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Initiative to Increase the Rate of Emergency Department Physician Preprocedure Time-out Documentation

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Abstract

Introduction: The preprocedure time-out is an important safety measure to verify patient identity and accuracy of a planned procedure. The time-out is an institutional and Joint Commission requirement. However, physicians in our emergency departments (EDs) document it inconsistently. We aimed to improve physician preprocedure time-out documentation for deep sedation (ketamine and/or propofol) from 75% to 90%, and separately for cutaneous abscess incision and drainage (I&D) from 94% to 98% by June 2020. **Methods:** We analyzed 1 year of baseline data and weekly electronic medical record (EMR) reports from November 2019 through June 2020. Our outcome measures were the rate of physician time-out documentation for deep sedation and I&D, respectively; our process measure was physician engagement. Our interventions included education, monthly reminders and updates, individualized feedback for insufficient documentation, EMR deep sedation, and I&D procedure note optimization, and academic and financial incentives. We used statistical process control chart quality improvement rules for discerning special versus common cause variation. **Results:** Physician documentation of a preprocedure time-out improved from 75% to 100% for deep sedation and from 94% to 99.3% for I&D. These improvements remained sustained. All physicians were eligible for the financial bonus, and 40 (63%) met Maintenance of Certification credit requirements. **Conclusions:** Using quality improvement methodology, we increased physician time-out documentation for deep sedation and I&D through education, feedback, and systems enhancement. We improved Joint Commission regulatory compliance and reduced potential harm through these safety checks. Future studies may quantify patient safety effects and examine the efficacy of similar interventions for other procedures. *(Pediatr Qual Saf 2021;6:e471; doi: 10.1097/pq9.0000000000000471; Published online September 24, 2021.)*

INTRODUCTION

Problem Description

The preprocedure time-out is one element of The Joint Commission (TJC) Universal

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Protocol, a National Patient Safety Goal,[1] which serves as a restatement of a patient's planned surgical site and procedure.[2] Our institution's standards manual, which reflects TJC requirements relating to patient care, recommends a time-out performance before invasive procedures or those performed under sedation/anesthesia to reduce serious safety event risk. It does not specifically state who must document the time-out in the electronic medical record (EMR), though physicians in our emergency departments (ED) document it inconsistently.

Frequent performance of invasive procedures in the ED[3] reinforces the importance of a time-out in this setting. Deep sedation, and cutaneous abscess incision and drainage (I&D), are two relatively high-risk procedures performed in our EDs.

Available Knowledge

The requirement for Universal Protocol adherence by TJC accredited hospitals, EDs, and ambulatory healthcare settings began in July 2004 to improve patient safety during operating room procedures.[4] In 2016, TJC reported 104 of 824 sentinel events involved the wrong patient, site, or procedure, the second most common category of reported events for that year.[5] Over 11 years from 2005 to 2016, 1,281 reported sentinel events

involved the wrong patient, site, or procedure, though it is unclear whether a time-out would have prevented these events.[6] Of note, reporting sentinel events to TJC is voluntary and may only represent a small proportion of actual events.[5]

ED patients are often awake or alert before and during procedures and frequently have apparent external pathology such as an abscess.[4] Therefore, the likelihood of risk related to the incorrect identification of a patient or site depends on the procedure, patient, and situational factors. We are not aware of literature regarding the performance or documentation of a time-out in children's hospitals. However, in a survey of national ED physician leaders, while 35% reported that an ED time-out was warranted, 13% were unaware of a formal time-out policy. Sixteen (7%) reported episodes of wrong-site error in their EDs, and 63% identified that the use of sedation necessitated a time-out.[7] The authors acknowledge that the error rate and risk would be lower for patients undergoing mild and moderate sedation.

A study by Siegel et al[8] reported on simulation-based improvement in the gap in procedural sedation preparation by senior emergency medicine residents, noting sedation rescue preparation, equipment checks, time-out, and documentation were frequently missed. In addition to the potential for improving patient safety and reducing harm, preprocedure checklists may also increase the quality of multidisciplinary teamwork, team communication, and policy adherence.[9] Potential barriers to a time-out performance include ambivalent compliance, a lack of engagement, and deficient patient safety culture.[10] Engagement in the performance of a time-out may add value in a setting that relies heavily on teamwork and communication, such as the ED.

Rationale
We believe that a time-out can do more than avoid adverse incidents related to the wrong patient, site, or procedure. It may also serve as an opportunity to confirm correct medications, dosages, equipment, and personnel are present and available in the ED, akin to a preprocedure checklist, to improve safety.[4,11] We base this on several anecdotal cases where adequate preparation has mitigated patient risk. We developed this initiative to improve physician documentation rates of a time-out for deep sedation and I&D procedures in our EDs as a proxy marker for performing a time-out.

Common procedures performed under deep sedation in our EDs include fracture reduction and casting, laceration repair, and I&D. We chose I&D as a target procedure because of the significant number of cases, as well as the potential variety of those involved, including but not limited to bedside nurse (RN), ED physician, general surgeon, orthopedic surgeon, and oral maxillofacial surgeon.

Our ED physicians documented a time-out in the EMR for 75% (1,274/1,710) of deep sedations and 94% (468/499) of I&Ds from June 2018 through May 2019.

We believe that improving physician documentation is likely to improve overall awareness and understanding of the time-out's utility and importance.

We gathered information from our key stakeholders, the ED physicians who perform the sedation and RN colleagues, and identified gaps, including: (1) lack of awareness of the importance of a time-out; (2) lack of knowledge of the requirement to perform a time-out; (3) forgetting to include time-out completion in the procedure documentation; and (4) suboptimal procedure documentation system. Therefore, our quality improvement (QI) team designed a key driver diagram (Fig. 1) and implemented interventions aimed toward these barriers.

Specific Aims
We aimed to improve documentation of the time-out in ED physician procedure notes from 75% to 90% for deep sedation and 94% to 98% for I&D between November 2019 through June 2020. We measured these aims separately.

METHODS
Context
We conducted this project at a free-standing, Midwest, academic pediatric hospital system with 2 EDs. One is in an urban, tertiary care, level 1 trauma center with approximately 70,000 visits annually. The other is within a suburban satellite hospital with approximately 45,000 visits annually. Our EMR is a product of Cerner Corporation (Kansas City, Mo.). During the study period, there were 63 physicians in our EDs: 35 pediatric emergency medicine (PEM) trained, 19 general pediatricians, and 9 PEM fellows.

The ED physician performing the procedure obtains verbal, informed consent and typically leads the time-out. For procedures performed by a subspecialist during which the ED physician provides deep sedation, the ED physician leads the time-out. The subspecialist's documentation was considered outside the project's scope. Before deep sedation, the RN documents a presedation checklist containing elements of the time-out in real-time, whereas the physician leads the time-out.

To prioritize patient safety related to invasive procedures and monitoring, we expect 1 physician to provide deep sedation while a separate physician performs the indicated procedure. Each procedure performed by an ED physician has a standalone procedure note separate from other documentation pertaining to the patient's ED visit. Therefore physicians document the time-out in their applicable procedure note after the procedure to minimize diverting attention or effort away from the patient. Thus, in cases where one ED physician provided deep sedation, and a separate ED physician performed I&D, we expected them to each document the time-out in their respective procedure notes.
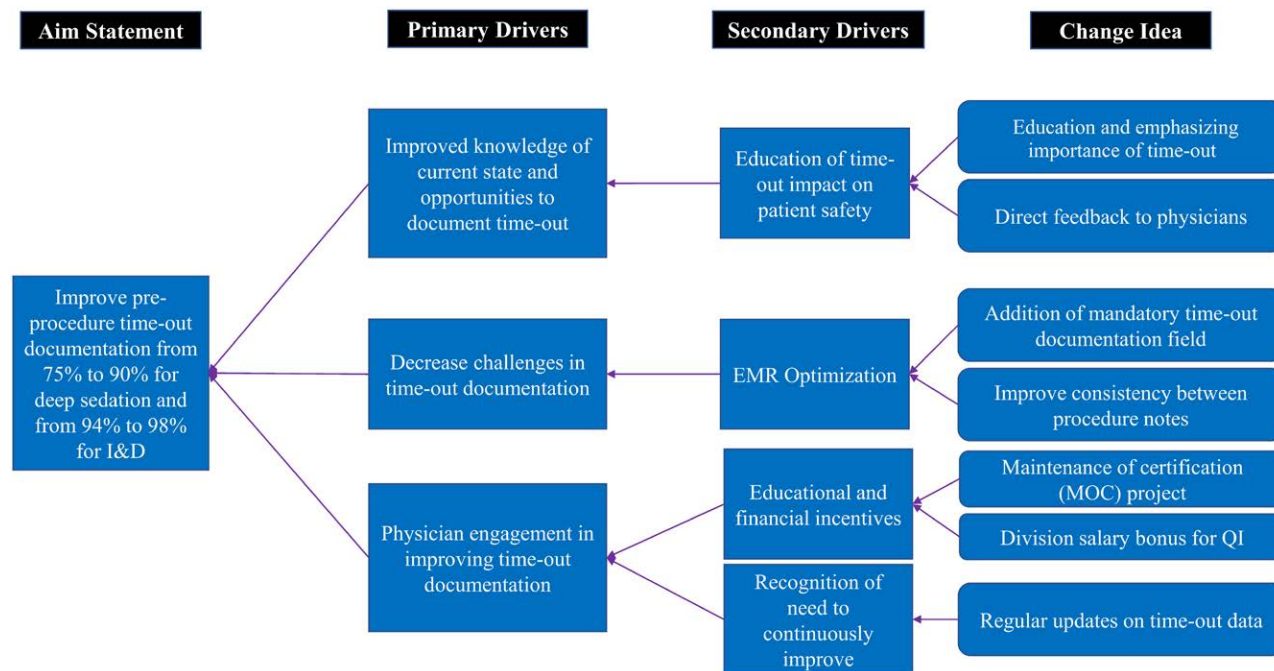
Fig. 1. Time-out documentation key driver diagram.

QI Team
The improvement team consisted of two PEM physicians, a QI consultant, and a medical informatics team (MIT) professional.

Interventions
Physician Education
We performed an in-person educational presentation to the physicians in November 2019, describing the history and importance of the time-out, TJC and hospital-specific regulatory policies, and baseline data from the preceding year. Though time-out documentation only reflects TJC elements (patient, site, and procedure), during this presentation, we emphasized that the time-out presented an opportunity to assess the presence and adequacy of necessary personnel and equipment. We encouraged our physicians to use this time to test equipment for functionality (eg, oxygen and bag-valve-mask) and confirm important patient factors (eg, weight and medication allergies) past the requirements of the time-out. We distributed this information via e-mail for those unable to attend. We chose this as our first intervention to promote awareness while soliciting staff input regarding barriers to the time-out performance or documentation.

Direct Feedback
From November 2019 through June 2020, we analyzed separate, weekly EMR reports of time-out documentation for deep sedation and I&D cases from both EDs. We provided feedback, overall documentation rates, and project updates to the physician group monthly over this period to maintain engagement and awareness. Due to

our hospital's COVID-19 pandemic, social distancing limitations, we provided initial education and 3 monthly updates in-person and via e-mail for those unable to attend. The remaining 5 monthly updates were via e-mail only. We provided personal feedback to the specific physician for every case of insufficient documentation and requested their input on barriers. Our team believes in the importance of culture change alongside process change and emphasized the value of their feedback. Additionally, since the documentation rate for I&D was high at baseline, we envisioned resource-intensive interventions such as manual review and regular e-mails would be necessary for improvement but realized they would not be feasible or automated for long-term use.

EMR Optimization
Based on discussions from the education session and direct feedback on deficient charts, we determined improvements to the deep sedation and I&D procedure notes were necessary to make it easier to remember to document the time-out. We optimized the procedure notes by making the time-out field mandatory in December 2019, meaning it must be completed before the note can be signed, and updated the wording of the field for consistency between the notes.

Incentives
To gather support and motivate participation and performance, we utilized scholarly and financial incentives, namely the American Board of Pediatrics Maintenance of Certification Part IV points and a departmental salary bonus for completed QI work. Annually, our institution offers a bonus for quality and safety work, awarded to

the entire division if everyone meets the proposed target. Our institution's terms for this bonus included measured improvement over a minimum 6-month span. We discussed the intent to utilize these incentives with the physicians at the onset of this project.

Measures

We collected a weekly data report from the EMR of patient encounters with deep sedation performed in our EDs and a separate weekly report for I&D. Since each instance of deep sedation, and each instance of I&D is documented in a separate and independent procedure note, we identified patients by the presence of either procedure note in the EMR.

The rate of physician time-out documentation for deep sedation was our first outcome measure, calculated as the number of ED patient encounters with a time-out documented in the deep sedation procedure note, divided by the total number of ED patient encounters with deep sedation performed. The rate of physician time-out documentation for I&D was our second outcome measure, calculated as the number of ED patient encounters with a time-out documented in the I&D procedure note, divided by the total number of ED patient encounters with I&D performed.

The percent of physicians engaged in the education provided at the commencement of our project and the monthly updates was our process measure, calculated as the number of physicians present at each meeting or who responded acknowledging understanding of an e-mail, divided by the total number of ED physicians.

We monitored and solicited physician feedback on the project, specifically including dislikes and difficulties as our balancing measures.

Study of the Interventions

Our operational definition of deep sedation was the use of ketamine and/or propofol. We obtained and analyzed baseline data from June 2018 through May 2019 via an EMR report provided by our MIT, which revealed physician time-out documentation for 75% of deep sedations and 94% of I&Ds. We chose to study the baseline over 12 months to negate the effects of seasonal volume changes. Once we established the baseline, we initiated interventions beginning with education and soliciting ideas for improvement while sharing the incentives. We studied the interventions using a weekly EMR report of deep sedation and a separate report of I&Ds. One study team member (A.S.) manually reviewed every procedure note deemed deficient for data validation and verification.

By completing this project, we learned our ED physicians are receptive to improvement initiatives, and improvement can remain sustained despite the removal of incentives. Additionally, we learned that various barriers might exist for the desired outcome, and high-reliability interventions such as modifying a documentation template are likely to yield sustainable improvement.

Analysis

We tracked time-out documentation rates for deep sedation and I&D on separate, monthly control charts. We shared this data with the physicians monthly from November 2019 through June 2020 to keep them updated and engaged.

We used Microsoft Excel and QI Macros to develop statistical process control charts to analyze trends and share with the physicians. Established statistical control chart QI rules were a priori agreed upon and used for discerning special versus common cause variation for our control chart. We utilized 7 or more consecutive points on one side of the mean resulting in a shift indicating special cause variation.

Ethical Considerations

Our hospital's institutional review board approved this project.

RESULTS

During the study period spanning November 2019 through June 2020, we averaged approximately 100 deep sedation procedures and 25 I&Ds per month. Physician documentation of a time-out for deep sedation increased from 75% to 100% (Fig. 2), and for I&D, from 94% to 99.3% (Fig. 3). This improvement has remained sustained past the original study period through January 2021.

Physician documentation of a time-out for I&D was below our goal for one month (April 2019), as seen in Figure 3, reflecting one instance of insufficient documentation given the number of procedures. We performed individual feedback and identified that the physician used an incorrect and outdated procedure note template without the mandatory fields. Therefore, we provided additional education.

Our process measure showed an increasing trend in opportunities to provide education and updates regarding our project (Fig. 4). Many physicians voiced appreciation for the interventions, and positive remarks regarding the results, throughout the study. There was no feedback received that the interventions or the project caused any dissatisfaction or distress. An unintended benefit of involvement in this project has been anecdotal improvement in procedural preparation. Although preprocedure time-out documentation does not explicitly include assessing appropriate equipment or staff, physicians reported a sense of improved preparation, especially with regards to equipment. However, this consisted of anecdotes without recorded data.

DISCUSSION

Summary

We used QI methodology to improve physician documentation of a time-out for deep sedation and I&Ds across
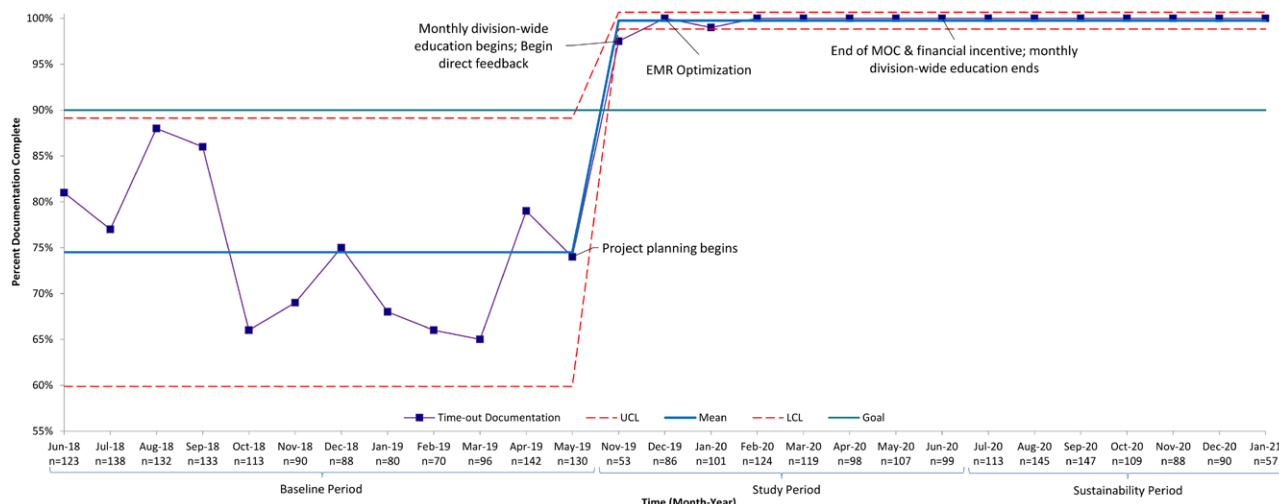
Fig. 2. Physician preprocedure time-out documentation for deep sedation, showing baseline and monthly trend with interventions. MOC, maintenance of certification.
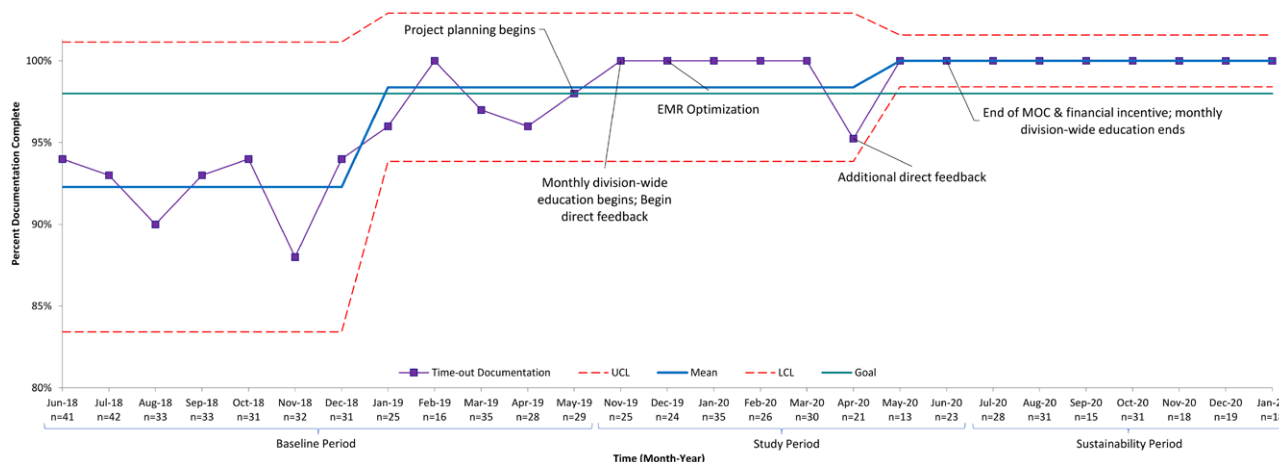

Fig. 3. Physician preprocedure time-out documentation for incision and drainage (I&D), showing baseline and monthly trends with interventions. MOC, maintenance of certification.

both of our EDs. The improvement took place over eight months, and we monitored data for seven additional months showing sustained improvements without additional intervention. Improvements took place through the use of education, feedback, and documentation template optimization. We treated deep sedation and I&Ds as separate entities, even when they were performed simultaneously for the same patient, to ensure both procedures were addressed during the time-out.

Making changes to optimize EMR documentation was a planned, high-reliability intervention that likely ensured sustainability. We made it easier to remember the need for time-out documentation, as this field must now be completed before the note can be signed. Therefore, we believe this improvement will remain sustained despite the retirement of incentives.

The project's specific strengths include the use of incentives, availability of electronic means for monthly

communication amidst the COVID-19 pandemic, and a multifaceted approach to interventions.

Interpretation

The time-out has long been recognized as an essential intervention to reduce procedural errors, and until recently, focused mainly on surgical specialties. Recently, anesthesia, radiology, electrophysiology, and other procedural disciplines have recognized and reported on the importance of a time-out. Studies in emergency medicine reveal a gap that could lead to patient harm. Jeong et al[12] developed a time-out protocol for nurses for procedures outside the operating room. In a study by Kelly et al,[7] most ED leaders reported a time-out was warranted when sedating patients. However, sedation preparation, time-out, and documentation were commonly missed in a study involving senior residents.[8]
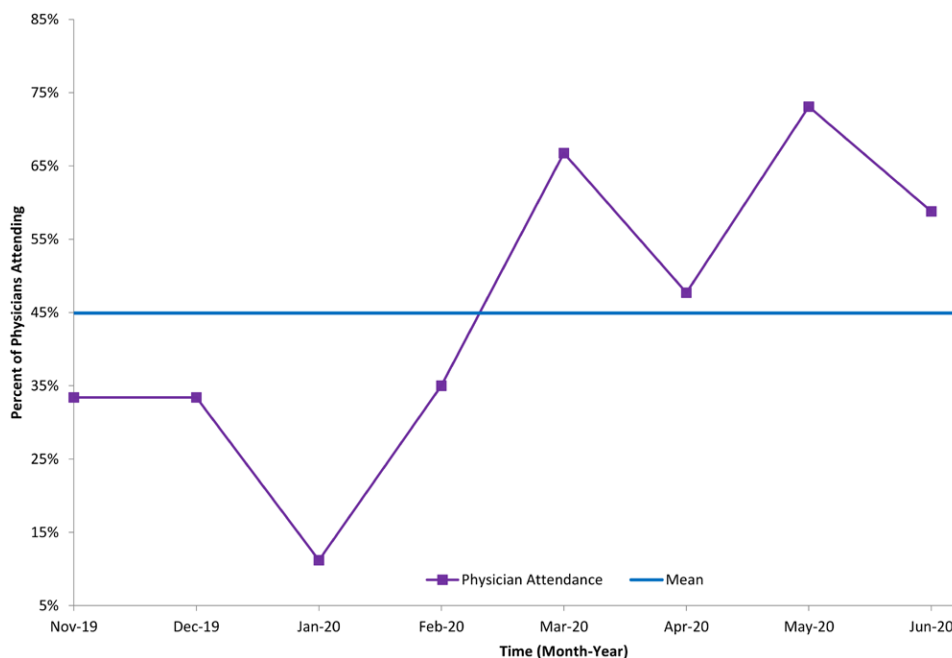
Fig. 4. Physician attendance at monthly project updates, in-person and virtual.

We believe our work offers an approach to improving documentation of this key safety measure and adds to the body of literature supporting the importance of a time-out before high-risk procedures, including sedation. We exceeded our goal for improving the rates of physician time-out documentation for deep sedation and I&Ds. The overall impact of this improvement is a greater focus on patient safety and decreased likelihood of medical error or patient harm during these procedures in our ED. Additionally, we improved compliance with TJC requirements and hospital policy.

Limitations

We recognize this project has several limitations. The baseline incidence of a time-out being performed before deep sedation or I&D may be higher than what was present in the EMR, as documentation deficiencies may have occurred, though we do not have a reliable way to analyze this retrospectively. Additionally, we may have missed instances of deep sedation or I&D in the EDs, though we worked closely with our MIT to refine the EMR reports to the maximal achievable accuracy.

Our measure of physician engagement does not specify which physicians were involved each month or how the group's composition changed over time. We provided approximately one-half of the monthly updates regarding the project via e-mail, given the limitations instituted in response to the COVID-19 pandemic. In-person, group discussion may have produced more robust interventions or critical suggestions.

Documentation of a time-out implies but does not ensure the performance of a time-out. However, we have confidence in our physicians' high standards, as per our hospital's code of ethics. The bedside RN reliably documents a separate, presedation checklist in real-time and in the ED physician's presence, containing the time-out elements. This documentation serves as corroborating evidence that the physician-documented time-out is being performed appropriately. Therefore, we did not actively study these beyond the planning stages.

In the future, we plan to ensure the performance of the time-out through direct observation, though RN documentation may serve as a supporting measure and can be further analyzed.

Although a previous study has described the impact of short-term financial incentives on improvement sustainability,[13] the ability to provide financial incentives and Maintenance of Certification credit, and the reproducibility of our other interventions may also affect generalizability. Though the terms of our academic and financial benefits ended in June 2020, the improvement remained sustained through January 2021.

CONCLUSIONS

A preprocedural summation of essential factors can reduce the likelihood of avoidable patient harm and is practical in a busy ED setting. These key factors include confirmation of the correct patient, site, and procedure and the appropriateness and functionality of procedural equipment and personnel. Consideration should be given to creating and implementing a preprocedure checklist with these relevant safety factors that extend past the scope of the time-out.

A similar framework of interventions may improve time-out documentation for other invasive ED procedures. Additional studies can quantify the change in

errors and complication rates due to improved physician time-out performance and documentation.

DISCLOSURE

ACKNOWLEDGMENTS

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