



HIPAA Driven Standards For Communication

*Improving the Quality
of Patient Care*

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Agenda

- HIPAA Legislative Directive
- NCVHS Study
- Patient Medical Record Information (PMRI) and Standards
- Computerized Physician Order Entry
- Future Strategic Considerations

Legislative Directive

- HIPAA Administrative Simplification
 - Encourages development of HIS standards
- Section 263 requires NCVHS to study PMRI and recommend standards

Patient Medical Record Information (PMRI) Definition

Medical information on an individual patient generated by a health care professional as a direct result of interactions with the patient or with individuals who have personal knowledge of the patient

Patient Medical Record Information (PMRI) Definition

- PMRI includes:
 - Demographics and health history
 - Details of present illness or injury and orders for care and treatment
 - Observations and records of medication administration
 - Test results, referral information

Patient Medical Record Information

- PMRI is the foundation for improving the quality of care
 - Primarily written, stored and transported on paper
 - Prone to errors, loss/misplacement
- Limited progress in using information technology to support patient care

NCVHS Findings – PMRI Constraints

1. Interoperability –EMR systems do not communicate clinical
 - WEDi 200+ EMR Vendors – none of which talk to the other
 - Limits availability & access to clinical information
 - Jeopardizes medical decisions

NCVHS Findings – PMRI Constraints (cont'd)

2. Comparability of clinical information
 - Limited data consistency
 - Consistent meaning
 - Differing terminologies – Medical, reference, coding, nomenclature
 - Interpretation errors

NCVHS Findings – PMRI Constraints (cont'd)

3. Data quality, integrity & accountability

- Unable to locate records & test results
- Missing information
- Duplicate records
- Units of measure

Lack of Standards Impacts Patient Care

- Exacerbates Medical Errors
 - Drug interactions and allergic reactions
 - Life-threatening morbidity and high healthcare costs
 - Inappropriate diagnosis and treatment

NCVHS Recommendation for Uniform Data Standards

- Standards should include those that identify:
 - Individuals, populations and events
 - Data elements and definitions and the source
 - Classification and coding of data elements
 - Data transmission formats

Benefits of PMRI Standards

- Enables caregiver access to information from multiple locations
- Support clinical guidelines and protocols to clinicians
- Prevent adverse events by providing warnings

Benefits of PMRI Standards - continued

- Improve confidentiality of healthcare information
- Improve data quality, coding and transmission
- Enable a comprehensive, lifelong healthcare record
- Improve the ability to react quickly to national health emergencies

NCVHS Data Transmission Standards Feb. 27, 2002

- PMRI Core Standard – HL-7 ver. 2.2, 2.3, 2.4, 2.(n)
 - Order Entry
 - Scheduling
 - Medical Record/Image Management
 - Patient Administration
 - Observation Reporting
 - Financial Management
 - Patient Care

NCVHS Data Transmission Standards Feb. 27, 2002

- DICOM - Digital Imaging and Communications in Medicine
- Supports retrieval of information from imaging devices/equipment to diagnostic and review workstations, and to short-term and long-term storage systems.

NCVHS Data Transmission Standards Feb. 27, 2002

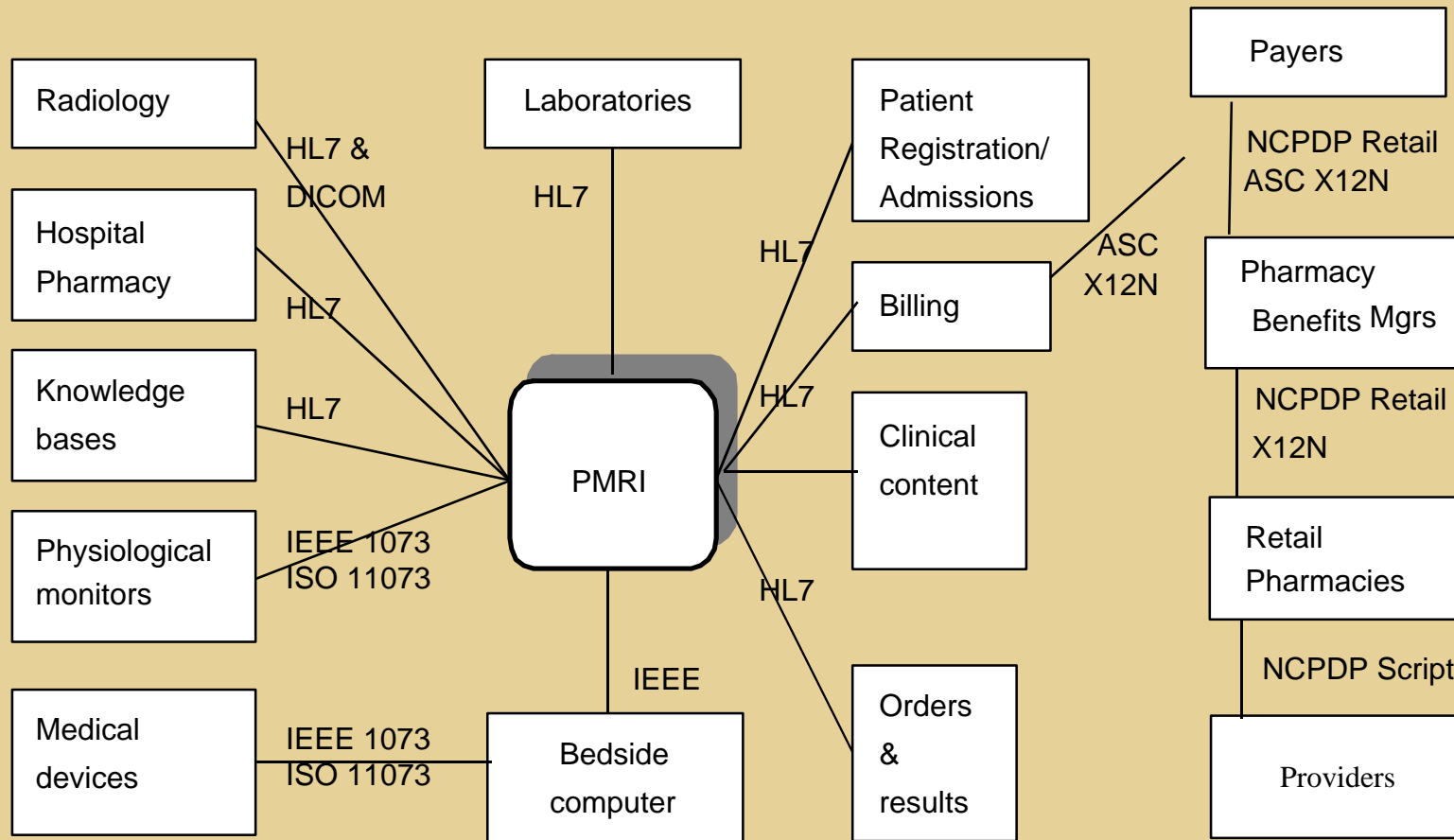
- NCPDP SCRIPT Standard
- Communicates prescription information between prescribers and pharmacies.
 - New prescription
 - Prescription refill requests
 - Prescription fill status notifications, and cancellation notifications.

NCVHS Data Transmission Standards Feb. 27, 2002

“Emerging Standards”

- IEEE 1073/ISO 11073 ver. 1.2.1, 1.3, 2.1.1 & 3.2
- Communicate patient data from medical devices typically found in acute- and chronic-care environments (e.g., patient monitors, ventilators, infusion pumps, etc.).

Health Care Standards Status



(Adapted from Electronic Health Records: Changing the Vision, Eds. GF Murphy, MA Hanken, and KA Waters. Philadelphia: W. B. Saunders Company, 1999)

The Technology Movement

Standard formats for communication of computerized patient information can positively impact the quality of care.

Code Sets Status (Comparability)

Other Codes

- Health Language Center
- UMDNS (ECRI)*
- DEEDS
- UPN (HIBCC)/UPC (UCC)

Message Specific Codes

- DICOM
- NCPDP
- IEEE 1073
- HL7*
- X12N

Nursing Codes

- HHCC*
- NANDA*
- NIC*
- NMMDS
- NOC*
- OMAHA*
- PCDS*
- PNDS

Diagnoses & Procedure Codes

- Alternative Link*
- CDT-2*
- CPT-4*
- HCPCS*
- ICD-9-CM/ICD-9-V3*
- ICD-10-CM*
- ICD-10-PCS
- ICIDH-2

Convergence

SNOMED RT/
NHS Clinical Terms

Clinically Specific Codes

- DSM*
- Gabrieli
- LOINC*
- MEDCIN
- MedDRA
- SNOMED V3*
- NHS Clinical Terms*

Drug Codes

- First Data Bank*
- Multum *
- NDC (retail)

* Fully or partially included in the
UMLS Metathesaurus as of March 1, 2000

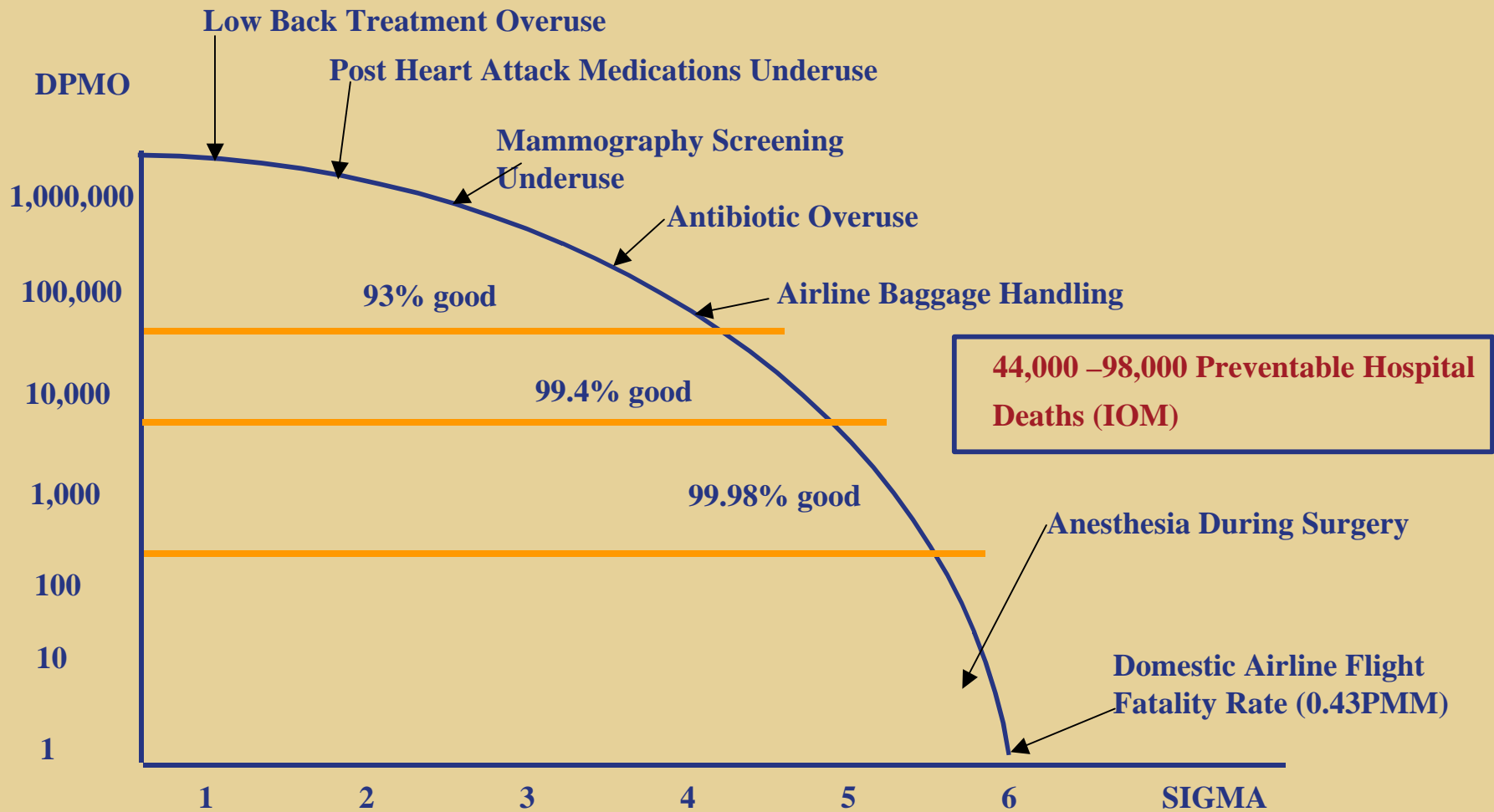
Computerized Physician Order Entry (CPOE)

P W C

Medical Errors: A Big Problem

- Medical errors cause 98,000 deaths per year (IOM – To Err is Human, 2001)
 - 7,000 deaths were attributed to drug errors (Kahn LT, 1999)
- More people die from medical errors than from breast cancer, AIDS, or vehicle accidents. (deBrantes, 2002)
- Medical errors – fourth leading cause of death (LeapFrog Group)

Medical Errors: A Quality Imperative



Source: The Leapfrog Group

Medical Errors: Cost Implications

- One Adverse Drug Reaction adds 1-5 days hospital stay (Classen, et al. 1997)
 - \$5.6M annually per hospital (Rashke, 1998)
- One Adverse Medical Event adds \$4,800 to hospitalization costs (Bates, 1997)

What is Computerized Physician Order Entry?

- Direct entry of medical orders at point of care
- Provides real-time, active clinical decision support
- Creates patient-specific evaluations & recommendations
- Alerts provider to prevent potential medical errors

CPOE in Action: GCPR

- Government Computer-based Patient Record
- Easily accessible, secure life-long record
- Share healthcare information across disparate information systems
- Project initially includes
 - DoD, VA and Indian Health Service

CPOE in Action: GCPR

- Enables secure information exchange among information systems in government environments and within the commercial health care system.
- Provides HIPAA-compliant capabilities for information exchange across governmental and commercial systems.

Advantages of CPOE

- Reduction in medical errors
 - Avert 522,000 serious medical errors (Birkmeyer KD, 2000)
 - Decision support reduced the rate of medical errors from 2.9 to 1.1 per 1000 patient days (Bates DW, 1999)

Benefits of CPOE

- Patient Safety
 - 56% of errors that cause adverse drug reactions occur at the time of ordering (Bates 1996)
- Timely Care
 - Data available to track orders & delivery of orders
 - 27% of cases, order & delivery delayed 5 or more hours

Benefits of CPOE

- **Appropriate Care**
 - Enhances compliance with protocols
 - Radiology orders – 10 to 12% wrong modality (Harpole, 1997)
 - Antibiotics – LDS saved \$1M first year
 - Lab testing – displaying results of lipid tests reduced time & improved care (Elson, 1997)

Benefits of CPOE

- Coordination of Individual Care
 - Improves continuity of care
 - Multiple locations
 - Reduces practice variations
 - Interactive smoking cessation reminders lowered smoking by 12% (Khoury, 1997)

Benefits of CPOE

- Preventive Care
 - Assists in clinical decision making
 - Physician receiving computerized reminders vaccinated twice the number of eligible patients (McDonald, 1992)

Benefits of CPOE

- Reduction Medical Errors
 - Decision support reduced serious medical errors from 2.9 to 1.1 per 1000 patient days (Bates, 1999)
- Care Management Support
 - Monitors health status of elderly/homebound patients

Benefits of CPOE

- Improving quality reduces costs – reducing costs does not improve quality
 - 69% reduction of redundant lab tests (Bates, 1999)
 - LDS showed a \$1M reduction of antibiotic costs first year
 - 13% reduction of length of stay (Tierney, 1993)

CPOE Potential

- CPOE holds the potential to help resolve two challenges of healthcare reform:
 - Quality improvement
 - Cost containment
- Other industry incentives
 - Risk/Liability
 - Market – e.g. LeapFrog Group

Future Strategic Considerations of Standardized PMRI

- Accepted protocol and clinical pathway standards could reduce geographic practice variations
- Further research devoted to “expert” medical systems such as POEMS, APACHE and GIDEON.
- Enable real time surveillance and notification for the CDC regarding bioterrorism or other epidemiological threats.



Questions?

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Sources

- American Hospital Association, AHA Guide to Computerized Physician Order-Entry Systems. November 2000.
- Bates DW, Leape LL, Cullen DJ, et al. Effect of computerized physician order-entry and a team intervention on prevention of serious medication errors. JAMA 1998;280:1311-6.
- Bates DW. Frequency, consequences and prevention of adverse drug events. J Qual Clin Pract 1999; 19:13-7.
- Bates DW, Pappius E, Kuperman GJ, et al. Using information systems to measure and improve quality. Int J Med Inf 1999;53:115-24.

Sources

- Elson RB, Connelly DP. The impact of anticipatory patient data displays on physician decision making: a pilot study. JAMIA Symposium Supplement: Proceedings Annual Fall Symposium 1997.
- Evans RS, Pestoonik SL, Classen DC, et al. A computer assisted management program for antibiotics and other anti-infective agents. N Engl J Med. 1997;338(4):232-8.
- Grandia LD, et al. "Building a Computer-based Patient Record System in an Evolving Integrated Health System," First Annual Nicholas E. Davies CPR Recognition Symposium Proceedings, Bethesda, MD: Computer-based Patient Record Institute, 1995.

Sources

- Kahn LT, et al. To err is human: building a safer health system. Committee on Quality of Health Care in America. Institute of Medicine. Washington, DC: National Academy Press; 1999.
- Khoury A, et al. "The Medical Automated Record System," Third Annual Nicholas E. Davies CPR Recognition Symposium Proceedings, Bethesda, MD: Computer-based Patient Record Institute, 1996.
- Kilbridge P, Welebob E, Classen D. Overview of the Leapfrog Group evaluation tool for computerized physician order entry. December 2001.
- Larsen RA, et al. Improved perioperative antibiotic use and reduced surgical wound infections through use of computer decision analysis. Infect Control Hosp Epidemiol 1989;10:316-20.

Sources

- Leape LL, Bates DW, Cullen DJ et al. Systems analysis of adverse drug events. ADE Prevention Study Group. JAMA 1995;274:35-43.
- McDonald CJ, Hui SL, Tierney WM. Effects of computer reminders for influenza vaccination on morbidity during influenza epidemics. MD Comput 1992;9:304-312.
- National Committee on Vital and Health Statistics, Report to the Secretary of the US Department of Health and Human Services on Uniform Data Standards for Patient Medical Record Information, July 6, 2000.
- Raschke RA, Golihare B, Wunderlich TA, Guidry JR, Liebowitz AI, Peirce JC, et al. A computer alert system to prevent injury from adverse drug events. Development and evaluation in a community hospital. JAMA 1998;280:1317-20.

Sources

- Tiech JM, Glaser JP, Beckley RF, et al. Toward cost-effective, quality care: The Brigham integrated computing system. Nicholas E. Davies CPR Recognition Program, CPRI, 1996
- Tierney WM, McDonald CJ, Martin DK, Rogers MP. Computerized display of past test results. Effect on outpatient testing. *Ann Intern Med* 1987;107:569-74.
- Tierney WM, Miller ME, Overhage JM, McDonald CJ. Physician inpatient order writing on microcomputer workstations. Effects on resource utilization. *JAMA* 1993;269:379-83.
- Weiner M, Gress T, et al. Contrasting views of physicians and nurses about an inpatient computer-based provider order-entry system. *J Am Med Inform Assoc* 1999;6(3), 234.