# Fetal movements

**IMPORTANT:** Consider individual clinical circumstances. Consult a pharmacopeia for complete drug information. Read the full disclaimer at www.health.qld.gov.au/qcg

## Clinical significance

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| Clinical significance      | • Maternal perception of their baby’s normal pattern of movements\(^1\):
  - Reassures that a baby is well\(^2\)
  - Promotes maternal-baby bonding\(^3,4\)
  - Investigating perceived changes in fetal movements (FM) may be an opportunity to reduce risk of stillbirth\(^5,6\)
  - Perceived changed or decreased fetal movements (DFM)\(^7\):
    - Sensitive non-specific indicator of fetal compromise
    - Associated with impaired placental function\(^8\)
  - Adverse pregnancy outcomes reported after altered FM\(^8,11\):
    - Threatened preterm labour; preterm birth\(^12\)
    - Fetal growth restriction (FGR); small for gestational age (SGA)\(^13\)
    - Stillbirth\(^7\) and neonatal death; congenital abnormalities\(^12\), neonatal stroke
    - Feto-maternal haemorrhage
  - Published evidence reports mostly on decreased movement from 28 weeks gestation\(^14\)  |

## Fetal movements

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| Description                | • May include a perception of a discrete kick, flutter, swish or roll\(^14\)
  - Each woman’s perception of individual FMs is different\(^15,16\)
  - FM pattern may vary between pregnancies and babies (e.g. in multiple pregnancy)
  - Physiological significance of fetal hiccups and association with fetal well-being is unknown\(^17\)  |
| Normal patterns of fetal movements | • Generally, first felt in primiparous women at 18–20 weeks and in multiparous women at 16–18 weeks gestation\(^18\)
  - Differentiate into a wide variety of movement types at similar points of prenatal development\(^19\)
  - Maximal movements between 28 and 34 weeks gestation\(^20\)
    - No reduction in third trimester but pattern of FM may change\(^12,14,21\)
  - FM in healthy baby vary from 4–100 per hour\(^20\)
  - Normal wake/sleep cycles\(^20\)
    - Diurnal changes—peak activity in afternoon and evening from 20 weeks
    - Activity—sleep cycles occur day and night for 20–40 minute; rarely exceed 90 minutes in healthy fetus\(^14\)
  - No definite conclusions about normal fetal movements in multiple pregnancies  |
| Factors affecting fetal movements | • Patterns change as fetus develops
  - Movements become more organised (increased motor co-ordination resulting in slower more powerful gross movements)\(^22\)
  - External stimuli (e.g. acoustic stimuli\(^23\)) may increase, decrease or arrest fetal movement\(^20\)
  - Movements may decrease because of\(^9,14,20,21,23,24,25,26,27\):
    - Fetal sleep cycle
    - FGR secondary to uteroplacental insufficiency
    - Fetal compromise—increased risk of adverse pregnancy outcome if woman has risk factors for stillbirth and presents with decreased DFM\(^8\) (e.g. body mass index (BMI) > 30 kg/m\(^2\))
    - Reduced amniotic fluid or polyhydramnios (rare)
    - Maternal use of substances (e.g. smoking, sedatives)\(^14\)  |
| Factors affecting maternal perception of fetal movements | • It has been reported that women may recognise only 40% of FM near term\(^20\)
  - Maternal—anxiety/stress\(^23,24,25\), mental distraction\(^25\), exercise\(^26\), medication use
  - Placental position\(^27\)
  - Fetal—anteroposterior position of the fetal spine (presentation has no effect on maternal perception\(^14\); akinesia syndromes\(^15\))  |
Assessing fetal movements

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| Assessing fetal movements   | • Advise woman about ‘normal’ or ‘usual’ FM early in pregnancy\(^2^8\)  
  o Provide written information including a list of reputable websites to women\(^2^9\)  
• Advise woman to get to understand their baby’s normal pattern of movements\(^1^5,2^8\)  
• Discuss and ask about fetal movements at each antenatal visit  
  o Focus on woman’s perception about normality of the baby’s activity\(^^\)  
• Regular measurement and recording of fetal movements may increase maternal anxiety\(^1^4\)  
  o No evidence to support the routine use of ‘kick charts’\(^2^0,2^1,3^0\)  
  o Use of personal hand-held Doppler devices is not recommended |
| Altered fetal movements     | • Maternal concern about FM indicates clinical assessment is required and over-rides any low risk pregnancy status or other factors\(^1^2\) (e.g. busy maternity unit)  
• Women presenting with concerns about a change in FM requires further investigation and management—reduced, weaker, absent, very vigorous\(^^\) |
| Published literature        | • Most publications and research relate to women presenting with concerns about decreased fetal movements (DFM)\(^1^2,2^5,3^1-3^3\)  
• No universally agreed definition of DFM\(^1^4,3^4\)  
• Awareness of less than 10 movements over two (2) hours reported as requiring review\(^1^1,3^5,3^6\)  
• Currently no RCTs to inform management of DFM\(^1^4\) |
| Clinical advice             | • Advise woman to present for urgent assessment if any concerns between scheduled appointments\(^2,1^2,1^4,3^7\)  
  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  
• Most women will have normal pregnancy outcome\(^1^4\)  
• If no FM felt by 26 weeks gestation, consider referral for obstetric ultrasound scan (USS)\(^3^0\) to assess growth and exclude fetal neuromuscular condition\(^1^2,1^8\) |

Decreased or changed fetal movements

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| 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\(^1^2\)  
  o Consider woman’s risk factors for fetal compromise or stillbirth  
• If risk factors identified manage woman as having a high risk pregnancy\(^1^2\)  
• Take baseline maternal observations including blood pressure (BP)\(^1^2\) urinalysis and an  
  abdominal examination  
  o Assess fetal size including symphysis-fundal height (SFH)\(^1^2\) (low quality evidence for  
    detecting abnormal fetal growth\(^3^6\); palpate for uterine activity or tenderness and fetal  
    movements; and identify any vaginal loss or bleeding) |
| Fetal heart rate assessment | • Confirm FHR by handheld Doppler or cardiotocography (CTG) to confirm fetal status  
  o If absent FM, FHR, or fetal compromise suspected at clinical assessment urgent USS  
• Perform CTG to exclude fetal compromise and prompt medical review where findings are  
  abnormal  
• A normal CTG with other normal clinical parameters (USS, BP, SFH) in the woman with  
  DFM reliably assures fetal wellbeing\(^3^9\)  
• 24–27+6 weeks gestation consider CTG monitoring according to local protocols  
  o May be difficult to interpret and not routinely recommended\(^1^2\); may reassure the woman  
• 28 weeks or more gestation:  
  o Commence CTG monitoring\(^1^2\)  
  o Monitor for a minimum of 20 minutes—if available use fetal movement recorder  
• 32 weeks gestation or less interpret CTG with caution |
| USS                         | • Consider referral for obstetric USS to assess biometry and fetal wellbeing, doppler studies and  
  amniotic fluid volume measurement for undetected fetal growth restriction (FGR); and if  
  not previously checked fetal morphology\(^7,2^5\)  
  o Individualise timing of obstetric USS based on stillbirth risk factors, clinical assessment  
    (including CTG), gestational age, recent USS findings and service capability\(^1^1,1^2\)  
• A repeat growth scan is not indicated within two weeks of a normal USS |
## Feto-maternal transfusion

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| **Feto-maternal transfusion assessment** | - Consider testing for feto-maternal transfusion\(^{12}\) by flow cytometry or Kleihauer-Betke test
  - Perform urgently if signs of fetal anaemia or if sudden cessation of FM
  - Repeat testing as clinically indicated
- Feto-maternal transfusions
  - May cause fetal anaemia\(^{40}\)
  - Are typically silent events\(^{41}\)
  - May not be suspected based on CTG\(^{42}\) or USS unless severe anaemia has occurred
  - Massive feto-maternal transfusion has been reported in up to 4.1% stillbirths\(^{43}\) and 0.04% neonatal deaths\(^{44}\)
- Recurrent, small to moderate feto-maternal transfusion, or chronic small volume over time may lead to fetal compromise and or fetal death\(^{12}\)
- Associated signs of fetal anaemia may include:
  - CTG—reduced or absent variability\(^{12}\); unexplained fetal tachycardia; sinusoidal FHR
  - USS—elevated middle cerebral artery Doppler peak systolic velocity (MCA PSV)\(^{25}\); ascities or fetal hydrops
- If positive maternal blood results:
  - Check maternal blood group and consider Rh D immunoglobulin in Rh negative woman
  - Refer to Queensland Clinical Guideline *Rh D negative women and pregnancy*\(^{45}\)
  - Consider advice from a healthcare specialist (e.g. obstetrician, MFM), as required

## Ongoing management

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| **Antenatal management and ongoing care** | - If CTG and clinical investigation normal; no risk factors for stillbirth identified; it is the first presentation for DFM and there are no maternal concerns of DFM no further investigations required\(^{12}\)
  - Plan clinical follow up within one week to ensure no further investigations required
  - Provide reassurance, education and continue usual antenatal care\(^{12}\)
- If recurrent DFM or risk factors for stillbirth, individualise management and care plan for each woman including follow-up CTG and/or USS, and discussion about obstetric intervention for birth
  - Consider repeat flow cytometry or Kleihauer-Betke test\(^{12}\)
- Women with recurrent presentation for DFM may be at increased risk of poorer perinatal outcomes\(^{12,14}\)
  - Consider close surveillance for women with ongoing concerns of DFM
- If fetal anaemia identified or suspected refer to materno-fetal medicine (MFM) specialist for ongoing management

| **Fetal movement awareness**\(^{6,7,46,47}\) | - There is a strong relationship between fetal movement changes and pregnancy outcomes, including stillbirth\(^{7,48}\)
- Raising awareness of fetal movements may have beneficial impacts on outcomes\(^{7,48}\)
- The most beneficial way to communicate and raise awareness about FM amongst pregnant women and clinicians is unclear\(^{49}\)
- Various studies with demonstrated positive outcomes for the woman, and baby, have included the following approach for raising awareness:
  - Mobile phone applications\(^{7}\)
  - Leaflet distribution at antenatal appointments\(^{46}\)
  - Side lying for 15 minutes each day, when the fetus is awake, and monitoring the character, strength and frequency of the movements\(^{46}\)
  - Clinician education\(^{48}\)
  - Social media (news and popular women’s websites)\(^{47}\)

| **Birth planning and considerations** | - Informed decision making on the benefits and risks of planned birth, when clinically indicated, with emphasis on delaying birth until greater than 39+0 weeks (where possible)\(^{12}\)
- 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
  - Individualise care with each woman dependent on clinical presentation
  - Consider ongoing fetal monitoring (e.g. CTG and obstetric USS if less than 37+0 weeks)
  - Consider consultation with a MFM specialist, if less than 37+0 weeks gestation
- If induction of labour is indicated refer to Queensland Clinical Guideline *Induction of labour*\(^{51}\)
- If fetal death—refer to Queensland Clinical Guideline *Stillbirth care*\(^{50}\)
Maternal concerns about altered fetal movements

- Advise woman to present for assessment
- If ≥ 28 weeks advise urgent presentation
  - Do not wait until next day

Assess woman as soon as possible within 2 hours of presentation

Perform clinical assessment
- Review history–current pregnancy, medical, previous obstetric, recent obstetric USS findings/growth (within last 2 weeks) and risk factors for SB
- Baseline maternal observations
- Abdominal examination–symphysis fundal height, uterine activity or tenderness, fetal movement, vaginal loss or bleeding

Perform FHR monitoring/CTG
- < 24 weeks–hand-held Doppler
- 24–27+6 weeks–hand-held Doppler
  - CTG as per local protocols
- ≥ 28 weeks–CTG for minimum 20 minutes
  - If available use fetal movement recorder
- If < 32 weeks–interpret CTG with caution

Consider obstetric USS
- Individualise timing based on SB risk, clinical assessment, CTG, gestational age and recent USS findings:
  - If fetal compromise suspected clinically, perform urgently
- Confirm biometry and fetal wellbeing, Doppler studies, amniotic fluid volume

Abnormal
- Consider Kleihauer-Betke or flow cytometry to exclude feto-maternal transfusion
- If signs of fetal anaemia or sudden cessation of FM perform urgently

Individualise plan of care
- High risk pregnancy care
- Consider MFM consultation
- Plan obstetric intervention for birth based on usual indicators including:
  - Evidence of fetal compromise
  - Gestational age

Normal/ woman reassured
- Reassure woman
- Routine antenatal care

If recurrent presentation

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
References


