Fetal movements

Clinical significance

Aspect	Consideration
Clinical significance	• Maternal perception of her baby's normal pattern of movements: o Indicates a well baby o Promotes maternal-baby bonding[1] • Investigating perceived changes in fetal movements (FM) is important to reduce risk of stillbirth • Perceived changed or decreased fetal movements (DFM) o Sensitive non-specific indicator of fetal compromise[2] o Associated with impaired placental function[3] • Adverse pregnancy outcomes reported after altered (FM)[3,4]: o Threatened preterm labour; preterm birth[5] o Fetal growth restriction (FGR); small for gestational age (SGA)[6,7] o Stillbirth[8,9] and neonatal death; congenital abnormalities[5] o Feto-maternal haemorrhage[6] • Refer to QCG *Stillbirth care* guideline[10] • Published evidence reports mostly on decreased movement from 28 weeks gestation

Fetal movements

Aspect	Consideration
Description	• Maternal perception of a discrete kick, flutter, swish or roll[11] • Each woman's perception of her fetal movements (FM) is different[12] • Fetal movement pattern may vary between pregnancies and babies (in multiple pregnancy) • Physiological significance of fetal hiccups and association with fetal well-being is unknown[8]
Normal patterns of fetal movements	• Generally, first felt in primiparous women at 18–20 weeks and in multiparous women at 16–18 weeks gestation • Differentiate into a wide variety of movement types at similar points of prenatal development[13] • Maximal movements between 28 and 34 weeks gestation[14] o No reduction in third trimester but pattern of FM may change[5,11,15] • FM in healthy baby vary from 4–100 per hour[14] • Normal wake /sleep cycles[14] o Diurnal changes–peak activity in afternoon and evening from 20 weeks o Activity–sleep cycles occur day and night for 20–40 minute; rarely exceed 90 minutes in healthy fetus[11] • No definite conclusions about normal fetal movements in multiple pregnancies[16]
Factors affecting fetal movements	• Patterns change as fetus develops o Movements become more organised (increased motor co-ordination resulting in slower more powerful gross movements)[14] • External stimuli (e.g. acoustic stimuli[17] may increase, decrease or arrest fetal movement[14] • Movements may decrease because of[4,11,14]: o Fetal sleep cycle o Fetal growth restriction (FGR) secondary to uteroplacental insufficiency o Fetal compromise–increased risk of adverse pregnancy outcome if woman has risk factors for stillbirth and presents with decreased DFM[4] (e.g. BMI > 30 kg/m^2) o Reduced amniotic fluid or polyhydramnios (rare) o Maternal use of drugs, smoking, sedatives[11]
Factors affecting maternal perception of fetal movements	• It has been reported that women may recognise only 40% FM near term[14] • Maternal–anxiety/stress[18,19], mental distraction[20], exercise[21], medication use • Placenta position[22] • Fetal–anterior position of the fetal spine (presentation has no effect on maternal perception[11]); akinesia syndromes[5]

Assessing fetal movements

Aspect	Consideration
Assessing fetal movements	• Advise woman about normal FM early in pregnancy o Provide written information including a list of reputable websites to women[23] • Advise woman to get to know her baby's normal pattern of movements[12] • Discuss and ask about fetal movements at each antenatal visit o Focus on woman's perception about normality of her baby's activity • Regular measurement and recording of fetal movements may increase maternal anxiety[11] o No evidence to support the routine use of 'kick charts'[14,15]
Altered fetal movements	• Maternal concern about FM indicates investigations are required and over-rides any low risk pregnancy status or other factors[5] (e.g. busy maternity unit) • Changes in FM requiring further investigation and management—reduced, weaker, absent, very vigorous[3,8]
Published literature	• Most publications and research relate to DFM[5,6,11,17,20,24,25] • No universally agreed definition of DFM[11] • Awareness of less than 10 movements over two (2) hours reported as requiring review[26] • Currently no RCTs to inform management of DFM[11]
Clinical advice	• Advise woman to contact health care provider if any concerns[5,11,27,28] o Maternal perception of any alteration in FM are an important clinical sign o If reduced or no fetal movements after 28 weeks gestation seek urgent help ▪ Do not wait until the next day • If the woman unsure/uncertain about her FM advise presentation to hospital for assessment • Most women will have normal pregnancy outcome[11] • If no FM felt by 26 weeks gestation consider referral for obstetric ultrasound scan (USS) to assess growth and exclude fetal neuromuscular condition

Decreased or abnormal fetal movements

Aspect	Consideration
Clinical assessment	• Perform assessment of woman and fetus as soon as possible within two hours of presentation including: o Review current pregnancy, medical and previous obstetric history o Review any previous USS for fetal growth assessment as plotted on growth charts[5] o Consider woman's risk factors for fetal compromise or stillbirth ▪ If risk factors identified manage woman as having a high risk pregnancy[5] • Take baseline maternal observations including blood pressure (BP)[5] and urinalysis[29] • Perform abdominal examination: o Assess fetal size including symphysis-fundal height (SFH)[5] (low quality evidence for detecting abnormal fetal growth[30]); palpate for uterine activity or tenderness and fetal movements; and identify any vaginal loss or bleeding
Fetal heart rate (FHR) monitoring/ cardiotocograph (CTG):	• Consider bedside USS to check for FH rate and FM and to reassure woman at time of presentation • Confirm FHR by hand-held Doppler to confirm fetal status and establish baseline, then if: o 24–27+6 weeks gestation consider CTG monitoring according to local protocols ▪ May be difficult to interpret and not routinely recommended[5]; may reassure the woman o 28 weeks or more gestation: ▪ Commence CTG monitoring to identify evidence of abnormal fetal status[5] ▪ Monitor for a minimum of 20 minutes—if available use fetal movement recorder • If less than 32 weeks gestation interpret CTG pattern with caution • If CTG abnormal consider–further investigations, planning for birth dependent on gestation[29] • A normal CTG with other normal clinical parameters (USS, BP, SFH) in the woman with DFM reliably assures fetal wellbeing[29] • If absent FM and FHR confirmed–obstetric USS to confirm fetal death[10]
USS	• Refer for obstetric USS to confirm biometry and fetal wellbeing, Doppler studies and amniotic fluid volume measurement; and if not previously checked, fetal morphology [20] • Individualise timing of obstetric USS based on stillbirth risk factors, clinical assessment (including CTG), gestational age and recent USS findings o If fetal compromise suspected at clinical assessment urgent USS

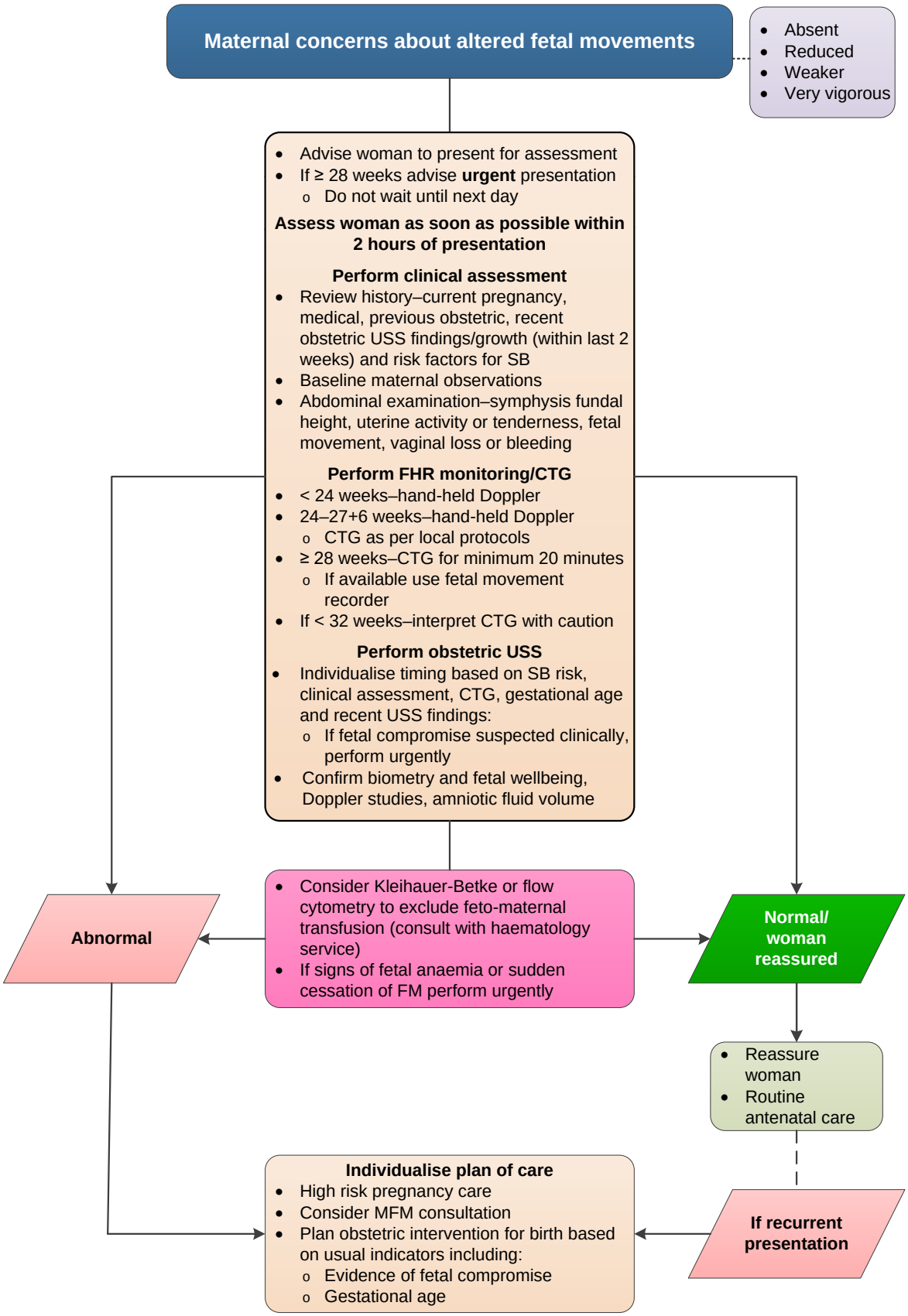
Fetal-maternal transfusion

Aspect	Consideration
Fetal-maternal transfusion assessment	• Consider testing for feto-maternal transfusion[5] by flow cytometry or Kleihauer-Betke test o Consult with haematology service at testing pathology laboratory for preferred test o Perform urgently if signs of fetal anaemia or if sudden cessation of FM • Feto-maternal transfusions o Cause fetal anaemia o Are typically silent events[31,32] o May not be suspected based on CTG[33] or USS unless severe anaemia has occurred o Massive feto-maternal transfusion has been reported in up to 4% stillbirths and 0.04% neonatal deaths[34,35] • Recurrent, small to moderate feto-maternal transfusion or chronic small volume over time may lead to fetal compromise and or fetal death[5] • Associated signs of fetal anaemia may include: o CTG–reduced or absent variability[5]; unexplained fetal tachycardia; sinusoidal FHR • USS–elevated middle cerebral artery Doppler peak systolic velocity (MCA PSV)[20]; ascities or fetal hydrops • If positive result check maternal blood group and consider RhD immunoglobulin in Rh negative woman

Ongoing management

Aspect	Consideration
Antenatal management and birth considerations	• If fetal death, manage as stillbirth[10] (refer to Queensland Clinical Guideline *Stillbirth care*[10]) • If clinical assessment and investigations normal continue usual antenatal care[5] and education • Results of the AFFIRM (awareness of fetal movements and focussing interventions to reduce fetal mortality study) demonstrated no change in stillbirth rates from 24 weeks (aOR 0.90, 95% CI 0.75 to 1.07; p = 0.22)[36], but increases in induction of labour (aOR 1.05; 95% CI 1.02 to 1.08, p = 0.012) and Caesarean section (aOR 1.09; 95% CI 1.06 to 1.12; p<0.001)[36] • If recurrent DFM individualise management and care plan for each woman including follow-up CTG and/or USS and discussion about obstetric intervention for birth o Consider flow cytometry or Kleihauer-Betke test[37] ▪ Consult with haematology service at testing pathology laboratory for preferred test • Recurrent presentation: o Presentation of woman on two or more occasions may increase the risk of poor perinatal outcome compared to women attending on only one occasion (OR 1.92; CI 1.21 to 3.02)[11,38] • Ongoing care based on local protocols and standard obstetric care o No published evidence to guide ongoing antenatal care • If fetal anaemia identified or suspected refer to MFM specialist for ongoing management • Plan obstetric intervention for birth based on usual indicators including evidence of fetal compromise (fetal distress on CTG, FGR, fetal anaemia on USS) and gestational age o Individualise care for each woman dependent on her clinical presentation o Consider ongoing fetal monitoring including CTG and obstetric USS if less than 37 weeks o Consider consultation with MFM specialist, if less than 37 weeks gestation o Refer to Queensland Clinical Guideline *Induction of labour*[39]

Flowchart: Altered fetal movements



Flowchart: F18.46-1-V2-R23

CTG: cardiotocograph; **FHR:** fetal heart rate; **FM:** fetal movements; **MFM:** maternal fetal medicine; **SB:** stillbirth; **USS:** ultrasound scan; **≥:** greater than or equal to; **<:** less than

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