CSC

ADOPTION OF
ADVANCED CLINICAL SYSTEMS IN MASSACHUSETTS HOSPITALS

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Sponsored by Blue Cross Blue Shield of Massachusetts

Baseline Clinical Systems

- Clinical Data Repository (CDR)
- Lab Information System
- Radiology Information System
- Pharmacy Information System
- Picture Archiving and Communication System (PACS)

Advanced Clinical Systems

- Electronic Nursing/Care Documentation (Includes: vital signs, assessment, care plans, progress notes, medication administration, medication administration with bar-coding)
- Computerized Physician Order Entry (CPOE) (Includes clinical decision support capabilities)
- Electronic Physician Documentation (Includes electronic documentation of: history and physical, admission note, progress note, consult note, operative note, discharge note)

Introduction

Hospitals in Massachusetts, just like those all across the country, are striving to provide the safest possible care. IT will play a critical role in meeting this goal, and many hospitals have already taken the first steps by implementing the key baseline clinical systems that enable patient data to be captured and shared electronically. To truly prepare for future realities, hospitals of all sizes will need to build on this foundation and successfully implement advanced clinical solutions that allow organizations to transform processes and improve the way care is delivered.

This paper reviews adoption and use of advanced clinical systems in hospitals across the country, and then examines the results of a recent Blue Cross Blue Shield of Massachusetts survey specifically looking at adoption of clinical technology in Massachusetts hospitals.

Understanding National Adoption

Across the country, a large majority of hospitals have purchased and implemented the five key baseline clinical solutions that provide the foundation for capturing patient data electronically and moving forward with advanced clinical systems (see sidebar).

However, adoption and use of key advanced clinical systems (specifically: nursing/care documentation, CPOE and physician documentation) varies much more widely. Nursing documentation appears to be the most widely implemented component of advanced clinicals, with just over half of hospitals nationwide in the HIMSS Analytics database as of October 2008 reporting that they are "live and operational" on a nursing documentation system.[1] According to a 2007 poll of College of Healthcare Information Management Executives (CHIME) members — leading edge organizations — 55 percent have implemented nursing documentation, and an additional 30 percent are in the process of doing so.[2]

National adoption of CPOE is much lower. The 2008 KLAS CPOE Digest reports that less than 10 percent of hospitals are "doing some level of CPOE." In only 6 percent of hospitals nationwide, physicians enter more than 50 percent of orders directly using the system.[3]

Just under one quarter of U.S. hospitals in the HIMSS Analytics database report being "live and operational" with physician documentation software, but recent data suggests that actual use of the software remains low. According to a survey of 127 CHIME members conducted in December 2007, only 19 percent of respondents had implemented inpatient electronic physician documentation. Even among these leading edge organizations, roughly 55 percent of those live on physician documentation indicated that "less than half of the inpatient physician documentation in the organization was being completed electronically."[4]

With much of the national focus on the use of core advanced clinicals, limited research has been done to quantify current adoption of supporting advanced clinical capabilities such as real-time quality reporting, infection management and medication reconciliation — all of which are essential to remaining competitive in the future.

The Status of Massachusetts Hospitals in Implementing Advanced Clinical Applications

To better understand current use of advanced clinical systems in Massachusetts hospitals, we conducted an online survey from April 24, 2008 to June 1, 2008, funded by Blue Cross Blue Shield of Massachusetts. Since recent data indicates that virtually all Massachusetts hospitals are "live and operational" with all baseline clinical systems (CDR, Lab, Radiology, Pharmacy, and PACS) , the survey focused only on advanced clinical capabilities.

Fifty-two hospital and health system CIOs, responsible for 70 hospitals in Massachusetts, were contacted via email and provided a link to the online survey. We received responses representing 43 facilities — or more than 60 percent of hospitals in the state.

Adoption of Advanced Clinical System Capabilities in Massachusetts

Advanced clinical system implementations are enterprise projects requiring significant investments of capital and time. Hospitals need to make choices around staging CPOE, nursing documentation and physician documentation; and the decision is unique to each facility. In some cases, staging may be simply dictated by what capabilities the hospital's enterprise clinical information system vendor can offer or what the institution is ready to implement. Other times, external pressures, such as incentives from payers or regulatory initiatives, and unique organizational characteristics like readiness and system affordability play a key role. Ultimately there is no universal "right" way to stage advanced clinical applications, provided all components are implemented.
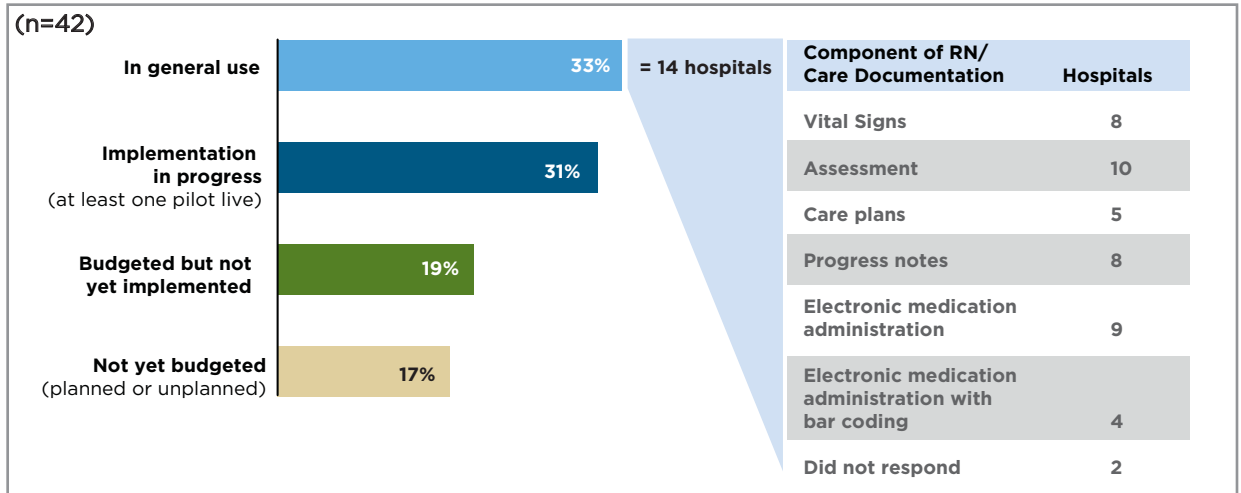
In Massachusetts, implementation of CPOE has been a priority for payers and advocacy groups, and statewide adoption is roughly twice the national average. Implementation of electronic nursing and physician documentation systems is slightly behind national averages, but there are a significant number of installations currently underway.

Nursing/Care Documentation

Nursing/care documentation products greatly improve clinical decision making by allowing nurses to electronically capture and share data such as vital signs and medications administered, as well as the information needed for assessments, care plans and progress notes.

Use of nursing/care documentation among Massachusetts respondents was below reported market averages, but Massachusetts hospitals appear to be in the process of catching up. Although only one-third of respondents reported that a nursing/care documentation system was "in general use," an additional 31 percent indicated that electronic nursing documentation was currently being implemented. Of the hospitals reporting electronic nursing/care documentation in general use, 71 percent were electronically documenting assessments in all units, 64 percent were documenting medications administered electronically in all units, and 57 percent were documenting vital signs and progress notes electronically in all units.

Which of the following best describes the status of your electronic nursing documentation initiative?

(n=42)

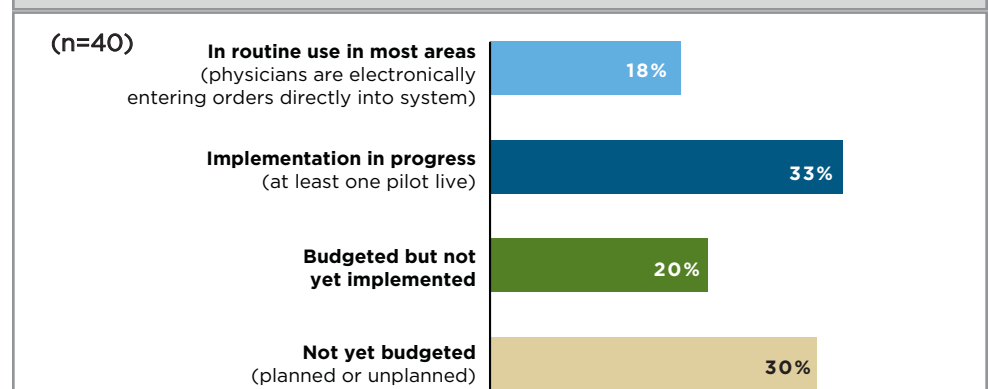|		Component of RN/ Care Documentation	Hospitals
In general use	33% = 14 hospitals		
		Vital Signs	8
Implementation in progress (at least one pilot live)	31%	Assessment	10
		Care plans	5
Budgeted but not yet implemented	19%	Progress notes	8
		Electronic medication administration	9
Not yet budgeted (planned or unplanned)	17%	Electronic medication administration with bar coding	4
		Did not respond	2

Although close to two-thirds of hospitals live on nursing documentation report that medications were being documented using an electronic medication administration record (eMAR), only 9 percent of all responding hospitals reported using an eMAR in conjunction with a barcode medication administration (BCMA) system to verify the drug, dose, time, route and patient. This appears to be well behind the national average. According to a 2008 study from the American Society of Health-System Pharmacists, 24 percent of hospitals use barcode medication administration "to verify the identity of patients and the accuracy of medication administration at the point-of-care."[6] Among leading edge hospitals participating in the recent 2008 CHIME survey, 34 percent had implemented eMAR with barcoding.[7]

CPOE

Electronically entering and managing orders with a CPOE system that has clinical decision support results in fewer preventable medical errors stemming from inappropriate, misinterpreted and lost orders. In Massachusetts, there have been initiatives by the Massachusetts Technology Collaborative and payers to encourage CPOE adoption. To maximize patient safety however, "adoption" of CPOE must include direct entry by the treating physician and use of a full range of decision support.

Eighteen percent of responding Massachusetts hospitals indicated that CPOE was in use in most areas of the hospital; a rate close to double the national average. Live sites also reported high levels of physician adoption. In all Massachusetts hospitals where CPOE is in general use, physicians are entering at least 75 percent of orders directly into the systems. This likely reflects the statewide push by Blue Cross Blue Shield and other Massachusetts payers and advocacy groups to achieve 100 percent CPOE adoption in the coming three to four years.

Which of the following best describes the status of your CPOE initiative?

(n=40)

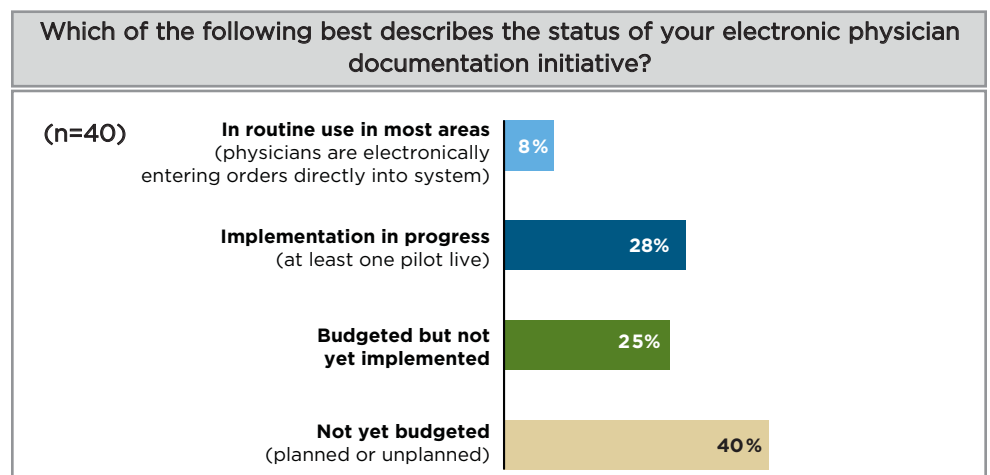|	
In routine use in most areas (physicians are electronically entering orders directly into system)	18%
Implementation in progress (at least one pilot live)	33%
Budgeted but not yet implemented	20%
Not yet budgeted (planned or unplanned)	30%

The impact of the statewide push to implement CPOE can also be seen in the uptick of CPOE activity over the last three years. In a similar survey of Massachusetts hospital and health system CIOs from 2004, one-third of the state's hospitals had at least begun implementation of CPOE.[8] In 2008, that number has increased to 50 percent. However, since 30 percent of hospitals have not yet budgeted for CPOE, much work remains to be done in order for all licensed hospitals in Massachusetts to adopt CPOE by 2012 as required by recent Massachusetts legislation.[9]

Physician Documentation

Physician documentation software captures the information required for history and physical, admission notes, progress notes, consult notes, operative notes and discharge notes. Having access to this information electronically is essential for clinical decision support and can also provide efficiency gains for physicians by avoiding the ongoing and time-consuming process of dictation, transcription and approval.

Use of physician documentation in Massachusetts hospitals is likely slightly below the national average, but is growing rapidly. Although only 8 percent of Massachusetts hospitals said that physician documentation was in general use, implementations are underway in an additionally 28 percent of organizations. However, 40 percent of Massachusetts hospitals overall have still not budgeted for an electronic physician documentation solution.

Which of the following best describes the status of your electronic physician documentation initiative?

(n=40)

Category	Value
In routine use in most areas (physicians are electronically entering orders directly into system)	8%
Implementation in progress (at least one pilot live)	28%
Budgeted but not yet implemented	25%
Not yet budgeted (planned or unplanned)	40%

Adoption of Next Generation Advanced Clinical Capabilities in Massachusetts
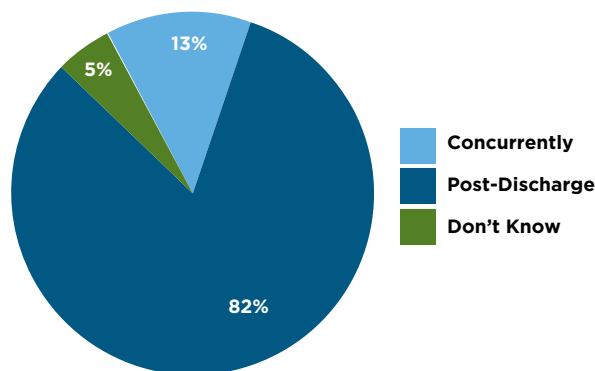
Real-Time Quality Reporting

The increasingly complicated quality reporting requirements for hospitals adds to the day-to-day workload of quality nurses and care managers and reduces the time that can be spent with patients. Real-time quality reporting solutions provide significant efficiency gains by pulling available information from electronic sources and allowing organizations to capture the specific data needed to report on quality measures at the time care is being delivered rather than post-discharge. Collecting quality data concurrently (while the patient is still in the hospital) also allows organizations to intervene on behalf of the patient if necessary.

In Massachusetts, the vast majority hospitals indicate that the data required for quality reporting is primarily gathered post-discharge. Quality nurses at 80 percent of the state's hospitals supplement information from electronic sources with information from paper medical records; only 10 percent rely primarily on paper.

(n=39)

13%

5%

82%

- Concurrently
- Post-Discharge
- Don't Know

| What is the main source of quality reporting data (n = 39)?	
Response	%
Quality nurses rely primarily on information in paper medical records	10%
Quality nurses supplement information from electronic sources with information from paper medical records	80%
Quality nurses obtain most of the information they need from electronic systems	10%

Infection Management

Infection management products provide the infection control team with real-time infection surveillance, recommendations on appropriate medication route and dosing, and access to comprehensive reporting on exposures. These capabilities are of increased interest given the current focus from the Joint Commission, CMS, and state agencies on hospital-acquired infections.

In Massachusetts, only one-third of responding hospitals indicated that the infection management team uses IT to perform infection surveillance and advise on appropriate antibiotic use. While this seems low given the significant attention around hospital-acquired infections, the results are probably representative of the national average. For example, a 2007–2008 CSC survey of 30 leading hospitals across the country found similar results, with only 34 percent of respondents saying that "the infection management team is equipped with technology that performs infection surveillance and advises on appropriate antibiotic use."[10]

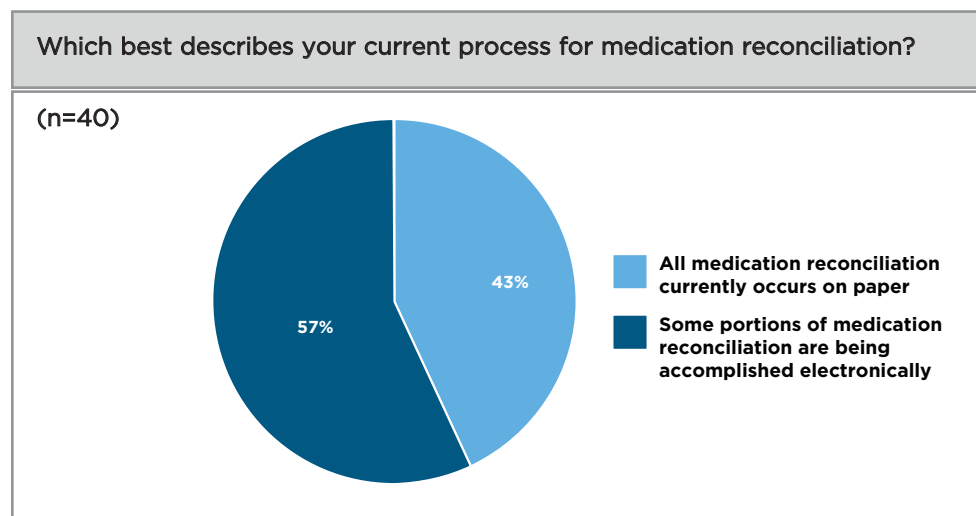| Is the infection management team equipped with information technology that performs infection surveillance and advises on appropriate antibiotic use? |
| --- |

(n=40)

No
42%

Yes
33%
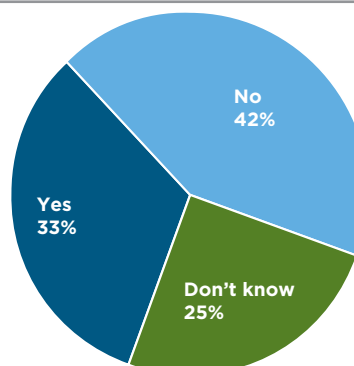
Don't know
25%

It is interesting to note that in Massachusetts, one in four hospital or health system CIOs were unsure about capabilities regarding infection management — by far the largest percentage of "don't know" responses to any question. This suggests that infection management may not be on the radar of IT leadership in Massachusetts at this point in time.

Medication Reconciliation

Studies suggest that a significant number of medical errors occur at admission, transfer or discharge because of inaccurate or missing information about a patient's medications. The Joint Commission currently requires that accredited hospitals have a process for comparing medications a patient is already taking with medications ordered by the physician at admission, transfer or discharge.

Which best describes your current process for medication reconciliation?

(n=40)

- 43% All medication reconciliation currently occurs on paper
- 57% Some portions of medication reconciliation are being accomplished electronically

Describe the portions of medication reconciliation that are being accomplished electronically. (check all that apply)

Components of Medication Reconciliation (n = 40)	%
Recording home medications electronically at emergency department (ED) arrival/admission	38%
Receiving electronic information concerning patient home medications at admission	10%
Documenting medication reconciliation at internal transfer electronically	28%
Producing patient discharge information, including medications, electronically	53%
Transmitting patient discharge information from the ED, including medications, to the next provider of care electronically	8%
Transmitting patient discharge information at hospital discharge, including medications, to the next provider of care electronically	8%

Fifty-seven percent of Massachusetts hospitals are accomplishing at least some portion of medication reconciliation electronically. This closely mirrors a 2007 study from the American Society of Health-System Pharmacists that found roughly 55 percent of hospitals nationwide[i] were performing at least some medication reconciliation electronically (10 percent have an entirely electronic medication reconciliation process while 45 percent rely on a combination of electronic and paper-based processes).[12]

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i   Excluding VA and specialty hospitals

Fifty-three percent of Massachusetts hospitals are producing patient discharge information (including medications) electronically — but interestingly, very few are transmitting it to next provider of care electronically. Overall, only two hospitals are doing all components of medication reconciliation electronically, with three additional hospitals performing more than three components of medication reconciliation electronically.

The Bottom Line

There is clear progress around adoption of advanced clinical systems in Massachusetts hospitals. The statewide push to implement CPOE appears to have had a positive impact, with state CPOE adoption now approaching almost twice the national average but far short of the goal of 100 percent adoption. Thirty-seven percent of the state's hospitals are now live on either CPOE, nursing/care documentation or physician documentation. A majority of facilities are doing at least some portion of medication reconciliation electronically, consistent with the national average.

A significant number of advanced clinical implementations are also underway, suggesting that Massachusetts hospitals are catching up to national averages for adoption of nursing and physician documentation. One-third of Massachusetts hospitals are currently implementing CPOE, while 37 percent are in the midst of rolling out either nursing/care documentation or physician documentation.

At the same time, challenges also remain. Only 12 percent of hospitals in the state are live with more than one component of advanced clinicals (CPOE, nursing documentation or physician documentation) and in some areas such as barcode medication administration, state adoption appears to be well behind national averages.

Despite the current and planned implementations underway at many hospitals in the state, a significant portion of other facilities statewide remain at the beginning of their journey. The state has mandated use of CPOE in all hospitals by 2012, but 30 percent have not yet budgeted for a solution. An additional 40 percent have yet to budget for physician documentation, and 17 percent have not budgeted for nursing documentation.

About the Authors

About Blue Cross Blue Shield of Massachusetts

Blue Cross Blue Shield of Massachusetts (www.bluecrossma.com) was founded 72 years ago by a group of community-minded business leaders. Today, headquartered in Boston, BCBSMA provides coverage to approximately 3 million members. BCBSMA believes in rewarding doctors and hospitals for delivering safe and effective care, and in empowering patients to take more responsibility, become educated health care consumers and become stronger partners with their doctors. Blue Cross Blue Shield of Massachusetts is an independent licensee of the Blue Cross Blue Shield Association.

References

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