Root Cause Analysis: Lessons Learned From Highly Reliable Organizations

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The Tipping Point

High Risk Industries

Aviation

- Pre-CRM – 2/3 of accidents a crew member knew something, but did not speak up
- 1979 Commercial aviation crash rate – 7.1/million departures
- 2009 Commercial aviation crash rate – 0.71/million departures
- Odds of being killed in a commercial plane crash – One in seven million!

Healthcare

- Errors in OR – 80% of cases no one spoke up
- Patient deaths – 200,000 to 400,000 per year
- HAI – 1 in 25 hospitalized patients
- VTE – 8 events per 1,000 stays; 1 out of 17 preventable deaths
- Medication errors – 7,000 deaths per year

Highly Reliable Organizations

- **Preoccupation with failure** – always asking *what if,* never taking past success as a prediction of future safety
- **Commitment to resilience** – capacities to detect unexpected threats/contain before harm or bounce back when they occur
- **Sensitivity to operations** – system undergoing constant change, scan for anomalies or potential problems
- **Culture of safety** – staff feel safe to report actual and or potential failures
- **Deference to expertise** – in emergency situations hierarchies are flattened

Normal Accident Theory

- Accidents are rare; however, they will occur.

- Major accidents become increasingly likely over time due to complexity and tight coupling.

  - Complexity – no single operator can immediately foresee the consequences of a given action in the system.

  - Tight coupling – occurs when processes are intrinsically time-dependent. Once a process has been set in motion, it must be completed within a certain period of time.

Lost in Translation

- "We must not make the error of false equivalence" (Fong, K.)
- Comparing two high-risk industries
  - Aviation and healthcare
- Use of CRM in healthcare – will it work?
  - No
  - Cultural differences
    - Aviation "what happened," "what went wrong"
    - Healthcare "who made a mistake," "who can we blame"
    - Teamwork and team training
    - Reporting systems – transparency
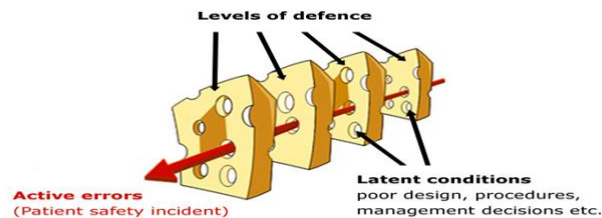 - Lack of critical language

Reporting Events

- Create psychological safety to report:
  - Latent conditions
  - Active Errors
  - Near Misses or Close Calls
  - Beware of hindsight bias
  - Investigate with human factors in mind
  - Incorporate a Just Culture in cause analysis

Active Errors vs. Latent Conditions

- James Reason

Swiss Cheese Model

Levels of defence

Active errors
(Patient safety incident)

Latent conditions
poor design, procedures,
management decisions etc.

A Just Culture

- Recognizes individuals should not be held accountable for system failings
- Recognizes many errors represent predictable interactions between human operators and systems
- Recognizes competent professionals make mistakes and will develop unhealthy norms (shortcuts)
- Has zero tolerance for reckless behaviors and holds individuals accountable no matter the outcome.

A Just Culture

| Human Error	At-risk Behavior	Reckless Behavior
Product of our current system design and behavioral choices Manage through changes in: • Choices • Processes • Procedures • Training • Design • Environment	A choice: Risk believed insignificant or justified Mange through: • Removing incentives for at-risk behaviors • Creating incentives for healthy behaviors • Increasing situational awareness	Conscious disregard of substantial and unjustifiable risk Manage through: • Remedial action • Disciplinary action
Console	Coach	Discipline

Lessons Learned
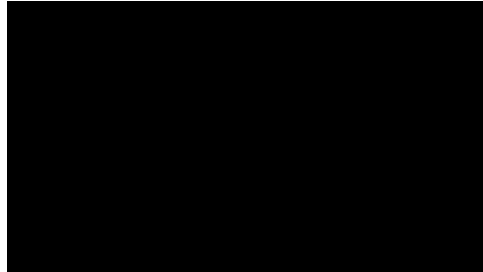
Lessons Learned

- China Airlines Flight 120
- Yes…but why?
- Was this a "one off"?
- What are the odds?
- Couldn't possibly happen again?

Lessons Learned

- Root Cause Analysis of China Airlines Flight 120
  - Human error

  - Flawed assumptions

  - Under-reported

Human Factors
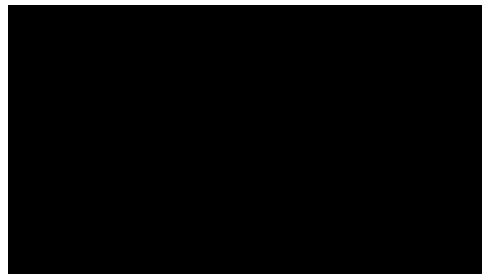
Human Factors & System Design

Overview LFN

- LFN began in 1978, as a hospital-based program
- Largest not-for-profit Air Medical Program in the U.S.
- Joint ownership
  - Oregon Health & Science University
  - Legacy Emanuel Medical Center
  - Providence Health & Services Oregon
  - Saint Alphonsus RMC
  - Locations: Oregon, Washington, Idaho & Montana
  - Number of bases
    - 17 RW
    - 5 FW
    - 3 Ground

LFN Quality Management System


LFN Quality Management System

- Reporting systems – NBS and Baldwin SR
- QM training
- When to report
    - Policy
    - Regulatory
    - Utilization Review
- Feedback loop
- Checks and balances
- Quality trackers outcome
- A Just Culture
- Reporting near misses – speak up – safety contract

LFN Quality Management System

- Several reports surrounding stretcher in FW
- The first two were regarded as a 'one off'
- The third not a coincidence or rare event…trend?
- RCA performed
  - Human factors
  - Distractions
  - Poor system design
  - Use of check list

LFN Quality Management System
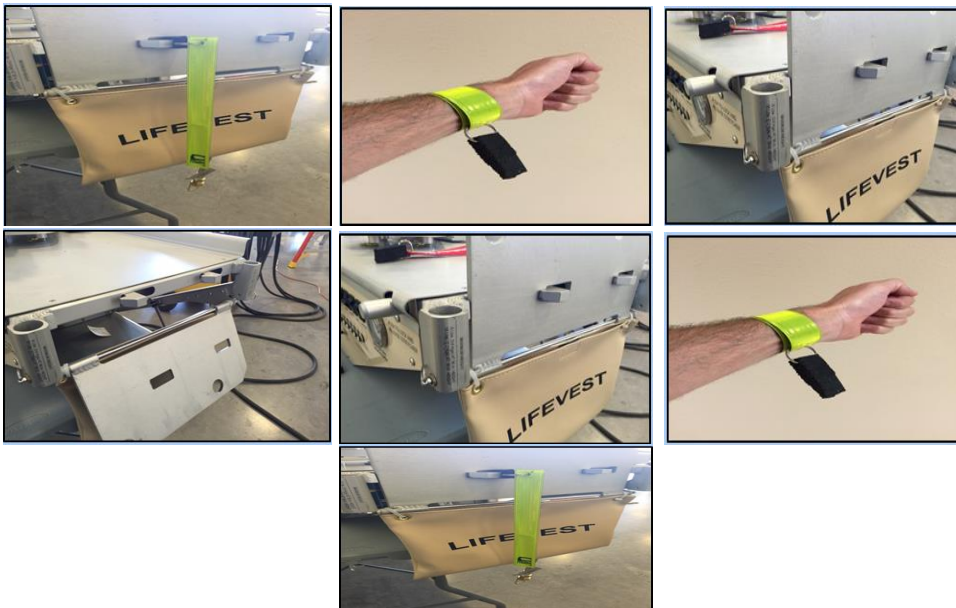
ETA Action Plan

- Concerns surfaced from customer surveys
  - Customer satisfaction
  - Patient safety
- RCA
  - Lack of standardization for data entry
    - Caused by - lack of standardized training
    - Variance identified by length of service of CS
  - No method to track and trend errors
  - Lack of clear expectations for CS and lack of accountability
  - Not all ETA calculations were performed in the database
  - Lack of standardization from data entry to reporting
- ETA – 42% accuracy increased to over 80% (± 3 min)

The Patient Safety Triangle

Conclusion

- Highly Reliable Organizations utilize a Just Culture, creating a safe place for staff to report errors, near misses and system problems
- During the RCA utilize:
  - A Just Culture
  - Human factors
  - Understand the culture and prevent hindsight bias
  - Discourage the use of simple explanations
    - "Communication issue"
    - "A one off"

Thank You!

References

- AACN, *Bold Voices.* Volume 6, No. 1 January 2014.
- China Airlines Flight 120. Retrieved online 2-2015. https://www.youtube.com/watch?v=6tplGAZTgw8
- Marx, D., *Whack-a-Mole The Price We Pay for Expecting Perfection. (2009)*
- NTSB, International Investigations Naha, Okinawa – *China Airlines Boeing 737 Fuel Leak and Fire.*
- Patient Safety Network, AHRQ. Patient Safety Primer, *Error Disclosure*. Retrieved online 1-2015. http://psnet.ahrq.gov/
- Risky Business Patient Safety Conference. Fong, K., *Relating Lessons From Other High-risk Industries Not Necessarily That Simple*. Retrieved online 1-2015. http://www.risky-business.com/video.php?videoid=237
- The Oregonian. Article retrieved online 1-2015. http://www.oregonlive.com/history/2014/12/portland_airliner_crash_in_197.html
- *To Err is Human*. Retrieved online 2-2015. https://www.youtube.com/watch?v=6tplGAZTgw8