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Computerized Physician Order Entry (CPOE) at Thomas Jefferson University Hospital

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Computerized Physician Order Entry (CPOE) at Thomas Jefferson University Hospital

Beginning in 1996, Thomas Jefferson University Hospital (TJUH) embarked on a mission to transform the way its clinicians and staff use clinical information. Starting from a completely paper-dependent system of clinical documentation, ordering tests and treatments and reporting results, TJUH staff have come to regard point-of-care availability of all clinical information as the standard. Fully half the nursing units in the hospital, accounting for nearly 300 patients, currently function with fully computerized physician order entry (CPOE) as the sole method of initiating orders, and the remainder of the hospital units are poised to complete the implementation of CPOE by next year. This review will describe the goals, obstacles, achievements, benefits and current challenges to this ambitious undertaking. With the strong support of TJUH and University leadership, a multidisciplinary task force was convened in 1994 to establish principles and goals for a new clinical information system. Three major goals were:

- Complete patient care information whenever/wherever patients receive care
- Cost and clinical information to be coordinated to optimize care
- Electronic databases to identify variation and identify best practice

A list of functional .wants. was created to help guide the design, selection and implementation of such a system:

- Link providers, settings, and patients
- Patient centered across settings and encounters
- Common registration
- Access to data for monitoring quality and resource use

Over the next year, a thorough review of potential vendors was conducted. We had made several strategic decisions including 1) buy rather than build, 2) stay on the leading but not "bleeding" edge of technology, and 3) partner with a vendor that had demonstrated success in a complex academic medical environment. PHAMIS (later acquired by IDX) Lastword was chosen as the preferred vendor.

In January 1999, TJUH went live with Lastword throughout the entire hospital for results reporting. This implementation required, in addition to planning by Information Systems (IS), training of the entire staff of TJUH using Lastword for admission, transfer and discharge, registration, medical records, and pharmacy, as well as clinicians using Lastword to retrieve results of tests.

In preparation for physician order entry, the workflows of individual departments were analyzed in a multidisciplinary group to identify opportunities for redesign in the new Lastword environment. Close involvement with the medical and house staff maximized the opportunity to design a useful and efficient system. Through an educational effort led by the Department of Nursing with strong IS support,

thousands of nursing and other staff were trained in preparation for the first .pilot. unit, which began nursing flowsheet documentation and CPOE in November 2001. Two other units quickly followed, and in a single conversion that encompassed an additional 227 beds across all clinical departments, every non-monitored bed was converted to Lastword for flowsheet documentation and CPOE by November 2002. Currently, Lastword is the only option for order "writing" on 16 nursing units encompassing 350 beds and in two post-anesthesia care units.

Anticipated and unanticipated benefits have been realized, including the elimination of handwriting as a source of potential error and computerized checking of drug allergies, drug interactions, and appropriate dosing ranges. The creation of order sets has not only permitted efficient ordering of complex sequences of tests, but has also facilitated best practice using evidence based medicine to select "up-front" the most effective therapies. Time delays between ordering and other processes (such as scheduling or performing tests) have been minimized through the elimination of "handoffs." For example, the order for a chest X-ray now is received in the radiology department instantaneously. The copying of the order sheet, hand carrying to the radiology department, and manually entering the order into the radiology information system have all been eliminated.

In a study conducted by Craig Senholzi, PharmD, and myself, we found a near elimination of certain error-correcting pharmacist intervention (for example, wrong doses of medications), but an increase in interventions needed to address duplicate orders. We anticipate that greater familiarity with the CPOE system by residents will minimize this problem.

The near future holds the promise of additional functionality, such as outpatient problem lists, automated discharge summaries and electronic prescription writing. By February 2004 every order written by physicians at Jefferson will be computerized. As systems become increasingly easy to use and powerful, there will undoubtedly occur a revolution in medical information systems as CPOE is widely adopted. The inherent complexities of medicine, the costs of implementing CPOE, the lack of standards of CPOE systems and the "tradition" of selecting and educating physicians have all delayed its arrival; as new young physicians enter the ranks of the profession, the latter obstacle will cease to exist. Addressing the other three remain important challenges.

About the Author

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