Inpatient Adult Behavioral Health Violent Events Failure Mode and Effects Analysis (FMEA)

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Introduction

Violence toward healthcare workers is a well-documented challenge in inpatient psychiatric settings. In 2021/2022, psychiatric and substance abuse hospitals reported 110.4 workplace violence incidents per 10,000 full-time workers versus 12.9 in general medical and surgical hospitals (Lombardi et al., 2024). These incidents cause physical injury, psychological trauma, burnout, and safety disruptions, and may require high-risk interventions such as restraints. At AtlantiCare's inpatient psychiatric unit (One Pines), increased reports of behavioral workplace violence in 2024 highlight a pattern of patient-initiated aggression, though contributing factors have not been systematically analyzed. This project applies a Failure Mode and Effects Analysis (FMEA) to retrospectively identify patterns, system vulnerabilities, and key drivers of violence, followed by the development and implementation of targeted interventions with prospective evaluation of their impact. The goal is to enhance safety for both patients and staff.

Objectives

- Implement interventions and prospectively assess changes in event frequency through April 2026.
- Identify patterns and contributing factors in violent events resulting in staff or patient assault using retrospective data.
- Apply FMEA to identify system vulnerabilities and inform targeted interventions.

Study Design

Phase 1 – Retrospective Analysis (Jan 2024–Jan 2025)
Safety events were extracted from the RL Datix reporting system and corresponding EHR data for the inpatient psychiatric unit. Of the 25 reported behavioral violent events, 21 patient assault events were analyzed.

- Variables analyzed: patient diagnosis, antecedent behaviors and triggers, agitation within 24 hours, commitment status, medication adherence, length of stay, restraint use, post-event interventions, discharge disposition, and recent admissions.
- Failure Modes and Effects Analysis (FMEA) was used to identify patterns and targets for intervention.

Phase 2 – Prospective Tracking (Post-intervention; Jan 2026-March 2026)
Following implementation of targeted interventions informed by Phase 1 starting 12/13/25, behavioral workplace violence events will be prospectively tracked using RL Datix reports from 1/1-3/12/26. Trends in event frequency and characteristics will be monitored over time. No randomization or control group; study is descriptive and observational.

- Two-phase, mixed retrospective and prospective observational study conducted on a single inpatient psychiatric unit, utilizing chart review.

Study Population
Patients on the One Pines psychiatric unit involved in reported behavioral workplace violence events.

- Inclusion:
  - Phase 1: Patients with RL Datix–reported events from 1/1/24-1/4/25
  - Phase 2: Patients with RL Datix–reported events from 1/1-3/12/26 following intervention (initiated 12/13/25)
- Exclusion: None (duplicates removed)

Sample Size

- Phase 1: 21 assault events, Phase 2: 8 assault events

Outcomes

- Primary: Change in frequency of reported behavioral workplace violence events post-intervention

Analysis Process

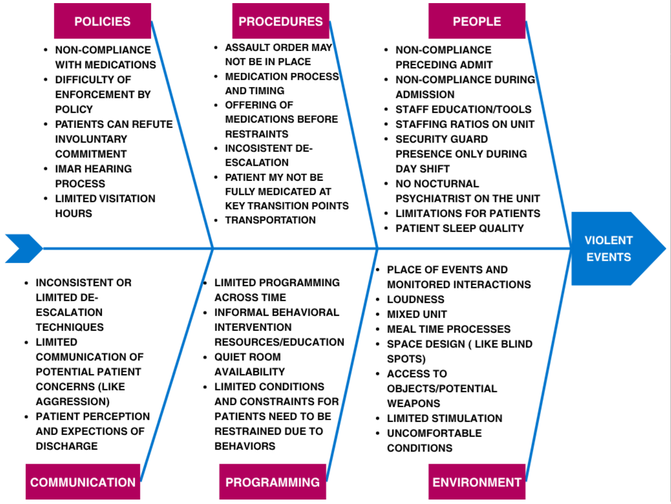

Figure 1: Fishbone diagram breaking down potential causes such as policies, procedures, people, communication, programming, and environment to explore all contributing factors of violent events at One Pines.

Identification and Management of Aggressive/Violent Behaviors								
Steps in the Process	Failure Mode	Failure Causes	Failure Effects	Likelihood of Occurrence (1-10)	Likelihood of Detection (1-10)	Severity (1-10)	Risk Profile Number (RPN)	Actions to Reduce Occurrence of Failure
	What could go wrong?	Why would the failure happen?	What would be the consequences of failure?	10 - very likely to occur	10 - very unlikely to detect	10 - most severe effect	Occurrence x Detection x Severity	
Care interventions (pharmacological and non-pharmacological) are initiated for patients at risk for aggressive/violent behaviors	Interventions are not initiated at all/in a timely manner Patient refuses treatment Staff may not use non-pharmacological methods to de-escalate Difficulty in accessing medications Not effective Wrong medications	Signs of aggression/agitation are missed, patient is not willing to participate in care planning Lack of precipitating signs of aggression Patient may become more agitated Patients have right to refuse Unit patient acuity level Multiple admissions at same time Delayed response of security Physical layout/limited view Environmental and roommate agitations factors	Harm done to staff/patients Patient may harm someone Medications don't work Increased patient aggression Exacerbation of untreated illness Property damage	5	4	9	180	More significant monitoring for signs of aggression, more patient education

Table 1: Example of the FMEA table used to identify potential failure points in a process or design. It lists steps in the process, potential failure modes (what goes wrong), causes, consequences (effects), and ranks them by severity, occurrence, and detection, culminating in a Risk Priority Number (RPN) to prioritize corrective actions. Care interventions were the highest scoring RPN (180), resulting in the development of our intervention of the One Pines Guide to improve patient education.

Results & Conclusions

	Pre-Implementation Period (1/1-3/12/24)	Post-Implementation Period (1/1-3/12/26)
Number of Violent Events	8	8

After analysis, an informative one-page document was created in multiple languages for dissemination to patients upon admission. Comparing the frequency of violent events between the pre-implementation period (January 1–March 12, 2024; n=8 events) and the post-implementation period (January 1–March 12, 2026; n=8 events) showed no significant difference in event rates after the intervention. Several limitations affect these findings. First, the short observation window of 10 weeks after implementation might be too brief to detect meaningful changes in violence patterns, especially considering the complex factors influencing patient aggression in psychiatric settings and the time needed for systemic changes to take full effect. Second, the FMEA process depends on subjective assessments, with team members rating likelihood and severity on a 10-point Likert scale—a method susceptible to bias could have impacted the prioritization of interventions. Third, the analysis identified multiple contributing factors during the FMEA that were not fully addressed by the intervention, representing ongoing confounders that might continue to affect violence rates regardless of the improvement efforts. The lack of a control group and the observational design further limit the ability to establish causality. Future efforts should include longer follow-up periods, address a wider range of failure modes, consider objective measurement strategies beyond incident reports, and possibly employ statistical process control techniques to identify meaningful trends over time.