Purpose: Failure Mode and Effects Analysis (FMEA) provides a proactive method of improving the quality and safety of treatments by identifying and correcting hazards points in the process of clinical care. FMEA, however, is often thought to be prohibitively labor intensive. This study outlines a method of streamlined FMEA, conducted with limited resources, and assesses its feasibility and effectiveness.

Methods: FMEA was performed on the external beam service of a clinic treating approximately 650 patients per year on three linear accelerators. A facilitator and local team leader were identified, and a plan was developed to complete the exercise in four one-hour meetings as follows: 1 (core group), introduction and process mapping, 2 (all staff) identification of failure modes from expert user input, 3 (core group) scoring of failure modes according to an FMEA risk priority number, RPN, i.e. the product of severity, occurrence and detectability scores, and 4 (all staff) error proofing of the top-five ranked failure modes.

Results: Fifty-two failure modes were identified, 43 of which were scored and ranked. Specific interventions were developed for the five highest ranked failure modes. FMEA scoring after intervention indicated that the average RPN score for the top five modes decreased from 273 to 161 (p=0.03) while FMEA scoring of a control group of failure modes with no intervention did not show a significant change in RPN (p=0.07). The exercise was accomplished within the expected timeline and required 55 total hours of staff time and 20 hours of facilitator effort.

Conclusion: Streamlined FMEA analysis is feasible with a relatively modest effort, and can reduce the risk profile of a facility. This may open the possibility of performing repeat FMEA on a regular basis.

Funding Support, Disclosures, and Conflict of Interest:

None