# Fetal movements

## Clinical significance

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| Clinical significance | • Maternal perception of her baby’s normal pattern of movements:  
  o Indicates a well baby  
  o Promotes maternal-baby bonding<sup>1</sup>  
  • 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<sup>2</sup>  
  o Associated with impaired placental function<sup>3</sup>  
  • Adverse pregnancy outcomes reported after altered (FM)<sup>3,4</sup>:  
  o Threatened preterm labour; preterm birth<sup>5</sup>  
  o Fetal growth restriction (FGR); small for gestational age (SGA)<sup>6,7</sup>  
  o Stillbirth<sup>6,9</sup> and neonatal death; congenital abnormalities<sup>5</sup>  
  • Feto-maternal haemorrhage<sup>6</sup>  
  • Refer to QCG Stillbirth care guideline<sup>10</sup>  
  • Published evidence reports mostly on decreased movement from 28 weeks gestation |

## Fetal movements

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| Description | • Maternal perception of a discrete kick, flutter, swish or roll<sup>11</sup>  
  • Each woman’s perception of her fetal movements (FM) is different<sup>12</sup>  
  • 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<sup>8</sup> |
| 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<sup>13</sup>  
  • Maximal movements between 28 and 34 weeks gestation<sup>14</sup>  
  o No reduction in third trimester but pattern of FM may change<sup>5,11,15</sup>  
  • FM in healthy baby vary from 4–100 per hour<sup>14</sup>  
  • Normal wake /sleep cycles<sup>14</sup>  
  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<sup>11</sup>  
  • No definite conclusions about normal fetal movements in multiple pregnancies<sup>16</sup> |
| 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)<sup>14</sup>  
  • External stimuli (e.g. acoustic stimuli<sup>17</sup> may increase, decrease or arrest fetal movement<sup>14</sup>  
  • Movements may decrease because of<sup>5,11,14</sup>:  
  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<sup>2</sup> (e.g. BMI > 30 kg/m<sup>2</sup>)  
  o Reduced amniotic fluid or polyhydramnios (rare)  
  o Maternal use of drugs, smoking, sedatives<sup>11</sup> |
| Factors affecting maternal perception of fetal movements | • It has been reported that women may recognise only 40% FM near term<sup>14</sup>  
  • Maternal–anxiety/stress<sup>18,19</sup>, mental distraction<sup>20</sup>, exercise<sup>21</sup>, medication use  
  • Placenta position<sup>22</sup>  
  • Fetal–anterior position of the fetal spine (presentation has no effect on maternal perception<sup>11</sup>); akinesia syndromes<sup>5</sup> |
**Assessing fetal movements**

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| **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**

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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\(^{5}\)  
  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\(^{4}\); 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

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| **Fetal-maternal transfusion assessment** | • Consider testing for feto-maternal transfusion 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  
  o May not be suspected based on CTG 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  
• Recurrent, small to moderate feto-maternal transfusion or chronic small volume over time may lead to fetal compromise and or fetal death  
• Associated signs of fetal anaemia may include:  
  o CTG–reduced or absent variability; unexplained fetal tachycardia; sinusoidal FHR  
  o USS–elevated middle cerebral artery Doppler peak systolic velocity (MCA PSV); ascites or fetal hydrops  
  o If positive result check maternal blood group and consider RhD immunoglobulin in Rh negative woman |

## Ongoing management

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| **Antenatal management and birth considerations** | • If fetal death, manage as stillbirth (refer to Queensland Clinical Guideline Stillbirth care)  
  • If clinical assessment and investigations normal continue usual antenatal care 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), 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)  
• 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 Consult with haematology service at testing pathology laboratory for preferred test  
  ▪ 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)  
  • 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 |

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

Perform 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 (consult with haematology service)
- If signs of fetal anaemia or sudden cessation of FM perform urgently

Normal/woman reassured

- Reassure woman
- Routine antenatal care

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

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


28. Malm M-C, Lindgren H, Rădestad I. Losing contact with one’s unborn baby—mother’s experiences prior to receiving news that thier baby has died in utero. Omega 2012;18:11-3.


