TYGERBERG HOSPITAL
Department of Obstetrics and Gynaecology: General Specialist Services

PROTOCOL FOR INDUCTION OF LABOUR (IOL)

- ☑ *Complete the IOL Safety Check List before starting any induction*
- ☑ *All patients that require an elective IOL must first be discussed with a consultant who must sign the form or give telephonic consent for the induction*
- ☑ *The indication for all IOL should be a well-defined and compelling enough for caesarean section (CS) if the IOL fails*
- ☑ *IOL for maternal request or maternal convenience is not an accepted indication*

Absolute contra-indications for labour induction	
Any gynaecological, obstetrical or medical condition that precludes safe vaginal delivery	
Malpresentation (e.g. transverse lie, footling breech)	Cord presentation
Contracted or Abnormal Pelvis	Active genital herpes
Major placenta praevia	Previous CS x 2 in third trimester
Large fetus (>4.5kg in non-diabetic mothers, >4.0kg in diabetic mothers) Based on best clinical judgement, not necessarily ultrasound	
Previous major uterine surgery incl. classical caesarean section	

Abbreviations:

EDV	Absent end diastolic flow	AROM	Artificial rupture of membranes
ASHT	Acute Severe Hypertension		
BMI	Body mass index	CS	Caesarean Section
CPR	Cerebroplacental ratio	CTG	Cardio-tocograph
EASI	Extra-amniotic saline infusion	EFW	Estimated fetal weight
IUFD	Intra-uterine fetal death	IUGR	Intra-uterine growth restriction
IOL	Induction of labour	PGWC	Provincial Government Western Cape
PG	Prostaglandin	PO	Orally
TOLAC	Trial of labour after Caesarean Section	UAD	Umbilical artery Doppler

Modified Bishop Score				
Cervical Feature	Score 0	1	2	3
Dilatation	< 1cm	1-2cm	3-4cm	>4cm
Length	>4cm	3-4cm	1-2cm	<1cm
Station	-3	-2	-1 / 0	+1 / +2
Consistency	Firm	Medium	Soft	
Position	Posterior	Mid	Anterior	
The following modifiers can be used for the 'Modified Bishop Score'	Add 1 point to score for: ◆ Preeclampsia ◆ Each prior vaginal delivery		Subtract 1 point from score for: ◆ Postdates pregnancy ◆ Nulliparity ◆ Premature/prolonged ROM	

1. PROCEDURE for IOL FOR GESTATION OF 26 WEEKS AND MORE:

Do a full maternal and fetal assessment with emphasis on:

- ☑ Abdominal examination (lie, presentation, estimated fetal weight, head above brim)
- ☑ Cervical assessment (Bishop score)
- ☑ 10 minute CTG to ensure fetal well being
- ☑ Complete an Induction Safety Checklist

1.1. IF THE CERVIX IS FAVOURABLE (BISHOP SCORE 8 OR MORE):

Do artificial rupture of membranes / amniotomy (AROM)

- This should only be done if there are no contra-indications; AND a normal CTG
- This is a sterile procedure (clean hands, sterile gloves, clean the perineum with tap water)
- Rupture of membranes should be followed by oxytocin administration one-hour later, if not adequate contractions by then (three contractions of at least 40s per 10 min)

Contra-indications for AROM in these circumstances

- HIV positive (If viral load unknown or any detectable viral load)
- Breech
- IUFD (except if acute abruption suspected)
- Unengaged presenting part (except in controlled AROM with severe polyhydramnios)
- Preterm fetus (Gestational age <35w0d)

If no contractions after one hour of AROM

↓

Start Oxytocin

Oxytocin for IOL- general remarks

1. Only administer in emergency centre with continuous CTG
2. Not to be used within 6 hours of any prostaglandin administration
3. Suitable after AROM or expulsion of the cervical balloon catheter, irrespective of Bishop score
4. Suitable in trial of labour after previous C/S (TOLAC) (for induction only, not to be used for augmentation)
5. Avoid oxytocin if membranes intact and Bishop score is unfavourable (i.e. < 8), except when HIV positive with failed or contraindicated misoprostol/mechanical methods

Preparing the infusion:

- Put 12 Units Oxytocin in 200ml Normal Saline as a side infusion
- Rinse administration set before connecting with IV line
- Write drug content on vaculiter in large black permanent marker (Koki pen)

Use the standard protocol sheet for Oxytocin infusion

1. Start at low dose (1-2mU/min) (at 2 dpm if using 60 dropper set or 2ml/h if IVAC)
2. After every 30 min: assess CTG & contractions. Only increase dose when CTG is normal and when less than 3 strong (>40s) contractions in 10 minutes palpated
3. Increase with 2ml/h increments at 30 minute intervals until 3 to 4 strong contractions / 10min. Up to a maximum of 20ml/h (20mU/min)
4. Review oxytocin when not in labour after 6 hours on maximum dose
5. Discuss further management with the consultant.

Stop or decrease the infusion when there are any of the following:

- 5 or more contractions / 10 minutes (tachysystole)
- Uterus not relaxing between contractions
- If CTG is suspicious or pathological

→You can restart at a lower dose once the incident has settled

In grand multiparas and TOLAC *wean* infusion (stepwise) after 2 hours of sustained 3 or 4 strong contractions/10 min

If contractions fade away after lowering the dose, increase it again to the previous level

2. IF THE CERVIX IS UNFAVOURABLE (BISHOP SCORE <8)

- Reconsider the indication and gestation
- Ensure that a full maternal and fetal evaluation is done

Use mechanical means (bulb catheter) or medical means (prostaglandins) or both for cervical ripening:

2.1. MISOPROSTOL FOR IOL

Misoprostol (oral dose of 20µg 2-hourly x 24 hours) if no contra-indications*

***Contra-indications for misoprostol** **(Consider Dinoprostone gel instead)**

- × Previous uterine surgery (C/S, open uterine surgery/ when the uterine cavity was entered]
- × Grande multiparity (Parity 5 or more)
- × IUGR with AEDV or REDV or severe redistribution
- × Severe pre-eclampsia (misoprostol not first choice, but can be can be considered if no there are no good alternatives, no ASHT, no imminent eclampsia, documented normal fetal growth/placental function, documented normal CTG and no previous abruption placentae)

- Do CTG for 10 minutes- if normal pattern, give misoprostol (Cytotec®) 20µg (20 ml of a 200µg in 200ml water solution; see below) orally.
- Repeat the same procedure at 2-hourly intervals for up to 24 hours
- As soon as the patient experiences **two regular, moderate contractions per 10 minutes**, stop the misoprostol and do a CTG for 30 minutes as well as a cervical assessment.
- If cervix is favourable for rupture, and no contra-indications - do AROM
- If the patient is in labour, allow labour to continue (without AROM). Transfer to labour ward.

Do not interrupt or delay the process once it has started (e.g. due to labour ward over capacity).

If Bishop score is still <8 after 24 hours of Misoprostol

Discuss with consultant again

Consider Intra-cervical balloon or Extra-Amniotic Saline Infusion (EASI)	Consider 2nd Course of Misoprostol Rest the patient for 24h (if maternal and fetal conditions are stable) Repeat 24 hours of misoprostol.	Consider C/S for failed IOL (see later)

2.2. INTRA-CERVICAL BALLOON FOR CERVICAL RIPENING

Intra-cervical balloon does not cause uterine contractions and does not need CTG monitoring. It can safely be done as an outpatient procedure.

This mechanical induction method is **NOT** the recommended method for:

- Patient with overt lower genital tract infection

- Immune-compromised patients / HIV stage 3 or 4 disease
- Patients with ruptured membranes

NOTE! *If this method is used in these circumstances (e.g. if other methods have failed and none of the alternative methods are suitable), then antibiotic cover is indicated.*

Technique for Intra-cervical balloon

- Aseptic technique throughout, pass sterile speculum (use lithotomy position)
- Disinfect the cervix with a water-based antiseptic solution
- Choose catheter with at least 30ml but preferably 50ml balloon
- Pass Foley's catheter tip through the internal os of the cervix
- Inflate balloon and retract until resistance
- Tape catheter to the inner thigh with light traction – patient can be allowed to mobilise with this
- After expulsion do cervical assessment (as expelled catheter does not automatically mean that the cervix is favourable) and review for AROM or oxytocin infusion
- Remove if still not expelled after 24 hours

Extra-amniotic saline infusion (EASI) Technique:

- **Could be considered if the induction is urgent or catheter expulsion has not occurred after 4-6 hours.**
- Infuse initial 200ml saline bolus at room temperature
- Infuse saline now at room temperature at 40-50ml/h through the intra-cervical catheter
- Do not exceed 2 litres in total

Oxytocin is needed in the majority of patients with intra-cervical catheter to initiate contractions.

The timing of oxytocin administration is either

- As soon as catheter is expelled OR
- As soon as catheter is placed (urgent induction)
- For urgent inductions, misoprostol can be started at the same time as the insertion of the bulb.

2.3. DINOPROSTONE GEL

Prostaglandin E2 is very expensive and NOT much more effective than misoprostol or the intracervical balloon catheter in the presence of an unfavourable cervix. It should therefore only be considered if these much cheaper alternatives are contraindicated or technically not possible.

→When used with a previous uterine scar, administer two doses only (6 hours apart) (note that the manufacturer regards a uterine scar as a contra-indication for dinoprostone).

Specific-indications for Dinoprostone:

- When AROM or intracervical balloon catheter is not feasible in patients with:
  - Grande multiparity (Parity 5 or more)
  - IUGR with AEDV or REDV
  - Severe placental insufficiency (strongly suspected or proven)
  - Previous uterine surgery (consultant decision needed - unregistered use)
  - The cervix is completely closed

Available preparations:

Prandin E_2 Gel 1mg/3g: 1mg IN THE POSTERIOR FORNIX every 6hrs (not exceeding 3mg in total).

Technique for Prostaglandin gel insertion:

- Assemble the syringe as shown in packaging.
  - For Prandin E_2
    - Insert into the posterior vaginal fornix; speculum not needed. Patient to remain supine for 30 minutes after insertion.
- Do a CTG for 60 minutes after each dose

3. IOL-RELATED COMPLICATION: HYPERSTIMULATION

Be prepared for hypercontractility when using Oxytocin (4-12% of cases) or any prostaglandins (up to 2% of cases):	
Hypercontractility:	▪ Tachysystole (6 or more contractions/10 min for 20 minutes) or ▪ Hypertonus (contraction lasting longer than 90s) ▪ Hyperstimulation syndrome: any of the above with abnormal CTG pattern
If hyperstimulation syndrome develops*:	
▪ Stop any uteronic agents (oxytocin administration etc.) ▪ Do intra-uterine resuscitation (turn mother on left side, give a 200 ml IV crystalloid fluid bolus) → Suppress contractions with ▪ Salbutamol 250 µg in 10 ml water, slowly IVI (Provided there are no **contraindications** to salbutamol) ▪ If CTG does not improve, for immediate delivery. If it does improve, observe for at least another hour on CTG in case the tocolysis wears off.* ▪ Good documentation of intra-partum resuscitation measures must be made in the notes	

*If hyperstimulation responds to tocolysis, wait 1 hour and start oxytocin again at lower dose (2 steps lower than before). If misoprostol was used consider alternative IOL method (AROM/balloon catheter) or wait at least 6 hours and start misoprostol again

4. IOL IN SPECIFIC SCENARIOS: HIV POSITIVE WOMAN

IOL Recommendations:

- Follow the same guidelines as for misoprostol, balloon catheter and oxytocin (and Dinoprostone) but add prophylactic antibiotic cover for intracervical catheter placement (ampicillin and metronidazole).
- If labour was not established after cervical ripening (mechanical/pharmacological) and Oxytocin infusion, do a C/S for failed IOL (if maternal condition allows for anaesthetic).
- Do not rupture membranes unless delivery is imminent (within 4 hours).
- If maternal condition is not favourable for anaesthetic (advanced HIV disease), discuss with the consultant in labour ward for possible sterile AROM and expedient delivery of the baby

5. IOL IN SPECIFIC SCENARIOS: PREVIOUS CAESAREAN SECTION.

The best method, efficacy, and safety of cervical ripening and/or labour induction in this population have not been established. At least 50 percent of inductions in women with a prior C/S are successful, with the highest chance of success in women with a prior vaginal delivery and favourable cervix. Induced labour appears to be associated with a higher rate of uterine rupture than spontaneous labour with the relative risk of rupture reported as 4.9 for induction of labor without prostaglandins and 15.6 for induction with prostaglandins.

Recommendations:

i. In-depth counselling about the risks and benefits of IOL versus repeat C/S, as well as the risks associated with waiting for spontaneous labour.

ii. Evaluate for strip (or sweep) of membranes after 38 weeks of gestation to hasten the onset of spontaneous labour.

iii. For a ***favourable cervix:*** choose AROM and administration of oxytocin, if not contraindicated. Do not exceed a maximum dose of 20 mU/min. Intrauterine pressure catheter monitoring for the prediction of uterine rupture can be useful for judicious titration of oxytocin.

iv. For an ***unfavourable cervix*** discuss the risks and benefits of mechanical and pharmacologic options of cervical ripening. Mechanical cervical ripening (bulb) followed by AROM and oxytocin administration appears to limit the risk of rupture in these women.

v. Prostaglandins (Dinoprostone) *should only be used*:

- If mechanical cervical ripening cannot be done.
- After appropriate and clearly documented counselling including discussion with the consultant in charge, as dinosprostone is NOT registered for use in a patient with previous uterine surgery
- if Prandin® is used the maximum total dose should not exceed 2mg.

6. FAILED INDUCTION

There is no universal agreement on what constitutes a failed IOL but it reflects the failure to achieve established active labour (regular contractions and progressive cervical dilatation and descent) after a predefined period of use of induction methods. The important principle is to allow adequate time for cervical ripening and development of an active labour pattern before determining that an IOL has failed. Take the indication, urgency of delivery, maternal condition, fetal condition and maternal wishes into account when discussing a possible failed IOL with the consultant.

Recommendation:

I. Prior to the initiation of any IOL there should be a clearly defined method/s and timeline.

II. If cervical ripening is required, the failure to establish sufficient cervical changes after pharmacological *and* mechanical ripening to enable AROM or to achieve regular contractions can be seen as a failed IOL.

III. Oxytocin as induction method is considered to have failed if regular contractions and cervical change do not occur after 12-18 hours of oxytocin administration. An alternative method (e.g. miso) can still be considered if not contraindicated, but if no alternatives are suitable, the IOL is considered a failed IOL.

IV. Always attempt safe AROM (if feasible and not contraindicated) before an IOL is considered to have failed.

7. PROCEDURE for IOL FOR GESTATION OF 26 WEEKS AND MORE WITH AN INTRA-UTERINE DEATH or SEVERE FETAL ANOMALY (NO FETAL MONITORING DONE)

- Use the same protocol as for viable pregnancies, without the need for CTG monitoring
- In a stable uncomplicated maternal condition and when abruption is not suspected consider mifepristone as 1st line in an outpatient setting before initiation of a misoprostol IOL

8. PROCEDURE for TERMINATION OF PREGNANCY/UNMONITORED INDUCTION FOR GESTATION 13-26 WEEKS (FIGO Regimen)

Sure gestation of 13- 24 weeks

- Mifepristone 200mg orally followed by misoprostol as set out below after 12-24 hours.
- Misoprostol 400 µg vaginally/sub-lingual/buccal 3-hrly (maximum dose x5)
- Halve the dose of misoprostol if previous caesarean section or uterine scar

Sure gestation of 25-26 weeks

- Mifepristone 200mg orally in an outpatient setting followed by misoprostol as set out below after 12-24 hours.
- Misoprostol 200 µg vaginally/sub-lingual/buccal 4-hrly (maximum dose x5)
- Halve the dose of misoprostol if previous caesarean section or uterine scar

9. PROCEDURE for IOL FOR GESTATION 13-26 WEEKS WITH AN INTRA-UTERINE DEATH

- Mifepristone 200mg orally in an outpatient setting followed by misoprostol as set out below after 12-24 hours.
- Misoprostol 200 µg vaginally/sub-lingual/buccal 4-6 hourly (maximum dose x5)
- Halve the dose of misoprostol if previous caesarean section or uterine scar

NB! If no response to above induction regimes then ensure again that pregnancy is intrauterine.

Balloon catheter/EASI can be done if no response to misoprostol.

The following can undergo MISOPROSTOL induction in the antenatal ward (F2)*
Chronic hypertension*
Gestational hypertension*
Diabetes Mellitus*
Previous abruptio placentae*
Prelabour Rupture of membranes (at ≥ 34w0d)
Previous Intra-uterine death (not due to abruptio placentae)
Post-term pregnancy
Previous IUFD ≥24 weeks gestation, of unknown/unexplored cause in uncomplicated pregnancy

* In stable maternal condition with no organ dysfunction and normal fetal assessment

The following can undergo CATHETER BULB CERVICAL RIPENING in the antenatal ward (F2)
Chronic hypertension
Gestational hypertension
Mild-moderate pre-eclampsia
Diabetes Mellitus
Grand Multiparas (parity 5 or more) for mechanical induction
All patients who need tertiary care due to maternal reasons (e.g. cardiac lesions, BMI >50 etc.)
Previous IUFD ≥24 weeks gestation, of unknown/unexplored cause in uncomplicated pregnancy
Previous uterine scar
Previous Intra-uterine death (not due to abruptio placentae)
Previous abruptio placentae
Post-term pregnancy

The following can undergo CATHETER BULB CERVICAL RIPENING in SPECIAL CARE WARD (C2A East)
Pre-eclampsia at 34 weeks
Diabetes Mellitus

Indications for induction in the Emergency Centre [C2A West]: *All patients with severe maternal disease**
All patients who need tertiary care due to maternal reasons (e.g. cardiac lesions, BMI >50 etc.)
Suspected chorioamnionitis
Two or more episodes of previous abruptio placentae
Severe fetal compromise (severe IUGR)
Early-onset severe pre-eclampsia (viable and non-viable pregnancies) (can already start with bulb induction in Special Care ward at 34 weeks)
Previous precipitous labour and Grand Multiparas (parity 5 or more) for medical or AROM induction
Previous CS for dinoprostone induction
Polyhydramnios for controlled AROM

Misoprostol Oral Solution

The maximum oral dose is 20 ug two hourly for 24 hours. Administer as follows:

Add a single 200 microgram tablet of misoprostol to a bottle of 200 mL tap water

Shake the bottle well until the tablet has dissolved. Discard unused solution after 24 hours

Give 20 mL of the solution orally every two hours, for 24 hours

As soon as the woman reports painful contractions, do a vaginal examination and a CTG. If she is in established labour, stop the misoprostol.

If there are no contractions in 24 hours, repeat the Bishop score and act accordingly (bulb, oxytocin or rupture of membranes if Bishop ≥ 8; if<8 repeat misoprostol).

Do not give oxytocin less than six hours after giving misoprostol.

Do not repeat the misoprostol course more than twice.

If there are no cervical changes after two courses of misoprostol, review the indication for IOL

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MISOPROSTOL-ONLY RECOMMENDED REGIMENS 2017

<13 weeks' gestation	13–26 weeks' gestation	>26 weeks' gestation[8]	Postpartum use
Pregnancy termination[a,b,1] 800µg sl every 3 hours *or* pv*/bucc every 3–12 hours (2–3 doses)	**Pregnancy termination**[1,5,6] 13–24 weeks: 400µg pv*/sl/bucc every 3 hours[a,e] 25–26 weeks: 200µg pv*/sl/bucc every 4 hours[f]	**Pregnancy termination**[1,5,9] 27–28 weeks: 200µg pv*/sl/bucc every 4 hours[f,g] >28 weeks: 100µg pv*/sl/bucc every 6 hours	**Postpartum hemorrhage (PPH) prophylaxis**[i,2,10] 600µg po (x1) *or* **PPH secondary prevention**[i,11] (approx. ≥350ml blood loss) 800µg sl (x1)
Missed abortion[c,2] 800µg pv* every 3 hours (x2) *or* 600µg sl every 3 hours (x2)	**Fetal death**[f,g,1,5,6] 200µg pv*/sl/bucc every 4–6 hours	**Fetal death**[2,9] 27–28 weeks: 100µg pv*/sl/bucc every 4 hours[f] >28 weeks: 25µg pv* every 6 hours *or* 25µg po every 2 hours[h]	**PPH treatment**[k,2,10] 800µg sl (x1)
Incomplete abortion[a,2,3,4] 600µg po (x1) *or* 400µg sl (x1) *or* 400–800µg pv* (x1)	**Inevitable abortion**[g,2,3,5,6,7] 200µg pv*/sl/bucc every 6 hours	**Induction of labor**[h,2,9] 25µg pv* every 6 hours *or* 25µg po every 2 hours	
Cervical preparation for surgical abortion[d] 400µg sl 1 hour before procedure *or* pv* 3 hours before procedure	**Cervical preparation for surgical abortion**[a] 13–19 weeks: 400µg pv 3–4 hours before procedure >19 weeks: needs to be combined with other modalities		

References

a WHO Clinical practice handbook for safe abortion, 2014
b von Hertzen et al. Lancet, 2007; Sheldon et al. 2016 FIAPAC abstract
c Gemzell-Danielsson et al. IJGO, 2007
d Sääv et al. Human Reproduction, 2015; Kapp et al. Cochrane Database of Systematic Reviews, 2010
e Dabash et al. IJGO, 2015
f Peritt et al. Contraception, 2013
g Market al. IJGO, 2015
h WHO recommendations for induction of labour, 2011
i FIGO Guidelines: Prevention of PPH with misoprostol, 2012
j Raghavan et al. BJOG, 2015
k FIGO Guidelines: Treatment of PPH with misoprostol, 2012

Notes

1 If mifepristone is available (preferable), follow the regimen prescribed for mifepristone + misoprostol[a]
2 Included in the WHO Model List of Essential Medicines
3 For incomplete/inevitable abortion women should be treated based on their uterine size rather than last menstrual period (LMP) dating
4 Leave to take effect over 1–2 weeks unless excessive bleeding or infection
5 An additional dose can be offered if the placenta has not been expelled 30 minutes after fetal expulsion
6 Several studies limited dosing to 5 times; most women have complete expulsion before use of 5 doses, but other studies continued beyond 5 and achieved a higher total success rate with no safety issues
7 Including ruptured membranes where delivery indicated
8 Follow local protocol if previous cesarean or transmural uterine scar
9 If only 200µg tablets are available, smaller doses can be made by dissolving in water (see www.misoprostol.org)
10 Where oxytocin is not available or storage conditions are inadequate
11 Option for community based programs

Route of Administration

pv – vaginal administration
sl – sublingual (under the tongue)
po – oral
bucc – buccal (in the cheek)

*Avoid pv (vaginal route) if bleeding and/or signs of infection

Rectal route is not included as a recommended route because the pharmacokinetic profile is not associated with the best efficacy

Standard Operating procedure for Elective IOL booked at High Risk Clinic

High Risk Clinic:

- Discuss case with consultant.
- Complete Induction of labour Safety Checklist but omit Bishop score until the date of induction.
- Book a date for admission (three patients per week day). If a fourth (urgent) case needs to be added it must be discussed with the consultant at the clinic first.
- Nursing staff do pre-admission preparation
- Leave extra patient stickers in the maternity case record for easy access on day of admission
- Identify the Maternity Case record with an "IOL" sticker (available in clinic)

On day of induction of labour:

- Patient arrives at **Fetal Evaluation Clinic at 07h00** and a CTG (10-minute strip) is done
- Patient then goes to High Risk clinic
- Registrar evaluate patient before clinic starts including assessment of CTG
- Review Safety Checklist
- Do Bishop Score now
  - If cervix unfavourable, insert catheter bulb (if not contra-indicated), tape to patient's leg and send to ward F2, where she can wait in the waiting room until a bed becomes available. Discuss with the ward team. (In very well-informed patients, she can go home with the catheter and come back the next morning to ward F2 or earlier to labour ward if it falls out).
  - If cervix favourable for AROM, wait until 10h00 and discuss with the labour ward team (who will now be busy with the bed status meeting) to obtain a bed in labour ward. If no bed in C2A, patient can wait in waiting room in triage, but AROM must ideally be done before 16h00. Do not send to F2 to await a space in labour ward.
  - If cervix unfavourable and impossible to pass a catheter bulb, ask the clinic consultant for help. If not possible to pass catheter, send to ward F2 for low-dose misoprostol IOL.

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DATE REVISED	14 April 2018
DATE EFFECTIVE	15 May 2018
REVIEW DATE	15 May 2021
EVIDENCE	Evidence basis for the above decision is available on request

Signed: Prof GS Gebhardt