

15. COMPLETING THE PARTOGRAPH AND FOLLOWING THE PROTOCOL

15.1 Summary

All partographs were screened for accuracy of completion and protocol adherence by WHO staff in Geneva. In the great majority of cases, the partograph was correctly completed and examinations performed at recommended intervals. The errors noted did not, in most cases, have major implications for labour management. Particularly critical features were the correct commencement of the partograph following the criteria laid down for the diagnosis of labour and the importance of an assessment of cervical dilatation 8 hours after admission in the latent phase.

The labour management protocol was applied appropriately in 93.0% of women from the normal group. Where (due to complications) appropriate deviation (2.5%) from the protocol took place, operative delivery rates were high. In 4.3% of cases, deviation appeared to be inappropriate. Operative delivery rates in these cases were also raised, though to a lesser extent than where deviation was appropriate. The inappropriate deviation may in itself have contributed to the increased interventions.

The partograph was embraced enthusiastically by all labour ward staff and no design alterations were recommended. Particular advantages included better use of resources, improved communication between all staff and students in the maternity care team, better counselling of women, and improved bonding between mother and neonate as well as the objective improvements reported elsewhere in this report.

15.2 Introduction

For most centres, graphically recording the progress of labour on a partograph was a new experience; for all centres using a partograph to indicate the appropriate timing of interventions in labour was entirely novel. It was, therefore, important to assess the accuracy with which partographs were completed and the diligence with which the recommended labour management protocol was followed. The results of the study could be invalidated if there were major difficulties in either area and any recommendations concerning worldwide promotion of the WHO partograph might require modification if there were problems in accurately completing the partograph.

As described in Chapter 2, all partographs were returned to WHO headquarters in Geneva and scrutinised for accuracy of completion and for compliance with the agreed management protocol. This chapter presents the results of that scrutiny together with a summary of subjective comments on the partograph and its use made by participants in the study.

15.3 Completing the Partograph

Table 15.1 indicates the most frequent faults noted in completing the partograph. In most cases (91.7%) the partograph was correctly completed throughout. The commonest faults were failure to record the fetal heart rate at satisfactory intervals, if at all (3.7% of cases), and incorrect recording of fetal head descent (1.8%). The number of errors in other elements were too few to merit individual inclusion but altogether comprised 2.4% of cases. As inappropriate completion of the partograph in the latent phase affected the further plotting and assessment of the whole partograph, errors in the latent phase were, however, noted separately. There were

major errors in only 0.7% of partographs although the majority of partographs did not include a latent phase.

At each centre, after the initial intensive week of teaching with the help of a WHO consultant at the time of implementation of the partograph, there were later visits by the WHO Study Coordinator (BEK). The impression was gained that the number of faults in completion of partographs decreased as the study progressed and the participants became more familiar with the partograph.

15.4 Frequency of Vaginal Examinations

The agreed protocol for labour management using the partograph included the recommendation that vaginal examinations should be performed every 4 hours unless membranes ruptured spontaneously or complications developed or labour was advanced (see Chapter 2). For many centres, performing vaginal examinations (VEs) at intervals of 4 hours required a change of practice. Before the implementation of the partograph several centres performed VEs more frequently than every 4 hours and it has already been noted (see Chapter 4) that there was a reduction in the number of VEs performed in labour after introduction of the partograph. The frequency of VEs on the partograph was reviewed by WHO staff in Geneva. In some cases, such as when complications developed, a change in the frequency of vaginal examination was clearly justified but, in other cases, there was no apparent justification for the change. Deviations from the recommended frequency were examined separately in the latent and the active phases. The results of this assessment are shown in Table 15.2. Most VEs were performed at the correct interval, but in 5.6% of cases in the latent phase and 4.1% of cases in the active phase the change in interval was considered unjustified. The frequency of this fault also appeared to decrease as the study progressed.

A particularly critical vaginal examination proved to be that performed 8 hours after admission in the latent phase so that a prolonged latent phase could be identified. There should be no flexibility about the timing of this vaginal examination. This is further discussed in the commentary.

15.5 Following the Protocol

In studying the partographs and associated labour management, deviations from the agreed management protocol could be recognised. In certain cases, the reasons for the deviation was recorded by the principal investigator at each centre or the reason was apparent from a study of the case. In these cases, the deviation was termed "appropriate". Where no reason was apparent, the deviation was termed "inappropriate". The management protocol most specifically applies to the "normal" group defined in Chapter 4 and only this group is studied here.

Of the 863 correctly completed and assessable partographs in this group, the protocol was accurately followed in 8151 (93.0%). Of the remaining 612 (7.0%), deviation from the protocol was assessed as appropriate in 231 (2.6% of all cases studied) and inappropriate in 381 (4.3%). The deviations could be further divided into those occurring in the latent or active phase of labour. There were 127 cases where deviations occurred in the latent phase, comprising 5.3% of all "normal" women with a latent phase; 52 of these were appropriate and 75 inappropriate. In the active phase, deviations occurred in 485 cases (5.6% of all "normal" women with an active phase); 179 were appropriate and 306 inappropriate.

The outcome of labour dependent on adherence to the labour management protocol is presented in Table 15.3. As previously discussed in Chapter 4, neonatal deaths were too inaccurately recorded for any conclusions to be drawn; intrapartum stillbirths in this group were also too few to be of significance. No significant conclusions can be drawn from the few babies with low 1-minute Apgar scores.

The best results in terms of lowest caesarean section rates were achieved when the protocol could be adhered to throughout. Operative delivery rates rose with deviation from the protocol. Many of these cases, however, developed complications, such as fetal distress, where it would clearly be appropriate to depart from the protocol. When there was inappropriate protocol deviation, operative delivery rates tended to be lower than when the deviation was appropriate. Appropriate deviation tended to occur in cases developing complications and the highest operative delivery rate would be expected in this group. Inappropriate deviation often took the form of unnecessary interventions (e.g. oxytocin augmentation) in uncomplicated cases. This would reduce the incidence of operative delivery in these cases. Conversely, delayed intervention when indicated (such as failure to perform any action at the action line) also occurred. In some cases, a non-operative delivery may have resulted, whereas protocol management would have led to an earlier operative delivery. This did not necessarily mean that the failure to intervene was appropriate.

15.6 Subjective Impressions by Participants

After some inevitable initial teething difficulties, many caused as much by language interpretation difficulties as anything else, doctors and midwives in all the participating centres embraced partography with enthusiasm. No new interventions were advocated and there were no difficulties encountered in performing procedures when indicated. The encouragement to perform earlier ARM than had hitherto been practised (especially in Indonesia) did cause some initial anxiety. This was to some extent counterbalanced by the less active management of labour which resulted from the implementation of the partograph in the Malaysian and Thai centres which had previously practised very early intervention with both ARM and oxytocin augmentation.

The most frequent difficulty encountered was that of the decision of when to start the partograph on women in early labour. Clear teaching of the agreed definition of labour (see Chapter 2) was important. Understanding of this increased as the study progressed and improved both the quality of the partographs and the enthusiasm for the method.

There were no strong arguments from the participants for significant alterations to the design of the WHO partograph. The words "latent phase" at the upper part of the cervicograph should be moved to the lower part to clarify to which part of the cervicograph they belong. In addition, the heavy line at 8 hours should not extend above 3 cm.

Difficulty was observed from time to time over the interpretation of a 3 cm VE after 8 hours, the cross for which sits at the beginning of the alert line, i.e. the start of the active phase. This also represents the top of the action line for the latent phase. Confusion sometimes arose at this point and careful teaching is needed.

The most positive points to emerge were the improved use of labour ward beds and of midwifery time. The criteria for starting partography based both on contraction frequency and cervical dilatation reduced the number of women waiting unnecessarily in early labour wards and freed midwives to concentrate on those women in established labour. The reduction in augmented labours also freed midwives to provide more personalised care to women in labour.

Medical and nursing staff, as well as the women themselves, welcomed the reduction in vaginal examinations.

Paediatricians appreciated the improved condition of neonates and midwives could effect more bonding between mothers and newborn.

Partography also improved comprehension of labour among midwives, medical students and resident medical staff. The quality of communication with consultant obstetricians was improved and management discussion and decisions became more rational.

15.7 Commentary

This chapter presents evidence that the partograph was embraced effectively and enthusiastically by the participating centres. This was expected as no partographic reports have described difficulty with use of the partograph provided teaching in its use is effective. Maternal and Child Health Aides have been taught effective use of a partograph,⁽¹⁴⁾ although difficulties have been experienced with its introduction into health centres.⁽¹⁶⁾ This further emphasises the need (discussed in Chapter 13) for further research into the use of the WHO partograph as a management and referral tool in peripheral centres.

The partograph was not correctly completed in all cases, but the quality of the partographs improved with familiarity as the study progressed. The faults noted in the completion of 8.3% of partographs were mostly minor with little bearing on the use of the partograph to aid labour management. All centres reported that the quality of labour observation improved with the introduction of the partograph. The 3.7% of cases where the fetal heart was inadequately recorded on the partograph probably represents a considerable improvement on the proportion of cases among whom fetal heart recording was poor before implementation of the partograph.

The overwhelming majority of cases (in the "normal" group) were managed according to the agreed protocol and this probably contributed to the excellent outcome. Where there was appropriate deviation from the protocol, complications had arisen which inevitably led to high intervention rates in this group. Inappropriate deviation occurred in only 4.3% of cases, many of these at an early stage of the study. This inappropriate deviation may have resulted in increased intervention rates, albeit lower than the understandably high rates when complications requiring appropriate deviation occurred.

No modifications to the design of the partograph were suggested other than the minor points described in Section 15.6. The critical importance of clear criteria for the diagnosis of labour and commencement of a partograph have been emphasised throughout this report. Partograph screening in Geneva also revealed the importance of an assessment of cervical dilatation 8 hours after admission in the latent phase. If this examination was delayed, difficulties arose in the use of the partograph once the active phase was reached as the alert and action lines could not be applied and appropriate management decisions were jeopardised. This was a particular problem early in the trial and was one of the main reasons for rejecting partographs as unassessable in the screening process.

To the participating centres, the positive attractions of partography far outweighed any criticism of the method. All centres elected to continue to use the partograph after the trial was completed and obstetricians in all three countries are extending the use of the device to many other centres. The overwhelming impression was of a simple technique which allows better use of labour ward resources and personnel, improves maternal neonatal outcome, and results

in improved bonding between mother and child. The importance of this has been emphasised elsewhere.⁽⁶⁰⁾

TABLE 15.1
ACCURACY OF PARTOGRAPH COMPLETION
(All centres)

Accuracy of partograph	No.	%
All elements correct	11 118	91.7
Latent phase only incorrectly recorded	49	0.4
Fetal heart inadequately recorded	449	3.7
Head descent incorrectly recorded	221	1.8
Other faults	286	2.4
Total partographs assessed	12 123	100.0

TABLE 15.2
ADHERENCE TO CORRECT FREQUENCY OF VAGINAL EXAMINATION
IN LABOUR ON PARTOGRAPH

Frequency of vaginal examination	In latent phase		In active phase	
	No.	%	No.	%
VEs performed at correct interval	3 245	91.2	10 896	92.9
Change in interval justified*	91	2.6	279	2.4
Change in interval not justified*	201	5.6	478	4.1
Plotting too faulty to assess	23	0.6	70	0.6
Total	3 560 ¹	100.0	11 723 ²	100.0

* See text for explanation.

¹ Total partographs with an assessable latent phase.

² Total partographs with an assessable active phase.

TABLE 15.3
FETAL OUTCOME AND MODE OF DELIVERY DEPENDENT ON ADHERENCE
TO LABOUR MANAGEMENT PROTOCOL

(Normal group, all centres)

Protocol management	Total ¹		Fetal outcome				Mode of delivery					
	No.	%.	Stillbirth	Neonatal death	Apgar <4	SVD	Operative vaginal	Caesarean section				
	No.	%	No.	%	No.	%	No.	%				
Correct protocol management throughout	8 151	100.0	3	0.1	40	0.5	7 215	88.5	717	8.8	209	2.6
Protocol deviation latent phase	52	100.0	0	0	0	0	44	84.6	6	11.5	2	3.8
- appropriate ²												
- inappropriate	75	100.0	0	0	0	0	64	85.3	9	12.0	2	2.7
Protocol deviation active phase	179	100.0	0	0	4	2.2	109	60.9	25	14.0	45	25.1
- appropriate												
- inappropriate	306	100.0	0	0	3	1.0	218	71.2	51	16.6	37	12.1

¹ Partograph not adequately assessable in 367 cases.

² These women either had no active phase or correct protocol management in the active phase.

16. BREECH LABOUR ON THE WHO PARTOGRAPH

16.1 Summary

There were 1740 singleton breech presentations in this trial. The total caesarean section rate among these women was 29.7% (nullipara 38.6%; multipara 23.4%). One quarter of all caesarean sections were elective.

Only 346 out of 816 women with a singleton breech after implementation had a partograph completed. The remaining women had either an elective or "immediate" caesarean section or were admitted in advanced labour. Despite this, similar overall improvements in labour and fetal outcome were achieved among breech presentations and cephalic presentations after implementation of the partograph. Labour duration and oxytocin usage fell and caesarean sections fell from 31.9% to 27.3% of deliveries. All of this drop occurred among multipara whose caesarean section rate fell from 27.1% to 19.3%. There was no change among nullipara. The fetal outcome was improved after implementation but throughout the trial the best fetal outcome was achieved when the mode of delivery for breech presentations was by caesarean section.

Labour on the partograph was slower among breech than among cephalic presentations. 24.9% of breech labours reached the referral zone (but no further) and 16.8% reached or moved beyond the action line. Parity had little influence on these rates. The caesarean section rate was 2.5% on or left of the alert line, 5.8% in the referral zone and 32.8% at or beyond the action line. Admission in the latent phase and nulliparity were both independently associated with an increased likelihood of caesarean section.

Artificial rupture of membranes (ARM) in the active phase of breech labour and the commencement of oxytocin if the action line was reached (or crossed) appeared to be appropriate and useful actions. The analysis suggests that the same labour management protocol used in cephalic presentation (Chapter 2) can be applied to a breech labour on the partograph.

In view of the improved fetal outcome with caesarean section delivery, careful consideration must always be given to this mode of delivery but, where labour is allowed to progress, the WHO Partograph is a useful management tool.

16.2 Introduction

The preceding chapters of this report have particularly concentrated on the identified "normal" group of women. The WHO Partograph was, however, used in all labouring women and the results presented in Chapter 4 suggested that there was an overall improvement in the outcome of labour with the introduction of the partograph regardless of the presence of risk factors. Controversy remains over the ideal mode of delivery and management of labour in breech presentation.^(57,58) The large numbers in this study provided an opportunity to evaluate the role of partography in the management of singleton breech labour. The numbers involved are first presented, followed by a description of the impact of the WHO Partograph on the outcome of breech labour and an analysis of the course of labour on the partograph and of the recommended protocol. The presentation of the results follows a similar pattern (but in abbreviated form) to those in Chapters 4, 6, 9, 10 and 14.

16.3 Breech Presentations and Labour

Of the 35 484 women, 1740 (4.9%) presented by the breech at the time of entry to the study. The distribution of these cases by parity, partograph, implementation, group (as defined in Chapter 4), mode of delivery, perinatal mortality and birth weight is shown in Table 16.1. The total caesarean section rate was 29.7%. Among nullipara, the total caesarean section rate was 38.6% (275/712), 67 (9.4%) of caesarean section being elective. The caesarean section rate for multipara was 23.4% (240/1024), 65 (6.3%) being elective.

16.4 The Impact of Partograph on the Outcome of Breech Labour

The impact of the introduction of the partograph on the outcome of labour was studied in the same way as in Chapter 4. All singleton vaginal breeches were studied together to ensure that a similar group before and after implementation was compared. In theory the group for whom a partograph could not be completed and those induced could have been eliminated from the comparison, leaving only those spontaneously labouring breeches who were eligible for partography. In practice, it was found that a significant number (113) of breeches in the high risk group after implementation did not have a partograph, usually (it appears) because a decision was made soon after admission for delivery by caesarean section. These cases should probably have fallen into the "excluded from partography" group but, by definition, this group only included those who were delivered by caesarean section within one hour of admission. If the caesarean section took place more than one hour after admission, they fell out with the "excluded from partography" group and were classified as in the high risk group and eligible for partography. As these cases inevitably had a high caesarean section rate this distorted (and potentially underestimated) the capacity of the partograph to modify intervention rates. The numbers of induced breech labours were small and it is uncertain whether all the cases were correctly categorised as inductions. To overcome these problems of definitions, the outcome among all singleton breech presentations before and after implementation of the partograph was studied in order to assess the overall impact of the introduction of the partograph.

The results are presented in a similar way to the tables in Chapter 4.

16.4.1 Labour duration, management and complications

Table 16.2 shows the impact of the introduction of the partograph among singleton breech presentation labours from the high risk group on the duration of labour, oxytocin usage, vaginal examinations, puerperal sepsis and postpartum haemorrhage. Tables 16.3 and 16.4 present the same information for nulliparous and parous breeches respectively. The results are very similar to those achieved among women from the normal group, as presented in Chapter 4. The mean length of labour was shortened (from 5.88 hours to 4.32 hours) with fewer labours lasting over 18 hours (down from 7.7% to 2.7%) and fewer vaginal examinations in labour (mean reduced from 1.54 to 1.26). Fewer labours were augmented (12.4% to 7.0%), and the mean duration of oxytocin usage fell from 4.44 to 3.96 hours. This was the one difference seen in the results compared to "normal" women among whom the duration of oxytocin use rose. Rates of postpartum haemorrhage and puerperal sepsis also fell. The observed changes occurred among both nulliparous and parous women (Tables 16.3 and 16.4).

16.4.2 Mode of delivery

When the mode of delivery is examined (Table 16.5), again the changes brought about by the introduction of the partograph were similar among breech labours to those among the

normal group studied in Chapter 4. The rate of vaginal breech delivery (spontaneous or assisted) rose from 67.0% to 72.3% while the rate of caesarean sections fell from 31.9% to 27.3%. When this analysis is made by parity groupings, it is seen that all of the reductions in caesarean sections occurred among parous women (27.1% to 19.3%). There was no change in the caesarean section rate among nulliparous women (38.5% before and 38.7% after implementation). It must be borne in mind that complications other than the breech presentation alone may have been present (unlike the defined "normal" group of women). Indeed (as is discussed later in this chapter), only 346 women with a singleton breech presentation after implementation of the partograph actually had a partograph completed (42.4% of all singleton breeches after implementation). Of all the caesarean sections performed for breech presentation, 132 were carried out electively (25.5% of all singleton breech presentation caesarean sections).

16.4.3 Fetal outcome

The fetal outcome improved after implementation of the partograph (Table 16.6). As previously discussed (Chapter 4), neonatal deaths were certainly under-reported and little attention should be paid to the figures. Intrapartum stillbirths fell from 1.7% to 1.0%, there were fewer Apgars <4 (7.0% to 5.7%) and fewer infants required ventilation (4.9% to 3.8%) and admission to a neonatal special care nursery (24.8% to 20.0%) or intensive care unit (1.2% to 0.7%). Tables 16.7 and 16.8 make the same comparisons among nulliparous and multiparous women. The same trends (i.e. slightly improved fetal outcome) are apparent with the exception of a small rise in babies with Apgars <4 at 1 minute among nullipara after implementation of the partograph (6.0% to 6.7%), offset by a greater fall in severely asphyxiated babies born to multipara (7.7% to 5.0%).

In view of this slightly improved fetal outcome in conjunction with a small reduction in caesarean sections (at least among parous women), it is worth noting that there was no change in the mean birth weight after implementation; indeed there was a small (non-significant) rise of birth weight among parous women.

16.4.4 Fetal outcome and mode of delivery

The fetal outcome dependent on the mode of delivery and by parity before and after implementation of the partograph is shown in Tables 16.9, 16.10 and 16.11. The most striking finding was the improved outcome for all babies born by caesarean section as compared to vaginal delivery regardless of implementation of the partograph. There was only 1 intrapartum fetal death when delivery was by caesarean section but 22 when delivery was vaginal. There was, however, a reduction in all intrapartum fetal deaths after implementation of the partograph (Table 16.6). In addition Apgar scores after vaginal delivery were poorer than after caesarean section. There was, however, a reduction in the proportion of babies with severe asphyxia (Apgar <4) after implementation of the partograph regardless of the mode of delivery.

Of further interest (not shown in Table 16.9) was the finding that the mean birth weight of babies born by caesarean section was higher than those born by vaginal delivery regardless of implementation of the partograph. The mean birth weight of vaginal deliveries before implementation was 2735 g (SD 689) and after implementation 2800 g (SD 634). The corresponding figures for caesarean section deliveries were 3047 g (607) and 3074 g (511).

Tables 16.10 and 16.11 present the same results for nullipara and multipara. The differences described above were consistent for the different parity groups

The fetal outcome in relation to mode of delivery is explored further in Tables 16.12 (all parities) 16.13 (nullipara) and 16.14 (multipara) where oxytocin usage is also considered. Many of the unaugmented caesarean section deliveries were those delivered by elective or immediate caesarean section and did not therefore continue in observed labour after admission. They cannot therefore be compared accurately with those who received augmentation. This fact may well, for example, explain the lower proportion of babies with Apgar scores <4 in the unaugmented group when compared to augmented labours. On the other hand, those from the augmented group who had Apgar scores <4 did not have long mean durations of oxytocin usage compared to the whole augmented group, particularly before implementation when there was a higher overall proportion of babies with Apgars <4. The figures do not suggest that there is added hazard to the fetus from using oxytocin in breech labour.

Tables 16.12-14 can be compared with Tables 14.10-12 which show the same information for women from the normal group.

16.4.5 Course of breech labour on the WHO partograph

This section examines the course of labour in singleton breech presentations as plotted on the partograph in order to ascertain that this design of partograph is appropriate to breech presentation and that the alert and action lines identify labours with an increased likelihood of caesarean section delivery, as was found to be the case in the normal group of women (Chapters 7 and 8). As described in Section 16.2, a large number of breech presentations did not have a partograph, even after implementation, because of the high incidence of elective and immediate caesarean section. In addition, breeches admitted at 9-10 cm cervical dilatation did not have a partograph. Of the 816 singleton breeches in the trial after implementation, 346 (42.4%) had a partograph completed and are studied here.

16.4.6 Course of labour

Of the 346 singleton spontaneous breech labours with a partograph 63 (18.2%) were admitted in the latent phase and 283 (81.8%) in the active phase. Only 2 women were delivered (by caesarean section) within a normal (8 hour) latent phase; 3 were delivered by caesarean section after a prolonged latent phase.

Of those who had an active phase (other than after a prolonged latent phase), 197 (56.9%) remained on or to the left of the alert line, 86 (24.9%) reached the referral zone (between the alert and action line) but no further and 58 (16.8%) reached or moved beyond the action line.

The course of labour among singleton breeches is compared to that among women from the normal group in Tables 16.15-17. All cases with an active phase, regardless of the phase of labour on admission, are counted together. Labour progress is clearly slower with breech labour. When nullipara and multipara are examined separately (Tables 16.16 and 16.17) it is of interest that very similar proportions of nulliparous and of multiparous breeches reached the referral zone and the action line. This was not true in cephalic presentations where fewer multipara than nullipara reached these zones of the partograph. Breech labour appears to be equally "inefficient" regardless of parity.

16.4.7 Course of labour and mode of delivery

Table 16.18 shows the caesarean section rates related to progress on the partograph and dependent on the phase of labour on admission. Only women with an active phase of labour

plotted on the partograph are included. It is of note (though not surprising) that the overall caesarean section rate among those 341 women was (at 8.5%) much lower than among the total group of singleton breeches. The women studied here had already been selected as being appropriate to continue in labour. Among these, there was a steady rise in caesarean section rates with slowing progress on the partograph. Caesarean section became necessary in 2.5% of those remaining on or to the left of the alert line, 5.8% of those moving beyond the alert line but not to the action line, and 32.8% of those reaching the action line. As with cephalic singleton presentations (Chapters 7 and 8) the caesarean section rate was higher when admission was originally in the latent rather than the active phase of labour. Among latent phase admissions, 61.5% of those reaching the action line were delivered by caesarean section. It was also more likely that latent phase admissions would reach the action line; 29.6% of latent phase admissions reached the action line, compared to 18.7% of active phase admissions.

These differences are partly explained by the higher proportion of nullipara (23%) than multipara (13%) admitted in the latent phase (Tables 16.19 and 16.20). The total caesarean section rate among nullipara was 13.0% and among multipara 5.7%. Despite similar rates of progress on the partograph (Tables 16.16 and 16.17), the caesarean section rate for multipara was lower at all points on the partograph. The rising trend of caesarean section rates with slower progress on the partograph was apparent for both parity groupings (Tables 16.19 and 16.20)

16.5 Breech Presentation and Labour Management Protocol

While the same demands for adherence to the agreed labour management protocol were not made in cases of breech presentation, breech labours were plotted on the partograph and suggested guidelines for labour management were agreed by WHO consultants. These were as follows:

- a. Management of latent phase as per protocol for cephalic presentation.
- b. Caesarean section may be indicated if the 8 hour latent phase "action line" is reached.
- c. In the active phase, dilatation slower than 1 cm/hour is a worrying sign.
- d. Consider oxytocin if dilatation moves to right of alert line.
- e. Reaching the active phase action line is normally an indication for caesarean section.

This section examines the actions taken at different points on the partograph and relates these to the subsequent course of labour and mode of delivery in an attempt to evaluate the recommended protocol.

The number of breeches delivered in the latent phase (2) or after a prolonged latent phase (3) was too small to merit detailed examination.

16.5.1 Oxytocin augmentation

The changes in oxytocin augmentation and the impact on mode of delivery brought about by the implementation of the partograph on women of all parities has already been shown in Tables 16.12 to 16.14, with comments under Section 16.2.4.

16.5.2 Action in the referral zone

Once breech labour moved to the right of the alert line, oxytocin augmentation was encouraged in the recommended protocol. In this respect, the protocol differed from that recommended for cephalic presentations. Possible actions among breech presentations depended on the state of the membranes on reaching the referral zone. For those with membranes intact, the options were ARM, ARM with oxytocin, oxytocin alone, none, or delivery by caesarean section. With membranes already ruptured, ARM was not an available option. These various options related to subsequent course of labour and the ultimate mode of delivery are shown in Tables 16.21 and 16.22. Parities are not presented separately because of the small numbers involved, but there were no outstanding differences between nullipara and multipara.

The high proportion of those reaching the referral zone with intact membranes (58/135 = 43.0%) probably reflects a reluctance to perform ARM in breech presentation. By contrast 473/1846 (25.6%) of cephalic presentations from the normal group reached the referral zone with intact membranes (Chapter 14). The majority of those with intact membranes had an ARM performed on arrival at the referral zone (36/55 = 65.5%). 8 of those reached the action line and 2 were delivered by caesarean section. Despite the encouragement in the breech management protocol to start oxytocin in the referral zone, this only occurred in 12 cases (3 with membranes intact and 9 with membranes already ruptured on arrival at the referral zone). This represents only 9.2% of all breeches reaching the referral zone and continuing in labour. The outcome (as measured by subsequent course of labour and caesarean section rates) was better among those arriving at the referral zone with intact membranes than when the membranes were already ruptured. Regardless of the action taken, 25.5% of the former group reached the action line and 10.9% were delivered by caesarean section. When the membranes were already ruptured, 33.8% ultimately reached the action line and 13.8% were delivered by caesarean section.

While this information does not clarify the role of ARM in breech labour, it confirms that ARM is an appropriate and helpful action if labour reaches the referral zone. The figures do also confirm that all breech labours reaching the referral zone should be transferred to a central unit if not already in one, particularly if the membranes are already ruptured. If labour is well advanced and the membranes are intact however ARM followed by a short period of observation may well be safe.

16.5.3 Action at the action line

The recommendations for breech labour stated that reaching the action line was normally an indication for caesarean section. Alternative actions were augmentation (if oxytocin had not already been started), or supportive conservative therapy (see Chapter 14). If none of these were carried out, no action was deemed to have been taken.

Table 16.23 relates those alternative actions once labour reached or moved beyond the action line to the mode of delivery. Labours which moved straight from the alert to the action line and reached the action line via the referral zone are considered together, and all parities

are combined. Twenty-three nullipara and 36 multipara reached the action line. Despite the recommendation that caesarean section was the appropriate action at the action line, only 3 out of 59 women had a caesarean section at this point. 21 received augmentation and had a relatively low caesarean section rate of 14.3%. Both "conservative" and "no" action were associated with higher caesarean section rates (66.7% and 35.5% respectively). Of the 21 who received oxytocin, 13 were multipara (caesarean section rate 15.4%) and 8 were nullipara (12.5% caesarean sections). There seem to be no particular added hazards or difficulties in augmenting multiparous as opposed to nulliparous breech labour.

16.6 Commentary

This multicentre trial was not designed to specifically address the management of breech presentation and firm conclusions cannot be drawn from the data presented here. As with other studies of breech presentation^(57,58) it is clear from the singleton breeches analysed here that case selection is important in the decision to attempt vaginal or caesarean delivery. Those babies born vaginally were in poorer condition than those born by caesarean section. An awareness of this was presumably a major factor in the high overall caesarean section rate among breeches (29.7%). The precise indicators for caesarean section have not been studied but after implementation of the partograph (when more information was available) there were 34 caesarean sections (9.8%) out of 346 women who laboured with a partograph (and therefore there was presumably an intention to deliver vaginally), and 189 caesarean sections (40.1%) out of 471 women who had no partograph; 227 (48.1%) of these women with no partograph were admitted at 9-10 cm in advanced labour. Breech labour on the partograph can therefore only be studied among the minority of women who were not admitted in very advanced labour and for whom there was no indication for elective or immediate caesarean section.

Despite these limitations to the use of a partograph, there was an overall improvement in the outcome of labour in all breech presentations after implementation. As among cephalic presentations (Chapter 4), prolonged labour (>18 hours) was reduced despite a reduction in the proportion of labours augmented and in the mean duration of oxytocin use. There was an increase in vaginal breech deliveries and a reduction in caesarean sections after implementation but this occurred solely among parous women who had a substantial drop from 27.1% to 19.3%.

Overall there was a relatively poor fetal outcome compared to uncomplicated pregnancies with cephalic presentations. 8.7% of singleton breech deliveries were stillborn although in the majority (7.4%), the fetus was already dead on admission. The intra-partum fetal loss was 1.4%. The fetal outcome also, however, improved after implementation of the partograph, both among babies delivered by caesarean section and vaginally.

Breech labour progressed more slowly than when the presentation was cephalic, and the rate of progress was similar regardless of parity. The significance of the alert and action lines in the active phase appeared similar, however, to when the presentation was cephalic. Apart from progress beyond the alert line, a high caesarean section rate was also associated with admission in the latent phase and with nulliparity. All of these factors should be taken into account when considering the management of breech labour and the referral of such cases to a central unit.

The results suggest that the guidance for referral in the referral zone of the partograph outlined in Chapter 14 (Section 14.5.2) can be applied to cephalic or breech labour. If the membranes are intact when the referral zone is reached and there are no other complications,

ARM and a short period of observation may well be reasonable. In all other circumstances, arrival in the referral zone is an indication for transfer to a central unit as caesarean section rates in such cases are high.

Only 56 women received oxytocin augmentation after implementation but there seemed to be no particular hazards associated with this, regardless of parity. Fetal condition at birth was more closely related to the mode of delivery than oxytocin usage. The use of oxytocin, whether at the referral zone or at the action line, was associated with a lower caesarean section rate than the avoidance of oxytocin. Provided the fetal condition is good, and no contra-indications exist, the use of oxytocin in breech labour appears worthwhile and could probably (as with cephalic presentation) be postponed until the action line is reached.

The use of the WHO partograph in the management of breech labour appears a useful and effective way of monitoring progress and timing decisions. Given, however, that the fetal outcome was better overall where delivery was by caesarean section, careful consideration must be given to the correct selection of women with breech presentation allowed to labour.

TABLE 16.1
BREECH PRESENTATIONS

Total women in study	=	35 484 (100%)
Singleton breech presentations	=	1 740 (4.9%)
Distribution of singleton breech presentations		
Nullipara*	=	712 (5.1% of all nullipara)
Para 1-4	=	858 (4.7% of all para 1-4)
Para 5+	=	166 (5.2% of all para 5+)
Before implementation	=	923 (5.1% of all women before)
After implementation	=	817 (4.7% of all women after)
Distribution by group (Chapter 4)		
Partograph not completed	=	650
Induced labour	=	91
High risk	=	999
Delivery (1 740 = 100%)		
Elective caesarean section	=	132 (7.6%)
Emergency caesarean section	=	376 (21.6%)
Unclassified caesarean section	=	9
Total caesarean sections	=	517 (29.7%)
Laparotomy for uterine rupture	=	4
Destructive delivery	=	10
Vaginal delivery	=	1 209 (69.5%)
Fetal outcome (1 740 = 100%)		
Intra-uterine deaths on admission	=	128 (7.4%)
Intrapartum fetal deaths	=	24 (1.4%)
Total stillbirths	=	152 (8.7%)
Perinatal deaths (stillbirths and first week deaths)	=	181 (10.4%)
Mean birth weight (g) (standard deviation)	=	2 856 (650)

* Parity unrecorded in 4 cases.

TABLE 16.2

LABOUR DURATION, LABOUR MANAGEMENT, COMPLICATIONS AND AUGMENTATION BEFORE AND AFTER IMPLEMENTATION

(Singleton breeches)

Maternal outcomes	Before implementation		After implementation	
Total women	923	(100.0)	817	(100.0)
Mean no. of VEs ¹ in labour	1.54	(1.31) ²	1.26	(1.15) ²
Mean duration of labour (hrs) ²	5.88	(8.08) ²	4.32	(5.59) ²
Labour ≤12 hours ⁴	797	(86.3)	743	(90.9)
Labour >12-18 hours ⁴	46	(5.0)	39	(4.8)
Labour >18 hours ⁴	71	(7.7)	22	(2.7)
Labour augmented	114	(12.4)	57	(7.0)
Mean duration of oxytocin use (hrs)	4.44	(3.71) ²	3.96	(2.84) ²
Postpartum haemorrhage (caesarean section) ³	144	(15.6)	109	(13.3)
Postpartum haemorrhage (vaginal) ³	20	(2.2)	13	(1.6)
Puerperal sepsis	9	(1.0)	3	(0.4)

Results show number of women (percentages in parentheses).

¹ VE = vaginal examination.

² Standard deviation.

³ Blood loss ≥500 ml.

⁴ Labour duration not recorded in 9 cases before and 13 cases after implementation.

TABLE 16.3

LABOUR DURATION, LABOUR MANAGEMENT, COMPLICATIONS AND AUGMENTATION BEFORE AND AFTER IMPLEMENTATION

(Nulliparous singleton breeches)

Maternal outcomes	Before implementation		After implementation	
Total women⁴	379	(100.0)	333	(100.0)
Mean no. of VEs ¹ in labour	1.65	(1.32) ²	1.26	(1.14) ²
Mean duration of labour (hrs)	6.70	(8.70) ²	4.39	(5.26) ²
Labour ≤12 hours ⁵	320	(84.4)	306	(91.9)
Labour >12-18 hours ⁵	26	(6.9)	19	(5.7)
Labour >18 hours ⁵	31	(8.2)	7	(2.1)
Labour augmented	50	(13.2)	19	(5.7)
Mean duration of oxytocin use (hrs)	4.62	(3.66) ²	3.39	(2.95) ²
Postpartum haemorrhage (caesarean section) ³	66	(17.4)	66	(19.8)
Postpartum haemorrhage (vaginal) ³	5	(1.3)	2	(0.6)
Puerperal sepsis	2	(0.5)	1	(0.3)

Results show number of women (percentages in parentheses).

¹ VE = vaginal examination.

² Standard deviation.

³ Blood loss ≥500 ml.

⁴ Parity not known in 2 cases.

⁵ Labour duration not recorded in 2 cases before and 1 case after implementation.

TABLE 16.4

LABOUR DURATION, LABOUR MANAGEMENT, COMPLICATIONS AND
AUGMENTATION BEFORE AND AFTER IMPLEMENTATION

(Parous singleton breeches)

Maternal outcomes	Before implementation		After implementation	
Total women⁴	542	(100.0)	482	(100.0)
Mean no. of VEs ¹ in labour	1.47	(1.31) ²	1.25	(1.16) ²
Mean duration of labour (hrs) ²	5.32	(7.59) ²	4.26	(5.82) ²
Labour ≤12 hours ⁵	475	(87.6)	435	(90.2)
Labour >12-18 hours ⁵	20	(3.7)	20	(4.1)
Labour >18 hours ⁵	40	(7.4)	15	(3.1)
Labour augmented	64	(11.8)	37	(7.7)
Mean duration of oxytocin use (hrs)	4.30	(3.76) ²	4.31	(2.79) ²
Postpartum haemorrhage (caesarean section) ³	77	(14.2)	42	(8.7)
Postpartum haemorrhage (vaginal) ³	15	(2.8)	11	(2.3)
Puerperal sepsis	7	(1.3)	2	(0.4)

Results show number of women (percentages in parentheses).

¹ VE = vaginal examination.

² Standard deviation.

³ Blood loss ≥500 ml.

⁴ Parity not known in 2 cases.

⁵ Labour duration not recorded in 7 cases before and 12 cases after implementation.

TABLE 16.5

MODE OF DELIVERY BEFORE AND AFTER IMPLEMENTATION AMONG
SINGLETON BREECHES

Parity and mode of delivery	Before implementation		After implementation	
All women¹	923	(100.0)	817	(100.0)
Vaginal breech	618	(67.0)	591	(72.3)
Destructive vaginal	8	(0.9)	2	(0.2)
Caesarean section	294	(31.9)	223	(27.3)
Laparotomy	3	(0.3)	1	(0.1)
Nullipara	379	(100.0)	333	(100.0)
Vaginal breech	229	(60.4)	204	(61.3)
Destructive vaginal	4	(1.1)	0	
Caesarean section	146	(38.5)	129	(38.7)
Multipara	542	(100.0)	482	(100.0)
Vaginal breech	388	(71.7)	386	(80.1)
Destructive vaginal	4	(0.7)	2	(0.4)
Caesarean section	147	(27.1)	93	(19.3)

Percentages in parentheses.

¹ Parity not recorded in 2 cases before and 2 cases after implementation.

TABLE 16.6
FETAL OUTCOME BEFORE AND AFTER IMPLEMENTATION
(Singleton breeches)

Fetal outcome	Before implementation		After implementation	
Total¹	922	(100.0)	815	(100.0)
Still births				
total	88	(9.5)	64	(7.9)
intra-partum	16	(1.7)	8	(1.0)
dead on admission	72	(7.8)	56	(6.9)
Neonatal deaths				
total	18	(1.9)	11	(1.4)
<24 hours	17	(1.8)	7	(0.9)
1-7 days	1	(0.1)	4	(0.5)
1 min. Apgar²				
0-3	58	(7.0)	43	(5.7)
4-7	256	(30.7)	279	(37.2)
8-10	520	(62.4)	429	(57.1)
Resuscitation				
bagging	125	(13.7)	113	(13.9)
ventilation	45	(4.9)	31	(3.8)
Admitted				
neonatal special care	228	(24.8)	163	(20.0)
neonatal intensive care	11	(1.2)	6	(0.7)
mean birth weight (grams with standard deviation)	2 836	(677)	2 878	(617)

¹ Fetal outcome not known in 1 case before and 2 cases after implementation.

² Apgar scores not recorded in 88 cases before and 64 cases after implementation.

TABLE 16.7

**FETAL OUTCOME BEFORE AND AFTER IMPLEMENTATION
(Nulliparous singleton breeches)**

Fetal outcome	Before implementation		After implementation	
Total	379	(100.0)	333	(100.0)
Still births				
total	27	(7.2)	20	(6.0)
intra-partum	4	(1.1)	2	(0.6)
dead on admission	23	(6.1)	18	(5.4)
Neonatal deaths				
total	5	(1.3)	9	(2.7)
<24 hours	5	(1.3)	5	(1.5)
1-7 days	0		4	(1.2)
1 min. Apgar¹				
0-3	21	(6.0)	21	(6.7)
4-7	111	(31.5)	116	(37.1)
8-10	220	(62.5)	176	(56.2)
Resuscitation				
bagging	52	(13.8)	50	(15.1)
ventilation	18	(4.8)	16	(4.8)
Admitted				
neonatal special care	102	(27.0)	59	(17.7)
neonatal intensive care	5	(1.3)	4	(1.2)
mean birth weight (grams with standard deviation)	2 777	(561)	2 765	(537)

¹ Apgar score not recorded in 27 cases before and 20 cases after implementation.

TABLE 16.8
FETAL OUTCOME BEFORE AND AFTER IMPLEMENTATION
(Parous singleton breeches)

Fetal outcome	Before implementation		After implementation	
Total¹	541	(100.0)	480	(100.0)
Still births				
total	61	(11.3)	44	(9.1)
intra-partum	12	(2.2)	6	(1.2)
dead on admission	49	(9.1)	38	(7.9)
Neonatal deaths				
total	13	(2.4)	2	(1.1)
<24 hours	12	(2.2)	2	(0.4)
1-7 days	1	(0.2)	0	
1 min. Apgar²				
0-3	37	(7.7)	22	(5.0)
4-7	144	(30.0)	162	(37.2)
8-10	299	(62.3)	252	(57.8)
Resuscitation				
bagging	73	(13.6)	63	(13.2)
ventilation	27	(5.0)	15	(3.1)
Admitted				
neonatal special care	126	(23.4)	104	(21.6)
neonatal intensive care	6	(1.1)	2	(0.4)
mean birth weight (grams with standard deviation)	2 879	(745)	2 954	(656)

¹ Fetal outcome not known in 1 case before and 2 cases after implementation.

² Apgar score not recorded in 61 cases before and 44 cases after implementation.

TABLE 16.9

**FETAL OUTCOME BY MODE OF DELIVERY BEFORE AND AFTER
IMPLEMENTATION OF PARTOGRAPH
(Singleton breeches)**

Fetal outcome	Mode of delivery			
	Before implementation		After implementation	
	Vaginal delivery	Caesarean section	Vaginal delivery	Caesarean section
All babies (N)	617	294	589	223
Intrapartum fetal death	14 (2.3)	1 (0.3)	8 (1.4)	0
Apgar 0-3*	44 (8.2)	13 (4.4)	38 (7.1)	5 (2.3)
Apgar 4-7*	184 (34.1)	68 (23.5)	207 (38.8)	72 (33.0)

* Numbers in parentheses are percentages of total.

TABLE 16.10

**FETAL OUTCOME BY MODE OF DELIVERY BEFORE AND AFTER
IMPLEMENTATION OF PARTOGRAPH**

(Nulliparous singleton breeches)

FETAL OUTCOME	MODE OF DELIVERY			
	Before implementation		After implementation	
	Vaginal delivery	Caesarean section	Vaginal delivery	Caesarean section
All babies (N)	229	146	204	129
Intrapartum fetal death	3 (1.3)	0	2 (1.0)	0
Apgar 0-3*	15 (7.3)	6 (4.2)	18 (9.7)	3 (2.4)
Apgar 4-7*	78 (37.9)	32 (22.2)	74 (39.8)	42 (33.1)

* Numbers in parentheses are percentages of total.

TABLE 16.11

**FETAL OUTCOME BY MODE OF DELIVERY BEFORE AND AFTER
IMPLEMENTATION OF PARTOGRAPH
(Parous singleton breeches)**

Fetal outcome	Mode of delivery			
	Before implementation		After implementation	
	Vaginal delivery	Caesarean section	Vaginal delivery	Caesarean section
All babies (N)	387	147	384	93
Intrapartum fetal death	11 (2.8)	1 (0.7)	6 (1.6)	0
Apgar 0-3*	29 (8.7)	7 (4.9)	20 (5.8)	2 (2.2)
Apgar 4-7*	106 (31.9)	35 (24.3)	133 (38.4)	29 (32.2)

* Numbers in parentheses are percentages of total.

TABLE 16.12

IMPACT OF OXYTOCIN USAGE ON MODE OF DELIVERY AND FETAL OUTCOME BEFORE AND AFTER IMPLEMENTATION OF PARTOGRAPH (Singleton breeches)

Oxytocin augmentation, mode of delivery and fetal outcome	Before implementation		After implementation	
	Number (percentage)	Mean duration of oxytocin ¹	Number (percentage)	Mean duration of oxytocin ¹
Augmented	114 (100.0)	4.44 (3.71)	56 (100.0)	4.00 (2.86)
Vaginal	92 (80.7)	3.93 (3.47)	49 (87.5)	3.60 (2.40)
Caesarean section	19 (16.7)	6.89 (4.08)	7 (12.5)	6.76 (4.29)
Intrapartum fetal death	4 (3.5)	5.25 (2.50)	1 (1.8)	5.00 (-)
1 minute Apgar <4	12 (10.5)	3.24 (1.66)	6 (10.7)	4.94 (2.98)
Not augmented	807 (100.0)	-	759 (100.0)	-
Vaginal	525 (65.0)	-	541 (71.3)	-
Caesarean section	274 (34.0)	-	215 (28.3)	-
Intrapartum fetal death	12 (2.3)	-	7 (1.3)	-
1 minute Apgar <4	46 (8.8)	-	37 (6.8)	-

¹ Number in parentheses = standard deviation.

TABLE 16.13

**IMPACT OF OXYTOCIN USAGE ON MODE OF DELIVERY AND FETAL OUTCOME BEFORE AND AFTER IMPLEMENTATION OF PARTOGRAPH
(Nulliparous singleton breeches)**

Oxytocin augmentation, mode of delivery and fetal outcome	Before implementation		After implementation	
	Number (percentage)	Mean duration of oxytocin ¹	Number (percentage)	Mean duration of oxytocin ¹
Augmented	50 (100.0)	4.62 (3.66)	19 (100.0)	3.39 (2.95)
Vaginal	39 (78.0)	3.98 (3.41)	15 (78.9)	2.80 (1.99)
Caesarean section	10 (20.0)	6.81 (4.00)	4 (21.1)	5.63 (5.06)
Intrapartum fetal death	0	-	0	-
1 minute Apgar <4	6 (12.0)	3.92 (1.47)	3 (15.8)	4.56 (2.31)
Not augmented	329 (100.0)	-	314 (100.0)	-
Vaginal	190 (57.8)	-	189 (60.2)	-
Caesarean section	136 (41.3)	-	125 (39.8)	-
Intrapartum fetal death	4 (1.2)	-	2 (0.6)	-
1 minute Apgar <4	15 (4.6)	-	18 (5.7)	-

¹ Number in parentheses = standard deviation.

TABLE 16.14

IMPACT OF OXYTOCIN USAGE ON MODE OF DELIVERY AND FETAL OUTCOME BEFORE AND AFTER IMPLEMENTATION OF PARTOGRAPH (Parous singleton breeches)

Oxytocin augmentation, mode of delivery and fetal outcome	Before implementation		After implementation	
	Number (percentage)	Mean duration of oxytocin ¹	Number (percentage)	Mean duration of oxytocin ¹
Augmented	64 (100.0)	4.30 (3.76)	37 (100.0)	4.31 (2.79)
Vaginal	53 (82.8)	3.90 (3.55)	34 (91.9)	3.96 (2.51)
Caesarean section	9 (14.1)	6.97 (4.41)	3 (8.1)	8.27 (3.29)
Intrapartum fetal death	4 (6.3)	5.25 (2.50)	1 (2.7)	5.00 (-)
1 minute Apgar <4	6 (9.4)	2.57 (1.67)	3 (8.1)	5.33 (4.04)
Not augmented	478 (100.0)	-	445 (100.0)	-
Vaginal	335 (70.1)	-	352 (79.1)	-
Caesarean section	138 (28.9)	-	90 (20.2)	-
Intrapartum fetal death	8 (1.7)	-	5 (1.1)	-
1 minute Apgar <4	31 (6.5)	-	19 (4.3)	-

¹ Number in parentheses = standard deviation.

TABLE 16.15

COURSE OF LABOUR AMONG SINGLETON BREECH PRESENTATIONS AND CEPHALIC PRESENTATIONS (Normal group)

Course of labour	Cephalic presentation	Breech presentation
Delivered in latent phase (<8 hours)	9 (0.1)	2 (0.6)
Delivered after prolonged latent phase (>8 hours)	103 (1.3)	3 (0.9)
Remained on or left of alert line	6 331 (71.8)	197 (56.9)
Between alert and action lines but not to action line	1 503 (17.1)	86 (24.9)
Reached action line	864 (9.8)	58 (16.8)
All women	8 810 (100.0)	346 (100.0)

Percentages in parentheses.

TABLE 16.16

**COURSE OF LABOUR AMONG SINGLETON BREECH PRESENTATIONS AND
CEPHALIC PRESENTATIONS**
(Normal group, nullipara)

Course of labour	Cephalic presentation	Breech presentation ¹
Delivered in latent phase (<8 hours)	8 (0.2)	2 (1.49)
Delivered after prolonged latent phase (>8 hours)	73 (1.9)	1 (0.75)
Remained on or left of alert line	2 427 (64.0)	74 (55.2)
Between alert and action lines but not to action line	771 (20.3)	34 (25.4)
Reached action line	514 (13.6)	23 (17.2)
All women	3 793 (100.0)	134 (100.0)

Percentages in parentheses.

¹ Parity unknown in 1 case.

TABLE 16.17

**COURSE OF LABOUR AMONG SINGLETON BREECH PRESENTATIONS AND
CEPHALIC PRESENTATIONS**
(Normal group, multipara)

Course of labour	Cephalic presentation	Breech presentation ¹
Delivered in latent phase (<8 hours)	1 (0.1)	0
Delivered after prolonged latent phase (>8 hours)	30 (0.6)	2 (1.0)
Remained on or left of alert line	3 904 (77.8)	122 (57.8)
Between alert and action lines but not to action line	732 (14.6)	52 (24.6)
Reached action line	350 (7.0)	35 (16.6)
All women	5 017 (100.0)	134 (100.0)

Percentages in parentheses.

¹ Parity unknown in 1 case.

TABLE 16.18

CAESAREAN SECTION DELIVERIES AMONG SINGLETON BREECH LABOURS BY COURSE OF LABOUR IN ACTIVE PHASE AFTER ADMISSION IN LATENT OR ACTIVE PHASE

Admission phase and delivery	On or left of alert line	Between alert and action line	Reached action line	All
All women	197 (100.0)	86 (100.0)	58 (100.0)	341 (100.0)
Caesarean section	5 (2.5)	5 (5.8)	19 (32.8)	29 (8.5)
Admitted in latent phase	31 (100.0)	14 (100.0)	13 (100.0)	58 (100.0)
Caesarean section	3 (9.7)	2 (14.3)	8 (61.5)	13 (22.4)
Admitted in active phase	166 (100.0)	72 (100.0)	45 (100.0)	283 (100.0)
Caesarean section	2 (1.2)	3 (4.2)	11 (24.4)	16 (5.7)

Percentages in parentheses.

TABLE 16.19

CAESAREAN SECTION DELIVERIES AMONG SINGLETON BREECH LABOURS BY COURSE OF LABOUR IN ACTIVE PHASE AFTER ADMISSION IN LATENT OR ACTIVE PHASE (Nullipara)

Admission phase and delivery	On or left of alert line	Between alert and action line	Reached action line	All
All women	74 (100.0)	34 (100.0)	23 (100.0)	131 (100.0)
Caesarean section	4 (5.4)	3 (8.8)	10 (43.5)	17 (13.0)
Admitted in latent phase	14 (100.0)	6 (100.0)	5 (100.0)	25 (100.0)
Caesarean section	3 (21.4)	2 (33.3)	4 (80.0)	9 (36.0)
Admitted in active phase	60 (100.0)	28 (100.0)	18 (100.0)	106 (100.0)
Caesarean section	1 (1.7)	1 (3.6)	6 (33.3)	8 (7.5)

Percentages in parentheses.

TABLE 16.20

CAESAREAN SECTION DELIVERIES AMONG SINGLETON BREECH LABOURS BY COURSE OF LABOUR IN ACTIVE PHASE AFTER ADMISSION IN LATENT OR ACTIVE PHASE (Multipara)

Admission phase and delivery	On or left of alert line		Between alert and action line		Reached action line		All	
All women	122	(100.0)	52	(100.0)	35	(100.0)	209	(100.0)
Caesarean section	1	(0.8)	2	(3.9)	9	(25.7)	12	(5.7)
Admitted in latent phase	16	(100.0)	8	(100.0)	8	(100.0)	32	(100.0)
Caesarean section	0		0		4	(50.0)	4	(12.5)
Admitted in active phase	106	(100.0)	44	(100.0)	27	(100.0)	177	(100.0)
Caesarean section	1	(1.0)	2	(4.6)	5	(18.5)	8	(3.8)

Percentages in parentheses.

TABLE 16.21

COURSE OF LABOUR AND MODE OF DELIVERY BY ACTION AT REFERRAL ZONE WHEN MEMBRANES INTACT (Singleton breeches)

Action	Course of labour	Mode of delivery		
		All	Vaginal	Caesarean section
Total group ¹ (55)	Did not reach action line	41 (100.0)	39 (95.1)	2 (4.9)
	Reached action line	14 (100.0)	10 (71.4)	4 (28.6)
ARM (34)	Did not reach action line	27 (100.0)	27 (100.0)	0
	Reached action line	7 (100.0)	5 (71.4)	2 (28.6)
ARM+Oxytocin (2)	Did not reach action line	1	1	0
	Reached action line	1	1	0
Oxytocin only (1)	Did not reach action line	0	-	-
	Reached action line	1	0	1
None (15)	Did not reach action line	11 (100.0)	11 (100.0)	0
	Reached action line	4 (100.0)	4 (100.0)	0

¹ In 3 cases, caesarean section was performed as an immediate action.

TABLE 16.22

COURSE OF LABOUR AND MODE OF DELIVERY BY ACTION AT ARRIVAL IN REFERRAL ZONE WHEN MEMBRANES ALREADY RUPTURED (Singleton breeches)

Action	Course of labour	Mode of delivery		
		All	Vaginal	Caesarean section
Total group ¹ (65)	Did not reach action line	43 (100.0)	40 (93.0)	3 (7.0)
	Reached action line	22 (100.0)	16 (72.7)	6 (27.3)
Oxytocin (9)	Did not reach action line	7 (100.0)	7 (100.0)	0
	Reached action line	2 (100.0)	2 (100.0)	0
No Action (54)	Did not reach action line	34 (100.0)	33 (97.1)	1 (2.9)
	Reached action line	20 (100.0)	14 (70.0)	6 (30.0)

¹ In 2 cases, caesarean section was performed as an immediate action.

TABLE 16.23

MODE OF DELIVERY BY ALTERNATIVE ACTIONS AT ACTION LINE AMONG SINGLETON BREECH LABOURS (Nullipara)

Mode of delivery	Action at action line*			
	Caesarean section	Augmentation	Conservative	None
All women (23)	1	8 (100.0)	2 (100.0)	12 (100.0)
Vaginal (13)	-	7 (87.5)	0	6 (50.0)
Caesarean section (10)	1	1 (12.5)	2 (100.0)	6 (50.0)

* See text for definition of actions.

17. MATERNAL DEATHS AND UTERINE RUPTURE

17.1 Summary

There were 47 maternal deaths and 55 cases of uterine rupture during the trial. The partograph played little or no role in any of these cases, most of which occurred as a result of late presentation of neglected problems. Eclampsia was the commonest cause of maternal death but infection, uterine rupture and postpartum haemorrhage accounted for 13 deaths; these problems may be associated with prolonged labour. In 43 of the cases of uterine rupture, the uterus was already ruptured on admission. The other cases were associated with operative vaginal delivery.

The partograph was not able to influence the incidence of maternal death or uterine rupture in this study but should be of benefit if it leads to the early referral of the prolonged and obstructed labours which caused many of the problems described in this chapter. Management in the referral centre must, however, then be optimal.

17.2 Introduction

The aim of the Safe Motherhood Initiative (of which this study was a part) is to reduce maternal mortality. The study would therefore not be complete without an examination of the maternal deaths which took place in the study population. An important cause of maternal death in prolonged labour is uterine rupture; this serious complication is studied separately as the partograph is primarily a tool to prevent prolonged labour and its sequelae.

17.3 Maternal Deaths

Forty seven maternal deaths were reported during the study (0.13%) of women admitted in labour. Only intrapartum deaths and those postpartum deaths occurring in the unit after delivery were recorded for the purpose of the study. The total maternal mortality rate is certainly higher. Most of the deaths (38) occurred in Indonesia, reflecting that country's poorer socioeconomic condition and probably poorer access to obstetric care.

Twenty-three maternal deaths occurred prior to implementation of the partograph and twenty-four afterwards. The partograph had no influence on maternal mortality as most of the deaths were admitted with severe complications already and the partograph could not have played a role in the management of these cases. Some cases admitted in advanced labour might have been referred earlier if the partograph had been used in labour management in a peripheral centre. Only five women had a partograph. Their cause of death was pulmonary embolism (2), eclampsia (2) and postpartum haemorrhage and/or anaesthetic death (1).

The mean age of those dying was 29 years (range 18-45 years) and the mean parity 3.1. Eleven (24%) were nullipara and 8 (18%) grand multipara. The mean gestation at delivery was 36.8 weeks, seven cases being under 34 weeks.

The majority (82%) of cases had had a minimum of two antenatal visits. Twenty-five (53%) came directly from home, the remainder being referred from domiciliary midwives (9), traditional birth attendants (3), maternity homes (4), health centres (3) or other hospitals (3). Three cases were induced, one went into spontaneous labour after admission and one had an elective caesarean section. The remainder were admitted in spontaneous labour.

Two deaths occurred intrapartum and were undelivered. The method of delivery of the remainder is shown in Table 17.1. The mean time spent in the unit before delivery was 9.0 hours (range 15 minutes to 44 hours) and the mean time from admission to the unit until death was 64 hours (range 1 hour to 7 days).

Twenty four babies were liveborn, at least two of these dying in the early neonatal period. Of the twenty-two stillbirths, 16 were fresh stillbirths.

The causes of maternal death are recorded in Table 17.2. Most of the deaths due to eclampsia occurred in a single centre and this may reflect a management problem there. The other most avoidable element among the deaths was the delayed transfer or admission to hospital of women with prolonged labour.

17.4 Uterine Rupture

During the study, there were 55 cases of uterine rupture; 3 of these women died. Most cases (50) occurred in Indonesia, probably reflecting the poorer socioeconomic and educational levels when compared to Thailand and Malaysia. Twenty-six occurred before the partograph was implemented and 29 afterwards. In 43 cases (78%) the uterus was already ruptured on admission. The majority were referred by another health worker but it is not known whether these women arrived already with a uterine rupture at their health facility.

The mean age of women was 30 years (range 17-45) with a mean parity of 4.0. Seventeen cases (31%) were grand multipara and there were three apparent cases in nullipara. Forty-two women (75%) had had antenatal care and 91% were admitted already in labour. Only 4 cases had definitely had a previous caesarean section though there may have been more where this information was not recorded.

The mean interval from admission to delivery in all cases was 3.2 hours (range 0.5-12). Of the 29 cases which occurred after implementation of the partograph, only one had a partograph completed; the remainder were admitted at 9-10 cm dilatation or were delivered immediately.

Although precise details of the surgical management of each uterine rupture was not available, the majority appear to have been managed by laparotomy with delivery of the fetus and hysterectomy. In only about a quarter of the cases did it appear that the uterus could be conserved. Forty-seven babies (84%) were stillborn (36 were fresh stillbirths). Of the 11 live births, at least one died in the neonatal period. The mean birth weight was 3240 g (range 2200-4300 g). There were 3 maternal deaths (5.4%).

17.4.1 Admitted with uterus ruptured

Among the 43 cases admitted with the uterus already ruptured, the diagnosis was usually made on or shortly after admission but there were frequently delays until laparotomy could be performed. The mean interval from admission to surgery was 2.3 hours but was in some cases 6 hours. All 3 maternal deaths due to uterine rupture occurred among women admitted with the condition. Laparotomy and hysterectomy was virtually universal management and all the babies were stillborn.

Two of the women apparently in this category were confirmed as nullipara.

17.4.2 Uterine rupture after admission

Among the 12 women who suffered uterine rupture after admission, oxytocin was used in 2. In one case, induction was performed with oxytocin alone at 41 weeks gestation for "bad obstetric history". Five hours later, ARM was performed. The baby died during labour and the uterus ruptured after 2 hours at full dilatation. A further case was admitted at 9 cm dilatation and delivered by craniotomy after 9 hours of oxytocin. The uterus was found to be ruptured following the craniotomy.

Ten of these cases were delivered vaginally, though none spontaneously. There were 4 embryotomies, 2 forceps, 2 vacuum extractions and 2 breech deliveries, one being an internal version and breech extraction. In all cases, uterine rupture was recognised either at or shortly after delivery and was doubtless often a direct consequence of the delivery method. Hysterectomy appears to have been the almost universal management.

Four babies were stillborn and there was at least one neonatal death.

17.5 Commentary

The 47 recorded maternal deaths represent a maternal mortality rate of 1.3/1000 in the study population. This cannot be said to be a true measure of the problem because of the selected nature of the women studied. This was not a community study. Even within the hospital, one maternal death occurred in a woman admitted with a ruptured uterus while a WHO consultant was present but no record was made of this in that centre's returns; there may have been others. In addition, this study only requested information on intrapartum and postpartum deaths. Many antepartum deaths may not have been reported.

The pattern of causation of the 47 deaths is unusual with a preponderance of eclampsia, but most of the deaths from that cause occurred in a single centre where there may have been a management problem. Most of the direct deaths were probably preventable with early and appropriate use of anticonvulsants, antibiotics, and blood transfusion. However, most women presented with severe and advanced complications after delay in presentation or referral. Once in hospital, the partograph had little role to play in preventing these deaths. It is, however, encouraging that no deaths occurred among all women in the study population presenting at an appropriate stage of labour and who were managed with the use of a partograph. Such management at health centre level may encourage more timely referral.

In a similar way, the partograph could have little influence on the cases of uterine rupture. Most were admitted with the uterus already ruptured. Correct use of a partograph in a peripheral centre should have a major role in preventing such disasters by indicating when referral is indicated (see Chapter 9) although this trial could not address this issue directly.

Most of the cases of uterine rupture which occurred after admission were probably caused by poor management, particularly by inappropriate or unsafe vaginal delivery. The partograph is a tool for first stage management only but may indicate when caesarean section in the first stage is more appropriate than a later traumatic second stage delivery.

Three cases of uterine rupture apparently occurred in nullipara. Details of each case were not always complete but rupture of the primigravid uterus does appear to be a possible hazard in this population.

The partograph was not able to influence the incidence of maternal death or of uterine rupture in this trial but it should be of benefit in the timely referral of women with prolonged labour. Management in a central unit must, then, however, be optimal.

TABLE 17.1
MODE OF DELIVERY AMONG MATERNAL DEATHS
(All centres)

	No.	%
Spontaneous vertex	13	27.7
Operative vaginal	11	23.4
Caesarean section	16	34.0
Laparotomy (ruptured uterus)	3	6.4
Embryotomy	2	4.3
Undelivered	2	4.3

TABLE 17.2
CAUSES OF MATERNAL DEATHS

Direct

Eclampsia/severe pre-eclampsia	18	(38.3%)
Infection	7	(14.9%)
Pulmonary embolism	4	(8.5%)
Postpartum haemorrhage	3	(6.4%)
Uterine rupture	3	(6.4%)
Amniotic fluid embolism	1	
Placenta praevia (APH/PPH)	1	
Placental abruption	1	

Indirect

Hepatitis	2	
Myocardial infarction	1	
Haematemesis	1	
"Cardio-pulmonary shock"	1	
Rabies	1	
Breast cancer	1	

Unknown

2

TOTAL

47 (100%)