Society of Hospital Medicine

ADVERSE EVENTS ANALYSIS AND INTERVENTION
EXECUTIVE SUMMARY

For a health system to improve, become highly reliable, and prevent patient harm, it must both know how harm is occurring and what latent conditions are putting future patients at risk, and act on that information to meaningfully improve its care delivery. Thus, a centralized electronic system allowing front-line staff to easily report events is essential. This system should use structured data fields (non-free text) to ensure effective classification, scalability, and interpretation of reports. The system should be user friendly; institutions using time-consuming event reporting systems can expect under-reporting of adverse events. However, the system should collect adequate information to facilitate event review. Report management can be enhanced by resourcing event analysis properly with dedicated staff, rather than layering report review on top of already full workloads. Training and adequate time can increase the consistency of event triage, review, and disposition, allowing more safety interventions to be planned and implemented.

Deploying any type of technology or new process is challenging and requires time and dedicated resources. Education about what constitutes an adverse event is a good starting point. Whether it's small or big, details about how/what to report are paramount for adverse events that result in patient harm, and must be reported. Near misses (or "close calls"), hazardous conditions, and system vulnerabilities should also be reported, as they offer a chance to improve safety before patient harm occurs. A safety event reporting system should not be routinely used by staff to report interpersonal conflicts. However, certain disruptive behaviors are a threat to patient safety and should be reported.

Reports should be promptly reviewed by unit leaders or event report managers. Timely review is important not only for patient care but also for front-line staff. Staff can be demoralized if they spend time reporting events and never perceive that their reports are valuable to safety staff or result in meaningful change. Unit leaders should then bring their assessments to a centralized patient safety team for discussion and prioritization. Review of Code Blues, rapid response team activations, all mortalities, and re-admissions can identify larger themes and safety issues at your institution. Involving trainees in the process, if applicable, both improves learning about the events and educates future leaders about event review and management. It also fulfills an ACGME requirement for quality and safety training. Trainees also serve as a resource for a time-intensive process.

Root Causes Analysis and Action (RCA2) is a structured method widely used in healthcare to analyze serious adverse events. Preventable medical errors undeniably contribute to patient morbidity and mortality in our healthcare system. It is imperative that organizations implement standardized efforts to decrease adverse events and improve patient safety. RCA2 is an essential tool that can prevent future adverse events by leading to systemwide changes.

There is growing recognition among healthcare providers and policymakers that patients and their families should be encouraged to participate in event investigation processes. Patient and family involvement in serious incident investigations can identify gaps in care provided, is meaningful for all key stakeholders, and promotes healing of injured patients and the repair of patient-provider relationships.

The electronic health record (EHR) is becoming an increasingly important part of how patient care delivery data is captured. The implications of changing to electronic, from written, data capture are important to note. Also, most prior studies focus on inpatient adverse events, so considering a strategy for transitions of care and how to integrate outpatient events is critical to getting a 360-degree view of patient safety. In addition, more efficient and reliable approaches have been established for the identification of adverse events, including the use of "triggers," whereby information in a medical record that was previously shown to be associated with adverse events is identified.[1,2]

Generative artificial intelligence (AI) and machine learning have great potential to improve healthcare quality and safety, and their application to healthcare is undergoing rapid growth and innovation. AI could be used to identify unreported adverse events and help with event analysis. AI could also improve diagnostic accuracy and identify early signs of patient decompensation, shifting the adverse event focus to prevention as well as management. This potentially "game-changing" impact could be similar to how safety and quality improvement science from industries like aviation and manufacturing transformed healthcare. Risks and benefits have yet to be fully characterized in this novel field. The World Health Organization has published guidelines on the ethical principles and governance of AI in healthcare, suggesting transparency, careful oversight, and policy development to improve outcomes and reduce inequities.[3] However, early applications like prediction models for sepsis and clinical deterioration and applications for radiology imaging interpretation have had mixed results and have been adopted more eagerly than data justifies.[4]

In conclusion, establishing a robust Adverse Event Risk Management plan is paramount for healthcare institutions committed to patient safety. Recognizing the limitations of voluntary

reporting, it is imperative to invest in user-friendly reporting systems, foster a blame-free culture, and assemble a multidisciplinary team proficient in interpreting event patterns. Utilizing advanced methodologies like RCA2 enhances the ability to make systemic changes based on findings. Furthermore, involving patients and their families in the event management process adds valuable perspectives and strengthens a delicate relationship. As technology evolves, leveraging electronic data capture in the EHR will widen the lens of patient safety across care transitions. AI may play a key role in adverse event management in the future, but applications have been limited or of mixed results so far. By leveraging electronic and human resources, healthcare organizations can proactively identify and mitigate adverse events, ultimately improving patient outcomes and fostering a culture of continuous improvement.

Key References:

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3. Ethics and governance of artificial intelligence for health. Guidance on large multi-modal models. Geneva: World Health Organization; 2024. License: CC BY-NC-SA 3.0 IGO.

4. Classen DC, Longhurst C, Thomas EJ. Bending the patient safety curve: how much can AI help?. *NPJ Digit Med*. 2023;6(1):2. Published 2023 Jan 4. doi:10.1038/s41746-022-00731-5