



---

---

---

---

---

---

---

---

**My motivation**

- Involved in ground EMS for over 10 years
- Future Fellow in EMS Medicine
- Active Flight Physician
- Assistant Medical Director

***“What you do...  
&  
What you don’t do...  
makes a difference”***



 **ITLS**  
International Trauma Life Support

 **Ohio ACEP**  
American College of Emergency Physicians  
Academy • Education • Leadership

University of Cincinnati  
Medical Center |  **UC Health.**

---

---

---

---

---

---

---

---



---

---

---

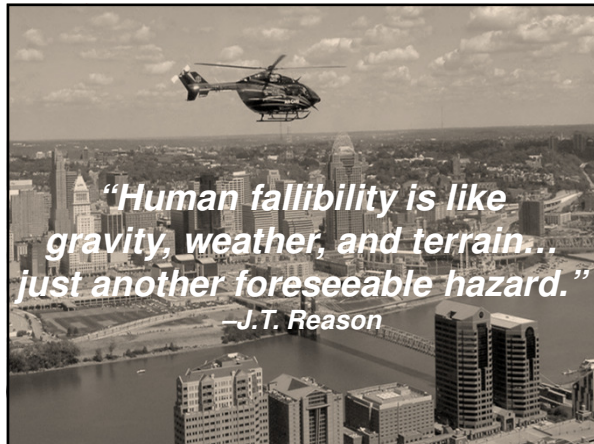
---

---

---

---

---



---

---

---

---

---

---

---



---

---

---

---

---

---

---



---

---

---

---

---

---

---



## Medical Errors... Our Objectives

- ✓ What are they?
- ✓ Who does them?
- ✓ Where do they occur?
- ✓ When do they occur?
- ✓ Why do they occur?
- ✓ Cases
- ✓ Solutions



University of Cincinnati  
Medical Center



---

---

---

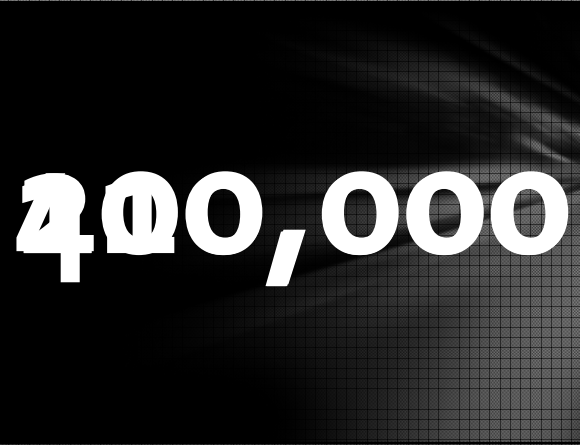
---

---

---

---

---



---

---

---

---

---

---

---

---

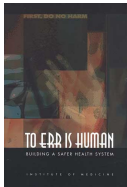
## Error in Medicine

- 1999 Institute of Medicine Report



Medical errors are the eighth leading cause of death for Americans — more than motor vehicle accidents, breast cancer or AIDS.





- Human error is only one small but important link in this chain of events




University of Cincinnati  
Medical Center



---

---

---

---

---

---

---

---

## Components of medical errors

***“... it is virtually impossible for one mistake to kill a patient in the highly mechanized & backstopped world of a modern hospital. A cascade of unthinkable things must happen, meaning catastrophic errors are rarely a failure of a single person, and almost always a failure of a system.”***

-Lisa Belkin  
From How Can We Save the Next Victim?  
NY Times Magazine, June 1997

---

---

---

---

---

---

---

---

## Why is this important?

- 1) Patient care and safety
  - 2) Patient satisfaction
  - 3) Health care professional satisfaction
- 
- 4) Financial (\$17-29 billion/year in hospitals nationwide)
  - 5) Trust in the healthcare system and your organization

---

---

---

---

---

---

---

---

## What are human errors?

- 1) Error of execution
- 2) Error of planning




---

---

---

---

---

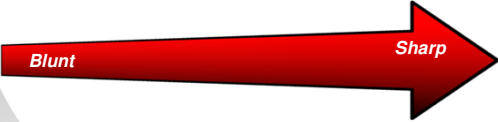
---

---

---

## Types of Human Error

- **Active:** “the sharp end”
- **Latent:** “the blunt end”
  - Often concealed & thus frequently remain unnoticed
  - Have the capacity to cause many types of active errors
  - *More menacing because they lie dormant*



ITLS International Trauma Life Support  
Ohio ACEP  
University of Cincinnati Medical Center | UH Health.

---

---

---

---

---

---

---

---

## Who makes errors?...

**Innately human limitations of mind & body**

- Limitations in memory capacity
- Limited ability to handle multiple competing demands
- Weakened mental abilities including decision making in the face of fear & fatigue
- Influence from the effect of group dynamics and culture



ITLS International Trauma Life Support  
Ohio ACEP  
University of Cincinnati Medical Center | UH Health.

---

---

---

---

---

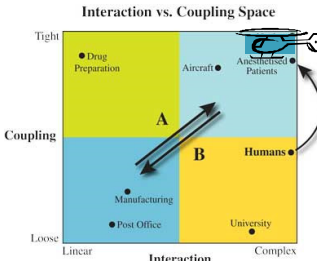
---

---

---

## When does it occur?

- ❖ **Complex systems**
  - Aircraft/vehicles
  - Multiple personnel
  - Patient care equipment
  - Patients' physiology
- ❖ **Tightly coupled**
  - Time-dependent process
  - Invariant sequences



**“Highly Complex, Tightly Coupled”**

ITLS International Trauma Life Support  
Ohio ACEP  
University of Cincinnati Medical Center | UH Health.

---

---

---

---

---

---

---

---

## Unique obstacles in EMS

- ❖ Dynamic and potentially dangerous environment
- ❖ Fast paced... where speed is perceived as excellence
- ❖ Limited resources, personnel, & time
- ❖ Reliance on inferred indications...
- ❖ Actions have immediate consequences with little recovery time to stop sequential errors

---

---

---

---

---

---

---

---

# 16,000,000

## 400,000

### 150,000

#### ???

---

---

---

---

---

---

---

---

Incidents During Out-of-Hospital Patient Transportation

A. FLABOURIS\*, W. B. RUNCIMANI†, B. LEVINGS‡

*NRMA CareFlight, N.S.W. Medical Retrieval Service, New South Wales and Intensive Care Unit, Royal Adelaide Hospital, Adelaide, South Australia, Australia*

• **4 organizations with 272 incidents related to:**

*Nature of patient care problems*

| Patient care problems                                     | No. | %  |
|-----------------------------------------------------------|-----|----|
| Patients condition more severe than expected              | 15  | 22 |
| Inappropriate or inadequate preparation at referring site | 13  | 19 |
| Hospital not prepared to receive patient                  | 8   | 12 |
| Deterioration of patients condition                       | 7   | 10 |
| Medication, dose/drug error                               | 7   | 10 |
| Inadequate patient preparation for retrieval              | 4   | 6  |
| Procedure technically difficult to perform                | 4   | 6  |
| Airway obstruction                                        | 3   | 4  |
| Delay in decision to retrieve patient                     | 3   | 4  |
| Oesophageal intubation                                    | 2   | 3  |
| Accidental extubation                                     | 2   | 3  |
| Endobronchial intubation                                  | 1   | 2  |

TABLE 4  
*Nature of interpersonal communication problems*

| Interpersonal communication problems                     | No | %  |
|----------------------------------------------------------|----|----|
| Receiving hospital not made aware of patient's condition | 7  | 28 |
| Problem with staff communication                         | 6  | 24 |
| Inaccurate patient information from site                 | 5  | 20 |
| Staff unhelpful or uncooperative                         | 4  | 16 |
| Unprepared or incomplete referral documentation          | 3  | 12 |

**Harm documented in 59% of incidents with one death**






---

---

---

---

---

---

---

---

**Incidents During Out-of-Hospital Patient Transportation**

N. FLABOURIS\*, W. B. RUNCIMAN†, B. LEVINGS‡  
 \*WVH4 Critical Care Medical Retrieval Service, New South Wales and Intensive Care Unit, Royal Adelaide Hospital, Adelaide, South Australia, Australia

**Contributing factors were:**

- System-based in 54%
- Human-based in 42%

**Contributing factors:**

- Haste (7.5%)
- Equipment mishap (7.2%)
- Equipment missing (5.5%)
- Failure to check (5.8%)
- Pressure to proceed (5.2%)

**TABLE 7**  
**Human based contributing factors**

| Human based contributing factors          | Total | % of all contributing factors |
|-------------------------------------------|-------|-------------------------------|
| <b>Violation/Rule based (18.8%)</b>       |       |                               |
| * Failure to check equipment              | 21    | 5.8                           |
| * Failure to follow policy/protocol       | 14    | 3.9                           |
| * Took a short cut                        | 9     | 2.5                           |
| * Failure to apply basic patient care     | 8     | 2.2                           |
| * Failure to act on available information | 8     | 2.2                           |
| * Took a risk                             | 7     | 1.9                           |
| * Failure to attend as required           | 1     | 0.3                           |
| <b>Skill based (15%)</b>                  |       |                               |
| * Haste                                   | 27    | 7.5                           |
| * Distraction                             | 9     | 2.5                           |
| * Inattention                             | 9     | 2.5                           |
| * Fatigue                                 | 8     | 2.2                           |
| * Stress                                  | 1     | 0.3                           |
| <b>Knowledge based (9.1%)</b>             |       |                               |
| * Unfamiliarity equipment/environment     | 11    | 3                             |
| * Inadequate/wrong knowledge              | 10    | 2.8                           |
| * Inexperience/inadequate training        | 5     | 1.4                           |
| * Technical problem with procedure        | 4     | 1.1                           |
| * Error of diagnosis                      | 3     | 0.8                           |

ITLS International Trauma Life Support  
 Ohio ACEP  
 Medical Center | UIC Health

**MEDICATION DOSING ERRORS IN PEDIATRIC PATIENTS TREATED BY EMERGENCY MEDICAL SERVICES**

John D. Hoyle, Jr., MD, Alan T. Davis, PhD, Kevin K. Putman, EMT-P, Jeff A. Trytko, MS, William D. Fales, MD

**2012**

- Retrospective look at 8 EMS agencies from 2004-2006
- Children < 11 years old
- Error defined as > 20% deviation from the weight appropriate dose determined by prehospital record
- Examined 6 medications
  - Albuterol
  - Dextrose
  - Epinephrine
  - Atropine
  - Benadryl
  - Narcan

ITLS International Trauma Life Support  
 Ohio ACEP  
 University of Cincinnati Medical Center | UIC Health

**MEDICATION DOSING ERRORS IN PEDIATRIC PATIENTS TREATED BY EMERGENCY MEDICAL SERVICES**

John D. Hoyle, Jr., MD, Alan T. Davis, PhD, Kevin K. Putman, EMT-P, Jeff A. Trytko, MS, William D. Fales, MD

**2012**

- 230 children underwent 360 medication administrations

**TABLE 3. Incorrect Medication Doses, Overdoses, and Underdoses**

| Drug                     | No. Incorrect Doses/Total Doses | % Incorrect Doses (95% CI) | No. Overdoses | Overdose Mean Error (% ± SD) | No. Underdoses | Underdose Mean Error (% ± SD) |
|--------------------------|---------------------------------|----------------------------|---------------|------------------------------|----------------|-------------------------------|
| Albuterol                | 55/236                          | 23.3% (18.4, 29.1)         | 1             | 200*                         | 54             | 48.4 ± 8.8                    |
| Atropine                 | 20/41                           | 48.8% (34.3, 63.5)         | 8             | 407 ± 277                    | 12             | 46.8 ± 15.0                   |
| Dextrose                 | 2/4                             | 50.0% (15.0, 85.0)         | 1             | 200*                         | 1              | 62.5*                         |
| Diphenhydramine          | 7/13                            | 53.8% (29.1, 76.8)         | 4             | 190.8 ± 45.3                 | 3              | 53.3 ± 16.3                   |
| Epinephrine (1:1,000)    | 28/43                           | 65.1% (50.2, 77.6)         | 6             | 655 ± 418                    | 22             | 29.9 ± 22.4                   |
| Intravenous/intraosseous | 13/25                           | 52.0% (33.5, 70.0)         | 4             | 808 ± 428                    | 9              | 35.5 ± 27.4                   |
| Endotracheal             | 14/14                           | 100.0% (79.5, 100.0)       | 2             | 200, 500*                    | 12             | 22.8 ± 14.7                   |
| Intramuscular            | 1/4                             | 25.0% (4.6, 69.9)          | 0             | —                            | 1              | 65.2*                         |
| Epinephrine (1:10,000)   | 12/21                           | 57.1% (36.5, 75.5)         | 2             | 167, 500*                    | 10             | 13.8 ± 5.3                    |
| Intravenous/intraosseous | 11/20                           | 55.0% (34.2, 74.2)         | 1             | 167*                         | 10             | 13.8 ± 5.3                    |
| Endotracheal             | 1/1                             | 100.0% (20.7, 100.0)       | 1             | 500*                         | 0              | —                             |
| Naloxone                 | 1/2                             | 50.0% (9.5, 90.5)          | 0             | —                            | 1              | 25.0*                         |

\*Actual values; the mean and standard deviation were not calculated because of small sample size.  
 SD = standard deviation.

**\*\*\*Dosing errors occurred in 34.7%\*\*\***

ITLS International Trauma Life Support  
 Ohio ACEP  
 University of Cincinnati Medical Center | UIC Health



## Why do they occur?

❖ Depends on how you look at it...

| Modern "System"          |                                                                               |
|--------------------------|-------------------------------------------------------------------------------|
| <b>Main Focus:</b>       | Errors are consequences rather than causes.<br>"Symptoms of a bigger disease" |
| <b>Cause:</b>            | Upstream systemic factors                                                     |
| <b>Foundation:</b>       | Recurrent error traps & organizational processes                              |
| <b>Counter Measures:</b> | We cannot change the human, we can only change the environment                |
| <b>Conclusion:</b>       | Important issue is not who made the error but how & why defenses failed       |






---

---

---

---

---

---

---

---



## How do YOU view error?

- ✓ Person approach dominates medicine
- ✓ "Myth of Infallibility"
- ✓ Blaming individuals is more emotionally satisfying then targeting systems
- ✓ Uncoupling a persons unsafe acts from institutional responsibility is potentially desirable...

❖ In yourself?  
❖ In your colleagues & partners?  
❖ In those you lead?




---

---

---

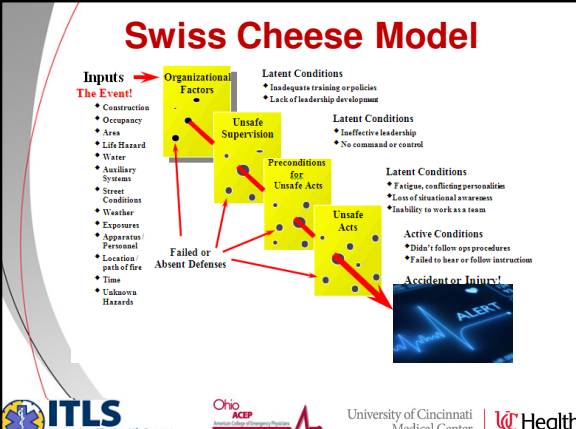
---

---

---

---

---



## Swiss Cheese Model






---

---

---

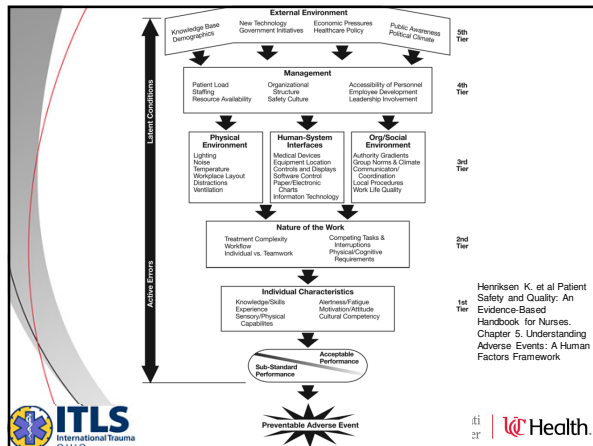
---

---

---

---

---




---

---

---

---

---

---

---

---

---

---



## How do YOU view error?

- ❖ Do you routinely inspect your patient care system from the ground up...
- ✓ Design & location of equipment
- ✓ Work structure
- ✓ Policies & Procedures
- ✓ Information availability
- ✓ Financial decisions & budgets

❖ In yourself?

❖ In your colleagues & partners?

❖ In those you lead?

University of Cincinnati  
Medical Center



---

---

---

---

---

---

---

---

---

---

## Cases

***“What is striking about many accidents is that people were doing exactly the sorts of things they would usually be doing the things that usually lead to success & safety...”***

***Accidents are seldom preceded by bizarre behavior.”***

-Sidney Dekker  
The field Guide to Human Error Investigations (2002)

---

---

---

---

---

---

---

---

---

---




---

---

---

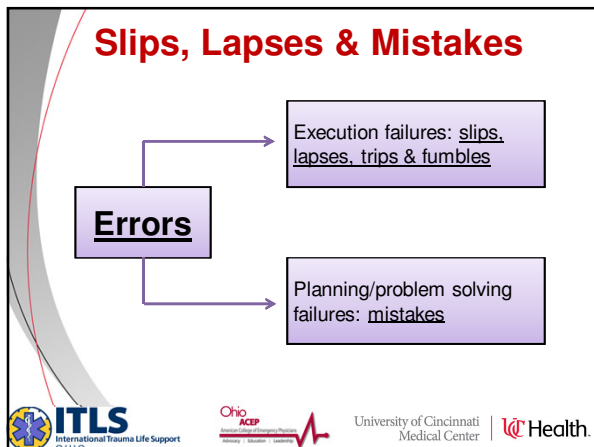
---

---

---

---

---




---

---

---

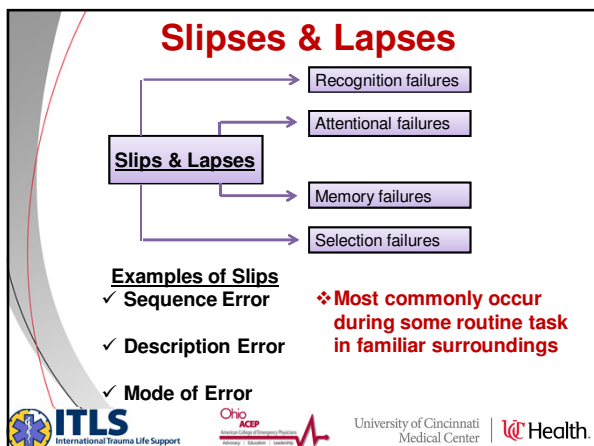
---

---

---

---

---




---

---

---

---

---

---

---

---

## Mistakes

- ✓ **Rule Based:** Preprogrammed solutions
  - 1) Misapplication of a good rule
  - 2) Application of a bad rule
  - 3) Non-application of a good rule
- ✓ **Knowledge Based:** No preprogrammed solutions
  - Occur in novel situations
  - Solution to a problem must be worked out on the spot
  - Inaccurate or incomplete "mental mode"

## Errors versus Violations

Violations are deviations from safe operating practices or rules.

- Violations differ from errors

| Errors                                                    | Violations                                                |
|-----------------------------------------------------------|-----------------------------------------------------------|
| Informational Problems<br>(forgetting, inattention)       | Motivational problems<br>(low moral, lack of concern etc) |
| Explained by what goes on in<br>the mind of an individual | Occur in a regulated social<br>context                    |
| Reduced by improving the<br>delivery of information       | Require motivational and<br>organizational solutions      |

Reason J. Understanding adverse events: human factors.  
Quality in Health Care 1995;4:80-89



University of Cincinnati  
Medical Center | UCH Health.

## Errors versus Violations

Table 1 Summary of error producing conditions ranked in  
order of known effect (after Williams<sup>25</sup>)

| Condition                                | Risk factor |
|------------------------------------------|-------------|
| Unfamiliarity with the task              | (x17)       |
| Time shortage                            | (x11)       |
| Poor signal/noise ratio                  | (x10)       |
| Poor human system interface              | (x8)        |
| Designer user mismatch                   | (x8)        |
| Irreversibility of errors                | (x8)        |
| Information overload                     | (x6)        |
| Negative transfer between tasks          | (x5)        |
| Misperception of risk                    | (x4)        |
| Poor feedback from system                | (x4)        |
| Inexperience - not lack of training      | (x3)        |
| Poor instructions or procedures          | (x3)        |
| Inadequate checking                      | (x2)        |
| Educational mismatch of person with task | (x1-6)      |
| Disturbed sleep patterns                 | (x1-2)      |
| Hostile environment                      | (x1-1)      |
| Monotony and boredom                     | (x1-1)      |

Reason J. Understanding adverse events: human factors.  
Quality in Health Care 1995;4:80-89



- ❖ **Factors that promote violations are less well understood than conditions producing errors**

Table 2 Violation producing conditions, unranked

| Conditions                                     |
|------------------------------------------------|
| Manifest lack of organisational safety culture |
| Conflict between management and staff          |
| Poor morale                                    |
| Poor supervision and checking                  |
| Group norms condoning violations               |
| Misperception of hazards                       |
| Perceived lack of management care and concern  |
| Little elan or pride in work                   |
| Culture that encourages taking risks           |
| Beliefs that bad outcomes will not happen      |
| Low self esteem                                |
| Learned helplessness                           |
| Perceived licence to bend rules                |
| Ambiguous or apparently meaningless rules      |
| Rules inapplicable due to local conditions     |
| Inadequate tools and equipment                 |
| Inadequate training                            |
| Time pressure                                  |
| Professional attitudes hostile to procedures   |



## Case 2- TRAUMA

---

---

---

---

---

---

---

---



Our environment...  
*full of risk & uncertainty*

- **"Jack of all trades"** expected to be good at everything
- Make multiple critical decisions **rapidly & simultaneously**
- Perceived to be an **action-oriented profession** with procedures being the most important skill set...
- Reality is that the majority of our time is spent **engaged in cognitive behavior**

---

---

---

---

---

---

---

---



## Fixation Errors / Anchoring

Persistent failure to revise a diagnosis or plan in the face of evidence that suggest revision is necessary...

- ✓ ***"This and only this"***
- ✓ ***"Everything but this"***
- ✓ ***"Everything's okay"***

❖ Affects all of us... even the wise and experienced

**"First come, best preferred"**






---

---

---

---

---

---

---

---

## Cognitive Errors

- ❖ Medicine has been slow to adopt the literature on cognitive bias in decision-making
- ❖ We should strive to understand why we have certain dispositions to respond in particular situations
- ❖ Pat Croskerry, MD, PhD
- ❖ *"Most important strategy is to familiarize clinicians with various types of biases..."*




ITLS International Trauma Life Support  
Ohio ACEP  
University of Cincinnati Medical Center | UCH Health.

---

---

---

---

---

---

---

---

- **Search satisfying:** calling off the search for further abnormalities after achieving satisfaction from finding the first abnormality
- **Premature closure:** when a dx is accepted before fully verified and other potential dx are not considered
- **Diagnostic momentum:** "following the crowd"
- **Overconfidence Bias:** over-reliance on the opinions of the expert that came before (officer, supervisor, etc.)



ITLS International Trauma Life Support  
Ohio ACEP  
University of Cincinnati Medical Center | UCH Health.

---

---

---

---

---

---

---

---

## A few examples...

|                      |                             |
|----------------------|-----------------------------|
| • Aggregate bias     | • Multiple alternative bias |
| • Anchoring          | • Omission bias             |
| • Ascertainment bias | • Order effects             |
| • Availability       | • Overconfidence bias       |
| • Base-rate neglect  | • Playing the odds          |
| • Commission bias    | • Premature closure         |
| • Confirmation bias  | • Psych-out errors          |
| • Diagnosis momentum | • Search satisfying         |
| • Feedback sanction  | • Triage cueing             |
| • Framing effect     | • Unpacking principle       |
| • Gamblers fallacy   | • Vertical line failure     |
| • Gender bias        | • Visceral bias             |

Croskerry P. The Importance of Cognitive Errors in diagnosis and Strategies to Minimize them. Acad. Med. 2003;78:775-780

ITLS International Trauma Life Support  
Ohio ACEP  
University of Cincinnati Medical Center | UCH Health.

---

---

---

---

---

---

---

---

## Debiasing Strategies

|                              |                                                                                                                                                                                                                                                                                             |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Simulation                   | Develop mental rehearsal, "cognitive walkthrough" strategies for specific clinical scenarios to allow cognitive biases to be made and their consequences to be observed. Construct clinical training videos contrasting incorrect (biased) approaches with the correct (debiased) approach. |
| Cognitive forcing strategies | Develop generic and specific strategies to avoid predictable bias in particular clinical situations.                                                                                                                                                                                        |
| Make task easier             | Provide more information about the specific problem to reduce task difficulty and ambiguity. Make available rapid access to concise, clear, well-organized information.                                                                                                                     |
| Minimize time pressures      | Provide adequate time for quality decision-making.                                                                                                                                                                                                                                          |
| Accountability               | Establish clear accountability and follow-up for decisions made.                                                                                                                                                                                                                            |
| Feedback                     | Provide as rapid and reliable feedback as possible to decision makers so that errors are immediately appreciated, understood, and corrected, resulting in better calibration of decision makers. <sup>28</sup>                                                                              |

**Croskerry P.**  
Acad. Med.  
2003;78:775-780

---

---

---

---

---

---

---

---

---

---



## Metacognition

- Overall term for cognitive forcing strategies
- **"thinking about thinking"**
- **"hallmark of human intelligence"**
- Ability to stand apart from your own thinking in order to be aware of your own preferred heuristics & thinking biases
- **Allows us to ask...**  
*"What will I do differently next time?"*

 University of Cincinnati Medical Center | 

---

---

---

---

---

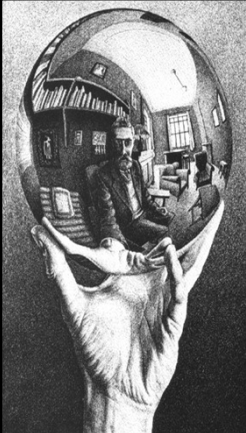
---

---

---

---

---



## Metacognition

### Two Stage Process

1. Develop awareness of the cognitive demands in a particular situation
2. Able to specify a particular strategy for improving the decision making

 University of Cincinnati Medical Center | 

---

---

---

---

---

---

---

---

---

---



## A couple of tips...



- Summarize the patient in a single sentence
- Then ask yourself a few of these questions...

1. **What was my first impression?**
2. What information is most relevant? What information was I looking for?
3. **How confident am I?**
4. **Could I be missing an alternative diagnosis?**
5. Significant **advantages or disadvantages of treatment?**
6. **If I was less busy, or tired would I do the same?**
7. **Clues to errors:** disparities, repeat run, pt not improving



**ITLS**  
International Trauma Life Support



Ohio  
**ACEP**  
American College of Emergency Physicians



University of Cincinnati  
Medical Center



**UC Health**

---

---

---

---

---

---

---

---

*“Unfortunately, the implicit assumption  
in medicine is that we know  
how to think...”*



*but the reality is we don't...”*

- Dr. Croskerry

---

---

---

---

---

---

---

---

### Case 3- The Details



---

---

---

---

---

---

---

---

## Communication Failure

- ❖ *“communication problems in transport medicine are numerous & a leading cause for breakdown in patient care...”*  
- To Err is Human: Building a safer healthcare system 1999
- Root cause in over 70% of sentinel events reported to the JACO
- Of these... 75% are associated with a patient's death
- Studies document communication failure as cause for medical errors in all aspects of transport from dispatch to treatment

Communication load  
Short Term Memory

---

---

---

---

---

---

---

---

## Communication Failure

- **“Read-Back” Process**
  - ✓ Active participation
  - ✓ Built in redundancy for clarity
  - ✓ Closed loop communication
- ❖ Ideal for efficient communication between fatigued or overwhelmed participants
- ❖ Should **NOT BE** used for all communication
- ❖ Should **BE** used in specific operational contexts
  - 1) Critical phase of operations
  - 2) Exchange of vital information

---

---

---

---

---

---

---

---

## When things get really bad?

- ❖ **Traditional “Hint and Hope model”**
  - Founded in hierarchy
  - Perpetuates lack of a common mental model
- **Appropriate Assertion**  
Stop and Listen... we may have a problem
- **CUS Program**
  - ✓ “I am concerned...”
  - ✓ “I am uncomfortable...”
  - ✓ “This is unsafe...”

---

---

---

---

---

---

---

---




---

---

---

---

---

---

---

---

### Near Miss

- ❖ An act of commission or omission that could have caused harm but was prevented through a planned or unplanned recovery
- ✓ *Do you recognize these events in your own clinical care?*
- ✓ *Do you acknowledge these events in your colleagues?*
- ✓ *Do you formally report these events?*
- ✓ *How does your organization view these medical near misses?*






University of Cincinnati  
Medical Center



---

---

---

---

---

---

---

---

### Normalization of Deviance

- ❖ A gradual shift in thought during which a nonstandard or unacceptable change in behavior or standards becomes acceptable to us
- ✓ Have YOU done this in your own clinical practice?
- ✓ Have you ever seen this in your colleagues?
- ✓ What do you do about it?
- ✓ What safety checks does your organization have against this?

---

---

---

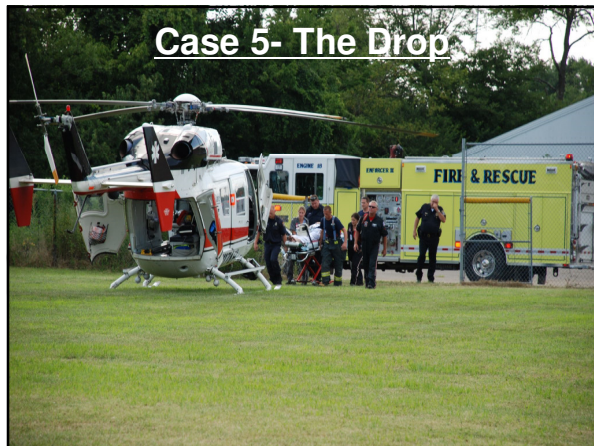
---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

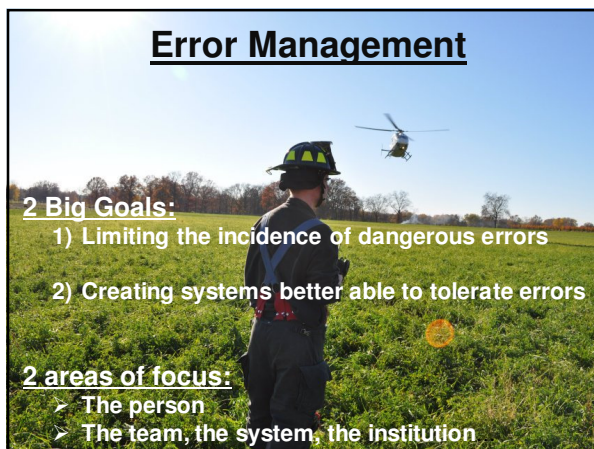
---

---

---

---

---



---

---

---

---

---

---

---

---

## Error Management

**The “Anti-personnel” approach has major problems**

- ✓ People do not intend to commit errors
- ✓ Psychological precursor of an error are the least manageable links in the chain of events leading to an error
- ✓ Accidents rarely occur as the result of single unsafe acts
- ✓ Designed counter measures create a false sense of security
- ✓ Increased automation does not cure the human factors, it simply changes its nature






---

---

---

---

---

---

---

---

## High reliability organizations



**Run high-risk operations for extended time periods with low rates of adverse events**

---

---

---

---

---

---

---

---

## PREOCCUPATION WITH FAILURE

- ✓ Lack of complacency in down times
- ✓ Reluctance to simplify explanations
- ✓ Training to “assume less but notice more”
- ✓ Deference to expertise and experience



THE PRINCIPLES OF  
**HRO**

---

---

---

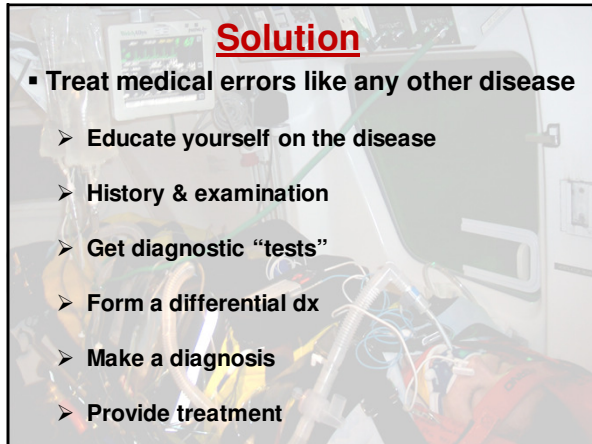
---

---

---

---

---



**Solution**

- Treat medical errors like any other disease
  - Educate yourself on the disease
  - History & examination
  - Get diagnostic “tests”
  - Form a differential dx
  - Make a diagnosis
  - Provide treatment

---

---

---

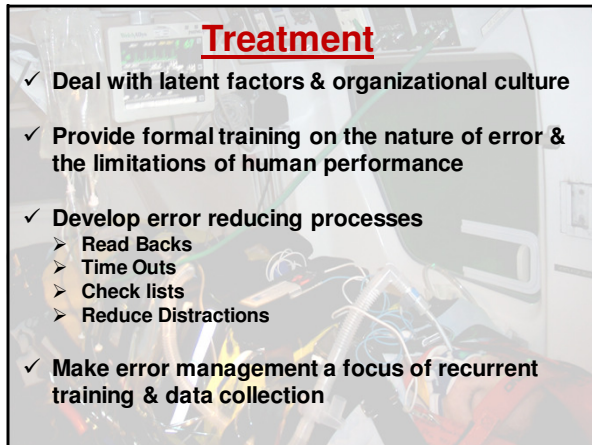
---

---

---

---

---



**Treatment**

- ✓ Deal with latent factors & organizational culture
- ✓ Provide formal training on the nature of error & the limitations of human performance
- ✓ Develop error reducing processes
  - Read Backs
  - Time Outs
  - Check lists
  - Reduce Distractions
- ✓ Make error management a focus of recurrent training & data collection

---

---

---

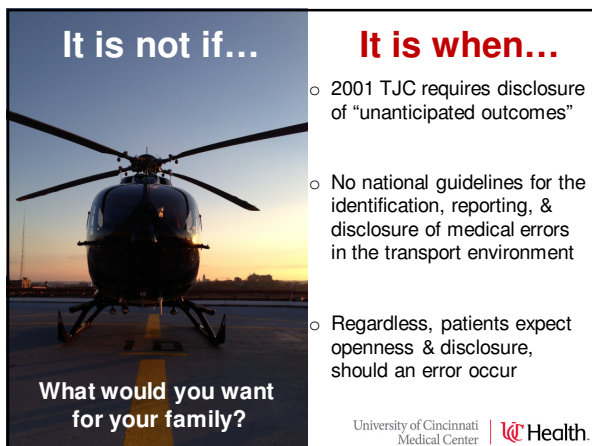
---

---

---

---

---



**It is not if...**

What would you want for your family?

**It is when...**

- 2001 TJC requires disclosure of “unanticipated outcomes”
- No national guidelines for the identification, reporting, & disclosure of medical errors in the transport environment
- Regardless, patients expect openness & disclosure, should an error occur

University of Cincinnati Medical Center |  Health.

---

---

---

---

---

---

---

---

### Disclosure for patients

- Supports truth-telling, patient safety, & trust
- Consistent with patient preference...even when errors are small & the harm is minor
- Patients seek acknowledgement of the pain & suffering that was caused by the error
- Patients want reassurance that future errors will be prevented

Lu DW, Guenther E, Wesley AK, Gallagher TH. Disclosure of Harmful Medical Errors in Out-of-Hospital Care. *Ann Emerg Med*. 2013;61:215-221

---

---

---

---

---

---

---

---

### Disclosure for providers

- Beware of the “disclosure gap” and its causes
- Clinicians experience significant emotional distress & isolation after errors occur
- Disclosure helps reduce burnout
- The transport environment is often difficult for large institutions to understand

Lu DW, Guenther E, Wesley AK, Gallagher TH. Disclosure of Harmful Medical Errors in Out-of-Hospital Care. *Ann Emerg Med*. 2013;61:215-221

---

---

---

---

---

---

---

---

### The Future...

- ❖ More time & training dedicated to understanding the causes of medical errors
- ❖ Confidential databases for reporting medical errors
- ❖ Research on minimizing error producing conditions
- ❖ Collaboration with industry, injury prevention specialists, & manufacturers to design equipment that is up to the task
- ❖ Policies guiding the disclosure of medical errors
- ❖ Publish our challenges & successes for the betterment of all patients

---

---

---

---

---

---

---

---

## Conclusions

- Error is part of the human condition but bad outcomes due to error don't have to be...
- Faulty systems call forth error behavior in even the most skilled and experienced clinician
- With adequate leadership, attention, & resources, improvements can be made to these systems.
- Different types of errors require different methods of risk management




University of Cincinnati  
Medical Center



---

---

---

---

---

---

---

---

## Conclusions

- The individual psychological factors involved in error are the last & least manageable links in the chain of error
- People do not act in isolation. Behavior is shaped by circumstances
- It may be part of human nature to err, but it is also part of human nature to create solutions, find better alternatives, & meet the challenges ahead....

**Error reduction begins & ends with relationships**




University of Cincinnati  
Medical Center



---

---

---

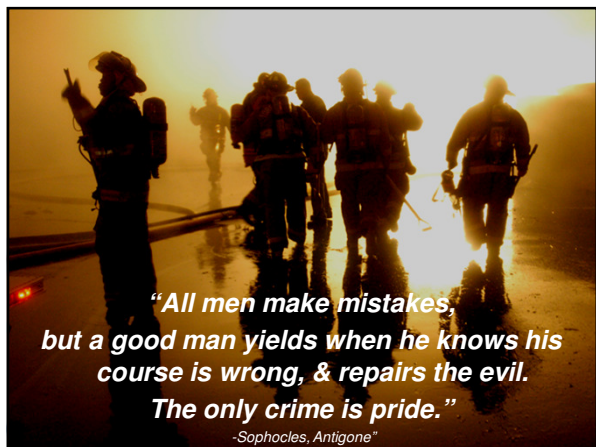
---

---

---

---

---



***"All men make mistakes,  
but a good man yields when he knows his  
course is wrong, & repairs the evil.  
The only crime is pride."  
-Sophocles, Antigone"***

---

---

---

---

---

---

---

---

## References

- A. flabouris, Runciman W.B., Levings B. Incidents During Out-of-Hospital Patient Transportation. *Anaesth Intensive Care* 2006; 34:228-236.
- Banja J. The Normalization of deviance in healthcare. *PMC2821100* 2011 January 1.
- Bigham BL, Buick JE, Brooks SC, Morrison M, Shojania KG, Morrison LJ. Patient Safety in Emergency Medical Services: A systematic Review of the Literature. *Prehosp Emerg Care* 2012;16:20-35.
- Croskerry P. The Cognitive Imperative: Thinking about How We Think. *Acad Emerg Med* 2000;7:1223-1231
- Croskerry P. The Importance of Cognitive Errors in Diagnosis and Strategies to Minimize Them. *Acad. Med.* 2003;78:775-780
- Greenwood MJ, Heninger JR. Structured communication for Patient Safety in Emergency Medical Services: A legal case report. *Prehosp Emerg Care* 2010;14:345-348.
- Heard, G. Errors in Medicine: A Human Factors Perspective. *Australian Anesthesia* 2005.
- Helmreich RL. On error management : lessons from aviation. *BMJ.* 2000;320:781-5.
- Henriksen K, Dayton E, Keyes MA, Carayon P, Hughes R. Patient Safety and Quality: An Evidence-Based Handbook for Nurses. Chapter 5. Understanding Adverse Events: A Human Factors Framework
- Hoyle JD, Davis AT, Putnam KK, Trytko JA, Fales WD. Medication Dosing Errors in Pediatric Patients Treated by Emergency Medical Services. *Prehosp Emerg Care* 2012;16:59-66.
- Kohn LT, Corrigan JM, Donaldson MS, eds. *To Err is Human: Building a Safer Health System.* Institute of Medicine, Washington, DC: National Academy Press; 1999.
- Leonard M, Graham S, Bonacum D. The human factor: the critical importance of effective teamwork and communication in providing safe care. *Qual saf Health Care* 2004;13(suppl 1):85-90
- Lu DW, Guenther E, Wesley AK, Gallagher TH. Disclosure of Harmful Medical Errors in Out-of-Hospital Care. *Ann Emerg Med* 2013;61:215-221.



## References

- McNutt RA, Abrams R, Aron DC. Patient safety Efforts Should Focus on Medical Errors. *JAMA.* 2002;287:15
- Meisel ZF, Hargarten S, Vernick J. Addressing Prehospital Patient Safety Using the Science of Injury Prevention and Control. *Prehosp Emerg Care.* 2008;12:411-416
- O'Connor RE, Slovis CM, Hunt RC, Pirralto RG, Sayre MR. Eliminating Errors in Emergency Medical Services: Realities and Recommendations. *Prehosp Emerg Care* 2002;6:107-113
- Reason J. Human Error: models and management. *BMJ* 2000;320:768-70.
- Reason J. Seven myths about human error and its management Published (in Italian) as: Come limitare l'errore. *KOS: Rivista di Medicina, Cultura e Scienze Umane* 2001; 187:10-17
- Reason J. Understanding adverse events: human factors. *Quality in Health Care* 1995;4:80-89
- Webster CS, Stabile M, Merry AF. *The Challenges of Technological Intensification.* Anesthesia Patient Safety Foundation 2009; 24:3.
- Tucker A, Edmondson A. why hospitals don't learn from failures: organizational and psychological dynamics that inhibit system change. *Calif Manage Rev* 2003; 45:55-72
- Vilensky D, MacDonald RD. Communicatio Errors in Dispatch of Air Medical Transport. *Prehosp Emerg Care* 2011;15:39-43.
- Wong DA, Herring SA. *The Role of Human Error in Medical Errors.* SpineLine North American Spine Society. July/August 2003.



ryan.gerecht@uc.edu



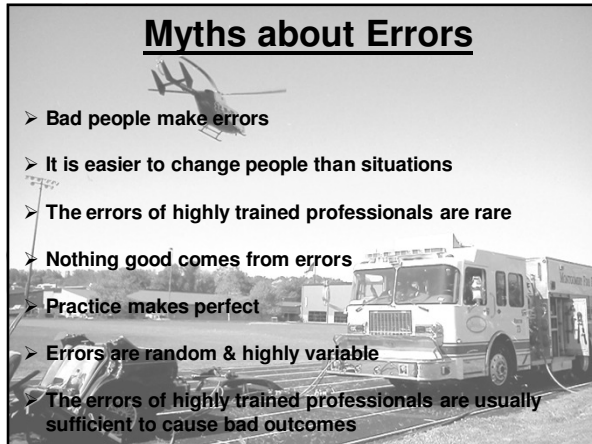
Program of the Year



Award Winning Excellence



### Myths about Errors



- Bad people make errors
- It is easier to change people than situations
- The errors of highly trained professionals are rare
- Nothing good comes from errors
- Practice makes perfect
- Errors are random & highly variable
- The errors of highly trained professionals are usually sufficient to cause bad outcomes

---

---

---

---

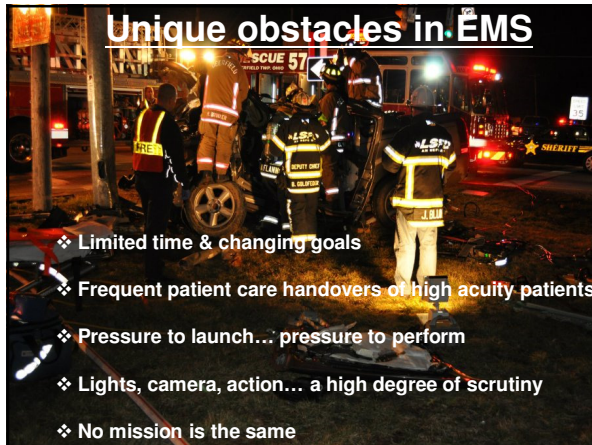
---

---

---

---

### Unique obstacles in EMS



- ❖ Limited time & changing goals
- ❖ Frequent patient care handovers of high acuity patients
- ❖ Pressure to launch... pressure to perform
- ❖ Lights, camera, action... a high degree of scrutiny
- ❖ No mission is the same

---

---

---

---

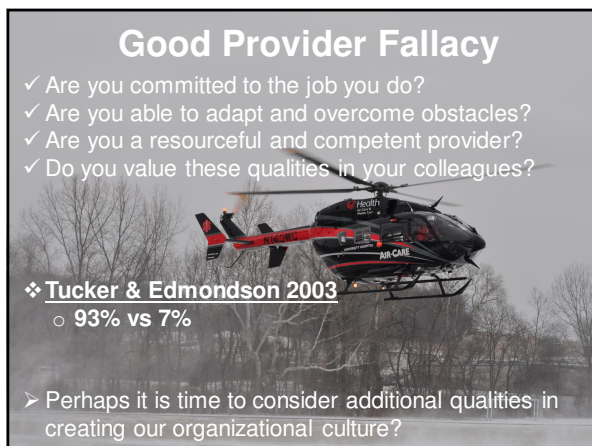
---

---

---

---

### Good Provider Fallacy



- ✓ Are you committed to the job you do?
- ✓ Are you able to adapt and overcome obstacles?
- ✓ Are you a resourceful and competent provider?
- ✓ Do you value these qualities in your colleagues?

❖ **Tucker & Edmondson 2003**

- 93% vs 7%

➤ Perhaps it is time to consider additional qualities in creating our organizational culture?

---

---

---

---

---

---

---

---