

The Financial Impact of an Emergency Department Information System

Implementing an EDIS can have far-reaching and multilayered positive effects on your medical center's ROI.

Michael Hocker, M.D., F.A.C.E.P., Duke University Medical Center

Emergency department information systems (EDIS) are appearing in more and more emergency departments (EDs), and their many features make them useful tools. The cost of these systems can impact purchasing and implementation decisions; determining their prospective ROI, however, can be difficult.

For the busy academic teaching ED at Duke University Medical Center, implementing an EDIS, such as the one offered by Wellsoft Corporation, produced a positive financial impact. After patient tracking, physician and nurse documentation, and billing interface were implemented, multiple financial impacts were observed. Some of these impacts have direct quantifiable effects that can be measured to determine ROI, while others are more ambiguous and have an indirect and qualitative impact. The most obvious and easiest ROI to quantify is the revenue generated by improved charge capture associated with use of template-driven documentation. Also, the time spent by providers performing functions such as order entry, documentation, retrieving ancillary studies, prescription writing, discharge instructions, and follow-up can be substantially reduced with an EDIS. One unexpected result that has a significant ROI is the decrease in physician turnover time at the end of a shift. Overall, the use of an EDIS has realized a positive ROI, allowing the hospital to recover costs associated with the purchasing, implementation, and support of the system.

Improved Charge Capture

For Duke University Medical Center, the revenue generated by improved charge capture associated with using template-driven documentation is the most obvious and easiest ROI factor to quantify. Pre-implementation baselines can be easily established to measure the benefit of increased charge capture. Previously, we dictated abbreviated charts. The dictation process utilized templates and key phrases to help ensure that docu-

mentation guidelines were being followed. In addition, the resident-generated paper chart was used to support documentation requirements and emergency management (E&M) codes. The charts were then reviewed and coded by professional coders. Prior to the implementation of electronic documentation, most providers and administrators believed we were generating a fairly complete chart that met regulatory documentation requirements. However, post-implementation of the electronic documentation system, we observed large shifts toward higher E&M codes without significant shifts in admission rates or other acuity factors. These increased E&M levels can be linked directly to increased billing, charge capture, and revenue generation.

The improvements in charge capture appear to be multifactorial in streamlining the clinical workflow as well as increasing efficiencies. EDIS-derived charts are more readable, allowing coders to clearly identify the components of the ED course workup (history, past medical and family history, review of systems, and exam) and medical decision making. Structured templates encourage real-time identification of additional documentation components by the provider. Due to the ease of documenting via the template system, procedures are documented more frequently. Professional coders are then able to identify the exact description, the extent of the procedure, and who ultimately performed the procedure for coding purposes. The timely completion of charts as the patient is being seen is crucial to generating a more representative chart and diminishes the lag time from chart completion to coding and bill generation. All of these factors have been a product of the EDIS implementation, resulting in dramatic improvements in revenue.

Michael B. Hocker, M.D., F.A.C.E.P., is an emergency physician and fellow in the American College of Emergency Physicians and is the medical director for the division of emergency medicine and assistant clinical professor of surgery at Duke University Medical Center in Durham, North Carolina. He chairs the ED patient flow, operations, and revenue enhancement committee; sits on the EDIS Steering, GME, and resident selection committees at Duke University Medical Center; and has an active interest in medical education, hospital administration, coding/billing, and reimbursement.

Time Savings

Now more than ever, medicine is being treated as a business and the old adage “time is money” has never been more true. Prior to implementing the EDIS, many physicians were concerned that the time spent utilizing all the features associated with an EDIS would decrease the time they had available to spend with patients. While it is difficult to determine the exact time spent interacting with the EDIS, the time providers spend performing functions such as CPOE, documentation, reviewing radiology and laboratory results, prescription writing, discharge instructions, and follow-up has been dramatically shortened with an EDIS. In addition, the system Duke University Medical Center utilizes incorporates all of the essential functions into one seamless system, which interfaces with other multiple hospital systems. These essential integrations result in decreased time needed to perform and complete processes and with fewer delays in moving through multiple electronic systems.

The time required to produce a chart using electronic templates varies widely based on the complexity and adaptability of the patient’s case to a template. At Duke University Medical Center, we have observed that the time spent using templates appears to be equivalent to dictation or handwritten charts, but further studies would be needed to prove this conclusively. When utilizing an EDIS, one important factor to consider is the group of users and their computer literacy. Not surprisingly, individuals with more computer experience require less training and can navigate through the EDIS system more efficiently. Thus, the learning curve can be dramatically decreased by proper pre-implementation training, a structured go-live process (with adequate supervision and support), and adapting the system to the users’ needs (i.e., structured templates for the most common diagnoses).

Reduction in physician turnover times is one important and unexpected observation that has had an indirect impact on ROI. After implementing the EDIS physician documentation, we observed a dramatic decrease in physician crossover time at the end of a shift. The average time spent by faculty members in turnover ranged from 30 to more than 90 minutes prior to the implementation of physician charting. Post-implementation, the turnover time diminished to 10 to 30 minutes. This decrease resulted in fewer overtime hours paid, fewer scheduled overlaps, and improved physician satisfaction (because of better adherence to their schedules). This decrease is due to real-time ability to view, edit, and complete charts combined with improved communication and readability. Figure 1 represents the entire improvement in time observed in charting and turnover pre- and post-implementation of Duke University Medical Center’s EDIS.

Timely access to previous patient records is a vital function in any ED. The EDIS Duke University Medical Center uses allows

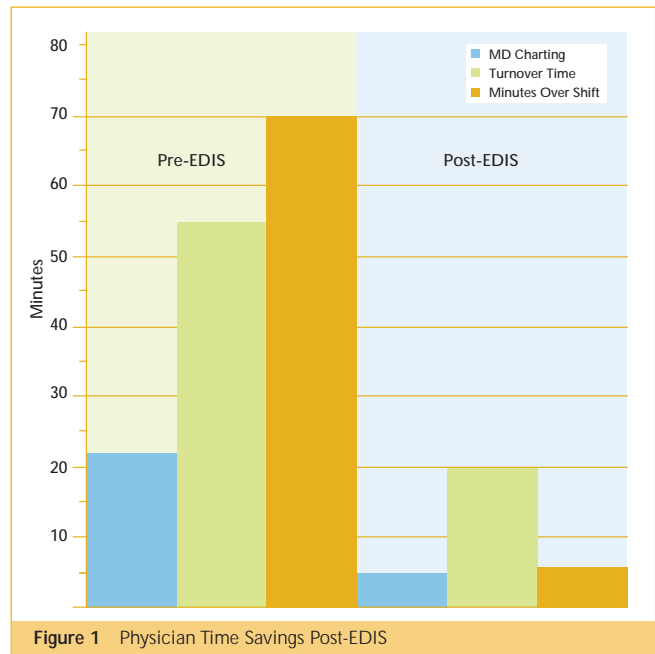


Figure 1 Physician Time Savings Post-EDIS

previous ED visits to be accessed and viewed instantaneously, directly from the patient tracking screen via the patient’s name or medical record number. In addition, an HL7 interface with the hospital information system (HIS) enables instantaneous real-time downloading of ED medical records. Patient demographics from the HIS are immediately available in the EDIS without data entry.

A CCOW-compliant version of the EDIS has been enabled to allow easier movement between the EDIS and the hospital electronic data repository. CCOW allows the ED user to access multiple CCOW-compliant applications with a single log-on, simplifying the use of multiple systems. While logged on to the EDIS, in any component of the patient record or tracking screen, one keyboard click on the hospital data repository brings up the patient’s hospital electronic medical record. At any time during the visit, a preliminary or final copy of the chart including EMS/pre-hospital, and nursing and physician documentation can be viewed from either the EDIS or data repository. Medical record availability and real-time charting have become valuable tools that have diminished staff workload and time, while ultimately improving patient care.

More difficult to quantify, but very real, are the downstream effects of an EDIS. The increased quality of the provider charts has resulted in diminished effort for the ED unit clerks, medical records, and billing departments. The charts are now readable, the procedures clearly documented, and the overall chart complete at the time the patient leaves the ED. In every aspect, there are reduced manpower hours and FTEs that can be realigned or reduced, resulting in financial savings to the ED and hospital.

Reduced Dictation and Paper Costs

Electronic documentation templates have resulted in financial savings to the department and hospital by reduced dictation cost. Prior to the implementation of the physician documentation system, the average dictation cost for the hospital averaged \$5 to \$10 per chart. We have chosen to keep dictation as an option for providers as backup for complex cases, when further explanation is indicated (medico-legal cases), and if technical issues with the system were to occur. With a large group of physicians and midlevel providers, we have gone from 100 percent of charts being dictated to currently less than 3 percent. One can calculate the cost savings of an EDIS charting system by simply multiplying the average cost of dictation times the number of visits per year; it is estimated that our institution will save approximately \$300,000 to \$500,000 a year in dictation costs.

Charting expenditures were further reduced as the hospital eliminated the 25 cents per chart for the paper records that were being completed by residents. With all the modalities of an EDIS including CPOE, nurse and physician documentation, and results reporting, a nearly paperless medical record can be generated and stored. The money saved in dictation and paper costs along with diminished workload for medical record upkeep can be significant, with major financial savings for the department and hospital.

Clinical Efficiencies

An EDIS can result in multiple improvements that may be difficult to quantify financially but have significant impacts on department function. Utilization of the various EDIS components has resulted in reduced waiting times, elopements, and decreased overall length of stay (LOS). LOS is determined by multiple factors once the patient enters the ED. Triage times have been reduced with nurse-driven template charts and a vital sign interface that automatically drops the vital signs into the nursing note once the measurements are taken. The EDIS tracking display then enables the triage nurse to determine the best placement for the patient. Additional tracking features such as color coding help alert staff to the need for nurse or physician evaluation. The CPOE function allows the provider to input lab sets that are interfaced with radiology and the laboratory as well as notifications of nursing needs. This process takes less than the time it would take to complete handwritten orders, is legible, and does not require further interpretation by a unit clerk. The order input also alerts nurses, ECG technicians, and respiratory therapists of pending orders. Once the task is complete, the EDIS can automatically drop the item into the completing user's notes. The result-return interface then notifies the provider of the completion of an ancillary test/study and the critical values

via the tracking screen, and can manually or automatically place the information into the provider's notes.

Once a disposition decision has been made, the EDIS is interfaced with the hospital bed control center, which then assigns a bed and updates a bed status. Upon patient discharge, the nurse is notified via the tracking screen and can then review the diagnosis and provide instructions and prescriptions for the patient. Once the patient leaves the room, environmental service is notified, via a tracking screen, for room cleaning and the process begins again. In addition, other areas of the hospital (cardiology and the operating room) have asked to view the EDIS system via virtual access to help with bed flow issues.

The EDIS has helped improve the efficiency of our very complicated ED through patient tracking, automated process, and communication functions.

Administrative ROI

The EDIS has been a valuable administrative tool in reliably tracking ED statistics. The system we utilize incorporates an active tracking process to monitor patient flow throughout the ED. Every status, such as nurse or physician evaluation, is time stamped and can be reviewed and reported on. In addition, consultant notification and arrival can be easily documented. The system has multiple standard administrative functions that easily produce daily reports. With minimal manipulation, these reports can be modified so that any component of the visit that is attached to a time stamp can be reviewed for any given time period. Data obtained from the EDIS can be sent to a spreadsheet where further analysis, data manipulation, and interpretation can occur. We have taken the data extracted from the EDIS and compared it against benchmarking data to determine areas for improvement. This information is currently being used by our ED to develop new strategies for further reducing overall LOS, consultant delays, ancillary service delays, and elopement patterns. The ultimate result of improved ED efficiency can be seen in improving patient and staff satisfaction scores. The ROI for this improvement is not always quantifiable but extremely important to the ED staff and hospital administration.

Conclusion

Implementation of an EDIS, such as the one offered by Wellsoft Corporation, has had dramatic effects on the way we currently practice emergency medicine and has resulted in numerous improvements in efficiency and patient care. Staff satisfaction and utilization of the system have been remarkable. In addition, the financial implications have been dramatic, proving that an EDIS can be financially advantageous. The positive ROI has been well documented, resulting in the hospital's ability to recover the costs associated with the implementation and continued support of such a system. ■

Maximize Emergency Department Information System Efficiency

Wellsoft Corporation is the leading provider of integrated software solutions for hospital-based emergency departments. For the second consecutive year, Wellsoft is ranked No. 1 Overall Emergency Department Information Systems (EDIS) in the KLAS Enterprises EDIS study. With 16 years of experience in providing emergency medicine software, Wellsoft leads the way in custom solutions for enterprisewide or single hospital implementations. Analyzing the client's existing workflow and infrastructure, Wellsoft configures the system to meet the individual challenges faced by each emergency department.

Increased Efficiency

Wellsoft patient tracking, nurse and physician documentation, and orders and results functionality provide the tools for greater efficiency. Decreasing waiting times, length of stay, and eelopements significantly improves throughput for an improved bottom line. Documentation templates ensure that regulatory standards are met, reduce dictation and paper usage, and improve charge capture, maximizing revenue. Extensive standard and custom reports provide clear, meaningful data for addressing bottlenecks, increasing accountability and meeting the Center for Medicare and Medicaid Services, the Joint Commission on Accreditation of Healthcare Organizations, and the Emergency Medical Treatment and Active Labor Act reporting requirements.

Improved Quality of Care And Patient Satisfaction

Instant, simultaneous access to patient charts ensures efficient patient throughput, improved clinical coordination, and significantly reduces departmental noise. A quieter department, decreased waiting time and length of stay promote increased patient satisfaction. Quality discharge instructions, prescriptions, and work/school releases reduce patient callbacks and promote increased patient compliance.

Enhanced Risk Management

Wellsoft Risk Management features aid in managing risk and are inherent in the design of the

software. The tracking feature automatically flags patients with previous visits and those with specialized care plans, promoting continuity of care. Medications and allergies are always displayed in the top right corner of the patient record, reducing the likelihood of errors. Alerts on the tracking display indicate a situation that requires attention, such as re-evaluation needed, insufficient documentation, or a reminder to check vital signs. Discharge instructions provide detailed instructions to the patient and are documented in the chart. Any data fields in the Wellsoft system can be made mandatory, enforcing compliance with pain scales, domestic violence screening, vital sign collection or any state mandated, hospital policy, or practice standard.

Seamless Integration

Wellsoft provides total integration within the hospital and across the enterprise. HL7 compliance ensures that Wellsoft can integrate with any system relevant to the emergency department visit such as the laboratory or radiology systems. CCOW compliance enables the emergency department user to access multiple applications with a single log-on, simplifying the use of multiple systems. Wellsoft's Integrated Clinical Management System provides access to patient data in real time across a WAN, enabling all departments to access and report on data either as a single hospital entity or a health system.

Greater ROI

Wellsoft's EDIS streamlines processes in the emergency department encounter resulting in increased efficiency in patient throughput. "Working smarter" reduces waiting time, length of stay and eelopements, maximizing capacity. Documentation templates result in improved charge capture and reduced paper costs. Real-time chart availability eliminates lost charts, improves communication, and reduces errors. Patient aftercare instructions and electronic prescriptions decrease liability. Auto-faxing and reporting decrease manual labor costs. In today's financial climate, IT expenditures must deliver overall value and real cost savings – the Wellsoft system achieves both. ■



Wellsoft Corporation is an innovative developer of software systems for emergency medicine, designing and implementing client-driven solutions since 1988.

John Santmann, M.D., F.A.C.E.P.
CEO and President

Denise Helfand
VP, Sales and Marketing

James Peck
Director, Implementations

Matthew Weintraub,
R.N., B.S.N., P.H.R.N.
Senior Clinical Implementation
Manager

Wellsoft Corp.
605 Franklin Blvd.
Somerset, NJ 08873-3645
Toll-free 800.597.9909
Fax 732.249.5071
wellsoft@wellsoft.com
www.wellsoft.com

Business Contact

Denise Helfand
Phone 800.597.9909
dhelfand@wellsoft.com