

# **Induction of Labor (IOL )**



IOL is the stimulation of uterine contractions during pregnancy before labor begins on its own to achieve a vaginal birth. IOL can be indicated for various reasons, primarily when concerned for a mother's health or a baby's health.

## **We need to evaluate several factors, before preceding into IOL**

- 1.comprehensive history tacking and examination to evaluate if the case needs IOL and do not have a contraindication to induction
2. wither she and her baby are fit for IOL
  - Maternal health, Assessment of pelvis in relation to fetal size
  - Cervical ripening which is One of the most important factors in predicting the successful IOL
  - Check the fetuse gestational age, weight and size, position and presentation
3. brief explanation of what is the method to be used for IOL.
- 4.Finally, she should be aware of the risks and benefits of IOL.

## **Reasons for labor induction include:**

- 1.Postterm pregnancy. two weeks beyond due date, and labor hasn't started. These pregnancies suffers Stillbirth fetal compromise in labour suffer from meconium aspiration Mechanical problems at delivery
- 2.Prelabor rupture of membranes. When forewater is broken, and labor not started
- 3.Chorioamnionitis.
- 4.Fetal growth restriction. The estimated fetal weight is <10th percentile
- 5.Oligohydramnios. There's not enough amniotic fluid surrounding the baby.
- 6.Gestational diabetes. You have diabetes that develops during pregnancy
- 7.High blood pressure disorders of pregnancy
- 8.Placental abruption. The placenta peels away the uterus before delivery
- 9.Certain medical conditions. You have a medical condition such as kidney disease or obesity.
- 10.Elective labor induction is the initiation of labor for convenience in a person with a term pregnancy who doesn't medically need the intervention. weeks or older before induction to reduce the risk of health problems for your baby.
- 11.Rhesus iso- immunization..Twin pregnancy continuing beyond 38 weeks.

## Risks To IOL :

- 1.**Failed induction.** Will happen in about 25 percent of these women, especially those with an unripened cervix,They might need a C-section..
- 2.**abnormal fetal heart rate.** The medications used to induce labor might cause abnormal or excessive contractions,thus causing fetal compermise .
- 3.**Hyperbilirubinaemia** resulting in neonatal jaundice or even **Delivery of preterm** infant
- 4.**Cord prolapsed** may result when ARM performed with presenting part still high.
- 5.**Infection.** Some methods of labor induction, such as rupturing your membranes, might increase the risk of infection for both mother and babyespecially if there was atime lag till the delivery.
- 6.**Uterine rupture.** Rare snd serious complication that happens along the scar line from a prior C-section or major uterine surgery. Very rarely, uterine rupture can also occur in women who had never had previous uterine surgery..
- 7.**post partum heamohge** . Labor induction increases the risk of uterian atony .
- 8.**Maternal water intoxication**

## Contraindication to IOL

1. prior C-section with a classical incision or major uterine surgery
- 2.placenta previa and vasa previa
- 3.baby is lying (breech) or (transverse lie)or (umbilical cord prolapse) where umbilical cord slips into vagina before delivery
4. active genital herpes infection
5. Invasive cervical cancer.

## Setting for IOL

Labor induction is done in a hospital or birthing center, where the mother and her baby can be monitored and labor and delivery services are readily available. However, some steps might be taken prior to admission.

## ASSESSING THE CERVIX

Before starting IOL, we assess the cervix to determine whether or not it is ready to . A **"favorable cervix"** or ripe" when cervix has softened or thinned out, and is stretchable for subsequent dilation.

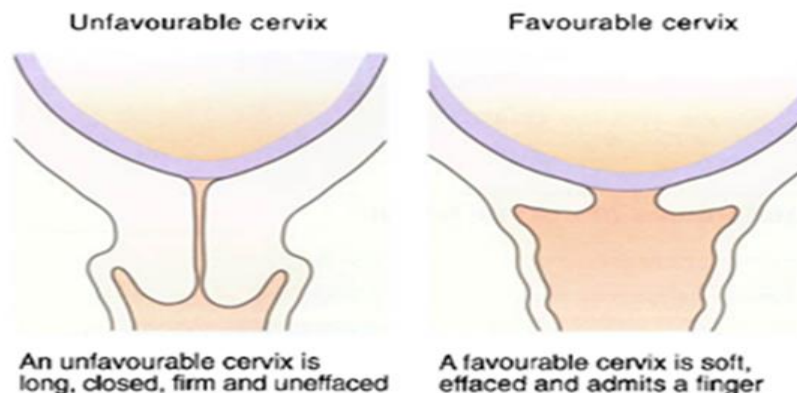
Accurate assessment of the cervix is essential, because(1)it affects the selection of induction method (2) determining cervical favorability, and (3)predict the likelihood of vaginal delivery with induction of labor

**Bishop Score**, is the most commonly used method to assess the ripeness of the cervix before induction. A score of 6 or less is used as a threshold to classify an "unfavorable cervix"

This system takes into account the position, consistency, effacement (shortening), and dilation of the cervix, as well as the station (location) of the presenting fetal part relative to ischial spine.

Table 1 Modified Bishop scoring system				
	0	1	2	3
Dilation, cm	Closed	1-2	3-4	5-6
Effacement, %	0-30	40-50	60-70	≥80
Station	-3	-2	-1, 0	+1, +2
Cervical consistency	Firm	Medium	Soft	—
Position of the cervix	Posterior	Midposition	Anterior	—

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### ➤ For Unfavorable cervix;Cervical ripening agents

local administration of *medication*, which softens and opens the cervix (prostaglandins) or nitric oxide donors (NO) as well as *mechanical*; insertion of catheters or dilators directly into the cervix

### ➤ For favorable cervix ;Induction methods :

Administration of *systemic medications* that stimulate uterine contractions (ie, synthetic oxytocin) and *mechanical methods* such as amniotomy:

,approach to labor induction should be tailored to the clinical scenario

gestational age, prior uterine surgery, fetal status, and spontaneous contractions. Additionally, system factors, availability of immediate emergency cesarean delivery,

## Unfavorable Cervix

### A.Cervical Ripening agents

#### 1. Prostaglandins PG

They lead to cervical changes similar to natural cervical ripening process, by dissolution of collagen fibrils and increased water content allowing cervix to swell, thin and be stretchable

We have 2 types of PG, prostaglandin E1 and prostaglandin E2.

**Prostaglandin E1** Misoprostol (Cytotec) safe and efficacious when used as a cervical ripening agent it can be used orally, sublingually, buccal and vaginally all were effective and have good safety profile. **Prostaglandin E2** is available orally and vaginal

**Side effects of prostaglandins** tachysystole, fever, chills, vomiting, and diarrhea

#### Contraindications of prostaglandins

- *Prior uterine surgery*: Prostaglandins should not be used in term pregnancies with a prior hysterotomy, prior cesarean birth or myomectomy) because of the increased risk for uterine rupture. *Maternal asthma* or conductive *heart disease*
- *concern for fetal status*: if there is fetal heart rate abnormalities, the increased uterine activity triggered by PG can compromise fetal status.

- **Other uses of PG**

1. In cases of abortion, missed miscarriages. Incomplete abortion, induced abortion
2. Cervical preparation before uterine instrumentation.
3. Pre-induction cervical ripening
4. Postpartum haemorrhage prophylaxis and treatment

## 2. Nitric oxide donors

The ideal agent for induction of labour would induce cervical ripening without causing uterine contractions. Otherwise, it will necessitate close monitoring of mother and baby within a hospital environment. Cervical ripening without uterine contractility could occur safely in an outpatient setting can be achieved via Nitric oxide, which is recommended as (ideal ripening agent)

- **Types** isosorbide mononitrate (ISMN) isosorbide dinitrate (ISDN) glyceryl trinitrate (GTN)
- **Effectivity** Nitric oxide (NO) donors reduce the proportion of women with an unfavourable cervix at 12 to 24 hours when compared to placebo for yet its is less effective than vaginal misoprostol
- **Safety** associated with a reduction in the rate of uterine hyperstimulation with fetal heart rate (FHR) changes when compared with vaginal misoprostol for induction of labour. Fewer women are undergoing a caesarean section.
- **Side effects** higher rate of maternal headache, many of women remain undelivered after 1-2 days of IOL.

## B. Cervical ripening with mechanical methods

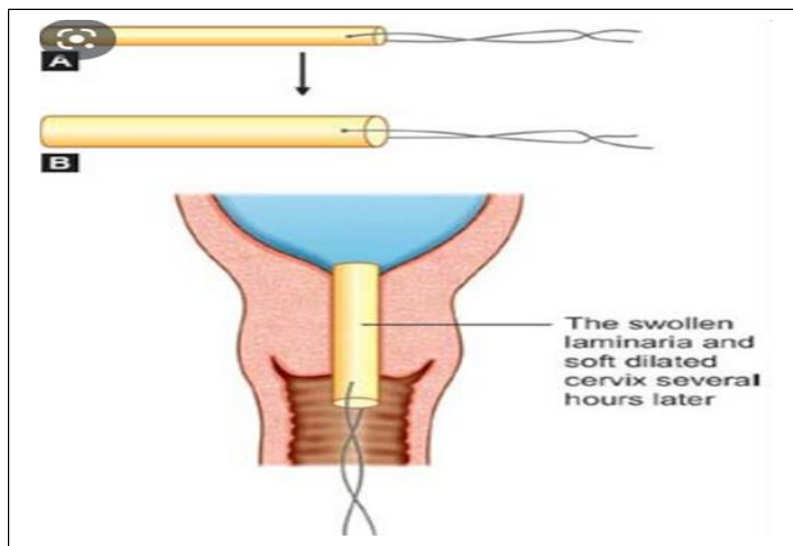
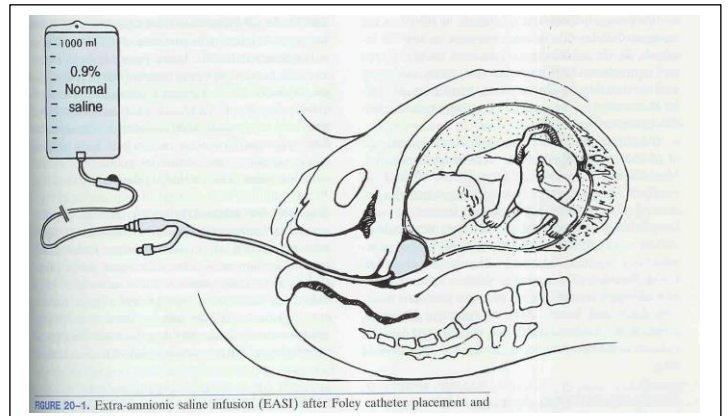
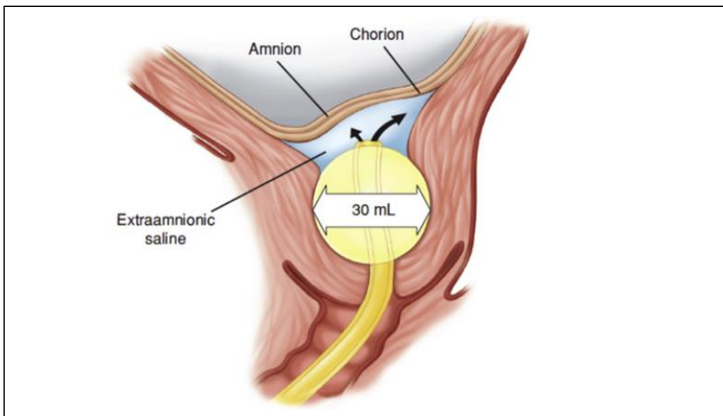
These methods initiate labor by stretching the cervix, and causing the release of local PG, its advantage their low cost and lower incidence of side effects compared with other induction agents

- **Membrane Sweeping** ( Stripping) technique is not only useful to ripe the cervix but also a preventative strategy to avoid prolonged pregnancy >41 weeks

- **Balloon Catheter** ( with & without cervical extra amniotic saline infusion) catheters are placed using aseptic technique with continuous fetal monitoring. After placing a sterile speculum, ring forceps can be used to pass the deflated balloon catheter tip through the internal cervical os and into the extraamniotic space and appropriate duration of Foley ripening (12 vs 24 hours). It is recommended to *remove the catheter* after **24 hours** if it has not been spontaneously expelled. No increased risk of infectious morbidity associated with this technique.

- **Natural dilators** as Laminaria

- **Combination Methods for Cervical Ripening** Given that mechanical and pharmacologic cervical ripening agents have different mechanisms of action, combined method produce synergistic effects. typically use Foley catheter with simultaneous administration of either prostaglandins or oxytocin infusions..



## Induction in the Favorable Cervix

**Either: Mechanical methods; Amniotomy OR Drugs; Oxytocin OR Non-pharmacological method**

### Oxytocin

Syntocinon is typically administered by intravenous infusion for labor induction with a favourable cervix. The common strategy is starting induction with oxytocin until artificial rupture of membranes is feasible and the vertex is well-applied to the cervix.

**Mode of action**; stimulate sufficient uterine activity to dilate the cervix and produce fetal descent via inducing biochemical changes in uterine myofibrils and increases local PG production

**Dosing** common concentration that is used for oxytocin is 10 IU in one liter(1000 ml) of balanced solution (such as normal saline or Ringer's lactate)

schedule would be 1 mU/min, doubling the rate of infusion every 20–30 min until adequate uterine contractions are achieved or a rate of 32 mU/min is reached

**Side effects** (1) hypertonic contractions of the uterus, (2) decrease oxygenation of the fetus and, (3) rarely, result in uterine rupture

### Treatment of hyperstimulation

If the fetal heart is OK stop the infusion **but** if abnormal heart rate we stop the induction & do the supportive measures of excessive activity

### Amniotomy

Artificial rupture of membranes is a procedure used to induce or augment labor.

**To rupture membranes**, The amniotomy procedure is typically carried out by an Amnihook, which is used to create a small opening in the membranes.

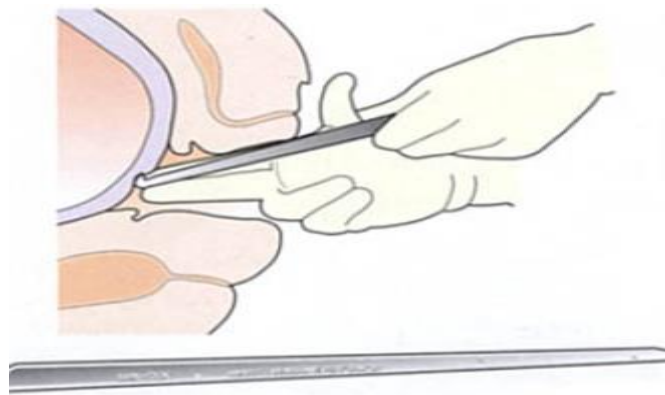
- the cervix must be dilated, typically to at least 3 cm.
- The fetal heart rate should be monitored before and after membrane rupture



- To minimize the risk of umbilical cord prolapse after rupture of membranes, the fetal vertex should not be floating and must be well-applied to the cervix.

### Timing of amniotomy

- There is concern that earlier rupture of membranes will lead to increase risk of chorioamnionitis. Therefore, the appropriate timing of artificial rupture of the membranes that balances the risk of infection with the benefits of expedited labor induction is debated.
- early amniotomy ***did not*** decrease the risk of cesarean delivery.



3 Artificial rupture of the membranes.

### Other non-pharmacological methods

Herbal supplements

Acupuncture

Castor oil, hot baths and enemas

Sexual intercourse

Breast stimulation

تم بعونه تعالى



