Curriculum Development
Centers Program

Awardee of The Office of the National Coordinator for
Health Information Technology

Unit 10: Measuring Patient Safety

This material was developed by Johns Hopkins University, funded by the Department of Health and Human Services, Office of the National Coordinator for Health Information Technology under Award Number IU24OC000013.

Objectives

At the end of this segment, the student will be able to:

- Explain the attributes of an effective reporting system
- Examine the importance of standardized and structured health information
- Discuss how HIT can facilitate data collection and reporting for improving quality and patient safety
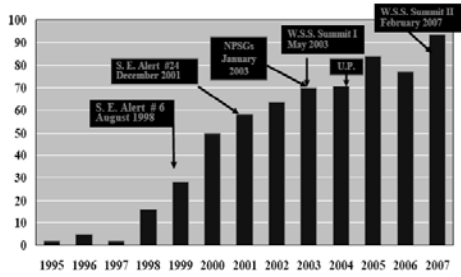

Exercise

Please answer each question with a score of 1 to 5. 1 is below average, 3 is average and 5 is above average.

- How smart am I?
- How hard do I work?
- How kind am I?
- How tall am I?
- How good is the quality of care you provide?

Wrong-site Surgeries Reviewed by Year

Image: AHRQ.gov

Conceptual model for measuring safety
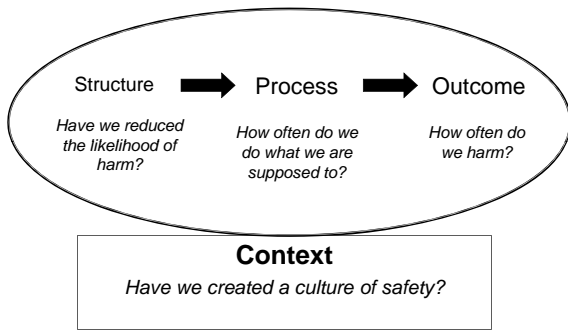
Structure → Process → Outcome

Have we reduced the likelihood of harm?

How often do we do what we are supposed to?

How often do we harm?

Context
Have we created a culture of safety?

Examples

- Structure measures: do you have a smoking cessation program
- Process measure: % of patients who receive smoking cessation education or time spent with patients
- Outcome measure: % of patients who quite smoking

What can be measured as a valid rate?

- Rate requires
  - Numerator - event
  - Denominator - those at risk for event
  - Surveillance for events and those at risk
- Minimal Error
  - Random error
  - Systematic error

Potential Biases

- Selection bias
  - example identifying sepsis patients
- Measurement bias
  - Definition of event
  - Definition of those at risk
  - Surveillance
  - Missing data
- Analytic bias

Sources Variation in Safety measures

- True variation in Safety
- Variation in data quality/definition/methods of collection
- Variation in case mix
- Variation historical rates
- Chance

How to measure Medication safety

STUDY	NUMBER STUDIED	NUMERATOR	DENOMINATOR	ASSESSED BY	RATE OF EVENTS
Leape, et al. NEJM 1991	30,195 records	Disabling adverse events	Per record reviewed/ admission	Physician Reviewer	3.7 per 100 admissions
Lesar, Briceland JAMA 1990	289,411 medication orders/1 yr.	Prescribing errors	Number of Orders written	Physicians	3.13 errors for each 1000 orders
Lesar, Briceland Stein JAMA 1997	1 year of prescribing errors detected and averted by pharmacist	Prescribing errors	Per medication orders written	Pharmacists, retrospectively evaluated by a physician and 2 pharmacists	3.99 errors per 1000 orders
Cullen, et al. Crit Care Medicine 1997	4031 adult admissions over 6 months.	Adverse drug events	Number of patient days	Self report by nurse and pharmacists, daily review of all charts by nurse investigators.	19 events per 1000 ICU patient days

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Improving Sepsis Care
(n= 19 ICUs)

Image: Johns Hopkins University

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Improving Sepsis Care
(n= 19 ICUs)

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It is Ok to have non-rate measures

Self reported measures are generally not valid as rates

A common mistake is interpreting a non-rate measure as a valid rate

How to get more valid data

- Structure data entry or data collection forms - clarify who what when where and how
- Pilot test entry to see if staff understand
- Train and evaluate competency
- Evaluate data quality (look at data)
  - Missing data, outliers, repeat values
- Ask if the consumer of the data believes it is valid and useful

Quality Report

- Generally present data over time in annotated run chart
- Clearly label x and y axis (usually time period)
- Select time period so that you have about 25 observations per time period
- Ask users of the data for feedback on making it more useful

Impact on Catheter-Related Bloodstream Infections(BSI)
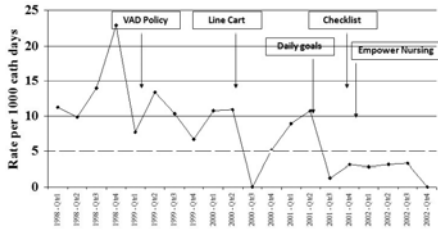
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Reference

- The Joint Commission. Speak Up. Available from: http://www.jointcommission.org/NR/rdonlyres/F8046F2C-A8A2-412F-88D4-E1762BCC5C26/0/UP_Poster.pdf
- Crit Care Med 2004;32(10):2014.

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