



CLINICAL PRACTICE

The partogram

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Professor R H Philpott published his landmark papers¹⁻³ in 1972. Since then, it has been repeatedly demonstrated that the use of the cervicograph (also called the partograph, partogram, labour graph/chart, and nomogram of cervical dilatation) reduces maternal and fetal morbidity and mortality.^{4,5} It has also been shown that the presentation of partogram information influences obstetric decision-making.⁶ Although most if not all publications refer to or claim to be inspired by Philpott's original papers, many published partograms deviate substantially from the original. The question is — are the changes useful or should we go back to the drawing board? The purpose of this overview is not to disregard the partogram in the current form as it is widely used in South African labour wards,⁷ but rather to call attention to the possible misinterpretations of the partogram that could lead to unnecessary interventions.

Philpott did not 'invent' the partogram; his graphic record of labour¹ was inspired by Friedman's original work and modified therefrom.⁸ It also referred to the contribution by Hendricks *et al.*⁹ which refuted Friedman's deceleration phase at the end of the first stage of labour, and showed that the latent phase was a phenomenon that often starts days or weeks before the onset of active labour. Philpott's major contribution was the concept of the 'alert line' and 'the action line'. In his words: 'The alert line joins points representing 1 cm dilatation at zero time (admission) and full dilatation (10 cm) 9 hours later, a rate of 1 cm per hour . . . The action line is arbitrarily drawn 4 hours later.'^{2,3} And, 'Progress [from ≥ 3 cm] is charted on the composite graph with the alert line regarding the time at 3 cm as zero time.'¹ In other words, Philpott's original chart does not represent the latent phase, the alert line is drawn from 1 cm (time zero) to 10 cm (9th hour), and the action line is drawn 4 hours behind the alert line.

One of the main obstacles to the partogram is difficulty with its use.¹⁰ The existence of many versions of the partogram may

be seen as an obstacle to its widespread implementation.¹¹ Subsequently published partograms all refer to Philpott and Castle's original work.^{4,10-20} On close examination, however, they mostly deviate from the original composite graph. At least 12 variations can be found (Table I). They differ in many respects. Two fundamental variations relate to the overall presentation: the presence or absence of the latent phase, and the shape of the grid (square or rectangular). Figs 1 - 3 illustrate three basic partograms.

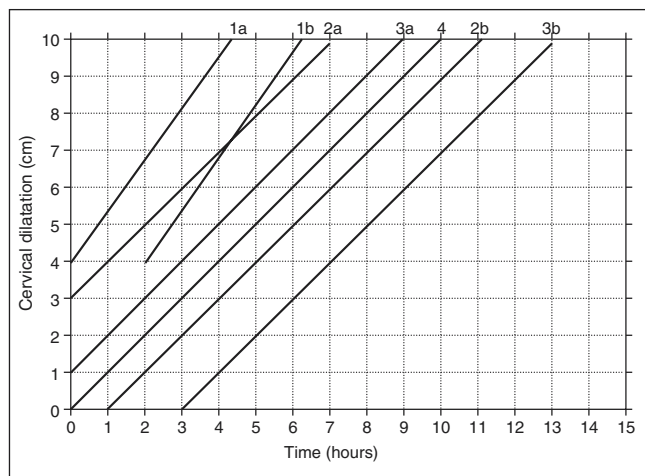


Fig. 1. Square grid partogram without latent phase. (1a = Webber's alert line, 1b = Webber's action line, 2a = Drouin's alert line, 2b = Drouin's action line, 3a = Philpott's alert line, 3b = Philpott's action line, 4 = O'Driscoll's alert line.)

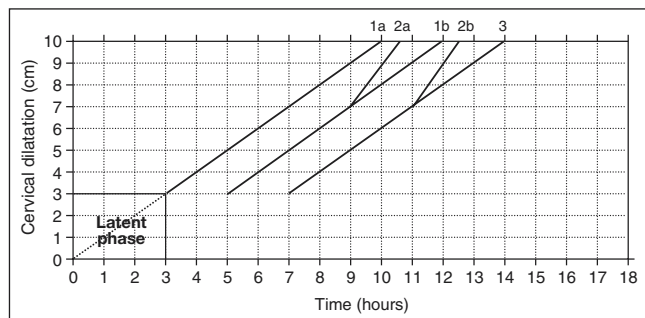


Fig. 2. Rectangular grid partogram with and without latent phase. (1a with latent phase = Bird, Larsen, DOHs alert line, 1a without latent phase = Studd's alert line, 1b = Bird's transfer line, Studd and DOH's action line, 2a = Larsen's transfer line, 2b = Larsen's action line, 3 = Bird's action line.)

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Table I. Main distinctive features of published partograms

| Author(s) | Latent phase | Alert line on y-axis (h) | Alert line on x-axis (cm) | Transfer line | Action line behind alert line (h) | Grid |
|--|-----------------|--------------------------|---------------------------|---------------|-----------------------------------|-------------|
| Philpott ¹ | No | 1 | 0 | No | 4 | Square |
| O'Driscoll <i>et al.</i> ¹⁷ | No | 0 | 0 | No | (-) | Square |
| Bird ¹⁰ | Yes | 4 | 8 | No | 2* | Rectangular |
| Drouin <i>et al.</i> ¹⁵ | No | 3 | 0 | No | (-) | Square |
| Studd <i>et al.</i> ¹⁸ | No | 0 | 0 | No | 2 | Rectangular |
| Burgess ¹⁹ | Yes | 3 | 8 | No | 3 or 4 [†] | Square |
| Webber ²⁰ | No | 4 | 0 | No | 2 | Square |
| Dujardin <i>et al.</i> ¹¹ | No [‡] | 3 | 0 | No | 3 | Square |
| WHO ¹⁴ | Yes | 3 | 8 | No | 4 | Square |
| Larsen ¹⁶ | Yes | 3 | 8 | Yes | 4 | Rectangular |
| Breen ¹² | Yes | 3 | 8 | No | 4 | Square |
| DOH ⁷ | Yes | 3 | 8 | No | 2 | Rectangular |

* Is in fact a transfer line.

† Three for multigravidas and 4 for primigravidas.

‡ On a separate sheet.

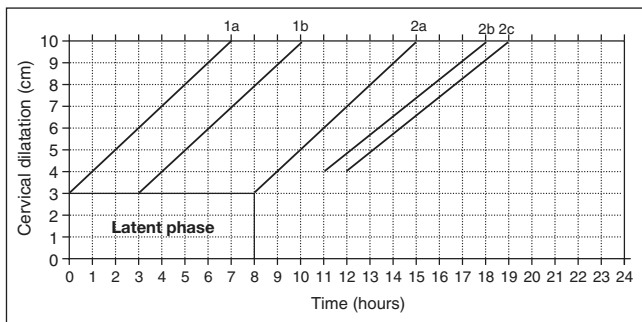


Fig. 3. Square grid partogram with and without latent phase. (1a = Dujardin's alert line (no latent phase), 1b = Dujardin's action line, 2a = Burgess, WHO, and Breen's alert line (with latent phase), 2b = Burgess's action line for multigravidas, 2c = WHO, Breen's action line, Burgess's action line for primigravidas.)

The latent phase

Since the first publications on cervicography, the issue of the latent phase has been controversial.⁹ It is noteworthy that Philpott's partogram does not depict the latent phase. The reason is that most African women are admitted in active labour. The World Health Organisation (WHO) collaborative study⁴ reported that only a small number of women experience a prolonged latent phase (more than 8 hours), and that a prolonged latent phase does not affect the caesarean section rate. As Bird¹⁰ has emphasised, if the cervix remains less than 4 cm dilated for more than 8 hours one needs to ask whether the patient is in labour. In other words, if she is not, there is no need to chart the partogram. According to Breen,¹² a prolonged latent phase with no evidence of fetal compromise (i.e. reduced fetal movement, post-maturity) should simply be observed. The question then remains — should the latent phase remain

an integral component of the partogram? Perhaps for those who maintain that it should be retained a reasonable compromise would be to chart the observations on a separate sheet.¹¹ One should, however, keep in mind the risk of inappropriate intervention if undue attention is paid to the latent phase.⁶ For instance, according to Gifford *et al.*,¹³ and contrary to the WHO's⁴ claim, 16% of caesarean sections are done in the latent phase because of lack of progress.

The alert line

The role of the alert line is to separate normal from abnormal labour. It has been shown that between 73% and 92% of labours resulting in spontaneous vertex delivery remain left of the alert line.¹⁴ There is widespread consensus on the slope of the alert line. With the exception of Drouin *et al.*,¹⁵ whose partogram exhibits a slope of 0.8 cm/hour, the slope is 1 cm/hour. The debate is about the onset of the alert line on the y-axis (cm of dilatation) and the x-axis (time in hours). The onset of the alert line on the y-axis varies from 0 to 4 cm of cervical dilatation; the onset on the x-axis varies from 0 to 3 hours (with or without the latent phase). Supporters of the concept of a latent phase put the starting point of the alert line at 3 hours.

The transfer line

Although some authors¹⁶ refer to 'Philpott's transfer line', Philpott's original work¹⁻³ does not exhibit any transfer line. What Philpott does say is the following: 'If the patient has been cared for in a peripheral unit, arrangements for transfer will need to be made as soon as her graph has crossed the alert line.'³ In other words, the alert line serves as an indication for



referral to a facility where abnormal labour can be managed. Bird¹⁰ makes similar recommendations about the use of the alert line (which he calls the warning line).

The action line

The action line is drawn 2, 3 or 4 hours behind the alert line. According to the WHO,^{4,14} a lag time of 4 hours before intervention is unlikely to compromise the fetus or the mother. However, Dujardin *et al.*¹¹ support the view that the lag time should be shortened to 3 hours because this significantly reduces the occurrence of fresh stillbirths.

What really matters is the nature of the action to be taken when the action line is reached or crossed. For Philpott and Castle,³ the recommendations are pelvic (re-)assessment to rule out cephalopelvic disproportion, a 6-hour 'trial of oxytocin' (only in primigravidae), (re-)hydration, and epidural block. A caesarean section is indicated if there is fetal distress or if augmentation fails. The WHO's recommendations are similar.^{4,14} The latter states that the function of the alert line is to indicate the need for transfer to hospital, and that the function of the action line is to indicate the need for (re-)assessment of the cause of delay and a decision about how to overcome it. WHO recommendations for labour that has reached or crossed the action line are artificial rupture of the membranes in active labour, augmentation of labour, supportive measures, and caesarean delivery if the former fail.⁴

Recently, the National Department of Health (DOH) circulated a new maternity case record and *Guidelines for Maternity Care*,⁷ which deserves comment. As already mentioned, there is no clear evidence regarding the need to include a latent phase on the graph. Furthermore, it is not clear why the action line is drawn 2 hours behind the alert line. This may lead to inappropriate interventions. The Guidelines state: 'The action line . . . represents the extreme of poor progress where action is mandatory' (e.g. transfer to hospital, oxytocin infusion or caesarean section). In a note, it states that a 4-hour action line is acceptable in hospitals but may be unsafe in community health centres because of transport delays.⁷ In other words, in labour wards without caesarean section facilities, the DOH action line should be interpreted as a transfer line. Finally, as pointed out by Cartmill and Thornton,⁶ a partogram

with a rectangular grid is likely to influence the interpretation and, once again, lead to inappropriate decisions. They argue that with a steep alert line (square grid) there is less risk of premature intervention than if the curve appears flat (rectangular grid) and than if the latent phase is included.

In summary, the partogram has been subject to change from the time it was conceived. What is important is that it should be used properly, keeping in mind the purpose of its components and their interpretation in context. One should be careful not to misinterpret the significance of the latent phase. The action line has two possible meanings depending on whether it is placed 2 or 4 hours right of the alert line (the former means transfer to a facility where appropriate action can take place). Finally, the slope of the alert and action lines should be borne in mind in order not to overdiagnose 'slow labour'.

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