Integrated Clinical Decision Support In Emergency Medicine: Transforming The Electronic Health Record In Order To Reduce Risk And Improve Medical Decision Making

Corresponding Author:
Dr. Ali S Raja,
Attending Physician, Department of Emergency Medicine, Brigham and Womens Hospital, 02130 - United States of America

Submitting Author:
Dr. Ali S Raja,
Attending Physician, Department of Emergency Medicine, Brigham and Women's Hospital, 02130 - United States of America

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Author(s): VanRooyen M, Raja A S

Medicolegal Issues in Emergency Medicine

The delivery of medical care in an emergency department (ED) is a high risk environment for clinical errors, breeches in patient safety and medicolegal consequences. Volume surges, high acuity patients, limited access to past medical records, and departmental overcrowding all combine to make the emergency department a complex practice setting with significant provider variability and a high potential for medical error.

It should come as no surprise that the high-risk environment of the ED is associated with considerable medicolegal risk:
- One out of every five hospital lawsuits originates in the Emergency Department
- The average hospital settlement rose from $180,000 in 1994 to $470,000 in 1999 to $1,210,000 in 2007 (an increase of 572% over 13 years)
- The average jury award for a lawsuit rose from $475,000 in 1996 to over $1 million in 2000; the current average award is $3.5 million

Given the current financial crisis and focus on cost-saving measures, this liability award data is especially worrisome for hospital administrators. For an “average” hospital with approximately 150 inpatient beds, malpractice expenses were $1,000,000 in 1995, $2,000,000 in 2000 and $6,000,000 in 2006. As claims take an average of 5 years (and occasionally up to 8-10 years) to resolve, both the timecourse and range of potential losses can vary widely. Additionally, there are significant indirect losses due to defensive medical practices and alterations in care by medical providers due solely to medical malpractice fears.

The American College of Emergency Physicians has called the current state of medical liability a “national crisis” and has increased efforts for meaningful malpractice reform. However, reducing malpractice claims and jury awards must begin with reducing provider variability, especially as the potential for medical errors and systems malfunctions are accentuated by the high acuity/high volume setting of the ED.

High Risk Settings and Practices

There are a number of processes in the daily clinical practice of emergency medicine that lead to increased potential for loss of information and a lack of communication, leading directly to medical errors.

Transition of care

Transition of care from one provider to another is a notoriously high-risk time in the ED, centering mainly on the relay of patients’ clinical information at change of shift. Because of the wide variability of practice patterns and systems of documenting, there are no identifiable standards for transitioning care. Furthermore, as EDs expand their scopes of services to care for admitted patients, ICU patients, and observation unit patients, the longitudinal management and reassessment issues required (which are outside the typical workflow of emergency medicine) will require additional information rechecks and well-planned management in order to ensure appropriate care.

Data retrieval (laboratory and radiology)

Radiology re-reads, especially missed fractures and incidental findings, present a significant area of risk of litigation. Other issues include EKG misinterpretation and variability of emergency physician follow up on abnormal results, blood cultures, laboratory abnormalities. Systems that depend on simply informing a busy emergency practitioner of critical laboratory results or radiology over-reads will likely result in missed values and compromised follow up.

Consultant Communication

The transition of care from the ED, either to an inpatient setting or to the outpatient care of a
consultant, is another high risk and particularly contentious issue. This communication of information from the emergency physician to the physician taking over a patient’s care requires the proper relay of information. High-risk consultant communications occur with cardiology, surgery (general, plastics, orthopedics, neurosurgery), OB/Gyn and general practice, and there is no identifiable standard for documenting the communication with consultants or admitting physicians.

Provider Variability
Provider variability is a major roadblock in the applicability of evidence-based practice in the ED.7 Although practice guidelines and standards exist, usage is inconstant.8 While some of this is due to inherent individual decision-making, some of this variability is due solely to the lack of availability of evidence-based practice guidelines. Curbing this variability will require both easily accessible point-of-care guidelines and active monitoring of provider compliance with practice standards.

Intellectual Anchoring
Finally, one of the major factors in individual decision-making in rapid care environments is intellectual anchoring, or the conceptual investment in a specific thought pattern or diagnosis. Anchoring may occur quickly and lead a clinician down a diagnostic and treatment pathway, even to the point of ignoring additional data that does not support the working diagnosis. Once invested in a particular diagnosis, physicians have significant difficulty considering new diagnoses.9 Often, external stimuli are required to prompt this consideration; decision support tools, the specific formatting of electronic charting elements, and even intelligent systems that propose alternatives to incongruent diagnoses have been developed for exactly this reason.

Intellectual Anchoring: An Example
Dr. Johnson examines a 70 year old male with chest pain in the emergency department. The pain is atypical, radiating to the neck and back. The patient is a smoker and has a prior history of hypertension and coronary artery disease. The pain responded partially to nitrates, the EKG is normal, the CXR reveals slight bilateral pleural effusions but no acute CHF, and the troponin is within the normal range. He discusses the case with the admitting cardiologist, treats the patient with morphine, aspirin, a heparin bolus and infusion, and admits the patient to a monitored bed for probable acute coronary syndrome.

The patient arrives on the floor, moves over to the bed, and suddenly develops severe, tearing chest pain, diaphoresis and syncope. The nurse gives a fluid bolus, and calls the cardiologist. Before the cardiologist arrives, the patient has a syncopal event and is found to be in cardiac arrest. The EKG reveals asystole, and CPR is unsuccessful. The patient expires 35 minutes after arriving to the floor. Post mortem reveals an acute thoracic aortic dissection.

What went wrong?
Was this an atypical presentation of a rare disease? No
Was diagnostic testing unavailable in the ED? No
Was the emergency physician unaware of the presenting symptoms of aortic dissection? No
Was there lack of available data or clinical information about aortic dissection? No
So why did the physician miss this diagnosis?
Intellectual anchoring

Methods for Improvement
Given the complex, high acuity, and fast paced environment of a busy ED, how can emergency physicians, midlevel practitioners, and nurses improve the care they provide, reduce variability, avoid medical errors, and decrease adverse outcomes, all while lowering their exposure to lawsuits? Many believe that the movement toward electronic documentation and patient management will assist clinicians in appropriate documentation and improved decision making.10

Electronic Health Records
The American Recovery and Reinvestment Act, passed in 2009, contained the Health Information Technology for Economic and Clinical Health (HITECH) Act, part of which designated $19.2 billion to increase the use of Electronic Health Records (EHRs) through incentive payments, grants, and loans.11 In an attempt to improve the care of ED patients, electronic tracking systems and health records have been developed to assist clinicians with managing both patient flow within the department and the documentation of the care rendered.

Simultaneously, professional societies have developed evidence-based clinical policies and guidelines in order to establish optimal strategies for the management of the many medical problems encountered in the ED.12, 13 These systems and resources, however, have not consistently been utilized in a manner that optimizes either medical decision making or its systematic documentation. As such, there still is a gap in our ability to maximize patient outcomes, optimize resource use, and mitigate risk when managing critically ill and injured ED patients.

Although a number of commercial ED tracking and
documentation systems have been designed, there is little integration of evidence based decision support that will address high risk diagnosis and treatment decisions in the emergency department. Properly designed and strategically placed decision support will:

- Assist clinicians in preventing medical errors before they occur
- Improve colleague and consultant communication
- Improve systems for lab and radiology reporting
- Decrease variation
- Reduce intellectual anchoring

Clinical Decision Support

Clinical Decision Support (CDS) provides clinicians and health care providers with patient-specific and complaint-specific information that is intelligently filtered to present data at appropriate times in the decision making process. CDS encompasses a number of tools, user templates, guidelines, prompts and information portals that can be found in the electronic medical record. While there have been some attempts to introduce filtered information in the electronic medical record to enhance decision making, the integration of real-time, usable, and filtered evidence-based medical decision making tools has not been fully realized.

In the document “A Roadmap for National Action on Clinical Decision Support”, the authors describe three pillars for fully realizing the promise of CDS:

- Best knowledge available when needed: The best available clinical knowledge that is well organized, accessible, stored and transmitted for effective utilization.
- High adoption and effective use: CDS measures that can be widely used in the clinical setting.
- Continuous improvement of knowledge: The ability to continuously update and upgrade both the knowledge base and the integration of CDS.

Body of Evidence

Decision aids come in emergency medicine are gleaned from a variety of validated and consensus driven guidelines and standards. These include regulatory mechanisms established by the Joint Commission and by the Center for Medicare and Medicaid Services (CMS). Consensus literature may include:

- The Cochrane Collaboration
- ACEP practice guidelines
- ABEM Life Long Learning and Self Assessment Literature
- Evidence based practice guidelines
- Major specialty texts
- Landmark publications
- Legal standards and proceedings

Integrating Decision Support into the EMR

In order to both reduce variability and decrease medicolegal risk, developers of EHRs for EDs need to present information to clinicians in a format that is a natural fit into their chaotic workflow. Identifying decision tools and evidence based practices are not enough to encourage meaningful use of data. Decision support must be accessible, but ignorable, evidence-based, available in real time, and linked to either specific chief complaints or specific differential diagnoses.

The future of integrated decision support will depend on the adoption of electronic medical records and the adoption of EHR vendors of decision tools that will give clinicians access to data and advice in the work environment. This will require a number of point of care medical support tools that can be seamlessly integrated into ED EHRs to allow clinicians to gain real time access to relevant clinical information and clinical policy recommendations while also systematically documenting the medical decision-making that prompted the emergency care that was rendered.

Summary

“There is hope, not yet fully realized, that computer support systems may eventually play a greater role in improving real-time decisions.”

The promulgation of EHRs has given emergency physicians the opportunity to integrate evidence based CDS into their documentation systems. In order to accomplish this, EHR’s must adopt a platform for integration of decision support tools. In so doing, practitioners may use the EHR to not simply as a documentation tool, but as a decision making tool to reduce provider variability, decrease medical errors, and reduce exposure to liability, and improve patient care.

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