Fetal movements

Clinical significance

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

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<tr>
<td>Maternal perception of a discrete kick, flutter, swish or roll&lt;sup&gt;11&lt;/sup&gt;</td>
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<tr>
<td>Each woman’s perception of her fetal movements (FM) is different&lt;sup&gt;12&lt;/sup&gt;</td>
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<td>Fetal movement pattern may vary between pregnancies and babies (in multiple pregnancy)</td>
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<tr>
<td>Physiological significance of fetal hiccups and association with fetal well-being is unknown&lt;sup&gt;8&lt;/sup&gt;</td>
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<td>Generally, first felt in primiparous women at 18–20 weeks and in multiparous women at 16–18 weeks gestation</td>
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<td>Differentiate into a wide variety of movement types at similar points of prenatal development&lt;sup&gt;13&lt;/sup&gt;</td>
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<td>Maximal movements between 28 and 34 weeks gestation&lt;sup&gt;14&lt;/sup&gt;:</td>
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<tr>
<td>- No reduction in third trimester but pattern of FM may change&lt;sup&gt;5,11,15&lt;/sup&gt;</td>
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<td>FM in healthy baby vary from 4–100 per hour&lt;sup&gt;14&lt;/sup&gt;</td>
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<td>Normal wake/sleep cycles&lt;sup&gt;14&lt;/sup&gt;:</td>
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<tr>
<td>- Diurnal changes–peak activity in afternoon and evening from 20 weeks</td>
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<tr>
<td>- Activity–sleep cycles occur day and night for 20–40 minute; rarely exceed 90 minutes in healthy fetus&lt;sup&gt;11&lt;/sup&gt;</td>
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<tr>
<td>No definite conclusions about normal fetal movements in multiple pregnancies&lt;sup&gt;16&lt;/sup&gt;</td>
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<td>Patterns change as fetus develops</td>
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<td>- Movements become more organised (increased motor co-ordination resulting in slower more powerful gross movements)&lt;sup&gt;14&lt;/sup&gt;</td>
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<td>External stimuli (e.g. acoustic stimuli&lt;sup&gt;17&lt;/sup&gt;) may increase, decrease or arrest fetal movement&lt;sup&gt;14&lt;/sup&gt;</td>
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<tr>
<td>Movements may decrease because of&lt;sup&gt;4,11,14&lt;/sup&gt;:</td>
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<tr>
<td>- Fetal sleep cycle</td>
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<td>- Fetal growth restriction (FGR) secondary to uteroplacental insufficiency</td>
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<td>- Fetal compromise–increased risk of adverse pregnancy outcome if woman has risk factors for stillbirth and presents with decreased DFM&lt;sup&gt;4&lt;/sup&gt; (e.g. BMI &gt; 30 kg/m&lt;sup&gt;2&lt;/sup&gt;)</td>
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<td>- Reduced amniotic fluid or polyhydramnios (rare)</td>
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<td>- Maternal use of drugs, smoking, sedatives&lt;sup&gt;11&lt;/sup&gt;</td>
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<td>It has been reported that women may recognise only 40% FM near term&lt;sup&gt;14&lt;/sup&gt;</td>
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<td>Maternal–anxiety/stress&lt;sup&gt;18,19&lt;/sup&gt;, mental distraction&lt;sup&gt;20&lt;/sup&gt;, exercise&lt;sup&gt;21&lt;/sup&gt;, medication use</td>
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<td>Placenta position&lt;sup&gt;22&lt;/sup&gt;</td>
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<td>Fetal–anterior position of the fetal spine (presentation has no effect on maternal perception&lt;sup&gt;11&lt;/sup&gt;); akinesia syndromes&lt;sup&gt;5&lt;/sup&gt;</td>
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### 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  
  β 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  
  β 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  
  β May be difficult to interpret and not routinely recommended\(^{5}\); may reassure the woman  
  o 28 weeks or more gestation:  
  β Commence CTG monitoring to identify evidence of abnormal fetal status\(^{5}\)  
  β 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\(^5\) by flow cytometry or Kleihauer-Betke 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  
  o 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

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| 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\(^{97}\)  
• 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\(^39\) |
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 detector
  - 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 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

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

Flowchart: Altered fetal movements

Flowchart: F18.46-1-V1-R23

Queensland Clinical Guidelines

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References


