New Zealand College of Midwives
TE KĀRETI O NGA KAIWHAKAWHANAU KI AOTEAROA

PRACTICE GUIDANCE

Practice guidance document

Assessment and promotion of fetal wellbeing during pregnancy

2021

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Introduction

This document provides guidance to midwives in relation to the assessment and promotion of fetal wellbeing during pregnancy. Antenatal care is an intrinsic part of the childbearing continuum[1,2,3]. Midwifery care aims to optimise wāhine/women's and fetal health through a holistic approach which is situated within a social model of health. The midwife and wahine/woman identify factors that have the potential to affect pregnancy outcome and plan care accordingly. Ongoing midwifery assessments monitor maternal and fetal well-being and identification of any concerns. Identifying these issues enables the initiation of referral, ongoing assessment and appropriate management.

Principles

1. This guidance is based on the understanding that midwifery in Aotearoa New Zealand is provided in a partnership model which is based on continuity of care[1,2]. Continuity of care throughout the antenatal period enables a continuous holistic assessment of the wahine and fetal wellbeing[3].

2. Optimum maternal health and wellbeing creates the best possible environment for fetal growth and development.

3. Midwives uphold the wahine right to informed decision-making and midwives' practice is evidence informed, integrating informed choice and evidence based practice[1.]

4. Midwives promote and advocate for equity in access to health services.

5. Midwives honour each wahine cultural identity and provide care that acknowledges and respects the wahine beliefs and values and that of her whānau/family and/or other significant support[1,5].

6. This guide for practice does not replace clinical judgement.

PRACTICE POINTS

This guidance focuses on particular aspects of assessment of fetal growth and behaviour as screening for and detection of small for gestational age (SGA)/fetal growth restriction (FGR) has been shown to reduce adverse outcomes[7,8].

Consider maternal health history and lifestyle factors that may affect fetal growth and wellbeing:

A detailed and comprehensive maternal health assessment is a routine part of midwifery care. This includes: medical/whānau and past maternity history (including birthweight and centile of previous babies/pēpi), current pregnancy history to date, maternal ethnicity, measurement of weight and height and calculated body mass index (BMI) either pre-pregnancy (optimal time for BMI calculation) or as early in the pregnancy as possible and smoking status. Identify other impacts on health including poverty, poor nutrition, inadequate housing, drug and/or alcohol use and family violence as these also have an effect on fetal well-being.

- Information to promote pregnancy wellbeing is shared, including healthy nutrition and activity, healthy weight gain, food safety and maternal immunisation to create the best circumstances for fetal growth and development.

- Identification of the need for support in these areas and of maternal physical, mental and cultural wellbeing forms an important component of assessment of fetal wellbeing. Offer the wahine referral to appropriate other providers who can assist her further [1].

- Share information about screening tests available throughout pregnancy including blood and ultrasound investigations to support informed decision making.

- Risk factors for SGA include:
  - Previous SGA infant
  - Previous stillbirth
  - Heavy bleeding prior to 20 weeks gestation
  - Low PAPP-A (<0.4MoM) result on first trimester screening
  - Underlying medical conditions
  - Continued smoking after 16 weeks gestation/Recreational drug use
  - BMI of >35
  - Multiple pregnancies
  - Hypertension/Pre-eclampsia
  - Antepartum haemorrhage

- Where any risk factors or concerns are identified recommend:
  - Referral for consultation (as per Referral Guidelines).
  - Increased assessments and monitoring of fetal growth including ultrasound growth scans
  - For wāhine at increased risk for FGR and/or pre-eclampsia, consider commencing low dose aspirin (100-150mg nocte) prior to 16 weeks' gestation see NZCOM/RANZCOG multidisciplinary guidance at https://www.midwife.org.nz/wp-content/uploads/2018/12/Guidance-regarding-the-use-of-low-dose-aspirin-in-the-prevention-of-pre-eclampsia-in-high-risk-women.pdf
  - Engagement with other services for support eg. housing, addiction services, family support

For wāhine who do not meet the criteria for specialist referral or those who decline referral, the midwife makes a plan in partnership with the wahine, using the NZMFMN SGA guideline as a guide for decision making[7].

Establish gestation

- Gestation is established using certain dates for the last menstrual period (LMP). If LMP or time of conception is unknown or unsure then an ultrasound scan towards the end of the first trimester (12 – 13^{+6}) can be offered to wāhine to estimate gestation. Evidence does not support early first trimester scan for dating purposes only[37].

Fetal Growth Assessment:

Abdominal assessment

- Physical identification and assessment of the lie, position and growth of the fetus by palpation is an integral and highly valued part of midwifery practice. It also provides a time for the wahine and midwife to discuss the developmental milestones of pregnancy, including sharing information about the pēpi growth and activity[1].

- A small for gestational age (SGA) fetus may be identified at any time in pregnancy but is rare before 20 weeks.

Measurement of fetal growth

- Fundal height and abdominal palpation assessment of fetal growth is most consistent when undertaken by the same practitioner where possible.

- From 26-28 weeks gestation measure fundal height but not more frequently than 2 -3 weekly, and record in centimetres, preferably on the wahine customized growth chart.

- Fundal height measurement is taken from the uppermost part of the fundus to the top rim of the symphysis pubis. A fundal height measures the size of the wahine uterus, not just the fetus

- In some situations fundal height measurement may be unreliable e.g. BMI 35+, large fibroids or polyhydramnios. It is not appropriate to use fundal height measurement to assess uterine growth in multiple pregnancies.

Recording and interpretation of measurements

- Measurement and recording of findings needs to be consistently applied whatever tool is used.

- When using a customised fetal growth chart to plot fundal height, practitioners are required to be conversant with their conditions (for example a condition for the use of the Perinatal Institute GROW© charts is that the Growth Assessment Programme (GAP) education has been undertaken prior to using them).

Actions

- If concern about fetal growth is identified, either from a single measurement or from the growth trajectory, more frequent assessments are indicated including consideration of ultrasound scans to estimate fetal weight and fetal biometry.

- Further investigation/referral/consultation is indicated if there are concerns that the fetus is not growing optimally.

- An ultrasound scan referral is recommended for wāhine when potential growth issues are identified on a growth chart: slow or static growth, growth crossing centile lines, or a single fundal height below the 10th centile; or slow or static growth if fundal height not increasing consistently as expected. (see Appendix 1 Ultrasound Scan – Fetal Biometry).

- For wāhine where it is not always possible to reliably measure fundal height (e.g. twin pregnancy, BMI > 35, large fibroids) recommend referral for serial ultrasound assessment of growth.

- If ultrasound assessment of growth confirms a suspicion of static or reduced growth of the tōhua or reduced amniotic fluid volume, appropriate referrals for consultation are made in partnership with the wahine.

- Where there is difficulty in accessing an ultrasound scan in the community eg. due to lack of availability, service restrictions, cost, distance then discussion with the DHB is appropriate to address the issues. Document any concerns with access to clinically indicated growth scans and any discussions undertaken about enabling appropriate and timely access.

Fetal activity:

- Provide wāhine with information on what to expect in relation to fetal movements as pregnancy progresses, including the presence of a diurnal pattern and development of longer quiet periods of fetal activity during the day near term. The diurnal rhythm of fetal movement is characterized by a lower incidence in the morning hours and an increase in the late evening and night.

- Most wāhine feel increasingly strong movements right up until birth, especially when sitting and during the evening.

- Encourage the wahine to learn what is usual for her pēpi during pregnancy.

- Recommend an assessment where a wahine has concerns about a decrease in frequency and/or strength of fetal movements and absence of normal activity in the evening.

- Encourage wāhine to make contact if they become aware of a progressive decrease in frequency and/or strength of fetal movements over a period of time.

- There is no evidence to support advice to stimulate the fetus with food or drink or by requesting the wahine to call back after a period of rest and concentrating on fetal movement.

- Wāhine who become concerned about a lack of fetal movement later in the day should be encouraged to seek assessment and not delay until the following day.

- For all wāhine reporting decreased fetal movements offer a full assessment including identifying the presence or absence of a fetal heart rate and a period of CTG monitoring.

Auscultation of the fetal heart rate:

- When auscultating a fetal heart it is important to distinguish between the maternal and fetal heart rates. Measurement of the wahine pulse while listening to the fetal heart rate is the best way to achieve this. Both rates are then documented.

- The midwife and wahine decide together on which equipment to use to auscultate the fetal heart. The three most common options are: Pinard stethoscope (monaural stethoscope), fetoscope (Allen stethoscope) and hand-held Doppler.

Documentation:

- The midwife comprehensively documents all assessments, information and advice shared and decisions made for the plan of care in the wahine maternity record [1].
- The College of Midwives Record Keeping Keteparaha/Toolkit will support your documentation. See https://www.midwife.org.nz/midwives/professional-practice/practice-guidance/

Background:

Fetal growth

Assessment and monitoring of fetal growth aims to confirm the normally growing pēpi and identify the small-for-gestational age (SGA) or large for gestational age (LGA) pēpi.

SGA is generally defined as a pēpi with birthweight less than the 10th centile or a fetus with an estimated fetal weight (EFW) less than the 10th customised centile for gestation[6,7]. Small for gestational age (SGA) pēpi have an increased chance of perinatal morbidity and mortality, however FGR pēpi have a greater potential for adverse outcomes [7, 8]. A growth-restricted pēpi is one that has not met its growth potential secondary to an underlying pathological process. The underlying cause may not always be clearly identifiable, and distinguishing between the small but healthy pēpi and the unwell small and/or poorly growing pēpi can be a challenge[6,8]. Not all growth restricted pēpi are SGA and not all SGA pēpi are FGR.

Large for Gestational Age (LGA) is generally defined as a pēpi with an EFW greater than the 90th customised centile for gestation or a birthweight greater than the 90th centile. A LGA fetus or pēpi is commonly referred to as being macrosomic. An EFW greater than the 90th centile increases the potential for labour abnormalities, shoulder dystocia, birth trauma and injury to the pēpi. However, the diagnosis of fetal macrosomia is imprecise. The accuracy of estimation of EFW (both clinically and on ultrasound) in a suspected LGA fetus in an uncomplicated pregnancy has been identified as, at best, variable and not an indication for intervention[10].

This guidance focuses on particular aspects of assessment of reduced fetal growth and behaviour as screening for and detection of small for gestational age (SGA)/fetal growth restriction (FGR) has been shown to reduce adverse outcomes [7, 8].

Abdominal palpation and measurement of the fundal height

Abdominal palpation enables midwives to make a variety of assessments including assessment of fetal growth[9]. There is a lack of high quality evidence available on the most effective methods of assessment used in screening for SGA during pregnancy. A Cochrane Systematic Review in 2015 found only one trial comparing repeated measures of fundal height with abdominal palpation that met the review criteria[13]. The trial found no difference in detecting poor growth between the two approaches. The overall evidence was of low/very low quality. Both approaches have limitations in that they are mediated by inter and intra-practitioner variation, however combining palpation with fundal height measurement has less subjectivity than palpation alone, especially if practitioners are able to access education on standardised serial fundal height measurement [12, 13].

Standardised serial measurement of fundal height and plotting on a growth trajectory chart is an increasingly recommended method of assessment for SGA [7, 11,14,15, 16,17]. Standardised serial fundal height measurement will reduce intra and inter-observer inaccuracies but will not indicate whether the pēpi is growing according to genetic potential, this is more likely to be identified when measurements are plotted on a customised growth chart[18] .

A number of international consensus based guidelines, developed using evidence from observational studies, recommend that fetal growth assessment be determined by using a combination of abdominal palpation with fundal height measurements at no less than 2-3 weekly intervals from 26 – 28 weeks gestation [7,11,13, 15]. A review of these guidelines identified a general consensus in recommending fundal height measurement however there are differences in recommendations for customised growth charts or the use of McDonald's rule[11]. McDonald's rule is where the fundal height in centimetres should be equal to the gestational age in weeks, and a measurement discrepancy of more 3cm is suggestive of a tōhua with growth problems, an abnormal amniotic fluid level, a transverse lie, a twin pregnancy, or uterine fibroids. There is currently no evidence to support the use of McDonald's rule, landmarks, palpation alone, or fundal height measurement without plotting on a reference chart.

There are different types of reference charts for documenting fundal height, for example standardised guides such as the INTERGROWTH-21 project or customised charts eg. GROW© (gestation related optimum weight) to assess the fetal growth trajectory in relation to gestational age[14, 19] . Customised growth charts are adjusted for maternal characteristics (eg. maternal height, weight, parity, ethnicity) [14]. Research into the effectiveness of customised charts (GROW©) compared to the INTERGROWTH-21 standard in identifying SGA in an Aotearoa multi ethnic population found customised charts improved identification of the SGA tōhua [19, 20]. A recent randomised trial comparing the plotting of fundal height on a population chart compared with a GROW© chart found a reduced incidence of stillbirth in wāhine where a GROW© chart was used[18].

In Aotearoa the use of the customised chart known as GROW© has come into common but not entirely universal usage as yet[11,,20]. Studies investigating fetal growth monitoring using fundal height measurement and customised growth charts in the Aotearoa context have shown their effectiveness in identifying pēpi who are SGA and therefore potentially at risk of adverse perinatal outcome [16,18,19,]. Evidence suggests that the use of customised growth charts is beneficial for Aotearoa multi-ethnic population[16,19].

Fetal movements

Fetal movements are well recognised as an indicator of fetal well-being [21,22,23]. Fetal movement varies depending on the time of day and gestational age. Generally the frequency of movement increases from morning to night, with peak activity later in the evening and night [27] . Decreased fetal movements are linked with adverse perinatal outcomes [21,23,24]. More than half of wāhine who present with a stillbirth identify a decrease in fetal movements before diagnosis of fetal death [21,22,23.]

There is no evidence on a clear, agreed definition of normal fetal movements and no objective definition of reduced fetal movements [29,30, 31]. The AFFIRM trial in the UK aimed to increase wāhine awareness of fetal movements and reporting of reduced fetal movements and to combine this with a package of actions including a low-threshhold for recommending induction of labour to reduce the risk of stillbirth [32]. The trial with the specific package of interventions did not reduce perinatal mortality at or after 24 weeks' gestation, but did increase inductions of labour and prolonged (>48 hours) neonatal unit stay. The outcomes of ongoing studies e.g My Baby's Movements will further inform clinical practice and advice in this area.

Maternal awareness of usual fetal movements and the recognition of a change in these does not rely on the counting of movements [27, 30,31]. Maternal recognition of a reduction or change in the pattern of fetal movements is based on her knowledge of her pēpi and what is usual for that pēpi[23,24,26,30]. Fetal movements that are decreased in strength and/or frequency or a perception by the wahine that the pēpi is quiet in the evening are associated with late stillbirth[24, 26]. Data from an Aotearoa study found that perception of fetal movements in wāhine with high BMI is similar to wāhine with a normal BMI[37].

All wāhine who raise concerns about decreased fetal movements require a discussion on the most appropriate fetal wellbeing assessment for their context [21,27,28]. Information for wāhine from early in the pregnancy on what is usual to expect in relation to fetal movements helps to reduce the time from when a wahine recognises reduced movements to when she seeks professional support [28, 32,33,36]. There is no evidence to support a delay in a full assessment by giving advice to stimulate the pēpi with food or drink or by requesting the wāhine to call back after a period of concentrating on fetal movement [27].

Auscultation of Fetal Heart

Listening to the fetal heart rate is a routine component of antenatal fetal assessment. It provides an opportunity for examination and discussion with the wahine about her pēpi wellbeing. Many wāhine and their whānau expect the fetal heart rate to be assessed at each antenatal visit and can feel reassured when the fetal heart is heard. One off periods of listening to the fetal heart rate confirms that the pēpi is alive but otherwise has little clinical or predictive value for fetal health.

For information on Intermittent Auscultation see the NZ College of Midwives practice guidance at https://www.midwife.org.nz/wp-content/uploads/2020/10/Practice-guidance-I.A.pdf

Appendix 1: Ultrasound Fetal Biometry

Fetal biometry by ultrasound is the measurements that are used to indirectly assess the growth and well-being of the tōhua[38]. The commonly identified measurements are:

- crown rump length (CRL)
- bi parietal diameter (BPD)
- head circumference (HC),
- abdominal circumference (AC)
- femur length (FL)

Interpretation of growth scan results

- Review the results of the scan in a timely manner and interpret the measurements, taking into account your clinical assessment.

- You should consider there may be growth issues when;
  - There is a discrepancy between the head circumference and the abdominal circumference centiles
  - The measurements cross centiles (see details below)

- It is recommended that individual ultrasound measurements are plotted on a consistently used chart eg. the Australasian Society of Ultrasound in Medicine (ASUM) population chart and EFW charted on a growth chart eg. GROW©[20].

- Interpretation of growth scan measurements requires consideration of the margin of error (generally identified on the scan report) especially if measurements vary from one scan to the next[20].

According to NZMFM SGA Guideline (2014) sub optimal fetal growth is suspected when:

- AC ≤5th centile on population chart
- AC centile smaller than head by ≥30 centiles
- AC >5th centile but dropping by ≥30 centiles
- Change in AC of <5 mm over 14 days
- EFW <10th centile on customised chart
- EFW dropping by ≥30 centiles on customised chart.

The minimum interval between growth scans is 14 days.

Where suboptimal fetal growth is identified further scan investigations should include:

- Amniotic Fluid Volume (AFI)
- Doppler velocimetry of umbilical artery.

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