Preterm Labour (PTL) - Management of Threatened and Active PTL

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Function	Clinical Practice, Patient Care
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Department(s) affected	Auckland District Health Board (Auckland DHB) Maternity
Patients affected (if applicable)	All Auckland DHB antenatal patients
Staff members affected	All clinicians in maternity service including Auckland DHB clinicians and Lead Maternity carers/NWH access holders
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1. Purpose of guideline

This guideline outlines the expected management of women presenting with threatened or active (established) preterm labour within Auckland District Health Board (Auckland DHB) at gestations ≥24^{+0} weeks and <37^{+0} weeks. Between 23^{+0} and 23^{+6} weeks gestation it may be appropriate to follow the pathway outlined in this guideline. However, this should **only be done after reviewing Section 13** (Threatened and active PTL at <24^{+0} weeks), and after discussion with both an obstetric specialist (and MFM when available) and neonatal specialist.

2. Management principles

Preterm birth is the leading cause of neonatal death and major morbidity. It imposes additional risks on infant, child and life-long health of the off-spring. The rate of preterm birth ranges from 5% to 18% of babies born worldwide and at National Women's Health, Auckland City Hospital it is 9-10%. Approximately half of preterm births within the Auckland DHB unit are due to spontaneous labour or preterm prelabour rupture of membranes (PPROM).

Current therapeutic strategies are unlikely to prevent preterm birth in women presenting with symptoms of preterm labour (PTL) (threatened PTL). However we do have an opportunity to identify those at most risk of going onto preterm birth so interventions that reduce neonatal morbidity and mortality can be targeted appropriately.

Of women presenting with symptoms of PTL, 60-70% do not deliver until term and therefore clinical assessments of threatened PTL alone is a relatively poor predictor of preterm birth. The use of adjunct tests including vaginal biomarkers such as fetal fibronectin (fFN) or transvaginal ultrasound measurement of cervical length with strong negative predictive values allows us to rule out the risk of preterm birth in many women and limit the use of unnecessary antenatal admissions and interventions. Those interventions proven to be of value in improving neonatal outcomes include antenatal corticosteroids prior to 34^{+6} weeks, magnesium sulphate prior to 30^{+0} weeks and delivery within a unit with level 3 neonatal intensive care unit (NICU) facilities available. Tocolysis therapy has only been shown to have limited effects on outcome, however, it has been demonstrated to delay delivery >48 hours therefore its use should be considered in women receiving a first course of antenatal corticosteroids at ≤34^{+6} weeks, magnesium sulphate at <30^{+0} weeks or if antenatal transfer is required to access appropriate NICU facilities.

3. Definition and Risk Factors

Preterm labour (PTL)

- Refers to the onset of labour <37^{+0} weeks gestation (and the fetus is deemed viable).
- Clinically it is determined by regular uterine contractions with accompanied significant cervical dilatation of ≥3cm.

Threatened PTL

- Defined as uterine contractions but with no or limited evidence of cervical change at <37^{+0} weeks gestation (and the fetus is deemed viable).

- Clinically it is difficult to differentiate those with threatened PTL who will go onto PTL and birth and those that will not.

Risk factors for PTL

Many cases of threatened PTL and PTL are not associated with any identifiable risk factors however; there are certain conditions which may increase the risk:

- Previous PTL
- Preterm PPROM
- Previous second trimester loss
- History of cervical surgery (cone biopsy, LLETZ with depth ≥10mm)
- History of ≥1 surgical termination of pregnancy or evacuation of retained products of conception after miscarriage
- Congenital uterine and/or cervical anomalies
- Multiple pregnancy
- Polyhydramnios
- Recurrent bleeding in first trimester (≥ 5 days)
- Placental abruption/antepartum haemorrhage
- Smoking, alcohol or illicit drug use

4. Diagnosis of Preterm Labour

4.1 History taking

- Review history for symptoms of labour or other diagnosis which may present with similar symptoms (eg APH, UTI, constipation) and review risk factors
- Confirm gestational age

4.2 Physical examination

- Examine for signs of PTL or other diagnosis which may present with similar symptoms
- Vital signs (temperature, pulse and BP)
- Abdominal palpation to detect uterine activity (frequency, duration and strength), assess fetal size and presentation
- Sterile speculum examination
- Avoid gel to allow fetal fibronectin (fFN) testing if indicated (see below)
- Look for pooling of liquor, discharge, cervical dilatation and length
- If pooling of liquor present, rupture of membrane is confirmed, please refer to Auckland DHB guideline Rupture of Membranes in Pregnancy
- Digital vaginal examination
- Assess using Bishops score if cervix <3cm dilated
- CTG - FHR pattern and evidence of uterine activity

4.3 Investigations

- MSU
- High vaginal swab for culture
- Consider use of fFN (see below) if ≤34^{+6} weeks
- If fFN is not available, consider transvaginal ultrasound of cervical length.

Cervical length	Management
≥ 30mm	Treat as negative fFN
15-30mm	Assess clinical situation and discuss with specialist obstetrician on-call
≤ 15mm	Treat as positive fFN

4.4 Fetal Fibronectin (fFN)

Fetal Fibronectin is one of several commercially available vaginal biomarker tests for the prediction of preterm birth in women presenting with symptoms of PTL. To date fFN is the most extensively tested with data on predictive value in several thousand symptomatic women.

It is a glycoprotein found in amniotic fluid and extracts of placental tissue that can be thought of as "trophoblast glue" promoting cellular adhesion at the utero-placental and decidual-fetal membrane interfaces. It is rarely detected at elevated levels in cervico-vaginal fluid in normal pregnancy during the second and third trimesters. However, it is released through mechanical or inflammatory mediated damage to the membranes or placenta before birth, and is therefore found at elevated levels in the cervico-vaginal fluid of women between 22 and 36 weeks gestation who have an increased risk of PTL.

The test uses an enzyme linked immunosorbent assay (ELISA) containing FDC-6 monoclonal antibody to detect fFN. Both a qualitative analyser (positive or negative result) and a quantitative analyser (absolute value 0-500 ng/ml) are commercially available. The qualitative analyser is currently used as a point-of-care test for symptomatic women at National Women's Health. A fFN concentration of ≥50ng/mL has been established as the best threshold to define a positive test result.

fFN should be used to identify women at most risk of PTL within the next seven days (when use of hospital admission, tocolysis and antenatal corticosteroids are being considered). Its greatest value lies in its negative predictive value.

	Negative test (<50ng/ml)
Delivery within the next seven days	▪ 98-100% negative predictive value i.e. women presenting with symptoms of PTL and a negative fFN are very unlikely (<2%) to deliver within a time-frame where current hospital admission and corticosteroid use will be of benefit ▪ **These women can be discharged home with no acute intervention if no other diagnosis is considered to be the cause of their symptoms**

Women with a positive test have a higher risk of delivery within the next seven days (positive predictive value 15-50%). They should be admitted to hospital and considered for tocolysis therapy and corticosteroids if ≤34^{+6} weeks. They should be advised that they are at an increased risk of early birth but may still continue their pregnancy to term.

Indications for fFN testing:

Inclusion criteria	Exclusion criteria*
▪ Fetus is alive and viable ▪ 24^{+0} - 34^{+6} weeks gestation ▪ 23^{+0} - 23^{+6} weeks gestation if active intervention is being considered** ▪ Membranes are intact ▪ Cervix is <3cm dilated ▪ Steroid use, +/- tocolysis, +/- magnesium sulphate are being considered ▪ Singleton and multiple pregnancy	▪ Other complications have been identified that warrant delivery within the next seven days (and admission/use of steroids) eg abruption ▪ PPROM ▪ Higher order multiple pregnancy (≥triplets)
** **Relative contraindications** to use of fFN include; current vaginal bleeding, sexual intercourse within last 24 hours, speculum or digital vaginal examination within the last 24 hours, transvaginal ultrasound examination within the last 24 hours. These factors will increase the likelihood of a positive fFN result (but may represent a false positive). However, a negative result will be a true negative result and women can be managed according to that result. The use of a fFN test can still be considered if the result may influence management provided eg clinician would be confident to discharge woman and withhold corticosteroids and tocolysis if the result is negative. It is recommended that these cases are discussed with the specialist obstetrician on-call.*	
*** fFN can be taken at time of first examination at 23^{+0} - 23^{+6} weeks and only sent after consideration of case and full discussion with specialist obstetrician on-call, neonatologist and parents (refer to Section 13 - Threatened and active PTL at <24^{+0} weeks).*	

The use of a gel lubricant at the time of testing may produce a false negative result. This should be avoided.

Biomarkers for Preterm Birth Study:

All women undergoing a qualitative fFN should be invited to take part in this blinded prospective observational study comparing qualitative fFN, quantitative fFN and PartoSure (PAMG-1). Patient information sheets, consent forms, study directions and swabs are available in Women's Assessment Unit. This Auckland led study will inform us for future best practice care of women presenting with symptoms of PTL.

Specimen collection:

This should be done at the time of first speculum examination. The speculum examination should use water as a lubricant (no gel). Collection of the fFN specimen must be prior to any other cervical examination or swab. Place fFN swab into posterior fornix of vagina and rotate for 10 seconds. Place the swab into the fFN plastic specimen collection tube.

Proceed with remainder of vaginal assessment and follow the PTL Care Plan Algorithm for on-going care. If assessment is not suggestive of significant risk of PTL the fFN sample can be stored before processing for up to six hours at room temperature and three days in the refrigerator if required.

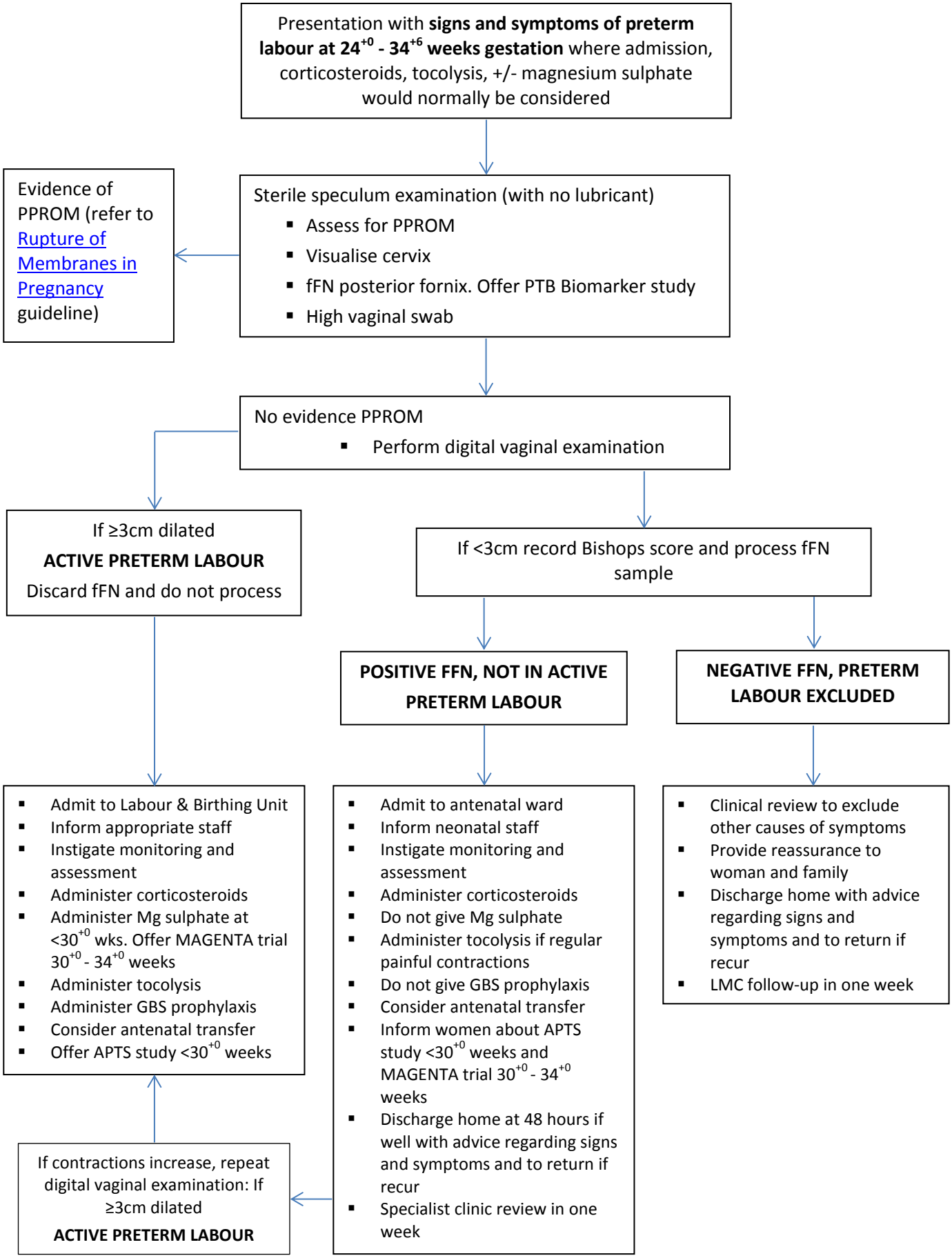
Note: there is no cost involved in taking the swab, cost to Auckland DHB is only incurred when sample is processed

5. Point of Care Testing

The Auckland DHB Point of Care Testing service provides an overview of testing using the Hologic fFN instrument. The following documents are provided to assist the user in obtaining a fFN result which can be used to aid clinical patient management:

1. fFN overview
2. Specimen collection
3. Important points (both around collection and use of the instrumentation)
4. Sample analysis

6. PTL Care Plan Algorithm



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7. Management of confirmed active Preterm Labour 24^{+0}-34^{+6} weeks

7.1 Admission to Labour and Birthing Unit

7.2 Staff to be informed

- Labour and Birthing Unit Clinical Charge Midwife
- Specialist obstetrician on-call
- Neonatal staff
  - Level 3 team if $<32^{+0}$ weeks
  - Level 2 team if $\geq 32^{+0}$ weeks

7.3 Monitoring and Assessment

- Insert IV line
- Obtain full blood count, CRP and group and hold sample
- Confirm fetal presentation by ultrasound scan
- Maternal monitoring (refer to Auckland DHB guideline Intrapartum Care - Normal Labour and Birth
- Fetal monitoring (refer to Auckland DHB guideline Fetal Surveillance policy. Continuous CTG should be performed while in active labour
- At peri-viable gestations 23^{+0}-25^{+0} weeks - individual plan to be made in consultation with parents, specialist obstetrician on-call, +/-MFM specialist and neonatal team regarding degree of monitoring and level of intervention (eg whether intrapartum CS should be performed for fetal distress). At $<24^{+0}$ refer to Threatened and active PTL at $<24^{+0}$ weeks (section 13)

7.4 Antenatal Corticosteroids

- Should be considered for all women $\leq 34^{+6}$ weeks gestation
- Refer to Auckland DHB guideline: *Antenatal Corticosteroids To Improve Neonatal Outcomes*
- In women who have received previous corticosteroids in this pregnancy use repeat single dose (11.4mg) if >7 days since first course/last dose if $\leq 32^{+6}$ weeks and <3 single repeat doses have been given

7.5 Magnesium Sulphate

- Should be considered for all women $<30^{+0}$ weeks gestation
- Refer to Auckland DHB guideline Magnesium Sulphate for Pre-eclampsia and for Neuroprotection in Pre-term Births < 30^{+0} Weeks
- MAGENTA trial should be offered to all women 30^{+0}-33^{+6} weeks gestation. Patient information sheets, consent forms and study directions are available in Women's Assessment Unit, Labour and Birthing Unit and in Ward 98. Study treatment packs are located in the Labour and Birthing Unit drug room.

7.6 Tocolysis

- Should be considered for all women $\leq 34^{+6}$ weeks gestation to allow time for corticosteroid, +/- magnesium sulphate administration (and rarely in-utero transfer)
- Nifedipine (section 10) should be the first-line tocolytic agent. It is administered orally with less side effects than other available tocolytic agents (betamimetics).
- Refer to and follow the Nifedipine use flowchart (section 11)

7.7 Neonatal Group B Streptococcal disease prevention

- Preterm birth is a risk factor for neonatal group B streptococcal disease
- Group B streptococcus prophylaxis should be considered for all women in active PTL <37^{+0} weeks gestation
- Refer to Auckland DHB guideline Group B Streptococcus (GBS) - prevention of early - Onset Neonatal Infection
- Treatment should continue until birth or until the patient is transferred from Labour and Birthing Unit if symptoms of PTL settle and the patient remains undelivered

7.8 In-utero transfer

- The case should be discussed with the neonatal team to ensure that the required level of care is currently available at Auckland City Hospital (ACH) NICU
- Consider antenatal transfer if it is necessary and if it is deemed safe

7.9 Cord clamping

- There is limited evidence that delayed cord clamping (up to 60 seconds) at the time of early preterm birth may have some beneficial effects on neonatal outcomes
- To date there is insufficient evidence to change practice but the APTS (Australian Placental Transfusion Study) should be offered to all women in active PTL <30^{+0} weeks gestation. Patient information sheets, consent forms and study directions are available in Women's Assessment Unit, Labour and Birthing Unit and in Ward 98

7.10 Future pregnancy

- Medical review prior to hospital discharge and advice regarding the risk of recurrence
- If delivery <34^{+0} weeks gestation, early specialist review during next pregnancy
- Consider referral to Preterm Birth Clinic for pre-pregnancy consult or in future pregnancy

8. Management of positive fFN, not in active Preterm Labour

8.1 Admission to antenatal ward for observation

8.2 Staff to be informed

- Neonatal staff
  - Level 3 team if <32^{+0} weeks
  - Level 2 team if ≥32^{+0} weeks

8.3 Monitoring and Assessment

- Insert IV line
- Obtain full blood count, CRP and group and hold sample
- Confirm fetal presentation and assessment of estimated fetal weight by ultrasound scan
- Maternal monitoring: four hourly pulse, BP and temperature (more frequent in first three hours of nifedipine use, refer to the Nifedipine use flowchart)
- Fetal monitoring: daily CTG unless uterine activity (refer to the Nifedipine use flowchart)

8.4 Antenatal Corticosteroids

- Should be considered for all women ≤34^{+6} weeks gestation

- Refer to Auckland DHB guideline *Antenatal corticosteroids to improve neonatal outcomes*
- In women who have received previous corticosteroids in this pregnancy use repeat single dose (11.4mg) if >7 days since first course/last dose if ≤32^{+6} weeks and <3 single repeat doses have been given

8.5 Magnesium Sulphate

- Should not be routinely used. Consider in women <30^{+0} weeks gestation only if they progress to active PTL
- Refer to Auckland DHB guideline Magnesium Sulphate for Pre-eclampsia and for Neuroprotection in Pre-term Births < 30^{+0} Weeks
- Women at 30^{+0} - 33^{+6} weeks gestation should be informed about the MAGENTA trial. Patient information sheets, consent forms and study directions are available in Women's Assessment Unit, Labour and Birthing Unit and in Ward 98. Consent can be obtained but randomisation should only occur if they progress to active PTL

8.6 Tocolysis

- Should be considered for all women ≤34^{+6} weeks gestation with on-going painful uterine contractions to allow time for corticosteroid administration
- Nifedipine (section 10) should be the first-line tocolytic agent. It is administered orally with less side effects than other available tocolytic agents (betamimetics).
- Refer to and follow the Nifedipine use algorithm (section 11)

8.7 Neonatal Group B Streptococcal disease prevention

- Should not be routinely used. Consider in women <37^{+0} weeks gestation if they progress to active PTL
- Refer to Auckland DHB guideline Group B Streptococcus (GBS) - prevention of early - Onset Neonatal Infection

8.8 In-utero transfer

- The case should be discussed with the neonatal team to ensure that the required level of care is currently available at ACH NICU
- Consider antenatal transfer if it is necessary and if it is deemed safe

8.9 Cord clamping

- Women <30^{+0} weeks gestation should be informed about APTS (Australian Placental Transfusion Study). Patient information sheets, consent forms and study directions are available in Women's Assessment Unit, Labour and Birthing Unit and in Ward 98. Consent can be obtained but randomisation should only occur if they progress to active PTL

8.10 On-going care

- The majority of women admitted with symptoms of PTL and a positive fFN will not deliver within the next seven days. If they are well and symptom free they should be discharged home at 48 hours
- A referral should be made for a specialist clinic review in one week
- All women should be advised of signs and symptoms of preterm labour with a plan for return if symptoms recur

9. Management of Negative fFN, Preterm Labour excluded

Patients with symptoms of PTL and a negative fFN are very unlikely to deliver within the next seven days (<2%)

- Reassurance should be given to these patients
- Clinical review to exclude other causes of symptoms eg UTI, placental abruption
- Discharge home with advice regarding signs and symptoms of preterm labour and plan for return if symptoms recur
- Follow-up with LMC in 1 week

10. Nifedipine tocolysis

Tocolysis therapy has only been shown to have limited effects on outcome in relatively small studies and is not a standard of care in some countries, regions and hospitals. However, it has been demonstrated to delay delivery >48 hours and so its use should be considered in women receiving a first course of antenatal corticosteroids at ≤34^{+6} weeks, magnesium sulphate at <30^{+0} weeks or if antenatal transfer is required to access appropriate NICU facilities.

There are a number of tocolytic agents. Of those available in New Zealand and where there is evidence to support use, nifedipine is first-line therapy. It is administered orally with less side effects than other available tocolytic agents (betamimetics). Two preparations of nifedipine are used within the tocolysis flowchart - short acting nifedipine and slow release nifedipine.

Trade name: Adalat (short acting nifedipine), Nyefax Retard (slow release nifedipine)
Mechanism of action: Calcium channel blocker
Contraindications:

Absolute:

- Suspected/confirmed intrauterine infection
- Suspected/confirmed placental abruption
- Significant hypotension
- Maternal shock
- Previous allergic response to nifedipine

Relative:

- Use of β-blocker (risk of hypotension)
- Lethal congenital anomalies of the fetus
- Severe fetal growth restriction with suspected fetal compromise
- Abnormal CTG

Possible adverse effects:

- Most common: transient palpitation, headaches and facial flushing
- Less common: constipation, dizziness, nausea, tachycardia, fatigue, peripheral oedema, increased liver enzymes. Liver enzyme changes are not a concern with such a limited use, but care should be taken in those with known liver disease

Dose and administration:

- Refer to Nifedipine use algorithm (section 11)

- Initial dosing: Short acting nifedipine 10mg (2 x 5mg capsules) (Adalat) every 15 minutes if still contracting (up to 4 doses)
- Maintenance: Slow release nifedipine 8 hourly 20 - 40mg (maximum of 160mg in 24 hours) (Nyefax Retard)
- Dose can be adjusted according to clinical symptoms
- Slow release nifedipine should be discontinued 12 hours after the last corticosteroid dose. There is no data to support continued maintenance therapy

Monitoring:

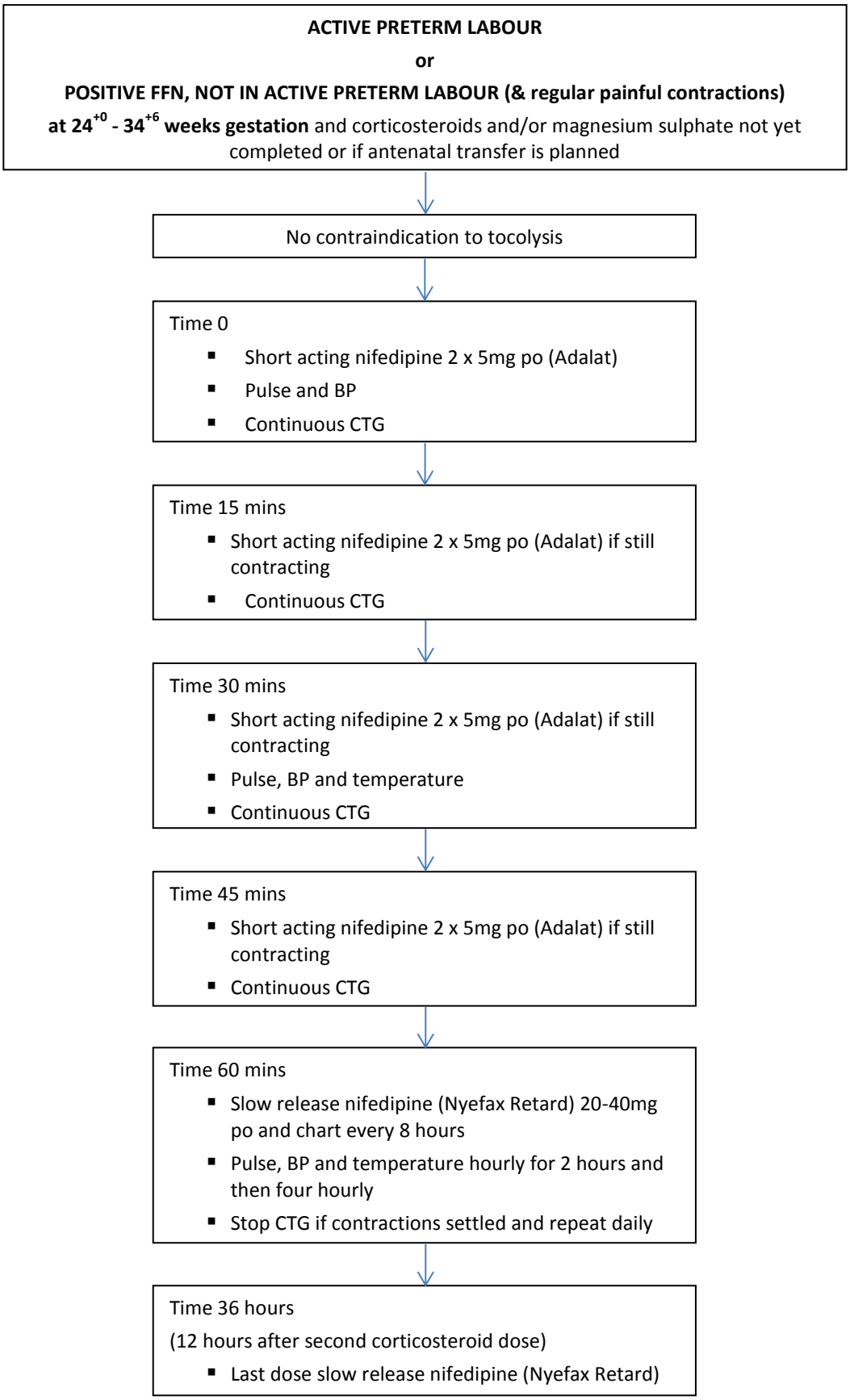
Maternal:

- First hour: pulse, BP at 0, 30 and 60 minutes
- Next 2 hours: pulse, BP and temperature hourly
- Remaining time on treatment: pulse and BP four hourly

Fetal:

- Baseline CTG must be normal before commencement of therapy
- CTG at commencement of treatment
- Continuous CTG for the first hour and until painful contractions cease
- Subsequent CTG daily or as clinically indicated eg increase in maternal temperature or pulse rate or return/increase in contractions

11. Nifedipine tocolysis flowchart



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12. Repeat presentation with symptoms of Preterm Labour

Women who present with symptoms of PTL but who do not go onto to deliver will be discharged from hospital with advice to return if symptoms recur (negative fFN, on day of review and positive fFN 48 hours after admission). If they represent with recurrence of symptoms of PTL ≤34^{+6} weeks they should undergo the same clinical review as those presenting for the first time (refer to Diagnosis of Preterm Labour - section 4).

For women in active preterm labour, follow management of confirmed active Preterm Labour algorithm (section 7).

For women with positive fFN but cervical dilatation <3cm, follow management of positive fFN, but not in active Preterm Labour algorithm (section 8).

For women with negative fFN, follow management of negative fFN, Preterm Labour excluded algorithm (section 9).

13. Threatened and active PTL at <24^{+0} weeks

Over the last 10-20 years there have been significant improvements in survival and survival free of major morbidity in infants born at peri-viable gestational ages (23^{+0} - 25^{+0} weeks). Active interventions including the use of antenatal corticosteroids and magnesium sulphate are likely to be significant influencing factors on survival and survival free from major morbidity. It is therefore appropriate to *consider* a more pro-active approach to care when women present with symptoms of PTL at 23^{+0} - 23^{+6} weeks.

'Active intervention' <24^{+0} weeks should not form standard routine care but each case must be individualised and tailored ensuring a multidisciplinary and family-centred approach to the care that is offered. All cases must be discussed with the specialist obstetrician on-call and a review of factors likely to influence outcome should be made. These factors include; presence of SGA and markers of fetal well-being (umbilical and other fetal Doppler waveforms, amniotic fluid volume); evidence of PPROM +/- chorioamionitis; abnormal fetal heart rate recording; presence of suspected fetal anomaly/malformation; fetal sex (where known); multiple gestation; and whether antenatal corticosteroids and magnesium sulphate have been administered (or sufficient time may be gained to administer them).

After careful consideration of these factors and discussion in advance with the on-call neonatology team, 'active intervention' should be offered to parents as an option but support also given for a more conservative approach to care. Ideally counselling should be provided by the specialist obstetrician on-call and specialist neonatologist on-call. If 'active intervention' is planned, the PTL Care Plan Algorithm (section 6) including the use of a fFN swab, where appropriate, should be followed.

If 'active intervention' is planned, the neonatology team should attend delivery. Assessment may include ongoing appraisal of any intra-partum factors that have developed, birthweight, baby's condition at birth and response to resuscitation in addition to factors known in advance. A plan for 'active intervention' at the time of presentation does not commit caregivers to full resuscitation after birth if this is not deemed to be in the baby's best interest and, antenatal counselling should cover this eventuality.

Discussion regarding use of caesarean section (CS) at gestational age 23^{+0} - 23^{+6} weeks should be included in parental counselling. A plan for 'active intervention' at the time of presentation does not commit parents or caregivers to perform a CS but this should be considered and discussed and there should be a plan documented. It is likely that a classical CS (or high transverse incision) may be required and the implications for a future pregnancy considered (i.e. need for elective CS). It is not clear that CS in some cases (eg for breech presentation or for CTG evidence of fetal distress) will improve outcome for the fetus/neonate, however, in others (eg transverse lie) where a decision for 'active intervention' has been made, it is likely to be beneficial. If a decision has been made not to perform CS for fetal indications, continuous CTG monitoring in labour is not recommended. However, intermittent fetal heart rate auscultation may aid the neonatal team's care at time of delivery and should be performed and documented.

fFN testing can be used at gestational ages >22^{+0} weeks but should only be considered if it is likely to significantly influence management decisions.

14. Research

The optimal management and care of women presenting with symptoms of preterm labour is constantly evolving. Over the last 30-40 years clinical trial research has led to significant improvements in neonatal survival and survival free from major morbidity due to preterm birth. It is still however, a leading cause of perinatal death that has huge costs both financially and emotionally to the families we care for and for our society as a whole. We are committed to on-going research to further improve the care we provide. All women presenting with symptoms of PTL who are eligible for on-going clinical trials that may be of benefit to them must be offered and actively encouraged to participate. This includes the Biomarkers for Preterm Birth Study, MAGENTA trial and APTS. Patient information sheets, consent forms and study directions are available in Women's Assessment Unit, Labour and Birthing Unit and in Ward 98.

15. Future Audit

There are a number of auditable standards within this guideline. These should be reviewed regularly and practice should be audited. Examples include:

- Use of fFN in women presenting with symptoms of PTL
- Invitation to join relevant research studies
- Adherence to use of management strategies according to PTL Care Plan algorithm
  - admission rates
  - use of tocolysis
  - use of corticosteroids, use of magnesium sulphate
  - discharge at 48 hours in women with positive fFN not in active PTL

16. Supporting evidence

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17. Associated Auckland DHB documents

- Antenatal corticosteroids to improve neonatal outcomes
- Diabetes in Pregnancy
- Fetal Surveillance Policy
- Group B Streptococcus (GBS) - prevention of early - Onset Neonatal Infection
- Intrapartum Care -Normal Labour and Birth
- Magnesium Sulphate for Pre-eclampsia and for Neuroprotection in Pre-term Births < 30^{+0} Weeks
- Point of Care Testing Equipment Management - POCT Protocol
- Rupture of membranes in Pregnancy

18. Disclaimer

No guideline can cover all the variations required for specific circumstances. It is the responsibility of the health care practitioners using this Auckland DHB guideline to adapt it for safe use within their own institution, recognise the need for specialist help, and call for it without delay, when an individual patient falls outside of the boundaries of this guideline.

19. Corrections and amendments

The next scheduled review of this document is as per the document classification table (page 1). However, if the reader notices any errors or believes that the document should be reviewed before the scheduled date, they should contact the owner or the Clinical Policy Facilitator without delay.