Failure Mode Effects and Analysis

FMEA, FMECA or RCA
How do you know?

Rossa, Rossa & Associates and Associated Surveys for Healthcare

Presented by
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FMEA Objectives
Participants will be able to:

- Increase knowledge of the basic concepts involved in failure modes effect analysis and the tools used to conduct these activities
  **WHY?**
- Determine internal and external reporting requirements
  **WHAT?**
- Explain FMEA techniques (preparing for the analysis through risk assessment/corrective actions)
  **HOW?**
- Factors that contribute to success to FMEA projects
  **TRENDS to REPLICATE**

**WHY FMEA?**
**Why Risk Assessment?**

Proactive rather than reactive

Involves knowledgeable customer focused team finding solutions

Prioritization of Performance Improvement efforts

Compliance with Joint Commission Standards
Why Individuals Don’t Report

- Why are errors not reported:
  - May get fired
  - May get reported to the board
  - May get someone in trouble
  - Will get put on a team to resolve issue
  - Don’t want (or have time for) all the paper work and follow-up

Why Facilities Don’t Get Involved

- Costly
- Too much time – to accomplish
- Not enough time – always putting fires out
- Recession
- Lay offs
- External pressures towards other priorities

FMEA Limitations

Limitation of FMEA:

1. lot of detail about the failure of individual components,

2. does not take combinations of failures into account.
FMEA Limitations

As with other numerical methods figures are best derived from either:

1. actual measurement or
2. controlled experiments.
3. If these are not available, then estimates should be treated with appropriate caution.

WHAT is FMEA?

A systematic, proactive method for evaluating a process to:

- identify where and how it might fail
- assess the relative impact of different failures.

Provides information to use in identifying the parts of the process most in need of change, Prioritization.

HOW does FMEA Process Work?

- **Failure Modes**
  (What could go wrong?)

- **Failure Causes**
  (Why would failure happen?)

- **Failure Effects Analysis**
  (What would be the consequence of each failure?)
**What Does this Mean?**

Severity x Occurrence x Detection = Risk Priority

Severity = potential effect of the failure

Occurrence = likelihood that the failure will occur

Detection = likelihood of problem detection before it reaches the patient

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**Example**

**Severity/Harm Scale**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very Low or None</td>
<td>Minor Nuisance</td>
</tr>
<tr>
<td>2</td>
<td>Low or Minor</td>
<td>Operable but reduced performance</td>
</tr>
<tr>
<td>3</td>
<td>Moderate or Significant</td>
<td>Gradual performance deterioration</td>
</tr>
<tr>
<td>4</td>
<td>High</td>
<td>Loss of function</td>
</tr>
<tr>
<td>5</td>
<td>Very High or Catastrophic</td>
<td>Safety related catastrophic failures resulting in harm</td>
</tr>
</tbody>
</table>

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**Example**

**Occurrence Scale**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Classification</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Very High</td>
<td>Inevitable Failure</td>
</tr>
<tr>
<td>8</td>
<td>High</td>
<td>Repeated Failures</td>
</tr>
<tr>
<td>6</td>
<td>Moderate</td>
<td>Occasional Failures</td>
</tr>
<tr>
<td>3</td>
<td>Low</td>
<td>Few Failures</td>
</tr>
<tr>
<td>1</td>
<td>Remote</td>
<td>Failure Unlikely</td>
</tr>
</tbody>
</table>
Using FMEAs & RPNs

- Select a process to improve
- Define FMEA process and scope
- Obtain materials about process
- Recruit knowledgeable customer focused team
- Identify failure modes and causes
- Calculate RPNs
- Evaluate results
- Use RPNs to plan improvement efforts

Add Criticality

- **Criticality**
  - can be applied both to failure modes and to effects
  - allows prioritization of remedial actions (rank order)

  **Failure mode criticality** simply put is the likelihood that it will occur in a given period (such as 12 months).

Criticality

- **Criticality of a failure effect (loss of utilities)** is the likelihood of that effect occurring due to any failure mode (car hits utility pole taking out all facility’s power)
  - How would that effect your facility?
    - Emergency Management or Utility Management
  - Criticality may be further refined by also taking into account any other items which are considered to be important, such as severity of failure or chance of injury to a patient.

  Detection = likelihood of problem detection before it reaches the patient
Acronyms

FMECA (Failure Mode, Effects and Criticality Analysis)

FMEA (Failure Mode, Effects and Analysis)

HFMEA (Healthcare Failure Mode Effectiveness Analysis)

Using TRENDS to REPLICATE

- Performance Improvement and Criticality
- Other Links from professional organizations
- References
- Joint Commission
  - National Patient Safety Goals
  - Priority Focus Areas
  - Clinical Service Groups
- Institute for Healthcare Improvement
- CMS and Core Measures
- Physician Peer Issues

Where to Start
Risk Analysis

1. Choose a Topic
2. Establish a PI Team
3. Set up a Process Flow Diagram
4. Decide what effects of failure might be on the remainder of the process
5. Decide on interventions to lower the criticality index
Root Cause Analysis (RCA) Process

- Root Cause Analysis for “After the Fact”
- Sentinel Events
- Tracing or Tracking Errors (process referred to by the Swiss Cheese Effect)
- Many others

FMEA and the RCA Process

Similarities
Focus on systems issues
Develop flow charts
Actions and outcome measures developed
Scoring matrix (severity/probability)
Use of Triage/ Triggering questions, cause & effect diagram, brainstorming
Interdisciplinary Team

Differences
Develop Flow Diagram
Focus on systems issues
Actions and outcome measures developed
Scoring matrix (severity/probability)
Use of Triage/ Triggering questions, cause & effect diagram, brainstorming
Interdisciplinary Team
FMEA and the RCA Process
Differences (cont’d)
Process vs. chronological flow diagram
Prospective (what if) analysis
Choose topic for evaluation
Include detectability and criticality in evaluation
Emphasis on testing intervention

Example: Hand Hygiene
Main Causes of Failure to Clean Hands (across all participating hospitals)

• Ineffective placement of dispensers or sinks
• Hand hygiene compliance data are not collected or reported accurately or frequently
• Lack of accountability and just-in-time coaching
• Safety culture does not stress hand hygiene at all levels
• Ineffective or insufficient education

http://www.centerfortransforminghealthcare.org/projects

Example: Hand Hygiene (Cont’d)
Main Causes of Failure to Clean Hands (across all participating hospitals)

• Hands full
• Wearing gloves interferes with process
• Perception that hand hygiene is not needed if wearing gloves
• Health care workers forget
• Distractions

http://www.centerfortransforminghealthcare.org/projects
Links

Tools & Resources
- Interactive FMEA Tool from the Institute for Healthcare Improvement
  [http://www.ihi.org/ihi/workspace/tools/fmea/]
- Examining Risk Numbers in FMEA
- Criticality: Improvement Failure Modes and Effects Analysis Tool Process Data Report.htm

Links/References

Association of Practitioners for Infection Control
  www.apic.org

Patient Safety & Quality Healthcare e-Newsletter
  www.psqh.com/forms/psqhnews.shtml

World Health Organization
  http://www.who.int

Behavioral Health References

• The latest issue of BHC News is now available at Joint Commission.
• New BHC team ready to serve you
• Resources:
  – Annual Behavioral Health Care Conference
  – Free chapter updates
  – Social media links
• BHC News online contact us or follow this link:
  http://www.jointcommission.org/AccreditationPrograms/BehavioralHealthCare/BHCNews/isue_03_09.htm
Joint Commission

• All other areas are also available by logging on to www.jointcommission.org

• Center for Transforming Healthcare tackling safety, quality problems

• Revised 2010 NPSGs

Healthcare Staffing Certification References


Not-yet-certified health care staffing firms are invited to attend a free briefing on The Joint Commission’s Health Care Staffing Services Certification Program. Attendees will learn about the benefits of Joint Commission certification and the process of becoming certified. The briefings include an opportunity to talk directly with Joint Commission staff about the application process, standards, on-site review and pricing. The briefings will be held:

October 20, 9 to noon, Florida Hospital, Winter Park, Fla., Others coming soon

To register, go to www.jointcommission.org/HCSbriefings.htm.

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CMS/CDC References

• CMS online tools at www.medicare.gov.
  – Restraints
  – Medication administration
  – Others

• Center for Disease Control (CDC) at www.cdc.gov
  – Handwashing !!!!!
General References

New Resource for Talking About Health Care Quality RWJ
Robert Wood Johnson Foundation

Talking About Quality is a bank of 150 ready-to-use slides that includes statistics, charts, graphics and messages, as well as audio clips from people on the front lines of health care. Users can easily download slides for use in their own presentations or create custom slideshows on www.rwjf.org using My Presentation Builder.

These slides will be updated on a regular basis with the most recent research and statistics.

General References

• Susan Mellott, RN, CPHQ, PhD (Mellott & Associates) offers a longer program with CEUs. Susan provided input including the next example.

• Jackie Webster, LMSW-AP, Behavioral Health input

• Peter Rossa, RN, CPHQ, PhD general and environmental issues
Acknowledgments

• Texas Healthcare Quality Association
  – TAHQ Board
  – TAHQ Educational Committee

• Texas Medical Foundation (TMF) Grant

• Mellott & Associates

QUESTIONS?