“Oops, I Did It Again!”
Root Cause Analysis in EMS

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This lecture has nothing to do with Britney Spears!

Introduction

• Matthew R. Streger, Esq.
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• Princeton, New Jersey
• Objectives
• History of this Lecture

How This Lecture Came to Be

• Cleveland, Ohio – a long time ago
• Saturday morning – Medic 18 dispatched to 4412 Bridge Ave., Cleveland – Cardiac Arrest
What Do You Do?

• Punishment? – BIG ISSUE
• Re-Education?
• Prevention?
• Chalk it up to “human error”?
• TWO ISSUES
  • Preventing failures from occurring
  • Changing failure culture

Objectives

• Do not be afraid of failure!
  • You ARE going to fail eventually
    – “I have not failed. I’ve just found 10,000 ways that won’t work.” Thomas Edison
  • Understand RCFA – Root Cause Failure Analysis
• Introduction to basic concepts
• Introduction to analysis procedures
• PREVENTING AND PUNISHING

What is Failure?

• “Mishaps are like knives, that either serve us or cut us, as we grasp them by the blade or by the handle.”
  — James Russell Lowell
• “Experience is simply the name we give our mistakes.”
  — Oscar Wilde
• “Only those who dare to fail greatly can succeed greatly.”
  — Robert F. Kennedy
• “Those who do not learn from history are doomed to repeat it.”
  — George Santayana

Scenarios

• Real World – Challenger and Columbia
• Near-Misses – Continental landing on taxiway at Newark Liberty 28 Oct 06
  — See Also Tenerife 27 Mar 77 for consequences (583 dead)
• EMS – dropped call, extended response time, missed esophageal intubation

Swiss Cheese

• Mechanisms always in place to prevent failure – and they are always porous
• Secondary mechanisms implemented to eliminate holes
• Sometimes the holes line up
• Goal is to eliminate as many holes as possible –

Examples

• HUMAN ERROR
  • Landed on wrong runway
  • Because lined up on wrong runway
  • Because operating VFR
  • Because pilot chose to operate VFR
  • Because no policy controlled
• HUMAN, MANAGEMENT ERRORS

• SYSTEM ERROR
  • Landed on wrong runway
  • Because lined up on wrong runway
  • Because VFR failed
  • Because circuit shorted
  • Because pin on chip bent
  • Because installed incorrectly
• HUMAN, QA, SYSTEM ERRORS
EMS Example
- Drove to wrong address
- Because heard wrong address
- Because of background noise in the ambulance?
  Or because read-back failed?
- Or because of failure in policy to require ROAD vs. AVENUE?
- HUMAN, MANAGEMENT, SYSTEM ERROR
- SWISS CHEESE!

Iceberg, Right Ahead!
It’s Easy to Call it Human Error

The ROOT Cause
- “Every great mistake has a halfway moment, a split second when it can be recalled and perhaps remedied.”
  —Pearl S. Buck
- The action, deficiency or decision which, if corrected, eliminated or avoided will eliminate the undesirable condition
  If not, it’s not a ROOT CAUSE

The PROXIMATE Cause
- The event that occurred immediately before the failure
- Chain leads from proximate cause to root cause
- Root causes are always organizational
- They cause or enable the proximate causes

History of RCA
- Aerospace and Manufacturing Industries
  - Aviation – cockpit resource management
  - Manufacturing – failure mode effects analysis (FMEA)
- Medical Industry – Medical Errors
  - JCAHO incorporation
  - Not really in EMS
  - Medical errors, operational errors

Failure is NOT Bad!
- Failure = Pain
  - Conditioned to avoid
  - Blame, punishment, humiliation
  - So we avoid and HIDE failures!
- Value in Learning
  - Embrace failures – Prevent future occurrences
  - Oscar Wilde – “Experience is simply the name we give our mistakes.”
Top Down vs. Bottom Up
- Bottom Down Looks More Desirable
- Prevent problems before they manifest
- Attack the root, kill the weed
- NEED to Change the Culture First
- People are conditioned to HIDE failure
- Must start with Top Down
- Change the culture – more manageable scope

Acute vs. Chronic
- Organizations always investigate acute failures
- Not always with a good process
- Organizations rarely investigate chronic failures
- Repetitive substandard conditions
- As you might guess, they are often linked

Acute - Initial Steps
- Develop a core group
- Identify failure
- Failure investigative processes
- Create a timeline
- Create a why tree
- Reach conclusions - STOP

Core Group
- 3 People
- Manageable scope
- No ties – 2 to 1 or 3 to 0
- Enables division of labor
- Organizational Leadership Support

Identify Target
- Define Failure
- Acute failures are usually fairly easy to spot
- Investigative scope often harder to handle
- Look at Frequency vs. Impact
- Ultimately, it’s the Organizational Leader Who Decides!

Failure Investigation
- FREEZE THE EVIDENCE!
- What happened, not WHY yet
- People
- Not databases
- Positions
- Paper
- Parts
**Create Timeline**
- Take the 4 P's and sequence the events
- As close to real time as possible
- Create flowchart with data points
- Time
- People
- Positions
- Parts
- Paper

**Why Tree**
- TOP BLOCK – last domino that fell
- TOP ROW – all the dominos that could have possibly hit it
- WHAT dominos exist
- WHY each event occurred

**Why Tree**
- If too many dominos, do an either / or choice with the top 2 options
- Examine each component individually, asking why each time
- Continually recheck your facts AND your logic

**End-Game**
- When do you stop asking why?
- Root cause found – ALL organizational factors
- Problem not correctible
  - Human error! Retraining! Punishment!
  - Insufficient data to continue investigation

**Obstacles**
- Leadership buy-in
- Attitudes
  - We've always done it this way
  - We punish failure
- Corporate culture is the biggest obstacle
  - Because all root causes are organizational

**Watch Your Language**
- External considerations
- "Failure" still has negative connotation
- Be aware of the words you use, especially if external sources are going to have access to your data
- Freedom of Information – Public Records
- Self-Critical Analysis Privilege
**Chronic - Steps**

- Same basic processes
- Often different people do the analysis
- Focus on one thing at a time
- Keep a narrow scope – easy to get distracted
- Harder to preserve evidence – more time usually elapsed

**Future Considerations**

- Start Charting Near Misses
- Goal is avoiding failure in the first place
- Bottom Up Failure Analysis
- Decentralized incident analysis for acute failures

**Conclusions**

- Insanity – doing the same thing over and over and expecting a different result
- Preventing failure in the first place
- Minimizing failures and impacts
- Changing failure culture
- Punishment, hiding failures
- LEARNING FROM FAILURES

**Bibliography**


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