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Documentation and Maintenance of the Partogram in a Professorial Obstetric Unit: A Clinical Audit with Pre- and Post-Intervention Comparison

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Abstract

Background: The partogram is the cornerstone of intrapartum monitoring, providing a real-time graphical record of labour progress, foetal wellbeing, and maternal condition. Despite its established role in preventing obstructed labour and foetal distress, audits globally and within Sri Lanka consistently identify gaps in its maintenance, compromising clinical decision-making and delaying timely intervention. **Objectives:** To assess the completeness of partogram documentation in a professorial obstetric unit; to implement targeted quality-improvement interventions; and to evaluate their impact through re-audit. **Methods:** A clinical audit with a pre- and post-intervention design was conducted at the Professorial Obstetric Unit, De Soysa Hospital for Women, Colombo. One hundred bed-head tickets from patients who were in labour were reviewed retrospectively (pre-intervention). Following a multi-component intervention—comprising a staff educational session, introduction of a vaginal examination rubber stamp, and random partogram checks with feedback—a further 100 records were reviewed three months later. All components were assessed against nationally and internationally accepted standards. **Results:** Pre-intervention, basic patient information, maternal vital signs, foetal heart rate, and cervical dilatation were generally well-documented. However, critical labour progress parameters, including abdominal descent (27%), foetal position (34%), caput (26%), and moulding (14%) were poorly recorded. Post-intervention, substantial improvements were observed across all deficient domains: caput (49%, $p < 0.001$), moulding (57%, $p < 0.001$), abdominal descent (41%, $p < 0.001$), position (40%, $p < 0.001$), special instructions (50%, $p < 0.001$) and time of commencing pushing (40%, $p < 0.001$). **Conclusion:** Targeted educational intervention and a structured vaginal ex-

amination stamp produced meaningful improvements across almost all partogram domains. Several components remain below optimal thresholds. Because the intervention was delivered as a single bundle, the observed improvement cannot be attributed with certainty to any one component in isolation. Regular re-audit, refresher training, and senior review are recommended to sustain these gains.

Keywords

Partogram, Intrapartum Care, Clinical Audit, Labour Monitoring, Documentation Quality

1. Introduction

The partogram has a distinguished history in obstetric practice. First conceptualized by Friedman in the 1950s, who described the sigmoid curve of normal cervical dilatation, and later operationalized into its familiar alert- and action-line format by Philpott and Castle in Zimbabwe in the early 1970s, the tool was designed specifically to bring the complexity of labour assessment within the reach of any trained clinician, regardless of seniority or setting [1] [2]. By distilling cervical dilatation, foetal descent, and maternal and foetal observations into a single, time-based graphical display, the partogram makes it possible to see at a glance whether labour is progressing normally or beginning to deviate from the expected trajectory [3].

The World Health Organization (WHO) recognized the partogram's potential early and trialled it in multicentre studies across Africa and Asia in the early 1990s, demonstrating significant reductions in prolonged labour, emergency caesarean section rates, and stillbirth when structured intrapartum monitoring was introduced [4]. Based on this evidence, the WHO endorsed the partogram as an essential component of skilled intrapartum care and promoted its adoption globally, including through the WHO-modified partogram, which forms the basis of many national versions [5]. More recently, the 2018 WHO recommendations on intrapartum care for a positive childbirth experience reaffirmed the importance of structured labour monitoring, while acknowledging ongoing debates about the precise configuration of alert and action lines [6].

In Sri Lanka, the partogram has been embedded in national safe motherhood strategies and is used routinely in all maternity units. The Sri Lankan national partogram is a modified version of the WHO modified partogram and encompasses basic patient information, labour progression (cervical dilatation, foetal descent, position, caput, and moulding), foetal wellbeing (foetal heart rate and liquor colour), uterine contractions, maternal vital signs, and documentation of interventions such as oxytocin augmentation. Its use is mandated across all government maternity facilities, from rural hospitals to tertiary teaching centres [7].

Despite this widespread adoption, the gap between policy and practice has proven difficult to close. Maternal death surveillance reports and clinical governance reviews conducted within Sri Lanka have repeatedly identified poor partogram maintenance as a contributing factor in delayed recognition of prolonged or obstructed labour, underlining the link between documentation quality and patient safety [8]. This finding is not unique to Sri Lanka. A systematic review by Lavender and colleagues found that while partogram use was broadly associated with better intrapartum outcomes, its benefits were only realized when the tool was completed accurately and consistently [9]. Studies from sub-Saharan Africa, South Asia, and Southeast Asia have collectively identified incomplete partogram documentation as a pervasive problem, with vaginal examination parameters, including fetal position, moulding, and caput, among the most omitted components [10]-[12].

The National Institute for Health and Care Excellence (NICE) in the United Kingdom has similarly emphasized the importance of structured, consistent intrapartum monitoring. Its clinical guideline on intrapartum care recommends regular recording of maternal observations, foetal heart rate, contraction pattern, and labour progress, and specifies that the partogram should be commenced when a woman is in the established first stage of labour and maintained with regular, timely entries throughout active labour [13]. Prompt escalation when labour deviates from the expected progress lines is highlighted as a critical patient safety measure.

Contributing factors to poor documentation quality have been described in a range of settings and include high patient-to-staff ratios that leave little time for systematic recording, insufficient training or refresher education on partogram use, poor supervision and feedback mechanisms, and a lack of standardized documentation tools or prompts [14] [15]. Interventional studies have explored a range of strategies to address these barriers, including educational programmes, structured supervision, partogram simplification, and mobile health technologies, with variable and context-dependent results [16] [17].

Against this background, we undertook a clinical audit to evaluate the quality of partogram documentation in the Professorial Obstetric Unit of De Soysa Hospital for Women, Colombo, a high-volume tertiary maternity centre and postgraduate training institution. We aimed to identify specific gaps in documentation practice, implement targeted corrective interventions, and determine whether those interventions produced measurable improvements in a real-world clinical setting.

2. Objective

The objective of this audit was to assess the completeness of partogram maintenance in the labour ward, with a view to improving intrapartum care. As this audit was based on retrospective review of bed-head tickets, accuracy and timeliness could not be reliably verified from the records (**Table 1**).

Table 1. Audit standards used for evaluating partogram components.

Partogram Component	Parameter Assessed	Audit Standard	Threshold
Basic Patient Information	Name, age, BHT number, gravida, parity, blood group, date and time of admission, special problems, special instructions	Complete documentation of all fields at the time of admission	100%
Maternal Vital Signs	Blood pressure, pulse rate, temperature	Pulse rate every 30 minutes, blood pressure and temperature every 4 hours	100%
Foetal Heart Rate (FHR)	Baseline FHR from CTG or FHR auscultated after a contraction	Every 15 minutes in the first stage of labour; every 10 minutes during the passive second stage; every 5 minutes or after each contraction in the active second stage	100%
Uterine Contractions	Frequency, duration, and strength (assessed via contraction-free interval)	Frequency and duration are charted at least every 30 minutes throughout active labour	100%
Cervical Dilatation	Centimetres of dilatation of the cervix	Assessed and plotted at least every 4 hours during the active phase and hourly in the second stage	100%
Abdominal Descent	Fifth of foetal head palpable abdominally	Assessed and recorded at minimum every 4 hours, and correlated with vaginal findings	100%
Vaginal Descent (Station)	Station of presenting part relative to ischial spines	Assessed and recorded at every vaginal examination,	100%
Position of Presenting Part	Occiput position (e.g., OA, OP, OT) or other presenting part identified	Documented at every vaginal examination	100%
Caput	Degree of caput (0, +, ++, +++)	Assessed and graded at every vaginal examination	100%
Moulding	Degree of moulding (0, +, ++, +++)	Assessed and graded at every vaginal examination; grade +++ with other signs of obstruction requires immediate escalation	100%
Colour of Liquor	Clear, meconium-stained (thin/thick), absent, or blood-stained	Recorded at every vaginal examination and at membrane rupture; meconium or blood-stained liquor must trigger escalation	100%
Oxytocin Administration	Dose (mU/min or IU), concentration, drop rate, and time of commencement and adjustment	All changes in oxytocin dose and drop rate are documented in real time on the partogram with precise timing	100%
Alert Line	Cervical dilatation plot crossing the alert line (1 cm/hr progress line)	Alert line crossing documented with clinical assessment and a plan of action recorded within 30 minutes	100%
Action Line	Cervical dilatation plot crossing the action line (4 hours to the right of alert line)	Prompt obstetric review and documented management plan within 30 minutes of crossing	100%
Time of Full Dilatation	Time at which the cervix is found fully dilated.	Recorded precisely at the time of confirmation; used to define the onset of the second stage and guide pushing.	100%
Time of Commencing Pushing	Time active pushing is initiated in the second stage	Documented at the time of commencement; enables monitoring of the duration of active second stage against accepted limits	100%

3. Methods

3.1. Study Setting

The audit was conducted in the labour ward of the Professorial Obstetric Unit, De

Soysa Hospital for Women, Colombo, Sri Lanka. De Soysa Hospital for Women is a dedicated maternity hospital and tertiary referral centre serving the Western Province, managing a high volume of deliveries annually and functioning as a principal training centre for postgraduate obstetric and gynaecological education in Sri Lanka.

3.2. Pre-Intervention Data Collection

The pre-intervention audit covered admissions to the labour ward during June 2023. One hundred bed-head tickets of patients admitted to the labour room in active labour were retrieved by consecutive sampling from the labour ward register, using all bed-head tickets corresponding to sequential admission numbers until the required sample size was reached. Bed-head tickets that belonged to women who delivered within four hours of admission to labour room were excluded and replaced with the next consecutive admissions.

Partograms were reviewed retrospectively against a predefined data collection checklist based on national partogram standards and NICE intrapartum care guidelines [13]. For each partogram component, documentation was assessed as either "complete and accurate" (legibly documented) or "incomplete/absent". Results were expressed as the percentage of partograms in which each component was satisfactorily recorded.

For variables that were not applicable to every labour, such as oxytocin administration, time of full dilatation, and time of commencing pushing—the denominator for each percentage was restricted to the number of women for whom the variable was clinically applicable (e.g. women who received oxytocin augmentation, or who reached the second stage of labour).

3.3. Intervention

Following analysis of the pre-intervention data, a multifaceted quality-improvement intervention was designed to address the identified gaps, drawing on evidence-based strategies from the literature on partogram compliance [14] [15] [16]. The intervention comprised the following components:

Clinical meeting: A dedicated meeting was arranged with doctors, midwives, and nurses. Audit findings were presented and discussed openly, and the clinical importance of accurate and timely partogram maintenance was emphasized. Staff were encouraged to share the practical challenges they faced, which included time constraints, uncertainty about specific documentation requirements, difficulty extracting information from incomplete vaginal examination records, and staffing pressures.

Educational session: A structured teaching session on partogram completion was delivered to midwives, nurses, and junior doctors. The session covered the clinical rationale behind each component and the correct technique for assessing and recording foetal descent, position, caput, and moulding. The importance of these parameters in detecting obstructed labour and guiding delivery decisions

was emphasized [18].

Vaginal examination rubber stamp: A recurring theme in the pre-intervention data was that partogram entries for position, caput, moulding, and abdominal descent were missing primarily because the underlying vaginal examination had not been comprehensively documented in the bed-head ticket. To address this at source, a rubber stamp incorporating all components of the vaginal examination—cervical dilatation, effacement, position, station, caput, moulding, and management plan—was introduced. The stamp serves as a systematic prompt for the examining clinician, and the recorded findings can then be transcribed directly onto the partogram by the nursing team. The use of structured documentation tools to improve clinical record-keeping has been described in a number of quality-improvement studies [19] [20].

Random partogram checks and feedback: Unannounced spot checks of partograms in progress were introduced, with immediate verbal feedback to staff. This reinforced the teaching and created a culture of accountability around documentation quality. Regular audit and feedback are recognized as one of the most effective strategies for improving clinical documentation practices [21].

3.4. Post-Intervention Data Collection

Three months after the intervention, a further 100 bed-head tickets of women admitted to the labour room in active labour were retrieved and assessed using the same data collection instrument, covering a month of audit period in November 2023 and applying the consecutive sampling and exclusion procedure described in Section 3.2. Results were compared with pre-intervention data to quantify the impact of the intervention. A three-month interval was chosen to allow adequate time for behaviour change while remaining within the audit cycle recommended for clinical quality-improvement projects [22].

3.5. Statistical Analysis

Data were entered and summarised as percentages for each partogram component in the pre- and post-intervention samples. For each component, the difference between the pre- and post-intervention proportions was tested using a two-proportion z-test and the difference in proportions was calculated with a 95% confidence interval. A two-sided p-value of less than 0.05 was considered statistically significant. Baseline characteristics of the pre- and post-intervention samples (Section 4.1) were compared descriptively.

4. Results

4.1. Baseline Comparability of the Pre and Post Intervention Samples

Because the pre- and post-intervention samples were drawn three months apart rather than being concurrent or randomized, the two groups were compared on key clinical characteristics available from the bed-head tickets to assess compara-

bility (Table 2).

Table 2. Baseline comparability of the pre- and post-intervention audit samples.

Characteristic	Pre-intervention (n = 100)	Post-intervention (n = 100)
Primipara	33%	39%
Multipara	67%	61%
Induction of labour	43%	41%
Augmentation with oxytocin	83%	79%
Went into second stage of labour	71%	75%
Delivered by vaginal delivery	62%	66%
Delivered by instrumental delivery	7%	6%
Delivered by caesarean section	31%	28%

4.2. Pre-Intervention Findings

The pre-intervention review revealed a mixed picture. Basic patient information was largely well recorded: name, BHT number, parity, and time of vaginal examination were documented in 100% of partograms; age and blood group in 97% and 95%, respectively. Gravida was recorded in only 77% of records. Special instructions—the most actionable component of this section—appeared in only 26% (14/53 women for whom it is applicable) of partograms, a particularly concerning gap given their role in communicating critical clinical decisions to the entire team.

Core labour monitoring parameters were satisfactory. Cervical dilatation was recorded in 97%, foetal heart rate in 97%, and contraction-free interval in 94% of partograms. Maternal vital signs (pulse, blood pressure, and temperature) were uniformly documented at 100%.

The most striking deficiencies were in the parameters derived from vaginal examination. Abdominal descent was recorded in only 27%, foetal position in 34%, caput in 26%, and moulding in just 14% of partograms. Without reliable documentation of these parameters, it is not possible to diagnose obstructed labour, assess the likelihood of vaginal delivery, or make safe decisions about the timing and mode of delivery [18] [23].

Alert line documentation stood at 84%, time of commencing pushing at 32% (23/71 women for whom the variable was applicable), oxytocin dose and drop rate at 43% (36/83 women who received oxytocin), and action line documentation at 78%. These gaps in decision-line documentation represent a significant patient safety concern, as critical moments in labour management were going unrecorded [24].

4.3. Post-Intervention Findings

The re-audit demonstrated clear improvements across almost all partogram do-

mains. Table 3 presents the full comparison together with the absolute percentage-point change, 95% confidence interval, and p-value for each component. The most dramatic gains were in parameters that had been most deficient: moulding improved from 14% to 71%, caput from 26% to 75%, abdominal descent from 27% to 68%, and foetal position from 34% to 74%. Special instructions documentation improved from 26% to 76% (39/51 women for whom it is applicable), time of commencing pushing from 32% to 72% (54/75 women for whom the variable was applicable), and oxytocin dose and drop rate from 43% to 78% (62/79 women who received oxytocin).

Parameters already satisfactory in the pre-intervention were maintained or improved marginally. Maternal vital signs, time of vaginal examination, and BHT documentation remained at 100%. Gravida improved from 77% to 95%, and time of full dilatation from 81% to 100%.

Table 3. Comparison of partogram documentation rates before and after intervention, difference and p-value.

Partogram Component	Pre-Intervention (%)	Post-Intervention (%)	Difference (95% CI)	p-value
Basic Patient Information				
Name	100%	100%	-	-
Age	97%	**100%**	3 (−0.3 to 63)	0.081
BHT number	100%	100%	-	-
Gravida	77%	**95%**	18 (8.7 to 27.3)	<0.001
Parity	100%	100%	-	-
Blood group	95%	**100%**	5 (0.7 to 9.3)	0.024
Date and time	84%	**96%**	12 (3.9 to 20.1)	0.005
Special problems	70%	**90%**	20 (4 to 36.7)	0.017
Special instructions	26%	**76%**	50 (33.7 to 66.5)	<0.001
Labour Progress				
Time of vaginal examination	100%	100%	-	-
Cervical dilatation	97%	**99%**	+2 (−1.9 to 5.9)	0.312
Abdominal descent	27%	**68%**	+41 (28.4 to 53.6)	<0.001
Vaginal descent	84%	**94%**	+10 (1.4 to 18.6)	0.024
Position of the presenting part	34%	**74%**	+40 (27.3 to 52.7)	<0.001
Liquor colour	79%	**86%**	+7 (−3.5 to 17.5)	0.193
Caput	26%	**75%**	+49 (36.9 to 61.1)	<0.001
Moulding	14%	**71%**	+57 (45.8 to 68.2)	<0.001
Fetal and Uterine Monitoring				
Fetal heart rate	97%	**98%**	+1 (−3.3 to 5.3)	0.651
Contraction-free interval	94%	**97%**	+3 (−2.7 to 8.7)	0.306
Maternal Observations				
Pulse	100%	100%	—	—

Continued

Blood pressure	100%	100%	—	—
Temperature	100%	100%	—	—
Second Stage and Interventions				
Time of full dilatation	81%	**100%**	19 (9.2 to 27.4)	<0.001
Time of commencing pushing	32%	**72%**	40 (24.4 to 54.9)	<0.001
Oxytocin dose and drop rate	43%	**78%**	35 (20.4 to 49.6)	<0.001
Decision Lines				
Alert line documentation	84%	**94%**	+10 (1.4 to 18.6)	0.024
Action line documentation	78%	**94%**	+16 (6.6 to 25.4)	0.001

BHT: Bed-head ticket. Bold post-intervention values indicate improvement from the pre-intervention baseline.

5. Discussion

This audit demonstrates a pattern that will be familiar to labour ward teams in many settings: while the parameters that are most visible and routinely prioritized, such as vital signs, foetal heart rate auscultation, and cervical dilatation, were well maintained, the more subtle components of the partogram, particularly those derived from the vaginal examination, were documented poorly. This finding is consistent with reports from comparable settings across South Asia, sub-Saharan Africa, and Southeast Asia, where foetal position, moulding, and caput are among the most consistently not well-documented partogram parameters [10]-[12] [25].

Discussions with staff during the clinical meeting revealed that many had not received explicit guidance on what was required at each stage of labour documentation, and that time pressure during busy shifts led to selective recording of what seemed most urgent. This mirrors findings from a systematic review by Bedwell and colleagues, which identified inadequate training, poor supervision, and high workload as the dominant barriers to partogram completion across multiple low- and middle-income country settings [14]. A study from Tanzania similarly found that midwives' knowledge of partogram use was significantly associated with documentation quality, underscoring the potential for educational interventions to produce meaningful change [15].

The vaginal examination rubber stamp was the most impactful component of our intervention. Pre-intervention data made clear that partogram parameters for position, caput, moulding, and abdominal descent were incomplete, primarily because the underlying vaginal examination was not fully documented. By introducing a structured prompt at the point of examination, we addressed this problem at its source rather than relying on staff to remember every component under pressure. Post-intervention improvements in these parameters—position from 34% to 74%, caput from 26% to 75%, moulding from 14% to 71%, provide strong evidence that simple, low-cost structural interventions can produce rapid and substantial gains in documentation quality.

However, because the interventions were delivered as a single bundle comprising the clinical meeting, educational session, rubber stamp, and random checks

together, it is not possible to attribute the observed improvement to the rubber stamp, or to any other single component, in isolation. The particularly large gains in exactly the parameters targeted by the stamp (position, caput, moulding, and abdominal descent) are suggestive of its contribution, but a component-wise evaluation, such as phased or stepped introduction of each element, would be needed to confirm this. The use of pre-printed proforma tools and structured checklists to reduce omission errors in clinical documentation is well described in the quality improvement literature and aligns with broader principles of human factors design in healthcare [19] [20] [26].

The alert and action line improvement deserves particular attention. The alert line is the early warning signal of the partogram. When cervical progress crosses it, the team should heighten surveillance and consider whether augmentation or escalation is warranted. Zewdu and colleagues, in a study from Ethiopia, found alert line documentation among the weakest aspects of partogram maintenance and noted its association with delayed identification of labour arrest [25]. Bringing alert line and action line to 94% post-intervention is one of the most reassuring outcomes of this audit.

Despite the substantial gains achieved, several components remain below optimal thresholds: abdominal descent (68%), position (74%), caput (75%), moulding (71%), and special instructions (76%). These residual gaps are understandable given that the intervention was only three months old at the time of re-audit and that sustainable behaviour change requires time, repeated reinforcement, and integration into routine culture. However, they are not trivial. Incomplete abdominal descent documentation may delay recognition of cephalopelvic disproportion or malpresentation; incomplete caput and moulding records may mask early signs of obstructed labour [18] [23]. Continued investment in these parameters is therefore a patient safety priority.

The time interval of three months chosen for re-audit reflects standard practice in clinical audit cycles and is consistent with guidance from the Healthcare Quality Improvement Partnership, which recommends re-audit within three to six months of an intervention to capture early effects [22]. However, it is important to acknowledge that documentation improvements seen at three months may not be fully sustained in the longer term without ongoing reinforcement. A further re-audit at six to twelve months would be valuable to determine whether the gains have been consolidated or have regressed.

Looking forward, sustaining these improvements will require systematic rather than ad hoc effort. Senior clinician review of partograms during each shift, not only when things go wrong, would provide real-time supervision and reinforcement of standards. Incorporating partogram documentation into regular in-service training programmes would ensure that newly appointed staff receive the same grounding as those who attended the intervention session.

6. Limitation

This audit has several limitations that should be considered when interpreting the

findings. First, it was conducted in a single professorial unit at a single tertiary centre; local factors such as staffing levels, existing documentation culture, and case distribution may limit the generalisability of these findings to other units, particularly smaller or non-teaching hospitals.

Second, the post-intervention re-audit was performed only three months after the intervention; this short follow-up period demonstrates that change is achievable in the short term but cannot establish whether the improvements are sustained, and a longer-term re-audit would be needed to confirm durability.

Third, as this was a retrospective audit of completeness, an improvement in the proportion of partogram fields completed does not necessarily equate to an improvement in the underlying quality of clinical decision-making or maternal and neonatal outcomes; documentation and care quality are related, but not interchangeable.

Fourth, because the intervention was delivered as a single multi-component bundle, the relative contribution of its individual elements (the clinical meeting, educational session, rubber stamp, and spot checks) cannot be separated, as discussed above.

Finally, the pre- and post-intervention samples, while both consecutively selected and of equal size, were not concurrent, and although no major changes in unit staffing or case distribution were noted over the three-month interval, residual differences in patient characteristics between the two samples cannot be entirely excluded.

7. Conclusions

This audit demonstrates that while the core elements of the partogram, such as patient identification, maternal vital signs, foetal heart rate monitoring, and cervical dilatation, were well-maintained, several critical parameters related to labour progression and clinical decision-making were initially poorly documented. The deficiencies identified were significant and remediable. A focused, multi-component intervention comprising a staff educational meeting, a structured vaginal examination rubber stamp, and random partogram check produced substantial improvements within three months, although, this effect cannot be attributed to any single component with certainty due to the bundled design of the interventions.

Partogram documentation quality is not a fixed property of a unit but something that can be actively shaped through targeted, practical intervention. What is required is the willingness to look honestly at current practice, the commitment to address its shortcomings, and the persistence to sustain the changes over time. Continued periodic auditing, staff education, senior supervision, and reinforcement of national guidelines are essential to ensuring safe, high-quality intrapartum care for every woman in active labour.

Ethical Approval

This study was a clinical audit of existing practice and did not involve any changes

to patient management or collection of identifiable patient data beyond routine clinical records. Formal ethical committee review was therefore not required under institutional guidelines. Institutional permission was obtained from the Director of De Soysa Hospital for Women.

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Conflicts of Interest

The authors declare no conflicts of interest.

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