1-23-2024

Early Immersion in Team-Based Event Review: Experiential Patient Safety Education for PGY 1 Internal Medicine Residents

Michelle Perkons

Alexis Wickersham
Thomas Jefferson University

Sonia Bharel
Thomas Jefferson University

Timothy Kuchera
Thomas Jefferson University

Rebecca Jaffe
Thomas Jefferson University

MedEdPORTAL® The AAMC Journal of Teaching and Learning Resources

Original Publication

Open Access

Early Immersion in Team-Based Event Review: Experiential Patient Safety Education for PGY 1 Internal Medicine Residents

Michelle Perkons, MD*, Alexis Wickersham, MD, Sonia Bharel, MD, Timothy Kuchera, MD, Rebecca Jaffe, MD

*Corresponding author: michelle.perkons@duke.edu

Abstract

Introduction: In recent years, there has been a national push to incorporate high-fidelity quality improvement and patient safety (QIPS) education into physician training programs. In fact, integration of robust patient safety education became an Accreditation Council for Graduate Medical Education (ACGME) Common Program Requirement for residency programs in 2017. We developed a curriculum to not only fulfill the ACGME's requirement but also provide PGY 1 internal medicine residents with the skills needed to become active participants in ongoing patient safety work throughout their training and careers. **Methods:** Our patient safety curriculum was woven into residents' existing protected educational time and supported by a standardized facilitator guide and participant workbook. It combined didactic prework with the review of recent near-miss or low-harm patient safety events, empowering residents to identify root causes and propose interventions. **Results:** We successfully delivered our patient safety curriculum to 80 PGY 1 residents over the course of 2 academic years. Residents rated the curriculum as a valuable educational experience, and the event reviews they completed met most of the criteria for high-quality patient safety reviews according to the Strong String Assessment. **Discussion:** Implementation of this standardized curriculum has allowed us to reliably and consistently incorporate experiential patient safety education into the first year of training for internal medicine residents. Unlike purely didactic sessions, our curriculum encourages active learning, building muscle memory for event reviews that enables future engagement in patient safety activities.

Keywords

Causal Analysis, Event Review, Root Cause Analysis, Case-Based Learning, Chart Review, Hospital Medicine, Internal Medicine, Interprofessional Education, Online/Distance Learning, Program Evaluation, Quality Improvement/Patient Safety

Educational Objectives

By the end of this activity, learners will be able to work in interprofessional teams to:

1. Describe the chronology of a safety event using a cause-and-effect diagram.
2. Perform a root cause analysis establishing connection between causes, effects, and events.
3. Write causal statements that adhere to the five rules of causation.
4. Propose potential action plans with a range of intervention strengths and methods.
5. Deliver a structured presentation of findings to an institutional quality or safety committee.

Citation:

Perkons M, Wickersham A, Bharel S, Kuchera T, Jaffe R. Early immersion in team-based event review: experiential patient safety education for PGY 1 internal medicine residents. *MedEdPORTAL*. 2024;20:11376. https://doi.org/10.15766/mep_2374-8265.11376

Introduction

Despite the 2017 Accreditation Council for Graduate Medical Education (ACGME) updates to the Common Program Requirements mandating that residents participate in interprofessional patient safety activities, the 2021 ACGME Clinical Learning Environment Review (CLER) report outlined widespread gaps in patient safety education.[1-3] In a nationwide sample, physician trainees demonstrated poor understanding of the scope of reportable patient safety events, did not appreciate the importance of reporting low-harm or near-miss events, and were not aware of the ways that reporting such events could lead to improvements in systems of care delivery. Beyond that, the number of trainees who participated in event review was limited, with only 41% of interviewed PGY 3 residents reporting event review experience during their training.[2] This pervasive educational quality gap is concerning, especially given that effective resident quality improvement and patient safety (QIPS) education has the potential to foster development of future QIPS leaders and improve institutional safety outcomes.[4,5]

To accelerate change, the ACGME launched the Pursuing Excellence Initiative: Pathway Leaders Patient Safety Collaborative (PEI PSC) with the goal of developing, implementing, and evaluating new ways to integrate patient safety education into physician training programs.[6] PEI PSC utilized the framework for new clinician engagement in patient safety developed by the National Collaborative for Improving the Clinical Learning Environment (NCICLE), involving four domains: Align With Safety Culture, Recognize and Report, Participate and Analyze, and Translate and Act.[7] With the postulation that early experience in the Participate and Analyze domain would fuel future investment in the safety process as a whole, the shared aim of PEI PSC was that "all new clinicians participate in a systematic interprofessional analysis of a real, recent safety event during their first year in graduate medical training."[6] Our institution participated in the second cohort of the PEI PSC, which involved a needs assessment, mentored curriculum design, and progressive implementation across residency programs in various specialties.

Here, we report on the implementation of our patient safety curriculum in Thomas Jefferson University Hospital's internal medicine residency program. Our goal was to develop and execute a standardized curriculum accomplishing PEI PSC's stated aim that would be sustainable with existing resources, be acceptable to learners, and result in high-quality systematic event analyses according to the Strong String Assessment, the standard used by the ACGME to assess learner-derived event reviews.[6,8-10] To accomplish this, we needed to integrate the learning experience into our program's existing clinical and educational schedule, standardize the approach to case selection and review, and align our curriculum with our institution's safety event review process.

We reviewed existing and published patient safety programming as part of our curricular development. Many curricula use online modules to teach key concepts, though this type of didactic-only education does not always translate to real-world implementation of principles.[11-13] To address this, some other curricula employ active learning by including interactive simulated cases in their modules.[14-16] Yet other programs conduct patient safety education by fostering resident involvement in morbidity, mortality, and improvement case conferences[17-19] or departmental peer review committees.[20,21] These educational methods are certainly valuable components of patient safety education; however, they are not sufficient in addressing the deficiencies outlined in the 2021 CLER report given that they typically do not emphasize the importance of reviewing low-harm or near-miss events and do not necessarily engage all residents in event review processes.[2] They additionally are not sufficient in fulfilling the goals of the PEI PSC given that they do not describe active participation in event review for PGY 1 learners.[6]

To improve patient safety engagement and education at our institution, bridge the gaps identified in the 2021 CLER report, and achieve the aims of the PEI PSC, we identified several key components of successful patient safety education that had not yet, to our knowledge, been combined in a single curriculum. First, our residents would perform independent reviews—they would not duplicate the work done by departmental peer reviews or institutional patient safety committees but rather report their findings to those committees, thus increasing authenticity and learner investment. Next, our curriculum would focus on first-year clinician learners (PGY 1 residents) so that they could utilize the concepts learned throughout their training to advance both their education and our institutional culture of safety. Additionally, to maintain an environment of psychological safety despite the sensitive nature of the event review process and to demonstrate the importance of reporting and analyzing a variety of events, the cases reviewed would all be near-miss or low-harm events. Finally, it was important that our curriculum include multidisciplinary interprofessional perspectives to help expand the residents' knowledge of patient safety concepts outside the physician viewpoint. This aspect was especially crucial given the rich experience of the nursing profession in the realm of QIPS.[22] We developed a curriculum based on the above and have iteratively improved it over the past 2 years using feedback from participants, educators, and institutional patient safety leadership.

Methods

Setting

This curriculum was designed and delivered in the internal medicine residency program at Thomas Jefferson University Hospital in Philadelphia, Pennsylvania, an urban academic medical center. Our PGY 1 internal medicine class consisted of 37 residents in 2020 and 43 residents in 2021. Our residents were supported in their QIPS education by an associate program director specializing in QIPS as well as one or two of the four chief residents designated as QIPS chief residents. All residents in our program were scheduled for clinical rotations on a 4+2 basis, whereby following every 4 weeks of core inpatient rotations they had 2 weeks of ambulatory or elective time. During these 2-week ambulatory blocks, they had 3 hours of protected educational time each Friday, which we identified as the opportune time to deliver this curriculum.

Development

A working group with expertise in QIPS and curriculum development, including our hospital patient safety manager, associate designated institutional official for quality and safety education, internal medicine associate program director, internal medicine chief resident for QIPS, and senior associate vice dean for graduate medical education, participated in the ACGME PEI PSC. Benefits of the PEI PSC included access to national expert faculty and a peer learning community that shared experience and insight into the design of similar curricula nationwide. The working group developed the curriculum in an iterative fashion beginning in September 2019.

Materials

We developed standardized curricular materials to serve as a scaffolding to the learning experience and ensure reproducibility. These materials included designated prework in the form of an online module (Appendix A), an electronic event review workbook (Appendix B), and a detailed guide to assist faculty facilitators with session structure and time management (Appendix C). All review materials were stored in a secure online drive approved for storage of protected health information and accessible to all team members.

Personnel

Given the size of our residency program and competing clinical, educational, and administrative demands, it was clear that involving every PGY 1 in an event review could only be achieved in a group format. We established six groups of learners per academic year aligning with our 4+2 schedule blocks, as described below. Each group was mentored by a physician faculty facilitator; we selected facilitators based on interest and experience in QIPS and medical education, and facilitation was linked to annual division incentives to motivate and reward involvement. Each group was also joined by at least one interprofessional team member from pharmacy, nursing, nutrition, or other allied health professions based on the specific case to be discussed. Recruitment of these members relied on existing relationships with interprofessional managers, such as unit nurse managers, who were invested in learner engagement in the safety process.

Implementation

With support from residency program leadership, we scheduled the curriculum to take place over a given 2-week ambulatory block. Three hours over 2 weeks were protected for group work, with several days of ambulatory time available before the first session for independent prework, which was estimated to take approximately 30 minutes, and 1 week between sessions for independent intersession work, which was estimated to take approximately 1 hour (Figure). Group work time occurred in a virtual videoconference or in-person setting, depending on COVID-19-related institutional restrictions on gathering at the time. The schedule allowed all groups to complete the curriculum over a 12-week period.

We selected a case for each group's review from cases referred to the Hospital Medicine Patient Safety Committee or reported through our institution's online event reporting system. All cases constituted near-miss or low-harm events that had occurred on our inpatient hospital medicine services within 45 days preceding the start of the review.

Prior to the start of each 2-week curricular block, we emailed the group (residents, faculty facilitator, and multidisciplinary team members) with expectations for their participation in the curriculum. This email included information guiding access to the secure online drive containing the review materials, the medical record number and a brief description of the case they would review, and the prework online module providing background on core patient safety concepts (Appendix A). Residents were expected to complete this prework prior to their first scheduled group session, but completion was not tracked. The online module remained available as a reference for just-in-time learning, so that participants could check specific definitions, methods, and tasks as questions arose during their reviews.

During the first session (1 hour in duration), each group of residents met with their faculty facilitator and interprofessional team member(s). Under the guidance of the faculty facilitator (Appendix C, page 2), the team collaborated in the electronic event review workbook (Appendix B, slides 1-7) to document the steps leading to the assigned near-miss or low-harm adverse event. They discussed potential contributing causes and identified gaps in their understanding of the event that would need to be clarified via in-depth chart review or stakeholder interviews. To conclude the session, the faculty facilitator delegated stakeholder interviews and chart review tasks to group members to be completed as intersession work.

Using nonclinical time during the following week (intersession work), members of the team each carried out different components of a multisource review, incorporating stakeholder interviews, chart review, and analysis of literature, guidelines, or hospital policy, as appropriate. During the second group session (2 hours), the residents again met with their faculty facilitator and interprofessional team. With facilitator guidance (Appendix C,

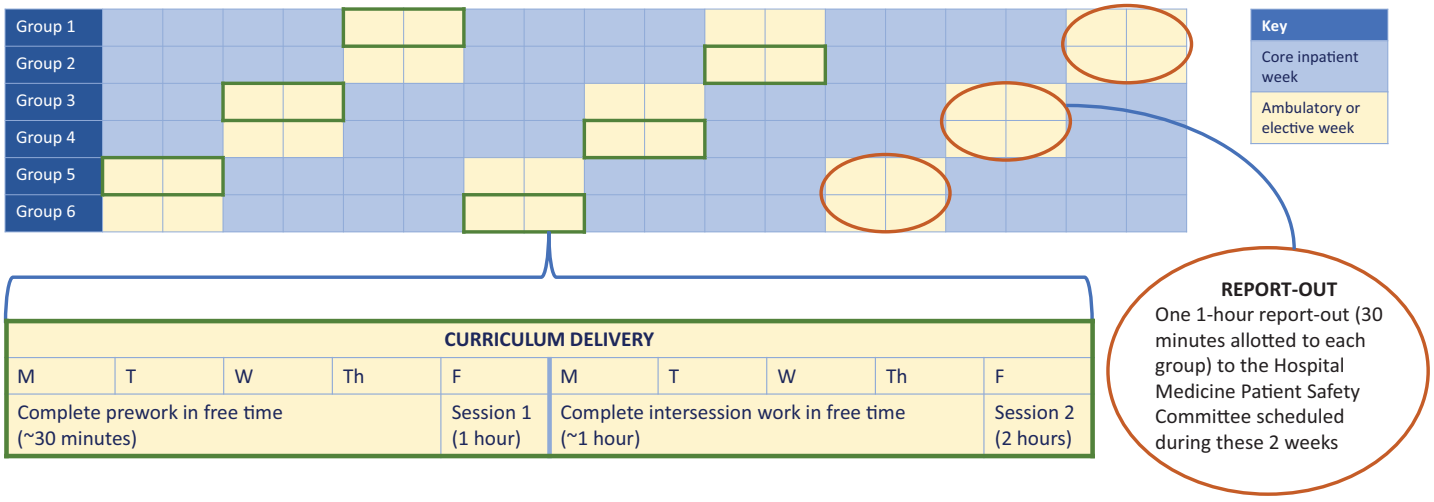

Figure. Schedule for curriculum delivery and report-out sessions.

page 3), the group finalized the timeline of the event and created a flow diagram in the event review workbook (Appendix B, slides 8-12) using information gathered from the intersession multisource review. Residents then pooled the information obtained from chart review and stakeholder interviews with their existing knowledge of the case to identify contributing causes to the event in the form of causal statements. To conclude the meeting, the group developed proposed action plans of varying modalities and strengths based on their causal statements.

Following their review, each group presented a structured summary of their investigation and proposed action plans to the Hospital Medicine Patient Safety Committee (Appendix B, slides 8 and 10-12). Thirty minutes were allocated to each group, allowing all six groups to present over the course of three meetings. The Hospital Medicine Patient Safety Committee then took on responsibility for implementing or escalating aspects of the suggested action plans and later followed up with each group to inform them of changes implemented based on their event reviews.

Assessment and Evaluation

We followed Moore's seven levels of continuing medical education outcomes in early evaluation of our curriculum, specifically focusing on level 1, participation; level 2, satisfaction; and level 5, performance.[23] We tracked learner attendance with the aim that all PGY 1 internal medicine residents would complete the entire learning experience. Additionally, each resident who participated in the curriculum completed a survey to assess satisfaction with various key elements of the educational experience (Appendix D). Finally, to measure the performance of each team in generating high-quality event reviews and to assess successful achievement of the educational objectives, a third-party safety expert evaluated each group's review using the Strong String Assessment (Appendix E), a standardized tool used by the ACGME for safety event reviews that considered the timeliness of the review, fidelity of the causal analysis, involvement of an interprofessional team, strength of proposed interventions, and handoff of action items to the organization.[6,8-10]

Results

At the time of writing, all 80 eligible PGY 1 residents in two subsequent cohorts of our internal medicine residency program have completed our patient safety curriculum, supported by eight faculty facilitators and 16 multidisciplinary team members in 12 separate event review groups.

The survey-based assessment of learner satisfaction (Table) illustrates that learners felt the patient safety curriculum was manageable in terms of workload, the curricular materials supported their review process, and the curriculum was a valuable learning experience overall. Notably, resident participants indicated that the curriculum provided an environment of psychological safety, and they responded most positively with regard to the involvement of interprofessional team members being a key part of the process.

In terms of the quality of the event reviews that were completed, the average Strong String Assessment score for the 12 reviews performed over our first 2 years of the curriculum was 9.4 out of a possible 10 points, with a range of 8.5 to 10. All 12 groups achieved the maximum possible points in six of the nine Strong

Table. Learner Satisfaction Scores From Postcurriculum Assessment

Statement[a]	*M*	*SD*
The workload required to complete the safety event review was manageable.	3.2	0.5
Review of the online module improved my understanding of basic patient safety concepts.	3.0	0.7
The safety event review workbook provided structure to help me complete the event review efficiently.	3.0	0.6
Involving an interprofessional team member in the event review improved my understanding of a care process at Jefferson.	3.5	0.5
I felt comfortable talking to people involved in the patient safety event about the details of the event.	3.2	0.6
Overall, I believe the safety event review curriculum was a valuable learning experience.	3.1	0.5

[a]Rated on a 4-point scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *agree*, 4 = *strongly agree*).

String Assessment domains. Areas where a perfect score was not achieved for all groups were the number of professional roles participating in the review (nine of 12 teams scored less than maximum for the domain, though all teams included at least one interprofessional team member); inclusion of cause, effect, and event in every causal statement (four of 12 teams scored less than maximum for the domain, though all teams created at least one causal statement that included cause, effect, and event); and adherence to all five rules of causation in every causal statement (one of 12 teams scored less than maximum for the domain, though all teams created at least one causal statement that adhered to all five rules of causation).

Discussion

Over the first 2 years of the curriculum, all 80 eligible first-year internal medicine residents completed systematic interprofessional reviews of actual recent near-miss or low-harm safety events. On average, learners were satisfied with the process, felt that the workload was manageable, viewed the educational infrastructure as having supported their learning, reported benefits from interprofessional involvement, and expressed that the review environment was psychologically safe. The 12 reviews performed via our process met most of the criteria for high-quality safety reviews as defined by the Strong String Assessment. Thus, the curriculum met our goals for participation, satisfaction, and performance.

Resident evaluations of our curriculum emphasize the importance of interprofessional collaboration throughout the learning experience. To quote one resident's comments in the survey, "The safety event review curriculum was fabulous. I think any additional involvement of other members of the interprofessional team would be a benefit." Another resident noted that the interdisciplinary team's importance "came out when our nursing colleagues were able to provide insights about how things really work behind the scenes. We learned more about the hospital—things we can't see in our day to day." To achieve maximal credit for interprofessional involvement on the Strong String Assessment, one more interprofessional role could have been added to several of our groups. The addition of more roles might enhance the event review experience and would be an opportunity for further growth in our curriculum, but our experience to date demonstrates that the addition of even a single nonphysician professional to the review team can have a profound impact on learners.

This curriculum is generalizable to large core residency programs in either a virtual or in-person setting and can be adapted to smaller programs by modifying group size and ratios. Successful completion of this learning experience in other environments will depend on many external factors, including institutional safety culture, organizational approach to risk management, levels of burnout/engagement, and integration between residency and patient safety processes. Our residency program has a few specific advantages that facilitated the success of this curriculum, but these could be addressed for effective implementation elsewhere. We operate on a 4+2 schedule, which provides built-in protected educational time for patient safety education in a sequence to allow for the natural cadence of a review. Programs that do not operate on a similar cyclical schedule would need to ensure that their residents have sufficient protected educational time to hold comprehensive meetings with facilitators and multidisciplinary team members as well as time for completion of work between sessions; this is feasible, as evidenced by the successful implementation of a version of this curriculum in the pathology residency program at our institution.[24] Additionally, we are fortunate to have multiple dedicated faculty mentors with both interest and expertise in QIPS. Residency programs earlier in the process of QIPS education implementation would first need to concentrate on faculty development to ensure an optimal learning experience.

Over the course of our curricular development, we made several key changes in response to feedback. In addition to formal survey-based evaluations, we also collected feedback about the curriculum in separate debrief sessions with the faculty facilitators, a small cohort of participating PGY 1 residents, and interprofessional team members and their managers, all with the goal of continuous curricular improvement. Using the plus/delta

format for small-group feedback, we solicited strengths of our curriculum and potential areas for change, which guided iterative change between years. In the first year of our curriculum, each weekly session was only 1 hour in duration, which faculty and residents did not feel was sufficient time to complete the event review workbook. In response, we expanded the second session to 2 hours in the second year of implementation, which improved time management, as reported by all team members in debrief sessions. Next, we adjusted the timeline of the report-out at the Hospital Medicine Patient Safety Committee meetings based on first-year feedback that the meetings were too remote from the time of the review and/or conflicted with residents' clinical schedule. In the second year of the curriculum, we scheduled all report-out meetings during the next ambulatory block following the 2-week curriculum to minimize these issues. Finally, in the second year of the curriculum, we added PGY 2 peer facilitators to some groups in addition to the faculty facilitators. As residents who had completed the curriculum the year prior and wanted to continue engaging with patient safety education, peer facilitators added a level of relatability and provided senior residents with an outlet to continue engagement with patient safety activities after completing the curriculum. PGY 2 engagement did occasionally come with challenges, such as faculty facilitators needing to simultaneously manage multiple levels of learners.

We continue to evaluate this curriculum in multiple ways. We evaluated Moore's levels 1, 2, and 5, though we did not directly assess the learning and competence of individual participants (levels 3 and 4).[23] We are thus able to state that the curriculum is satisfactory to learners and reliably produces high-quality team reviews that meet our educational objectives. Ongoing evaluation will focus on individual learning and behavior change resulting from the curriculum, including downstream impacts such as event reporting rates. We also continue to improve the integration of the curriculum with institutional safety infrastructure. Specifically, we are exploring including hospital safety managers in the final report-out, integrating reviews into unit-based leadership structures to grow interprofessional involvement, and archiving causal statements and action plans with our patient safety office for future follow-up. Finally, we are leading an effort to disseminate this curriculum across graduate medical education training programs at our institution, which is providing us an opportunity to learn more about the numerous ways it might be modified to fit the structure and resources of varied programs.

We suggest that groups planning to implement a curriculum similar to ours consider how they might provide exposure to all four key NCICLE domains to ensure a comprehensive educational experience. Ideal implementation of this type of curriculum relies on some prior experience in the Align With Safety Culture and Recognize and Report domains, as well as future education in the Translate and Act domain later in training.[7] Long-term investment in patient safety by physicians is crucial and comprises workplace culture as well as a variety of curricula focused on knowledge, skills, and practice; while this curriculum does not address all these aspects, it introduces early postgraduate learners to patient safety event reviews and produces high-quality event reviews, offering structure for a key component of the lifelong QIPS learning experience.

Appendices

A. Safety Event Review Prework.docx

B. Safety Event Review Workbook.pptx

C. Facilitator Guide.docx

D. Curriculum Evaluation.docx

E. Strong String Assessment.docx

All appendices are peer reviewed as integral parts of the Original Publication.

Michelle Perkons, MD: Assistant Professor, Department of Medicine, Duke University School of Medicine; ORCID: https://orcid.org/0000-0002-3041-4736

Alexis Wickersham, MD: Clinical Associate Professor, Department of Medicine, Thomas Jefferson University Hospitals; ORCID: https://orcid.org/0000-0001-9981-2700

Sonia Bharel, MD: Clinical Assistant Professor, Department of Medicine, Thomas Jefferson University Hospitals; ORCID: https://orcid.org/0000-0002-1649-0951

Timothy Kuchera, MD: Clinical Assistant Professor, Department of Medicine, Thomas Jefferson University Hospitals

Rebecca Jaffe, MD: Associate Professor, Department of Medicine, Thomas Jefferson University Hospitals

Disclosures
None to report.

Funding/Support
None to report.

Ethical Approval
Reported as not applicable.

References

1. *ACGME Common Program Requirements Section VI With Background and Intent*. Accreditation Council for Graduate Medical Education; 2017. Accessed December 8, 2023. https://www.acgme.org/globalassets/PFAssets/ProgramRequirements/CPRs_Section-VI_with-Background-and Intent_2017-01.pdf
2. Koh NJ, Wagner R, Newton RC, et al; CLER Evaluation Committee; CLER Program. *CLER National Report of Findings 2021*. Accreditation Council for Graduate Medical Education; 2021. Accessed December 8, 2023. https://www.acgme.org/globalassets/pdfs/cler/2021clernationalreportoffindings.pdf
3. Summary of proposed changes to ACGME Common Program Requirements Section VI. Accreditation Council for Graduate Medical Education. Accessed December 8, 2023. https://www.acgme.org/programs-and-institutions/programs/common-program-requirements/summary-of-proposed-changes-to-acgme-common-program-requirements-section-vi/
4. Parente V, Feeney C, Page L, et al. Sustained impact of a pediatric resident-led patient safety council. *J Patient Saf*. 2021;17(8):e1346-e1351. https://doi.org/10.1097/PTS.0000000000000495
5. Wong BM, Etchells EE, Kuper A, Levinson W, Shojania KG. Teaching quality improvement and patient safety to trainees: a systematic review. *Acad Med*. 2010;85(9):1425-1439. https://doi.org/10.1097/ACM.0b013e3181e2d0c6
6. Passiment M, Wagner R, Weiss KB; Pursuing Excellence in Clinical Learning Environments: Pathway Leaders Patient Safety Collaborative. *ACGME Summary Report: The Pursuing Excellence Pathway Leaders Patient Safety Collaborative*. Accreditation Council for Graduate Medical Education; 2020. Accessed December 8, 2023. https://www.acgme.org/globalassets/pdfs/peisummary1patientsafety.pdf
7. Disch J, Kilo CM, Passiment M, Wagner R, Weiss KB; National Collaborative for Improving the Clinical Learning Environment. *The Role of Clinical Learning Environments in Preparing New Clinicians to Engage in Patient Safety*. National Collaborative for Improving the Clinical Learning Environment; 2017. Accessed December 8, 2023. https://storage.googleapis.com/wzukusers/user-27661272/documents/59d51146c6d86WpcPxps/NCICLE%20Preparing%20New%20Clinicians%20to%20Engage%20in%20Patient%20Safety%202017.pdf
8. Bagian JP, Gosbee J, Lee CZ, Williams L, McKnight SD, Mannos DM. The Veterans Affairs root cause analysis system in action. *Jt Comm J Qual Improv.* 2002;28(10):531-545. https://doi.org/10.1016/S1070-3241(02)28057-8
9. Bagian JP, King BJ, Mills PD, McKnight SD. Improving RCA performance: the Cornerstone Award and the power of positive reinforcement. *BMJ Qual Saf*. 2011;20(11):974-982. https://doi.org/10.1136/bmjqs.2010.049585
10. Bagian JP, Lee C, Gosbee J, et al. Developing and deploying a patient safety program in a large health care delivery system: you can't fix what you don't know about. *Jt Comm J Qual Improv*. 2001;27(10):522-532. https://doi.org/10.1016/S1070-3241(01)27046-1
11. Peterson G, Bramhall J. Patient safety training: National Patient Safety Goals and CMS hospital quality. *MedEdPORTAL*. 2013;9:9560. https://doi.org/10.15766/mep_2374-8265.9560
12. Stewart D, Lye C, Lopez M, Mothner B, Camp E, Vachani J. Engaging learners through modules in quality improvement and patient safety. *MedEdPORTAL*. 2016;12:10482. https://doi.org/10.15766/mep_2374-8265.10482
13. Szymusiak J, Fox MD, Polak C, et al. An inpatient patient safety curriculum for pediatric residents. *MedEdPORTAL*. 2018;14:10705. https://doi.org/10.15766/mep_2374-8265.10705
14. Cumbler E, Glasheen J. Teaching patient safety via a structured review of medical errors: a novel approach to educating residents about medical error, disclosure, and malpractice. *MedEdPORTAL*. 2007;3:761. https://doi.org/10.15766/mep_2374-8265.761
15. Forstater A, Levinson M, Bellot J, Hess M, Spandorfer J. Patient safety symposium: issues, analyses, prevention. *MedEdPORTAL*. 2013;9:9637. https://doi.org/10.15766/mep_2374-8265.9637
16. Goolsarran N. Patient safety education curriculum for medicine residents. *MedEdPORTAL*. 2015;11:10208. https://doi.org/10.15766/mep_2374-8265.10208
17. Chen A, Wolpaw BJ, Vande Vusse LK, et al. Creating a framework to integrate residency program and medical center approaches to quality improvement and patient safety training. *Acad Med.* 2021;96(1):75-82. https://doi.org/10.1097/ACM.0000000000003725
18. Garcia C, Goolsarran N. Learning from errors: curriculum guide for the morbidity and mortality conference with a focus on patient safety concepts. *MedEdPORTAL*. 2016;12:10462. https://doi.org/10.15766/mep_2374-8265.10462
19. Werner JA. An integrated, multimodal resident curriculum in patient safety and quality improvement. *MedEdPORTAL*. 2017;13:10641. https://doi.org/10.15766/mep_2374-8265.10641
20. Allen-Dicker J, Markoff B, Nguyen VT, Radbill B, Shah B. Engaging and educating resident physicians in patient safety and peer review. *MedEdPORTAL*. 2016;12:10401. https://doi.org/10.15766/mep_2374-8265.10401
21. Carbo AR, Goodman EB, Totte C, et al. Resident case review at the departmental level: a win-win scenario. *Am J Med.* 2016;129(4):448-452. https://doi.org/10.1016/j.amjmed.2015.12.003
22. Vaismoradi M, Tella S, Logan PA, Khakurel J, Vizcaya-Moreno F. Nurses' adherence to patient safety principles: a systematic review. *Int J Environ Res Public Health.* 2020;17(6):2028. https://doi.org/10.3390/ijerph17062028

23. Moore DE Jr, Green JS, Gallis HA. Achieving desired results and improved outcomes: integrating planning and assessment throughout learning activities. *J Contin Educ Health Prof.* 2009;29(1):1-15. https://doi.org/10.1002/chp.20001

24. Tucker CM, Jaffe R, Goldberg A. Supporting a culture of patient safety: resident-led patient safety event reviews in a pathology residency training program. *Acad Pathol*. 2023;10(1):100069. https://doi.org/10.1016/j.acpath.2023.100069

Received: October 23, 2022
Accepted: October 23, 2023
Published: January 23, 2024