STATE COMMISSION ON PATIENT SAFETY
ROUND ONE RECOMMENDATIONS
APRIL 28, 2005

Category: Setting Performance Standards and Expectations for Safety

Recommendation #C.22 (MedPrac).1
In order to ensure the safe practice of medication administration, computerized medication tracking systems should be adopted/created. These systems would allow for vital medication information to be accessed by all health care providers as well as patients along the full continuum of care. Computerized systems would include the following protected elements, each of which addresses a different facet of patient safety:

C.22.1.1 A patient's medication history including known drug allergies and interactions and use of over the counter medications and herbal supplements

C.22.1.2 A pharmaceutical database, to include potential reactions to pharmaceuticals, accessible to community pharmacists, providers and patients

C.22.1.3 A state registry to support the transfer/exchange of medication information across all health care organizations and pharmacies, including mail order pharmacies

C.22.1.4 An electronic medication log for patient use

C.22.1.5 Computerized physician order entry

C.22.1.6 A program that alerts health care providers to similar drug names, labels, and physical appearance.

Rationale:

Information technology (IT) plays a critical role in improving quality health care standards, in part through IT applications that offer specific patient care information.[1] Computer-based medical records, one type of IT application, have been called "essential technology" by the IOM (1991) and were concluded to be the new standard for all health care records.[1] The General Accounting Office (1991) also stated, "…that automated medical records offer great potential to improve patient care, increase efficiency, and reduce costs, and calling for the development of standards to ensure uniform electronic recording and transmission of medical information."[2]

Over 770,000 individuals are estimated to either die or be injured by adverse drug events (ADE) every year.[3,4,5] ADEs can be significantly reduced by computerized applications. The type of information used in these computerized programs not only offers information concerning the patient's medical condition, but also have incorporated medication order entry systems in an attempt to reduce errors.[1] As cited in the Institute of Medicine's (IOM) report *Crossing the Quality Chasm*: *A New Health System for the 21st Century*, Bates and colleagues (1998) as well as the Leapfrog Group (2000) noted that reductions in prescribing medication errors decreased when order entry systems were used to track patient data such as current medication and history of drug interactions.[6,7] The type of function and data order entry systems offer, such as current medications and history of drug interactions, are consistent with the components of the recommendation above.

The testimony presented suggested that more must be done in the way of tracking medication histories and allowing access to various medication records and general information. The crux of the testimonies reported that some type of computerized system was essential in this process. These testimonies were consistent with the recommendations placed forward by other institutions such as the IOM. The testimonies strongly support improvements made to the quality of patient care by use of computerized medication systems.

Evidence and/or information on comparable initiatives being carried out in other states:

As described above, computerized information systems are essential in improving the quality of health care standards. The IOM (2001) states that evidence supporting these types of systems is growing.[1] This evidence suggests that "…various types of IT applications lead to improvements in safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity."(p.176) [1] It was the recommendation that these types of systems be adopted/created in the state of Michigan for the purpose of improving medication information.

The Institute of Medicine has also referred to electronic registry systems as computerized surveillance or monitoring systems. It has been documented by the Agency for Healthcare Research and Quality (AHRQ) that between 28%-95% of ADEs can be prevented by the use of computerized monitoring systems.[8] In a study conducted by Classen et al. it was discovered that of 648 patients who had an ADE, 631 were discovered by a computerized surveillance system.[9] Similarly

the electronic medication registry would be able to make similar surveillance scans and flag potential ADEs.

Among one of the sub-recommendations was the call for a system that could transfer patient information across health care professionals. However, this type of application would need state consensus. According to the IOM (2001), the concept of computerized systems that offer this type of information and also protect privacy are obtaining national focus and consensus.[1] The concept of one overriding computer system is currently being debated, and has been referred to as a “comprehensive national health information infrastructure.”[10] This infrastructure would provide a road map for connecting and distributing health care data, or medication information in a secure network.[1]

Another sub-recommendation calls for the use of a program similar to the FDA’s MedWatch. Currently, MedWatch reports the potential for adverse drug reactions, obliging the FDA to require label changes when necessary.[11] A similar focus on developing a program to address labeling procedures of medications that have similar properties is needed. As the number of medications being administered increases, so does the potential for medication errors.[12] It is imperative that medications are properly labeled to minimize confusion and administration errors.

Computerized systems such as medication order entry and electronic medical records are currently being used in many hospitals to assist with providing efficient and effective patient care. Yet, these systems are not the standard and the majority of health care systems are still using paper as a means of recording patient information.[1] While other states have created mandated medication error reporting systems to reduce ADEs, little has been done to create a state-wide data base or mandate computerized technology in the hospital setting. The focus has been to concentrate on reporting medication and medical errors to improve patient safety.

The need for information technology in assisting with quality patient care is a recommendation that has been more generally approached. For instance, the IOM recommended in their report *Crossing the Quality Chasm*: *A New Health System for the 21st Century* that

> *“Congress, the executive branch, leaders of health care organizations, public and private purchasers, and health informatics associations and vendors should make a renewed national commitment to building an*

> *information infrastructure to support health care delivery, consumer health, quality measurement and improvement, public accountability, clinical and health services research, and clinical education. This commitment should lead to the elimination of most handwritten clinical data by the end of the decade." (p.166)*[1]

Based on the knowledge that computerized systems offer significant advancements in improving patient safety across all areas of health care, adopting or creating these types of systems is essential for health care organizations. The above recommendation is focused on medication tracking systems, yet the framework for the system is consistent with recommendations put forward by other institutions such as the IOM.

Pros:

- Research has already shown that computerized monitoring or surveillance systems reduce ADEs. Thus, implementing this recommendation will improve patient safety.
- Pharmaceutical databases can provide consistent, current information to providers and consumers alike.
- Computerized medication records can bridge the gap from home to inpatient setting and back again, ensuring that vital medications are not overlooked, and that serious drug interactions are avoided.
- Both computerized physician order entry applications and a program similar to the FDA's MedWatch provide support and resources to busy healthcare providers.
- The adoption of computerized medication tracking, information, and surveillance systems stand a better chance of reducing medication errors than other recommendations, because they address the issue of medication errors from more than one perspective.

Barriers:

- An extensive pharmaceutical database and/or state-wide medication registry will be expensive to set up and maintain.
- Even when computerized, patients' medication records may not be accessible across the continuum of care. Computer software programs vary by vendor, and are not necessarily compatible with each other.

- Access to databases and patient records must be a protected privilege. Adequately protecting confidentiality while providing access to a wide variety of stakeholders will be challenging.
- Training of healthcare professionals and consumers to use computerized databases and records will take time, effort, and funds that may not be readily available.

Cost: TBD

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[1] IOM. (2001). *Crossing the quality chasm: A new health system for the 21st century*. National Academies Press: Washington, DC.
[2] GAO (1991) as cited in IOM (2001). *Crossing the quality chasm: A new health system for the 21st century*. National Academies Press: Washington, DC p. 171.
[3] Cullen D.J., Bates D.W., Small S.D., Cooper J.B., Nemeskal A.R., & Leape L.L. (1995). The incident reporting system does not detect adverse drug events: a problem for quality improvement. *Jt Comm J Qual Improvement,* 21, 541-548.
[4] Classen D.C., Pestotnik S.L., Evans R.S., Lloyd J.F., & Burke J.P. (1997).Adverse drug events in hospitalized patients. Excess length of stay, extra costs, and attributable mortality. *JAMA,* 277, 301-306.
[5] Cullen D.J., Sweitzer B.J., Bates D.W., Burdick E., Edmondson A., & Leape L.L. (1997). Preventable adverse drug events in hospitalized patients: A comparative study of intensive care and general care units. *Crit Care Med*, 25,1289-1297.
[6] Bates, D.W., Leape, L.L., Cullen, D.J. et al. (1998). Effect of Computerized Physician Order Entry and a Team Intervention on Prevention of Serious Medication Errors. *JAMA* 280(15), 1311–6 as cited in IOM. (2001). *Crossing the quality chasm: A new health system for the 21st century*. National Academies Press: Washington, DC.
[7] Leapfrog Group. (2000). Leapfrog Patient Safety Standards: The Potential Benefit of Universal Adoption. Online. Available at http://www.leapfroggroup.org [accessed Jan. 3, 2001] as cited in IOM. (2001). *Crossing the quality chasm: A new health system for the 21st century*. National Academies Press: Washington, DC.
[8] AHRQ. (2005). Reducing and preventing adverse drug events to decrease hospital costs. Retrieved April, 14th, 2005 from http://www.ahrq.gov/qual/aderia/aderia.htm.
[9] Classen, D.C., Pestonik, S.L., Evans, S., Burke, J.P., et al. Computerized Surveillance of Adverse Drug Events in Hospital Patients. *JAMA.* 266(20):2847–2851, 1998.
[10] Detmer (2000) *Information Technology for Quality Healthcare: A Summary of United Kingdom and United States Experiences.* Background Paper for the Ditchley Park Conference: Co-sponsored by The Commonwealth Fund and the Nuffield Trust, Oxfordshire, England as cited in IOM. (2001). *Crossing the quality chasm: A new health system for the 21st century*. National Academies Press: Washington, DC.
[11] AHRQ. (2005). Reducing and preventing adverse drug events to decrease hospital costs. Retrieved April, 14th, 2005 from http://www.ahrq.gov/qual/aderia/aderia.htm.
[12] IOM (2000). *To Err is Human: Building a safer health system*. Washington DC: National Academy Press.