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Migration of Patient Data from Monitor to Record

By Jonathan Barmettler, Western Region CTO for Bio-Clinical Integration

In most high-acuity environments, the steady beep of a vital signs monitor is a muted sound in the background, indicating that the patient is stable – at least for the moment. The nurse generally writes the vital readings on the patient chart on a regular basis. If trending information is required, recordings over appropriate time intervals are printed and added to the patient chart. It's a highly manual process in a high-cost and high-intensity environment. Now, it's all about to change.

As several of my colleagues have written in previous columns for this newsletter, an organization's compilation of patient data is becoming a valuable strategic asset. It is always important for treating the patient, but it also constitutes a significant competitive differentiator in the new marketplace. The data from patient monitoring devices are necessary both in terms of quantity (i.e., as a large percentage of recorded data) and in terms of quality because measurements indicate patient status over time and provide a real-time indicator of sentinel events.

The emergence of electronic medical/health records (EMR/EHR) systems and the need to streamline clinical data-gathering are focusing more attention of the implications of automating the data collection/recording process. A review of both the rewards and requirements of migrating (computer-speak for *transferring*) monitoring data from "a box on the wall" to the "patient clinical record" is clearly in order.

The Rewards:

Organizations that automate the gathering and recording of data from patient monitors gain in two significant areas. The first major benefit is data quality (such as the reduction of data entry error), while the second is an increase in the productivity of nurses (e.g., eliminating clerical time spent reading data from a device and writing the numbers in the chart). Obviously, the process of taking digital information from the monitors' visual interfaces, writing the numbers down on paper (the flowsheet) and then keying them into the EMR/EHR system introduces the possibility for data error at all steps along the way. Also, recording the same information two or three times is wasteful of nursing time and energy.

A comprehensive analysis helps explain the true magnitude of potential for problems in terms of nursing productivity and errors. Studies by ACS-HCS in high-intensity care environments with high density flowsheet requirements have identified between 600 and 700 data entries in a single shift.

Subsequent analysis indicates a potential for reducing clerical entries by as much as 68 percent, depending on the total number of systems integrated for automated data collection (see Table 1 on next page). Current estimates suggest that one to three hours of nursing time per eight hour shift could be returned to patient care when a nurse's clerical load is reduced through automation. The relief to nursing staff, as well as the draw for nursing recruitment, is a valuable benefit that the organization can realize.

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TABLE 1		
ACS Healthcare Solutions		
MSICU Flow Sheet Data Elements	**Entries Documented in 8 hours**	
Systems assessment every 8 hours	1	
Nursing Care Plan Note	1	
Evaluative Satement	1	
Scheduled Meds	25	Plus Re-entered again in Pharmacy sys
IV's and IV Drips Documented	89	Plus Re-entered again in Pharmacy sys
CCRT Replacement Solution		
CCRT Dialysate Solution		types
Norepinephrine Drip		of IV's/ drips/blood products
Ocetreotide Drip		patients on multiple pumps
Transfuse 2 PRBC's		
Patient Restraints		counted in routine entries below
I&O	24	
Vent Settings		
FiO_2	24	
Sat	24	
Peep	24	
Set P	24	
PIP	24	
V_te	24	
Spont. V_t	24	
V_e	24	
VSS	24	
Glasgow coma Scale data X3 elements	36	
Pupils	16	
Pedal Pulses	8	
Pain 0-10	16	
Consiousnesss	16	
Agitation	16	
CVP	8	
RR:V/PT	24	
Routine Care Entries	72	Some entries N/A or negative
Invasive Devices	2	
Lab results entered on flow sheet	46	
Manual Total Entries	**617**	**for 8 hour shift**
Redundant Medication Entries	**114**	
Grand Total Entries	**731**	
Device Data Integration Potential	**498**	**(includes redundant meds)**
Nurse direct entry reduction estimated	**68%**	

Of course, this analysis does not suggest that automation is the only factor that needs to be considered. All electronically gathered data must still be validated by clinical personnel before it can become part of the final patient record. Observational validation of clinical data cannot be automated, and it remains a clinical imperative regardless of the systems involved.

The Requirements:

Migration of monitoring data from a manual process to an automated process is not without its costs, even though the rewards may be great. Integration is required not only between systems, such as the monitors and integration engines, but also between clinical services and support departments.

The biomedical engineering department's concern with the proper function of the monitor remains, but the automation process adds concern with network connectivity, HL7 data conversion and interface configuration. Access to the EMR/EHR must also be

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assured in the clinical setting where nursing and other clinical workflows will change. In addition, conversion from manual to automated data transfer will create new facility casualty requirements and disaster recovery elements. The migration of these data also necessitates attention to the care and maintenance of all related systems.

Major external forces – like marketplace demands for patient safety, error reduction, patient safety and clinical resources management – are accelerating the adoption of automation. The forces are all accelerating, adding importance to the automation of patient monitoring data as a key element of patient care in the future. Organizations that accomplish the migration sooner stand to reap the benefits well in advance of competitors that continue to use a human to read and write at the interface between monitor and record. Health professionals should be able to spend their time looking at patients.

Jonathan Barmettler, is one of ACS-HCS's chief technical officers for bio-clinical integration. He has over 26 years of IT experience, with over 18 years in healthcare. He has numerous IT certifications, including Security Officer (CISSP), Network Architect (Cisco – CISS, CCDA, CCNA) and Systems Engineer (Microsoft – CCIE with Security). He can be contacted at 925/980-2055 or jonathan.barmettler@acs-hcs.com.

Physicians Urged To Adopt E-Prescribing

Most U.S. physicians have not yet adopted electronic prescribing, which the federal government estimates could save $27 billion in health care costs nationwide by reducing adverse drug interactions and increasing efficiency, the *Associated Press* reports.

E-prescribing now is legal in 49 states after recent updates to state laws and regulations, and Alaska soon will allow it, according to Kevin Hutchinson, president and CEO of SureScripts.

Allscripts and Dell earlier this year formed a coalition, called the National ePrescribing Patient Safety Initiative, to provide $100 million in no-cost, Web-based e-prescribing technology to every physician nationwide. The coalition has not provided statistics, but Allscripts CEO Glen Tullman said the initiative is "making great progress" and has given e-prescribing technology to thousands of physicians.

Tullman in September expects "a very strong, very high-visibility" increase in its efforts, with large employers, managed care companies and other institutions to join the coalition. He added that he expects state governments to mandate e-prescribing, the Associated Press reports.

Health and Human Services, in a recent report to Congress, cited expert predictions that e-prescribing could prevent more than two million drug errors annually. However, five government-funded e-prescribing pilot projects did not find such an effect on patient safety. The report noted the role of office staff members in handling e-prescribing tasks and said that the pilot projects did not establish the effect of e-prescribing on patient safety.

AMA Resolutions Include Health IT

Along with resolutions that call for bans on health clinics in retail settings and a call for limits on high-fructose corn syrup and decibel levels for in-ear headphones, several information technology items are also on the agenda for the American Medical Association's House of Delegates meeting now in Chicago. These include resolutions opposing any government or private-payer mandates that require the use of electronic medical records to qualify for medical-care reimbursement or pay-for-performance programs – or any penalties for not using them.

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Hospitals Start to Collect Early

A patient had just been treated for back and ankle injuries from a fall when officials at Southern Hills Medical Center in Nashville said he had three days to pay a $75 co-pay or have his debt turned over to a collections agency.

Such blunt conversations used to come weeks or even months after a patient left a hospital, but as the volume of unpaid medical bills increases, hospitals in Middle Tennessee and nationally are turning into more aggressive bill collectors, according to the *Tennessean* newspaper.

Hospitals aren't denying patients critical care, but increasingly they are using sophisticated computer models to screen the insured as well as the uninsured, estimate their ability to pay and ask more patients to pay some of what they owe up-front or soon after treatment. Hospitals say they may decline to perform elective procedures on patients who can't pay.

Critics say such efforts to collect payment can squeeze patients when they're at their most vulnerable. Hospitals say asking people to pay what they owe earlier and more directly are a matter of survival.

Hospital companies such as Nashville-based HCA Inc., which owns Southern Hills, said they can't afford to let even the smallest bills go unpaid because the cost of care is rising and a shift toward so-called consumer-driven health plans means patients are responsible for paying more of their own medical bills.

In 1995, U.S. consumers paid $146.3 billion in medical bills out of pocket, according to a report by the American Hospital Association. In 2005, consumers paid $249.4 billion out of pocket. Over the same period, unpaid medical bills nationwide climbed from $17.5 billion to $28.8 billion.

The nonprofit Nashville-based Saint Thomas Health Services says it's collecting three times as much in up-front payments from patients now than it did a year ago simply by asking, spokeswoman Rebecca Climer told the *Tennessean*.

"Before, we waited for them to see what their insurance would pay and didn't initiate those conversations ahead of time like we are doing now," she said. "What we don't want to happen is for them to be surprised when they've received the bill post-treatment and hospitalization."

Saint Thomas, whose four hospitals include Baptist and Saint Thomas hospitals, now offers uninsured patients discounts of 15 percent for those who pay up front – or 10 percent to those who pay within a month – on top of a 25-percent charity care markdown.

By screening in advance, hospitals can direct patients to programs that help cover costs, Climer said. "We're a faith-based organization and don't make care decisions based on ability to pay."

Vanderbilt University Medical Center has seen collections as patients are discharged rise from an average of $30,000 a month in 2004 to $300,000 a month today, Warren Beck said. He is the finance director at the center.

Two and a half years ago, the academic hospital began asking patients leaving emergency rooms for $300 to cover their portion of a bill, Beck said, "If their insurance can kick in and pay or the patient may qualify under charity guidelines, we may provide them a refund."

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