

# Making Health Care Safe: Easier Said Than Done

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HARVARD SCHOOL OF PUBLIC HEALTH

Safety:

Freedom from accidental injury



# Medical Practice Study

|                  |        |        |
|------------------|--------|--------|
| Records reviewed | 30,000 |        |
| Positive screen  | 7,817  |        |
| Adverse Events   | 1,133  | (3.7%) |
| Preventable AE   | 788    | (2.5%) |
| Deaths           | 157    | (0.5%) |



# The Extent of Medical Injury

- New York MPS '91 3.7%
- CO/UT MPS '99 3.1%
- Australia '95 13%
- UK '00 10%
- Denmark '01 9%
- New Zealand '01 11%
- Utah ICD-9 listing '01 8.5%



# Adverse Drug Event Studies

| <u>Study</u>            | <u>ADE</u> | Prev<br><u>ADE</u> |
|-------------------------|------------|--------------------|
| ● Leape '91 (Records)   | 0.7%       | 0.4 %              |
| ● Bates '95 (Solicit +) | 6.5%       | 2 %                |
| ● Gandhi '03 (Patient)  | 25 %       | 3 %                |



The idea that medical errors are caused by bad systems is a transforming concept



# Lessons from Cognitive Psychology

1. Errors are normal behavior
2. The causes of errors are not obscure



# Causes of Errors

Habit

Interruptions

Hurry

Fatigue

Anger

Anxiety

Boredom

Fear



# Cognitive Dispositions to Respond

|                               |                             |                              |
|-------------------------------|-----------------------------|------------------------------|
| Aggregate bias                | Gender bias                 | Representativeness restraint |
| Anchoring                     | Hindsight bias              | Search satisficing           |
| Ascertainment bias            | Multiple alternatives bias  | Sutton's slip                |
| Base-rate neglect             | Omission bias               | Sunk costs                   |
| Commission bias               | Order effects               | Triage cueing                |
| Confirmation bias             | Outcome bias                | Underconfidence              |
| Diagnosis momentum            | Overconfidence              | Unpacking principle          |
| Feedback sanction             | Playing the odds            | Vertical line failure        |
| Framing effect                | Posterior probability error | Visceral bias                |
| Fundamental attribution error | Premature closure           | Yin-Yang out                 |
| Gambler's fallacy             | Psych-out error             | Zebra retreat                |

Paris  
in the  
the Spring





To err is human,

~~To forgive, divine~~

*Alexander Pope*



Man - a creature made at the  
end of the week when God was  
tired.

Mark Twain



# Lessons from Cognitive Psychology

1. Errors are normal behavior
2. The causes of errors are not obscure
3. Human errors result from latent errors



# Latent Errors

- Design of work
- Conditions of work
- Training
- Design and maintenance of equipment



# Latent Errors

Design characteristics that induce errors:

a) Create conditions that generate known causes of errors

OR

b) Require work that exceeds the capacity of the human brain



# The Real Word

Healthy appearing decrepit 69 year old male,  
mentally alert but forgetful

The skin was moist and dry

Occasional, constant, infrequent headaches

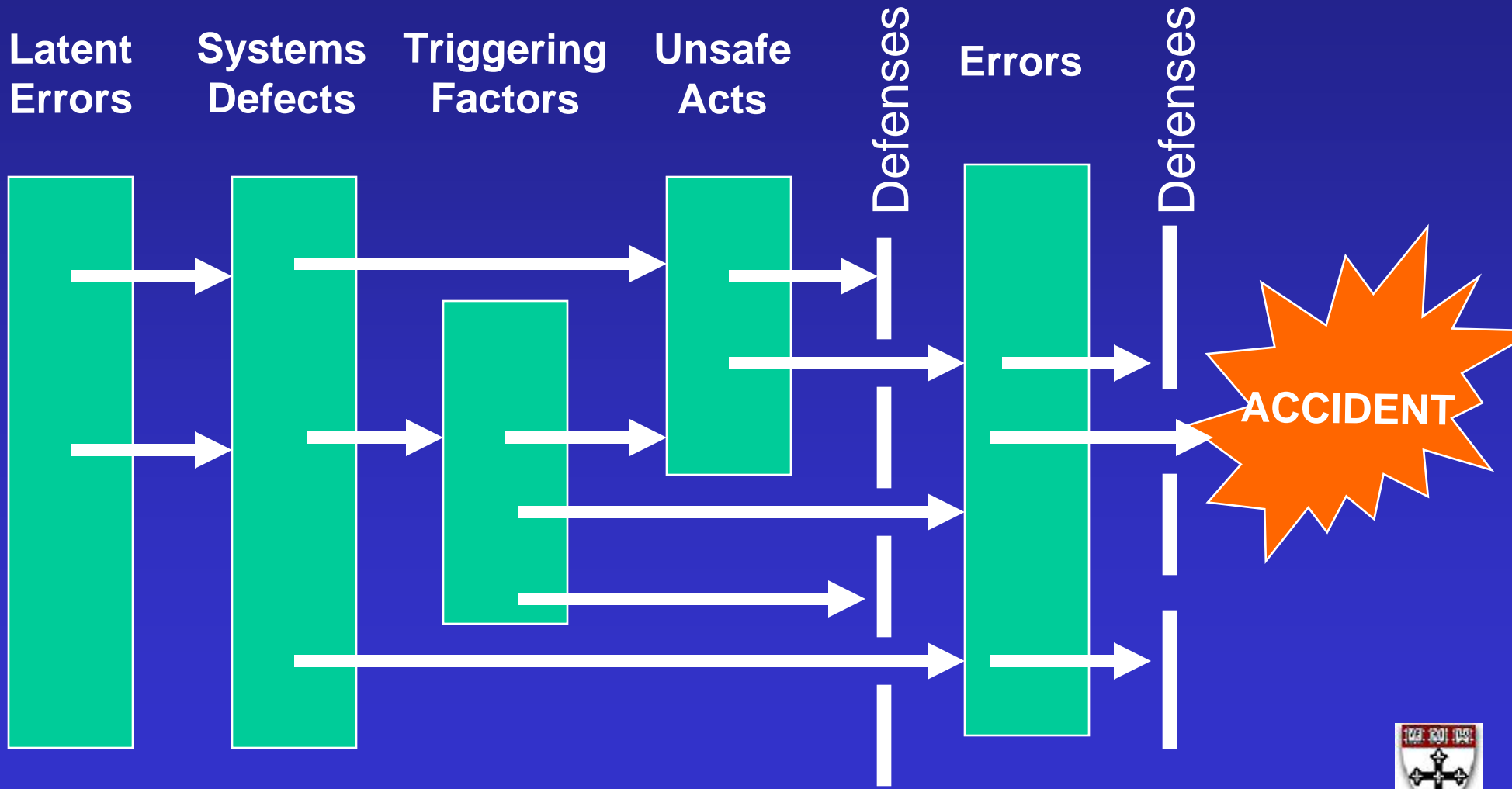
Patient was alert and unresponsive

Rectal examination revealed a normal sized  
thyroid

She stated that she had been constipated for  
most of her life, until she got a divorce



# Accident Causation Model



# Human Factors Principles

- Avoid reliance on memory
- Simplify
- Standardize
- Use constraints and forcing functions
- Use protocols & checklists wisely
- Avoid long hours and fatigue
- Match work loads to capacity

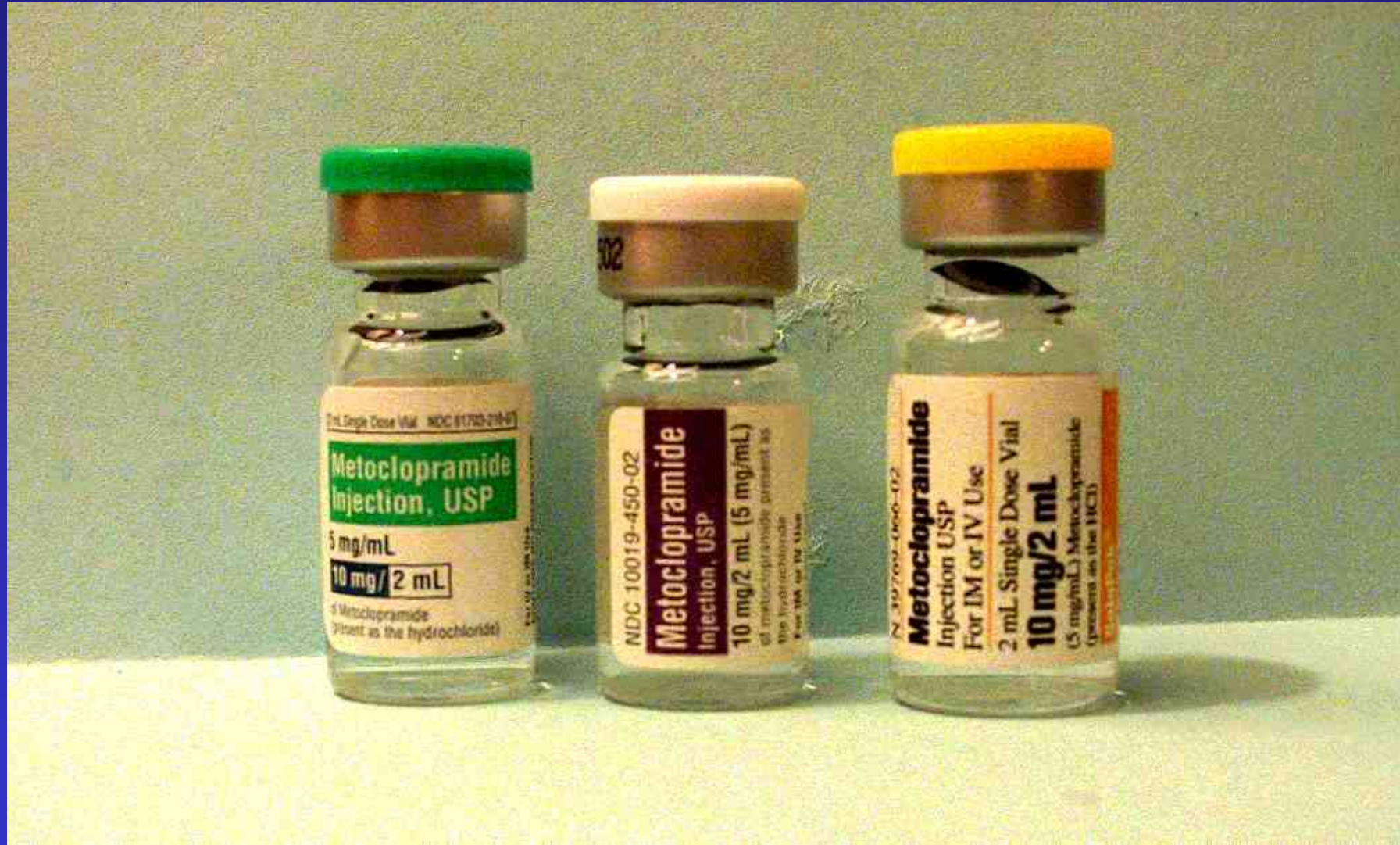


# Human Factors Violations

- Reliance on memory
- Excessive number of handoffs
- Non-standard processes
- Resist use of protocols
- Long work hours
- Excessive work loads







1 mL Single Dose Vial NDC 81782-214-01  
**Metoclopramide  
Injection, USP**  
5 mg/mL  
**10 mg / 2 mL**  
Metoclopramide  
(present as the hydrochloride)

502  
NDC 10019-450-02  
**Metoclopramide  
Injection, USP**  
10 mg/2 mL (5 mg/mL)  
Metoclopramide present as  
the hydrochloride  
For IM or IV Use

N 30702-066-02  
**Metoclopramide  
Injection USP**  
For IM or IV Use  
2 mL Single Dose Vial  
**10 mg/2 mL**  
(5 mg/mL) Metoclopramide  
(present as the HCl)





# Examples of Systems Redesign

- Warfarin clinics
- Heparin protocols
- Removal of KCI from nursing units
- Reconciling medications on admission and discharge
- Matching on-call schedule to load



# Types of Systems

- Process, tasks, and equipment
- Education and training
- Teamwork and interpersonal relationships
- Conditions of work
- Organizational culture



# What Have We Learned?

- Systems Theory works in health care
- Hospitals can make substantial reductions in errors by applying known safe practices
- Collaboration is a powerful mechanism for advancing patient safety
- Leadership and champions are essential
- Reporting works when it is safe and productive



# Progress in safety is too slow

- Most hospitals have implemented only a few simple safe practices
- Cultures haven't changed
- There is great resistance to taking on the serious issues: working conditions, full disclosure, teamwork
- No evidence that care is safer
- Public / media perceive little improvement



# Barriers to progress in patient safety

- Complexity
- Pressure of concerns about costs
- Lack of leadership
- Physician resistance



# Barriers to progress in patient safety

- Complexity

- 9,000 drugs (v. 600 in 1960)
- 77,000 lab tests per year
- 5,000 prescriptions per year
- Ever-changing technology
- Multi-specialty, multi-professional teams
- Expanding knowledge base



# Barriers to progress in patient safety

- Complexity
- Pressure of concerns about costs
  - Public is more concerned about access
  - Doctors are more concerned about falling income and rising malpractice premiums



# Barriers to progress in patient safety

- Complexity
- Pressure of concerns about costs
- Lack of leadership
  - CEOs don't want to believe the numbers
  - Can't get too far ahead of doctors
  - Not feeling much heat from public, boards or regulators



# Barriers to progress in patient safety

- Complexity
- Pressure of concerns about costs
- Lack of leadership
- Physician resistance



# Physician Resistance

Don't believe the numbers

- Don't want to believe them
- Don't square with personal experience
  - Most mistakes are not recognized

Autopsy studies:

|                         |        |
|-------------------------|--------|
| Major unsuspected dx    | 20-40% |
| Probable cause of death | 10-20% |

- “Tyranny of small numbers”



# The Tyranny of Small Numbers

No. of practicing physicians ~ 600,000

No. of preventable deaths/yr ~ 100,000



# The Power of Numbers

|                   |   |               |
|-------------------|---|---------------|
| Prescriptions     | = | 3,000,000,000 |
| X 10% error rate  | = | 300,000,000   |
| X 10% are serious | = | 30,000,000    |
| X 20% cause ADE   | = | 6,000,000     |
| X ? 1% are fatal  | = | 60,000        |



# Physician Resistance

The transforming concept is hard to accept

- Vague and complicated
- Goes against everything we were taught
- Smacks of irresponsibility
- Offends our sense of free agency
- Offends our sense of equilibrium



# Physician Resistance

- Don't believe the numbers
- The transforming concept is hard to accept
- Fear
  - Shame and guilt
  - Loss of reputation
  - Punishment



# Creating a Culture of Safety

1. How do you prevent accidental injuries?
2. What do you do when they occur?



# Creating a Culture of Safety

## How do you prevent injuries?

- Implement safe practices
  - Which ones?
  - How are they enforced?
- Implement new policies
  - Is it safe to talk about mistakes?
  - Are the conditions safe?
  - Is there mutual respect?
  - Is everyone accountable?



# Creating a Culture of Safety

1. How do you prevent accidental injuries?
2. What do you do when they occur?



# Creating a Culture of Safety

How do you respond to injuries?

- What happens when someone reports a serious event?
- What happens to the patient?
- What happens to the caregiver?



# Patient's Concerns

- Pain and dysfunction caused by injury
- Worry about prognosis
- Injury caused by trusted caregiver
- Continue to be cared for by those who hurt them



# Patients' Needs After Injury

1. Know what happened
2. Receive an apology
3. Be assured the hospital is doing all it can to prevent a recurrence



# Full Disclosure

- Clear, well-understood policy
- Strongly supported by the CEO, the Board, and Department Chairmen
- *How* it is done is as important as doing it.



# The “Second Victim”

- Often overlooked
- Shame, guilt and fear can be profound
- Impaired ability to deal with patients
- Needs colleagues’ support
- May need psychological counseling



Safety is not a program, it is a  
way of life



# Success Stories

- Roger Resar  
Eau Claire, WI
- Paul Uhlig  
Concord, NH



# Luther-Midelfort Safety

- Non-punitive Error Reporting
- Leadership Training
- Videos and Education
- Culture Surveys
- Principles of Medication Administration
- Discharge Medication Calendars



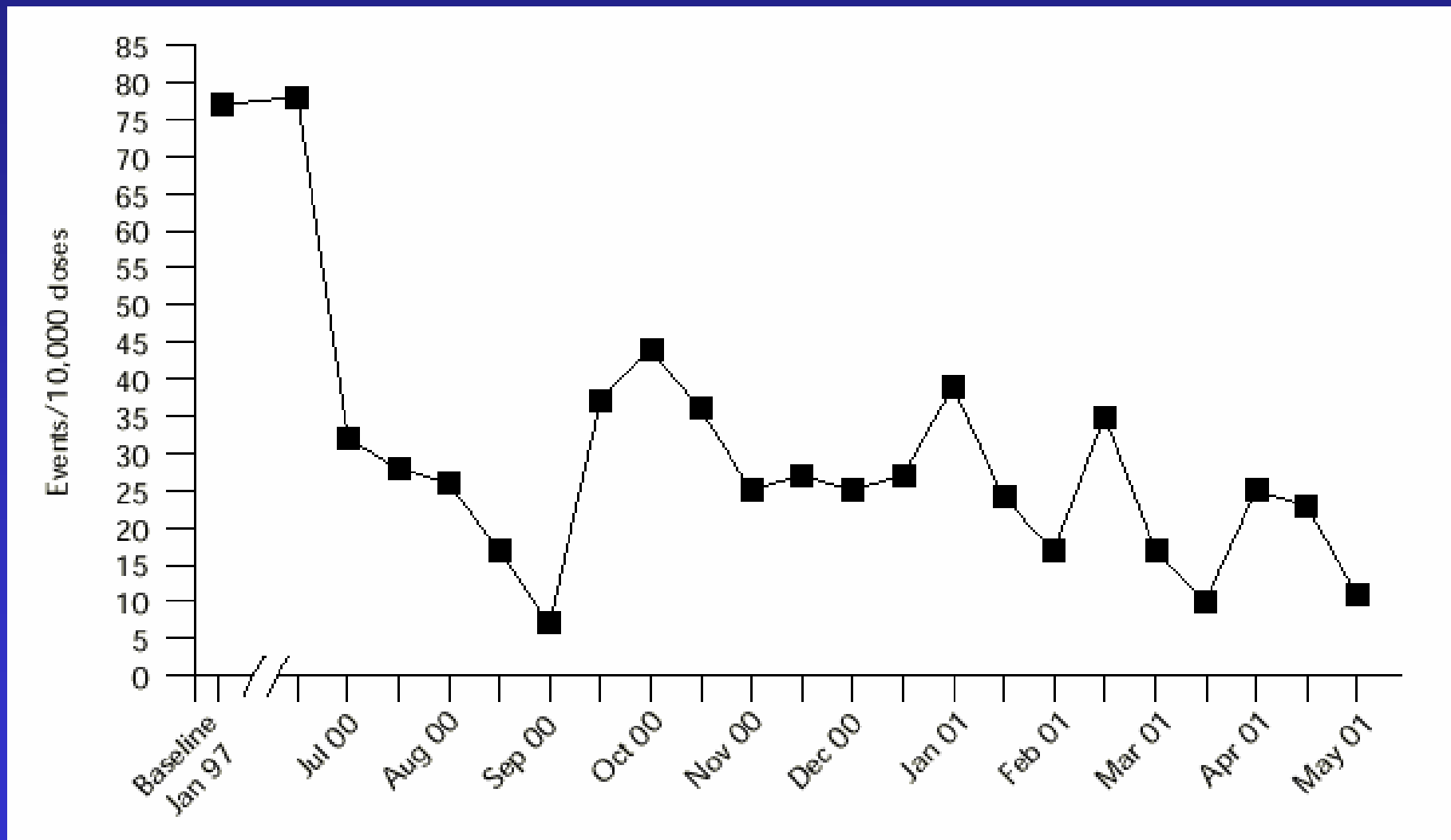
# Luther-Midelfort Protocols

- Sliding Scale Insulin
- Hypoglycemia
- Coumadin
- Heparin
- Admission Reconciliation
- Discharge Reconciliation
- Renal Dosing
- Potassium Replacement
- Neuromuscular Blockade (Ventil)
- Resuming Home Medications
- Pain Management
- Sedation (Ventil)



# ADE's/1000 Doses

Luther Midelfort Mayo Health System





# The Concord Cardiac Team

- Nurse-Practitioner
- Cardiac Surgeon
- Card Surg Resident
- Physician Assistant
- ICU nurses
- Pharmacist
- Physical Therapist
- Occupational Therapist
- Dietician
- Social worker
- Spiritual care giver
- Outpt Coordinator
- Office nurse
- Patient
- Family members



# Concord Cardiac Results

- Patient satisfaction: up
- Employee morale: up
- Surgical complications: down
- Surgical mortality: down



# Operative Mortality Concord Cardiac Surgery 7/6/98 to 10/4/01

— expected  
— observed

Institution of collaborative rounds

