To Err is Human: To Understand Error is Divine – Part I

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Objectives

At the end of this session participants will be able to:

- Describe the extent of medical error
- Demonstrate an understanding of medical error
- Discuss methods to decrease medical error

Epidemiology

Harvard Medical Practice Study:

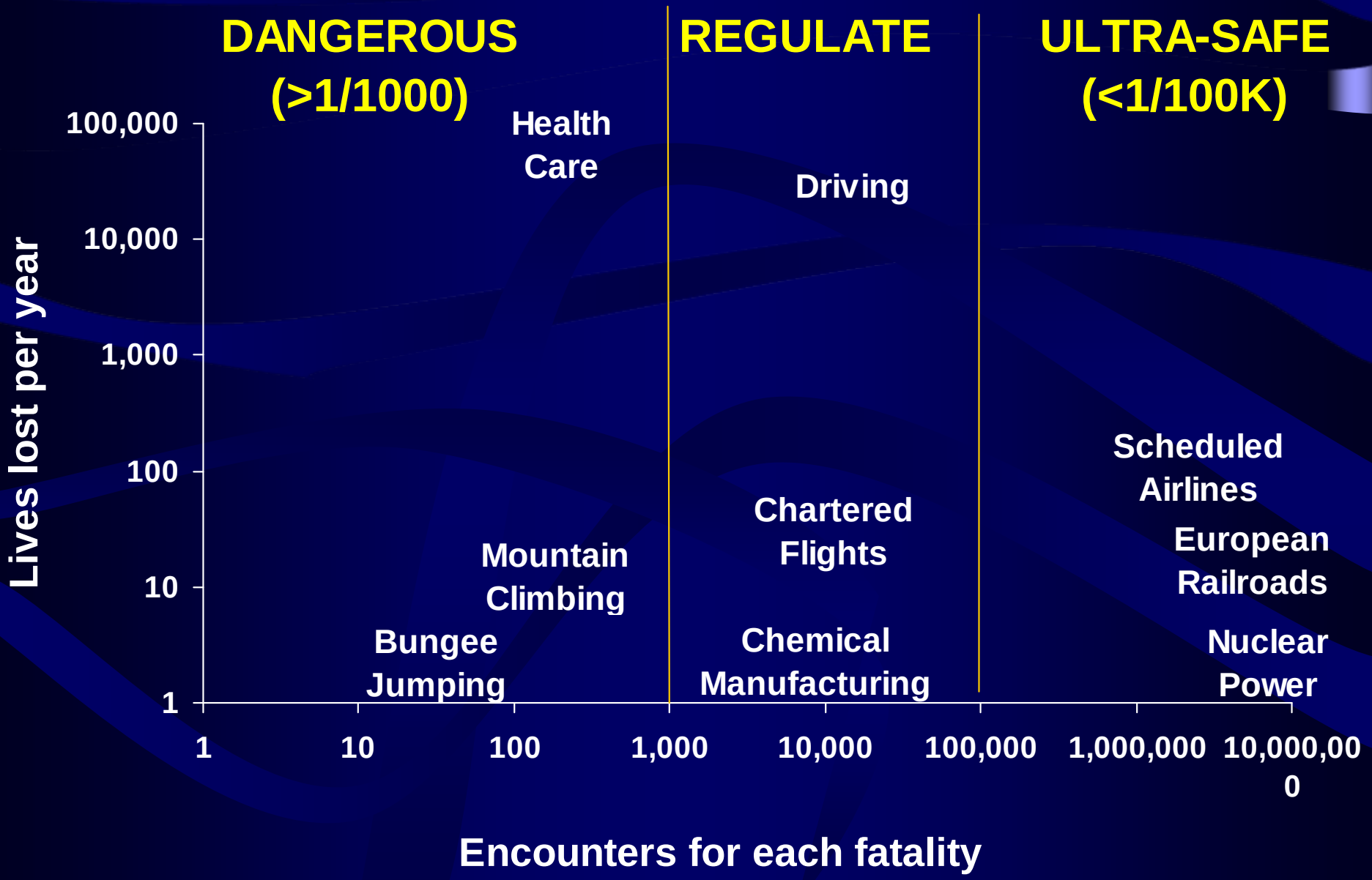
- As many as 98,000 deaths annually in U.S. hospitals as a direct result of medical error
- Exceeds annual death rates of:
  - AIDS
  - Motor vehicle collisions
  - Breast cancer

N Engl J Med 1991;324:370-376

Epidemiology

- Adverse events occur in 3.7% of admissions
- 13% end in death
- 2.6% cause permanent disability
  - N Engl J Med 1991;324:370-376
  - IOM National Academy Press 2001

Health Care Hazards



Epidemiology

Over vs Under Estimate?

- Some deaths are not preventable
- Definition of error is overly broad
- Adverse events are not recorded in the medical record
- Ranges reported 2.9% - 13%

Definition

What is medical error?

Failure to meet some realistic expectation that is both desirable and achievable

- Process
- Action
- Diagnosis
- Endpoint

Definition

IOM version of medical error?

- Use of a wrong plan to achieve an aim – error of planning…..or……
- Failure to complete a planned action as intended – error of execution
  - IOM National Academy Press 2001

Medicine Risks

Inherent risks in medicine:

- Much in medicine involves uncertainty
- Diagnosis is an inaccurate science
- Delivery of healthcare is fraught with danger and risk
- Our systems are classically stressed with limited resources

Medicine Risks

Inherent risks in medicine:

- Often work with incomplete information
- We administer drugs, radioactive agents, chemotherapy, and perform high risk procedures
- We work in loose-knit teams and use informal lines of communication

Types of Error

- Human error – directly attributable to the actions of a person
- System error – related to the design of systems and not directly related to the fault of a front line provider
- These two types of error are not mutually exclusive and are often linked

N Engl J Med 2003;348:851-855

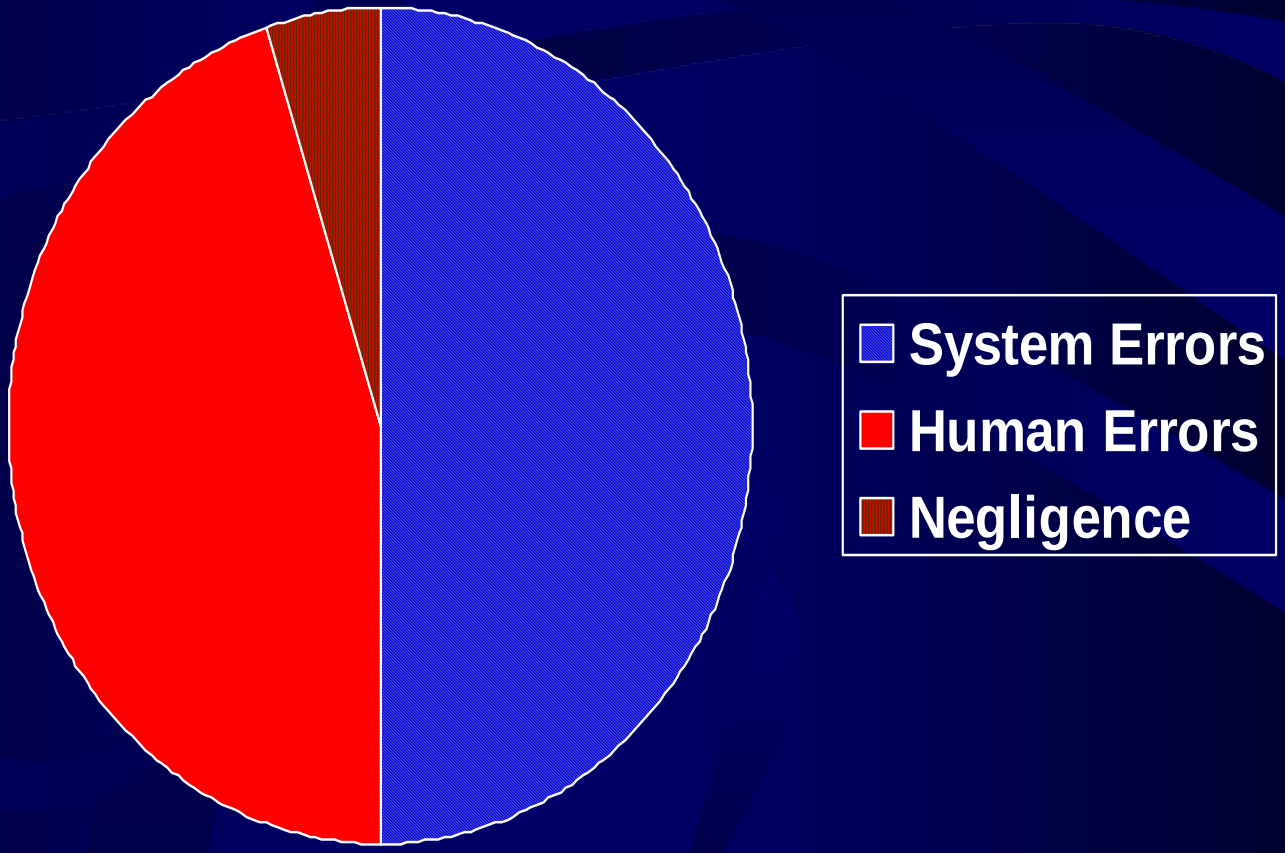
Complexity and Volume

Number of steps	Prob error @ 99.5%
–1	–0.5%
–5	–2.5%
–10	–4.9%
–20	–9.5%
–30	–14.0%
–50	–22.2%%

Complexity and Volume

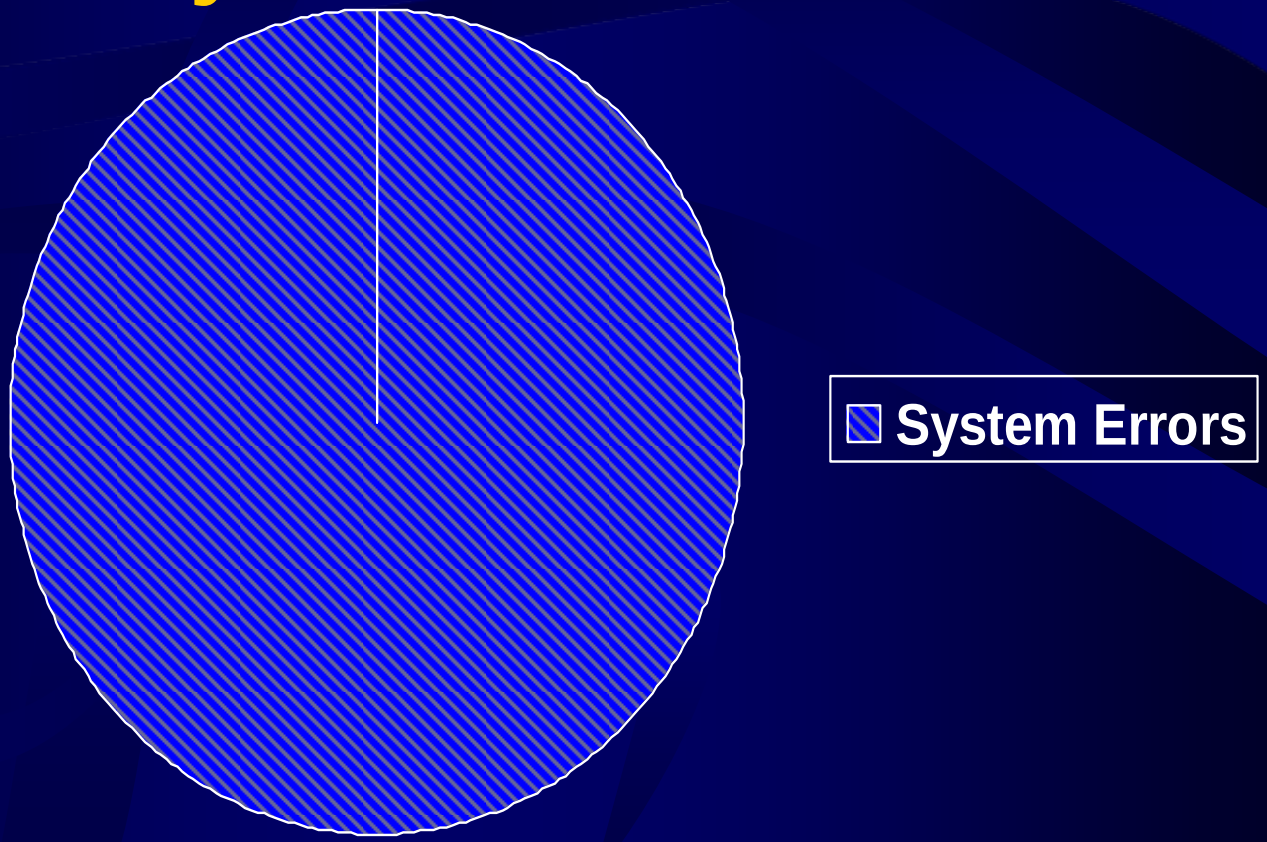
- Typically 25 steps in getting drug to patient
- Med error rate of 1% per order implies each step executed at 99.96% accuracy
- “Be careful” just won’t work

The Error Myth: Human error is equivalent to System error



Reality:

ALL errors are system errors. Human errors are *caused* by system errors



Reality Check

- Multifactorial etiology to medical error
- Requires solutions that will be multifactorial and require widespread changes

Challenges

Physician Culture

- "Bad Apple" theory – error is a character flaw, or negligence
- Misplaced focus on the incident and the individual-not the system
- Emphasis on punishment and remediation of the individual

Challenges

Physician culture causes dysfunctional error management:

- Repression – don’t tell anyone
- Projection – “the lab did not tell me”
- Denial – “the patient did it to themselves”

Non-admissibility

- Even when fatigued, I perform effectively in critical phases
  - –Pilots 25%
  - –Doctors 62%
    - •Residents 56%
    - •Attendings 70%

Case One

Mr. John Davis, a 67 year old, was admitted to room 304-A with a diagnosis of CHF at 10 am. At 3pm Mr. William Davis was admitted to 304-B with a diagnosis of alcoholic withdrawal. The evening nurse mistakenly administers Haldol and Ativan to Mr. John Davis. A code is called 45 minutes later when Mr. John Davis develops ventricular tachycardia.

JCAHO Goal 1

Improve accuracy of patient identification

- Use at least two methods of patient identification (excluding room #) whenever drawing blood or administering medications.
- Before the start of any surgical or invasive procedure, conduct a final verification process to confirm correct patient, procedure and site utilizing active communication skills.

Case Two

Mr. Bill Owens is a 62 year old in the CCU with a history of atrial fibrillation and CHF. He is on Digoxin, Coumadin, Lasix, Captopril and K-dur. The CCU nurse calls the cardiologist in the special procedures cath lab who is in sterile garb and receives orders through the special procedures nurse to give the patient 40 of K. The CCU nurse wrote the order as “Give 40 of Vitamin K now”.

JCAHO Goal 2

Improve the effectiveness of communication among caregivers

- Implement a process that requires verification “read-back” of verbal orders by the person receiving the order.
- Measure timeliness of critical test results/values reported to caregivers
- Standardize abbreviations, acronyms, and symbols within an institution
- The Institute for Safe Medication Practices has published a list of dangerous abbreviations and the recommended removal of these.

Case Three

Ms. Donna Sperry, a 32 year old AIDS patient, is admitted with severe dehydration due to infectious diarrhea. Her initial potassium is 2.5. Her initial admission orders include potassium runs of 40 meq IV over two hours. Floor nursing faxes the order to the pharmacy and the drip is hung. The patient complains bitterly of arm pain at the infusion site and the drip is discontinued until the house officer comes to the bedside.

JCAHO Goal 3

Improve the safety of using high-alert medications

- Remove concentrated electrolytes (potassium and concentrated sodium) from patient care units
- Standardize and limit the number of drug concentrations available in an institution
- Remove/minimize look-alike/sound-alike drugs

Case Four

Ms. Emelda Wills a 54 year old patient with diabetes, hypertension and severe degenerative joint disease. She has been admitted and scheduled for a knee replacement of her right knee. She awakes in the Recovery Room and is startled by the bandage on her left knee and her right knee without change.

JCAHO Goal 4

Eliminate wrong-site, wrong-patient and wrong-procedure surgery

- Create and use a preoperative verification process, such as a checklist, to confirm appropriate documents are available
- Implement a process to mark the surgical site and involve the patient in the marking process

JCAHO Goal 5

- Improve the safety of using infusion pumps
- Ensure free-flow protection on all general-use and PCA intravenous pumps used within the institution

JCAHO Goal 6

Improve the effectiveness of clinical alarm systems

- Implement regular preventive maintenance and testing of alarm systems
- Assure that they are activated with appropriate settings and are sufficiently audible with respect to distances and competing noise within the unit

JCAHO Goal 7

- Reduce the risk of health care-associated infections.
- Comply with current Centers for Disease Control and Prevention (CDC) hand hygiene guidelines.
- Manage as sentinel events all identified cases of unanticipated death or major permanent loss of function associated with a health care-associated infection.

JCAHO Goal 8

Patient Medication Lists:

- Obtain and document a complete list of the patient's current medications
- Patient medication lists must be effectively communicated upon transfer of patient care

JCAHO Goal 9

Patient Falls- Risk Assessment:

- Assess upon admission and periodically reassess patient risk for patient fall and injury
- Assess the potential risk of fall considering the patient's medication regimen

JCAHO Goal 10

Patient Vaccination:

- Develop and implement a protocol for influenza and pneumococcal vaccines
- Develop and implement a protocol for identifying new cases of influenza and associated outbreaks