

A Multi-Strategy Approach for Cesarean Section Reduction at an Urban Community Medical Center

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OBJECTIVE: To develop a multi-strategy approach to reduce the cesarean section (C/S) rate at a community hospital serving a multiethnic patient population.

STUDY DESIGN: A combination of antepartum and intrapartum strategies to reduce C/S were created and implemented over a period of 10 months. These were applied as clinically indicated for every patient who was being considered for undergoing a primary C/S or an elective repeat C/S. The resulting total C/S rate was retrospectively compared with the total C/S rate of a cohort of patients within the same department who underwent C/S prior to the implementation of these strategies.

RESULTS: In the period prior to implementing the strategies, there were 3,566 deliveries and a total C/S rate of 39% versus 3,425 deliveries and a total C/S rate of 29% in the study period. This was statistically significant ($p < 0.05$).

CONCLUSION: Implementing a combined approach of strategies that addressed the issues both in the antepartum and the intrapartum periods resulted in a significant decrease in the total C/S rate. This was accomplished by getting greater buy-in from the providers and also by formally including the patients into the decision-making

process. Of note, these results were achieved without any compromise to the safety and quality of patient care in the department. (J Reprod Med 2017;62:469–474)

**...implementing this
multi-strategy approach ...
can be successful in achieving
the goal of reducing overall
C/S rates...**

Keywords: C-section (OB); caesarean section; cesarean section; cesarean section rate, cesarean section reduction; delivery, abdominal; repeat cesarean section; vaginal birth after cesarean; VBAC.

Cesarean sections (C/Ss) are a major contributor to maternal morbidity and mortality. The rate has been steadily increasing over the past several years, mostly due to patient/clinician preferences.¹ One possible explanation for the increasing C/S rate may lie in women's preferences and their effect on medical decision-making. When asking patients about their own delivery preferences, many studies indicate that approximately 15% prefer C/S deliveries.²⁻⁴ Additionally, patients who have undergone a C/S delivery in the advanced stages of labor, specifically after achieving full dilation and pushing, have a significantly decreased chance of successful vaginal birth in a subsequent pregnancy.⁵

Several interventions to decrease the rate have been described in the literature and have had mixed

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results. Chaillet et al⁶ suggest that disseminating the total C/S rates of the individual providers is helpful because it shows interprovider rankings and thus generates a desire among the clinicians to implement best practices. In this way, the providers are fully invested into the correction processes. In a related study, Jang et al⁷ described the effect of public release and feedback on institutional (clinics and hospitals) C/S rates. They found that the initial public release, out of a total of 4 consecutive releases, had the most significant effect on decreasing the C/S rate.

In 2012 the national C/S rate was 33%, and the rate in the state of New York was 34%. The institution where this study was performed is an urban, community, teaching healthcare system with approximately 2/3 service patients, the majority being Hispanic and underserved.

Our C/S rate was 39.2%, which was among the highest in the state. In an attempt to decrease this rate, we identified an ideal rate of 29% for our institution, which would translate into an approximate 10-point drop from the current rate. This was based on the information reported by Roberts et al,⁸ who used longitudinally linked data for women with consecutive births. In order to accomplish this, we implemented 4 strategies that were aimed at decreasing this high rate without resulting in any compromised patient quality and safety outcomes.

Materials and Methods

After a review of the literature to identify best practices for reducing the C/S rate and with significant support from our hospital administration to set the tone and pace for this endeavor, 4 specific strategies were created and implemented:

a. Each scheduled C/S required prior approval by one of 2 senior Ob Attendings. The approval form was completed and submitted by the obstetrician's office via fax to the scheduler's office because the electronic medical record system of the hospital was different from those used by the private doctors and the outpatient clinic system. The turnaround time for all approvals was mandated to be within 72 hours. All patients were made aware of and accepted this departmental requirement prior to scheduling the procedures. This requirement was preceded by an educational intervention in which all providers were given refreshers on appropriate criteria for preg-

nancy dating and also for scheduling the C/S. This allowed them to vocalize their individual concerns (including medicolegal concerns) regarding vaginal births after C/S (VBACs).

b. The providers were required to offer a VBAC education class to all patients who were eligible for a VBAC trial. The information disseminated was based upon the ACOG Practice Bulletin addressing this issue.⁷ This was to be offered in the antepartum period. These classes were held weekly, with <7% of eligible patients opting to miss the classes. All classes were taught by one of 2 midwives so as to standardize the content, which included discussions regarding availability of analgesia, VBAC success rates, and other relevant information. If any provider opted out of sending his/her patient to the class, s/he was required to provide the patient with a pamphlet that outlined the relevant information. This was documented on the VBAC counseling form, which was put into the patient's chart.

All Ob Attendings in the department had credentials to perform VBACs, and they did offer this option to patients whenever clinically indicated.

The newly created departmental C/S scheduling form that was used also required documentation on whether the VBAC counseling had been done (Figure 1).

c. All intrapartum C/Ss required a second approval by one of the 2 Attendings who were always assigned to cover Labor and Delivery (L&D) during every shift (Laborists). This requirement also applied to every private Attending who planned to do an intrapartum C/S whereby the clinical scenario was reviewed and evaluated by one of the 2 hospital Laborists who always covered L&D for every shift. Any emergency C/S (e.g., non-reassuring fetal heart rate pattern, abruption, etc.) was exempted from this requirement. Any disputes occurring between the clinician performing the C/S and the one reviewing the indication were referred to either the Director of Maternal-Fetal Medicine or the Chief of Obstetrics, based upon whichever one of them was assigned to perform this function. That schedule was prominently displayed on the L&D bulletin board.

d. Every Attending's individual C/S rate was

Scheduled Cesarean Section Approval Documentation

1. The requesting physician is to complete the c-section approval form at least 3 weeks prior and fax it to the OB leadership team.
2. If approved, the OB leadership team will return the form by fax to the physician, with a copy to the OR scheduling office.
3. If the case is not approved, a member of the leadership team will contact the physician to plan alternatives.

Patient Name: _____ Proposed Date of Procedure __/__/__

MR# _____ DOB: __/__/__

Attending Physician: _____ Phone # _____

Fax # _____

Patient Age: ____G____P____ LMP _____ EDC _____ EGA _____

Date 1st visit: __/__/__ EGA@ 1st visit: _____

Date 1st sono: __/__/__ EGA@ 1st sono: _____

Indication for c-section delivery

- Scheduled repeat # of previous c-sections _____
- Maternal request VBAC/TOL counseling done: Yes ___ No ___
- Other (please be specific) _____

Medical History

Surgical History

Medications

- Approved
- Pending approval (additional information requested)
- Denied approval (appropriate indication not present)

By: _____ Date Approved: __/__/__

Figure 1
Scheduled cesarean section approval documentation.

posted on L&D. This information was analyzed and communicated regardless of whether the Attending was employed full-time by the hospital or was a volunteer Attending and also regardless of whether s/he was part of a group or was a solo provider. The document outlining the individual rates had a prominently visible line drawn at the level of the percentage goal C/S rate. This was

an additional way to help every Attending visually compare his/her rate with the desired goal rate.

These strategies were formulated based upon known successes previously outlined in the literature.¹⁰ For instance, publicizing the C/S rates of individual Attendings as a comparison with the rates of their peers and also of the departmental goal has been known to help create an inherent

desire of each Attending to actively work towards achieving the stated goal(s).

This was a pilot study performed over a 10-month period to observe whether these approaches would result in tangible results. A retrospective chart analysis was performed to review the C/S rates and the quality outcomes from April 2011 to January 2012, and during which the above-mentioned strategies were in place. These results were compared with the results obtained from a control period, which was the 10 months prior to the implementation of these strategies (June 2010 to March 2011).

There were no other notable neonatal or obstetrical policy or staff changes during the study period.

The clinical outcomes of the patient cohorts were analyzed. These included a review of maternal complications specific to operative deliveries and VBAC trials of labor. Neonatal morbidity and mortality outcomes were also analyzed. Univariate comparisons of outcomes before implementation (control period) versus after implementation (study period) were tested using chi square test of independence and Student's *t* test for categorical and continuous data, respectively.

Results

There were 3,566 deliveries during the control period (before implementation of the strategies). The total C/S rate was 38.7% (n=1,380). Of those, the scheduled C/S rate was 25.3% (350 out of 1,380). The remaining 1,030 C/Ss were performed during the intrapartum period and were for the customary obstetrical indications.

There were 3,425 deliveries during the study period (after the strategies were implemented). The total C/S rate was 29% (993/3,425). Of those, the scheduled C/S rate was 25% (249/993). The remaining 744 were performed during the intrapartum period and were for the customary obstetrical indications. There were no significant differences in the demographic characteristics and distribution of other indications for C/S between the 2 groups (Table I).

Although the rates of scheduled C/S were not statistically significant between the study and control periods (27.4% vs. 25%), there were significant differences in the numbers performed by the private (voluntary) Attendings versus the service (full-time employed) Attendings. The service Attendings' scheduled C/Ss dropped from 150 in the control period to 79 during the study period, likely

Table I Demographic Characteristics and Indications for C/S

	Control group n=3,566	Study group n=3,425	p Value
Age (yrs)	26.85±5.72	27.13±6.10	NS
GA (wks)	38.91±2.99	38.54±2.61	NS
Gravida	3	3	NS
Para	1	1	NS
Dystocia	424 (11.9%)	561 (16.4%)	NS
NRFHRT	225 (6.3%)	247 (7.2%)	NS
Inductions	200 (5.6%)	312 (9.1%)	NS

NRFHRT = nonreassuring fetal heart rate tracing.

due to more patients choosing VBAC attempts. This was statistically significant. On the other hand, the private Attendings performed 200 C/Ss in the control period and 170 in the study period (Table II). There were no significant differences in the maternal and neonatal outcomes during the study and the control periods (Table III).

Because of the above-mentioned strategies being implemented on L&D, the need for any mediation between the obstetrician who was planning the C/S and the one who was reviewing the indication was extremely rare, occurring in <1% of all the cases.

Discussion

Although the total C/S rates have steadily increased over the past several years, and although there may be appropriate clinical justification for this intervention, it is generally agreed that there is ample room for trying to decrease the total C/S rates.^{8,9} Towards that end, we instituted the 4 strategies aimed at simultaneously addressing the issue both from an antepartum and an intrapartum point of view.

These strategies did result in a 10-point (statistically significant) decrease in the total C/S rates, from almost 39% to 29%. We noted, however, that the total scheduled C/S rates of the private Attendings did not show any significant down-

Table II Scheduled C/S (Private Versus Service Attendings)

	Control group n=1,380	Study group n=993	p Value
Private Attendings	200	170	0.163
Service Attendings	150*	79*	0.002*

*Statistically significant, *p*<0.05.

Table III Maternal and Neonatal Outcomes

	Control group n=1,380	Study group n=993	p Value
Maternal outcomes			
Chorioamnionitis*	151 (11%)	69 (7%)	NS
Uterine rupture/ dehiscence**	2 (0.2%)	2 (0.2%)	NS
Postpartum hemor- rhage***	13 (1%)	11 (1%)	NS
Neonatal outcomes			
Sepsis****	12 (0.87%)	15 (1.5%)	NS
Macrosomia (EFW ≥4 kg)	229 (17%)	216 (22%)	NS
Apgar scores <7 at 5 min	28 (2%)	31 (3.1%)	NS
Neonatal birth trauma	18 (1.3%)	17 (1.7%)	NS

EFW = estimated fetal weight.

*Temperature ≥100.4°F (38°C) (2 readings 6 hours apart).

**Evidenced by fetal heart rate abnormalities, increased vaginal bleeding (for rupture), or separation of uterine incision seen at C/S or palpated after vaginal delivery (dehiscence).

***Estimated blood loss ≥900 cc after vaginal delivery or ≥1,300 cc after C/S.

****Defined as fever and positive blood cultures.

ward trend. However, the rates of the scheduled C/Ss performed by the service/full-time Attendings significantly dropped. This finding occurred in spite of the fact that private Attendings generally operated on their own patients whereas the service Attendings performed all operations that had been scheduled for whichever day they were covering the labor floor. Given the requirement at our institution that every shift was covered by 2 Hospitalist Attendings, the indication for every nonemergency C/S was discussed and reviewed by the "other" Attending (i.e., the one not actively managing the patient). This intervention was also applied to every private Attending's patient. One other factor was that a larger number of the service Attendings' patients attended the weekly VBAC counseling classes, which were held in the evenings with refreshments served so as to maximize attendance. The patients managed by the private Attendings were more likely to choose to receive the various printed materials (including ACOG booklets) so that they could read the information on their own. It may be possible that the patients who attended the VBAC classes had their questions and concerns more thoroughly addressed and were thus able to make more informed decisions regarding their own care. For the purposes of this study, we did not review the

rates of successful VBACs nor the rates of VBAC attempts, although it is highly likely that these rates increased because of the larger number of patients who attended the classes and who elected to avoid elective repeat C/Ss.

Additionally, for every patient undergoing an elective repeat C/S, we required either documentation of her attendance at a VBAC class or a form signed by her which stated that she had read the VBAC brochure.

For purposes of this study, we did not analyze outcomes such as postpartum hemorrhage for the entire patient population as it was unlikely that such a complication would be decreased due to the overall decrease in the C/S rates.

The underlying reason, if any, for the private Attendings' C/S rates to remain virtually unchanged during the study period, when the 4 strategies were in place, was likely attributable to the fact that the private Attendings' opinions may have affected the final decisions as to route of delivery.

The above-mentioned 4 strategies were formulated based upon the known successes previously outlined in the literature. For instance, publicizing the C/S rates of individual Attendings as a comparison with the rates of their peers and also of the Department goal has been shown to help create an inherent desire of each Attending to actively work towards achieving the stated goal(s). These actions, partnered with identifying "change champions" (influential physicians who were most likely to be listened to by their colleagues), were adopted and were shown to have the desired results. In our study, while there was an overall trend showing a decrease in the C/S rates of the Attendings, this did not reach statistical significance.

In conclusion, we found that implementing this multi-strategy approach, which includes a focus on both antepartum (where the patients are actively involved in the information gathering and decision-making) and intrapartum (where the Attendings receive information about their own rates and also receive support from colleagues in the clinical decision-making) interventions, can be successful in achieving the goal of reducing overall C/S rates without any notable compromise in the morbidity and mortality outcomes.

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