

# Improvement in Documentation Using an Electronic Checklist for Shoulder Dystocia Deliveries

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**OBJECTIVE:** To estimate if using an electronic checklist improved the documentation of shoulder dystocias that occurred at our institution.

**METHODS:** A standard checklist of key elements that should be included in the delivery note after a shoulder dystocia was added to the electronic delivery note at our institution. We identified shoulder dystocia deliveries from the department's delivery database for 3 years before and after the checklist was included and compared delivery notes written from these time periods with respect to their content.

**RESULTS:** Forty-six shoulder dystocia deliveries were identified before the checklist being available and 82 after. There was a significant increase noted in the frequency with which several elements were documented after the checklist was implemented including McRoberts maneuver (before checklist 69%, compared with after checklist 90%,  $P=.003$ ), head-to-body interval (22% compared with 84%,  $P<.001$ ), which shoulder was anterior (48% compared with 96%,  $P<.001$ ), and if the neonate was moving its arms after delivery (50% compared with 93%,  $P<.001$ ).

**CONCLUSION:** Use of a standard checklist for shoulder dystocia in the delivery note resulted in a significant improvement in the documentation of several critical elements.

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Shoulder dystocia is one of the leading causes of obstetric malpractice allegations.<sup>1–3</sup> As a result of the frequency with which this complication is litigated, accurate and comprehensive documentation is essential for medical liability defense. A recent publication highlighted this fact and reported that when a malpractice payment was made after shoulder dystocia litigation, in 54% of cases, the issue driving payment was not the care rendered but a lack of clear documentation.<sup>4</sup>

Two separate studies using simulation have demonstrated that after a shoulder dystocia exercise, residents and midwives often do not document some of the critical elements, with one study reporting inadequate documentation in 80% of notes.<sup>5,6</sup>

Strategies suggested to potentially improve documentation and mitigate the frequent malpractice litigation after shoulder dystocias have included using simulation and standard checklists to improve delivery technique and documentation. Goffman et al<sup>7</sup> demonstrated improvement in the quality of documentation through shoulder dystocia simulation and concluded that standardized forms for shoulder dystocia delivery notes may provide the best solution to insure appropriate documentation. A similar study by Croft et al<sup>8</sup> demonstrated that a preformatted checklist resulted in more complete documentation of a simulated shoulder dystocia event in comparison to a free texted narrative.

As recommended in the conclusions of prior studies, our institution implemented a standard checklist into our electronic medical record delivery note that includes key components in the documentation of a shoulder dystocia. This electronic checklist has now been in place for approximately 3 years. With this study we sought to estimate if the presence of this electronic checklist improved the documentation of shoulder dystocias that occurred at our institution.



## MATERIALS AND METHODS

This study was approved by the Madigan Army Medical Center Institutional Review Board. All delivery notes at our institution are entered into an electronic medical record system. Approximately 3 years ago, in an effort to standardize and improve our documentation of shoulder dystocia deliveries, a checklist was added to the standard electronic delivery note, which previously included only a section for a narrative of the delivery. The checklist has drop-down boxes for the critical elements of the note, which were previously left to be included in the free-text narrative section of the delivery note. The list, which was generated from the current literature and previously published work in this area, can be seen in Box 1.

At the time the providers write their delivery note, after a shoulder dystocia delivery, they are able to check a designated box that opens up the standard-

### Box 1. Electronic Shoulder Dystocia Checklist\*

Providers present:

Provider Type and Name

Staff \_\_\_\_\_

Resident \_\_\_\_\_

Anesthesia \_\_\_\_\_

Pediatrics \_\_\_\_\_

Nurse \_\_\_\_\_

Pediatrics Present at Delivery: Yes/No

Head to Body Interval (seconds): \_\_\_\_\_

Anterior Shoulder: Left/Right

Sequence of All Maneuvers Used: (drop-down boxes for up to 10 maneuvers)

Gentle traction

McRoberts maneuver

Suprapubic maneuver

Episiotomy

Delivery of posterior arm

Rubins maneuver

Woodscrew maneuver

Gaskins "all-fours" maneuver

Symphysiotomy

Zavenelli

Cord Gases Sent: Yes/No

Neonate Moving Both Arms After Delivery: Yes/No

Evidence of Clavicular Fracture: Yes/No

Brief Narrative of Delivery:

\*Note: Additional important elements for documentation that were already present in the electronic delivery note before the checklist was added include date/time of delivery and note, risk factors for shoulder dystocia (ie, gestational diabetes, estimated fetal weight greater than 4,000 g, etc), neonatal birth weight, Apgar scores, and estimated blood loss.

ized shoulder dystocia checklist. All providers were briefed on this new format when it was implemented through presentations at morning report and departmental staff meetings.

All deliveries complicated by shoulder dystocia were identified from the department's delivery database for 3 years before the checklist being implemented (January 2003 to January 2006) and afterward (April 2006 to May 2009). We did not evaluate notes for the 2 months during which the note was initially made available and the staff was being trained on its use (February–March 2006). Records were obtained and reviewed by two research staff who recorded whether specific components were present or absent from the delivery note and results recorded into an electronic database.

Although most of the data elements were simply present or absent, three of them (whether the neonate was moving its arms after delivery, whether cord gases were sent, and evidence of clavicular fracture) were recorded in the database if they were mentioned in the note (ie, if the note stated the neonate was or was not moving its arms, this still meant that it was documented).

Analysis was conducted and  $\chi^2$  tests performed to estimate if there was any difference in the inclusion of the checklist items after implementation of the electronic checklist. Of note, the two groups for purposes of comparison were divided by the time when the standardized checklist was implemented so even if it was not used after this, these notes were still included in the postimplementation group.

Although we did consider the recording of the date and time of the note as important elements, we did not include these in the analysis because the electronic note automatically enters these parameters when the note is saved. Other important items such as the estimated blood loss, birth weight, and Apgar scores were also already included in the electronic note in other sections before the checklist was implemented. Additionally, even although the checklist includes drop-down boxes for maneuvers to be entered in the order in which they were performed and includes a pick list of all commonly described maneuvers, we did not include anything other than McRoberts maneuver and suprapubic pressure in the analysis because these are the initial maneuvers generally performed at our institution.

## RESULTS

A total of 46 shoulder dystocia deliveries were identified before the checklist was used and 82 after. The incidence of shoulder dystocia deliveries was slightly



higher in the latter period (1.12% [46 of 4,090 vaginal deliveries) compared with 1.67% [82 of 4,901] vaginal deliveries,  $P=.03$ ).

Of the 82 deliveries that occurred after the checklist was implemented and were included in the study, the electronic delivery checklist was used in 77 of them (94%). For the five cases in which it was not used, we were unable to determine if the provider simply forgot that the checklist was available or chose to write their own narrative instead.

With regard to initial maneuvers, McRoberts maneuver was documented more frequently after implementation of the checklist (69% compared with 90%,  $P=.003$ ), whereas the mention of suprapubic pressure was not significantly different (78% compared with 90%,  $P=.061$ ).

There were significant differences noted in the documentation of several important components after the checklist was implemented, including the head to body interval (22% compared with 84%,  $P<.001$ ), which shoulder was anterior (48% compared with 96%,  $P<.001$ ), if the neonate was moving its arms after delivery (50% compared with 93%,  $P<.001$ ), and whether cord gases were collected (17.3% compared with 97.5%,  $P<.001$ ).

Table 1 provides a breakdown of all elements evaluated before and after implementation of the checklist.

## DISCUSSION

Our study suggests that the use of a standardized checklist after deliveries complicated by shoulder dystocia can

improve the documentation and frequency with which several critical elements are included.

The leading cause of birth trauma in a newborn is shoulder dystocia, which may result in serious and permanent injuries from asphyxia, brachial plexus injury, and fractures of the humerus or clavicles. Therefore, it is imperative that healthcare providers have adequate resources to be able to document all appropriate facts regarding this adverse event because the medical record can sometimes be considered the "silent witness."<sup>9</sup> A checklist for documenting an adverse event such as shoulder dystocia may be the answer. In the aviation industry and with other industrial manufacturers, the use of standardized checklists has been found to prevent oversights and streamline procedures and resulted in a reduction in critical incidents.<sup>10</sup> In our own profession of medicine, pre-operative checklists have been shown to have a positive effect by reducing surgical morbidity and mortality.<sup>11</sup> Although improving documentation after the complication does not improve the immediate clinical outcome, it may provide useful and more accurate information for future treatment of the patient.

Because the patient's record is a discoverable document, the medical record is always critically reviewed during a medical malpractice claim. Over time, specific details of an emergent event, such as a shoulder dystocia, may become less clear to the healthcare providers who were involved with the event. Therefore, the medical record becomes the sole source that describes the events as they occurred, the clinical management decisions that were made, and communication that took place with the patient, the family, or both. Even documentation of things that did not occur, for instance, that cord gases were not obtained because the blood clotted or the providers were unable to obtain a sample, are important to demonstrate the thought process of the providers.

The quality of the documentation is also often viewed as a reflection of the physician's professional practice and the quality of the patient care rendered. Documentation that is thorough may be seen as evidence of high-quality care and a skilled and safe healthcare provider, whereas an incomplete record may give the perception of wider problems with an individual's practice.<sup>12</sup> Because of this, we feel that the use of an electronic checklist tool such as the one we have described may be a reasonable option for effectively communicating the event so that it is legible, factual, and timely.

The checklist we used has the typical maneuvers that are used for shoulder dystocia relief included as options. Because the McRoberts maneuver is gener-

**Table 1. Delivery Note Components Evaluated Before and After Checklist Implementation**

Delivery Note Component	Before Checklist	After Checklist	<i>P</i>
Gentle traction applied	36.9 (17/46)	79.2 (65/82)	<.001
McRoberts maneuver performed	69.5 (32/46)	90.2 (74/82)	.003
Suprapubic pressure	78.2 (36/46)	90.2 (74/82)	.061
Anterior shoulder	47.8 (22/46)	96.3 (79/82)	<.001
Head-to-body interval	21.7 (10/46)	84.1 (69/82)	<.001
Cord gases collected	17.3 (8/46)	97.5 (80/82)	<.001
Neonate moving both arms	50 (23/46)	92.6 (76/82)	<.001
Evidence of clavicular fracture	21.7 (10/46)	81.7 (67/82)	<.001
Pediatrics present for delivery	30.4 (14/46)	87.8 (72/82)	<.001

Data are % (n/N) unless otherwise specified.



ally used as the initial maneuver at our institution, we believe it was likely used in nearly all of these deliveries despite the lack of documentation before use of the checklist. This key piece of information shows where an absence of data could be detrimental to defending a malpractice case.

We recognize that there are limitations of this study, mostly related to its retrospective design. Although we observed significant differences in the documentation of how often pediatrics was present at deliveries, we cannot say definitively that this is actually different between time periods because the absence of documentation may be related to omission rather than what really occurred. We also considered the possibilities that simulation training or the actual education of the staff about the checklist could be responsible for the improvements in documentation that we observed but feel these are unlikely because simulation training was initiated in 2004 and a one-time inservice about the checklist is unlikely to have such a lasting effect.

Also, because this was a retrospective study, we were not able to determine how accurate the documentation was with regard to whether all of the maneuvers performed were documented completely or in the order in which they were performed. However, issues related to this have specifically been addressed in previously mentioned simulation studies and because shoulder dystocia occurs infrequently and is not predictable, a prospective study is probably not practical.

With regard to the increased incidence of shoulder dystocia noted in our study between the two time periods (1.12% compared with 1.67%,  $P=.03$ ), it is possible that this event was truly more common or that providers were more likely to document given the emphasis and focus placed on this. Larger and multicenter studies would be necessary to determine if the incidence of shoulder dystocia is truly increasing, although with higher mean birth weights being reported across the United States, this is definitely a possibility.

Increasingly more healthcare institutions are using information technology and electronic medical records to document patient care, including labor and delivery summaries, with paper records being a fallback. The checklist that we used could easily be applied to either situation. When filled out correctly, the electronic medical record or paper record de-

scribes pertinent information about what happened during and after a delivery. In addition, checklists can be used for quality improvement processes and evaluating risk management strategies. In the evaluation of the medical records before the implementation of the shoulder dystocia checklist, we found that the standard delivery notes, written as a narrative, lacked many critical elements in a majority of cases.

This study suggests that the simple process of including a standardized checklist in the delivery note after a shoulder dystocia occurs can markedly improve documentation of several critical elements, probably most importantly, the head to body interval, which shoulder was anterior, and if the neonate is moving its arms after delivery. Given these findings, we have expanded the use of checklists now to both forceps and vacuum deliveries.

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