KootenaiHealth

Teaching and Role Development

SE10EOa: Mock Codes Improve Percentage of In-Hospital Cardiac Arrests Ending in Patient Return of Spontaneous Circulation (ROSC)

Using the required empirical outcomes (EO) presentation format, provide an example of an improved patient outcome associated with the needs assessment and a related implementation plan at the ambulatory care setting, or inpatient unit, or division level. A copy of the needs assessment must be attached.

Problem:

In-hospital cardiac arrest (IHCA) is a high-risk, time-sensitive clinical event where survival hinges on immediate and well-coordinated action. National guidelines stress the importance of timely CPR initiation (within 1 minute), early defibrillation (within 2 minutes when indicated), and prompt rhythm identification to improve chances of Return of Spontaneous Circulation (ROSC) and survival to discharge (Anderson et al., 2021). At Kootenai Health (KH), these benchmarks are tracked through the Code Blue Committee, a multidisciplinary team that meets monthly to review IHCA performance and opportunities for improvement. Through these meetings, the team identified that staff delays in IHCA situations contributed to a lower than desired rate of these events ending in ROSC.

Pre-Intervention:

December 2023

In 2023, the committee identified opportunities for improvement in code blue performance in the adult acute care setting. A review of calendar year 2023 IHCA data from the Medical-Surgical, Progressive Care (PCU), and Critical Care Units revealed a rolling 12-month ROSC rate of 63.6%, which was below the internal performance target. Data also showed inconsistencies in key process indicators, including:

- Delays in starting the first chest compression
- Delays in administering the first shock (when indicated)
- Delays in identifying the cardiac rhythm

These delays were most pronounced in units without frequent exposure to IHCAs, such as medical-surgical and PCU units, where staff may go extended periods without a code event. Anecdotal evidence from post-code debriefs and voluntary simulation events highlighted widespread discomfort and lack of confidence among nurses not routinely involved in resuscitation, especially regarding:

- Activating a code

- Operating the code cart and defibrillator
- Communicating effectively during a high-stress, emergent event
- Recognizing cardiac arrest and initiating CPR

Needs Assessment Process:

In alignment with evidence-based quality improvement methodology, the Code Blue Committee initiated a structured needs assessment using a triangulated approach:

1. Data Analysis: Review of IHCA outcome metrics and process indicators (time to CPR, defibrillation, and rhythm identification).
2. Stakeholder Input: Post-event debriefs and written feedback from clinical staff participating in voluntary simulation center code drills.
3. Direct Observation and Requests: Reports from unit managers, physician partners (Drs. Menard and Hoopman), and PRRN educators citing consistent staff requests for more frequent, realistic code training.

The committee identified that the existing organizational approach to BLS training (biennial renewal) was insufficient for maintaining practical readiness. Although Kootenai Health offered simulation-based code blue training on a voluntary basis, only 26 RNs participated in 10 sessions in 2022. While increased to 12 sessions in 2023, this format remained optional and disconnected from unit-based operational workflows. The conclusion: a lack of structured, frequent, and contextual practice in real clinical environments was contributing to performance variability and compromised staff readiness, especially in low-frequency, high-acuity situations.

Action Plan Formation:

In response to the needs assessment findings, J.T., BSN, RN, PCCN, Manager of 3 South and the Monitor Studio, reached out to K.J., BSN, RN, CCRN, and J.H., BSN, CCRN, Preceptor Resource Nurses, to work with their leadership team to develop a formal intervention proposal and implementation plan. The plan was submitted in January 2024 by:

- S.O., MS, BSN, RN, NE-BC – Manager, Preceptor Resource Nurse Team
- R.G. MSN, NPD-BC – Manager, Nursing Education Specialists
- K.P., DNP, RN, NPD-BC – Manager, Simulation Center

The goal of the project was to improve the rolling 12-month ROSC rate by increasing the confidence and proficiency of nursing staff in BLS/code blue response through unit-based mock code drills, designed to simulate real-time IHCA events in the staff's actual clinical environment.

The action plan was based on published literature supporting in-situ simulation and ongoing, context-specific training for acute resuscitation performance (Goldshtein et al., 2020; Northrop et al., 2024).

Key Components of the Action Plan:

- Baseline Assessment: Pre-intervention surveys to assess nursing staff confidence levels in initiating and participating in code blue scenarios.
- Simulation Strategy: Conduct unannounced, unit-based mock code scenarios with real teams, equipment, and workflows.
- Debrief and Just-in-Time Education: Immediate facilitated debrief and feedback sessions to reinforce learning, clarify roles, and correct misconceptions.
- Post-Intervention Surveys: Follow-up confidence assessments to measure perceived improvement.
- Sustainability Plan: Implement monthly unit-based mock codes across inpatient and procedural areas with tracking of participation and outcome metrics.

This proposal was approved by the Code Blue Committee on January 30, 2024, and implementation began the following month.

Goal:

To increase the rolling 12-month average of INCA events resulting in ROSC by enhancing staff confidence and proficiency in performing BLS during Code Blue events.

Participants:

Code Blue Committee, Nursing Education Specialist Manager, Simulation Center Manager, Nursing Preceptor Resource Nurse Manager, nursing department leadership. Preceptor Resource Nurses. Code Bue Committee members include direct care nurses.

Intervention:

January – March 2024

The intervention carried out was to perform mock codes on the patient care units with the on-shift nurses, CNA, and unit clerks, starting with the Progressive Care Unit.

Timeline:

On January 30th, 2024, the Mock Code Blue Project form was approved for implementation, starting in the Progressive Care Unit. The plan for the project entailed the education team, consisting of the Preceptor Resource Nurse (PRRN) team conducting surveys to assess staff confidence in code situations both before and after on unit mock codes. The mock code scenarios would be carried out at unplanned intervals on the units and be followed by a de-brief and educational session with participants.

In mid-February the project launched in the progressive care unit on both shifts. Implementation of the project in the medical surgical units followed closely and by the end of March 2024, all five medical-surgical units, and the progressive care unit had implemented mock code drills on all shifts with the PRRN team running the drills and education.

On April 10th, S.O., MS, BSN, RN, NE-BC presented current project outcomes to the Code Blue Committee. Feedback from the code drills had been positive, and staff pre and post drill surveys indicated improvements in staff level of confidence in code events. The PRRN team will proceed with rolling out mock codes to Critical Care staff in April. Meanwhile, additional work was in process with procedural areas with different teams.

The Code Blue Committee continues to meet quarterly to review metrics and discuss ways to improve clinical staff performance at IHCA events, as well as how to further drill into the data to focus on identified demographics, such as patients with stroke and sepsis. The PRRN team provides mock code drills and education on the inpatient units monthly and has expanded the program to include code drills in procedural areas such as interventional radiology and the specialty procedural areas.

How the Intervention Impacted the Outcome:

By providing mock code drills on the units, staff were able to practice these lifesaving skills, in their units with their own equipment more frequently. This practice has helped to improve staff confidence in identifying and responding to in hospital cardiac arrest events as reflected in mock code evaluations. The increase in confidence is also reflected in improvements in IHCA metrics such as time to CPR and defibrillation. Ultimately, this increase in confidence has correlated with an improvement in the frequency of IHCA ending in ROSC, or improved survival for KH patients.

Outcome and Impact

The effectiveness of the intervention was evaluated through both quantitative metrics and qualitative staff feedback.

Quantitative Outcome: Improvement in ROSC:

The organization's benchmark for improvement was an increase in the rolling 12-month percentage of IHCAs ending in ROSC.

Month	ROSC % (Rolling 12-Month)
Dec 2023 (Baseline)	63.6%
May 2024	66.2%
Jun 2024	66.2%
Jul 2024	63.2%
Aug 2024	64.6%
Sep 2024	65.7%
Oct 2024	65.3%
Nov 2024	66.2%
Dec 2024	66.2%

This represents a sustained 2.6 percentage point increase from the pre-intervention baseline, with fluctuations likely related to patient acuity variation, but with overall improvement in ROSC rates throughout the year.

Qualitative Outcome: Improved Staff Confidence:

- Staff pre- and post-drill surveys showed statistically significant improvements in self-reported confidence across all domains: CPR initiation, rhythm identification, code team communication, and defibrillator use.
- Verbal feedback during debriefs indicated greater comfort assuming leadership roles, initiating code calls, and navigating the code cart.

Conclusion and Magnet Alignment:

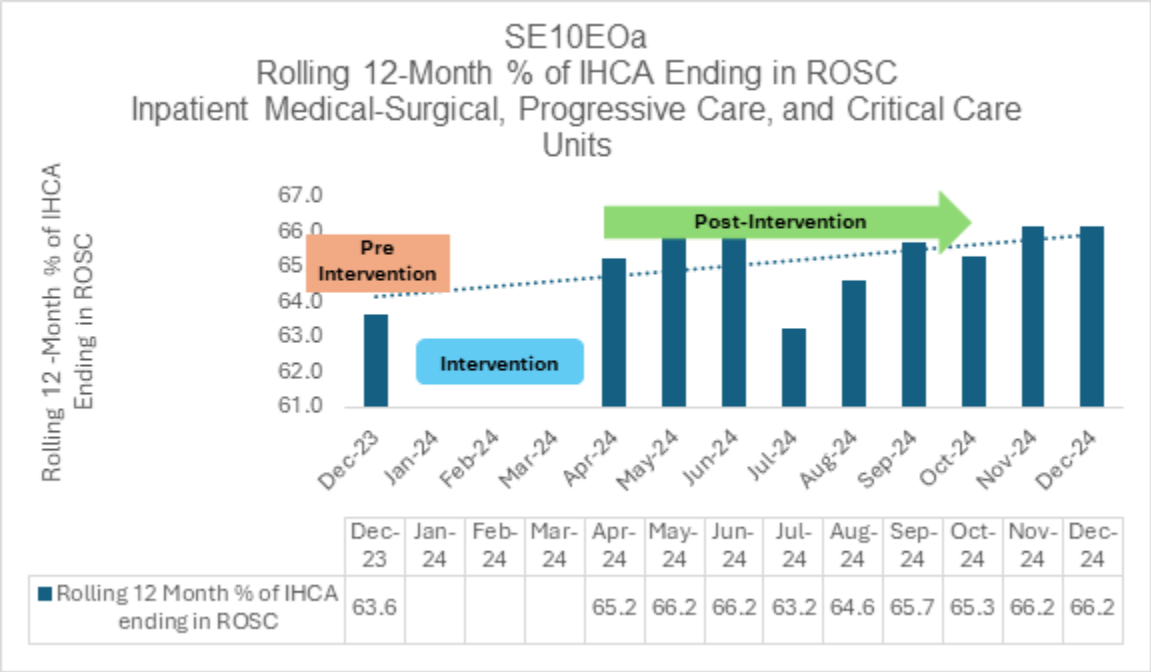
The Mock Code Blue project at Kootenai Health is an example of a high-impact, interdisciplinary initiative resulting from a formal needs assessment and structured action plan. By creating a system for routine, unit-based resuscitation practice, the organization improved nursing staff readiness and contributed to improved patient outcomes, specifically ROSC following IHCA.

This initiative aligns with Magnet principles by:

- Empowering clinical nurses to participate in and lead performance improvement
- Using evidence-based educational strategies to address care gaps
- Achieving measurable improvements in patient outcomes
- Fostering interdisciplinary collaboration across nursing, respiratory therapy, pharmacy, medicine, and simulation education

The project continues to evolve, with plans underway to expand to procedural and ambulatory care areas.

Evidence:
SE10EOa-1 Needs Assessment
SE10EOa-2 Action Plan
SE10EOa-3 Outcome Graph



	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24
Rolling 12 Month % of IHCA ending in ROSC	63.6				65.2	66.2	66.2	63.2	64.6	65.7	65.3	66.2	66.2

References:

Anderson, T. M., Secrest, K., Krein, S. L., Schildhouse, R., Guetterman, T. C., Harrod, M., ... & Nallamothu, B. K. (2021). Best practices for education and training of resuscitation teams for in-hospital cardiac arrest. Circulation: Cardiovascular Quality and Outcomes, 14(2), e008587.

Goldshtein, D., Krensky, C., Doshi, S., & Perelman, V.(2020). In situ simulation and its effects on patient outcomes: a systemic review. BMJ Simulation Technology Enhanced Learning, 6 (1): 3-9. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8936935/#

Northrop, D., Decker, V., & Woody, A. (2024). Responding to In-hospital Cardiac Arrests During Times of System-wide Strain: A Code Refresher Training. *The Journal of Continuing Education in Nursing*, *55*(9), 442–448. https://doi.org/10.3928/00220124-20240617-03 (Original work published September 1, 2024)