 5. Apply the 80/20 rule
- Build the most common orders used approximately 80% of the time.
- Providers can add the other 20 percent later.
- Keep order set length short
- Use common sub-sets (short order sets nested within major order set, i.e. common IV fluids)
- Notes within order sets should be pertinent to procedures and patient safety—keep to a minimum
- Include evidence links when possible

### 6. Allow for Provider Training
- Moving from paper to EHR system with CPOE creates a steep learning curve for many providers
- Schedule training for order sets in advance of go-live
- Allow for practice environment and mandate participation
- One-on-one peer coaching during go-live
- Increase number of providers during go-live to allow reasonable workload
7. Conduct Annual Review and Change Control

- As new evidence becomes available, order sets must be updated to reflect these changes.
- Establish a process for routine and emergent reviews and associated change control
- Establish metrics to determine impact of order sets on clinical outcomes

Glossary of Terms

- **Change Control**: A component of change management within Information Technology (IT). Change control is typically a multistep approach to ensuring that all changes made to a product or system are necessary and documented and that resources are used in the most effective way possible.
- **EHR Incentive Programs**: The EHR Incentive Programs, run through Medicare and Medicaid, provides payments to eligible professionals, eligible hospitals, and critical access hospitals (CAH) for demonstrating successful adoption, upgrading, implementation, and/or meaningful use of certified EHR technology. The Medicare EHR Incentive Program provides up to $44,000 to eligible professionals who qualify, and the Medicaid program provides up to $3,750. Providers must demonstrate “Meaningful Use” in order to receive a financial award. The EHR incentive programs are designed to improve the quality of care, increase efficiency, and decrease the cost of healthcare through the use of health information technology.
- **Stage 2 Meaningful Use**: Beginning in 2014, the second stage of meaningful use focuses on advanced clinical processes. Attaining meaningful use in Stage 2 requires that eligible professionals (EPs) meet criteria in the areas of:
  - More rigorous health information exchange (HIE)
  - Increased requirements for e-prescribing and incorporating lab results
  - Electronic transmission of patient care summaries across multiple settings
  - More patient-controlled data
- The Office of the National Coordinator for Health Information Technology (ONC) and the Centers for Medicare & Medicaid Services (CMS) have finalized the specific certification criteria for Stage 2.

Building Electronic Evidence Based Order Sets

Summary

The use of evidence-based order sets within entry systems is expanding rapidly. This session explores strategies for development, deployment and outcomes of evidence-based electronic order sets.

Sue Schubert Cheeseman, DNP, APRN, NNP-BC
cheesema@sllu.org