

# Evolution of the Quality of the Partogram in 96 Health Care Facilities of 3 Provincial Health Divisions in the Democratic Republic of the Congo

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## Abstract

The partogram is an accurate labor monitoring tool for reducing maternal and perinatal mortality due to prolonged labor and dystocia. The aim of this study is to assess how the quality of the partogram has evolved in health care institutions (HCI in short) that have benefited from the primary health care support project (ASSP in short) after formative supervision. This is a descriptive study by periodic clinical audit between 2020 and 2022, carried out in 96 HCI in 3 provincial health divisions (DPS in short) of DR Congo. Each photographed partogram page was sent to the project's central level for review by a team of experts (3 obstetric gynecologists and 3 midwives). The compliance rate for completing partograms in the 96 health facilities of the 3 DPS was 86.8%. The rate of traceability of labor continuity was 88.2%, and that of traceability of acts, incidents and treatments during labor was 87.1%. Finally, the compliance rate for filling out partograms in the immediate post-partum period was 81%. A clear improvement was noted between the January 2020 and March 2022 assessments.

## Keywords

Partogram, Status Report, Quality, Maternal Health and Health Facilities

## 1. Introduction

In general, the majority of women give birth vaginally without complications. However, when complications arise during labor or delivery, they can lead to the death of the mother and/or the newborn [1]. This is a situation frequently en-

countered in low-resource countries [2]. Philpott and Castle [3] [4] in Zimbabwe (formerly Rhodesia) and Malawi experimented with a labor monitoring tool that reduced prolonged labor, maternal and perinatal mortality as well as cesarean sections rates in both countries. In the light of these encouraging results, the World Health Organization (WHO) drew on this work to develop an improved partogram with an alert line to draw the attention of healthcare professionals to increased vigilance, and a parallel action line 4 hours later to enable healthcare professionals to make a decision on the conduct of the delivery [1] [5]. The Democratic Republic of the Congo (DRC), one of the countries with one of the highest rates of maternal and perinatal mortality in the world, has adopted the WHO partogram for monitoring childbirth, but a number of constraints have been raised regarding its completion and use. Then, the aim of this study is therefore to assess how the quality of partograms has evolved in health care institutions (HCI in short) that have benefited from the Primary Health Care Support (ASSP in short) project, following formative supervision.

## 2. Methods

This is a descriptive study by clinical audit which was carried out 5 times in 40 health zones (ZS in short) of 3 provincial health divisions (DPS in short) of the DRC beneficiaries of the ASSP project: Nord Ubangi (11 ZS), Kasai (Kasai - Tshikapa, Kasai - Mweka 18 ZS) and Kasai Central (11 ZS) between September 2019 and March 2022 and which aimed to improve the quality of care offered by 96 randomly selected health care facilities (*ESS*) in these DPS. In each DPS, 5 partograms were randomly selected from the partograms of women who had been monitored during labor in the DPS and who had given birth vaginally, and only one was used to assess filling compliance. Interviewers received training followed by a pre-test on the conduct of data collection in the field. They were provided with tablets for taking photos of these partograms by respecting the following instructions: turn on the device and choose the photo application, increase the brightness of the smartphone or tablet as much as possible, turn your back to the sun to avoid backlighting, point the camera lens of the phone at the partogram page, place the phone or tablet horizontally parallel to the partogram sheet to be captured, center the image of the partogram sheet on the phone's full screen to avoid cutting off parts of the sheet when taking the photo, stand still for 15 seconds to automatically adjust the sharpness of the image, snap the photo without tilting for a good image capture, take another photo of the same page, retain the image that is clearer and sharper, and delete the bad images. These images were transferred to Kinshasa by internet, where a team of 3 obstetricians and gynecologists, and 3 midwives examined the compliance of all these partograms using an appropriate evaluation grid adapted to the ANAES 2000 referential [6] developed by the Programme National de Santé de la Reproduction (PNSR in short) [*National Programme for Reproduction Health*] comprising 92 criteria in accordance with the DRC partogram. Data

from each partogram were grouped on a Microsoft Excel 2016 sheet and exported to SPSS 22.0 software for analysis. Each compliant criterion was scored 1 and 0 for the non-compliant criterion. The criterion that did not apply for a given situation was given a NA rating. The compliance rate for each variable was calculated by adding all 1's divided by all 1's and 0's eventually subtracted by the number of NA multiplied by 100. A compliance rate of 80% was considered excellent.

### 3. Results

#### 3.1. Conformity of Partogram Presentation

The identity of the parturient was noted in almost all files (98% - 100%), the reporting rate for reasons for consultation remained high (90.8% - 97.9%), as did obstetrical history (88.8% - 100%), time and date of admission (88.8% - 100%), time and date of labor onset (82.7% - 94.5%), information from the first clinical examination of the parturient on admission (87.9% - 100%), conclusion of the first clinical examination of the parturient (81.6% - 99%), with a clear improvement on the initial assessment except for the prognosis for vaginal delivery (97.3% - 96.8% or 89.3%).

Concerning the partogram as a whole, completion of all parts of the partogram improved markedly from 51% to 89%. The partogram respected the hourly rhythm of monitoring the woman during labor in 41% initially, rising to 89% at the last assessment; the partogram enabled the precise date and time of each act, examination and/or incident to be found in 49.9% at the start of the assessment, compared with 83.8% at the last assessment; the names of the providers involved in the delivery process were found in over 80% of partograms, with an overall improvement over the course of the supervisions (**Table 1**).

#### 3.2. Conformity of Partogram Completion during the Latent and Active Phases

All the criteria for filling in the partogram during the latent and active phases have improved significantly, except for the annotation of Fetal heart rate during the active phase 1. From all these criteria, the reporting of the date and time of membranes rupture, the search for cervical edema, the reporting of cervical dilatation during the latent phase and the linking of dilatations during the active phase by a line remained below 80%, despite a clear improvement compared with the initial period (**Table 2**).

#### 3.3. Compliance with Completion of Delivery, Newborn and Immediate Postpartum Information in the Partogram

All childbirth and newborn criteria were filled in excellently, except for perineal status (64.7%), newborn height measurement (69.6%) and head circumference measurement (58.5%), although there was a steady improvement over the course of supervisions (**Table 3**).

**Table 1.** Conformity of partogram presentation.

Criteria	Evaluation periods				
	January 2020 (%)	July 2020 (%)	February 2021 (%)	August 2021 (%)	March 2022 (%)
The identity of the parturient is noted.	98	100	100	99	99
Reason for consultation noted.	90.8	96.7	96.7	94.8	97.9
Obstetrical history noted or commented on.	88.8	94.2	100	96.9	94.7
Date and time of parturient's admission noted.	88.8	94.3	100	96.9	97.9
Date and time of labor onset noted.	82.7	94.3	94.5	93.8	91.6
Information from the parturient's first clinical examination on admission is noted.	87.9	97.5	100	95.8	100
Fundal height is noted.	86	97.6	96.7	94.6	100
Fetal presentation is noted.	87.8	95.6	95.6	96.9	99
Fetal position is noted at least once.	56.1	84.1	91.1	96.9	83.3
The level of presentation engagement on admission is noted.	62.2	56.6	93	96.9	93.7
The pelvis assessment is noted.	70.4	89.4	96.6	96.9	96.9
The conclusion of the first clinical examination of the parturient is noted.	81.6	93.4	96.3	95.8	99
The prognosis for vaginal delivery is noted.	97.3	89.3	95.4	96.8	96.9
All sections of the partogram (according to stage of labor on admission, through to postpartum) are completed.	51	70.2	87.6	84.4	89
Completion of the partogram follows the hourly rhythm of monitoring the woman in labor.	41	75	69.9	83.3	89
The partogram makes it possible to record the precise date and time of each procedure, examination and/or incident.	49.9	63.2	73.3	84.4	83.8
The name(s) of the care provider(s) involved can be found on the partogram.	81.6	92.6	98.9	94.6	82.5

**Table 2.** Compliance with partogram completion on admission and traceability and continuity of labor during the latent and active phases.

Criteria	Evaluation periods				
	January 2020 (%)	July 2020 (%)	February 2021 (%)	August 2021 (%)	March 2022 (%)
The level of presentation engagement is noted at each examination.	23.5	56.6	73	79.2	84.2
Fetal heart rate (FHR) is noted at each reassessment during the latent phase.	11.2	59.3	63.6	3.1	0
FHR is noted at each reassessment during the active phase.	48	76.7	85.2	91.7	91.1
FHR annotations are linked by a curve.	36.7	64.9	78.9	72.9	80.3
Evaluation of contractions is noted at each examination: during the latent phase.	7.1	48	57.1	1	100
During the active phase.	42.9	76.3	87.8	88.5	95.2

**Continued**

The status of the water sac on admission is noted.	79.6	95	96.6	96.9	97.9
The state of the membranes is noted at each examination until rupture of the membranes.	33.7	78.5	87	78.1	97.3
The date and time of membrane rupture are noted.	43.9	69.3	72.4	65.6	78.5
The appearance of the amniotic fluid is noted on admission or at rupture.	45.9	78.1	86.3	88.5	93.2
The appearance of the amniotic fluid is noted at each examination.	26	78.1	75	71.9	93.3
Cervical length (effacement) on admission is noted.	-	-	97.8	97.9	96.9
Cervical dilatation on admission is noted.	86.7	92.6	98.9	96.9	96.9
The search for cervical edema is recorded.	8.2	0	49.4	44.8	51
Cervical dilatation is noted at each examination: during the latent phase.	10.2	62.2	80	1	50
During the active phase.	58.2	78.4	89.5	90.6	93
The dilation annotations are linked by a curve during the active phase.	42.9	51	69.8	68.8	73.2
The time of complete dilation is noted.	0	0	83.7	87.5	89.4

### 3.4. Compliance of Immediate Postpartum Monitoring Information

In general, postpartum monitoring was excellent at the end of the evaluation period, except for the treatment received by the mother postpartum and by the newborn after birth in occurrence the name of the drug (74.6% vs 54.7%), the dosage (51.4% vs 41.9%) and the route of administration (33.3% vs 35.1%) although filling improved during the different supervision periods (**Table 4**).

## 4. Discussion

The overall analysis at the end of these audits shows a global improvement in the compliance rate of partograms in some *ESS* compared with previous assessments. Nevertheless, this improvement is disparate when examined criterion by criterion. Indeed, some improved, others regressed and several remained stable and excellent. Concerning the partogram presentation, all criteria were excellent at the end of the supervision period. This rate is higher than those reported by Limam *et al.* [7] in Tunisia and by Mwembo-Tambwe *et al.* [8] in Lubumbashi. This is justified by the regular supervisions organized in these *ESS*. Indeed, African studies [9] [10] [11] [12] have shown that on-the-job training increases the knowledge, attitude and skills of healthcare providers in the use of the partogram. The fact that some criteria have regressed may be explained by a lack of motivation, as some providers working in these areas are not yet paid by the government. All the criteria for completing the partogram during the latent and active phases improved significantly, except for the annotation of Fetal heart rate during the active phase 1. From all these criteria, the reporting of the date and time of membranes rupture, the search for cervical edema, the reporting of cervical dilatation during the latent phase and the linking of dilatations during the

**Table 3.** Completeness of information on delivery, newborn and immediate postpartum in the partogram.

Criteria	Evaluation periods				
	January 2020 (%)	July 2020 (%)	February 2021 (%)	August 2021 (%)	March 2022 (%)
Time of delivery noted.	72.4	95	97.8	96.9	95.6
Mode of delivery (normal, instrumental extraction, Caesarean section) is noted.	75.5	92.4	93.3	93.6	95.7
Any indication for instrumental extraction, Caesarean section or other intervention is noted.	7.1	12.5	40	10.4	81
Performance of the 3 AMTSL ( <i>GATPA</i> ) gestures is documented: oxytocin 10 IU IM.	68.4	89.7	94.4	96.9	98.9
Controlled traction.	70.4	88.8	93.3	96.9	98.9
Uterine massage after delivery.	70.4	88.8	88.8	92.7	97.8
The time of delivery is noted.	70.4	88.8	97.8	94.8	96.7
Mode of delivery (spontaneous or artificial) is noted.	70.4	87.2	94.4	89.6	91.3
The condition of the placenta and membranes is noted.	71.4	87.3	95.6	95.8	95.7
Assessment of the extent of haemorrhage is noted.	61.2	82.9	95.5	96.9	96.7
The state of the perineum is noted.	43.9	59.3	60.7	58.3	64.7
The date and time of birth are noted.	79.6	96.7	98.9	96.9	97.8
The baby's gender is noted.	78.6	93.2	96.7	95.8	97.8
Baby's birth weight is noted.	60.2	82.9	87.8	86.5	87.8
Baby's height at birth is noted.	22.4	40.7	51.1	56.3	69.6
Baby's head circumference at birth is recorded.	13.3	24.6	37.9	46.9	58.5
Apgar at birth is recorded at 1, 5 and 10 minutes.	72.4	90.9	97.7	96.9	97.8
Resuscitation of the baby at birth is documented, if performed.	2	41.7	100	22.9	87.1
The way in which the partogram is completed enables a clear interpretation of the way in which labor has progressed.	54.1	66.2	77.9	87.5	86.7

active phase by a line remained below 80%, despite a clear improvement compared with the initial period (**Table 2**). Generally speaking, labor monitoring during the latent phase is poorer than during the active phase. This may be due to the fact that labor progresses too slowly, requiring hourly assessments that some health care providers find excessive, especially as for some women this phase can be extremely long. This is why the WHO [1] has decided to dispense with these latter partograms.

As far as the active phase is concerned, the majority of criteria were met in an excellent manner. Our results are superior to those reported in Lubumbashi by Mwembo-Tambwe *et al.* [8] and by Limam *et al.* [7] in Tunis. The effects of the different formative supervisions may explain these differences, especially as the rates are comparable with those at the start of our program. In our study, all

**Table 4.** Compliance of information in the immediate postpartum period monitoring.

Criteria	Evaluation periods				
	January 2020 (%)	July 2020 (%)	February 2021 (%)	August 2021 (%)	March 2022 (%)
Mother's general condition is noted at least once.	30.6	63	93.5	96.9	98.9
The mother's vital signs are noted on admission: Temperature.	30.6	63	96.7	96.9	99
Pulse.	31.6	62.2	96.7	94.8	95.8
blood pressure.	29.6	58.3	93.3	95.8	96.9
The mother's vital signs are noted at each examination: Temperature.	31.6	63	88.9	90.6	97.6
Pulse.	31.6	62.2	86.4	86.5	96.4
Blood pressure.	31.6	58.3	87.7	89.6	97.6
The precise time is noted for any examination, procedure/treatment or incident.	63.3	67.1	77.5	89.6	88
For any treatment administered: the name of the product is clearly noted.	15.3	39.4	81.7	62.5	74.6
Route of administration noted.	15.3	40	50	33.3	33.3
Dosage is noted.	4.1	24.1	47.9	35.4	51.4
For each examination, the annotation of the examination time corresponds to the time elapsed since the last examination recorded on the partogram.	50.3	67.2	75.3	78.1	88.7
The partogram is used to record decisions made on the basis of the progress of labor.	23.4	49.6	75	67.7	88.7
Monitoring of the mother's vital signs is recorded every 15' for the first 2 hours: blood pressure.	31.6	59.5	81.1	93.8	95.8
Pulse.	31.6	59.5	82.2	90.6	94.8
Temperature.	31.6	59.5	82.2	93.8	95.8
Breathing.	31.6	59.5	83.3	93.8	93.8
Consciousness.	31.6	59.5	82.2	93.8	93.8
Assessment of the "safety" globe is recorded every 15' for the first 2 hours.	31.6	59.5	80.9	92.7	95.8
Assessment of blood loss volume is recorded every 15' for the first 2 hours.	31.6	59.5	84.4	91.7	99
Newborn monitoring elements are recorded every 15' for the first 2 hours: breathing.	29.6	61.7	85.4	90.6	94.8
Coloration.	29.6	61.7	84.3	91.7	95.8
Axillary temperature.	28.6	62.7	84.4	88.5	93.8
Looking for danger signs.	24.5	58.6	76.7	91.7	94.8
For any treatment: Time of administration.	63.3	24.5	49.3	40.6	56.6
The name of the product is clearly noted.	133	43	63	69.8	54.7
Route of administration noted	7.1	24.1	23	19.8	35.1
Dosage noted.	8.2	26.2	28.8	29.2	41.9

criteria relating to delivery and the newborn were fulfilled to an excellent standard, with the exception of perineal condition (64.7%), measurement of newborn height (69.6%) and measurement of head circumference (58.5%), although a steady improvement was observed over the course of supervisions (**Table 3**). Our results are in line with those of Limam *et al.* [7] in Tunis, who show that very often the criteria relating to childbirth are well rated, probably because this is the period when care providers are most mobilized around the mother and newborn.

In the postpartum period, all criteria were excellent, except for the name of the drug (74.6% vs. 54.7%), the dosage (51.4% vs. 41.9%) and the route of administration (33.3% vs. 35.1%), although completion improved during the different supervisions periods. The same findings were made by Mwembo-Tambwe *et al.* [8] in Lubumbashi. This may be due to the insufficient number of providers in some maternity units, but also to the lack of internal auditing of the quality of intrapartum and postpartum care in *ESS*.

## 5. Conclusion

These evaluations have shown an improvement in the completion of the partogram over time, even if not all information is always recorded in the various sections of the partogram. This improvement is largely attributable to formative supervisions. The various shortcomings identified in the analysis of individual sections should be brought to the attention of supervisors and trainers, so that they can place greater emphasis on problematic sections to ensure correct completion of the partogram as a whole in future supervisions and training courses on the partogram.

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## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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