

# Enhancing Safe Sleep Counseling by Pediatricians through a Quality Improvement Learning Collaborative

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**Background:** Approximately, 3,500 infants die annually from sleep-related infant deaths in the United States. We sought to improve pediatricians' counseling on safe sleep from birth through 6 months of age through a virtual quality improvement learning collaborative (QILC). Our aim was appropriate screening, counseling, and documentation of safe sleep advice in 75% of eligible patient encounters after the QILC. **Methods:** We formed a 9-month QILC for inpatient and outpatient pediatricians. Pediatricians collected data on safe sleep documentation in a newborn discharge or well-child visit note. Data were submitted at baseline and in 9 subsequent phases. Participants met monthly via a webinar, which included a QI presentation, data review, and facilitated discussion among participants. Practices were contacted 12 months after the conclusion of the QILC to assess sustainment. **Results:** Thirty-four pediatricians from 4 inpatient and 9 outpatient practices participated in the QILC. At baseline, documentation of safe sleep practices varied greatly (0%–98%). However, by the end of the QILC, all participating practices were documenting safe sleep guidance in over 75% of patient encounters. Aggregate practice data show a significant, sustained improvement. The 12-month follow-up data were submitted from 62% of practices, with sustainment of improvement in 75% of practices. **Conclusion:** A facilitated, virtual QILC is an effective methodology to improve safe sleep counseling among a diverse group of pediatric practices. It is one step in improving consistent messaging around safe sleep by healthcare providers as pediatricians work to decrease sleep-related infant deaths. (*Pediatr Qual Saf* 2020;4:e327; doi: 10.1097/pq9.0000000000000327; Published online 26 June, 2020.)

## INTRODUCTION

### Problem Description

Approximately, 3,500 infants die each year in the United States due to sudden unexpected infant death (SUID). SUIDs are the most common cause of infant death in the postneonatal period (28 days–12 months of life). Many of these deaths can be prevented through the consistent practice of



safe sleep. After an initial decline in sleep-related infant death in the 1990s with the “Back to Sleep” campaign, the death rate from SUIDs has remained stagnant over the past decades. In 2016, the American Academy of Pediatrics (AAP) updated its recommendations for a safe infant sleeping environment to decrease the risk of sleep-related suffocation, asphyxia, and entrapment, in addition to sudden infant death syndrome (SIDS). These recommendations include placing infants alone, on their back and in their own, firm, flat, and empty sleep surface for every sleep.<sup>1</sup>

### Available Knowledge

Pediatricians are a well-respected source of information for families, and families frequently turn to pediatricians for advice on infant sleep practices and child safety. In the first year of life, infants have at least 7 well-child visits in their medical home, providing multiple contact points for pediatric offices to provide anticipatory guidance on safe sleep.<sup>2</sup> A 2017 study in *Pediatrics* showed that mothers were less likely to place their infant on their belly or side to sleep when they had received advice from a physician consistent with the AAP's recommendations.<sup>3</sup> In a 2019 study, receiving advice from a physician was associated with a 12%–28% increase in prevalence in safe sleep practices; however, mothers reported that they did not receive consistent advice in aspects of safe sleep beyond “back to sleep.”<sup>4</sup> This finding is consistent with prior

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literature showing that families often report that they do not receive comprehensive safe sleep advice from their pediatric provider.<sup>5-7</sup> Also, there are demonstrated gaps in pediatrician knowledge about safe sleep practices.<sup>8</sup>

### **Rationale**

This project sought to enhance discussions about safe sleep practices between pediatric providers and families in a state with a significant rate of SUIDs. Through informal conversations at local pediatric meetings, we found that many pediatricians included safe sleep as another topic in a long list of anticipatory guidance, including feeding habits, car seats, and vaccinations. Rather than having safe sleep as another “box to check,” our goal was to open conversations with families about what their infant’s sleep environment looked like and ensure that pediatricians were advising that babies sleep alone, on their back and in their crib (or another firm, flat, and empty sleeping surface). This advice, which was the minimum safe sleep guidance pediatricians were expected to provide in the project, is known as the “ABCs of safe sleep.”

We chose a virtual quality improvement learning collaborative (QILC) model for this intervention to reach pediatricians throughout a wide geographic area. QILCs have been successful in implementing practice changes in both the outpatient and inpatient pediatric setting, particularly around topics impacting infant care.<sup>9-11</sup> Because both inpatient and outpatient pediatric providers are crucial in providing safe sleep guidance to families, we designed the QILC to include pediatricians practicing in the clinic and the newborn nursery setting. Although SUIDs can occur throughout the first year of life, we chose to focus on encounters for infants less than six months of age, given that the burden of SUIDs deaths occurs between 1 and 4 months of age.<sup>1</sup>

### **SPECIFIC AIMS**

The goal of the project was to screen families for a safe sleep environment and to counsel on the “ABCs of safe sleep” at discharge visits from the newborn nursery and all well-child visits for infants less than 6 months of age. The specific aim was to document appropriate safe sleep screening and guidance in 75% of eligible encounters by 6 months into the learning collaborative with sustainment of practice improvement at the 9-month conclusion of the QILC.

### **METHODS**

#### **Context**

To improve safe sleep counseling by pediatricians, we formed a 9-month QILC using the Institute for Healthcare Improvement’s Breakthrough Series<sup>12</sup> as a model. We created the QILC through a pre-existing physician quality network-based at a children’s hospital. The Institutional Review Board at the university associated with the children’s hospital determined that a formal review of this quality improvement project was not required as no

identifiable patient data were being collected, tracked, or stored.

Pediatricians were recruited for this learning collaborative offering Maintenance of Certification (MOC) Part 4 credit through direct emails, the newsletter of the state chapter of the AAP, and social media postings. Participants registered through a website link. Any physician who cares for infants was eligible to participate, and multiple physicians from the same practice were able to participate. Participants registered their practice as either an inpatient or outpatient practice based on the location where they would be implementing the practice change.

#### **Intervention**

The project leadership team created a key driver diagram (Fig. 1). The QILC was entirely virtual and met via webinars led by the project leader, a pediatrician. A project coordinator managed administrative tasks and data analysis. Monthly hour-long learning collaborative webinars allowed practices to view their progress, share current plan-do-study-act cycles, review safe sleep best practices, and learn about quality improvement topics (Table 1). The learning collaborative commenced with an introductory webinar and baseline data collection in September 2017. Subsequently, monthly webinars and data collection occurred from October 2017 through July 2018. The last webinar was a wrap-up discussion, feedback session, and celebration of success. Pediatricians who submitted all data and participated in 6 out of 9 webinars were eligible for 25 points of American Board of Pediatrics MOC Part 4 Credit.

All practices engaged a multidisciplinary team to plan changes within their site. The practices were able to design their own PDSA cycles and implement changes that the multidisciplinary team identified as critical steps to improving safe sleep counseling and screening in their site. Practices identified different team members to perform safe sleep screening and counseling based on their site workflow. Many clinics utilized the medical assistant or the nurse rooming the patient to conduct the screening. Pediatricians in the inpatient setting verbally screened families for a safe sleep environment during the discharge day visit. Counseling on safe sleep practices was most often performed by the pediatrician seeing the infant in both the inpatient and outpatient settings.

#### **Study of the Intervention**

Participants collected a month of baseline data, followed by 9 monthly phases of data collection. Data were collected for the entire practice, rather than just the pediatricians participating in the QILC. If practices saw more than 40 eligible infants per month, participants were able to select 40 charts to review. There was no standardization of this selection process, although the project leader suggested that they review 10 charts from each week. If practices saw less than 40 eligible patients per month, they were asked to review all eligible encounters’ medical records. One clinic (patient practice 9) was able to build an

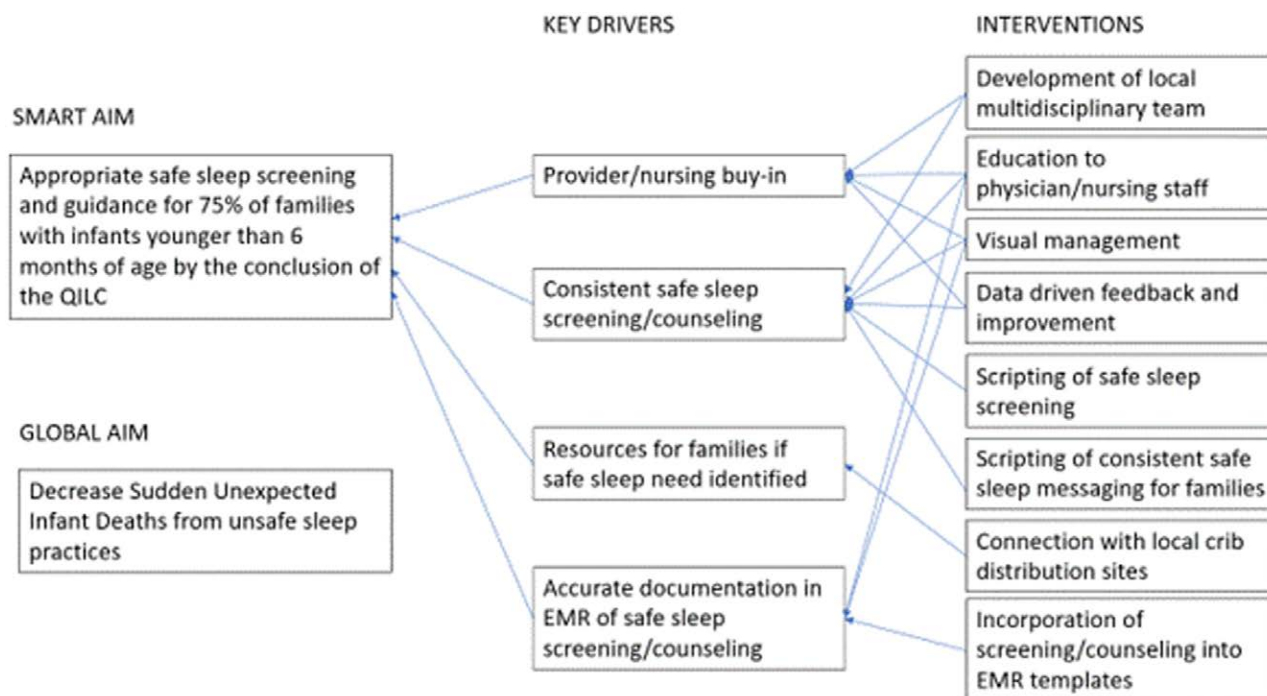


Fig. 1. Key driver diagram for safe sleep QILC.

Table 1. Learning Collaborative Sample Agenda

12:00–12:05	Welcome, Introductions
12:05–12:15	Ask a local expert, featuring speakers from - State Health Department - County Health Department - State Chapter of the American Academy of Pediatrics
12:15–12:25	Review of QI topics (for example, creating a key driver diagram, forming a multidisciplinary team, interpreting run charts, etc.)
12:25–12:30	Review of practices' run charts
12:30–12:45	Practices share current PDSA cycles, successes, barriers
12:45–12:55	Discussion of recent literature on safe sleep, infant mortality and/or commercially available infant sleep products
12:55–13:00	Wrap-up, Questions

electronic health record (EHR) report that captured data from all eligible encounters and therefore submitted data on more than 40 patients each month. Data were submitted and managed using the secure, web-based application, REDCap (Research Electronic Data Capture), which provides an interface for validated data entry.<sup>13</sup> Each practice received a unique website link each month for data collection. If multiple physicians from a single practice were participating, data were submitted monthly for the entire practice. Run charts were created with Microsoft Excel every month and shared during the learning collaborative webinars so that practices could see their change and how they compared to other participating sites. We created separate run charts for inpatient and outpatient practices.

**Measures**

Patient visits were eligible for inclusion if the infant was six months of age or less and was seen for either

a well-child visit or a newborn hospital discharge visit. Pediatricians collected data on the presence of appropriate safe sleep documentation in the visit note. We defined appropriate safe sleep documentation if the family was screened for a safe sleep environment and counseled on the “ABCs of safe sleep” during the visit. The numerator was the number of patient visits with appropriate documentation of safe sleep counseling, whereas the denominator was the number of eligible charts reviewed by the practice each month.

After the conclusion of the QILC, the collaborative leadership decided to survey the participants by email 12 months after the end of the collaborative to assess sustainment. Participants were asked to audit an additional 20 charts to assess the sustainability of the practice change. If participants did not respond to the first email, we contacted them a second time 2 weeks later. If more than one provider participated at a site, they were asked to coordinate so that only one set of data was submitted. Participants submitted the number of charts audited and the number of records with safe sleep screening and counseling documented via email. After completion of the learning collaborative, pediatricians who recollected data received a \$5 coffee gift card.

**RESULTS**

Thirty-four pediatricians from 4 inpatient practices and 9 outpatient practices participated actively in the QILC and met requirements for ABP MOC 4 credit. One physician assistant fully participated in the project as well. Six additional pediatricians registered but participated in less

than 6 sessions, and therefore were not eligible for MOC 4 credit. However, all registered practices maintained active involvement of at least 1 pediatrician throughout the entire project. The practices varied from large practices affiliated with children's hospitals to small, independent practices. The number of pediatric providers at each site ranged from 2 to 15. Practices were located anywhere from 1 to 128 miles from the host children's hospital.

At baseline, there was a wide variability among practices in terms of documentation of safe sleep screening and counseling. Inpatient participants reported that they were documenting appropriate safe sleep guidance in 0%–73% of eligible patient encounters. Likewise, for the outpatient practices, appropriate safe sleep guidance was documented in 0%–98% of eligible patient encounters (Figs. 2 and 3).

By 6 months into the learning collaborative, all practices (inpatient and outpatient) were meeting the 6-month goal of 75% of infants screened and counseled for safe sleep. All practices sustained their improvement at the 9-month conclusion of the learning collaborative (Figs. 2 and 3).

At the 12-month follow-up, 4 of the 9 outpatient practices and the 4 inpatient practices resubmitted data (Table 2). Of the 4 outpatient practices that submitted data, all sustained their improvement in safe sleep screening and counseling 12 months after completion of the learning collaborative. However, of the 4 inpatient practices that submitted data, all had a decrease in safe sleep screening and counseling documentation. Two had minor performance drops (inpatient practices 2 and 3), whereas 2 had a substantial decrease in performance (inpatient practices 1 and 4).

## DISCUSSION

A facilitated QILC was successful in improving documentation of safe sleep screening and counseling in both the pediatric office and the newborn nursery setting. Practices consistently endorsed that modifying their EHR was the highest yield change to drive improvement in performance. EHR modifications included the addition of a safe sleep screening prompt in well-child visit templates and the use of autotext to facilitate the addition of safe sleep counseling documentation to the physician note. These EHR prompts standardized safe sleep screening, counseling, and appropriate documentation across practice sites. Most practices made a change to their EHR as their first PDSA cycle during the initial phase of data collection. Other interventions included standardizing a verbal or written screening process, utilizing available safe sleep education materials for families, and providing practice-wide education on safe sleep counseling to ensure consistent messaging among all practice staff. Most practices utilized visual management, such as small reminder signs on physician computers, to prompt providers to document safe sleep screening and counseling. Participants

used educational materials through the National Action Partnership to Promote Safe Sleep and the National Institute of Child Health and Human Development Safe to Sleep campaign. Another significant intervention included linking practices with distribution sites to provide free access to portable cribs if families did not have a safe place for their baby to sleep. One practice creatively implemented a “safe sleep game” to have families modify an unsafe sleep environment for a doll to ensure families understood all aspects of safe sleep practices.

At the end of the 9-month QILC, participating pediatricians did not identify any continued barriers to screening for a safe sleep environment or providing safe sleep education to families. Participating in the QILC was a successful step to increase safe sleep promotion that required minimal time investment and no financial burden to the practice. Upon recontact 12 months after completion of the QILC, most responding practices stated that screening and counseling were easy to maintain in their workflow. The two practices that had a significant decrease in performance identified several factors that contributed to their decline in safe sleep screening and counseling. These factors included staff turnover, a decreased emphasis on safe sleep documentation during resident orientation, and reliance on safe sleep screening and counseling in nursing, rather than physician, documentation at hospital discharge.

### *Interpretation*

Practices saw a sudden increase in documentation during phase 1, likely due to interventions to facilitate entry of screening and counseling into the EHR. This steep increase could also have been a result of increased physician action around safe sleep-related to their participation in the QILC. Practices were able to sustain that improvement throughout the learning collaborative. In verbal feedback on the webinars, the pediatricians frequently remarked on how the quality of their safe sleep counseling had improved. Pediatricians endorsed that they were more thorough and able to answer questions from families more completely, particularly regarding the “why” behind specific recommendations. A favorite segment of the webinar was a review of current products marketed for infant sleep. Participants remarked that this helped them have a better understanding of what families may be using in their homes and prepared them for conversations about unsafe products. This segment also was an area of significant engagement with the participants, with the physician facilitator receiving several emails each month with products for discussion. Participants also commented that hearing from state experts on infant mortality helped put their role in advising families on safe sleep into context.

Eight of the 13 practices (62%) resubmitted data 12 months after completion of the project with a minimal incentive (\$5 coffee gift card). Because participants were not expecting to be contacted after the conclusion of the



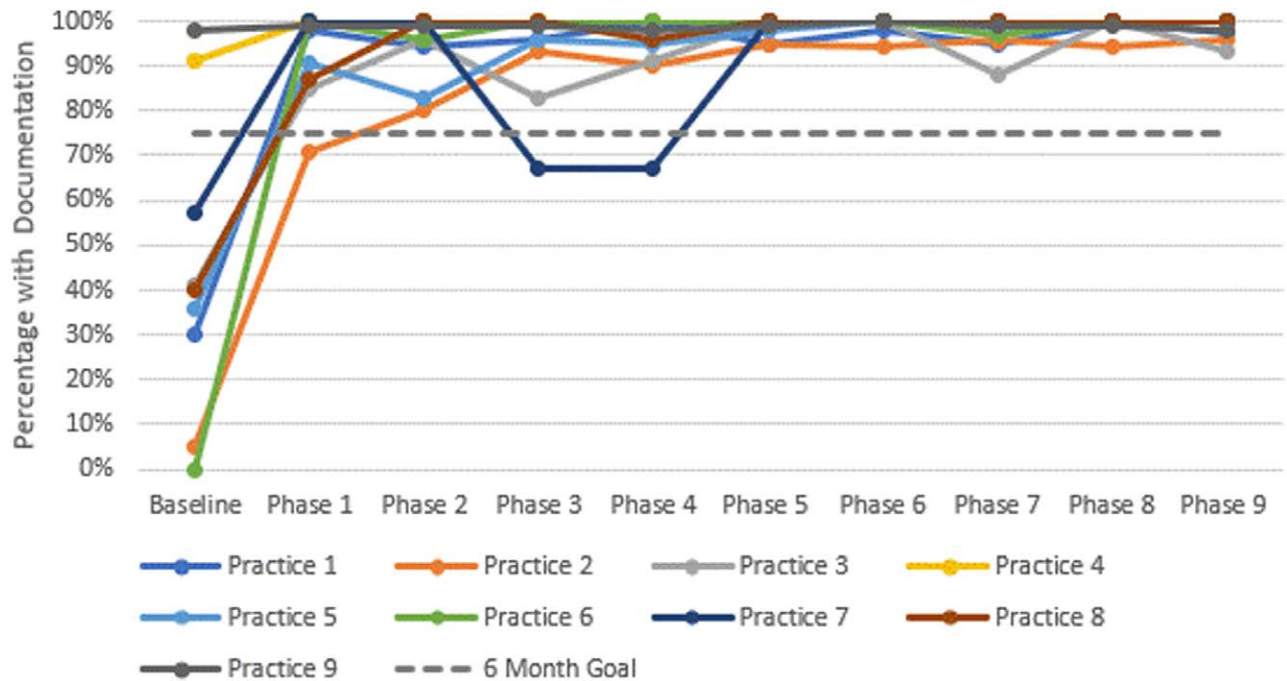


Fig. 2. Appropriate screening and counseling on a safe sleep environment—outpatient run chart.

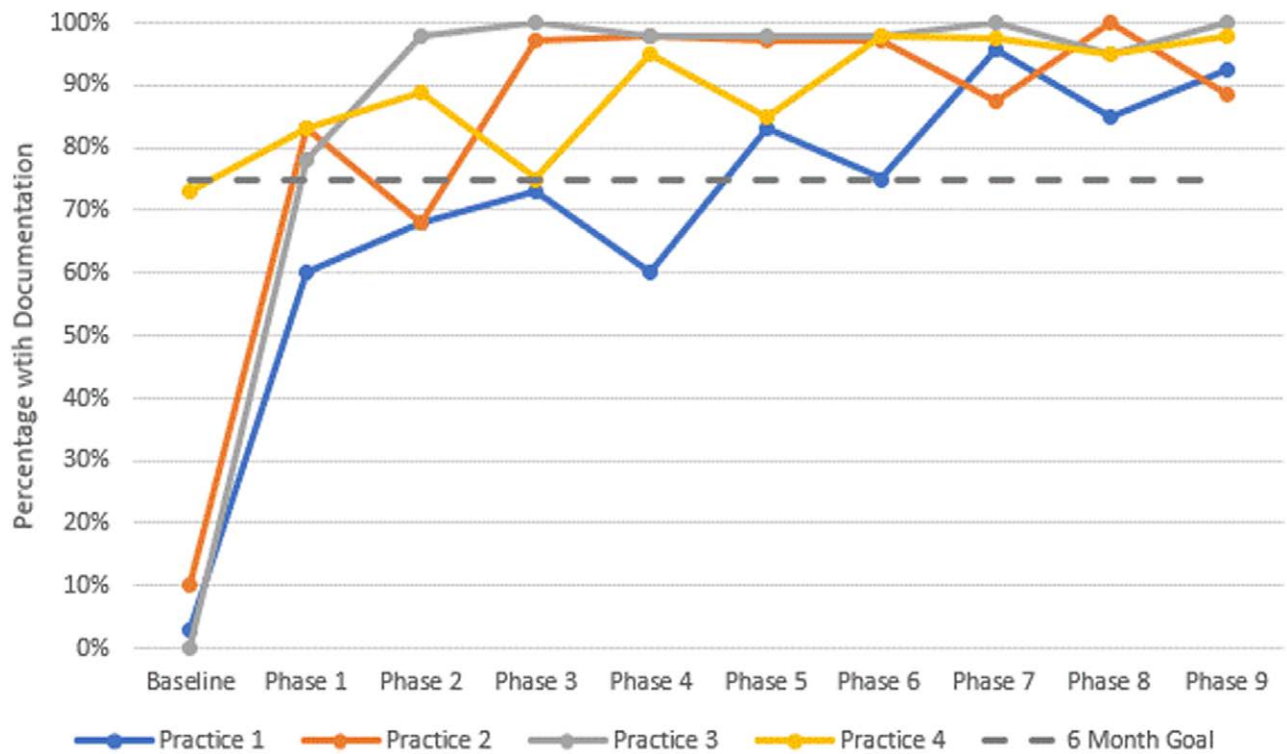


Fig. 3. Appropriate screening and counseling on a safe sleep environment—inpatient run chart.

QILC, the authors feel that more than half of the practices responding showed continued engagement of the participants one year after the project. The two practices with a decrease in performance experienced common challenges in practice sustainment—frequent provider turnover and a change in workflow. More dedicated

guidance on sustaining QI improvements in light of these common barriers to sustainment would be beneficial in future QILCs. We are unable to comment on whether the 5 practices that did not respond are sustaining their practice change. Nonresponse may indicate a lack of engagement, time constraints, or nonsustainment in practice.

**Table 2. 12-month Sustainment of Safe Sleep Screening and Counseling**

	Baseline (%)	Phase 9 (%)	12-month Follow-up (%)
Outpatient practice 3	41	93	95
Outpatient practice 6	0	100	100
Outpatient practice 8	40	100	100
Outpatient practice 9	98	98	98
Inpatient practice 1	3	93	70
Inpatient practice 2	10	89	87
Inpatient practice 3	0	100	95
Inpatient practice 4	72	98	61

The experience of this QILC builds upon existing literature that shows that QILCs can be successful in driving practice change among various sites, both in the type of practice, patient population, and geographic location. This QILC was unique in that it was held entirely virtually to maximize reach and minimize cost. We attribute the success of this format to engaging content, free registration for practices, and the availability of MOC part 4 credit from the American Board of Pediatrics. There was a time investment required by the participating pediatrician for data collection and entry, work on monthly PDSA cycles, and the one-hour webinar each month. This work decreased for practices with more than 1 pediatrician participating as they could share data collection work. When seeking informal, verbal feedback from participants during the final webinar, pediatricians did not feel that the project was too time-intensive or lengthy.

## LIMITATIONS

This QILC was open to all interested pediatricians within the state, and there was no specific targeting based on known baseline performance. Participation was entirely voluntary, so data may be skewed toward improvement as pediatricians who enrolled in the QILC may have been more motivated to change their practice. Baseline data were collected over 1 month to decrease the burden of data collection on pediatricians participating in the QILC, but this may not have been sufficient to establish a reliable baseline. Pediatricians also did their data collection and chart audits, which may inherently bias the results. As this QILC was entirely virtual, there were no site visits to ensure that participating pediatricians were engaging a multidisciplinary team and performing PDSA cycles. Although PDSA worksheets were provided virtually to all participants, there was no expectation that practices had to share their current PDSA worksheets during the webinars. Although the engagement was high on the webinars with several pediatricians sharing current interventions each month, this was voluntary. Some practices may have only performed 1 or 2 PDSA cycles through the 9-month learning collaborative. In the future, a requirement for a minimum number of PDSA cycles to be shared during the collaborative would help ensure each participant has a full grasp of basic QI methodology after the QILC. Also,

participants were not sent their data in a run chart form before the learning collaborative webinar each month. Although no practices mentioned this as a barrier, providing them with this ahead of time may have allowed pediatricians to speak more clearly about how the changes made impacted their results. Although the goal of the project was to increase physician counseling on safe sleep practices, we could not track the content of physician counseling during patient encounters. Therefore, we used documentation of safe sleep screening and counseling as a marker for this physician–family discussion. Although the authors assume that there is a direct correlation between physician behavior and documentation in the medical record, this is a limitation of the study. Finally, this QI project did not look specifically at any changes in infant mortality rates in the communities served by the participating clinics and hospitals, nor did practices track any change in referrals to community crib distribution sites.

## CONCLUSIONS

Decreasing mortality from SUIDs requires the effort of all health care providers who care for infants. A facilitated quality improvement learning collaborative is a useful methodology to improve safe sleep counseling among a diverse group of pediatric practices. Coordinated, consistent messaging to families on how to reduce the risk of SUIDs is crucial to driving a cultural shift in infant sleeping practices. As the methodology in this QILC is straightforward and replicable, the authors encourage broader application to improve safe sleep counseling across other communities.

## DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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