MOH/P/PAK/455.21(GU)-e

GUIDELINES ON INDUCTION OF LABOUR

MINISTRY OF HEALTY MALAYSIA

Guideline on Induction of Labour
was developed by
Obstetricians & Gynaecologists of the Ministry of Health Malaysia,
in collaboration with
the Obstetric & Gynaecology and Paediatric Services Unit of the
Medical Services Development Section, Medical Development Division,
Ministry of Health Malaysia
www.moh.gov.my

Published in 2021

A catalogue record of this document is available from the Institute of Medical Research, Ministry of Health;

MOH/P/PAK/455.21(GU)-e

And also available from the National Library of Malaysia;

ISBN 978-967-25780-0-0

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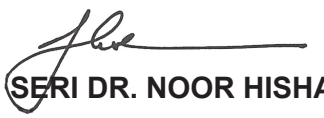
FOREWORD

BY DIRECTOR-GENERAL OF HEALTH MALAYSIA

Improving the quality of care is a complex and multifaceted process that requires the simultaneous deployment of a combination of interventions. Therefore, a policy document that empowers clinicians and those who are involved in the care of pregnant women and labour will improve clinical practices at the frontlines. Improved guidelines tailored to current and evidence-based clinical practices will close the gap between actual and achievable performance in delivering quality health care services.

The updated Guideline on the Induction of Labour, therefore, is a timely review since its first publication in 2008. Apart from a revision of recommendations, this review incorporates updated indications for the induction of labour and the management of its complication. The updated guidelines will guide clinicians for better and systematic handling of induction of labour which ensures good maternal and neonatal outcomes despite the inherent risk to mother and foetus.

I wish to take this opportunity to thank all contributors and hope this review will serve as a guide to improve the quality of clinical management and ensure patient safety. On the same note, I would like to offer a distinguished commendation to the editors, contributors, and all parties that were involved in making this revised guideline a reality. Additionally, I urge the obstetrics fraternity to continue strengthening the partnership between clinicians and patients that drives the quality of care overall.



TAN SRI DATO' SERI DR. NOOR HISHAM BIN ABDULLAH
DIRECTOR-GENERAL OF HEALTH MALAYSIA

FOREWORD

BY DIRECTOR OF MEDICAL DEVELOPMENT DIVISION

Pregnancy and childbirth are the main cause of admission in Ministry Of Health hospitals, comprising of 22.2% of all admissions. Meanwhile, the incidence of labour induction, the artificial initiation of labour has continued to rise which may pose risks to mothers and their babies. This update is necessary and timely in view of there exist new evidence and clinical practices.

When undertaken for appropriate reasons and by appropriate methods, induction is useful and benefits both mothers and newborns. The goal of induction is to achieve a successful vaginal delivery that is as natural as possible. The objectives of this guideline are to summarize the indication for induction, review current methods of cervical ripening and labour induction, and evaluate the safety and effectiveness of agents and methods used in cervical ripening and labour induction. Treatment and care should take into account women's individual needs and preferences. Women who and having or being offered induction of labour should have the opportunity to make informed choices about their care and treatment with their healthcare providers.

I hope this updated guideline on induction of labour will be useful in improving women's health and will be fully utilized by all relevant health care professionals.

I would also like to congratulate and express my gratitude to everyone for their support, dedication and contribution to the development of this guideline.

DATO' DR NORHIZAN BIN ISMAIL
DEPUTY DIRECTOR-GENERAL OF HEALTH (MEDICAL)
MINISTRY OF HEALTH MALAYSIA

PREFACE

BY NATIONAL HEAD OF OBSTETRICAL AND GYNAECOLOGICAL SERVICES

Induction of labour (IOL) is one of the commonest procedures that is performed in Obstetric Practice. The induction options have increased and newer modalities with varied degrees of success are now available.

It is indeed very timely that this review of the “IOL guidelines” has been done. A lot of hours have been spent to make sure that these guidelines are user friendly and evidenced based. The team has endeavoured to make this guideline as an easy read. Appropriate references are provided to make this document as resourceful as possible.

As we are all aware that in the current times medical practice is very dynamic with management options and treatment modalities being always reviewed and updated. In the same manner this document has to be treated in the way it was intended too, that is as a guideline and as the authoritative and exhaustive manual on IOL.

Allow me to congratulate the entire team for the dedication on their excellent piece of work.

DR. RAVICHANDRAN JEGANATHAN
NATIONAL HEAD OF OBSTETRICAL AND GYNAECOLOGICAL SERVICES
MINISTRY OF HEALTH MALAYSIA

CONTENTS

DEFINITIONS:

Definition from the original version of this guideline is maintained.

Labour :	*The process by which uterine contractions of increasing frequency, amplitude and duration together with the progressive effacement of the uterine cervix and dilatation of the cervical os leads to the gradual descent of the fetal presentation and the birth of the baby.*
Induction of labour :	*Artificial initiation of labour*
Augmentation :	*Active intervention during labour to promote the frequency, duration and amplitude of uterine contractions.*
Cervical favourability : (Bishop's score)	*A clinically assessed score of the uterine cervix used to predict success of induction of labour*
Cervical ripening :	*A process to prepare an unfavourable cervix resulting in softening and distensibility of the cervix*
Post date :	*Beyond Expected Date of Delivery (EDD) or 40 weeks and above*
Social induction of labour :	*Induction of labour in the absence of a definite medical indication.*
Uterine hyperstimulation :	*Excessive uterine contractions exceeding 5 or more contractions in10 minutes in frequency, more than 90 seconds in duration or greater than 100 mmHg in amplitude.*

SUMMARY OF RECOMMENDATIONS

1. Mothers should be fully informed of the risks/benefits associated with induction of labour and expectant management.**(C)**

2. Induction of labour should be recommended if delivery confers clear benefit to mother and/or fetus in comparison to risks if pregnancy is allowed to continue.**(C)**

3. Induction of labour should be performed by trained personnel who are able to recognise complications of induction of labour.**(C)**

4. Induction of labour should be performed in facilities that can detect complications of induction of labour and manage them appropriately.**(C)**

5. Assessment of fetal health should be performed prior to induction of labour.**(C)**

6. Cervical ripening is recommended if the cervix is assessed to be unfavourable prior to induction of labour.**(A)**

7. Vaginal prostaglandin is the agent of choice if cervical ripening is necessary provided there is no contraindication.**(B)**

8. Electronic fetal heart monitoring and uterine activity monitoring facilities should be available when labour is induced. **(C)**

9. Induction of labour with vaginal prostaglandin is superior to amniotomy with oxytocin (but with a higher risk of scar dehiscence / rupture)

10. Membrane sweeping and stripping may be offered to all mothers awaiting formal induction of labour for prolonged pregnancies.**(A)**

11. Amniotomy alone should not be routinely used as method of induction of labour.**(A)**

12. Amniotomy should be combined with immediate/early oxytocin infusion in induction of labour.**(A)**

13. Oxytocin dosage should be titrated to response and individualised.**(A)**

14. Oxytocin is best administered by automated controlled infusion pump.**(C)**

15. Oxytocin infusion should be titrated by doubling at intervals of at least 30 minutes.**(A)**

16. Oxytocin may be used in the presence of pre-labour rupture of membranes.**(A)**

17. In the presence of a favourable cervix, amniotomy with oxytocin infusion is equally efficacious as the usage of prostaglandin.**(A)**

18. Concomitant use of prostaglandin and oxytocin is absolutely contraindicated.**(C)**

19. Oxytocin infusion should be delayed by at least 8 hours after the last dose of prostaglandin.**(C)**

20. In pre-labour rupture of membranes, prostaglandin may be used although oxytocin is preferable.**(A)**

21. Close monitoring of the fetal heart rate should be performed throughout induction.**(C)**

22. Routine early pregnancy ultrasound dating scan should be performed to identify accurately post-date pregnancy.**(A)**

23. Routine induction of labour after 41 weeks should be performed to reduce perinatal mortality.**(A)**

24. Every induction of labour should be appropriately documented.

25. Decision for Induction of Labour (IOL) should be made by specialist.

Note:

(i) Prostaglandin in this guideline refers to vaginal prostaglandin.

(ii) Clarification of the statement for Recommendation No. 23:
Induction of labour after 41 weeks refers to IOL done immediately after the duration of pregnancy has reached 41 weeks.

(iii) Please refer Appendix 3 for grading of recommendations.

ABBREVIATION

AFI	Amniotic Fluid Index
CRC	Clinical Research Centre
LSCS	Lower Segment Caesarean Section
DM	Diabetes Mellitus
GBS	Group B Streptococcus
GDM	Gestational Diabetes Mellitus
HDP	Hypertensive Disorders in Pregnancy
IOL	Induction of Labour
IUFD	Intra-Uterine Fetal Death
IUGR	Intra-Uterine Growth Restriction
IVF	In Vitro Fertilization
MVP	Maximum Vertical Pocket
NICU	Neonatal Intensive Care Unit
O&G	Obstetrics and Gynaecology
PPROM	Premature Prelabour Rupture of Membrane
PROM	Prelabour Rupture of Membrane
RCOG	Royal College of Obstetrician and Gynaecologist
RCT	Randomised Control Trial
RFM	Reduced Fetal Movement
SCN	Special Care Nursery
SGA	Small for Gestational Age
WHO	World Health Organization

1. INTRODUCTION

This is a review version of guideline on induction of labour (IOL) following the first guideline dated January 2008. This review was based on current changes in the evidence-based clinical practice.

In 1985 the World Health Organization (WHO) set the optimal rate for Caesarean Section (CS) at 10-15% of all births. A recent review showed a global CS rate around 19% and some regional rates above 30%.

Malaysian public hospitals had a CS rate of 15.7% in 2006. The National Obstetrics Registry, Malaysia had reported the CS section rate in 2010 at 23%, in 2012 at 25.1% and in 2015 at 25.7% and this trend is on the rise. This rise in CS rates have caused concerns, however striving to keep the rates low should not jeopardize maternal and fetal health. It is timely to explore ways to reduce this rising trend and IOL has been proven to reduce CS rates.

IOL is defined as artificial initiation of labour. This is a therapeutic option when the benefits of expeditious delivery outweigh the potential maternal and fetal risks of continuing pregnancy.

IOL carries inherent benefits and risks to both mother and fetus. As such, the women and partner should be counselled and their concerns taken into consideration in coming to a decision on IOL.

Even though there is no strong evidence that first trimester ultrasound dating can reduce the rate of IOL (British Journal of Obstetrics and Gynaecology, 2006), WHO (2011) regarded sweeping the membranes as an intervention aimed to reduce the need for formal IOL. Thus, the following steps may be considered: offer vaginal examination prior to formal IOL, offer the woman a membrane sweep when vaginal examination is carried out to assess the cervix, and offer membrane sweeping at the 40 weeks during antenatal visit for uncomplicated pregnancies.

2. PREREQUISITES FOR INDUCTION OF LABOUR

Good planning of the procedure, adequate communication between health care providers and pregnant mothers and accurate dating of pregnancy are key to success.

2.1 Prior to IOL, the following assessments must be carried out and the following requirement must be looked into:

i) Review of maternal history.

ii) Confirmation of gestational age of fetus by reliable menstrual dates, ideally supported by early ultrasound examination.

iii) Assessment of indications and contraindications of IOL.

iv) Abdominal palpation to confirm presentation and engagement.

v) Vaginal examination to assess the cervix (Bishop score/Modified Bishop score) and assessment of membrane status (ruptured/intact).

vi) Assessment of fetal wellbeing. A normal fetal heart rate pattern should be verified using electronic fetal monitoring.

vii) IOL should be performed in facilities with access to caesarean section.

2.2 Information and decision.

2.2.1 Prior to IOL, the women and her partner or legal guardian should be counseled and informed consent obtained.

2.2.2 Counseling should address the following:

i) Indication/reasons for considering IOL

ii) Method of IOL

iii) Potential risk (i.e. uterine hyperstimulation, antepartum haemorrhage, scar dehiscence, fetal distress, uterine rupture, amniotic fluid embolism)

iv) Success/failure rate

v) Timing and place of IOL

vi) Options for pain relief

vii) Options if IOL is unsuccessful

viii) Options if IOL is declined

This task can be undertaken by a medical officer/ registrar/ specialist/ consultant

2.2.3 Suggest departmental routine audit on IOL based on its incidences and outcomes.

2.2.4 Proper documentation is recommended.

2.2.5 Decision for IOL be at the level of Specialist/ Consultant.

2.2.6 A quality initiative effort in the form of a checklist to facilitate decision making may be useful to ensure IOL is performed only in cases with appropriate indications.

3. INDICATIONS FOR INDUCTION OF LABOUR

The risk and benefit of the common indications for IOL with recommendations are summarized below. This can be used as a guide during communication with women before IOL.

3.1 Post-Dated Pregnancy

Percentage of women remaining undelivered

i) At 41 weeks gestation – approximately 19.0%

ii) At 42 weeks gestation – approximately 3.5%

The risk of fetal death increases significantly with gestational age

i) At 38 weeks gestation – 0.25%

ii) At 42 weeks gestation – 1.55%

Risk and Benefit:

(a) IOL at 41 weeks or beyond compared to awaiting spontaneous labour for at least one week is associated with:

  i) Fewer perinatal deaths – 1/3285 (0.03%) versus 11/3238 (0.34%)

  ii) No significant difference in the risk of caesarean section for women induced at 41 and 42 weeks

  iii) Lowers the risk of meconium aspiration syndrome as its at 42 weeks (4.7%), at 41 weeks (3.8%) and 38 weeks (1.31%)

(b) Most women preferred IOL at 41 weeks over serial antenatal screening.

(c) There is evidence of the benefits of IOL at 39 weeks: ARRIVE study (A Randomized Trial of Induction Versus Expectant Management study) showed elective IOL in low risk nulliparae at 39 weeks lowers rates of caesarean delivery without significantly increasing adverse perinatal outcomes. Thus, this benefit may be

offered or may be considered to women who conceived through IVF or nulliparae with advanced maternal age.

Recommendation

a) For women with uncomplicated pregnancies, IOL at 40 weeks + 7 days.

b) Awaiting spontaneous labour beyond 42 weeks is not recommended.

3.2 Term Pre-labour Rupture of Membranes

Spontaneous labour commences:

i) within 24 hours in 70% of women

ii) within 48 hours in 85% of women

Risk and Benefit:

a) IOL (induction commenced within 24 hours after PROM) compared with expectant management decreases:

   i) admissions to the NICU from 17% to 12.6%

   ii) chorioamnionitis from 9.9% to 6.8%

   iii) postpartum endometritis from 8.3% to 2.3%

   However, there is

   i) no differences in LSCS rate

   ii) no significant difference in neonatal sepsis

b) When associated with GBS (Group B Streptococcus) infection, compared to expectant management and IOL with Prostaglandin E2, IOL with oxytocin is associated with a lower rate of neonatal infection (2.5% versus more than 8%).

Recommendation

a) IOL is appropriate approximately 24 hours after pre-labour rupture of membranes at term.
b) If the woman is known to be GBS positive, advise to expedite IOL.

3.3 Preterm Pre-labour Rupture of Membranes

Risk and Benefit:

a) Gestation between 34 - 36 weeks:
    i) IOL versus expectant management
        - Reduces chorioamnionitis
        - Reduces maternal length of hospital stay
    ii) Decreased neonatal intensive care unit (NICU) length of stay and hyperbilirubinemia if delivery occurs after 34 weeks
b) Gestation less than 34 weeks:
    i) Birth before 34 weeks is associated with increased neonatal mortality, adverse neonatal outcomes including respiratory distress syndrome, intraventricular haemorrhage, necrotising enterocolitis and other long-term complications
    ii) Neonatal mortality and morbidity increase with decreasing gestational age

Recommendation

Gestation at 36 weeks

- IOL if spontaneous labour has not commenced within 24 hours.
- Oxytocin is preferred to vaginal prostaglandin due to shorter time interval to birth and reduced rate of neonatal infection

Gestation between 34 – 35 week (+6 days)

- IOL is not recommended as a routine for gestations less than 36 weeks unless there are maternal or fetal indications.

Gestation less than 34 weeks

- IOL is generally not recommended, with few exceptions following careful consideration in highly individualized cases.

3.4 Gestational Diabetes (GDM)/Diabetes Mellitus (DM)

Twenty-seven percent of normally formed stillbirths in women with pre-existing diabetes occur after 37 completed weeks. GDM/DM on diet control is associated with good pregnancy outcome

Risk and Benefit:

In women with GDM on insulin, comparing IOL in the 38th week with expectant management showed:

i) Reduced macrosomia in the IOL group (10% versus 23%)

ii) No difference in LSCS rates

iii) A non-significant increase in shoulder dystocia in the expectant group

Recommendation

a) Deliver at 37 – 38 week (+6 day) in women with diabetes requiring insulin.
b) Not to allow postdate for women with well-controlled GDM on diet, with no evidence of fetal macrosomia.

3.5 Hypertensive Disorders in Pregnancy

Risk and Benefit:

a) In non-severe hypertension, compared to IOL, expectant management showed increased risk of poor maternal outcome:

   i) 44% compared to 31% in IOL group

   ii) No differences in neonatal outcome

Recommendation

a) Consider individual circumstances when determining timing and mode of IOL for cases of HDP.
b) Generally, offer delivery at 37-38 weeks if well-controlled on antihypertensive (Induction of labour versus expectant monitoring for gestational hypertension or mild pre-eclampsia after 36 weeks' gestation (HYPITAT) study).
c) Consider IOL at 40 weeks in well-controlled HDP not requiring antihypertensive.

3.6 Twin Pregnancy

a) IOL in twin pregnancy is not routine.

b) Determination of chorionicity, presentation of fetuses, estimated fetal weight and presence of previous uterine scar are important parameters before considering IOL.

c) Optimal timing of delivery for uncomplicated twin pregnancy (either monochorionic or dichorionic) is uncertain.

d) Spontaneous labour commences before 37 weeks in 60% of women with twin pregnancy.

Risk and Benefit:

a) Retrospective studies demonstrated that

   i) Perinatal mortality rate is lowest for birth at 37 weeks gestation

   ii) Stillbirth rate increase from 38 weeks

   iii) No statistically significant difference in caesarean section rate comparing expectant management with IOL

b) The main determinant of risk in a multiple pregnancy is chorionicity and this may influence decisions regarding timing of delivery in individual cases

   i) Evidence suggest consistently higher fetal death rate (at all gestational ages) in monochorionic than if dichorionic pregnancies; risk of IUFD increased with gestational age (dichorionic diamniotic, 1:333 at 28 weeks to 1:69 after 39 weeks; monochorionic diamniotic, 1:23 after 32 weeks)

   ii) Risk of cord entanglement in monochorionic monoamniotic pregnancies

Recommendation

Consider vaginal delivery in uncomplicated twin pregnancy, for

i) Monochorionic Diamniotic at 36 - 37 weeks.

ii) Dichorionic Diamniotic at 37 - 38 weeks.

For caesarean section after corticosteroid cover

i) Monochorionic Monoamniotic at 34 weeks

3.7. Small-for-Gestational Age (SGA) & Intrauterine Growth Restriction (IUGR)

3.7.1 SGA fetuses :

a) 50 - 70% are constitutionally small and healthy with predicted normal outcome.

b) Suggest timing of IOL for SGA at 40 weeks with 2 weekly umbilical artery (UA) Doppler and growth assessment.

c) Some studies suggest that SGA fetuses can be offered IOL at 37 – 39 weeks (RCOG Green Top Guidelines).

3.7.2 IUGR fetuses:

a) Approximately 10 to 15% are classified as IUGR with predicted adverse perinatal outcome.

b) There is inadequate evidence to suggest timing of delivery when IUGR has been diagnosed.

c) Use of umbilical artery and ductus venosus Doppler has been shown to improve perinatal outcome.

3.7.2.1 Preterm IUGR:

Risk and Benefit:

The Growth Restriction Intervention Trial (GRIT) study comparing expectant management versus immediate birth (IOL and CS) between 24 and 36 weeks showed that

a) Perinatal survival of both (early delivery group and expectant management group) were similar
b) There was also no difference in cognitive, language, behaviour, or motor abilities at 6-12-year follow-up

The timing and mode of delivery are to be decided based on individual cases.

3.7.2.2 Term IUGR:

Risk and Benefit:

Disproportionate Intrauterine Growth Intervention Trial at Term (DIGITAT) comparing expectant versus immediate birth at term, showed no significant difference in

i) Maternal morbidity

ii) Perinatal death

However, in view of small study cohort, timing for IOL cannot be determined because of insufficient evidence.

Recommendation

a) A constitutionally small but healthy fetus is not to be allowed post-date.
b) Evidence is insufficient to guide timing of birth for IUGR. Delivery is generally indicated when the risk of fetal death or morbidity is greater than the risk of prematurity.
c) The plan should be individualized and the timing of IOL depends on the severity of IUGR and the presence of evidence of fetal compromise.
d) Consider expediting birth when IUGR diagnosed at term.
e) IOL is not recommended for severe IUGR.

3.8 Intrauterine Fetal Death (IUFD)

a) There is no evidence addressing timing of delivery or intra-uterine fetal death.

b) Majority of women go into spontaneous labour within 2-3 weeks of IUFD.

c) Risk of coagulopathy is usually only a concern after 4 weeks of diagnosis of fetal death.

d) Timing of IOL will depend on the woman's's wishes and presence or absence of complication.

Recommendation

a) Support the woman's preferences regarding timing of IOL.
b) Surgical method of IOL should not be recommended for IUFD.
c) Aim for vaginal delivery
d) Spontaneous labour can be waited for up to 4 weeks before considering IOL.

3.9 Reduced Fetal Movement (RFM)

Risk and Benefit:

a) 70% of pregnancies with a single episode of RFM are uncomplicated.
b) No study to determine whether intervention alters perinatal morbidity.

RCOG statement: Decision whether or not to consider IOL at term is by individual preference.

Recommendation

a) IOL should not be routinely offered for uncomplicated pregnancy presenting with single episode of RFM even at term
b) Consider IOL if recurrent RFM at term after discussion with the woman
c) Consider IOL if RFM at postdates (more than 40 weeks)

3.10 Oligohydramnios

Amniotic Fluid Index (AFI) is a better parameter to diagnose oligohydramnios. Recent evidence suggested that compared to Maximum Vertical Pocket (MVP), the use of AFI increases the rate of diagnosis of oligohydramnios, the rate of IOL and the rate of LSCS for fetal distress but without improvement in peripartum outcomes.

The increased perinatal mortality rate (PMR) is related to the underlying aetiology, prematurity and sequelae of PPROM (principally to those with mid-trimester membrane rupture).

Recommendation

Oligohydramnios

a) Timing and mode of delivery prior to term will depend on gestational age, underlying aetiology and fetal wellbeing.
b) Consider IOL if oligohydramnios is diagnosed at term.

3.11 Maternal Request

Routine IOL on maternal request is not generally encouraged and the benefits and risk of the procedure should be appropriately addressed and discussed with the couple.

a) There are no studies that address this group specifically.

b) If the pregnancy is uncomplicated, consider the risk of neonatal respiratory distress syndrome and related adverse effects if IOL is carried out.

Recommendation

- IOL should not be encouraged on maternal request.
- Proper counselling of maternal and fetal risk should be emphasized.

4. INDUCTION OF LABOUR IN PREVIOUS CAESAREAN SECTION SCAR

One previous caesarean section scar is a relative contraindication to IOL.

The risk of uterine rupture with:

i) Spontaneous labour is 4/1000

ii) Augmentation with oxytocin is 9/1000

iii) IOL with prostaglandin with/without oxytocin is 14/1000

iv) IOL using mechanical methods with/without oxytocin is 9/1000

AHRQ meta-analysis and NICHD study concluded that IOL particularly in cases with unfavourable cervix are associated with 3 folds increased risk of uterine rupture.

In NICHD study, IOL with prostaglandin had 3 times higher risk of uterine rupture compared to amniotomy or transcervical Foley catheter.

Cochrane review revealed insufficient evidence from RCT to suggest low dose prostaglandin E2.

Recommendation

a) Women in this group should be adequately and appropriately assessed before decision for IOL.

5. CONTRA-INDICATIONS FOR INDUCTION OF LABOUR

IOL is contra-indicated mainly when vaginal route of delivery carries significant maternal and fetal risk, for example in

1) Previous Classical Caesarean Section
2) Previous Inverted T
3) Previous J-incision (extension of lower segment incision laterally and vertically into the upper segment)
4) Unknown uterine surgery
5) Previous Hysterotomy
6) Myomectomy with entry into uterine cavity / extensive dissection
7) Previous uterine rupture
8) More than one previous caesarean
9) Suspected fetal macrosomia (≥4000gm)
10) HIV positive mothers with viral load more than 50 copies/ml (abdominal delivery results in lower risk of vertical transmission). Communication with Infectious Disease Specialist is preferable.
11) Suspected cephalo-pelvic disproportion
12) Cord presentation
13) Breech
14) Active Herpes Genitalis
15) Fetal Malpresentation

6. RECOMMENDED METHODS OF INDUCTION OF LABOUR

6.1 Membrane sweeping and stripping

Membrane sweeping and stripping is a digital separation of membranes performed during vaginal examination, usually prior to formal IOL.

Indication	• It is used to promote spontaneous labour and reduce the need for medical / surgical / mechanical IOL.
Benefit and Risk	• Applicable for both unfavourable and favourable cervices. • Offer to low risk women especially multiparous • Postdatism can be significantly reduced if done between 39 and 40 weeks • No evidence of increase maternal and neonatal infections • Associated with discomfort and vaginal bleeding

6.2 Mechanical method

<u>Trans-cervical catheter / balloon Foley catheter / Hygroscopic Stents</u>

- Mechanical method is an alternative option for IOL
- Causes cervical dilatation with release of prostaglandin secretion.
- Evidence suggests that double balloon is not superior as compared to single balloon and the likelihood of favourable cervix following single balloon Foley catheter is greater with larger filling volume (60 mls versus 30 mls).

Indication	▪ In cases of relatively high risk with PGE2 such as previous caesarean scar and grand multiparae ▪ Women's choice
Contra-indication	▪ Ruptured membranes ▪ Active herpes and GBS ▪ Antepartum haemorrhage ▪ PROM/PPROM and high station

Risk and Benefit	▪ No evidence of increased infections ▪ Low risk of uterine hyperstimulation
Monitoring	▪ CTG pre-insertion and 1 to 2 hours post insertion ▪ Monitor maternal vital signs and uterine contractions ▪ Review within 12 – 24 hours or when catheters falls off.

6.3 Surgical Method

Amniotomy.

Amniotomy alone should not be considered a primary method of IOL unless there are specific clinical reasons.

Indications	▪ Favourable cervix – Bishop score 7 or more ▪ In cases with relative contraindication to PGE2
Contraindications	Abnormal CTG, placenta/vasa praevia, active genital herpes and intra-uterine fetal death.
Caution	High station / presenting parts
Risk	Cord prolapse / bleeding / unintended trauma to fetal scalp
Benefit	▪ May reduce length of labour. ▪ Reveal colour and smell of liquor
Monitoring	▪ CTG ▪ Maternal vital signs and uterine contraction
Adverse effect	Discomfort and bleeding
Notes	Recommended to combine with oxytocin infusion

6.4 Pharmacological method

6.4.1 Vaginal prostaglandin (PGE2)

Indication	Unfavourable cervix
Contra-indication	▪ Known hypersensitivity ▪ Sign of fetal compromise / maternal risk ▪ Chorioamnionitis ▪ Vaginal bleeding ▪ Refer to list of contraindications to IOL
Caution	▪ Multiple pregnancy. ▪ High parity more than 5. ▪ Previous caesarean scar. ▪ Uncomplicated uterine surgery. ▪ Medical illness namely bronchial asthma, cardiovascular disease, epilepsy and glaucoma. ▪ If oxytocin infusion required, start after 8 hours post-prostaglandin. ▪ Should not be used with chlorhexidine. ▪ Failure to maintain cold chain may reduce efficacy.
Risk	▪ Gastro-intestinal upset such as nausea /vomiting /diarrhoea ▪ 4% risk of hyperstimulation and higher with oxytocin used
Benefit	Ripening and softening of cervix
Dose	Tablet or gel (if available) or controlled release pessary (if available) Suggested** regimen of vaginal PGE2 tablet 3 mg: • First dose 3 mg followed by second dose 3 mg after 6 hours (if labour is not established). • Maximum 2 doses (one cycle). • Decision for the third dose must be made after clinical evaluation of the cases by specialist / consultant. ** Depending on obstetricians, indications and centers.
Pre-requisite	▪ Ask patient to empty the bladder. ▪ CTG tracing
Monitoring	▪ Remain recumbent at least 30 minutes after insertion ▪ CTG monitoring 1 hour post PGE2. ▪ Maternal vital signs and uterine contraction monitoring ▪ Reassess Bishop score 6 hours post prostaglandin

6.4.2 Intravenous oxytocin with amniotomy

- Intravenous oxytocin with amniotomy should be considered a primary method of IOL.

Indication	▪ Preferred method if Bishop score more than 6/13 ▪ Women's choice ▪ Use in cases with relatively high risk with PGE2 such as previous caesarean scar, high station and increased liquor volume.
Caution	▪ Should not start within 8 hours after vaginal prostaglandin. ▪ Caution in previous caesarean scar
Risk and Benefit	▪ Uterine hyperstimulation is one of known complication ▪ Shortens duration of labour. ▪ May decrease risk of chorioamnionitis and neonatal infection in pre-labour rupture of membranes cases.
Monitoring	▪ CTG ▪ Maternal vital sign and uterine contraction ▪ Caution regarding fluid infusion as it may cause water intoxication
Regimen	▪ Initial dose of oxytocin is 1-2 milliunits/minute (refer appendix 2) ▪ Increase dose at intervals of 30 minutes until good uterine contractions are achieved ▪ Do not exceed maximum dose of 32 milliunits/minute for primiparae and 16 miliunits/minute for multiparae.

7. CARE IN INDUCTION OF LABOUR

7.1 Setting and Timing

IOL should be carried out preferably in centres with specialists equipped with 24 hours operation theatre and neonatal intensive care.

It is suggested that IOL of low risk women can be initiated in the antenatal wards, however high risk cases should be induced in labour room / high dependency area. Elective IOL should be carried out during daytime, preferably in the morning, in order to improve maternal satisfaction as well as for staff convenience.

7.2 Pain relief

The availability of pain relief options should be informed to women and provided to them adequately and appropriately. Collaboration with pain relief team lead by the anaesthetic department may be applicable in some hospitals (please refer to local protocol).

8. MANAGING COMPLICATIONS OF LABOUR INDUCTION

8.1 Uterine Hyperstimulation

Definition

Occurrence of uterine contractions lasting more than 90 seconds, or occurrence of more than five contractions within 10 minutes, or greater than 100 mmHg in amplitude, regardless of the state of the fetus.

Prevention

If the pre-induction CTG shows contractions of 2-3 in 10 minutes, avoid prostaglandins induction.

Management

i) Prompt recognition of uterine hyperstimulation is crucial.

ii) Anticipate fetal distress.

iii) Remove the prostaglandins if still in-situ (+/- flushing vagina with normal saline) or stop oxytocin infusion immediately.

iv) Consider tocolysis if uterine hyperstimulation persist despite immediate measures especially in the event of fetal distress. A single dose of terbutaline 250 micrograms (0.25 mg) may be given intravenously or subcutaneously.

v) The O&G specialist/consultant should be informed immediately.

vi) Adequate hydration.

vii) Adequate and appropriate pain relief.

8.2 Failed Induction

Definition

Inability to achieve active phase of labour despite IOL.

Management

i) Specialist should discuss with the woman and provide support.

ii) The woman's condition and the pregnancy in general should be carefully reassessed by senior doctors/specialist, and fetal wellbeing should be reassessed using electronic fetal monitoring.

iii) Decisions on further management should be made in accordance with the woman's wishes, and should take into account the clinical circumstances.

iv) Subsequent management options include:

   a) further attempt at IOL (the timing should depend on the clinical situation and the woman's wishes)

   b) caesarean section

8.3 Cord Prolapse

Definition

Presence of the cord in the vagina when membrane is already ruptured.

Prevention

i) Amniotomy should be avoided if fetal head is high.

ii) In women with polyhydramnios, stabilising artificial rupture of membranes (ARM) is advocated.

iii) The following precautions should be taken during amniotomy:

a) Before induction, engagement of the presenting part should be assessed.

b) Exclude umbilical cord presentation during the preliminary vaginal examination.

Management

In the event of cord prolapse, the managing team should manage as emergency obstetrics event following local protocol.

8.4 Fetal Distress

Definition

Fetal distress in women undergoing IOL is diagnosed based on abnormal fetal heart pattern or colour of liquor.

Management

Expedite delivery according to local protocol.

8.5 Uterine Rupture

Definition

Uterine rupture or scar dehiscence is a known complication of IOL. The incidence increases in women with previous uterine scar and grandmultiparae.

Management

i) Importance of early recognition of uterine rupture/scar dehiscence.

ii) In the event of suspected uterine rupture, expedite delivery after maternal condition is stabilised.

8.6 Placental Abruption

Definition

Premature separation of the normally situated placenta

Anticipate placenta abruption in polyhydramnios and in patients with uterine hyperstimulation.

Management

Management of abruption as per local protocol.

9. CONCLUSION

IOL is a fairly common procedure that is known to carry inherent maternal and fetal benefits and risks. Thus, systematic and comprehensive planning followed by adequate, appropriate and timely implementation of IOL are keys to quality improvement in clinical management and safe practice.

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APPENDIX 1

THE MODIFIED BISHOP SCORE (JULY 2008)

CERVICAL FEATURE	Modified Bishop Score			
	0	1	2	3
DILATATION (CM)	< 1	1 - 2	2 - 4	> 4
LENGTH OF CERVIX (CM)	> 4	2 - 4	1 - 2	< 1
STATION (RELATIVE TO ISCHIAL SPINE)	-3	-2	-1 / 0	+ 1 / + 2
CONSISTENCY	FIRM	AVERAGE	SOFT	-
POSITION	POSTERIOR	MID / ANTERIOR	-	-

A FAVOURABLE CERVIX IS DEFINED AS ONE WITH A MODIFIED BISHOP SCORE OF >7

APPENDIX 2

Oxytocin : Dose Regime

30 unit oxytocin in 500ml sodium chloride 0.9% should be used. Thus, if infusion rate is 1 ml/hour, the rate of oxytocin infusion dose is 1 mu/minute.

Dilution may be tailored to local practice such as 6 unit in 100ml or 3 unit in 50ml (via syringe pump).

Commence infusion at 2ml/hour (=2 mu/min).

Increase infusion every 30 mins by 4 ml/hour.

Time after starting (mins)	Oxytocin Dose (mU/min)	Volume infused (mls/hour)
0	**2**	**2**
30	**4**	**4**
60	**8**	**8**
90	**12**	**12**
120	**16**	**16**
150	**20**	**20**
180	**24**	**24**
210	**28**	**28**
240	**32**	**32**

Maximum dose of oxytocin

Multiparae - 16 ml/hour (16 mU/min)

Nulliparae - 32 ml/hour (32 mU/min)

If there is a need to increase oxytocin infusion higher than the above regimen, a consultant must be informed.

APPENDIX 3

LEVELS OF EVIDENCE

Ia	Evidence obtained from meta-analysis of randomised controlled trials.
Ib	Evidence obtained from at least one randomised controlled trial.
IIa	Evidence obtained from at least one well-designed controlled study without randomization.
IIb	Evidence obtained from at least one other type of well-designed quasi-experimental study.
III	Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies.
IV	Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities.

GRADE OF RECOMMENDATION

A	**Ia, Ib**	Requires at least one randomized controlled trial as part of the body of literature of overall good quality and consistency addressing the specific recommendation.
B	**IIa, IIb, III**	Requires availability of well conducted clinical studies but no randomised trials on the topic of recommendation.
C	**IV**	Requires evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities. Indicates absence of directly applicable clinical studies of good quality.

TECHNICAL COMMITTEE ON GUIDELINES ON INDUCTION OF LABOUR

CHAIRPERSON

1. Dr. Ravichandran Jeganathan
   Senior O&G Consultant (Maternal Fetal Medicine)
   Department of Obstetrics and Gynaecology
   Hospital Sultanah Aminah, Johor Bahru

TECHNICAL DRAFTING COMMITTEE

2. Dr. Mohd. Zulkifli bin Mohd Kasim
   Senior O&G Consultant
   Department of Obstetrics and Gynaecology
   Hospital Sultanah Nur Zahirah, Kuala Terengganu

3. Dr. Ravinderjit Kaur
   Senior O&G Consultant (Maternal Fetal Medicine)
   Department of Obstetrics and Gynaecology
   Hospital Pulau Pinang

4. Dr. Wan Zahanim binti Wan Yusoff
   Senior O&G Consultant
   Department of Obstetrics and Gynaecology
   Hospital Raja Perempuan Zainab II, Kota Bharu

5. Dr. Charnjeet Kaur
   Senior O&G Consultant (Maternal Fetal Medicine)
   Department of Obstetrics and Gynaecology
   Hospital Selayang

6. Dr. Mohd Azam bin Mohd Yusof
   Senior O&G Consultant
   Department of Obstetrics and Gynaecology
   Hospital Pekan

7. Dr. Muniswaran Ganesham
   Senior O&G Consultant
   Department of Obstetrics and Gynaecology
   Hospital Tunku Azizah, Kuala Lumpur

8. Dr. Noor Aziah binti Zainal Abidin
   Senior Principal Assistant Director
   O&G and Paediatrics Services Unit
   Medical Services Development Section
   Medical Development Division
   Ministry Of Health Malaysia

9. Dr. Arpah binti Ali
   Senior Principal Assistant Director
   O&G and Paediatrics Services Unit
   Medical Services Development Section
   Medical Development Division
   Ministry Of Health Malaysia

10. Dr. Muhamad Aadiyat bin Abdul Hamid
    Principal Assistant Director
    O&G and Paediatrics Services Unit
    Medical Services Development Section
    Medical Development Division
    Ministry Of Health Malaysia

11. Pn. Siti Rahmah binti Abdul Rashid
    Registered Head Nurse
    O&G and Paediatrics Services Unit
    Medical Services Development Section
    Medical Development Division
    Ministry Of Health Malaysia

REVIEWERS:

1. Profesor Dr. Zaleha Abdullah Mahdy
   Senior O&G Consultant
   Department of Obstetrics and Gynaecology
   Hospital Canselor Tuanku Muhriz UKM

2. Profesor Madya Dato' Dr. Hamizah binti Ismail
   Senior O&G Consultant
   Department of Obstetrics and Gynaecology
   Sultan Ahmad Shah Medical Centre (SASMEC@IIUM)
   Universiti Islam Antarabangsa Malaysia, Kuantan, Pahang

ACKNOWLEDGEMENT

The Technical Committee On Guidelines On Induction Of Labour would like to express their gratitude and appreciation to Medical Development Division, Ministry of Health and all those who provided valuable input and support in the development of this guideline.

MINISTRY OF HEALTH OF MALAYSIA

MEDICAL DEVELOPMENT DIVISION
Block E1, Parcel E, Federal Government Administrative Centre,
62590 Putrajaya, Malaysia.

Tel : 603-8883 1047 Fax : 603-8883 1427
http://www.moh.gov.my

ISBN 978-967-25780-0-0

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