Medical Errors
What to Avoid

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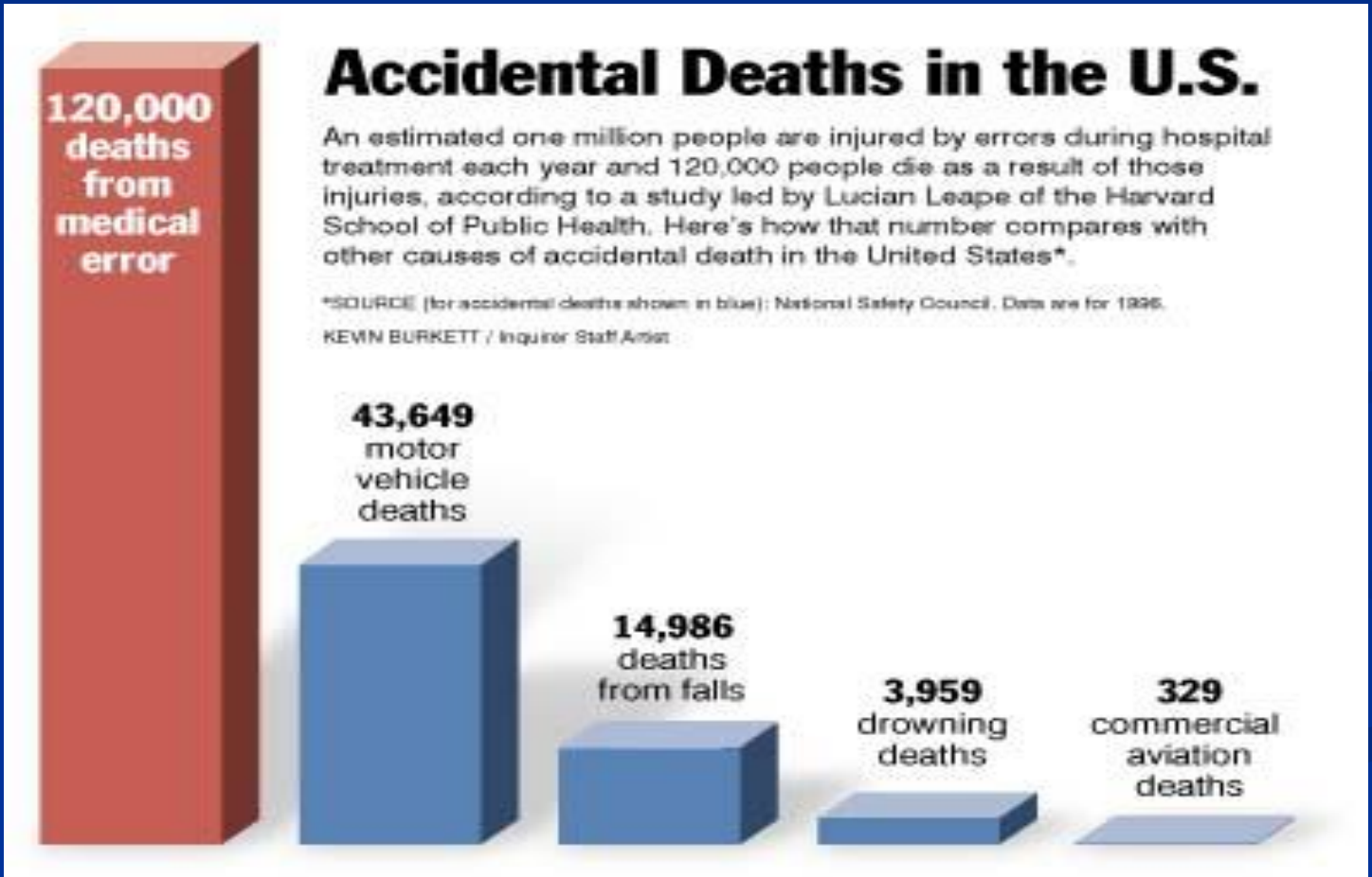
Disclosures

- I have no disclosures

Objectives

- Understand the importance of the IOM report
- Identify the major areas for medication error
- Identify major “error-prone” abbreviations
- Understand “Just Culture”
- Identify the primary root cause of sentinel events

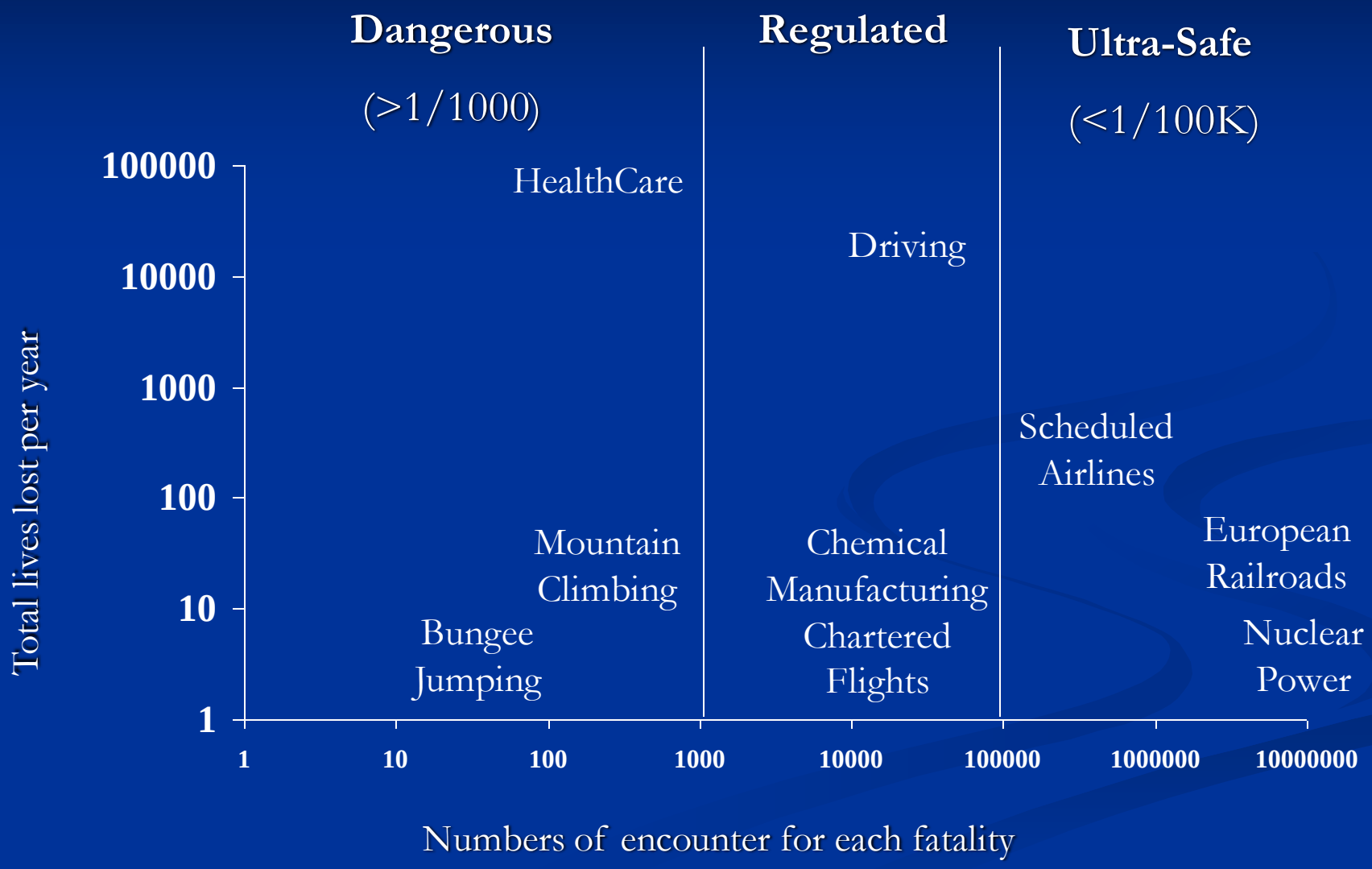
Estimated Deaths Due to Medical Error



Source – The Philadelphia Inquirer

How Hazardous Is Health Care?

(Modified from Leape)



Boeing 747

- 450 would have to crash every year to equal medical deaths
- That's more than ONE A DAY!

Medical Care…Then and Now

Definitions

- Error
  - Failure of a planned action to be completed as intended (i.e., error of execution) or the use of a wrong plan to achieve an aim (i.e. error of planning)
- Adverse Event (AE)
  - An injury caused by medical management rather than the underlying condition of the patient
- Preventable Adverse Event
  - An adverse event attributable to an error

Source – IOM, 2000

To Err is Human

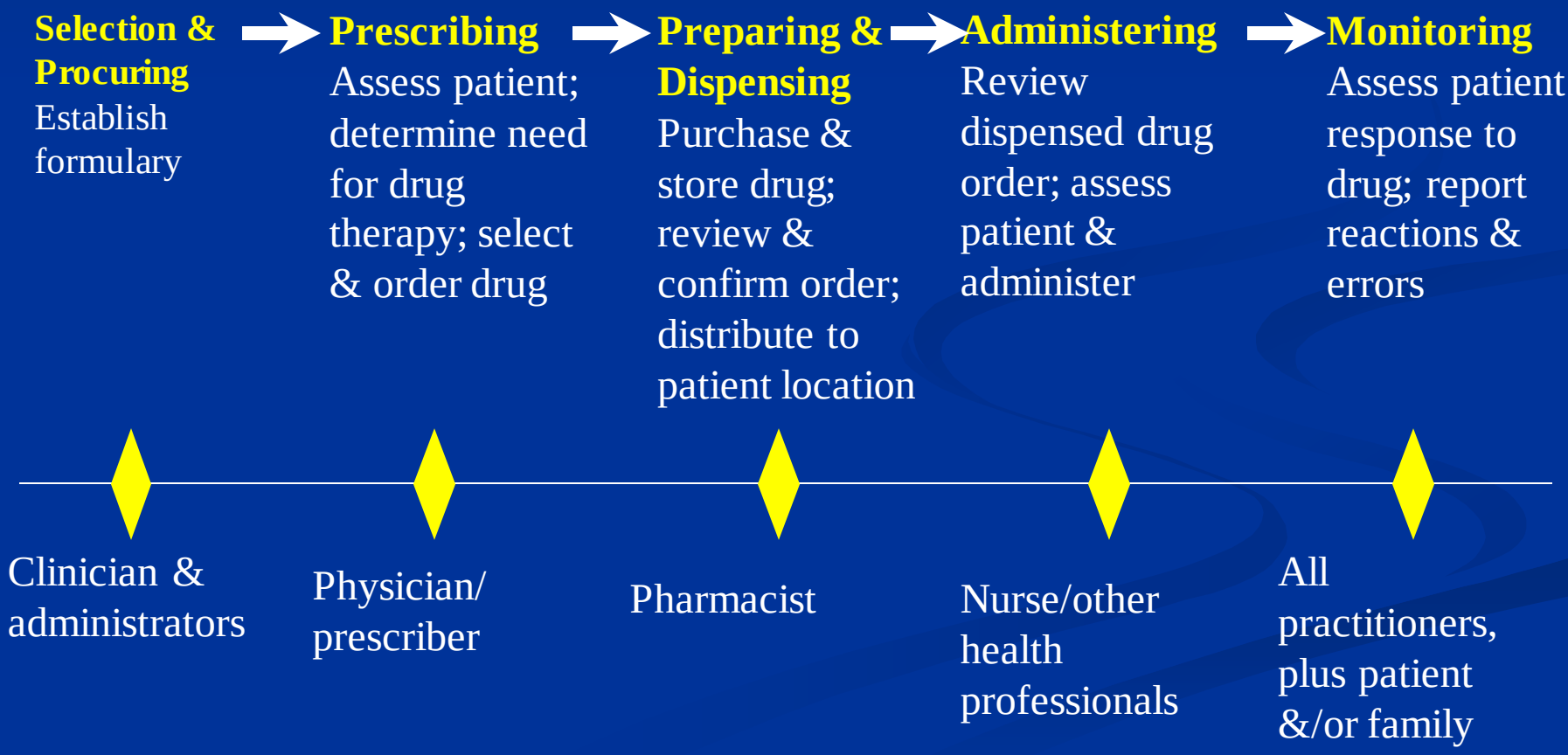
- IOM releases report *To Err is Human* (2000)
  - Estimates 44,000 to 98,000 unnecessary deaths each year due to medical error
  - Estimated 1,000,000 excess injuries due to medical error
  - Numbers based on the MPS and extrapolated to the general population

Why is medicine so susceptible?

- Lack of awareness to the problem
- "Culture of Silence"
  - Blame and shame mentality
- System constraints
  - Staffing problems
  - Fatigue
  - Knowledge requirements
  - Communication and continuity of care

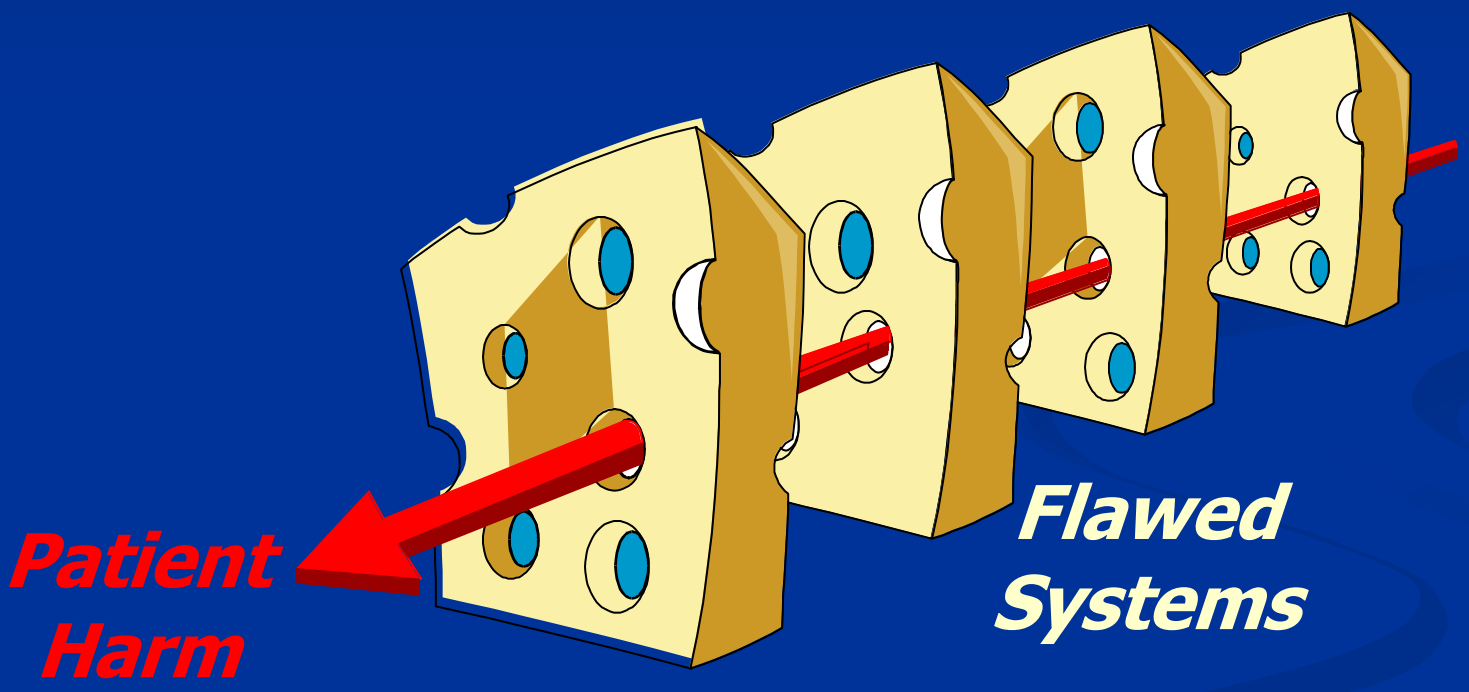
The Medication Use System

High-Level Portrayal of a Medication Use System



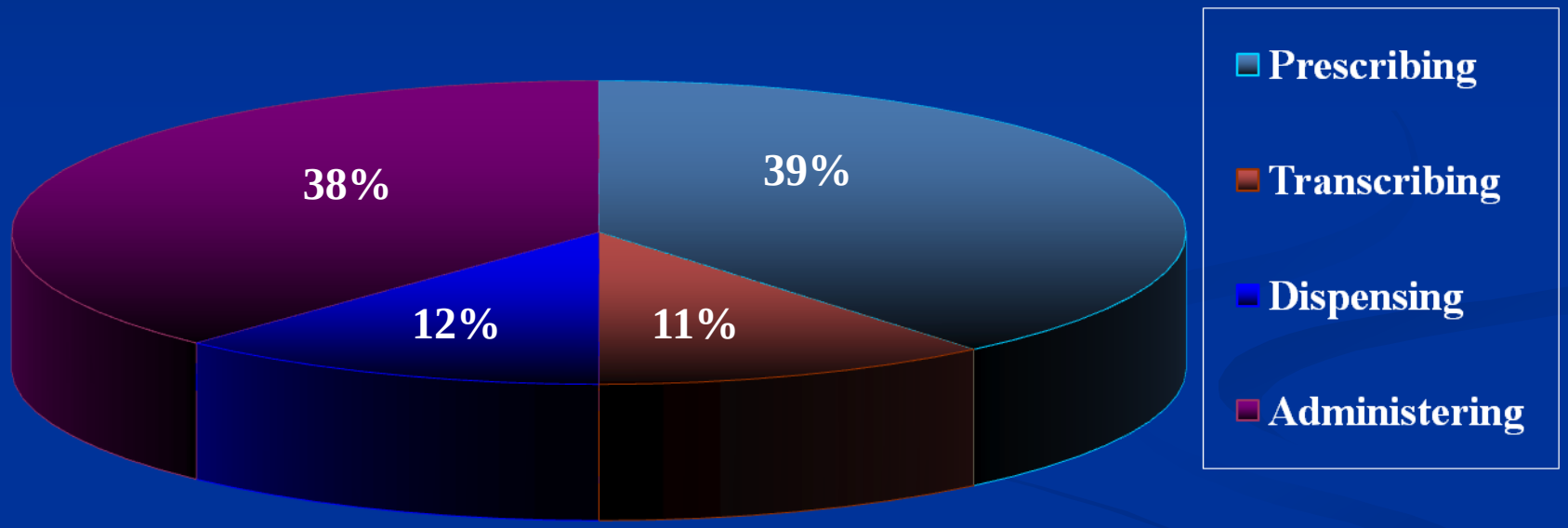
Joint Commission. 1998

The "Swiss Cheese Model" of Major Accidents & Errors



James Reason,
Human Error

Major Areas for Medication Error



Medication Errors Reporting Program US

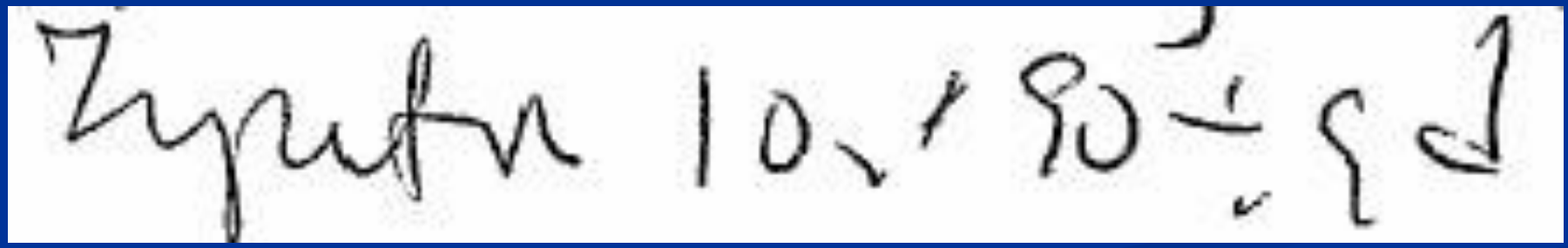
Prescribing Errors

Contributing factors:

- Illegible handwriting
- Inaccurate medication history taking
- Confusion with the drug name
- Inappropriate use of decimal points
- Use of abbreviations
- Use of verbal order

Prescribing Errors….. Examples

Name That Drug…

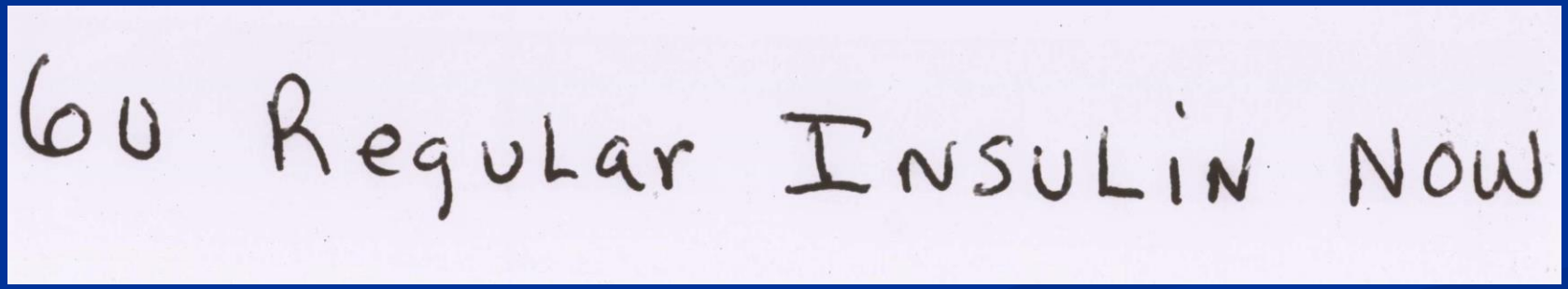


Lipitor 10mg PO QD

Filled Rx: Zyrtec 10mg

Prescribing Errors….. Examples

Name That Drug…

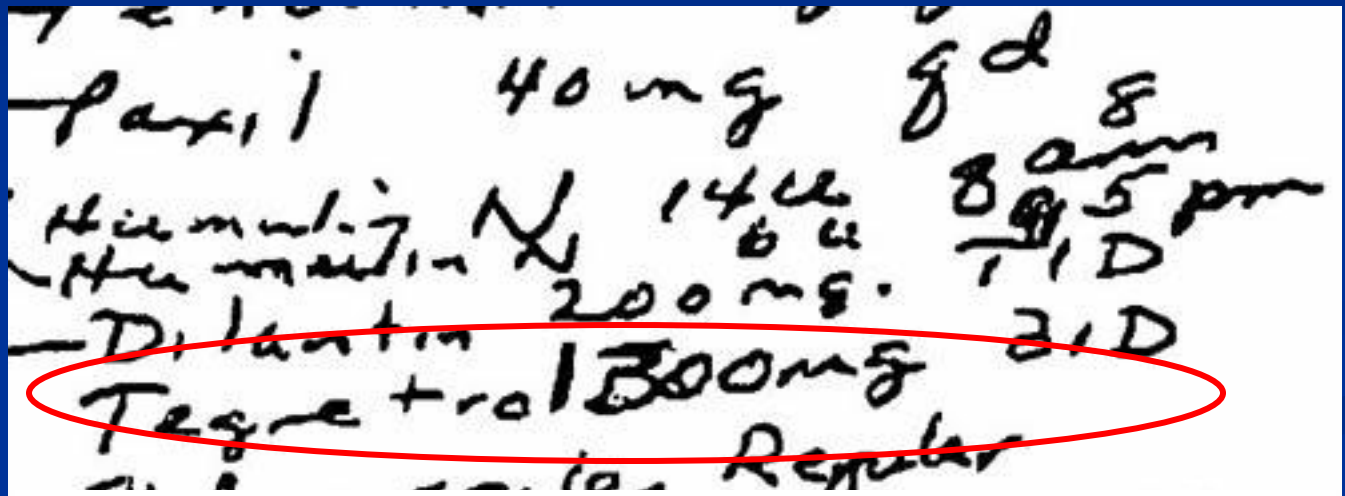


6 units of regular insulin now

Filled Rx: 60 units

Prescribing Errors….. Examples

Name That Drug…

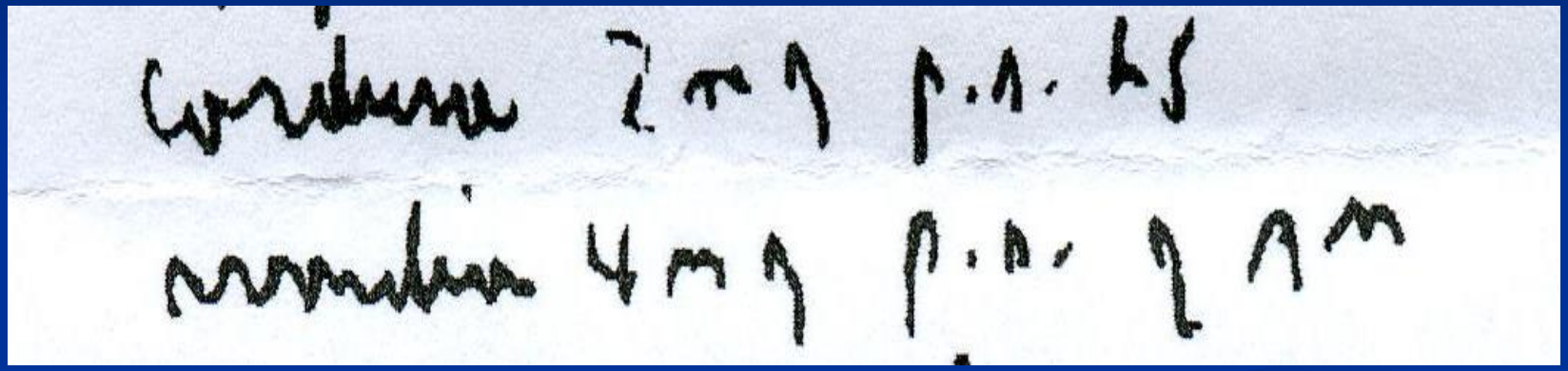


Tegretol 300mg BID

Filled Rx: Tegretol 1300mg

Prescribing Errors….. Examples

Name That Drug…



Cardura 2mg PO HS &
Avandia 4mg PO QAM

Filled Rx: Coumadin 2mg PO HS & Coumadin 4mg PO QAM

Patient received 6mg of Coumadin PLUS no treatment for hypertension & diabetes

Dispensing Errors

- It is an error that occurs at any stage during the dispensing process from the receipt of a prescription in the pharmacy through to the supply of a dispensed product to the patient
- Studies have estimated that dispensing errors occur at a rate of 1-24%
- These errors include the selection of the wrong strength/product. This occurs primarily when ≥ 2 drugs have a similar appearance or similar name (look-a-like/sound-a-like errors)

Dispensing Errors…..Examples

Dispensing Errors…..Examples

Dispensing Errors…..Examples

Institute for Safe Medication Practices

ISMP's List of *Confused* Drug Names

This list of confused drug names, which includes look-alike and sound-alike name pairs, consists of those name pairs that have been published in the *ISMP Medication Safety Alert!*® and the *ISMP Medication Safety Alert!*® Community/Ambulatory Care Edition. Events involving these medications were reported to ISMP through the ISMP National Medication Errors Reporting Program (ISMP MERP).

We hope you will use this list to determine which medications require special safeguards to reduce the risk of errors. This may include strategies such as: using both the brand and generic names; including the purpose of the medication on prescriptions; configuring computer selection screens to prevent look-alike names from appearing consecutively; and changing the appearance of look-alike product names.

Updated through June 2011

Drug Name	Confused Drug Name
Abelcet	amphotericin B
Accupril	Aciphex
acetaZOLAMIDE	acetoHEXAMIDE
acetic acid for irrigation	glacial acetic acid
acetoHEXAMIDE	acetaZOLAMIDE
Aciphex	Accupril
Aciphex	Aricept
Activase	Cathflo Activase
Activase	TNKase

Drug Name	Confused Drug Name
amLODIPine	aMILoride
amphotericin B	Abelcet
amphotericin B	Ambisome
Anacin	Anacin-3
Anacin-3	Anacin
antacid	Atacand
Antivert	Axert
Anzemet	Avandamet
Apresoline	Priscoline

Look Alike/Sound Alike Names

Serzone (nefazodone) vs. Seroquel (quetiapine)
(antidepressant) (antipsychotic)

- Similar overlapping strengths (100 mg and 200 mg)
- Similar dosage forms (tablets)
- Similar dosing interval (BID)
- Similar titration schedule
- Often stocked in close proximity on pharmacy shelf

Prescribing and dispensing errors have led to a number of adverse events (N/V, hallucinations, AMS, lethargy, seizures, death)

Administration Errors

- Defined as a discrepancy between the drug therapy received by the patient & the drug therapy intended by the prescriber
- Drug administration is associated with one of the highest risk areas in nursing practice

Administration Errors

Contributing factors:

- Failure to check the patient's identity prior to administration
- Storage of similar preparations in similar areas
- Noise, interruptions while undertaking a drug round, & poor lighting

Williams DJ. 2007

Administration Errors…..Examples

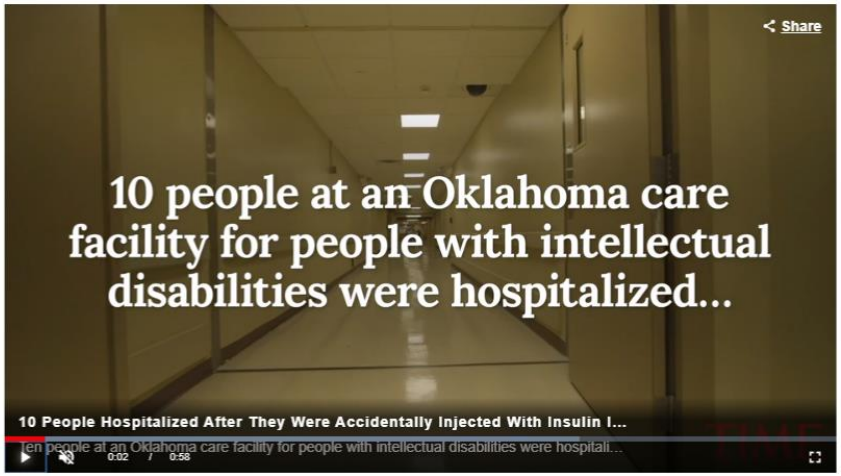
A patient had an epidural line for pain management & a peripheral IV line containing insulin

- The nurse caring for the patient was busy & asked a second nurse to retrieve the next scheduled epidural infusion bag
- The second nurse delivered a new bag of insulin to the patient's bedside

Without checking the label, the primary nurse hung the insulin infusion to the epidural line

U.S. • OKLAHOMA

10 People Hospitalized After They Were Accidentally Injected With Insulin Instead of Flu Vaccine



BY ASSOCIATED PRESS NOVEMBER 8, 2019

(BARTLESVILLE, Okla.) — Ten people at an Oklahoma care facility for people with intellectual disabilities were hospitalized after they were apparently accidentally injected with what's believed to be insulin rather than flu shots, authorities said.

Emergency responders were called Wednesday afternoon to the Jacquelyn

How Can We Identify The Risk?

- High alert medication
- Error prone notations
- Look-a-like & sound-a-like medications

"Top 10 High Alert" Medications Involved in Drug Errors

Agent	% of Drug Errors Associated with Acute Hospital Care
Insulin	4% of all medication errors in 2005
Morphine	2.3%
Potassium Chloride	2.2%
Albuterol	1.8%
Heparin	1.7%

United States Pharmacopeia.2007

"Top 10 High Alert" Medications Involved in Drug Errors

Agent	% of Drug Errors Associated with Acute Hospital Care
Vancomycin	1.6%
Cefazolin	1.6%
Acetaminophen	1.6%
Warfarin	1.4%
Furosemide	1.4%

United States Pharmacopeia.2007

Strategies To Reduce Risk From High-Alert Medications

- Limit the access to these medications
- Standardizing the ordering/preparation & administration
- Independent double check at dispensing & administrating phase

Implement "Do Not Use" Abbreviation List

- ISMP & FDA recommend that ISMP's list of error-prone abbreviations be **considered** whenever medical information is communicated

Complete list is located at:

www.ismp.org/Tools/errorproneabbreviations.pdf

ISMP= Institute for Safe Medication Practices,
FDA= Food and Drug Administration

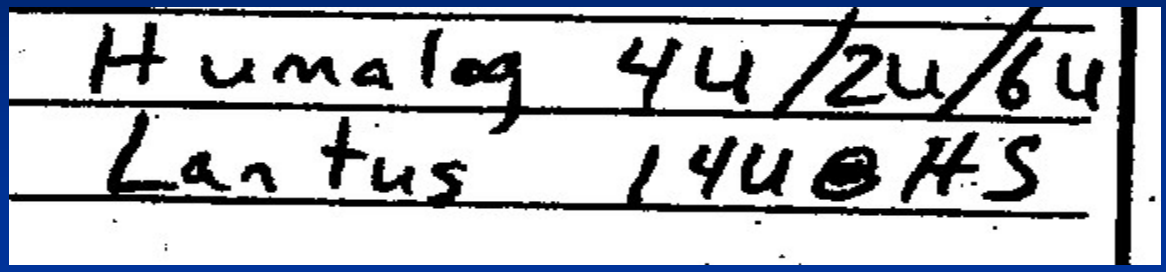
List of dangerous abbreviations, acronyms, and symbols
JCAHO MINIMUM REQUIRED LIST

Abbreviation	Potential Problem	Preferred Term
U (unit)	Mistaken as zero, four, or cc	Write "unit"
IU (international unit)	Mistaken as IV or 10	Write "international unit"
Q.D., Q.O.D.	Mistaken for each other. Period after Q and O after Q can be mistaken for "I"	Write "daily" and "every other day"
Trailing zero and lack of leading zero	Decimal point missed	Never write a zero by itself after a decimal point, and always use a zero before a decimal point
MS, MSO4, MgSO4	Confused for one another	Write "morphine sulfate" or "magnesium sulfate"

List of additional dangerous abbreviations, acronyms, and symbols

ABBREVIATON	POTENTIAL PROMBLEM	PREFERRED TERM
µg (microgram)	Mistaken for mg (milligram)	Write "mcg"
H.S. (at bedtime or half – strength)	Mistaken for either meaning: Also mistaken for every hour	Write out "half – strength" or "at bedtime"
T.I.W (three times a week)	Mistaken for three times a day or twice weekly	Write "three times weekly" or "3 times weekly"
S.C. or S.Q. (subcutaneous)	Mistaken for SL for sublingual or "5 every"	Write "Sub-Q" or "subQ" or "subcutaneously"
D/C	Interpreted as discontine whatever medication follows (typically discharge meds)	Write "discharge"
c.c.	Mistaken for U (units) when poorly written	Write "ml" for milliliters
A.S., A.D., A.U. (Latin abbreviations for left, right, both ears) O.S., O.D., O.U. (Latin abbreviations for left, right, both eyes)	Mistaken for each other (A.S. for O.S., A.D. for O.D., A.U. for O.U., visa versa)	Write out "left ear" or "right ear" or "both ears" Write out "left eye" or "right eye" or "both eyes"

Error-Prone Notations…..Examples

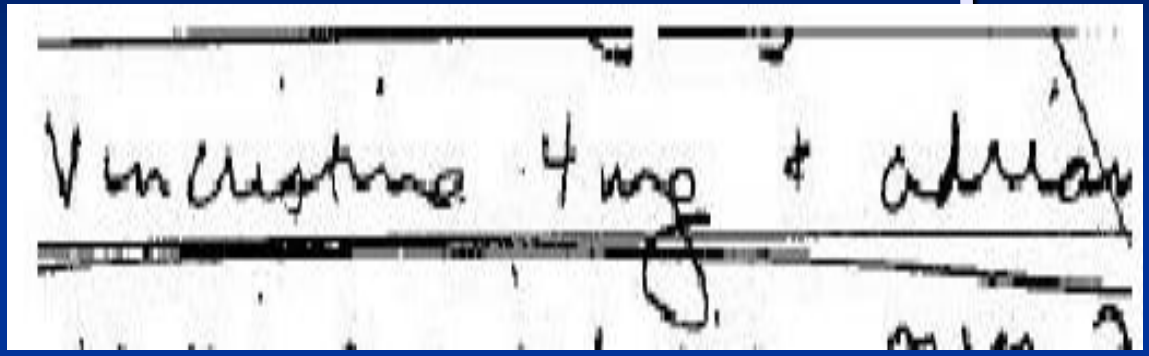


Intended dose of 4 units

Administered 44 units

Should be written as “4 units”

Error-Prone Notations…..Examples



Intended dose of ".4 mg"

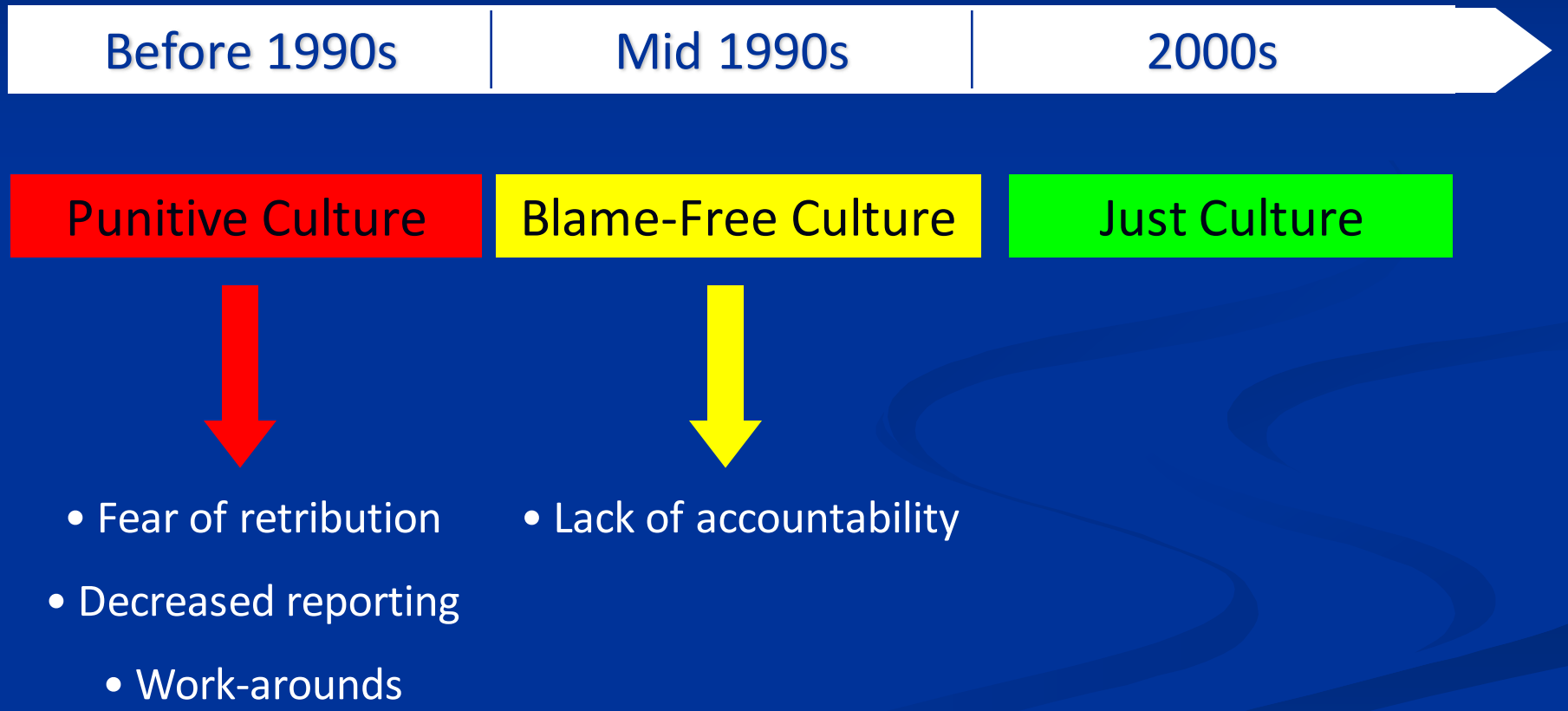
Administered 4mg

Should be written as "0.4 mg."

A New Way of Thinking in Medication Safety:

From	To
Who did it?	How did it happen?
Punishment	Thank you!
Errors are rare	Errors will happen
Only Nurses involved	Everyone is involved in problem solving
Add more layers	Simplify/standardize
Calculating error rates	Learn from error reporting

Culture of Safety Timeline



Institute for Safe Medication Practices. Medication Safety Alert. Sept 7, 2006.

Behaviors Observed in Errors

- **Human Error:** an inadvertent action; inadvertently doing other than what should have been done; slip, lapse, mistake
- **At-Risk Behavior:** a behavioral choice that increases risk where risk is not recognized, or is mistakenly believed to be justified
- **Reckless Behavior:** a behavioral choice to consciously disregard a substantial and unjustifiable risk

Just Culture

Type of Behavior	Description	Suggested Response
Human Error	Unintentional acts	Console
At-Risk	Short-cuts	Coach
Reckless	Intentional Substantial risk Outside the norm	Discipline

Nursing Management: 50; 6: 38-45.

Institute for Safe Medication Practices. Medication Safety Alert. September 21, 2006.

Just Culture

During a busy shift, a pharmacist fails to check a patient's renal function when entering an order for an antibiotic.
The patient is not harmed.

Type of Behavior
Human error
At-risk
Reckless

Response
Console
Coach
Discipline

Just Culture

A pharmacist inadvertently hits the zero key an extra time and enters an order for 100 mg instead of 10 mg. The patient receives an overdose and must be transferred to the ICU.

Type of Behavior
Human error
At-risk
Reckless

Response
Console
Coach
Discipline

Response is dictated by type of behavior, not outcome of patient.

http://www.safetycenter.navy.mil/photo/archive/

FMEA

- Step-by-step approach for identifying all possible failures in a design, process, product or service.
- "Failure modes" = the ways, or modes, in which something might fail.
- "Effects analysis" refers to studying the consequences of those failures.
- Failures are prioritized according to how serious their consequences, how frequently they occur and how easily they can be detected.

FMEA

- Ideally, FMEA begins during the earliest conceptual stages of design and continues as long as that process, etc is used
- For use in continuous improvement
  - documents current knowledge and actions about the risks of failures
- FMEA is used during design to prevent failures.
- Similar to *proactive risk modeling/ assessment*

FMEA vs. RCA

- *Pro*active v. *Re*active is the most basic
  - though not entirely true
  - FMEA based on history (experience) to some extent

RCA^2

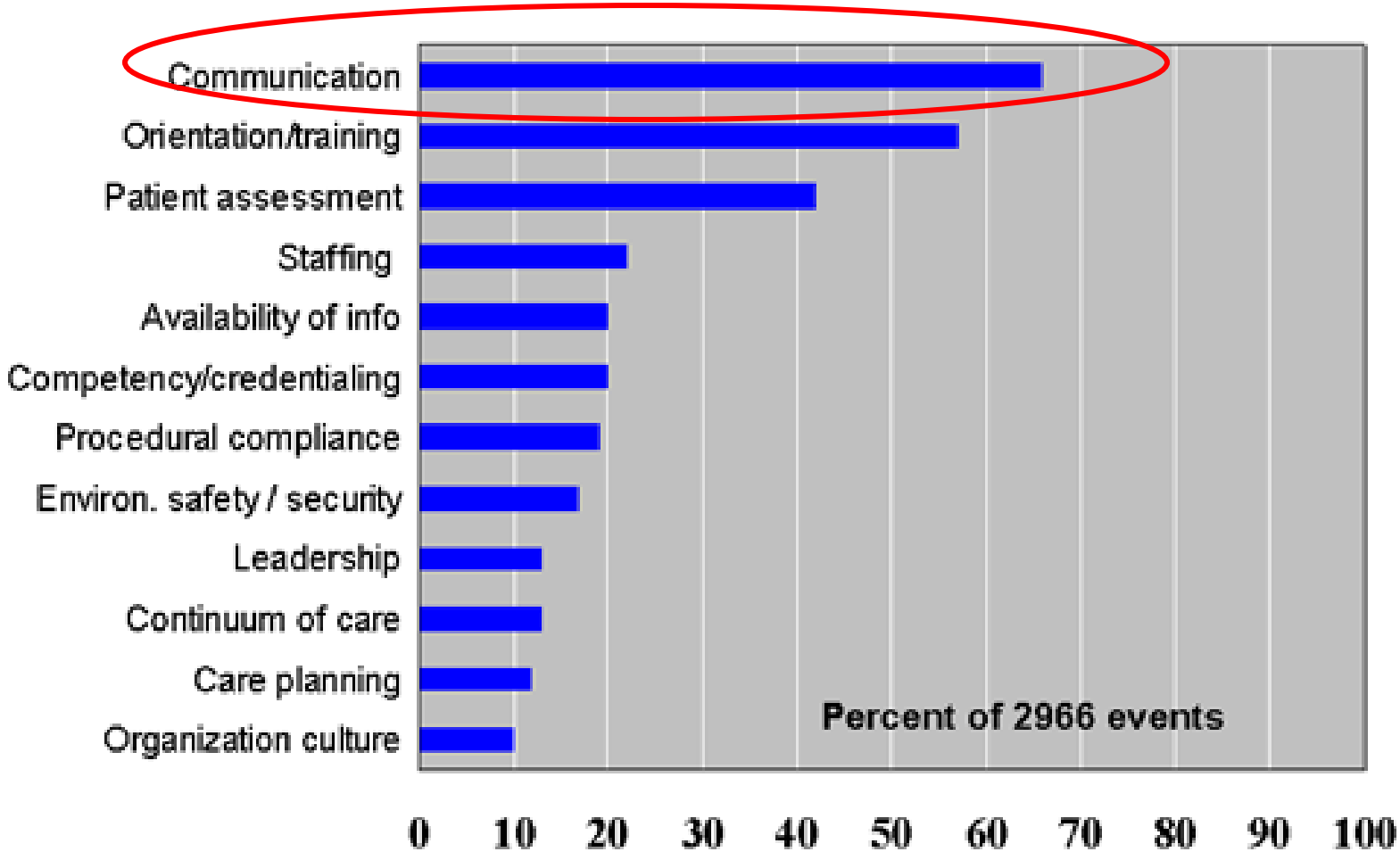
- RCA^2: Improving **R**oot **C**ause **A**nalyses and **A**ctions to Prevent Harm
- Main message: It cannot be over-emphasized that if actions resulting from an RCA^2 are not implemented and measured to demonstrate their success in preventing or reducing the risk of patient harm in an effective and sustainable way, then the entire RCA^2 activity will have been a waste of time and resources.

RCA^2 Role

- Triage adverse events and close calls/near misses
- Identify the appropriate RCA2 team size and membership
- Establish RCA2 schedules for execution
- Use tools provided to facilitate the RCA2 analysis
- Identify effective actions to control or eliminate system vulnerabilities
- Develop Process/Outcome Measures to verify that actions worked as planned
- Use tools provided for leadership to assess the quality of the RCA2 process

Root Causes of Sentinel Events

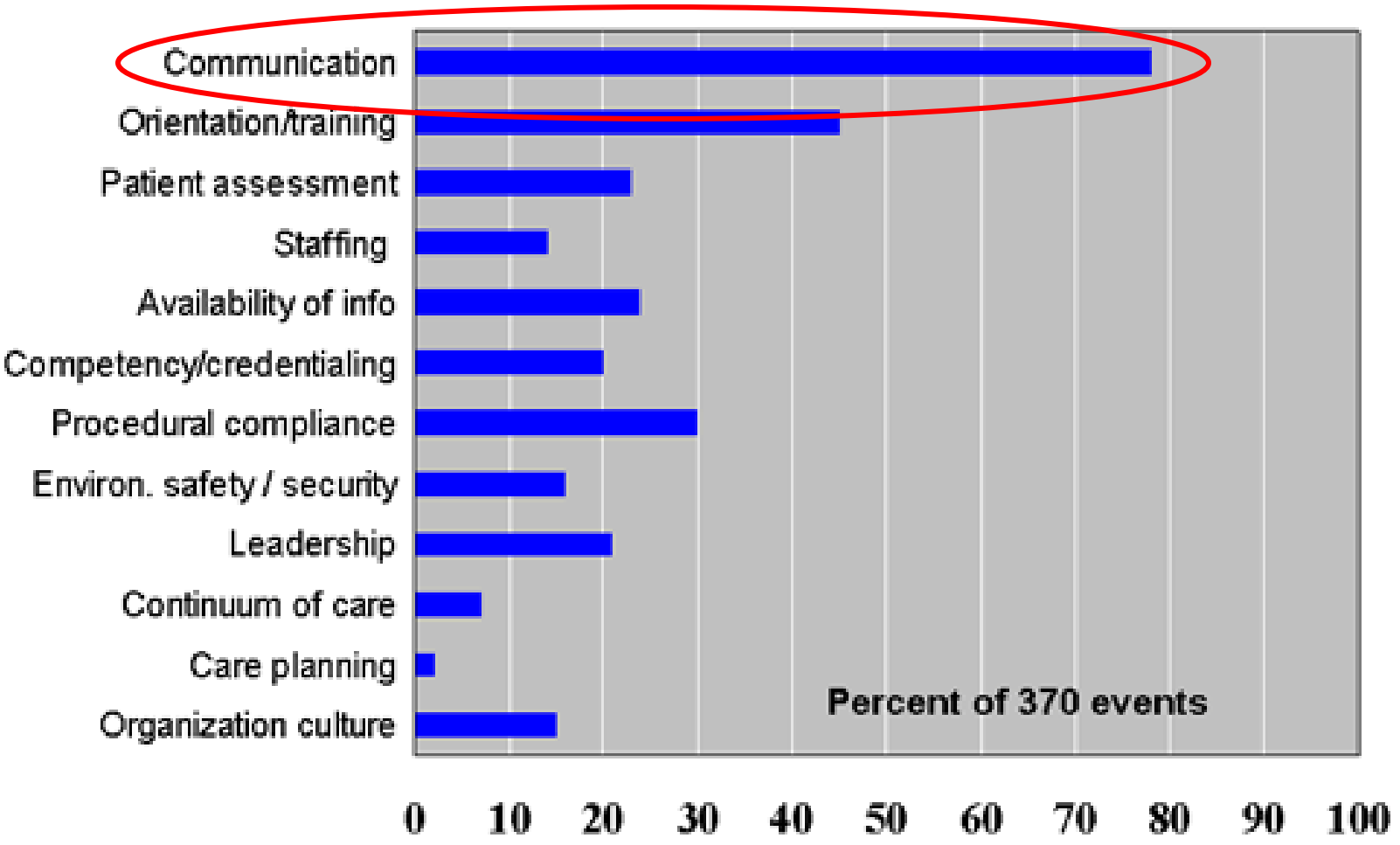
(All categories; 1995-2004)



JCAHO Sentinel Event Statistics, 2004

Root Causes of Wrong Site Surgery

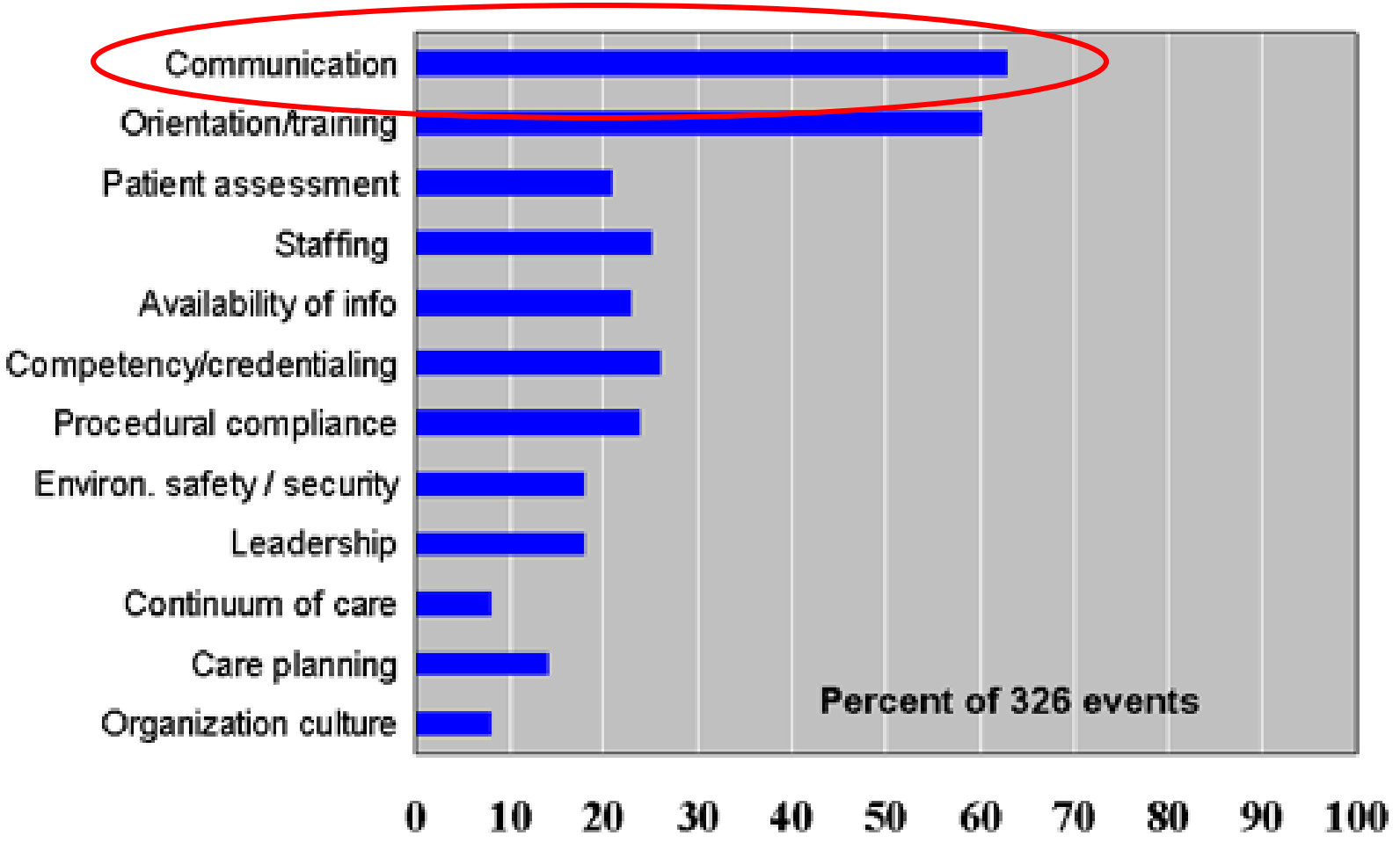
(1995-2004)



JCAHO: Sentinel Event Statistics, 2004

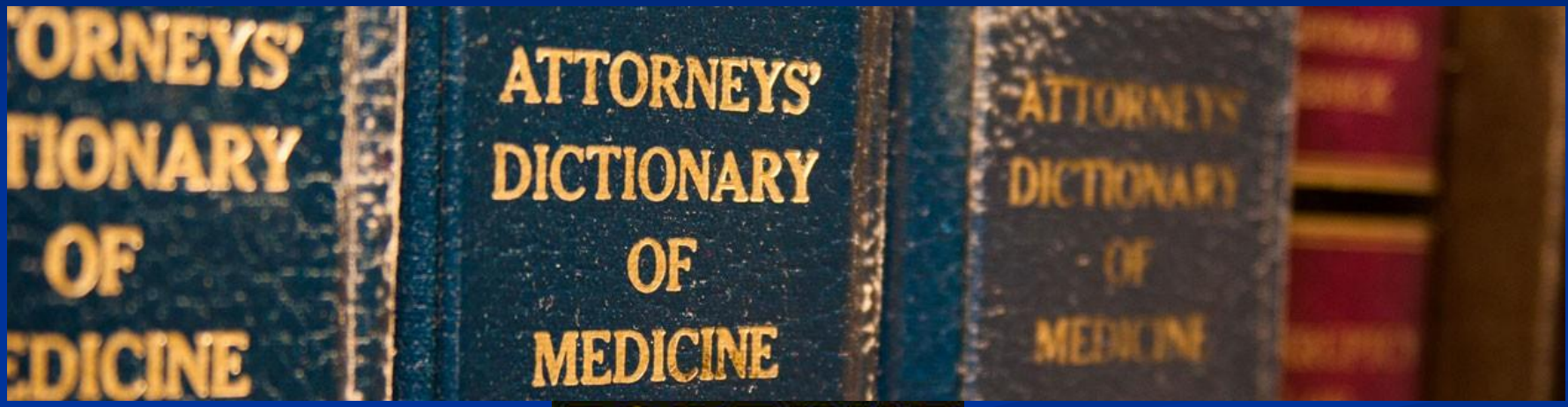
Root Causes of Medication Errors

(1995-2004)



JCAHO Sentinel Event Statistics, 2004

Patient Cases of Medical Error



AM	1	2	3	4	5	6	7	8	9	10	11	12	PM	13	14	15	16	17	18	19	20	21	22	23	24

DATE 1.22	IVF: Sterile H_2O run @ 75 cc/h
TIME 1900	(Sterile Water)
PROCESSED BY:	
VERBAL ☐ TELEPHONE ☐	Print Name/Title of Person Giving Order / Signature/Title of Person Taking Order

DATE 1/22/03	TIME 1900	DR. SIGNATURE [redacted]	DR. # [redacted]

Case

- Attending MD tells the resident to give the patient “free water” (meaning let her drink water”)
- Resident assumes he meant an IV and writes for water to be given IV
- New RN can’t find IV water and calls pharmacy asking where they get IVs; pharmacy asks no questions and tells the RN they get them from C.S.
- RN obtains IV from C.S. never questioning RN why she by-passed pharmacy; water bag says “water for irrigation”

Willie King – 1995, Tampa

https://www.patient-safety-blog.com/2014/01/16/the-willie-king-case-wrong-foot-amputated/

Table 4. Factors Contributing to WSPE From Case Analyses*

Human factors
High workload environment
Fatigue
Multiple team members
Diffusion of authority/lack of accountability
Team communication
Change of personnel
Haste
Inexperience
Incompetence
Other cognitive factors
Patient factors
Sedation or anesthesia
Patient not consulted before block or anesthesia
Patient confusion of side, site, or procedure
Inability to engage patient (eg, young child or decreased competence)
Patient ignorance
Patient has common name or same name as another patient in hospital
Procedure factors
Wrong side draped/prepped
Similar or same procedures back to back in same room
Patient position or room changed prior to initiating procedure
Attempts to prevent WSPE
Not observing marked site/marking wrong site
Not cross-checking for consistency in consent form, patient chart, or OR booking form

SURGICAL SAFETY CHECKLIST

All team members have an obligation to verbalize their concerns at any step in the process

Before Induction of Anesthesia → **Before Skin Incision** → **Before Patient Leaves Operating Room**

Briefing Required

- **Surgeon identifies patient, procedure, site/side mark,** (confirmed with consent by RN) and discusses the plan for surgery
- **Identify** new team member(s) and role
- **Discussion Points** (as applicable):
  - Antibiotic status
  - Glycemic control
  - Beta-blockers
  - Medications needed on field/irrigation
  - Patient position
  - Equipment/implants required for procedure
  - Patient safety considerations
  - Blood
  - DVT prophylaxis
  - Allergies
  - Special considerations (hearing deficit, language barrier, friable skin, risk for pressure ulcer, pacemaker, etc.)
  - X-rays/PACS up on screen
  - Lab work
  - Consult(s)
- **Does anyone have any concerns?**
- **Surgeon asks are we ready to begin?**

Time Out Required

- **Initiated by attending surgeon**
- **Patient identification, procedure site/side** (confirmed with consent by RN through read back)
- **Surgeon's initials (if applicable) on procedure site/side visible after prepping and draping**
- **Confirmation by team that the mark (If applicable) is visible**
- **Does anyone have any concerns?**
- **Are we ready to proceed?**

Debriefing Required

- **Initiated by attending surgeon prior to leaving the Operating Room**
- **Specimen labeling and destination communicated**
- **Confirmation of procedure performed**
- **Discussion Points** (as applicable):
  - Post-op plan of care (ICU bed, ventilator, etc.)
  - Patient temperature
  - Wound classification
  - Review of what worked well and what could have been done differently
  - Identify any instrument/ equipment concerns

Adapted standards from the World Health Organization.

Revised 06/18/10

Lewis Blackman – 2000, South Carolina

https://patientsafetymovement.org/advocacy/patients-and-families/patient-stories/lewis-blackman/

17-year-old Jesica Santillan – 2003, Duke

https://www.ausmed.com/cpd/articles/anatomy-error-jesica-santillan

Emily Jerry – 2006, Ohio

https://emilyjerryfoundation.org/emilys-story/

Rhode Island = wrong side brain surgery (x3)

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Cars Homes Jobs

In Paper Ads
Circulars
Special Sections

Rhode Island news

Comments 38 | Recommend 6

Another wrong-site surgery at R.I. Hospital

12:41 PM EDT on Wednesday, October 28, 2009

By Felice J. Freyer
Journal Medical Writer

An orthopedic surgeon at Rhode Island Hospital op
wrong finger during outpatient hand surgery on Th
a string of wrong-site surgeries at the hospital ove
years.

The mistake occurred despite multiple efforts to eli

R.I. hospital fined $300,000 for leaving drill bit in patient's head

October 27, 2010
by Brendon Nafziger, Writer

A Rhode Island hospital was fined $300,000 by the state for leaving a broken drill bit in a patient's head for two days following brain surgery, according to state officials, and local media also report a separate case at the hospital where forceps were left in a patient for three months after surgery.

http://www.nbcnews.com/id/21981965/ns/health-health_care/t/third-wrong-sided-brain-surgery-ri-hospital/#.Xg4FBEdKiUk

Table 1. Examples of Sentinel Events That Are Reviewable Under The Joint Commission's Sentinel Event Policy

Note: *This list may not apply to all settings.*

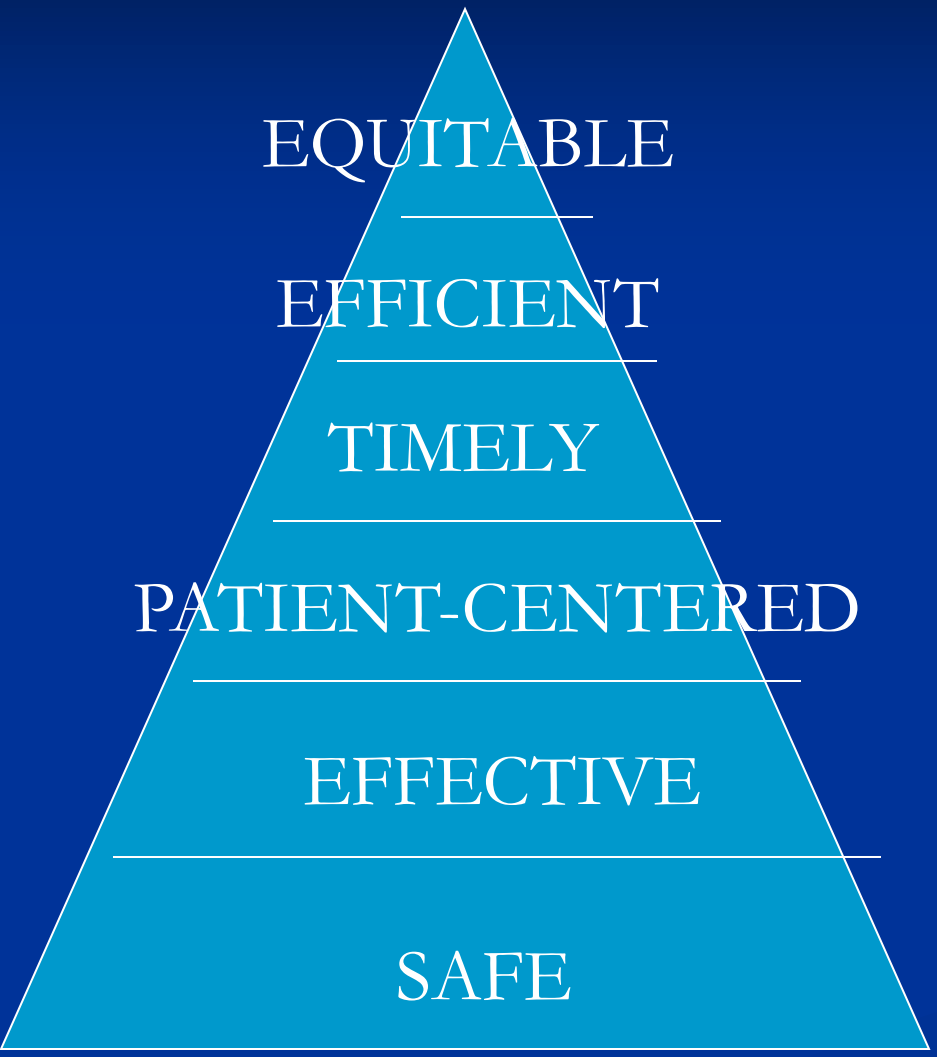
Examples include the following:

- Any patient death, paralysis, coma, or other major permanent loss of function associated with a medication error
- A patient commits suicide within 72 hours of being discharged from a hospital setting that provides staffed around-the-clock care
- Any elopement, that is, unauthorized departure, of a patient from an around-the-clock care setting resulting in a temporally related death (suicide, accidental death, or homicide) or major permanent loss of function
- A hospital performing the wrong invasive procedure or operating on the wrong side of the patient's body, on the wrong site on the patient's body, or on the wrong patient
- Any intrapartum (related to the birth process) maternal death
- Any perinatal death unrelated to a congenital condition in an infant having a birth weight greater than 2,500 grams
- A patient is abducted from the hospital where he or she receives care, treatment, or services
- Assault, homicide, or other crime resulting in patient death or major permanent loss of function
- A patient fall that results in death or major permanent loss of function as a direct result of the injuries sustained in the fall
- Hemolytic transfusion reaction involving major blood group incompatibilities
- A foreign body, such as a sponge or forceps, that was left in a patient after surgery

Note: *An adverse outcome that is **directly** related to the natural course of the patient's illness or underlying condition, for example, terminal illness present at the time of presentation, is **not** reportable **except** for suicide in, or following elopement from, a 24-hour care setting (see above).*

Six Aims to Achieve Quality

IOM (2001). *Crossing the Quality Chasm.*



- Safety: "the prevention of harm caused by errors of commission and omission"
- A system that produces care that is effective, patient-centered, timely, efficient, and equitable requires a foundation of a culture of safety

QUESTIONS?