



**MATERNAL HEALTH
AND SAFE MOTHERHOOD PROGRAMME**

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**THE PARTOGRAPH:
THE APPLICATION OF THE WHO PARTOGRAPH
IN THE MANAGEMENT OF LABOUR**

Report of a WHO multicentre study
1990-1991



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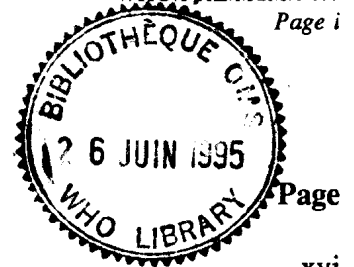


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INTRODUCTION

Despite extensive research particularly in the 1970s, the active management of labour remains a topic of controversy.⁽¹⁾ Practices vary enormously worldwide and within individual health systems. This disparity exists against a background of depressingly high maternal mortality rates throughout most of the developing world⁽²⁾ and a rising caesarean section rate in the developed world, but with little evidence that fetal outcome is the better for it.^(3,4)

Half a million women worldwide die annually as a result of pregnancy and childbirth.⁽⁵⁾ Most of these deaths are theoretically preventable and many die as a result of inappropriately timed referral to an obstetric unit and poor management within obstetric units. For those who survive, the sequelae of difficult labour (anaemia, infertility through puerperal infection, and vesico-vaginal fistulae) may be devastating. Fetal outcome in such cases is also poor.

Although maternal deaths in developed countries are relatively rare, those that do occur are frequently associated with delivery by caesarean section.⁽⁶⁾ This, together with rising public opinion against intervention in obstetric care, makes the rising caesarean section rate a matter of concern and increases the need for a clearer definition of the correct management of labour. The pattern of progressive cervical dilatation in normal labour was identified by Friedmann nearly 40 years ago.⁽⁷⁾ The application of this knowledge to the management of labour with the aid of a partograph to graphically record the progress of labour was developed by Philpott in Zimbabwe,^(8,9) Studd in the United Kingdom⁽¹⁰⁾ and O'Driscoll in Ireland⁽¹¹⁾ who reported improved results in the outcome of labour. Reports of the use of the partograph in many other countries have also been published.^(12,13,14,15,16,17,18,19,20,21) It has become clear that the pattern of cervical dilatation in normal labour in different racial and ethnic groups is so similar⁽²²⁾ that it should be possible to produce a partograph suitable for worldwide application.

Despite the encouraging results from publications in the early 1970s, and in particular the pioneering work of Philpott in Zimbabwe, the partograph has not been adopted universally either as a means of graphically recording labour or, even less, as a management tool for labour. Few publications of significance on the topic have appeared in the last 15 years. Caesarean section rates in the developed world continue to rise and there is no sign of a drop in worldwide maternal mortality rates.

Recognizing the unacceptable levels of maternal mortality, the Safe Motherhood Conference organized jointly by the World Bank, the World Health Organization and the United Nations Population Fund and held in Nairobi in 1987 concluded with a "call to action".⁽⁵⁾ Among the recommendations was the need to ensure that all pregnant women are managed in labour by appropriately trained personnel using practical and relevant technology. Responding to this call, WHO developed a project to investigate and promote the management of labour using a partograph.

This project included the development of a printed partograph by a WHO Technical Working Group (1987) which reviewed all available partographs, published manuals, teaching aids and operations research guidelines.^(24,25) A large multicentre trial on the impact of partography on labour management and outcome was conducted by WHO in Thailand, Malaysia and Indonesia from January 1990 to April 1991. This document reports on the outcome of this trial and discusses the implications of the results.

After a brief description of the WHO partograph and of the rationale behind the trial (Chapter 1), a detailed description of the methodology is given (Chapter 2). The remaining chapters describe in detail various elements of the results. Most chapters consist of a summary, a short introduction, a presentation of particular results and a commentary. Chapters 5-12, which contain related information, have a single joint commentary which comprises Chapter 13.

A complete list of references is contained at the end, followed by Appendices which show some of the results for individual participating centres.

1. THE WHO PARTOGRAPH AND THE NEED FOR A TRIAL

1.1 Design of the WHO Partograph

Partography is a method of graphically recording the progress of labour. It may be used purely to record observations but management guidelines to indicate the appropriate timing of certain interventions can be incorporated. Recognizing the potentially important role for such a tool in labour management, an Informal Working Group was convened by WHO in Geneva in 1988 to develop a partograph suitable for universal application. All available partograph designs were reviewed and an agreed model developed. The final version closely resembles that promoted by Philpott in Africa in the 1970s.⁽²⁶⁾ Detailed descriptions of the WHO partograph are available in other WHO documents^(24,25) and an example of normal labour plotted on the partograph is illustrated in Figure 1.1. The essential features and the rationale are, however, summarized below.

The central feature is the cervicograph where cervical dilatation is plotted against time. While accepting that the transition from the latent to the active phase of labour may take place at differing cervical dilatations in individual cases, 3 cm dilatation is believed to be the most frequent dilatation at which the transition takes place and the cervicograph is marked accordingly. It was thought that the observed length of the latent phase should not be more than 8 hours, and a heavy vertical line from 0 to 3 cm dilatation after 8 hours of observed latent phase indicates this.

In the active phase of labour, a rate of dilatation of 1 cm per hour represents the mean dilatation rate of the slowest 10% of Zimbabwe primigravida.⁽⁸⁾ All partographs designed accept 1 cm per hour or faster as an acceptable level of dilatation. This rate is designated the **alert line** on the partograph. The **action line** on the partograph is drawn parallel to, but 4 hours to the right, of the alert line. The "four hour action line" was found by Philpott⁽⁹⁾ and Bird⁽¹³⁾ to be the most efficient means of identifying particularly slow labours and avoiding unnecessarily early or dangerously late intervention.

The cervicographic features are incorporated into the WHO partograph together with the facility to record all other essential observations in labour on an hourly or half hourly basis. Experience with partography has shown that fewer recording errors are made when the action, alert and latent phase lines are pre-printed on to the partograph rather than being drawn on by the observer.⁽¹⁶⁾ When admitted in labour in the latent phase (cervix <3 cm dilated with 2 contractions or more in 10 minutes, lasting 20 seconds or more), cervical dilatation is plotted at '0' hours at the beginning of the partograph. When labour subsequently reaches the active phase (cervix \geq 3 cm dilated) within 8 hours of admission, plotting is transferred to the alert line (see Figure 1.1). If admission occurs already in the active phase, the cervical dilatation is plotted directly on to the alert line but contractions must be 1 or more in 10 minutes, lasting 20 seconds or more. Vaginal examinations are recommended at 4 hourly intervals, though more frequently if indicated by complications or advanced labour.

The level of the fetal head and the duration and frequency of contractions are also recorded in the central part of the partograph. All routine observations of maternal and fetal condition are also recorded on the partograph (Figure 1.1). Additional writing is rarely needed.

1.2 Management of Labour Using the WHO Partograph

The partograph with associated management guidelines is designed to improve the timing of critical management decisions in labour. These are:

- a. Transfer of a woman in labour from a peripheral unit (health centre) to a central unit (hospital with facilities for caesarean section delivery).
- b. Augmentation of labour with oxytocin infusion.
- c. Termination of labour by operative delivery (usually caesarean section).

Poor timing of, or failure to perform, these actions may lead to problems of iatrogenesis or neglect. Without management guidelines, these decisions may be made on the basis of intuition or experience which probably contributes to the widely varying rate of, for example, caesarean section delivery.

Based on the experiences of Philpott^(8,9) and Bird,⁽¹³⁾ the WHO Working Group considered that the actions appropriate at different points on the partograph should be as follows:

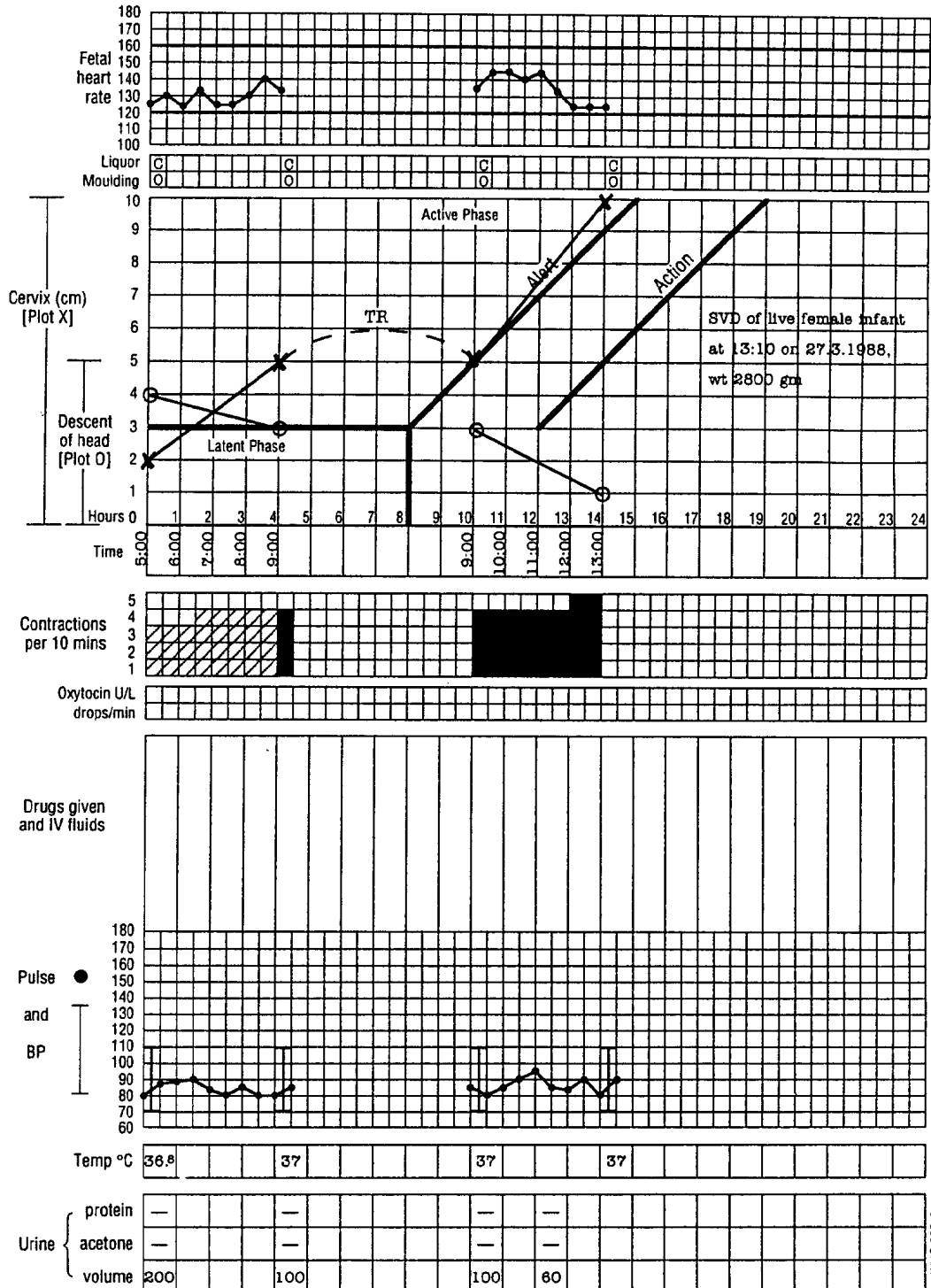
- a. If cervical dilatation remains on or to the left of the alert line in the active phase - no action is indicated.
- b. If cervical dilatation moves between the alert and action lines (but not to the action line)
 - if in a peripheral unit, transfer to a central unit
 - if in a central unit, no specific action indicated.
- c. If cervical dilatation reaches or crosses the action line:
 - review by medical staff with a view to augmentation, termination of labour, or supportive therapy.
- d. Prolonged latent phase (8 hours of observed latent phase):
 - review by medical staff.

The WHO manuals for use with the partograph give little detail on the suggested managements. The manuals advise the development of local protocols.

FIGURE 1.1
LABOUR PLOTTED ON THE WHO PARTOGRAPH

PARTOGRAPH

Name Mrs B. Gravida 1 Para 0 Hospital no. 1059
Date of admission 27.3.1988 Time of admission 5:00 Ruptured membranes 2 hours



WHO 83513

1.3 The Need for a Trial

It can be seen above that the design of the partograph was thought to represent the best available from published information but the management guidelines were not spelt out in any detail. Operations research is encouraged and a booklet describing the methodology of operations research using the WHO partograph has been produced.⁽²⁵⁾ Three particular issues, however, were of clear importance.

First is the failure of the obstetric world to adopt fully the partographic principles so well demonstrated by Philpott⁽²⁶⁾ who dramatically improved obstetric outcome with the use of the partograph. Second, there is continuing uncertainty about the best possible design of the partograph, illustrated by the variety of published partographs. Third is the lack of a specific management protocol accompanying the partograph. WHO, through the Safe Motherhood Initiative, organized the multicentre trial reported here using the WHO partograph to address these issues particularly. In addition, it was hoped that the trial could confirm that the WHO partograph can be accurately and correctly completed and used by medical and midwifery staff, that it is of use in abnormal as well as apparently normal pregnancies and also that it is of use in management decisions in the latent phase of labour.

It was hoped that a thorough examination of these issues would confirm the value of the WHO partograph as a tool for improving the outcome of labour and promote its more widespread adaptation worldwide.

In the developing world the partograph is of value in two circumstances: in a peripheral centre to indicate the correct time to transfer a woman whose labour is prolonged and, in a central unit, to indicate the correct timing of certain interventions. A trial in the first setting is best conducted in a local setting following the WHO Operations Research guidelines.⁽²⁵⁾ The logistical difficulties of a large international multicentre trial at the health centre/hospital interface are considerable. It was therefore decided to conduct a trial based in hospitals not previously using a partograph which influenced labour management. The impact on labour management and outcome made by the introduction of the partograph would be studied, together with a detailed analysis of the progress of labour charted on the partograph. In this way it was hoped that the potential role of the partograph as a tool to aid referral decisions in labour could also be made more clear.

The partograph alone is unlikely to have an influence on the progress of labour unless a labour management protocol is introduced as well. The management guidelines described in the WHO manuals on the partograph are not at all detailed. It was recognized that the establishment of a labour management protocol needed to be included in the multicentre trial. However, hospitals in the trial would need to be already practising active management of labour so that the protocol in combination with the partograph merely influenced the timing of management decisions rather than introducing entirely new methods of management.

It would be impossible to randomly allocate individual women within one hospital to labour with or without a partograph as cross-contamination would be considerable. The design of the study therefore required the identification of matched pairs of similar hospitals with random allocation of one hospital to partographic usage. The principle involved the collection of baseline data from all participating hospitals with the subsequent introduction of the partograph to one member of each matched hospital pair. It was decided that all hospitals would ultimately use the partograph using a phased implementation programme.

As a major objective of the trial was to prove that the introduction of the partograph improved the outcome of labour by reducing the rates of operative deliveries and maternal and neonatal morbidity and mortality, a large number of deliveries would be required to achieve statistical significance.

Within the above principles and objectives, the methodology described in the following chapter was established.