



Enhancing Patient Safety with Clinically Intelligent Physician Order Entry

WHO IN HEALTH CARE is not concerned about quality and patient outcomes? As clinicians struggle to ensure patient safety, health care workers manage the best they can within the realities of shrinking budgets and limited resources. Financial, regulatory, and consumer pressures mount on providers, forcing them to question their ability to deliver care efficiently and effectively.

The recently released report from the Institute of Medicine (IOM, 2001), "Crossing the Quality Chasm: A New Healthcare System for the 21st Century," is one more lightning rod for those pushing for action. The report calls for fundamental changes within the U.S. health care system to better deliver uniform quality health care.

The IOM calls for improvement in six key areas. Health care should be:

1. *Safe* — avoiding injuries to patients from care that is intended to help them.
2. *Effective* — providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit (avoiding underuse and overuse, respectively).
3. *Patient-centered* — providing care that is respectful of and responsive to individual patient preferences; ensuring that patient values guide all clinical decisions.
4. *Timely* — reducing waits and sometimes harmful delays.
5. *Efficient* — avoiding waste, including waste of equipment, supplies, ideas, and energy.
6. *Equitable* — providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status.

In the 1999 report "To Err is Human: Building a Safer Health System," the IOM addressed the overabundance of medical errors, and in particular adverse drug events. In both of these respected studies, computerized physician order entry (CPOE) is identified as a key information technology tool that can improve patient safety. In addition, the Leapfrog Group, a coalition of purchasers of health care, including both employer organizations and Fortune 500 companies, specifically identified CPOE as one of three key strategies to ensure patient safety.

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Unfortunately, less than 10% of all hospitals have any type of CPOE.

What Is CPOE?

There are many definitions of CPOE that make comparisons of clinical experiences with such technology difficult. The American Hospital Association (AHA, 2000) defines CPOE as "a system for direct entry of one or more types of medical orders by a physician into a system that transmits those orders electronically to the appropriate department." As clinicians other than physicians now write orders, all types of practitioners should be considered when referring to CPOE.

The sophistication of CPOE varies from simple systems that electronically record and deliver orders to those that include varying levels of clinical decision support. It is these latter "active feedback" systems that can make the greatest difference on patient care.

Clinical Decision Support Enhances Benefits of CPOE

CPOE provides numerous benefits including eliminating illegible orders, reducing transcription, rapid routing of orders to the appropriate destination, and with decision support the checking of orders against varied clinical knowledge bases. Decision support enhances care delivery by searching for potential treatment conflicts. For example, prescribed medications are checked against patient allergies, drug-drug interactions are explored, and therapeutic interventions are evaluated against patient characteristics and limitations.

In addition, alerts and reminders, automatically generated in real-time, notify clinicians of therapeutic actions that may positively or negatively affect care. These automatic alerts free clinicians to concentrate on collecting and synthesizing patient information to develop effective treatment plans rather than engage in routine, memory tasks. In addition, the sheer volume of medical information today makes it impossible for any clinician to effectively and efficiently do the checking that is possible with clinical information technology tools.

To reduce variation and make outcomes more predictable, some organizations may employ CPOE to implement standard orders and clinical guidelines. CPOE offers organizations a way to introduce evidence-based medicine quickly. This is in contrast to some studies that have determined that it takes as long as 17 years for new medical knowledge to filter completely through the medical community.

In addition to enhancing patient safety, CPOE can significantly control costs. Several hospital-based

studies have shown a marked decrease in duplicate orders, unnecessary procedures, and contraindicated therapies. In particular, these medical errors present a large burden on health care resources due to increased lengths of stay, need for correcting interventions, and an overall reduction in staff efficiency.

Implementing CPOE

Implementing any new clinical system, particularly one that so strongly influences all caregivers, requires strong clinical leadership. Top executives, both administrative and clinical, must be strongly in favor and unwavering in their support of CPOE for its implementation to be successful.

To facilitate clinician acceptance, organizations should appoint clinical leaders to represent the physician and nursing staffs. These respected clinician leaders must have a working knowledge of clinical information technology systems and possess the skills to communicate effectively with their peers. These leaders act as conduits of information between the clinical group they represent and the administrative staff working to implement the new system.

Throughout the installation process, these leaders will educate their representative groups about each step in the implementation while sharing with the administrative staff the concerns and needs of the clinicians. Only through open and honest dialogue and tweaking of plans to reflect realities can CPOE be implemented successfully.

Perhaps the greatest obstacle to implementing CPOE successfully is its impact on clinician workflow. Re-engineering of workflow before implementation reveals potential problems and bottlenecks that can be addressed during CPOE implementation design. In addition, clinicians can participate in the implementation planning thereby "buying into" the workflow changes before they are imposed. This process delivers a clinical information tool that is desired rather than tolerated.

Summary

The AHA, in its *Guide to Computerized Physician Order-Entry Systems* (2000), sums things up this way: "CPOE systems with clinical decision support are uniquely qualified to prevent prescription errors due to lack of available information on drug or patient, and transcription errors due to the misreading of the name or dose of a handwritten drug."

As clinicians concerned about the quality of health care and the well-being of our patients, it is time for us to welcome the introduction of CPOE and take an active role in its successful adoption. \$

REFERENCES

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