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IMPROVEMENT BRIEF

Impact of a Daily Huddle on Safety in Perioperative Services

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Background: Communication failures contribute to quality gaps and may lead to serious safety events (SSEs) in the operating room (OR). Our perioperative services team experienced an increased rate of SSEs in 2020. Event analysis revealed clustered causes: communication failures and lack of timely information to prepare for cases. Consequently, the team implemented a daily morning OR safety huddle conducted before bringing patients into the OR to reduce quality gaps and improve communication.

Methods: The attending surgeon and anesthesiologist, circulating nurse, and scrub staff are required to be present. Cases are discussed using a standard format designed by the OR team with built-in time for questions and clarifications. The surgeon initiates the huddle; the circulating nurse leads and records the discussion. OR leadership initially performed daily audits but gradually reduced them when huddles became standard operating procedure (SOP). SSEs were recorded from December 2015 to September 2020 preintervention and October 2020 to July 2023 postintervention.

Results: Following the implementation of huddles, there were no SSEs for more than 900 days (2.0 SSEs/year preintervention vs. 0.0 SSEs/year postintervention). The first SSE during the postintervention period occurred in March 2023. Huddle compliance was consistently > 95%. No delays were observed in first-case on-time starts postintervention. The huddle is now SOP for all general OR teams and interventional radiology.

Conclusion: Implementing the morning safety huddle contributed to a reduction in the rate of SSEs without introducing delays to first-case start-times.

Communication failures in perioperative services are pervasive, contributing to quality gaps. Previous studies demonstrated that communication failures lead to significant negative impacts on patient safety, surgical outcomes, and health care costs, which can manifest as infections, prolonged hospital stays, wrong-site procedures, inadequate case preparation, and even preventable deaths.[1,2] Safety checklists, teamwork, and effective communication are essential to ensuring surgical safety, improving outcomes, and promoting proactive error mitigation.

Prominent bodies and experts such as the World Health Organization, The Joint Commission, and Dr. Atul Gawande have underscored the importance of checklists and robust communication strategies in promoting surgical safety and demonstrated decreased morbidity and mortality for surgical patients.[3–5] These guidelines have been widely adopted and have shown a profound impact in reducing surgical errors and enhancing patient safety, but some studies have shown that the adoption of checklists alone is not always sufficient in reducing complications and mortality due to limited relevance and poor implementation and adherence.[6–8] Consequently, operating room (OR) huddles have emerged as a vital tool to complement checklists and improve communication, serving as structured forums where team members can articulate concerns, clarify case details, enhance preparation for complex cases, and collaboratively strategize to reduce errors.[9–11]

Our perioperative services experienced an increased rate of serious safety events (SSEs) in 2020, coinciding with the COVID-19 pandemic, with the last two in that year occurring within 30 days (Supplementary Table 1, available in online article). The SSEs were related to inaccuracies in consent forms, absent supplies and equipment, and OR process errors. Event analyses suggested clustered causes: communication failures and lack of timely information to assist with case and procedure preparation. Communication across all team members and shared understanding of the plan leading to readiness for the day was a challenge for OR nurses, surgical technologists, anesthesiologists, and surgeons—each working in separate cognitive, operational, and physical space silos. Even with the use of electronic case scheduling, opportunities for improved communication and preparation for all cases were present.

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Consequently, we implemented a mandatory daily morning OR huddle in which all OR team members (surgeons, anesthesiologists, nurses, and surgical techs) meet in person to discuss all cases for the day for 20 minutes prior to starting the first surgical case. Our huddle initiative aimed to reduce the incidence of SSEs from 2 to 0 per year by enhancing team communication and psychological safety, reducing errors, improving case preparation and efficiency, and mitigating quality gaps within perioperative services.

METHODS

We implemented the safety huddle in a tertiary/quarternary care academic children's hospital system. Perioperative care consists of 17 ORs, including hybrid rooms; 3 procedure rooms; more than 70 pediatric specialty surgeons; 58 anesthesiologists; 70 staff of nurses and technologists; and more than 10,000 operations performed per year during the study period. To enhance patient safety, the daily safety huddle was implemented in all general surgical specialties and interventional radiology services.

The safety huddle was instituted in October 2020 for each operating and procedure room and was held at the beginning of the day with support from the OR nurse director, chief medical officer, chief operating officer, medical director of Perioperative Services, and chief of surgery (OR leadership). This was important as faculty and staff buy-in is essential in attaining high compliance and maximizing the safety huddle benefits.[12–14] The huddle mandated the presence of the primary surgeon, anesthesiologist, circulating nurse, and scrub person assigned to the OR; trainee presence was optional but encouraged. The attending surgeon initiated the huddle, and the circulating nurse recorded notes on the surgical, anesthetic, or procedural needs for each patient. Cases were thoroughly discussed using a standard checklist format designed by the OR team, with built-in time for questions or concerns (Figure 1). The initial safety huddle checklist's items included specimen harvest and planning, consent, anesthetic needs, imaging, equipment, positioning, postoperative destination, and COVID-19 status. It has now evolved to include fire safety.

The physical presence of the OR leadership during huddles was used to demonstrate the importance and potential impact of the new process. To foster buy-in at the onset, OR leadership initially performed daily audits to evaluate compliance and huddle performance. Nurses and other OR staff were empowered to speak up and actively participate in enforcing the safety huddle, ensuring surgeon and anesthesiologist timely attendance and proper implementation. Surgeons who did not attend or arrived late were contacted via e-mail and reminded of their required presence at 7:10 A.M. to prevent delays in first-case on-time starts. They were also informed that the OR team cannot bring a patient back to the OR without holding a full in-person safety huddle. If there was a change in primary surgeon or an add-on or urgent case, the team was required to repeat the safety huddle with the new surgeon prior to proceeding. Multiservice procedures required the presence of the primary surgeon and encouraged the presence of other participating attending surgeons.

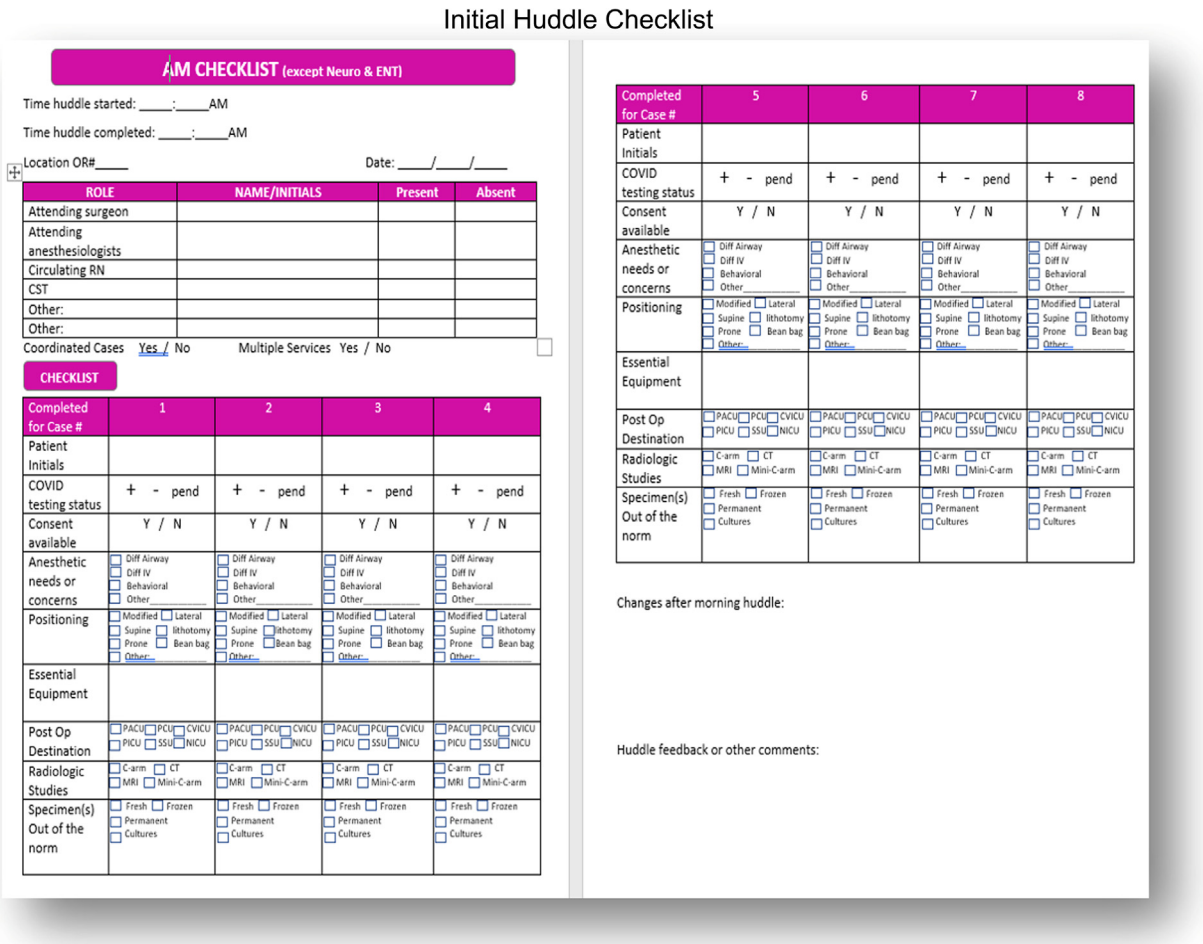
Over a three-month gradual rollout period, the huddle process became standard operating procedure (SOP), and ongoing daily audits were discontinued. Monitoring compliance with the huddle process was continued through random spot-checking, and performance was presented monthly to each subspecialty chair. The first case is expected to enter the room at 7:30 A.M., and the surgical team meets in the OR for the huddle at 7:10 A.M., allowing for ample time to avoid delaying first-case on-time starts. Data on first-case on-time starts (defined as + 5 minutes) were collected and tracked using the Tableau data visualization software.[15,16] Subspecialty chairs wrote e-mail notes to surgeons or proceduralists who were late for the huddle, delaying the first-case on-time start. The notes were tracked daily and outlined the background and importance of the surgical huddle process and how their behaviors delayed the first-case on-time start. In the early phases of the project, these reminders were sent nearly twice per month, but over the past 12 months, they were sent less than once per month due to high compliance.

This protocol is consistent with Jain et al.'s published study on daily preoperative huddle quality improvement in orthopedic ORs and its impact on interruptions, delays, and surgeon satisfaction in orthopedic ORs.[6] We compared the rate of SSEs preintervention (December 2015 to September 2020) and postintervention (October 2020 to July 2023) using descriptive statistics and statistical process control t-chart.[17,18] The SSEs were recorded using the RL Solutions Healthcare Risk Management Software,[19] and the type of SSE was determined according to the patient safety level of harm and serious safety event classification (Supplementary Table 2).[20] Statistical analysis was conducted using the QI Macros Software.[21]

This study was reviewed and approved by the Institutional Review Board and did not require oversight, as it was considered a quality improvement project. The manuscript was written following the Standards for Quality Improvement Reporting Excellence (SQUIRE) 2.0 guidelines.[22]

RESULTS

Following the institution of the safety huddle, we had no SSEs for 908 days (2.0 SSEs per year preintervention) (Figure 2). We experienced our first SSE postintervention in March 2023. Compliance was consistently > 95% throughout the safety huddle's gradual rollout (Supplementary Table 3). We observed comparable compliance between high-SSE services, otolaryngology and neurosurgery, and all other general surgical services and interventional radiology. As OR staff found value in the huddle and were encouraged


Initial Huddle Checklist

AM CHECKLIST (except Neuro & ENT)

Time huddle started: ____:____AM

Time huddle completed: ____:____AM

Location OR#____ Date: ____/____/____

ROLE	NAME/INITIALS	Present	Absent
Attending surgeon			
Attending anesthesiologists			
Circulating RN			
CST			
Other:			
Other:			

Coordinated Cases Yes / No Multiple Services Yes / No

CHECKLIST

Completed for Case #	1	2	3	4
Patient Initials				
COVID testing status	+ - pend	+ - pend	+ - pend	+ - pend
Consent available	Y / N	Y / N	Y / N	Y / N
Anesthetic needs or concerns	Diff Airway, Diff IV, Behavioral, Other	Diff Airway, Diff IV, Behavioral, Other	Diff Airway, Diff IV, Behavioral, Other	Diff Airway, Diff IV, Behavioral, Other
Positioning	Modified, Lateral, Supine, lithotomy, Prone, Bean bag, Other	Modified, Lateral, Supine, lithotomy, Prone, Bean bag, Other	Modified, Lateral, Supine, lithotomy, Prone, Bean bag, Other	Modified, Lateral, Supine, lithotomy, Prone, Bean bag, Other
Essential Equipment				
Post Op Destination	PACU, PCU, CVICU, PICU, SSU, NICU	PACU, PCU, CVICU, PICU, SSU, NICU	PACU, PCU, CVICU, PICU, SSU, NICU	PACU, PCU, CVICU, PICU, SSU, NICU
Radiologic Studies	C-arm, CT, MRI, Mini-C-arm	C-arm, CT, MRI, Mini-C-arm	C-arm, CT, MRI, Mini-C-arm	C-arm, CT, MRI, Mini-C-arm
Specimen(s) Out of the norm	Fresh, Frozen, Permanent, Cultures	Fresh, Frozen, Permanent, Cultures	Fresh, Frozen, Permanent, Cultures	Fresh, Frozen, Permanent, Cultures

Completed for Case #	5	6	7	8
Patient Initials				
COVID testing status	+ - pend	+ - pend	+ - pend	+ - pend
Consent available	Y / N	Y / N	Y / N	Y / N
Anesthetic needs or concerns	Diff Airway, Diff IV, Behavioral, Other	Diff Airway, Diff IV, Behavioral, Other	Diff Airway, Diff IV, Behavioral, Other	Diff Airway, Diff IV, Behavioral, Other
Positioning	Modified, Lateral, Supine, lithotomy, Prone, Bean bag, Other	Modified, Lateral, Supine, lithotomy, Prone, Bean bag, Other	Modified, Lateral, Supine, lithotomy, Prone, Bean bag, Other	Modified, Lateral, Supine, lithotomy, Prone, Bean bag, Other
Essential Equipment				
Post Op Destination	PACU, PCU, CVICU, PICU, SSU, NICU	PACU, PCU, CVICU, PICU, SSU, NICU	PACU, PCU, CVICU, PICU, SSU, NICU	PACU, PCU, CVICU, PICU, SSU, NICU
Radiologic Studies	C-arm, CT, MRI, Mini-C-arm	C-arm, CT, MRI, Mini-C-arm	C-arm, CT, MRI, Mini-C-arm	C-arm, CT, MRI, Mini-C-arm
Specimen(s) Out of the norm	Fresh, Frozen, Permanent, Cultures	Fresh, Frozen, Permanent, Cultures	Fresh, Frozen, Permanent, Cultures	Fresh, Frozen, Permanent, Cultures

Changes after morning huddle:

Huddle feedback or other comments:

Figure 1: Shown here is the initial huddle script and recording form. The checklist has since evolved to include fire safety.

to actively participate, it was rapidly adopted as SOP for all general OR teams and interventional radiology.

As a countermeasure, we assessed the impact of the safety huddle on delays. First-case on-time start performance did not worsen (Figure 3).

DISCUSSION

Communication gaps in protocols can lead to SSEs in perioperative services, jeopardizing patient safety. Checklists have been instrumental in reducing errors, but poor adherence and implementation, automated use, and limited relevance increase the risk of SSEs.[8,23,24] Implementing a safety huddle is one solution that contributes to reducing SSEs.[6] After implementing our safety huddle, we had no SSEs for more than 900 days. Real-time feedback from OR staff, surgeons, and anesthesiologists at the launch of the huddle process and throughout the rollout period for two months, and formal feedback from surgical and procedural specialty leaders, indicated that the safety huddle enhanced communication among faculty and staff and improved readiness, engagement, and psychological safety, providing time and space to timely ask questions and raise concerns, such as the inclusion of fire safety on the safety huddle checklist. This effect is consistent with other studies that showed safety huddle benefits, including improved information sharing, accountability and empowerment, and a sense of community and collaboration, which are all essential for preventing SSEs.[9,25,26]

Overall, the success of the safety huddle was achieved by ensuring that its protocol comprehensively addressed communication gaps that may have existed in checklists and universal protocols. Previous studies have demonstrated that such gaps may be due to patient care involving multidisciplinary teams providing care at different times of the day or locations, and often with varying priorities.[27,28] To fill these gaps, we built a universal protocol covering the entire pre, intraoperative, and postoperative patient flow and possible communication gaps (Supplementary Figure 1). This universal protocol contains question checkpoints from the morning safety huddle stage to case sign-out. These checkpoints ensure that everyone stops and actively participates, curbing checklist automation and SSE risks.

Our universal protocol has been effective in reducing SSEs, but some studies have suggested that adding to checklists may present barriers to the efficiency of workflows.[29,30] Some barriers cited include taking too much time, particularly during emergencies; duplicating safety

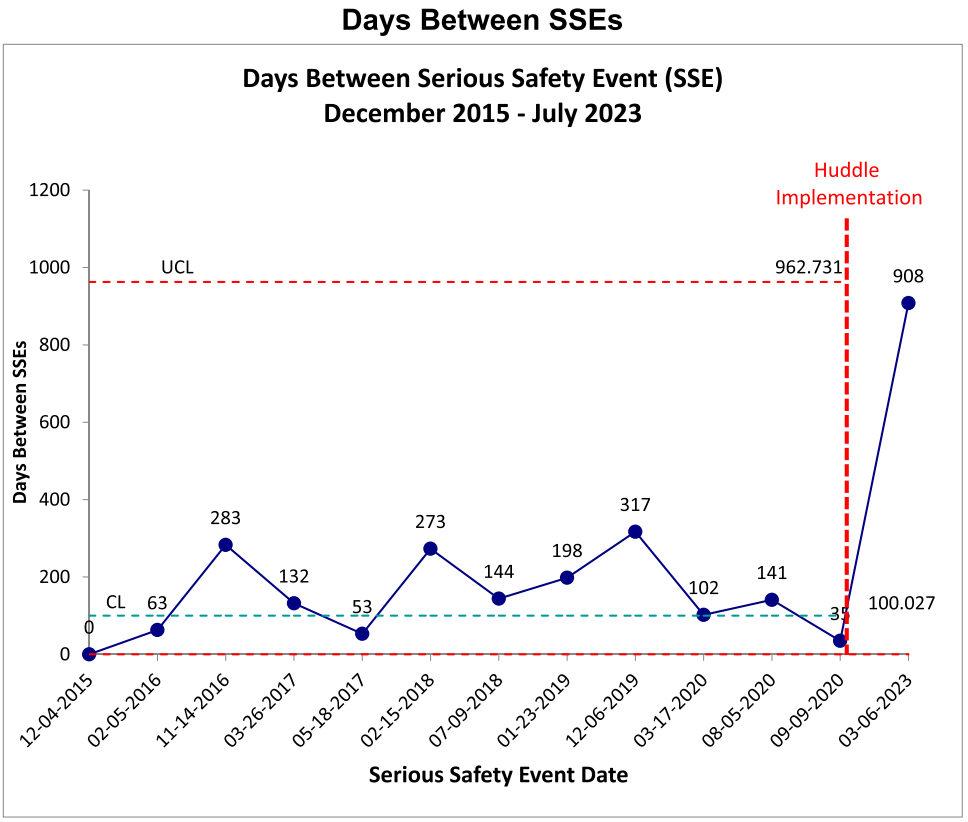


Figure 2: This t-chart describes the impact of the huddle following its implementation. The effect continued for nearly three years before we had another huddle-preventable SSE. UCL, upper control limit; CL, center line.

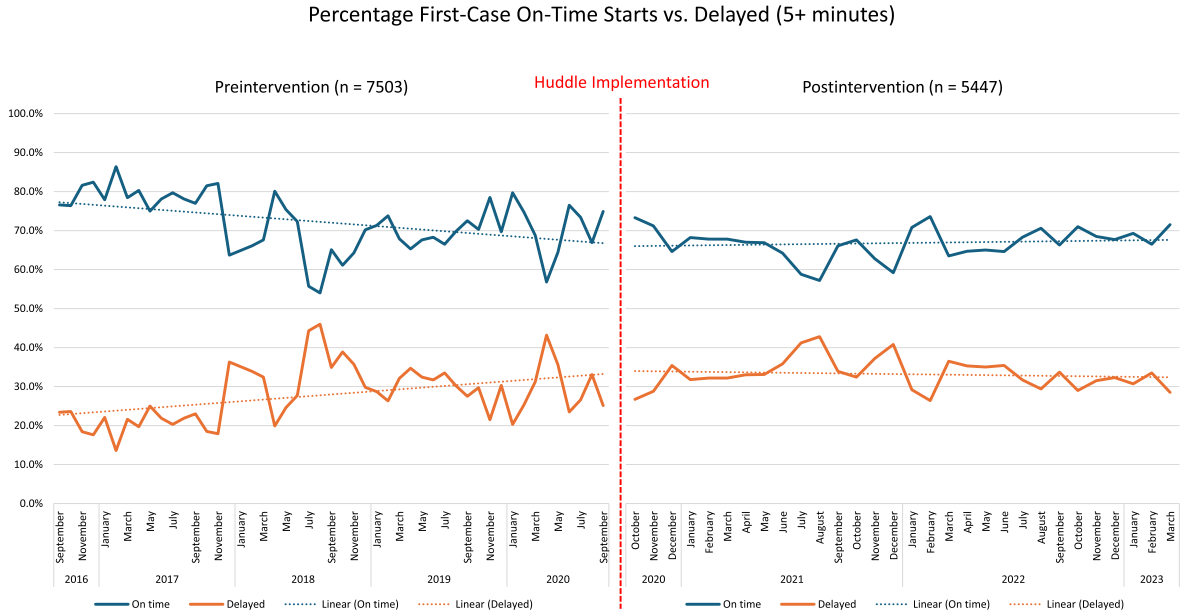


Figure 3: This graph shows the percentage of first-case on-time starts compared to delayed cases (+ 5 minutes).

procedures; routine disruption due to attending or staff turnover; and checklist fatigue.[30–33] Our comprehensive protocol addresses these barriers, and we believe that the morning safety huddle optimizes case preparation early in the day and prepares the OR team to perform more efficiently, thus improving OR performance. For example, ensuring that all team members meet at least 20 minutes prior to bringing the first patient to the OR for a pro-

cedure reduces the likelihood of unplanned events, such as missing equipment or tools, special needs, or other unanticipated factors that can delay cases or prolong OR times. Our counterbalance measure showed no increase in first-case delays after launching the huddle process. This experience highlights our belief that the huddle process can support and enhance OR efficiency with first-case on-time starts, as the entire OR team is better prepared for the cases of the day. We also believe that this A.M. huddle will help decrease OR case turnaround times, as the OR team is better prepared for the rest of the cases during the day, by reviewing a checklist for all cases on the schedule.

Though the safety huddle may contribute to reducing SSEs, it is important to recognize that it may not prevent all SSEs. For example, SSEs preintervention resulted largely from process and communication errors, while the SSE following the huddle implementation was due to a medication dosing error. Assessing local setting needs and expanding the list of items discussed during the safety huddle may reduce the risk of SSEs. In addition, integrating multiple checkpoints into the universal protocol is vital to creating opportunities to reset, ask questions, and assess events that may increase the likelihood of SSEs outside of the safety huddle time.

Limitations

Limitations of this safety huddle project include its implementation at a single tertiary hospital, which may have a tailored universal protocol that is not representative of other institutions. However, as multiple studies showed, safety huddles reduce the rate of SSEs and improve staff readiness, engagement, and trust in various settings, including orthopedic, cardiac, emergency, trauma, and COVID-19 services.[6,9,10,34] Our findings, consistent with previous studies, indicate that the benefits of the safety huddle are reproducible in other settings. In addition, the study period overlapped with the COVID-19 pandemic; this may have affected the number of cases and protocols. Notably, we observed an increased rate of SSEs in 2020 (3 SSEs), prior to the implementation of the safety huddle, and a subsequent reduction postintervention. Compliance was monitored via random spot-checking, through which some incidences of improper huddle implementation may have been missed. Granted, the huddle has become SOP, and OR and procedure teams have embraced it. Finally, other factors may have been associated with the impact of the huddle but out of control of OR teams or the huddle protocol itself. It is essential for other organizations to continually assess hospital policies, protocols, and other external factors and monitor their impact on the huddle and ultimately the safety of patients.

Future directions may include using electronic huddle formats days to weeks before a procedure to improve case preparation and communication, particularly for more complex cases or those that require coordination with critical care units or multiple surgical services. These electronic huddle formats will complement the in-person morning huddles. In addition, implementing and assessing the impact of safety huddles at the end of the day to debrief about cases and lessons learned could be beneficial. Finally, quantifying associated cost and time saved may provide deeper insights for future huddle implementation.

CONCLUSION

We implemented a structured morning OR team safety huddle in response to an increased rate of SSEs at our hospital. We observed no SSEs for more than 900 days following the implementation of the huddle, and the single SSE since the huddle was instituted was secondary to a dosing error, not an error in communication. Implementation of the huddle did not result in a decrease in first-case on-time starts. Understanding the impact of safety huddles in other specialties, implementing them at the end of the day, and quantifying benefits such as exact time and cost saved may provide opportunities to scale up to other settings in the future.

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Conflicts of Interest. All authors report no conflicts of interest.

SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jcjq.2024.04.012.

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