



# Safety, Quality and Information Technology and NHII

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# Overview

- Background
- Safety and IT
- Quality and IT
- Conclusions

# Current State of Healthcare

- Care is complex
- Care is uncoordinated
- Information is often not available to those who need it when they need it
- As a result patients often do not get care they need or do get care they don't need

*IOM, Crossing the Quality Chasm*

# Data on Safety and Quality

- 44,000-98,000 deaths/year in hospitals as a result of adverse events
  - ◆ Over 1,000,000 injuries
- Enormous practice variation
  - ◆ Estimated \$450 billion unnecessary spending
- Slow translation of research to practice
  - ◆ One estimate 17 years

# Crossing the Quality Chasm

- Care should be safe
- Care should be effective
  - ◆ Based on sound knowledge
- Care should be patient-centered
  - ◆ Respectful, responsive to individual preferences, needs and values
- Care should be timely
  - ◆ Unnecessary waits should be reduced

# Crossing the Quality Chasm

- Care should be efficient
- Care should be equitable
  - ◆ Should not vary in quality because of patient characteristics, such as ethnicity, or geographic location

# Safety and Quality

- Safety is a subset of quality
  - ◆ Comes first
  - ◆ Haven't taken as seriously as we should have in healthcare
- Quality improvements will produce even greater societal benefit



# Ways IT Can Improve Safety

- Prevent errors and adverse events
- Facilitating a more rapid response after an adverse event has occurred
- Tracking and providing feedback about adverse events



# Main Strategies for Preventing Errors and AEs Using IT

- Tools to improve communication
- Making knowledge more readily accessible
- Requiring key pieces of information
- Assisting with calculations
- Performing checks in real time
- Assisting with monitoring
- Providing decision support

*Bates and Gawande, NEJM 2003*

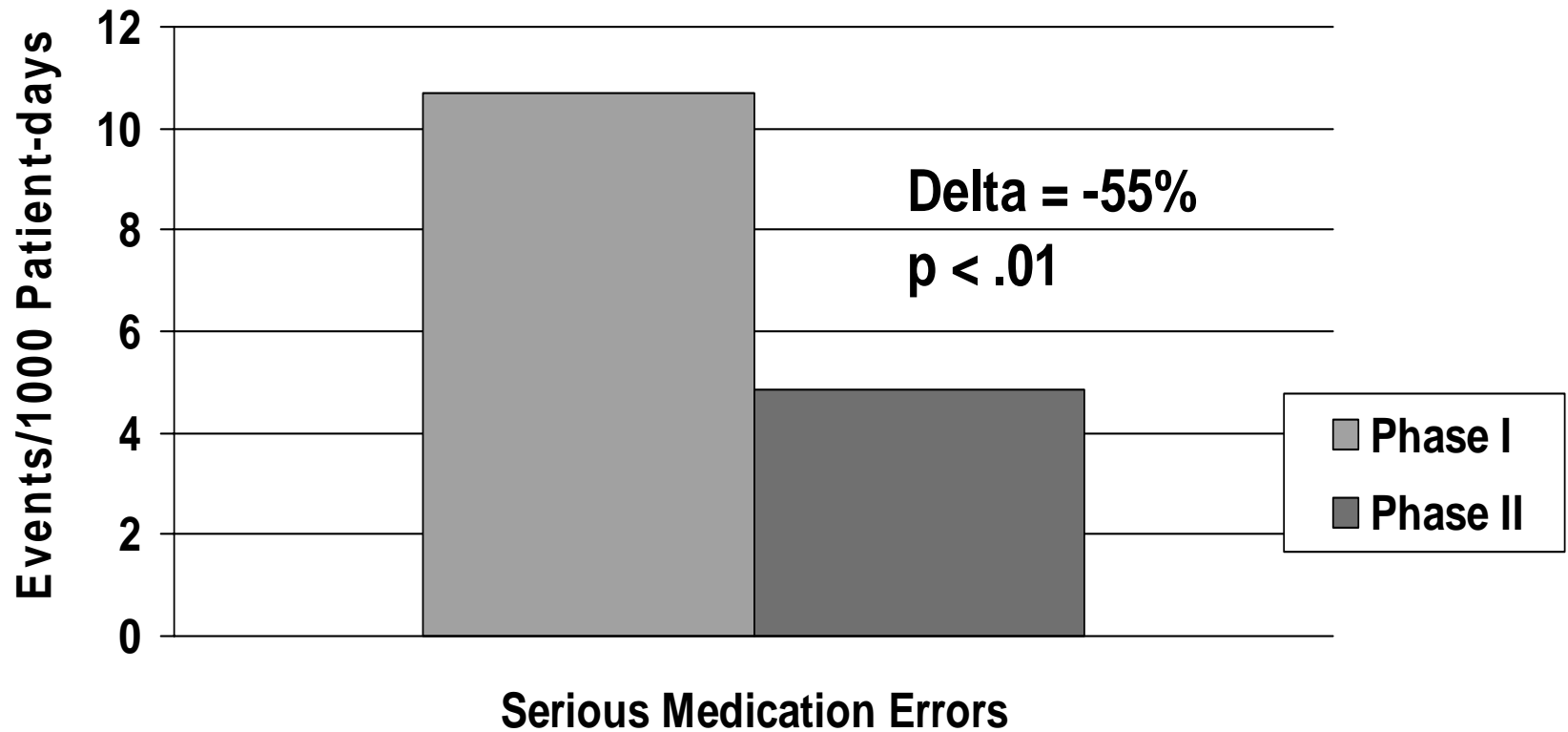
# Handwriting example

Arundel 4 May 1852

# Improving the Quality of Drug Ordering with Order Entry

- Streamline, structure process
  - ◆ Doses from menus
  - ◆ Decreased transcription
  - ◆ Complete orders required
- Give information at the time needed
  - ◆ Show relevant laboratories
  - ◆ Guidelines
  - ◆ Guided dose algorithms
- Perform checks in background
  - Drug-allergy                      Dose ceiling                      Drug-lab
  - Drug-drug                          Drug-patient

# Serious Medication Error Rates Before and After CPOE



Bates et. al. Effect of Computerized Physician Order Entry and a Team Intervention on Prevention of Serious Medication Errors, JAMA 1998.

# Impact of “Smart” IV Pumps

- Few administration errors get caught
  - ◆ Yet intravenous errors can be especially dangerous

## *Case*

- Heparin bolus dose of 4000 units, followed by an infusion of 890 units/hr
  - ◆ 4000 unit bolus dose was given appropriately
  - ◆ But nurse misinterpreted the order and programmed the infusion device to deliver 4000 U/hour, not 890 U/hour
- Smart pump alerted nurse
- Early data—2 such errors/day in 400-bed hospital

***ISMP Newsletter Feb 6, 2002***

# Evidence on IT and Quality

- Computerization of reminders and prevention guidelines improves adherence
  - ◆ Some data from other areas
- Reminders and guidelines especially important in care of chronic conditions
- IT can make routine quality measurement possible
  - ◆ Need data on both process, outcomes
  - ◆ Should be collected as byproduct of care

# Advantages of Computerized Guidelines

- Facilitate memory, always findable
- Immediately generalizable to all patients, providers
- Possible to point providers to them
- Facilitates central control
- Allows measurement of outcomes
  - ◆ Whether people use
  - ◆ Patient outcomes
- Easy to get feedback to developers, allows iterative refinement

# Future of Quality Improvement and IT

- Outside hospitals
  - ◆ Longitudinal medical records will allow tracking of patients' conditions
  - ◆ Widely available to appropriate providers
  - ◆ Interdisciplinary teams managing patients with chronic conditions will track panels, seamlessly exchange information
  - ◆ Will include broad array of decision support



# Future of Quality Improvement and IT

- Inside the hospital
  - ◆ Tracking from admission to discharge
  - ◆ Array of decision support including guidelines
  - ◆ Will be easy to assess:
    - ◆ Where patient is physically
    - ◆ Where they are in course
    - ◆ Whether guidelines being followed
- Patients/providers will have a better sense of what to expect/higher satisfaction

# Conclusions

- Safety—large gains possible
  - ◆ Over 80% reduction in serious medication error rates
  - ◆ Better communication, monitoring
- Quality
  - ◆ Toward closure of huge gaps between evidence and practice
  - ◆ Readily available data for consumers
- More IT ▶ improved safety, quality, efficiency
  - ◆ NHII will be pivotal for getting there