HUTT maternity
Hutt Valley Maternity Care

HUTT VALLEY DHB

Document ID: MATY113	Version: 1.0
Facilitated by: Ed Hyde	Last reviewed: June 2019
Approved by: Maternity Quality Committee	Review date: June 2020

Time of Planned Birth

By Induction of Labour (IOL) and elective Caesarean section (CS)

Hutt Maternity Policies provide guidance for the midwives and medical staff working in Hutt Maternity Services. Please discuss policies relevant to your care with your Lead Maternity Carer.

Introduction

The purpose of this guideline is to guide the timing of elective birth, either by induction of labour (IOL) or Caesarean section (CS). It is based upon the 'Auckland Consensus Guideline on Induction of Labour' from June 2014 (available here[1]). This was created as a consensus between the obstetric and midwifery staff at Auckland, Counties Manukau and Waitemata DHBs, combining local expert advice, national guidelines, Cochrane meta-analyses, randomised control trials with induction as the intervention, and significant observational studies.

The approach of this document was to take the guidelines and modify them for use at Hutt Hospital Maternity, as well as updating to reflect newer guidelines etc.

Purpose

The purpose of this guideline is to provide guidance on the indications and timing for elective birth, to guide clinicians on if and when to offer elective birth (i.e. where evidence shows that benefit to mother and/or bay outweighs the risk of remaining pregnant), and to avoid IOL / CS when not appropriate.

Induction of labour (IOL) is defined as the artificial initiation of labour[2]. The alternative is expectant management of the pregnancy where spontaneous labour is awaited. The outcome for the woman is achieving a vaginal birth within 24 hours.

Hopefully with its implementation across New Zealand, this guideline will lessen variation in clinical practice between and within hospitals, improve patient safety and satisfaction, and increase the proportion of clinically appropriate inductions. The target population is pregnant women who develop a maternal, fetal or obstetrical risk or complication where expedited delivery would be considered.

The population includes women planning their birth in the Hutt Valley DHB catchment area.

There may be other situations where elective early birth by either IOL or CS is appropriate based on the individual clinical situation.
Augmentation of labour is not covered by this guideline. This guideline outlines recommendations on the timing of planned (elective) birth in pregnant women.

Scope

All medical and midwifery staff employed by Hutt Valley DHB. All Hutt Valley DHB Maternity access holders.

Rationale

Rate of IOL is one of the ten clinical maternity indicators identified by the New Zealand Ministry of Health, as part of its national quality and safety programme for maternity services.[3] Overall IOL rates have steadily increased over the last two decades.

In 2016, in women expected to have an uncomplicated pregnancy and low intervention rates (defined as nulliparous, age 20-34 years, 37+0 – 41+6 weeks' gestation, cephalic-presenting singleton baby, and no obstetric complications, known as a 'standard primipara'), the induction of labour rate at Hutt Hospital was 6.1%. The average for New Zealand that year was 6.3%.[3]

The overall rate of IOL at Hutt Hospital for 2017 was 25% for all women booked at the hospital.

The most common indications were: pre-labour rupture of membranes at term, post-term, suspected small for gestational age fetus, and diabetes in pregnancy.

The Ministry of Health has been collecting comprehensive maternal outcome data since 2009. The annual reports show that by DHB of residence, for Hutt Valley DHB the IOL rate for standard primiparae has been:

Year	Inductions of labour	Standard primiparae	Hutt Maternity Rate (%)	NZ Average Rate (%)
2016	21	347	6.1	6.3
2015	16	305	5.2	5.7
2014	14	266	5.3	5.6
2013	9	263	3.4	5.2
2012	8	323	2.5	4.2
2011	11	338	3.3	4.3

Levels of evidence for intervention studies [2]

Level 1: Meta-analyses, systematic reviews of randomized controlled trials (RCTs), or RCTs with a low risk of bias

Level 2: Systematic reviews of case–control or cohort studies, or well conducted case–control or cohort studies with a low risk of confounding, bias or chance and a moderate probability that the relationship is causal

Level 3: Non-analytic studies (for example, case reports, case series)

Level 4: Expert opinion, formal consensus

List of possible indications for planned early birth by IOL or CS

1. Post-term
2. Pre-labour rupture of membranes ≥ 37 weeks (term PROM)
3. Premature pre-labour rupture of membranes between 34+0 and 36+6 weeks (PPROM)
4. Advanced maternal age
5. Obesity in pregnancy
6. Gestational diabetes
7. Hypertension in pregnancy
8. Suspected small for gestational age (SGA) and/or fetal growth restriction (FGR) ≥ 34 weeks
9. Suspected macrosomia
10. Multiple pregnancy
11. Pregnancy following artificial reproductive techniques (ART)
12. Fetal growth restriction (FGR) / intrauterine growth restriction (IUGR)
13. Antepartum haemorrhage (APH) of unknown origin / recurrent APH
14. Previous stillbirth
15. Obstetric cholestasis
16. Placenta praevia and accreta
17. Vasa praevia
18. Polyhydramnios at term

Membrane sweeping to reduce the risk of post-term induction of labour

Membrane sweeping performed at ≥ 38 weeks reduces the duration of pregnancy.[4] It is not a method of IOL.

Eight women would need to have membrane sweeping in order to prevent one formal post-term IOL. Thus, all women should be offered the option of membrane sweeping from 38 weeks.

Consider offering membrane sweeping after 39-40 weeks, especially in low-risk multiparous women.

Advise of the benefits of repeated membrane sweeping.

Post-term / post-dates pregnancy	Evidence
Women should be offered the option of IOL between 41+0 weeks and 42+0 weeks to reduce the risks associated with post-term pregnancy (generally from 41+3 weeks onwards)	
Post-term pregnancy is defined as pregnancy that has progressed beyond 42 weeks.[2] The term post-dates is often used for women between 40+0 and 41+6 weeks. The risk of fetal death increases significantly with gestational age: • At 37-40 weeks: 0.16% (1.58 per 1000) • At or beyond 41 weeks: 0.22% (2.2 per 1000) [44] Women in the studies included in the Cochrane review that underwent planned IOL at 41 or more weeks versus expectant management (awaiting spontaneous labour) had significantly fewer perinatal deaths (RR 0.3). In addition, women in the planned IOL group were significantly less likely to have a Caesarean section (RR 0.82).[5] A systematic review of nine RCTs comparing expectant management with planned IOL had similar findings.[6] Factors associated with successful labour induction included increased parity, more favourable Bishop score at commencing IOL, and decreased gestational age. IOL at 41 weeks or beyond, compared with awaiting spontaneous labour for at least another week, is associated with: • Fewer perinatal deaths: 0.03% versus 0.34% • No significant difference in the risk of Caesarean section for women induced at 41 and 42 weeks • Lower risk of meconium aspiration syndrome at 42 weeks (3.0% versus 4.7%) and significantly lower at 41 weeks (0.9% versus 3.3%) [5]	Level 1

Pre-labour rupture of membranes ≥ 37 weeks (term PROM)	Evidence
Women with diagnosed term PROM should be offered the option of IOL or expectant management • If GBS positive – prophylactic antibiotics and early induction recommended • If GBS negative / low-risk – may wait expectantly for 18-24 hours (see guideline)	
Women in the studies included in the Cochrane review that underwent planned early birth (usually IOL with oxytocin or prostaglandins) for PROM at ≥ 37 weeks vs. expectant management (wait for spontaneous labour) were significantly less likely to develop infection (chorioamnionitis in labour or postnatal endometritis (RR 0.45)), and were not more likely to have a Caesarean section. Their babies were less likely to be admitted to the neonatal unit (RR 0.7), and there was a trend to less neonatal infection requiring intravenous antibiotics.[7]	Level 1
The New Zealand consensus guideline[8] on the prevention of early-onset neonatal Group B Streptococcal infection agreed that membrane rupture longer than 18 hours is a risk factor infection, and so in women with term PROM longer than this, they ought to be offered IOL and antibiotics once labour is established.	Level 4

Advanced maternal age (AMA)	Evidence
Women ≥ 40 years old may be offered IOL at 40+0 weeks In the absence of other obstetric or medical indications, maternal age 39 years or less is not an indication for IOL	
Advanced maternal age is an independent risk factor for perinatal mortality. A systematic review of eight cross-sectional population-based studies in USA, Canada and Australia found that advanced maternal age (≥ 35 years) was an independent risk factor for perinatal death, and the risk was considerably higher in women ≥ 40 years.[9] A 2012 retrospective cohort study in Australia of women with singleton pregnancy who gave birth at ≥ 37 weeks showed a rate of stillbirth < 35 years of 1/1000, for 35-39 years rate of 0.8/1000, and for 40 years and older a rate of 2.4/1000. After adjusting for smoking and small for gestational age fetus, risk of stillbirth for women ≥ 40 years was 2.4 times higher than women < 40 years. Modelling based on UK data from 2010 suggests that a policy of routine IOL at 40 weeks in women ≥ 40 years would require an extra 679 women to be induced to prevent one stillbirth.[10]	Level 4
The 35/39 Trial[11] randomised 619 women over 35 years old to IOL at 39 weeks or expectant management. IOL had no significant effect on the rate of Caesarean section and no adverse short-term effects on maternal or neonatal outcomes. The study was under-powered and there were no stillbirths in neither group.	Level 1
There has been a trend across New Zealand over recent years toward early IOL for women ≥ 35 years. In women between 35 and 39, consider fetal assessment from 40 weeks (ultrasound scan, CTG); if there are any concerns about fetal well-being, then IOL should be offered. In the absence of other obstetric or medical indications, age (35-39 years) alone is not an indication for IOL.	Level 4

Obesity in pregnancy	Evidence
In the absence of other obstetric or medical indications, obesity alone is <u>not</u> an indication for IOL	
Women with booking body mass index (BMI) ≥ 35 have an increased risk of antenatal complications such as pre-eclampsia, gestational diabetes and small for gestational age fetus, and of complications during labour and birth (emergency Caesarean section, shoulder dystocia and post-partum haemorrhage).[12] In addition, a population-based cohort study in the United States found a significant increase in risk of stillbirth with increasing BMI, and with increasing gestational age.[13] After adjusting for confounders, risk of stillbirth for women with BMI ≥ 40 years was 2.5 times higher than women with normal BMI. However, no evidence was found about the effectiveness of early IOL to reduce these risks. In the absence of other obstetric or medical indications, obesity alone is not an indication for IOL. Ongoing risk assessment and fetal surveillance through pregnancy, in consultation with an obstetrician, is important.	Level 4

Gestational diabetes	Evidence
Normally grown fetus and good glucose control – offer IOL at 40 weeks If baby >90th centile customised and/or maternal co-morbidities – offer IOL from 38 weeks	
No evidence was found about the effectiveness of early IOL to reduce risks associated with gestational diabetes, with the exception of macrosomia.[14, 15] Women with GDM, a normally grown fetus, and good glucose control throughout pregnancy (≥ 90% of blood glucose readings within treatment targets) should not be routinely offered IOL before 40 weeks. The decision about IOL needs to be individualized in women with poor glucose control, a large or small baby, or co-morbidities (such as pre-eclampsia, BMI ≥ 40, age ≥ 40), in consultation with an obstetrician. The Ministry of Health 2014 guideline[16] suggests that if ultrasound at 36-37 weeks reports normal fetal growth (≤ 90th centile customised) and there are no maternal or fetal comorbidities, plan delivery at 40+ weeks. If, however, fetal growth is > 90th centile customised or there are maternal and/or fetal comorbidities, plan delivery for 38-39 weeks.	Level 4

Hypertension in pregnancy	Evidence
Women with **gestational hypertension and/or pre-eclampsia** should be offered IOL at 37 weeks to improve maternal outcomes Women with **chronic hypertension** and no other concerning features can be managed expectantly beyond 37 weeks. Offer IOL no later than 40 weeks	
In the HYPITAT trial[17] women with hypertension, with or without proteinuria, who underwent IOL at 37 weeks versus expectant management were significantly less likely to develop adverse maternal outcomes (eclampsia, HELLP, pulmonary oedema, venous thromboembolism, abruption, severe pre-eclampsia, post-partum haemorrhage > 1000m/) (31% vs. 44%, p<0.01).	Level 1
The 2018 Ministry of Health guideline on the diagnosis and treatment of hypertension and pre-eclampsia in pregnancy[18] recommends that in deciding on the timing of birth, consider blood pressure level and its treatment, potential complications linked with the chosen mode of birth, health of the mother and fetus, other obstetric complications or co-morbidities, and the woman's preferences. • **Chronic hypertension**: For women with low risk of adverse outcomes, consider expectant management beyond 37 weeks with increased monitoring, offer IOL at 38 weeks, recommend no later than 40 weeks • **Gestational hypertension**: Under 37 weeks recommend expectant management, unless other concerns. Consider birth after 37+0 weeks and by 39 weeks • **Pre-eclampsia – stable & not severe**: Under 37 weeks recommend expectant management, unless other concerns. **Usually ought to be managed as in-patient.** Recommend birth after 37+0 weeks, as no appreciable benefit and increases the risk of deterioration. • **Pre-eclampsia – unstable/severe or eclampsia**: *Under 34 weeks*: adopt an expectant approach in a secondary or tertiary centre with resources for maternal and fetal monitoring and critical care of the mother and the baby. If indication for birth presents, administer corticosteroids for fetal lung maturation and magnesium sulphate for fetal neuroprotection (if < 30 weeks). *After 34 weeks*: recommend birth after stabilising the woman in a centre with appropriate resources to care for the mother and the baby. • **HELLP syndrome**: At any gestational age recommend birth after stabilising woman and after she has completed a course of corticosteroids (≤34+6 weeks) for fetal lung maturation and magnesium sulphate for fetal neuroprotection (if < 30 weeks), if time permits.	Level 4

Suspected small for gestational age (SGA)	Evidence
SGA babies should be managed as per NZ MFM Network SGA Guideline[19] Babies on 10th centile customised (i.e. not SGA but very close) can be monitored carefully and consider IOL at 40 weeks In SGA babies with EFW ≥ 5th centile and normal Doppler indices, plan birth by 40 weeks In SGA babies with either EFW < 5th centile or abnormal Doppler indices, plan birth by 38 weeks	
Suspected small for gestational age (SGA) is defined as a fetus with a customized estimated fetal weight (EFW) below the 10th centile for gestation. Fetal growth restriction (FGR) is defined as a fetus that has failed to reach its growth potential; it has considerable overlap with SGA but is more difficult to define. SGA babies have increased rates of perinatal morbidity and mortality. Improved antenatal detection, careful management and timely delivery may be associated with reduced morbidity and mortality in SGA pregnancies.[20] Early induction, however, has not been shown to improve neonatal outcomes. Secondary analysis of the DIGITAT RCT using the Morbidity Assessment Index for Newborns as the outcome, found that neonatal admissions to NICU were lower after 38 weeks compared with 36 or 37 weeks' gestation.[21] In settings where middle cerebral and uterine Doppler studies are not available, women with suspected SGA/FGR should be offered IOL at 38 weeks.[19] In settings where detailed Doppler studies are available, the decision about IOL needs to be individualized based on these results along with the severity of suspected growth restriction, in consultation with an obstetrician. Women with small babies with normal middle cerebral and uterine Dopplers may be at lower risk of adverse outcome and may be managed expectantly.	Level 4

Suspected macrosomia / large for gestational age (LGA)	Evidence
In the absence of other obstetric or medical indications (such as diabetes), suspected fetal macrosomia alone is not an indication for routine IOL	
Whilst there is not a universal definition of fetal macrosomia[22], it is generally defined in New Zealand as customized EFW > 90%. It must be remembered that there is a 10% margin of error in estimated fetal weights on scan, and frustratingly this can be higher in babies greater than 4kg. There is consistent evidence that increasing birth weight heightens the risk of shoulder dystocia and brachial plexus injury. The 2016 Cochrane review[23] of four small trials in non-diabetic women with a suspected macrosomic fetus at term (> 4000g or EFW > 97%), assessing a policy of early IOL (37-40 weeks) versus expectant management, concluded that there was no clear effect of IOL on the risk of Caesarean section or instrumental delivery. The risk of shoulder dystocia (RR 0.6) and any fetal fracture (RR 0.2) were reduced in the IOL group. Birthweight was reduced in the IOL group, but an average of 178g. There is no evidence that IOL decreases the risk of brachial plexus injury, but the background risk is so low that the studies were not powered to clearly see an effect. Interestingly, the risk of 3rd and 4th degree vaginal tears was higher in the IOL group (RR 3.7). A subsequent meta-analysis in 2017 of the same four RCTs[25] concluded that IOL ≥ 38 weeks is associated with a significant decrease in fetal fractures and thus that IOL is a reasonable option. A useful patient information leaflet based upon the Cochrane findings can be found here.[24] There are several RCTs planned or in progress considering IOL for suspected LGA. Currently there is no high-quality evidence for this. In the absence of other obstetric or medical indications, macrosomia alone is not an indication for IOL.	Level 1

Multiple pregnancy	Evidence
In order to reduce the risk of adverse outcomes to babies, women should be recommended for twins to be born by: • **DCDA** – 37 to 38 weeks • **MCDA** – 36 weeks • **MCMA** – 32 weeks by Caesarean section (refer to Maternal Fetal Medicine) If the leading twin is cephalic IOL is recommended, but given potential complexities of twin birth, care should be individualised	
The Twins Timing of Birth RCT[26] showed that for women with an uncomplicated twin pregnancy, elective birth at 37 weeks was associated with a significant reduction in risk of serious adverse outcome for the infant (4.7% vs. 12.2%, RR 0.39, p<0.01), primarily SGA. A Cochrane review[27] of two RCTs concluded that early birth at 37 weeks for an uncomplicated twin pregnancy is not associated with an increased risk of harm to the babies, compared to expectant management. Thus, women with an uncomplicated DCDA twin pregnancy should be offered IOL at 37-38 weeks in order to reduce the risk of adverse outcome in the infants.	Level 1
The 2011 NICE guideline[28] advised that uncomplicated DCDA pregnancies should be delivered after 37+0 weeks and that risks increase after 38+0 weeks, whilst MCDA pregnancies should be delivered from 36+0 weeks and that risks increase beyond 38+0 weeks. The 2016 RCOG guideline reiterated this[29]. It did, however, state that parental views are also important in deciding the best, individualised mode of delivery, especially for MCDA twins, including opting for Caesarean section.	Level 4
A Cochrane review[30] demonstrated no evidence of benefit from planned Caesarean section for term twin pregnancies (DCDA or MCDA) when the leading twin was cephalic.	Level 1

Pregnant following ART (IVF or ICSI)	Evidence
Offer IOL to women with IVF / ICSI pregnancies at 40 weeks, but not other ART techniques	
Women with pregnancies conceived by IVF or ICSI are at an increased risk of adverse perinatal outcomes. This does not appear to be true for pregnancies conceived via ovulation induction by clomiphene or letrozole. Women with singleton pregnancies who conceive after IVF/ICSI have a significantly higher risk of perinatal mortality (relative risk 1.9) and other obstetric and perinatal complications compared to women who conceive spontaneously.[31] However, no evidence was found about the effectiveness of early IOL to reduce this risk. In the absence of other obstetric or medical indications, conceiving after in vitro fertilization alone is not an indication for IOL. Ongoing risk assessment and fetal surveillance through pregnancy, in consultation with an obstetrician, is important.	Level 4
Pooled results from studies suggest there is nearly a 70% increased risk in perinatal death for IVF singletons compared with natural conceptions. [32] However, out of all assisted reproductive techniques, only women who conceived with IVF had a statistically significant four-fold increased risk of stillbirth compared with fertile women.56 This would suggest that the increased risk of stillbirth is associated with treatment-related factors to a greater degree than infertility/subfertility itself.	

Fetal growth restriction (FGR) / intrauterine growth restriction (IUGR)	Evidence
All decisions on timing and mode of delivery should be made by the Obstetric and Neonatal Consultants Care needs to be individualised for the women, the fetal gestation and the extent of growth restriction If preterm FGR / IUGR is suspected, birth should organised from 37+0 weeks at the latest If FGR / IUGR diagnosed at term, plan birth for as soon as reasonably possible	
Defined as occurring when a fetus has failed to reach its growth potential and may be associated with serious intrapartum and neonatal complications. [32, 33] It results mostly from chronic placental insufficiency. These fetuses are identified by the presence of growth below the 10th customised centile (SGA) which is usually associated with umbilical artery Doppler abnormalities and reduced amniotic fluid volume. [32, 34] The optimal timing of birth in a preterm fetus with growth restriction is controversial, requiring careful consideration of the severity of the growth restriction and its impact on fetal wellbeing balanced against the gestational age.	Level 4

Antepartum haemorrhage (APH) of unknown origin / recurrent APH	Evidence
If there is no evidence of maternal and/or fetal compromise, expectant management with increased fetal surveillance recommended If there is evidence of maternal and/or fetal compromise, timing and mode of birth to be agreed by SMO, LMC and the woman	
APH of unknown origin refers to women with vaginal bleeding after 20 weeks without maternal or fetal compromise and without evidence of abruption or placenta praevia. In nulliparous women who have APH of unknown origin, there is no increased risk of perinatal mortality, after adjusting for preterm birth. [36, 37] The decision about IOL needs to be individualized based on clinical considerations, in consultation with an obstetrician.	Level 4

Previous stillbirth	Evidence
Women may be offered IOL one week earlier than the previous stillbirth, but not earlier than 37+0 weeks, after careful discussion of the lack of evidence for this (assuming no other indications)	
Large population based studies have shown an increased risk of recurrent stillbirth / intrauterine fetal death (IUFD) in a subsequent pregnancy. [38, 39] These studies do not identify gestation at first or subsequent stillbirth and therefore cannot help with decision making around induction for a previous stillbirth. Maternal request for scheduled birth should take into account the gestational age of the previous stillbirth, previous labour history and the safety of induction of labour. [40] A large retrospective study showed that a previous stillbirth conferred a greater risk of future early IUFD (20 to 28 weeks) than of late IUFD (over 29 weeks). [41] There are no studies that have adequately tested fetal benefit from intervention by routine IOL. Meanwhile, higher rates of IOL may be associated with higher rates of instrumental delivery and emergency Caesarean sections. [42, 43] The decision about IOL needs to be individualized based on clinical considerations (such as risk factors for recurrence and other antenatal risk factors) and maternal anxiety, in consultation with an obstetrician.	Level 4

Obstetric cholestasis	Evidence
Women can be offered IOL at or after 38+0 weeks Women can be offered IOL earlier than 38+0 weeks in the presence of worsening biochemical or clinical evidence	
Obstetric cholestasis (OC) is associated with an increased risk of premature birth – both spontaneous and iatrogenic. The evidence for increased risks of meconium-stained liquor, Caesarean section and postpartum haemorrhage (PPH) are inconclusive. [45] It has long been thought that women with cholestasis in pregnancy have higher rates of perinatal mortality. Analysis of observational studies between 2001 and 2011, however, suggests that the perinatal mortality rate in pregnancies complicated by cholestasis is 5.7/1000,[45] which is similar to the perinatal mortality rate in the general population in NZ (6.7/1000 babies born, UK definition).[46] In pregnancies complicated by cholestasis, there does not appear to be an association with oligohydramnios or SGA/FGR, thus fetal monitoring has not been shown to be helpful. There remains insufficient data to clearly support or refute the practise of IOL at 37-38 weeks, with the intent of reducing late-term stillbirth. The decision about IOL needs to be individualized based on clinical considerations (such as symptoms, gestational age at diagnosis, and biochemical abnormalities), in consultation with an obstetrician. Timing of birth decisions should not be based on the degree of abnormality of biochemical tests alone (no clear correlation between maternal liver function enzyme levels or bile salts, and fetal death). Based on weak evidence, IOL may be recommended after 38+0 weeks.	Level 4

Placenta praevia & accreta	Evidence
Asymptomatic: consider delivery by Caesarean section 36+0 to 37+0 weeks Symptomatic or high-risk of preterm birth: consider delivery by Caesarean section 34+0 to 36+6 weeks	
In September 2018 the RCOG published updated its guidance [47] on the management of women with placenta praevia and accreta. The key relevant recommendations are: • Individualised care for women, whether asymptomatic or having recurrent bleeding, is important – consider in-patient management • Consider a single course of antenatal steroids for fetal lung maturation between 34+0 and 3+6 weeks, and prior to 34+0 weeks if at higher risk of preterm birth • Tocolysis for women presenting with symptomatic praevia or a low-lying placenta may be considered for 48 hours to facilitate administration of antenatal steroids • Late preterm (34+0 to 36+6 weeks) delivery should be considered for women presenting with placenta praevia if they have a history of bleeding or other associated risk factors for preterm birth • Delivery between 36+0 and 37+0 weeks should be considered for women with an asymptomatic placenta praevia or low-lying placenta	Level 4

Vasa praevia	Evidence
Planned Caesarean section at 34+0 to 36+0 weeks is reasonable in asymptomatic women with a confirmed vasa praevia	
In September 2018 the RCOG published a new guideline [48] on the management of women with vasa praevia. The key relevant recommendations are: • In the presence of confirmed vasa praevia in the third trimester, elective Caesarean section should ideally be carried out prior to the onset of labour. • A decision for prophylactic hospitalisation from 30-32 weeks in women with confirmed vasa praevia should be individualised and based upon a combination of factors, including multiple pregnancy, antenatal bleeding and threatened preterm labour. • In confirmed cases of vasa praevia, planned Caesarean section at 34-36 weeks is reasonable in asymptomatic women. • Antenatal steroids for fetal lung maturation should be recommended from 32 weeks due to the increased risk of preterm delivery.	Level 4

Polyhydramnios after 37 weeks	Evidence
It is reasonable to offer induction at 40 weeks if polyhydramnios detected, to reduce the risk of an adverse perinatal outcome	
Polyhydramnios is present in approximately 2% of pregnancies.[49, 50] There are a wide number of possible causes of polyhydramnios after 37+0 weeks. The commonest are idiopathic (at least 50%) and diabetes in pregnancy. Although there is not a universally agreed definition, at term an amniotic fluid index (AFI) ≥ 25.0 cm (≥97.5th centile for any gestation) and/or or a single deepest pocket (SDP) ≥ 8.0cm is definitely polyhydramnios (if the SDP is > 8cm but the AFI < 25cm, then mild polyhydramnios can still be diagnosed).[49] Mild: AFI 25.0 – 29.9cm. Moderate AFI 30.0 – 34.9cm. Severe: AFI ≥ 35.0cm. If polyhydramnios is suspected, a growth scan with anatomy review should be requested. • If isolated mild polyhydramnios is confirmed on scan, a glucose tolerance test should be performed. • If moderate polyhydramnios is confirmed on scan, basic investigations should include glucose tolerance test, $HbA1_c$, RBC antibody screen and a TORCH screen. • If severe polyhydramnios is seen and/or other anomalies, the same investigations as for moderate polyhydramnios should be performed and referral to MFM is indicated. Mild polyhydramnios (AFI 25-30cm) is associated with a higher incidence of LGA babies, but otherwise not associated with an increased risk of adverse outcomes.[50] Severe polyhydramnios (AFI ≥ 35.0cm) is associated with an increased risk of adverse pregnancy outcomes such as congenital anomalies (especially occult trachea-oesophageal fistulae), preterm birth (iatrogenic and spontaneous), SGA, aneuploidy and perinatal mortality.[49, 50] There is a two- to five-fold increase in perinatal mortality.[50, 51] One retrospective cohort study demonstrated a risk of fetal death in non-anomalous pregnancies affected by polyhydramnios to be seven times higher at 37 weeks, and eleven times higher at 40 weeks, compared to pregnancies unaffected by polyhydramnios.[52] Although the evidence is poor, mostly due to the lack of prospective randomised studies, it is reasonable to offer induction at 40 weeks if polyhydramnios detected, if not indicated before. This may reduce the risk of an adverse perinatal outcome, primarily intrauterine fetal death.	Level 4

References

1) Wise *et al*. 2014. Auckland Consensus Guideline on Induction of Labour. doi
2) National Institute for Health and Clinical Excellence. Induction of labour. NICE Clinical Guideline 70; 2008. doi
3) Ministry of Health. 2018. NZ Maternity Clinical Indicators 2016. Wellington: Ministry of Health
4) Boulvain M, Stan CM, Irion O. Membrane sweeping for induction of labour. Cochrane Database of Systematic Reviews 2005, Issue 1. doi
5) Gulmezoglu AM, Crowther CA, Middleton P, Heatley E. Induction of labour for improving birth outcomes for women at or beyond term. *Cochrane Database of Systematic Reviews* 2012, Issue 6
6) Caughey AB, Sundaram V, Kaimal A, et al. Maternal and neonatal outcomes of elective induction of labour. Evidence report/technology assessment No. 176, AHRQ Publication No. 09-E005. Rockville, MD: *Agency for Healthcare Research and Quality*. 2009
7) Middleton P, Shepherd E, Flenady V, McBain RD, Crowther CA. Planned early birth versus expectant management (waiting) for pre-labour rupture of membranes at term (37 weeks or more). *Cochrane Database of Systematic Reviews* 2017, Issue 1. CD005302.
8) Consensus Guideline 2014. The Prevention of Early-Onset Neonatal Group B Streptococcus Infection.
9) Carolan M, Frankowska D. Advanced maternal age and adverse perinatal outcome: a review of the evidence. *Midwifery* 2011;27:793-801
10) Induction of labour at term in older mothers. Scientific impact paper No. 34. Royal College of Obstetricians and Gynaecologists. 2013.
11) Walker, KF *et al*. Randomized trial of labor induction in women 35 years of age or older. *N Engl J Med* 2016; 374:813-822.
12) Management of women with obesity in pregnancy. Centre for Maternal and Child Enquiries (CEMACE)/Royal College of Obstetricians and Gynaecologists (RCOG) Joint Guideline. 2010
13) Yao R, Ananth CV, Park BY et al. Obesity and the risk of stillbirth: a population-based cohort study. *Am J Obstet Gynecol* 2014. (in press) http://dx.doi.org/10.1016/j.ajog.2014.01.044
14) Kjos SL, Henry OA, Montoro M, et al. Insulin-requiring diabetes in pregnancy: a randomized trial of active induction of labour and expectant management. *Am J Obstet Gynecol* 1993;169(3):611-5.
15) Biesty LM, Egan AM, Dunne F, Dempsey E, Meskell P, Smith V, Ni Bhuinneain GM, Devane D. Planned birth at or near term for improving health outcomes for pregnant women with gestational diabetes and their infants. *Cochrane Database of Systematic Reviews* 2018, Issue 1. CD012910.
16) Ministry of Health. 2014. *Diabetes in Pregnancy: Quick reference guide for health professionals on the screening, diagnosis and treatment of gestational diabetes in New Zealand*. Wellington: Ministry of Health.
17) Koopmans CM, Bijlenga D, Groen H, et al. Induction of labour versus expectant monitoring for gestational hypertension or mild preeclampsia after 36 weeks' gestation: a multi-centre, open label randomised controlled trial (HYPITAT). *Lancet* 2009;374:979-88.

18) Ministry of Health. 2018. *Diagnosis and Treatment of Hypertension and Pre-eclampsia in Pregnancy in New Zealand: A clinical practice guideline.* Wellington: Ministry of Health.
19) McCowan, L and Bloomfield F. Guideline for the management of suspected small for gestational age singleton pregnancies and infants after 34 weeks' gestation. New Zealand Maternal Fetal Medicine Network. 2014 (2nd edition).
20) Guideline for the management of suspected small for gestational age singleton pregnancies after 34 weeks gestation. New Zealand Maternal Fetal Medicine Network, 2013.
21) Boers KE, van Wyk L, van der Post JAM, et al. Neonatal morbidity after induction versus expectant monitoring in intrauterine growth restriction at term: a subanalysis of the DIGITAT RCT. *Am J Obstet Gynecol* 2012;206:344.e1-7
22) Norwitz, ER. Induction of labour for fetal macrosomia: do we finally have an answer? *BJOG* Dec 2016. Published online. **https://doi.org/10.1111/1471-0528.14458**
23) Boulvain M, Irion O, Dowswell T, Thornton JG. Induction of labour at or near term for suspected fetal macrosomia. *Cochrane Database of Systematic Reviews* 2016, Issue 5. Art. No.: CD000938. DOI: 10.1002/14651858.CD000938.pub2
24) Cochane Pregnancy and Childbirth. Induction of labour for big babies. https://pregnancy.cochrane.org/sites/pregnancy.cochrane.org/files/public/uploads/induction-for-macrosomia%20%28screen%29.pdf\
25) Magro-Malosso ER, Saccone G, Chen M, Navathe R, Di Tommaso M, Berghella V. Induction of labour for suspected macrosomia at term in non-diabetic women: a systematic review and meta-analysis of randomized controlled trials. *BJOG* 2017;124:414–421.
26) Dodd J, Crowther CA, Haslam R, Robinson J. Elective birth at 37 weeks of gestation versus standard care for women with an uncomplicated twin pregnancy at term: the Twins Timing of Birth Randomised Trial. *BJOG* 2012;119:964-974.
27) Dodd JM, Deussen AR, Grivell RM, Crowther CA. Elective birth at 37 weeks' gestation for women withan uncomplicated twin pregnancy. *Cochrane Database of Systematic Reviews* 2014, Issue 2. Art. No.: CD003582. DOI:10.1002/14651858.CD003582.pub2.
28) National Institute for Health and Clinical Excellence. Multiple pregnancy: antenatal care for twin and triplet pregnancies. NICE Clinical Guideline 129; 201. doi
29) Kilby MD, Bricker L on behalf of the Royal College of Obstetricians and Gynaecologists. Management of monochorionic twin pregnancy. *BJOG* 2016; 124:e1–e45. doi
30) Hofmeyr GJ, Barrett JF, Crowther CA. Planned caesarean section for women with a twin pregnancy. *Cochrane Database of Systematic Reviews* 2015, Issue 12. Art. No.: CD006553. DOI: 10.1002/14651858.CD006553.pub3.
31) Pandey S, Shetty A, Hamilton M, Bhattacharya S, Maheshwari A. Obstetric and perinatal outcomes in singleton pregnancies resulting from IVF/ICSI: a systematic review and meta-analysis. *Hum Reprod Update*. 2012;18(5):485-503.

32) Suzuki S, Otsubo Y, Sawa R, Yoneyama Y, T A. Clinical trial of induction of labor versus expectant management in twin pregnancy. *Gynecologic and Obstetric Investigation*. 2000; 49:24-7.
33) Tan TYT. Intrauterine growth restriction. *Current Opinion in Obstetrics and Gynecology* 2005;17(2):135–42.
34) Harkness UF. Diagnosis and management of intrauterine growth restriction. *Clinics in Perinatology* 2004;31(4):743–64
35) Women's Health Service Maternity Guidelines. Induction of labour. May 2018. Canterbury DHB. doi.
36) Bhandari S, Raja EA, Shetty A, Bhattacharya S. Maternal and perinatal consequences of antepartum haemorrhage of unknown origin. *BJOG* 2013; DOI: 10.1111/1471-0528.12464.
37) Thompson AJ *et al*. Royal College of Obstetricians and Gynaecologists. *Green-top Guideline No. 63 – Antepartum Haemorrhage*. November 2011. doi
38) Bhattacharya S, Prescott G, Black M, Shetty A. Recurrence risk of stillbirth in a second pregnancy. *Brit J Obstet Gynaecol*. 2010; 117:1243-1247.
39) Sharma PP, Salihu HM and Kirby RS. Stillbirth recurrence in a population of relatively low-risk mothers. *Paed Perinat Epidem*. 2007; 21(Suppl.1):24-30.
40) Siassakos D *et al*. Royal College of Obstetricians and Gynaecologists. Green-top Guideline No. 55 – Late Intrauterine Fetal Death and Stillbirth. October 2010. doi
41) Sharma PP, Salihu HM, Kirby RS. Stillbirth recurrence in a population of relatively low-risk mothers. *Paediatr Perinat Epidemiol* 2007;21 Supple 1:24-30
42) Black M, Shetty A, Bhattacharya S. Obstetrics outcomes subsequent to intrauterine death in the first pregnancy. *BJOG* 2008;115:269-74.
43) Robson S, Chan A, Keane RJ, Luke CG. Subsequent birth outcomes after an unexplained stillbirth: preliminary population-based retrospective cohort study. *Aust N Z J Obstet Gynaecol* 2001;41:29-35.
44) Vashevnik, S., S. Walker, and M. Permezel, Stillbirths and neonatal deaths in appropriate, small and large birthweight for gestational age fetuses. *Aust N Z J Obstet Gynaecol* 2007. 47(4): p.302-6
45) Kenyon AP and Girling, JC. Royal College of Obstetricians and Gynaecologists. *Green-top Guideline No. 43 – Obstetric Cholestasis*. April 2011. doi
46) PMMRC. 2013. *Seventh annual report of the Perinatal and Maternal Mortality Review Committee: Reporting mortality 2011*. Wellington: Health Quality & Safety Commission 2013.
47) Jauniaux ERM, Alfirevic Z, Bhide AG, Belfort MA, Burton GJ, Collins SL, Dornan S, Jurkovic D,Kayem G, Kingdom J, Silver R, Sentilhes L on behalf of the Royal College of Obstetricians and Gynaecologists. Placenta Praevia and Placenta Accreta: Diagnosis and Management. Green-top Guideline No. 27a. *BJOG* 2018; https://doi.o rg/10.1111/1471-05 28.15306.
48) Jauniaux ERM, Alfirevic Z, Bhide AG, Burton GJ, Collins SL, Silver R on behalf of the Royal College of Obstetricians and Gynaecologists. Vasa praevia: diagnosis and management. Green-top Guideline No. 27b. *BJOG* 2018; https://doi.org/10.1111/1471-0528.15307.

49) Pri-Paz S *et al*. Maximal amniotic fluid index as a prognostic factor in pregnancies complicated by polyhydramnios. *Ultrasound Obstet Gynaecol* 2012l; **39**: 648-653. doi
50) Karthanis P, Patni S. Polyhydramnios in singleton pregnancies: perinatal outcomes and management. *The Obstetrician & Gynaecologist* 2014;16:207-13. doi
51) Magann EF, Chauhan SP, Doherty DA, Lutgendorf MA, Magann MI, Morrison JC. A review of idiopathic hydramnios and pregnancy outcomes. *Obstet Gynecol Surv* 2007;62:795–802. doi
52) Piliod RA *et al*. The risk of fetal death in nonanomalous pregnancies affected by polyhydramnios. *Am J Obstet Gynecol* 2015 Sept;213(3):410.e1-6 doi

Informed Consent

The right of a consumer to make an informed choice and give informed consent, including the right to refuse medical treatment, is enshrined in law and in the Code of Health and Disability Consumers' Rights in New Zealand. This means that a woman can choose to decline treatment, referral to another practitioner, or transfer of clinical responsibility. If this occurs follow the process map on page 18 of the Referral Guidelines (Ministry of Health, 2012).