

# Using the FMEA as a Novel Experiential Learning Tool within a Resident Patient Safety Curriculum

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## Introduction

Annually, medical errors are the third leading cause of death for 400,000 patients. The Accreditation Council of Graduate Medical Education (ACGME) core requirements state **"All physicians are [responsible] for promoting patient safety... and graduate medical programs must prepare residents...with continuous focus on [patient] safety."** Residency programs are therefore challenged to implement effective methods to educate and engage residents in patient safety. Studies on patient safety curricula in trainees are emerging. Most studies showed significant improvements in knowledge acquisition and all studies reported favorable changes in safety-related behaviors.

One method to assess patient safety is use of the failure modes and effects analysis tool (FMEA). The FMEA proactively assesses risks to identify potential areas of failure and strategies for prevention. The FMEA integrates core quality improvement (QI) and patient safety strategies by supporting longitudinal critical analysis of a process through interprofessional, team-based interaction and QI activities. Community Health of South Florida, Inc. (CHI) has an embedded culture of quality improvement; it is a level-III PCMH and was recognized as a Health Center Quality Leader in 2018. Residents at CHI are already involved in QI projects to intervene on existing suboptimal outcomes. To enhance resident education and engagement in QI and patient safety processes, we initiated a patient safety curriculum with the FMEA implemented as an experiential activity.

## Objective

To promote and sustain longitudinal resident education and involvement in team-based patient safety initiatives with the FMEA as an experiential activity.

## Methods

To support resident competency in patient safety, we applied the revised Bloom's taxonomy.

First, family medicine residents at CHI received education on proactive risk assessments and the FMEA through a 1 hour-long institutional grand rounds lecture. Knowledge was reinforced in a didactic session, the following week, where examples of the FMEA tool in practice were provided.

In the next phase, residents were assigned to three high risk processes critical to patient safety: (1) after-hours calls, (2) missed appointments (no show), and (3) mammogram orders and abnormal result follow-up. Residents first reviewed the process on their own and then discussed with core faculty and co-residents their observations. The focus of this first session was to ensure understanding of the use of the tool to assess high-risk processes and to help identify operational departments involved in the processes that should be involved in QI efforts.

Thereafter, during quarterly didactics, residents presented their risk assessments to be reviewed with co-residents, core faculty, and representatives from CHI's administration and risk management department. Feedback would be given on how to proceed and update the proactive analysis of the process to be presented at the next meeting.

After implementation of the FMEA resident projects, a survey of residents' attitudes and behaviors to patient safety was administered to both Psychiatry and Family medicine residents. Questionnaire was adapted from the Attitudes in Patient Safety Questionnaire (APSQ). Thereafter, didactic instruction of general patient safety concepts was initiated as a 3-year curriculum using the WHO curriculum patient safety curriculum guide that would be given as lecture, quarterly prior presentation of the FMEA projects.

## Results

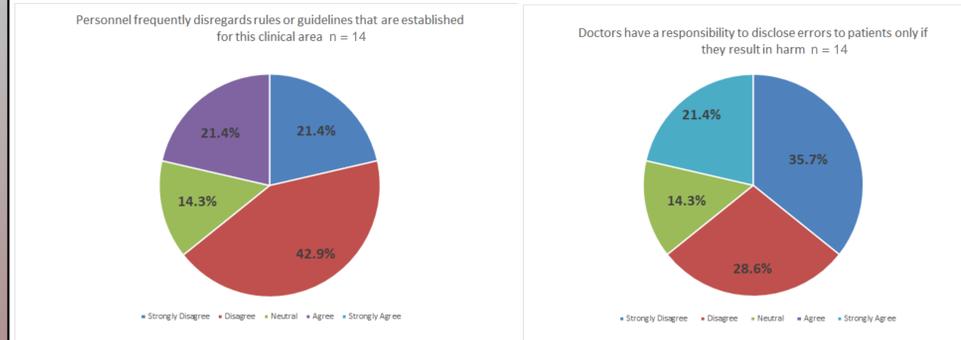


Figure 1. Resident responses to "Attitudes and behaviors to patient safety" questionnaire.



Figure 2. Residents and faculty working on patient safety project using FMEA worksheet

Community Health of South Dade, Inc.  
**CHI**  
Performance Improvement Council  
Family Medicine Residents Safety Project  
HIGH-RISK PROCESS REVIEW – AFTER HOURS PATIENT CALLS PROCESS FLOW

| Steps                                    | Breakdown Points  | Potential Effects of Breakdown   | Root Causes of Breakdown  | Recommendations  | Person Responsible                          | Status   |
|--|---|--|---|--|---|--|
| Patient calls after hours                | -For issues not emergent<br>-Call about appointment<br>-Inappropriate calls from attendings   | -Calls being taken for minor issues and more mistakes being made<br>-Patient care is compromised                         | -Patients not being told what to call for<br>-Provider/staff not adequately trained on how to use/access EMR  | -Educating patients about when to call and/or what to call about<br>-Provider/staff training on EMR and accessing records  | -Call4Health<br>-JMH training/nursing staff | -Staff currently finding ways to obtain records without OB residents                             |
| After hours answering service takes call | -Does not ask pertinent questions<br>-Contact info of pt not gathered<br>-Miscare abbreviated messages unclear<br>-MiSecure staff does not respond back to messages sent back | -Provider given incomplete info<br>-Difficulty locating patient record in EMR<br>-Patient not contacted in timely manner | -Training of call center personnel<br>-Mishearing/Misspelling patient name<br>-Abbreviations in text overused | -Educate call service about appropriate questions<br>-Request for identifying patient information to be checked<br>-Call 4Health messages to be typed without abbreviations<br>-Obtain set of primer questions from Call4Health. Review and provide feedback | -Call4Health                                | -Contact Candelle Santos<br>-Follow-up with Angela Rivera to join monthly calls with Call4Health |

Figure 3. FMEA worksheet for After hours calls process, page 1 of 2.

## Discussion

Residents use of the FMEA tool enhances their education and involvement in organizational activities in patient safety. While not methodologically evaluated, use of the FMEA provided a structure for applying patient safety skills learned through didactics, and analyzing and evaluating processes that impact patient safety. The FMEA process also demonstrated the ability of residents to proactively identify potential areas of failure in a process, communicate at an interdepartmental level to develop strategies, and participate in implementation of QI activities.

For the resident survey, most residents agreed/strongly agreed with provider disclosure responsibility for medical errors, though there was some variability to the response *"Doctors have a responsibility to disclose errors to patients only if they result in harm."* This reinforced the need for formal resident education on patient safety which is addressed through the didactic portion of our curriculum. There was also variability in resident response *"Personnel frequently disregard rules or guidelines (e.g., handwashing, treatment protocols/clinical pathways, sterile field, etc.) that are established for this clinical area."* Involving residents in a patient safety culture, through lectures and the FMEA activity, could help increase the number of patient safety champions within the organization indirectly helping to improve patient safety behaviors.

Prior studies identified that burdensome time commitment is a challenge in implementing patient safety education. We found that periodic quarterly assessments and creating teams of residents to assess critical processes was acceptable to residents and faculty.

## Next Steps

Future directions include continuing resident didactics on patient safety concepts using the WHO curriculum; continuing family medicine resident involvement in organizational patient safety activities using the FMEA to conduct proactive risk assessments; initiating psychiatry resident involvement in patient safety activities using the FMEA; comparing resident patient safety attitudes and behaviors as they advance through their training under the current patient safety curriculum; and faculty development in patient safety education.

## Literature cited

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