

**PRACTICE GUIDANCE**

# Programmed Labor—Indigenous Protocol to Optimize Labor Outcome

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## Abstract

**Objective:** To Assess and develop an indigenous protocol to optimize labour outcome, as Programmed Labor.

**Design:** Open, prospective (Between January 2000 to December 2007), randomized, parallel group, monocentric, comparative matching trial.

**Settings:** Labor rooms at Nowrosjee Wadia Maternity, Mumbai.

**Selection criteria:** 200 patients in each group, aged between 21-30, as low-risk parturient.

**Intervention:** Partography, Oxytocin, Primiprost, Pentazocin, Dizepam, Tramadol, Drotin, Ketamine.

**Outcome parameters:** Satisfactory obstetric outcome, progressive labor of shorter duration, less blood loss and pain relief.

**Results:** Study group had mean shorter duration of active labor as 3.5 hrs compared to controls of 5.2 hrs. Excellent pain relief was of 24 and 62% of substantial relief in comparison to 32% only in other group with no patient falling in excellent group. Second stage of labor was reduced by half (26 to 48 meters) and lesser third stage blood loss.

**Conclusions:** Programmed labor with indigenous protocol developed and practiced, results in progressive, shorter, and comfortable labors with lesser blood loss.

**Keywords:** Programmed labor, indigenous protocols, drugs for pain relief, partography, optimized obstetric outcome.

## DEFINITION

Programmed labor is an indigenously developed protocol for labor management (Daftary et al 1977, 2001, 2003), developed with the dual objective of providing pain relief during labor and reaching the goals of safe motherhood by optimizing obstetric outcome.

## INTRODUCTION AND BACKGROUND MATERIAL

Normal labor is the result of optimal integration of the Three 'P's namely, the "Powers" or driving forces provided by the

uterine contractions, "Passenger" or the fetus of optimum size and in favorable presentation and position. "Passages" or the birth canal made up of the soft tissues and the bony pelvis being adequate in capacity.

Pain relief during labor spells a humane approach to delivery. Experience has shown that providing pain relief to the mother allays fear and anxiety, and provides a more favorable environment for improved obstetric outcome. Labor analgesia ensures relief from pain, controls alterations of placental circulation thereby safeguarding the fetus against hypoxia and depression at birth. Pain relief prevents maternal hyperventilation and undue muscular efforts which exhaust the mother, ensures periods of restful sleep and willing cooperation with her attendants in labor. Pain relief favors cervical dilation resulting in labors of shorter duration, less traumatic and requiring lesser obstetric interventions. Shorter labors are also associated with a lowered incidence of intrapartum infections. For the fetus, programmed labor confers the benefits of shorter and less traumatic labors and freedom from obstetric interventions necessitated by maternal distress. The obstetrician is benefited by having a better control over the events of labor, reduced pressure from the patient and her relatives to intervene because of unbearable pain, and lastly programmed labor ensures prevalence of optimum conditions at the time of delivery.

Although Epidural Analgesia offers the best method of providing pain relief, one must accept the fact that services of trained anesthesiologists are not universally available, and beyond the reach of a large section of our population. Hence, the adoption of an analgesia protocol which can be easily followed by the attending obstetrician has much to recommend for wider acceptance by the profession in all parts of our country.

*Partography* denotes the graphical representation of cervical dilatation on a time scale. Friedman (1955, 1967) introduced the now well-known S-shaped or sigmoid curve representing the Mean Cervical Dilatation-Time curve of labor, this forms the basis of partograms commonly used for Labor-Documentation. Studd (1973) demonstrated the importance of utilizing the nomograms based on the mean cervical dilatation time curve of normal primigravidae and multiparae in any ethnic population as the basis for comparing the labor progress in any parturient during labor. The patient's partogram is charted alongside the standard 'nomogram'. Should the patient's partogram stray to the right of the nomogram, it automatically draws the clinician's attention to a tardy labor. The clinician should try to determine the cause of the slow progress. Often the pains are inadequate in intensity or infrequent, in which case the decision to accelerate labor with oxytocin or prostaglandins can be implemented without delay. Should the pains be incoordinate, analgesics help to relieve the distressing pain and correct the incoordinate uterine activity, thereby reducing the incidence of cervical dystocia.

*Alert line* and *Action line* are drawn on the partography record chart to draw the clinicians attention to impaired progress in labor, so as to adopt corrective measures in time and to detect underlying factors like fetal malpositions (occipito posterior position) or pelvic bony abnormalities of the lower pelvic strait (prominent ischial spines, flat sacrum suggestive of funneling of the pelvic cavity) commonly seen with an android pelvis. This causes disproportion in the midpelvis and outlet. Once the cause of dysfunction has been identified, the clinician may decide to give a trial of labor under close supervision, but with everything in readiness to interfere in the interest of the mother or her fetus. Philpott et al (1988) demonstrated the importance of partograms in the management of labor and improving the obstetric outcome in Rhodesia (Zimbabwe). This experience also applies to all the underdeveloped countries of the world.

*Active management of labor* was a concept advanced by the Irish school. In 1973, O'Driscoll and his colleagues reported on the advantages of active management of labor resulting in shorter labors, improved obstetric outcome and lowered cesarean section rates. The concept of programmed labor incorporates these principles advantageously.

*Programmed labor concept:* The protocol developed by Daftary et al (1992-2001) at the Nowrosjee Wadia Maternity Hospital over a period of many years rests on three pillars of:

1. Ensuring adequate uterine contractions—Active management of labor.
2. Providing optimum pain relief—Use of analgesics and antispasmodics.
3. Close clinical monitoring of labor events—Maintaining a PARTOGRAM.

## MATERIALS AND METHODS

This study was undertaken between January 2000-December 2007. This study included two hundred low-risk primigravidae treated as per programmed labor protocol and their obstetric outcome was compared with that of 200 matching controls treated as per prevailing practices. All patients and controls included in this study satisfied the below mentioned selection criteria:

1. Age between 21-30 years.
2. No identifiable medical or obstetric complications present.
3. Admission NST-satisfactory.
4. Patient counseled and consent taken.
5. All observations made by above mentioned clinicians.

### Admission Criteria—Programmed Labor

The medication protocol for programmed labor begins only after the patient enters the *Active Phase* of labor. The starting point of active phase of labor is identified on the basis of clinical evaluation, when the following parameters are satisfied:

- The cervical dilatation is 3.0 cm or more, and the cervical effacement is > 50%.
- The uterine contractions come at a frequency of at least 3/10 mins. And last for 35-45 secs.
- The head should be engaged.
- There should be no clinical suspicion of CPD.
- The patient may have show or draining.

*Medications used in programmed labor:* As per this protocol—a combination of drugs are used to provide effective pain relief (labor analgesia), coupled with antispasmodic drugs which help cervical softening, yielding and dilatation to moderate driving forces. This policy provides with the benefits of drug synergism whilst at the same time restricting the doses of drugs to minimal amounts commensurate with achieving progressive labor whilst at the same time safeguarding the mother and her fetus against any major drug adverse effects.

### PROGRAMMED LABOR

- Start an intravenous infusion line with 5% Ringer Lactate solution @ about 20 drops/min.
- Ensure that the pains are optimal, i.e. 3-4 sustained pains/10 minutes. If necessary, you may add 2 units of oxytocin to the drip or give a tablet of primiprost orally every hour to ensure optimal pains resulting in progressive labor.
- Dilute an ampoule of 30 mg. Pentazocine or Fortwin with a diluent like normal saline/distilled water, and similarly dilute an ampoule of diazepam (Calmpose/Valium/Anxol). In 10 ml of diluent. Administer 1/5 of each drug, i.e. 6.0 mg of Fortwin and 2.0 mg of diazepam, slowly in bolus form through the tubing of the infusion line (Ganla et al 2000, Guseck 1952).

- Administer inj. Tramadol (Inj. Domadol/Tramazac ) in the dose of 1 mg/kg body wt. Intramuscularly, along with an antispasmodic like Inj. Drotin 40 mg, (other alternatives include Inj. Anafortan, Buscopan, or Epidosin, as per clinician’s choice-Etterich 1959, Khosla et al 2003, Mishra et al 2002 (Mukhopadhyaya et al 2000).

Observe the progress of labor by charting the maternal and fetal parameters every hour or earlier if indicated, and assess the progress of labor on the basis of cervical dilatation and descent of the fetal head, as documented periodically on the partogram.

When the patient is in advanced labor, and the fetal head pressing down on the pelvic floor, the patient starts complaining of severe pain, or bearing down sensation. At this time the cervix is often almost 7-8 cm dilated. This is the time to administer Inj. Ketamine if required, in the following manner (Ganla et al 2000).

*Initial dose:* Inj. Ketamine 0.25 mg to 0.5/kg body weight. Dilute the drug in 10 ml of saline, and administer slowly through the tubing of the infusion line as a bolus over a period of a few minutes until the desired effect is obtained. Often a small dose of 0.25 mg/kg or less suffices. Do not exceed the maximum dose.

For a patient weighing 60 kg. The initial Ketamine dose works out at 15-30 mg. All subsequent top-up doses of Ketamine are given at 20-30 min intervals. These top-up doses are half of the initial dose, i.e. 7.5-15 mg in the patient weighing 60 kg.

The last top-up dose of ketamine should be given after the birth of the baby. This will relax the patient, and allow

satisfactory inspection of the Vulva, Vagina, and Cervix to exclude traumatic injuries requiring repair.

### MANAGEMENT OF THIRD STAGE OF LABOR

This is the treacherous and unpredictable part of labor. To shorten the duration of the third stage, minimize blood loss, ensure sustained uterine contraction, and obviate entrapment of the placenta. We have adopted the following options in the management of the third stage of labor.

1. Inject Inj. Prostodin 125 mg IM after the birth of the baby.  
or
2. Inject 10 units of Oxytocin diluted in 20 ml saline through the umbilical vein of the placenta. OR administer it slow intravenous to the mother. The above suggested regime of programmed labor yields.

*The following advantages:*

- a. Shorter labors with substantial pain relief.
- b. Significant amnesia of painful events of labor.
- c. Significant reduction of dystocia.
- d. Lowering of the incidence of operative deliveries.
- e. Obstetric management simplified.
- f. Short duration of third stage of labor.
- g. Minimal blood loss after delivery.

### RESULTS

A comparison of the obstetric outcome in the two groups is shown in Table 1.

**Table 1:** Two groups of obstetrics outcome

Parameter	Primigravidae	
	Study group	Controls
1. Number	200	200
Vaginal delivery	176 (88.0%)	162 (81.0%)
Spontaneous unassisted delivery	121	120
Low forceps assistance	14	18
Ventouse assisted	31	24
LSCS	24 (12.0%)	38 (17.0%)
2. Mean duration of active phase of labor	3.5 hours	5.2 hours
3. Mean rate of cervical dilation	2.5 cm /hour	1.2 cm/hour
4. Mean duration of second stage of labor	26 minutes	48 minutes
5. Mean duration of 3rd stage of labor blood loss (average)	3.5 minutes	15 minutes
6. Pain relief	about 60 ml	about 120 ml
	Excellent	nil
	Substantial	32%
	Insufficient	56%
	None	12%
7. Perinatal loss	Nil	one

## DISCUSSION

The experience of the study revealed that patients treated with the above protocol had progressive, shorter and more comfortable labors. The duration of the third stage of labor was much shorter and the blood loss was drastically reduced.

Other workers have also evaluated this protocol, their experiences have been documented below.

1. Hema Divakar and Anupama Patil of Bangalore analyzed their data on cases treated as per the Programmed Labor protocol and concluded that 85% of patients experienced substantial pain relief. The duration of labors was much curtailed, the obstetric interventions did not increase, they reported a cesarean section rate of 4.5% and a vaginal assistance rate of 6%, the neonatal outcome was satisfactory, and there was no perinatal loss. Maintenance of the partogram helped in early identification of emerging obstetric problems alerting the clinician to adopt timely corrective measures.
2. A clinical study of programmed labor and its outcome—Chauhan R, Gupta A (2003) from Jubalpur. Reported on their experience of 75 cases. 25 primiparae and 50 multiparae. They reported the mean time for onset of analgesia to be around 16 mins. Satisfactory pain relief was experienced by 88% of primiparae and 92% of multiparae. The mean duration of the first stage of labor was  $3.4 \pm 1.55$  hrs and in multiparae it was  $2.50 \pm 1.25$  hrs which was significantly lower than in controls observed as  $4.50 \pm 1.20$  hrs in primis and  $3.58 \pm 1.47$  hrs in mults. In their study, 92% of primiparae and 98% of the multiparae had normal vaginal delivery. The duration of the third stage was 3-5 mins. The total blood loss was much reduced. The APGAR scores were satisfactory in all patients in the treatment group.
3. Priyanki Kadakia and Ragini Verma (personal Communication) undertook a study of 90 parturients adopting the programmed labor protocol for labor analgesia at Govt. Medical College, Surat. A summary of their experience is presented
  - The study included 90 cases, 62% of the patients were aged between 17 and 25 years. Mean weight of the patients was 52.3 kg.
  - Primiparae accounted for 49 cases and multiparae were 41. 95.5% of cases delivered within 4 hours of commencing analgesia. Mean time of onset of analgesia was 3.56 minutes.
  - 74.4% patients experienced substantial pain relief whilst in 10% pain relief was excellent.
  - 97.8% patients had normal deliveries.
  - The rate of cervical dilatation achieved was 1.9 cm / hr. in primigravidae and 2.8 cm / hr in multiparae.
  - The fetal heart rates and APGAR scores after birth remained unaffected.

- Maternal vital parameters were unaffected.
- Minor side effects like nausea, vomiting, drowsiness, and malaise were observed in 23 (25.5%) cases. None suffered any serious side effects.
- The ease of administration, the need for minimal patient monitoring with systemic analgesia made programmed labor protocol highly acceptable.

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