



Measuring Medication Harm: Advantages of Using a Trigger Tool

Frank Federico
Executive Director
ffederico@ihi.org

Objectives

- Review the use of the trigger tool
- Discuss how to use the trigger tool for high-alert medications
- Share experiences of others

Why Use Trigger Tools?

- Traditional reporting of errors, incidents, or events does not reliably occur in the best of cultures in health care
- Voluntary methods underestimate events and concentrate on what is interpreted as being preventable
- Easily identifies events without complex technology
- Can be integrated into a good sampling methodology

Voluntary Reporting

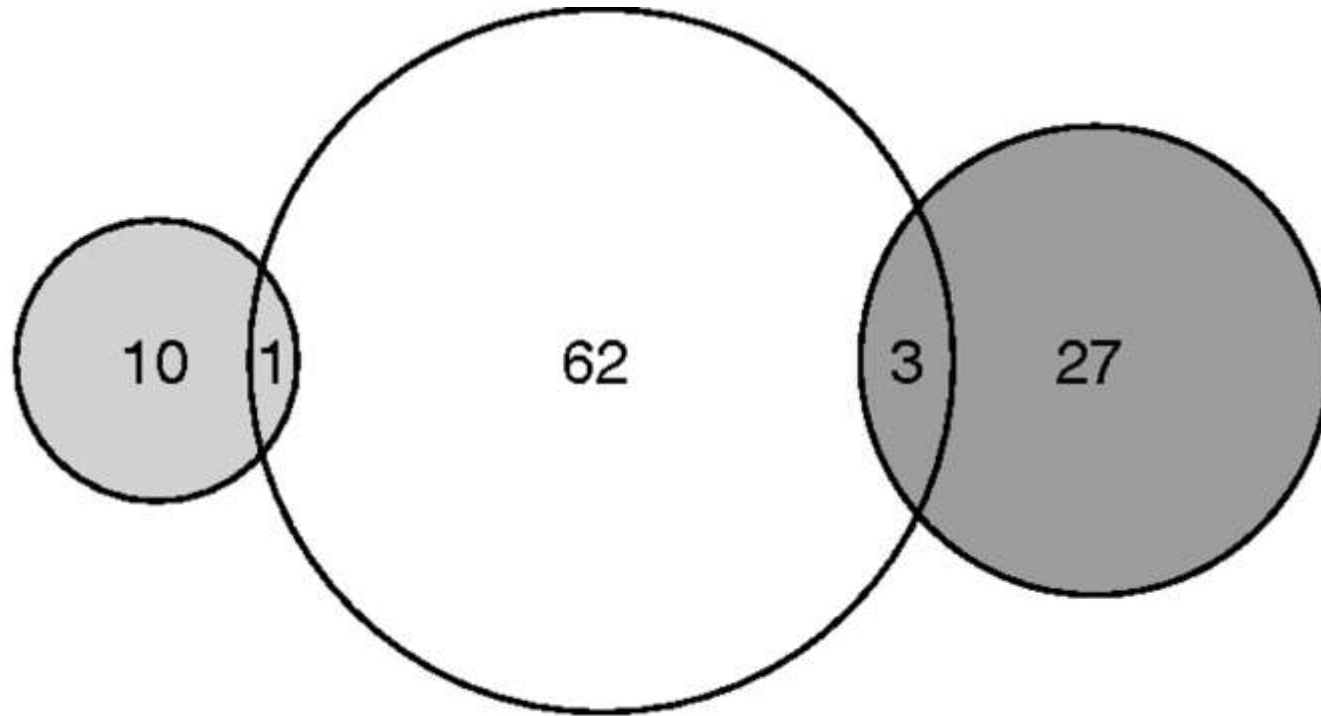
“We found that less than 4% of all adverse drug events involving use of rescue drugs were reported.”

Schade, Am J Med Qual. 2006 Sep-Oct;21(5):335-41

Studies of medical services suggest that only 1.5% of all adverse events result in an incident report.

O'Neil A,. Ann Intern Med 1993;119:370-376)

Incidents Detected by Three Methods



Incident reports

Record review

Pharmacist report

By David C. Classen, Roger Resar, Frances Griffin, Frank Federico, Terri Frankel, Nancy Kimmel, John C. Whittington, Allan Frankel, Andrew Seger, and Brent C. James

'Global Trigger Tool' Shows That Adverse Events In Hospitals May Be Ten Times Greater Than Previously Measured

ABSTRACT Identification and measurement of adverse medical events is central to patient safety, forming a foundation for accountability, prioritizing problems to work on, generating ideas for safer care, and testing which interventions work. We compared three methods to detect adverse events in hospitalized patients, using the same patient sample set from three leading hospitals. We found that the adverse event detection methods commonly used to track patient safety in the United States

DOI: 10.1377/hlthaff.2011.0190
HEALTH AFFAIRS 30,
NO. 4 (2011): -
©2011 Project HOPE—
The People-to-People Health
Foundation, Inc.

David C. Classen (dclassen@csc.com) is an associate professor of medicine at the University of Utah, in Salt Lake City.

Roger Resar is a senior fellow at the Institute for Healthcare Improvement, in Cambridge, Massachusetts.

Article Summary

The Institute for Healthcare Improvement's Global Trigger Tool found at least ten times more confirmed, serious events than these other methods. Overall, adverse events occurred in one-third of hospital admissions. Reliance on voluntary reporting and the Patient Safety Indicators could produce misleading conclusions about the current safety of care in the US health care system and misdirect efforts to improve patient safety.

ADE Trigger Tool

- A practical and efficient method for quantifying the occurrence of ADEs in inpatients
- Can be efficiently and consistently applied to describe the extent and scope of the ADEs identified in different inpatient organizations
- Supplement incident reports and pharmacy interventions

What Percent of Medical Errors Actually Lead to Harm ?

- 3.7% of patients experienced adverse events;
58% due to error

(Harvard Medical Practice Study, 1991)

2.99% of reported medication errors (41,296) led to harm

(Med Marx 2000 Report; NCC MERP data)

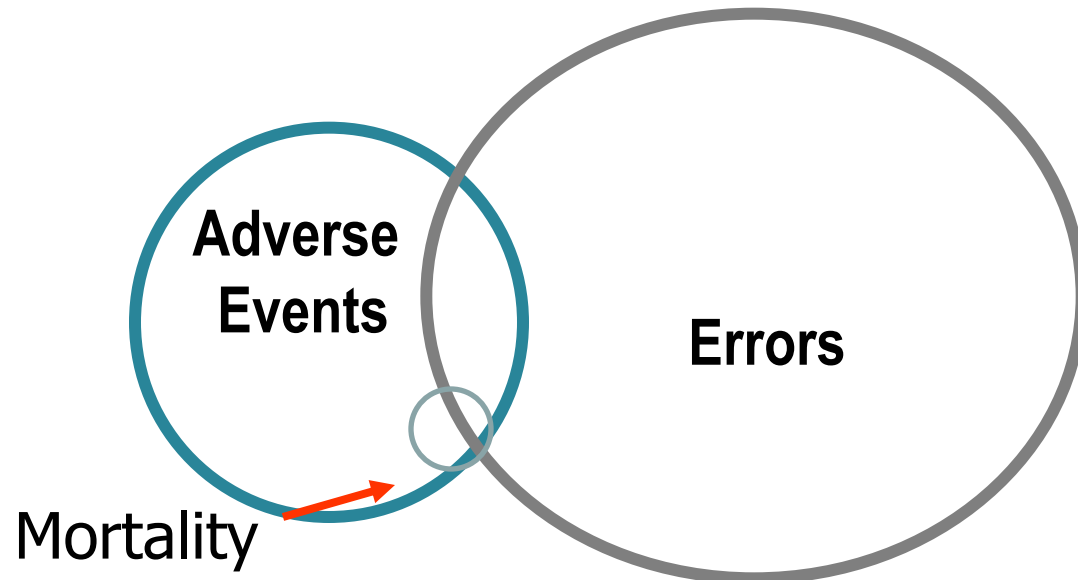
5% of reported medication errors (>11,000) in perioperative settings led to harm

(US Pharmacopeia 3/5/07)

Accepting the Harm Burden

Adverse Event and Errors

- “Error” definition bears upon concept of preventability and human mistake
- “Adverse event” describes harm to the patient regardless of error and is often system-based
- Relationship between errors and adverse events:



Definition of Harm

World Health Organization (WHO) Collaborating Centers for International Drug Monitoring defines an adverse drug event as follows:

“Noxious and unintended and occurs at doses used in man for prophylaxis, diagnosis, therapy, or modification of physiologic functions.”

- The IHI Trigger Tool methodology includes these PLUS any noxious or unintended event occurring in association with medical care.

Our Definition

HARM = Unintended physical injury resulting from or contributed to by medical care that requires additional monitoring, treatment or hospitalization, or that results in death.

Think of Harm in This Way

- Would you be happy if the event happened to you? If the answer is no, then there was harm.
- The next test is whether the event is a part of the natural progression of the disease process or a complication of the treatment related to the disease process.
 - The decision is subjective at times and physician input will be critical.
- Was the event an *intended* result of the care (e.g., a permanent scar from surgery)?
- Psychological harm by definition has been excluded as an adverse event.

Adverse Events

Harm and Error

NEW

- Harm is the focus of discussion
- Looks at all unintended results
- Measurement is clear and direct
- Nothing is theoretically unpreventable

OLD

- Errors and humans are the focus of discussion
- Tends to focus only on those outcomes felt to be related to error
- Measurement relies on self-reporting
- Many ADEs are seen as unpreventable

Category of Harm

(Modified NCC MERP Index)

- E - Temporary harm, intervention required
- F - Temporary harm, initial or prolonged hospitalization
- G - Permanent patient harm
- H - Life sustaining intervention required
- I - Contributing to death

In the General Population

- Adverse drug events present the single greatest risk of harm to patients in hospitals
- Tracking ADEs over time is a useful way to tell if changes the team is making are improving the safety of the medication system

Triggers

- T1** Diphenhydramine (Benadryl)
- T2** Vitamin K (Aqua-mephyton)
- T3** Flumazenil (Romazicon)
- T4** Anti-emetics (Inapsine, Zofran, Phenergan, Vistaril, Compazine, Reglan)
- T5** Naloxone (Narcan)
- T6** Anti-diarrheals (diphenoxylate/Lomotil, loperamide/Imodium, Kaopectate)
- T7** Sodium Polystyrene (Kayexalate)
- T8** Serum glucose < 50
- T9** C. difficile positive
- T10** PTT > 100 seconds
- T11** INR > 6
- T12** WBC < 3,000
- T13** Platelet Count < 50,000
- T14** Digoxin Level > 2
- T15** Rising Serum Creatinine
- T16** Over- sedation/lethargy/fall/hypotension
- T17** Rash
- T18** Abrupt Cessation of Medication
- T19** Transferred to a Higher Level of Care

Records Selected

Should meet the following criteria

- Closed and completed record (discharge summary and all coding is finished)
- Length of stay at least 24 hours and formally admitted to the hospital
- Patient age 18 years or older

Review Team

The review team should consist of, at a minimum, three people:

- Two record reviewers
 - Clinical backgrounds and knowledge about the contents and layout of the hospital's record, as well as about how care is generally provided in the hospital.
 - Typically used nurses, pharmacists, and respiratory therapists on their review teams.
 - Experienced nurses have been the best reviewers, but other combinations of team composition can be used since each person brings unique expertise.
- A physician who does not review the records, but authenticates the consensus of the two record reviewers.
 - The physician authenticates the findings of the adverse events, the rating of severity, and provides answers to questions the record reviewers have about findings in a specific record.

Review Methodology

- Each chart is reviewed in a two-step process.
- Each chart is reviewed by two non-physician reviewers and a consensus is reached.
 - A physician reviewer reviews only the consensus and agrees or changes the consensus decision.
 - Charts are reviewed every two weeks.

Determining Harm

- Minor events need to be graded and are open to subjective decisions.

EXAMPLE: A little nausea treated and resolved is not an adverse event; a lot of nausea is.

- H events (life-saving intervention) occur when measures need to be taken to save the patient's life within a short period of time (e.g., within an hour).
- Most important: BE CONSISTENT.

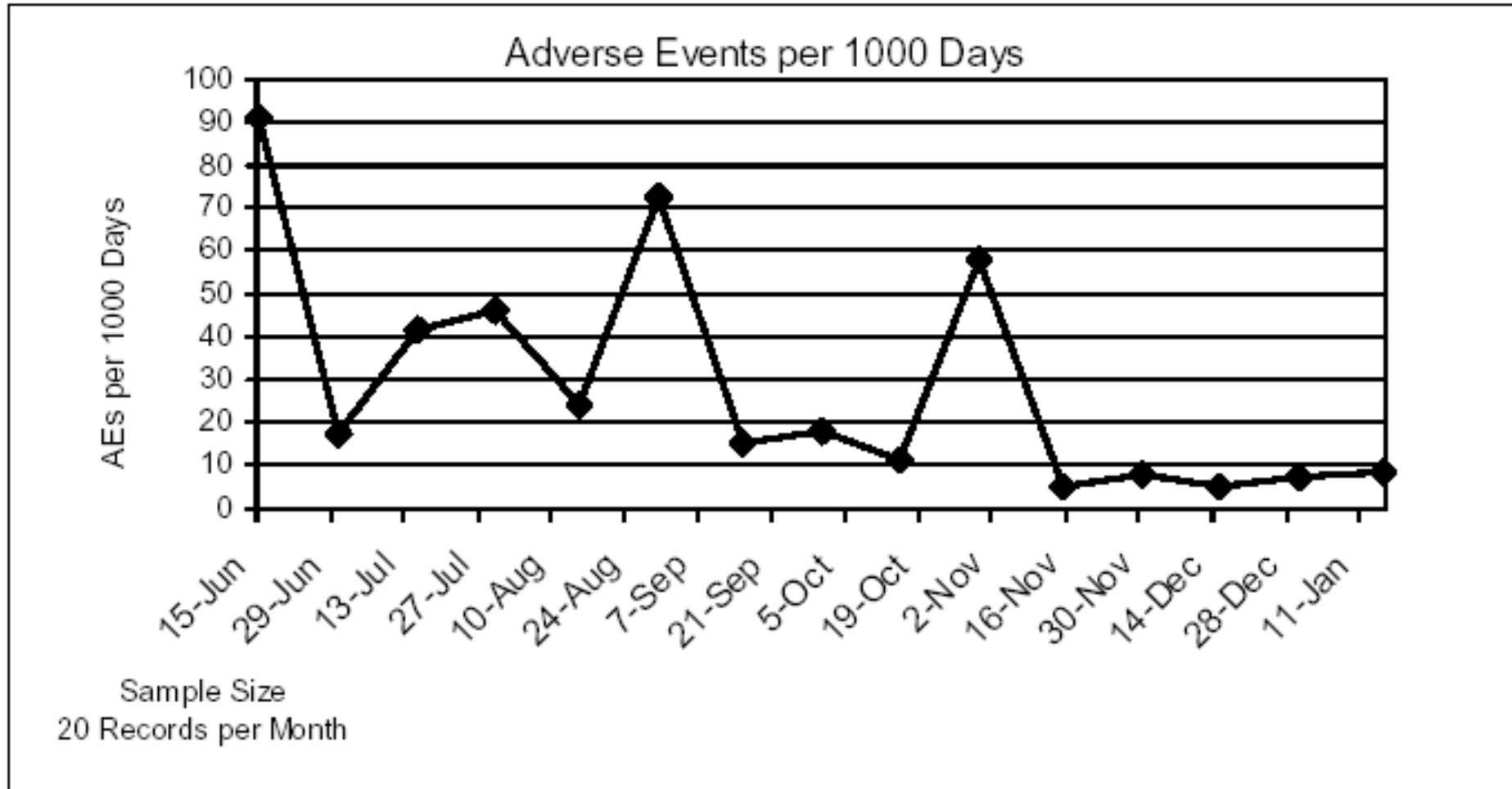
Counting Adverse Events

- Post-operative complications are always adverse events, even if expected (they are still *unintended*).
- An adverse event found without a trigger should be included in your data.
- All events are counted, even if they occurred outside of hospital.
- The perspective is the harm experienced by the *patient*, not the location.
 - Track these separately if you wish.

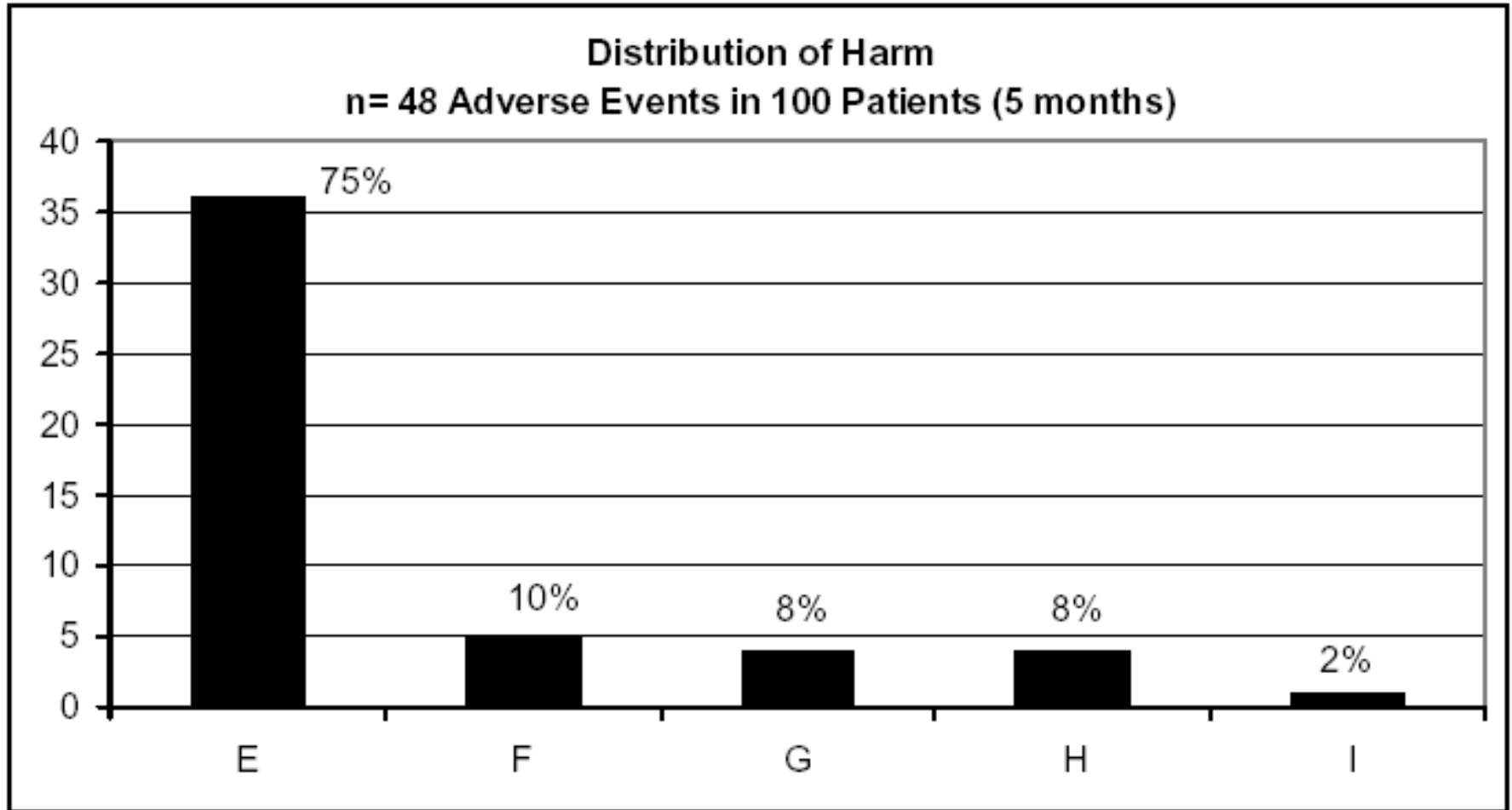
What To Do With The Data

- Identify harm
 - Type of harm
 - Categories of harm
- Triggers
 - May be an indicator of process problems

Run Chart



Distribution of Harm

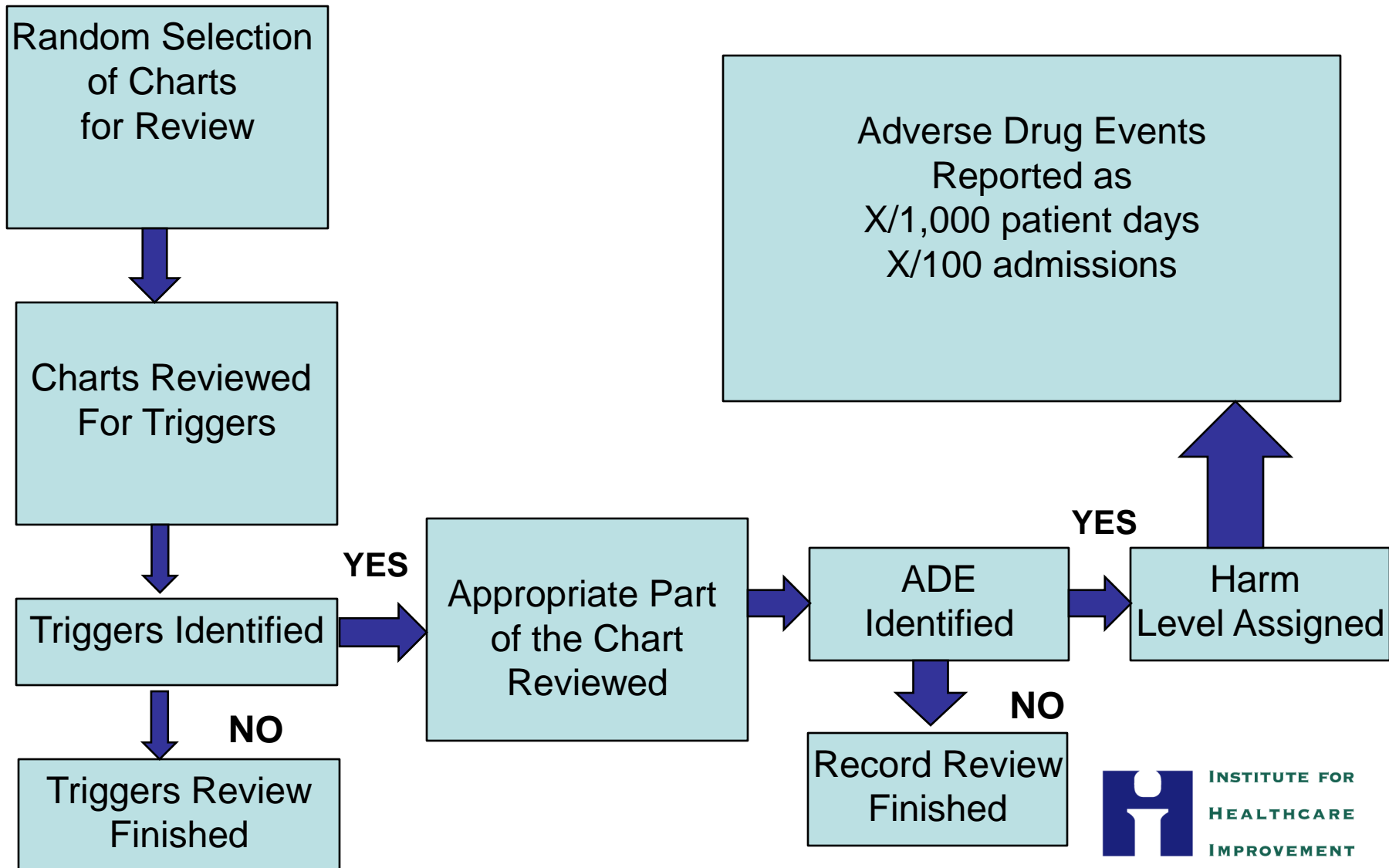


Steps

Reviewing charts:

- Set a timer for 20 minutes
- Coding summary (look for e-codes and obvious events)
- Discharge summary
- Orders
- Medication administration record
- Laboratory results
- X-ray reports procedure notes
- Nursing / multidisciplinary notes (if time left)

Flow of the Process



Key Points

- Follow recommended sequence for review.
- Look for triggers only ...don't read the chart.
- Remember that a positive trigger is not necessarily an adverse event.
- Determine and assign harm based on perspective of patient:
 - “Did I suffer harm?”

Basic Principles

- Review with a trained team.
- Select a small, random sample.
- Look for the presence of triggers only.
- Determine whether harm occurred from perspective of the *patient*.
- Assign category of harm.
- Tabulate data and track over time.
- ***DO NOT REPORT UNTIL YOU HAVE COLLECTED AT LEAST 12 DATA POINTS.***

High Risk

- Most common harm from medication:
 - Hypoglycemia
 - Bleeding
 - Lethargy/somnolence
 - Hypotension
- Most common medications related to harm:
 - Insulin
 - Anticoagulants
 - Narcotics/opiates
 - Sedatives

Focusing on High-alert Medications

- Random sampling may not include enough patients on high-alert medications
 - Consider enriched sample
- Ongoing improvement efforts decrease chances of finding harm
 - Consider enriched sample
- Connecting events with larger system issues is frustrating
 - Sample with indicators that may link to system issues

Random or Enriched

Random

- Rate of harm across organization
- Sample from all patients
- Many medications may be identified
- Focus on all improvement efforts

Enriched

- Not intended to be a rate
- Sample from specific segment
- Focus only on one medication or category
- Focus on specific interventions

Enriched Sample

- Sample based on specific trigger
 - e.g. INR > 6
 - blood glucose < 50
 - patients who receive naloxone
 - all patients on Drug Z if number is small

Indicators that may Link to System Issues

- All INRs greater than X
 - Indicates system performance
- Blood glucose < Y
 - Indicates system performance

Measurement

- Randomly selected charts of all patients on high-alert medications: rate of harm
- Enriched sample: rate of harm only with selected group or trigger
 - Useful to help identify opportunities for improvement

Summary

- Trigger tools
 - will determine a rate of harm
 - will not identify all harm in a sample
 - better at identifying harm than other methods
 - are part of a larger measurement strategy
- Specific triggers can be used for focused reviews
- The method has been tested and can be used instead of a full chart review



Thank You
Questions and Comments