Chapter 20

INDUCTION OF LABOUR

Abstracted from SOGC Clinical Practice Guideline No 107, Induction of Labour, 2001 and the SOGC ALARM Course Syllabus, 22nd edition, 2015-2016

Introduction

The induction of labour is the initiation of uterine contractions before the spontaneous onset of labour, for the purpose of achieving a vaginal birth. Labour induction is an active intervention with potential risks for the mother and fetus. In nullipara, overall, induction is associated with twice the risk of Caesarean section, as compared with spontaneous labour. Induction is indicated when the risk of continuing the pregnancy to the mother and/or fetus exceeds the risk associated with the induced labour and birth. The indication must be convincing, compelling, consented and documented. Therefore, elective induction, in the absence of maternal or fetal indications, *should not be undertaken*.

Pre-induction Assessment

Before induction, several clinical elements need to be considered to estimate the success of induction and minimize the risk of cesarean section. Factors that have been shown to influence success rates of induction include the Modified Bishop score, parity, BMI, maternal age, estimated fetal weight and diabetes.

Methods of Labour Induction

Before inducing labour, the physician should have completed a thorough evaluation of the mother and fetus. This evaluation should include documentation of the indication for, and method of, labour induction.

A. Cervical Ripening

Cervical ripening, when indicated, should be considered part of the labour induction process. The state of the cervix is the most important predictor of success. A Bishop's score of > 6 is considered favourable and is likely to result in successful labour induction. It, therefore, follows that women with an unfavourable cervix will

likely require a longer induction to delivery period than those with a favourable cervix

1. Prostaglandin

The use of PGE2, (as gel or pessary – Cervidil), is associated with risk for uterine hyperstimulation, which occurs usually shortly after PGE2 administration.

The woman remains in bed for 2 hours following insertion of Cervidil, with fetal well-being being assessed. The Cervidil is removed after 12 hours, or if there is spontaneous rupture of the membranes. Oxytocin can be started 30 minutes after removal of Cervidil.

At present, there is insufficient evidence to make a recommendation on the safety of the use of PGE2 in the presence of previous Caesarean section, multiple gestation, or in the outpatient setting. Having said that, there are multiple reports in the literature of ruptured uterus following PGE use in patients with previous Caesarean section. In these situations, the attending physician is encouraged to inform the woman of the current state of evidence.

Hyperstimulation can lead to abnormal fetal heart rate patterns. If hyperstimulation occurs:

1) remove the Cervidil, and perform intra-uterine resuscitation while notifying the physician to request an order for Nitroglycerine sublingual spray - 0.4 to 0.8 mg q 1 minute X 3 doses, or until desired effect.
2) administer a tocolytic agent. Agents used include Nitroglycerine 50 µg IV push to a maximum of 200 µg. It is important for the unit to develop a protocol.
3) It is important for the unit to develop a protocol to assist staff in the event of uterine hyperstimulation

2. Mechanical

The Foley catheter is a mechanical alternative to PG for cervical ripening. The proposed advantages of the Foley catheter over PGE2 are that it is considerably less

expensive, and it can be deflated and removed immediately, should any undesirable side effects occur.

B. Labour Induction

1. Amniotomy

It has been suggested that artificial rupture of the membranes is an effective method of labour induction, particularly when the cervix is favourable. It has been reported that spontaneous labour is established in 60 percent and 80 percent of cases within 6 and 12 hours respectively, following rupture of the membranes.

2. Oxytocin

The goal of oxytocin administration is to effect uterine activity that is sufficient to produce cervical change and fetal descent, while avoiding uterine hyperstimulation. At present, there is no clear evidence to suggest the most appropriate oxytocin infusion regimen. However, using the minimum dosage that achieves active labour seems prudent. Therefore, it is recommended that the rate of oxytocin infusion can be increased **by 1 – 2 mu/min** every 30 minutes **until a maximum dose of 20 mu/min is reached.**

Finally, it should be noted that the induction of labour with only oxytocin infusion is associated with a significant proportion of women remaining undelivered after 24 hours.

Procedure Using Intravenous Oxytocin

1. Oxytocin is administered intravenously, using a constant infusion pump.

2. A detailed conversion table giving the equivalent in **milliunits per minute of oxytocin,** of drops per minute, or other expressions of the volume or rate of infusion related to the specific equipment being used, needs to be available in the labour/birth unit during the induction. Acceptable medical and nursing practice recognizes only the dose given per unit time as terminology

to describe the administration of any drug, including oxytocin. **Please refer to table 2.**

3. An intravenous infusion of a balanced salt solution (0.9% NaCl), using an 18-gauge intracatheter, is started at a site that allows mobility of the woman's arm. The oxytocin should be delivered through a secondary IV connected to the main infusion line as close to the primary venipuncture site as possible.

4. Five (5) units of oxytocin are added to 500 ml IV solution (0.9% NaCl) (10 mu/ml solution), and the infusion is started at 1 - 2 milliunits (mu) per minute. Alternative concentrations of oxytocin, and volumes of dilutant fluid, particularly those compatible with locally available infusion pumps, are equally acceptable. It is the dose of oxytocin per unit time which is important, and not the fluid infused (although fluid overload must be avoided).

5. If a long induction process is anticipated, it may be prudent to double the concentration to reduce the amount of free water and prevent water intoxication syndrome, ie. 10 U in 500 cc 0.9% NaCl, started at 1 - 2 mu/min.

6. If contractions have been initiated by the starting dose, then:

    a) if contractions are satisfactory, keep the dose constant.

    b) if contractions are not satisfactory, (ie. irregular or poorly sustained) increase by 1 - 2 mu/min., 30 min.

    c) it is unusual to require more than 10 - 20 mu/min to initiate and maintain good uterine activity. The dose of Oxytocin may have to be reduced as labour becomes well established. Maintenance dose is often 8-12 mu/min.

d) if more than 20 mu/min of oxytocin is needed to achieve good contractions, the clinical situation needs to be carefully reassessed. Care must be taken to avoid water intoxication, including use of electrolyte solutions such as Ringer's Lactate, and use of concentrated oxytocin solutions to decrease the total volume infused, as per # 5. An intrauterine pressure catheter may be needed to facilitate assessment of uterine activity.

e) if fetal heart rate abnormalities develop, the infusion must be decreased or discontinued immediately, **IV fluid resuscitation**, the woman placed on her left side, and oxygen given by face mask. The attending physician should be notified immediately. A pelvic examination is done.

f) if tetanic contractions (contractions lasting more than 90 seconds), **or** uterine tachysystole (5 or more contractions in a 10-minute period), **or** increased baseline uterine tone, are observed, the oxytocin infusion must be decreased or discontinued and the attending physician notified immediately.

g) Following the birth, an oxytocin infusion of 20 units in 1000 ml Ringer's lactate or normal saline at 100 - 125 ml/hr should be continued for at least three hours to prevent uterine atony.

TABLE I

PRE-INDUCTION CERVICAL SCORING
Points Assigned

Factor	0	1	2	3
Dilatation (cm)	**0**	**1-2**	**3-4**	**5-6**
Effacement (%)	**0-30**	**40-50**	**60-70**	**80**
Station	**-3**	**-2**	**-1 or 0**	**1+ or +2**
Consistency	**Firm**	**Medium**	**Soft**	
Position	**Posterior**	**Mid**	**Anterior**	

Reprinted by permission of the publisher from Bishop EH. Pelvic scoring for elective induction. Obstet Gynecol, Vol. 24, No. 2, p 267. Copyright 1964 by Elsevier Science Inc.

Reference
SOGC ALARM Manual 22nd Edition 2015-2016

Table 2

Oxytocin table: Start at 1-2 mu/min or 3-6 mL

2 mu/min	**6 mL**
4 mu/min	12 mL
6 mu/min	18 mL
8 mu/min	24 mL
10 mu/min	30 mL
12 mu/min	36 mL
14 mu/min	42 mL
16 mu/min	48 mL
18 mu/min	54 mL
20 mu/min	60 mL

References

1. SOGC, **Advances in Labour and Risk Management (ALARM) Course Syllabus**, 22nd Edition 2015-2016
2. Leduc, D., Biringer, A., Lee, L., Dy, J., **SOGC Clinical Practice Guideline: Induction of Labour,** No. 296, September 2013. JOGC S1-S18.