Lessons Learned for Healthcare from the Air Carrier Industry

Captain William R. Hamman, M.D., Ph.D.
Center of Excellence for Simulation Research

The Quality Colloquium The leading Forum on Health Care Quality Enhancemen and Medical Error Reduction

Focused Goals Need to be Established In The Healthcare Industry

A common language

- **To continuously improve the systems and operational environment of the organization.**

A change in culture

- **Create a culture of trust where the focus is on what is right not who was right.**

Focused Goals Need to be Established In The Healthcare Industry

A common goal

To harm no patient

The Quality Colloquium The leading Forum on Health Care Quality Enhancemen and Medical Error Reduction

THE ISSUES ARE THE SAME IN HEALTHCARE AND AIR CARRIER EVENTS

- Medical mistakes that occur in hospitals account for a minimum of 120 deaths per day.

- In 2006 the IOM estimated that medication mistakes alone added an extra 3.5 billion to the U. S. health care tab each year.

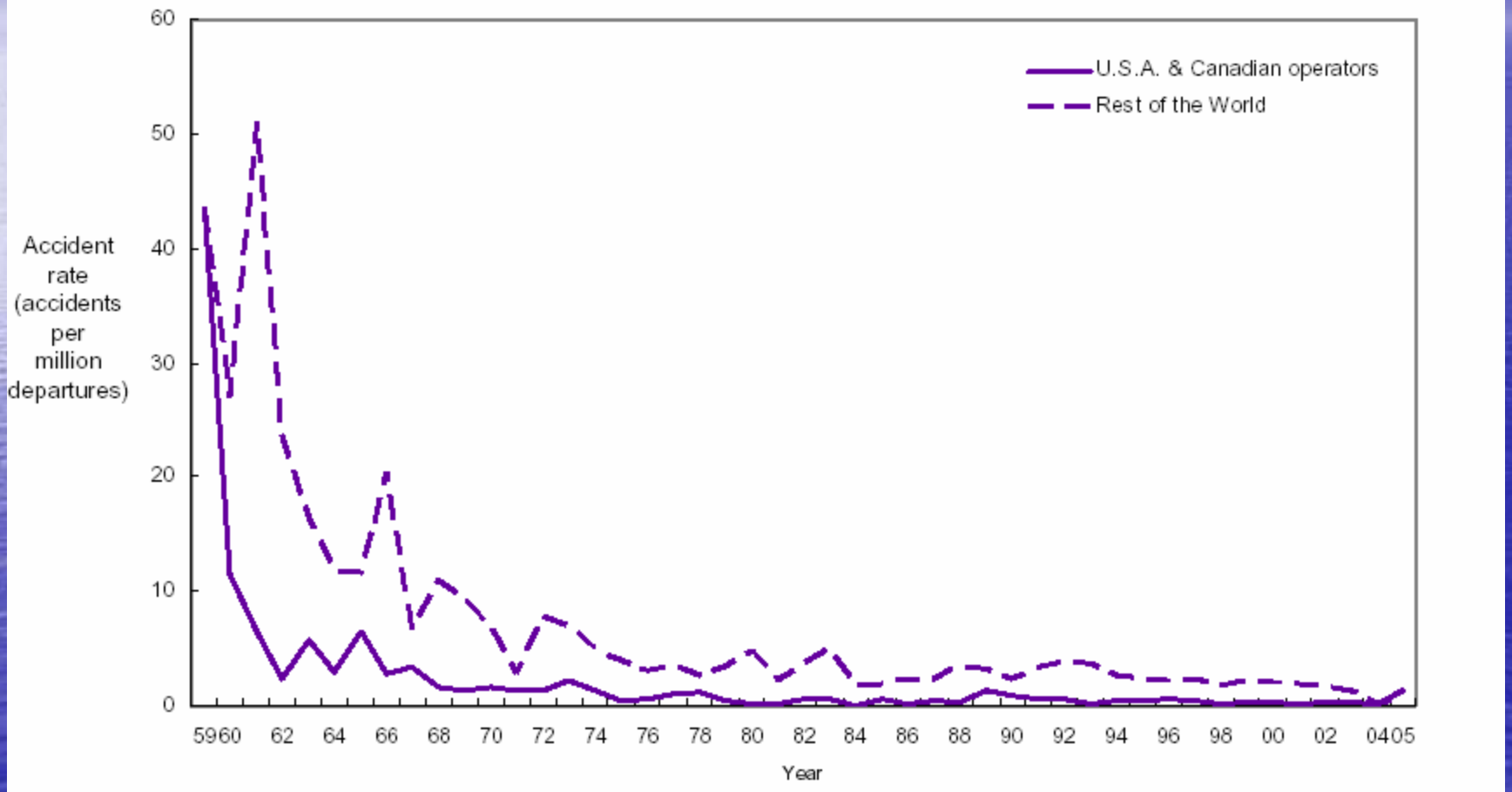
THE ISSUES ARE THE SAME IN HEALTHCARE AND AIR CARRIER EVENTS

- In our world this would be a crash of a Boeing 747 every week killing everyone on board.

- Healthcare must link the cost of error, in human lives and wasted healthcare resources.

U.S.A. and Canadian Operators Accident Rates

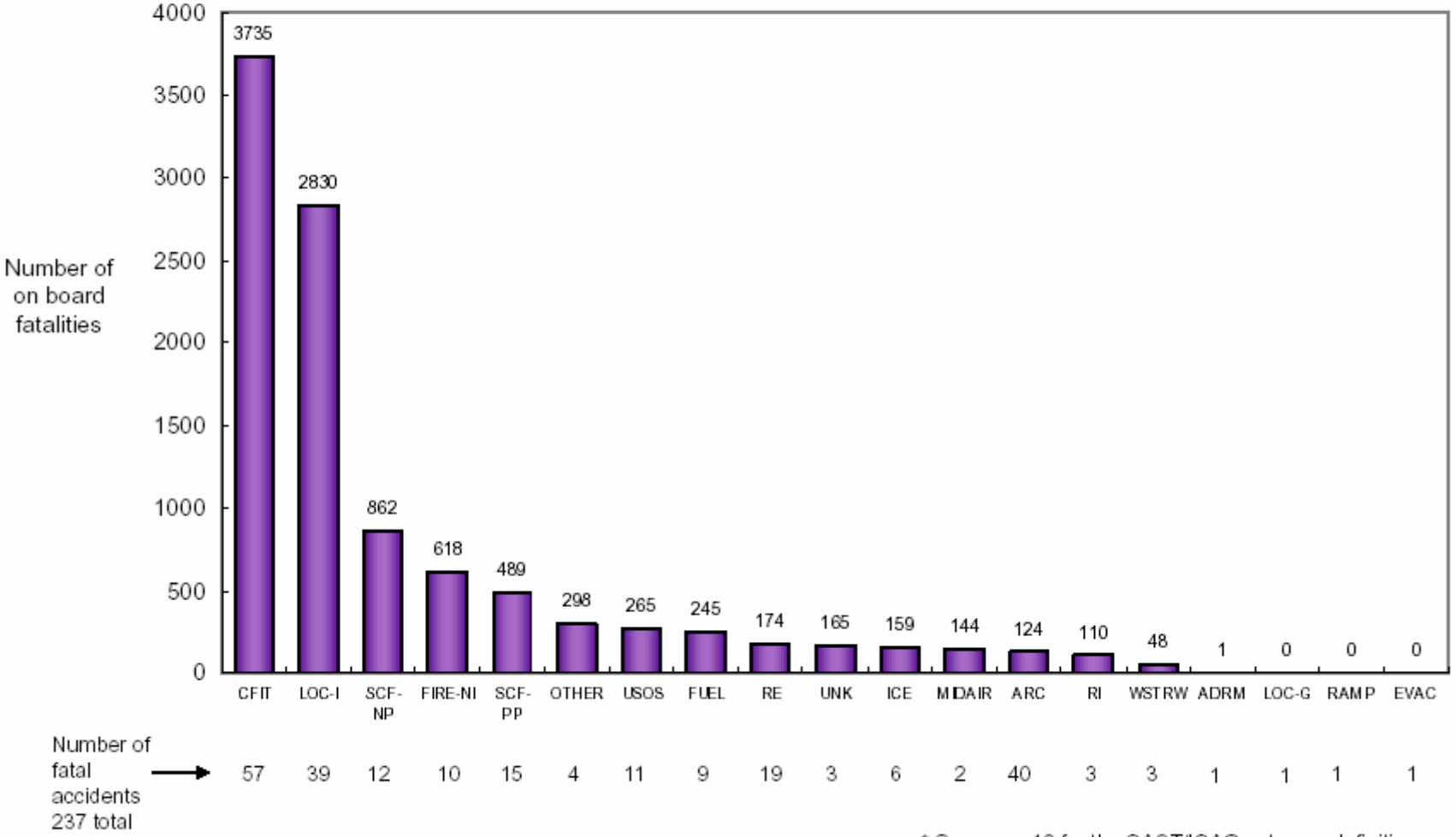
Hull Loss and/or Fatal accidents – Worldwide Commercial Jet Fleet – 1959 through 2005



leading Forum on Health Care
Quality Enhancemen and Medical
Error Reduction

Fatalities by CAST/ICAO Taxonomy Accident Category*

Fatal Accidents – Worldwide Commercial Jet Fleet – 1987 Through 2005



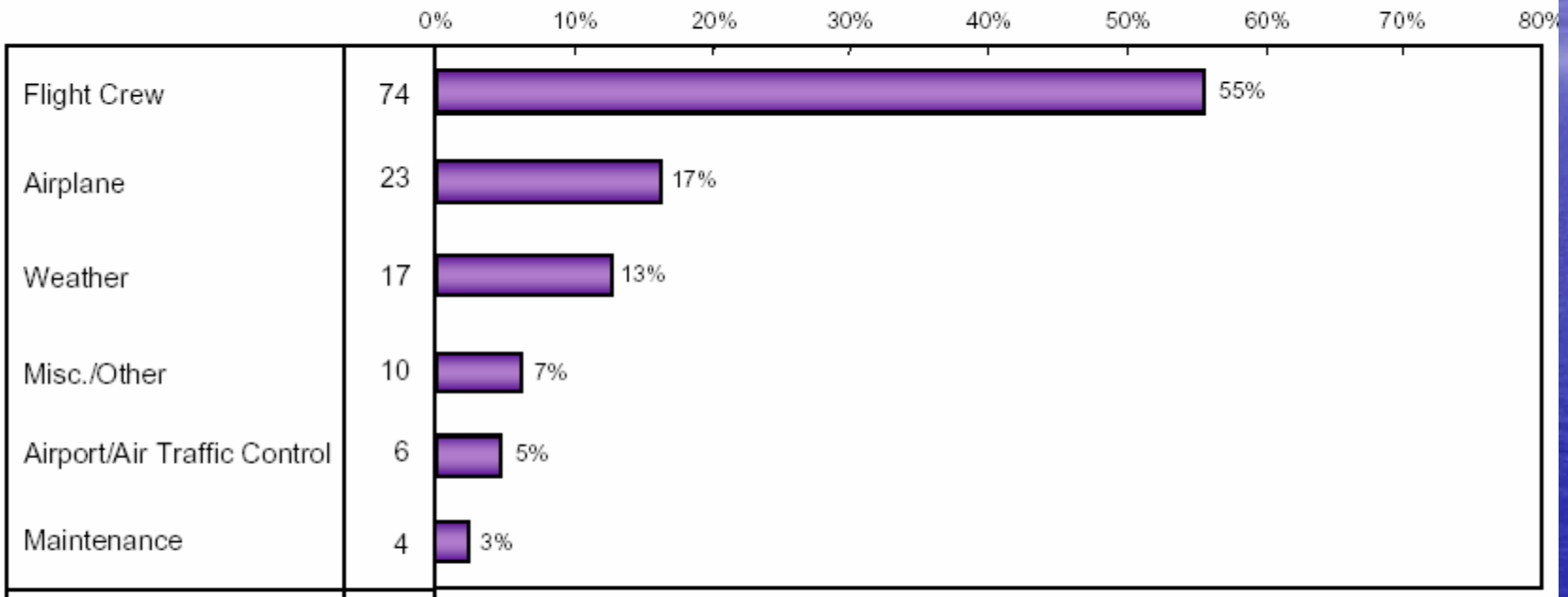
* See page 19 for the CAST/ICAO category definitions

BOEING

Error Reduction

Accidents by Primary Cause*

Hull Loss Accidents – Worldwide Commercial Jet Fleet – 1996 through 2005



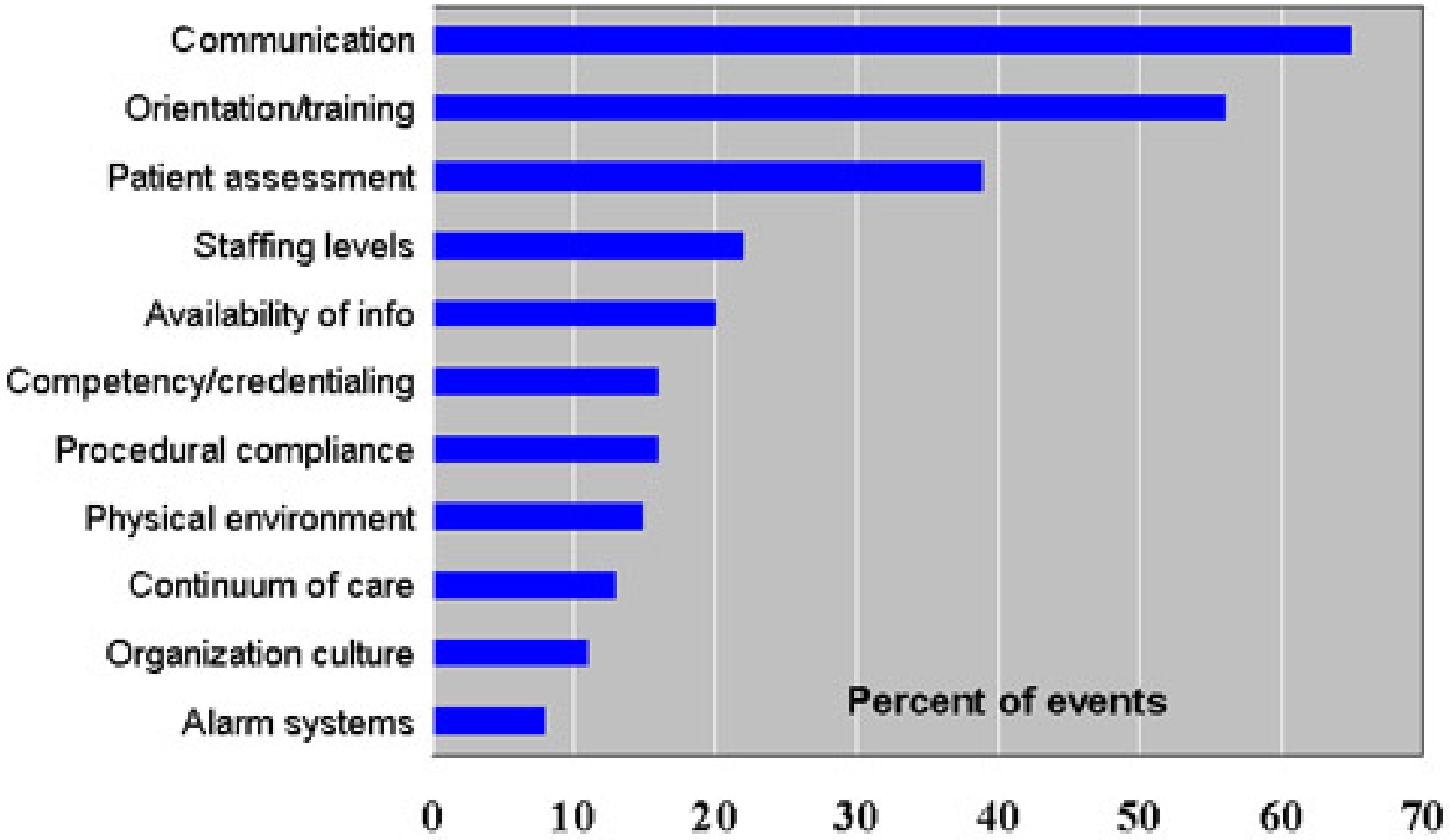
Total with known causes	134
Unknown or awaiting reports	49
Total	183

*As determined by the investigating authority, percent of accidents with known causes.

Error Reduction

Root Causes of Sentinel Events

(All categories; 1995-2003)



Healthcare must develop new processes through simulation to understand the challenges and train healthcare teams in the team and technical competencies.

The challenges faced by healthcare teams when compared to air carrier teams are significantly different.

During debriefing of In-Situ Simulations

- Team stability
- Leadership variability
- The operational systems

Simulation Must be Carefully Designed and Implemented to Elicit Team Skills

Scenario/Event-Set methodology
Identifiable/teachable skills

- ✓ Focused team goals are established
- ✓ Some behaviors are integrated with defined procedures
- ✓ Cross-cultural teams are allowed to practice the concepts in an operational based team scenario

Simulation Must be Carefully Designed and Implemented to Elicit Team Skills

- Some of the critical design issues are the triggers which should stimulate team dynamics and elicit the skills of team performance. Some examples triggers include:
  - Two nurses are working with the patient and then a physician enters the room.
  - Rapid formation of a team in an operating room for an emergency procedure.
  - Key members of healthcare team are called away for another emergency.
  - Errors are introduced into the care of patient.
  - Critical resources such as blood products are needed but are not of immediately available.

Simulation Must be Carefully Designed and Implemented to Elicit Team Skills

- ***In-situ*** **simulations® are a realistic representation of the challenges, systems, and operational environments of healthcare workers conducted on the patient care units, not in a simulation laboratory.**

Simulation Must be Carefully Designed and Implemented to Elicit Team Skills

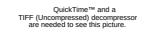
- Although the simulator provides a focus and creates the technical criteria for the scenario, it is the connectivity of the healthcare team into the systems and culture of the healthcare organization that is generating the wealth of information on healthcare team performance

Healthcare needs develop processes to understand team performance
Conducting the Facilitative Debriefing

- In Health care, the discussion and critique of performance normally occurs in morbidity and mortality (M&M) conferences.
- The discussion is normally limited to technical rather than teamwork issues. Moreover, the tone of M&M conferences reinforces a “shame and blame” culture that is not conducive to the open discussion about human error (in order to learn from such errors).
- Finally, very little information about the healthcare organization’s larger systems issues is discussed.

Conducting the Facilitative Debriefing System Diagnostics Through Simulation

- **During the simulation, the team's performance is captured using sophisticated audio/visual recording systems to record examples of particularly effective and ineffective team performance.**



Quality Enhancemen and Medical Error Reduction

Conducting the Facilitative Debriefing System Diagnostics Through Simulation

- **These recordings are then used to help diagnose breakdowns in team performance and system safety during a facilitative debriefing that occurs immediately following the simulation.**

Conducting the Facilitative Debriefing System Diagnostics Through Simulation

- **The purpose of the debriefing is to help understand the complex team skills and knowledge required in today's world of patient care.**

Conducting the Facilitative Debriefing System Diagnostics Through Simulation

- **In this perspective, the focus is on how behavior impacts patient care (both positively and negatively) rather than assessing individual performance.**
- **Emphasis is on “what is right” not “who is right.”**

In-situ Simulation®:

System Diagnostics Through Simulation

- A picture is worth a thousand words!

In-situ Simulation®:

System Diagnostics Through Simulation

- In the debriefings performed to date we have identified several areas for improvement:
  - Teams working together for years do not understand the roles and responsibilities of the other team members. It is most significant across disciplines.
  - Healthcare individuals do not understand the need for standardized roll definitions when working on the floor. The thinking is chaos is normal business and I will perform based on what I think is necessary rather than by a predefined roll.

In-situ Simulation®:

System Diagnostics Through Simulation

- Healthcare must understand the impact of this chaos on team performance:

Variability on a typical unit:

Physicians	93
Nurses	50
Anesthesiologists	16
NNPs	12
Scrub Techs	14
CRNAs	35

How many teams are possible with these staff numbers?

437.5 Million

In-situ Simulation®:

System Diagnostics Through Simulation

- There are few processes or backup plans if errors occur.
- There is an unwarranted assumption by team members that everyone will perform at 100% with no methods to assure this is occurring.
- This is compounded by a culture of silence in healthcare that does not allow individuals to discuss with other team members that they may not be “on top of their game” because of fatigue, illness, or emotional issues.

In-situ Simulation®:

System Diagnostics Through Simulation

- There is poor understanding of the boundries and differences between Leadership and Authority:
  - Some Physicians fear and feel challenged by leadership which is focused on care of patient.
  - Team members must learn “Physicians style” which makes consistent team dynamics difficult.
  - The impact of the Physician on the team is significant.

What is the future...

- A change in how we train healthcare professionals both technically and on team behaviors
- Although the need to change is evident in how healthcare professionals learn, practice, and maintain their skills there has been little effort to change.
- The cost is thought to be too high for supporting these changes.

Lessons Learned for Healthcare from the Air Carrier Culture of Safety

- What is missed is balancing these costs with the cost of error.
- It would seem the cost impact would be small if healthcare could just save one 747 from crashing by changing processes, training, and learning for healthcare professionals.