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RCOG GUIDELINES

Reduced Fetal Movements Green-Top Guideline No. 57

Melissa Whitworth | Margaret Fisher | Alexander Heazell | on behalf of the Royal College of Obstetricians and Gynaecologists

Correspondence: Royal College of Obstetricians and Gynaecologists (clinicaleffectiveness@rcog.org.uk)

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KEY RECOMMENDATIONS

- Advise women to report any decrease or cessation of fetal movements to their maternity provider. [Grade B]
- There is insufficient evidence to recommend formal fetal movement counting using specified numbers. [Grade A]
- All clinicians should be aware of the association of reduced fetal movements (RFM) with fetal growth restriction (FGR), a small-for-gestational-age (SGA) fetus, placental insufficiency and congenital anomalies. [Grade C]
- When a woman presents with RFM in the community or hospital setting an attempt should be made to auscultate the fetal heart using a handheld Doppler device to exclude fetal death. [Grade C]
- Clinical assessment of a woman with RFM should include assessment of fetal size by measuring symphysis-fundal height (if not having serial growth scans), blood pressure and urinalysis. [Grade C]
- In women with RFM, after fetal viability has been confirmed, arrangements should be made for a woman to have a computerised cardiotocograph (CTG) to exclude acute fetal compromise if the pregnancy is 26^{+0} weeks of gestation or later (see Section 14 for recommendations prior to this gestation). [Grade B]
- Ultrasound scan (USS) assessment should be undertaken as a part of the preliminary investigations of a woman presenting with RFM after 28^{+0} weeks of gestation if the perception of RFM persists despite a normal CTG, if there are any additional risk factors for FGR and/or stillbirth and if an USS has not been performed in the preceding two weeks. [Grade B]
- If anomalies are present on antenatal CTG, intervention should be discussed with a senior obstetrician and decisions about birth should consider gestation and the degree of anomaly. [Good Practice Point (GPP)]
- If the fetus is found to be SGA and/or there are anomalies of umbilical artery Doppler or liquor volume, care should be in accordance with RCOG Green-Top guideline No 31 *Investigation and care of a Small for Gestational Age Fetus and a Growth Restricted Fetus*. [GPP]
- If women who have normal investigations after one presentation with RFM have another episode of RFM, they should be advised to contact their maternity unit for further assessment as indicated in Section 8 of this guideline. [Grade B]
- Where there is no objective evidence of fetal compromise (no CTG anomalies, no evidence of reduced fetal growth, oligohydramnios or umbilical artery Doppler anomalies) women should be reassured there is no indication for expediting birth. [Grade A]
- A decision to expedite birth should be made on an individual basis in partnership with the woman. If women present with RFM after 39^{+0} weeks of gestation, expediting birth does not appear to be associated with increased risk to the woman or baby. [Grade A]
- When a woman recurrently perceives RFM her case should be reviewed to exclude predisposing causes. [Grade C]
- When a woman presents with RFM in a multiple pregnancy, investigations to identify developing fetal compromise should be undertaken including CTG, assessment of fetal growth, liquor volume and umbilical artery Doppler. [Grade C]

This is the second edition of this guideline. The first edition was previously published in 2011 under the same title.

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- If a woman presents with RFM between 24^{+0} weeks of gestation and 28^{+0} weeks of gestation the presence of a fetal heartbeat should be confirmed by auscultation with a Doppler handheld device and a history taken to determine other risk factors for stillbirth or early onset FGR. [GPP]
- If a woman presents with RFM prior to 24^{+0} weeks of gestation, the presence of a fetal heartbeat should be confirmed by auscultation with a Doppler handheld device. [GPP]

1 | Purpose and Scope

The purpose of this guideline is to advise clinicians, based on the best evidence where available, on the care of women presenting with reduced fetal movements (RFM) during pregnancy. This guideline reviews the risk factors for RFM in pregnancy and aspects influencing maternal perception. Recommendations are provided on how to care for women presenting in both the community and hospital settings. Many of the recommendations are graded lower owing to the available evidence, but the aim has been to provide a broad practical guide for both midwives and obstetricians in clinical practice, with the understanding that in individual women alternative approaches may be reasonable.

This guideline is for healthcare professionals who care for women, non-binary and trans people who present with RFM. Within this document we use the terms woman and women's health. However, it is important to acknowledge that it is not only women for whom it is necessary to access women's health and reproductive services in order to maintain their gynaecological health and reproductive wellbeing. Gynaecological and obstetric services and delivery of care must therefore be appropriate, inclusive and sensitive to the needs of those individuals whose gender identity does not align with the sex they were assigned at birth.

1.1 | Population and Setting

Pregnant women in community or hospital settings reporting RFM.

1.2 | Interventions to Be Studied

Comparison of modalities to detect and care for women who report RFM.

2 | Background

Maternal perception of fetal movements is regarded as a sign of fetal wellbeing [1, 2]. This perceived fetal activity/movement begins between 16 and 24 weeks of gestation and usually acquires a regular pattern by 28–32 weeks of gestation [3]. It has been suggested that reduced or absent fetal movements may be a warning of impending fetal death via placental dysfunction [3]. Studies of placental structure and function have consistently demonstrated an association between RFM and placental pathology [4–6]. A significant reduction or sudden reduction in fetal movement is a potentially important clinical sign identified by multiple observational studies [7–9] and was highlighted by the 2015 and 2017 Confidential Enquiries into Non-Anomalous Term Stillbirths, Intrapartum-related perinatal deaths and Perinatal Deaths in Multiple pregnancies [10, 11]. Some studies have also identified a period of extremely vigorous activity preceding stillbirth [9, 12–14]. The stillbirth rate in 2022 was 3.35 per 1000 live births, using the Codac classification [15]. Of these, 33.9% were unexplained and 36.3% were related to placental causes. Importantly, observational studies conducted where protocols were in place for managing RFM have shown there was no reported increase in stillbirths in women with RFM [16, 17]. Other studies have reported higher incidence of small-for-gestational-age (SGA) births and other adverse outcomes compared with women experiencing normal movements [16, 17]. A more recent systematic review of 39 studies concluded women with RFM had increased odds of stillbirth (OR 3.44, 95% CI 2.02–5.88) and an SGA infant (OR 1.37, 95% CI 1.16–1.61) [18].

3 | Identification and Assessment of Evidence

The Cochrane Library and electronic databases (MEDLINE, EMBASE, Trip and PubMed) were searched using the relevant Medical Subject Headings (MeSH) terms, including all subheadings, and this was combined with a keyword search. Search terms included 'fetal activity', 'fetal movement + detection', 'reduced fetal movement', 'fetal cardiotocography', 'fetal heart auscultation', 'umbilical artery Doppler'; the search was limited to humans and the English language. The National Guideline Clearinghouse, NICE Evidence Search, Trip and Guidelines International Network were also searched for relevant guidelines. The search was restricted to articles published between 2008 and April 2017; an additional search was completed in August 2023. Papers identified by peer reviewers and the developers that fall outside the literature searches, which may be more recent, have also been included. The full search strategy is available in Appendices S1 and S2.

This guideline was developed using the methodology described in the Royal College of Obstetricians and Gynaecologists (RCOG) handbook *Developing a Green-top Guideline: Guidance for developers*. Where possible, recommendations are based on available evidence. Areas lacking evidence are highlighted and annotated as 'good practice points' (GPP). Further information about the assessment of evidence and the grading of recommendations can be found in Appendix A.

3.1 | Limitations of Data Used in This Guideline

Interpreting studies of women perceiving RFM is complicated by multiple definitions of normal and abnormal fetal

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movements (see Section 5 for more detail), and few conducted large scale (more than 1000 participants) descriptive or intervention studies. There have been few randomised controlled trials (RCTs) addressing the management of RFM, and those that have been published involved different comparisons making meta-analysis difficult [19]. In addition, the main outcome of interest (i.e., stillbirth) is relatively uncommon, and adequately powered studies of different management protocols would require large numbers of participants (a 10% reduction in stillbirth from 4.0 per 1000 births to 3.6 per 1000 births would require more than 370 000 participants in each group). Consequently, many studies have been underpowered and have had limitations in terms of defining RFM and outcomes, ascertainment bias and selection bias.

4 | What are Considered To Be Normal Fetal Movements During Pregnancy?

Recommendation	Evidence quality	Strength	Rationale for the recommendation
Advise women they are likely to feel fetal movements from 20 weeks of gestation.	2–	C	Observational studies describe onset of fetal movements for most women by 20 weeks of gestation.
Advise women that fetal movements are likely to plateau after 32 weeks of gestation but do not normally reduce in the third trimester.	2–	B	Although the nature of fetal movements changes in late pregnancy, there is no reduction of frequency or strength of fetal movements in the third trimester.
Advise women that the presence of regular fetal movements during pregnancy is an indicator of fetal wellbeing.	2++	B	Presence of regular fetal movements is associated with significantly reduced odds of stillbirth.

Perceived fetal movements are defined as the maternal sensation of any discrete kick, flutter, swish or roll [3]; such activity provides an indication of the integrity of the fetal central nervous and musculoskeletal systems. A healthy fetus is active, capable of physical movement and goes through periods of both rest and sleep. The majority of women perceive fetal movements and intuitively view their experience of fetal activity as normal.

Most pregnant women become aware of fetal activity from 18 to 20 weeks of gestation although some multiparous women may perceive fetal movements as early as 16 weeks of gestation and some primiparous women may perceive movement much later than 20 weeks of gestation [1]. The number of spontaneous movements tends to increase until 32 weeks of gestation [20–22]. After this gestation the majority of women (90%) experience either an increase or no change in the frequency and strength of fetal movements until the onset of labour [23]. *[Evidence level 2++]*

However, the nature of fetal movement may change as pregnancy advances in the third trimester [20–22, 24–25]; kicks tend to be replaced by rolling, stretching and pushing movements [26–28]. *[Evidence level 2–]*

Importantly, the frequency of fetal movements does not decrease at term, but the complexity, type and nature varies [26, 28–30]. *[Evidence level 2–]*

By term, the average number of generalised movements per hour is 31 (range 16–45) with the longest interval between movements ranging from 50 to 75 min [31]. Changes in the number and nature of fetal movements as the fetus matures are considered to be a reflection of the normal neurological development of the fetus. From as early as 20 weeks of gestation, fetal movements show diurnal changes. The afternoon and evening periods are periods of peak activity [31–33]. Fetal movements are usually absent during fetal 'sleep' cycles which occur regularly throughout the day and night and usually last 20–40 min [34, 35], and rarely exceed 90 min in a healthy fetus [34, 36–37]. *[Evidence level 2–]*

Because of a paucity of robust epidemiological studies on fetal activity patterns and maternal perception of fetal activity in normal pregnancies, there is currently no universally agreed definition of normal or RFM. However, a meta-analysis of case–control studies demonstrated that perception of increasing strength or frequency of fetal movements was associated with a significant reduction in stillbirth (aOR 0.18, 95% CI 0.14–0.23) [23]. In addition, fetal hiccups were also associated with a reduction in stillbirth (aOR 0.42, 95% CI 0.34–0.53). *[Evidence level 2++]*

5 | Advice for Women About Their Perception of Fetal Movements

Recommendation	Evidence quality	Strength	Rationale for the recommendation
Advise women to be aware of fetal movements up to and including the onset of labour.	2–	C	Although nature of movement changes there should be no reduction of fetal movements in the third trimester of pregnancy.
Advise women to report any decrease or cessation of fetal movements to their maternity unit.	2++	B	Meta-analysis of observational studies linked these patterns of fetal activity with increased risk of stillbirth.
Advise women to report any decrease or cessation of fetal movements, especially if following an episode of sudden excessive, vigorous fetal movements.	2++	B	Meta-analysis of observational studies linked these patterns of fetal activity with increased risk of stillbirth.

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Recommendation	Evidence quality	Strength	Rationale for the recommendation
Do not attribute RFM to a raised body-mass index (BMI).	2++	B	Increased BMI is not associated with altered perception of fetal movements. Women with increased BMI have an increased risk of stillbirth.
Do not attribute RFM to an anterior placenta if a change in movement occurs.	2–	C	Women with anterior placenta perceive fewer movements, but this should not cause a sudden change.

It is well established that women do not perceive all fetal movements. Studies of the correlation between maternal perception of fetal movements and fetal movements concurrently detected on ultrasound scan (USS) show a wide variation, ranging from 37% to 88%, with large body movements and those lasting more than 7 s most likely to be felt [38–45]. *[Evidence level 2– to 2+]*

Women's perception of fetal activity is influenced by a wide variety of factors (see Table 1). There is some evidence that women perceive most fetal movements when lying down (except when supine), fewer when sitting, and least while standing, and activity appears to be greatest in the evening [24, 33, 46]. *[Evidence level 2+]*

Maternal activity can alter maternal perception of fetal movements. Reported RFM in singleton pregnancies with good outcomes were increased in women who were not taking daily exercise and women who were in employment. Regular mild to moderate exercise appeared to increase maternal perception of fetal movements. Whether this was because of the effects of exercise itself is not known [46]. When attention was paid to fetal activity in a quiet room and careful recordings were made, fetal movements not previously perceived were often recognised clearly [19, 20]. The difference in mean time to perceive 10 movements varied between 10 min for focussed counting to 162 min with unfocussed perception of fetal movements [27, 30, 36, 47]. *[Evidence level 2– to 2+]*

Prior to 28^{+0} weeks of gestation, an anterior placenta may decrease a woman's perception of fetal movements [30, 48–49]. After 28 weeks, one study [50] reported no reduction in women's perception of movements, but another found more women with anterior placenta presented with RFM [51]. *[Evidence level 2–]*

Drugs that cross the placenta such as alcohol, benzodiazepines, methadone, and other opioids can have a transient effect on fetal movements [52, 53]. *[Evidence level 3]*

Caffeine has been reported to alter fetal activity; two studies reported that coffee consumption was a significant predictor of less movement of fetal limbs [54]. Conversely, another study of women consuming 500 mg or more of caffeine per day found that the fetuses spent increased time in an active (arousal) state [55]. *[Evidence level 2–]*

Another prospective study detected increased multiple limb movements in fetuses whose mothers were anxious in the second trimester [54]. *[Evidence level 2+]* Women reported being more aware of fetal behaviour during pregnancies subsequent to a stillbirth, and of being particularly vigilant in monitoring fetal movements as tangible evidence of wellbeing in these pregnancies [56]. *[Evidence level 2+]*

Several observational studies have demonstrated an increase in fetal movements following an elevation of glucose concentration in maternal blood, although other studies refute these findings [57, 58]. Qualitative interviews with low-risk women have suggested that maternal meals may influence the pattern of fetal activity, with 73.6% saying that movements increased at mealtimes, with fewer fetal movements following a meal, suggesting satiation and contentment being the dominant pattern, although 36.8% described greater activity when mothers were hungry or during the period prior to meals [27]. *[Evidence level 2+]*

From 30 weeks of gestation onwards, the level of carbon monoxide in maternal blood influences fetal respiratory movements, and some studies report that cigarette smoking is associated with a decrease in fetal activity [28, 53, 59–61]. *[Evidence level 2–]*

The administration of corticosteroids to enhance fetal lung maturation has been reported to decrease fetal movements and fetal heart rate (FHR) variability detected by CTG over the 2 days following administration [59, 60, 62]. However, the pathophysiology of corticosteroid changes in fetal movements and FHR variability is still unclear and has not been definitely proven [59–62]. *[Evidence level 2–]*

Fetuses with major anomalies are generally more likely to demonstrate reduced fetal activity [61]. Though normal or excessive fetal activity has been reported in anencephalic fetuses [63, 64]. A lack of vigorous motion may relate to central nervous system or skeletal anomalies, or muscular dysfunction [65].

Fetal presentation has previously been found to have no effect on perception of movement [66]. A subsequent observational study [67] determined that, although no differences in spontaneous behaviour were noted between fetuses presenting as breech or cephalic, some differences in responses were identified in the presence of either vibroacoustic stimulus or airborne sound, which may be attributed to conduction through maternal tissues and amniotic fluid to the fetal skull. *[Evidence level 2– to 2+]*

Fetal position might influence maternal perception, as in cases where women were unable to perceive fetal movements despite being able to visualise them when an USS was performed, 80% were shown to have the fetal spines lying anteriorly [49]. Observational studies [45] have also reported women to perceive a higher proportion of movements where there is contact with the uterus rather than the placenta. *[Evidence level 2–]*

A systematic review and meta-analysis of 10 observational studies found that increased maternal BMI was not associated with altered perception of fetal movements, but that this group of women were more likely to present with RFM [68]. *[Evidence level 1–]*

However, some studies identified more frequent presentation of perceived RFM in overweight (BMI above 25 kg/m^2) or obese

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TABLE 1 | Factors that can alter maternal perception of fetal activity.

Factors that increase perception of fetal movements	Factors that decrease perception of fetal movements	Factors that have an unclear effect on perception of fetal movements
Focussed attention on fetal movement	Anterior placenta	Caffeine
Maternal exercise	Drugs (alcohol, benzodiazepines, methadone)	Glucose
Maternal anxiety	Fetal musculoskeletal or neurological anomalies	Corticosteroids
Mealtimes	Distraction	Raised body-mass index

(above 30 kg/m^2) women, and a significant increase in counting time throughout pregnancy before ten movements were felt [30, 69–70]. *[Evidence level 2–]*

Importantly, a cohort study of women who had experienced stillbirth identified that 8% had misinterpreted uterine contractions as fetal movement; this was particularly evident at 28–36 weeks of gestation [14]. *[Evidence level 2+]* This was also identified in women not experiencing RFM [71]. *[Evidence level 2–]*

A cohort study of 244 women [14] investigated whether experiences of fetal movements were different for women experiencing stillbirth of term singleton pregnancies (later than 37 weeks) compared with stillbirths between 28 and 36 weeks of pregnancy. Decreased or weak movements were identified by more women in the term stillbirth category. In 18% of the cohort, there was no indication of a changed pattern of movement, but 23% identified a cessation in activity. Most of the women experienced decreased, weaker or no fetal movements 2 days before diagnosis of fetal demise; with some stating that they had interpreted the warning signs as normal as they had heard that movements decreased in late pregnancy. Reasons cited for delay in presentation included false reassurance from family members or friends, fear of intervention or not being taken seriously by healthcare staff [49, 72]. *[Evidence level 2–]*

A period of extremely vigorous activity followed by limited or cessation of movements was also reported by 10% of the participants. Women described this as repeated kicks or twitching, with a sensation of the fetus trying to escape [9, 13, 73]. *[Evidence level 2+]*

6 | How Can Fetal Movements Be Assessed?

Recommendation	Evidence quality	Strength	Rationale for the recommendation
Fetal movements can only be assessed over time by maternal perception, which is subjective, unless undergoing repeated ultrasounds.	3	D	Not all fetal movements are perceived during pregnancy, but there are currently no objective means for a woman to reliably assess fetal activity.

Fetal movements are most commonly assessed by maternal perception alone. The subjective nature of maternal perception and variation in normal perception of fetal movement make interpretation of maternal perception of RFM and associated clinical significance more challenging.

Studies of objective assessments of fetal movements utilise ultrasound techniques to detect fetal movement. These studies report slightly increased sensitivity for fetal movements recorded by ultrasound, with 31.4%–57.2% of all movements recorded compared with 30.8% for maternal perceived fetal movements [45, 50, 74–75]. However, the duration of recording is restricted to 20–30 min with the mother in a semi-recumbent position. Newer devices have employed accelerometers, actography or fetal vector cardiography to detect fetal movements (see Appendix B for descriptions). These devices are largely in early phase studies [76]. One device was found to reliably measure fetal movements, detecting 82% of maternally sensed fetal movements, with an overall accuracy of 90% including non-fetal movement events [77]. Another study reported objectively measured fetal movements are associated both with fetal size in relation to gestation and umbilical Doppler parameters [78]. There are no studies evaluating longer periods of fetal movement counting by objective methods or whether extended monitoring can detect fetuses at risk of stillbirth [76]. Given the potential detection of false positive signals from maternal abdominal wall movements such as coughing, such devices may not be a useful means to objectively measure fetal movements in all pregnant women [79]. *[Evidence level 2–]*

7 | Should Fetal Movements Be Counted Routinely in a Formal Manner?

Recommendation	Evidence quality	Strength	Rationale for the recommendation
There is insufficient evidence to recommend formal fetal movement counting using specified numbers.	2– to 1+	A	There is insufficient evidence from randomised and non-randomised studies to demonstrate that formal fetal movement counting has a favourable effect on perinatal mortality.

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Recommendation	Evidence quality	Strength	Rationale for the recommendation
Women should be advised to be aware of their baby's individual pattern of movements.	3	C	There is significant variation between perceived fetal movements in individual women and other pregnancies in the same women.
If women experience reduced fetal movements, they should be seen by their maternity service.	2– to 1–	C	Meta-analysis of observational studies identifies reduced fetal movements with increased risk of adverse neonatal outcomes.
The majority of evidence indicates asking women to monitor fetal movements is not associated with increased maternal anxiety and increases maternal–fetal attachment.	1–	B	Data from meta-analysis of RCTs suggest there is no significant increase in maternal anxiety and maternal–fetal attachment is increased in women who undertake formal fetal movement counting.

Formal fetal movement counting relies on a woman counting fetal movements, and if she perceives fewer movements than a specified number (alarm limit) contacting her care provider. There are several problems with this strategy. Firstly, there is a wide range of 'normal' fetal movements, leading to a wide variability between mothers. Secondly, the most frequently used definition of an alarm limit was developed in women at high risk who counted fetal movements during hospital admission; therefore these observations may not be applicable to a general population [80]. Ideally, any trigger for concern would be developed using the whole obstetric population and then be proven to reduce stillbirth rates in a prospective study.

There have been seven quantitative studies evaluating maternal fetal movement assessment (see Table 2). Grant et al. published a multicentre study randomising women ($n = 68\,654$) to counting fetal movements using the 'count-to-ten' chart or a non-counting group [47]. There was an overlap between the two groups as women in the non-counting group were also instructed to count fetal movements if they were deemed to be at high risk. There was no reduction in perinatal mortality in the group randomised to counting fetal movements, although the number of women presenting initially with a live fetus that was subsequently stillborn was greater in the counting cohort (11 versus 6) [47]. It was acknowledged that these intrauterine fetal deaths (IUFDs) may have been preventable, resulting from false reassurance from CTG and clinical error. Importantly, the perinatal mortality rate for the whole study population fell to 2.9 per 1000, compared with 4.0 per 1000 reported prior to the study, suggesting that participation in the trial may have been beneficial [81]. A systematic review and meta-analysis of randomised and non-randomised studies found that although raising awareness of fetal movements was not associated with a significant reduction in perinatal death, there were reductions in neonatal intensive care unit (NICU) admission and fetal compromise at birth (Apgar score less than seven at 5 min) [19]. *[Evidence level 1–]*

Neldam et al. [82] randomised 2250 women to either focus on fetal movements for 2 h three times a week or were given no information. There were eight IUFDs, all of which were in the control group, leading to a significant decrease in perinatal mortality in women who formally counted fetal movements. Over 75% of the study population were classified as women at high risk. *[Evidence level 1–]*

Saastad et al. [83] tested the count to ten method of assessment of fetal movements after 28 weeks of gestation against standard care in 1076 women. There was a significant reduction in babies born with an Apgar score less than four at 1 min of age (0.4% versus 2.3%; RR 0.2, 95% CI 0.04–0.7). Fetal growth restriction (FGR) was more often identified prior to birth in the intervention arm than the control group (87% versus 60%; RR 1.5, 95% CI 1.0–2.1). There was no increase in maternal anxiety in women who were allocated to the intervention arm of the study. *[Evidence level 1+]*

Akselsson et al. [84] tested the 'Mindfetalness' method in 67 maternity clinics in Stockholm, Sweden ($n = 39\,865$ women). Women in the intervention group received a leaflet about Mindfetalness, a method to focus on fetal movement [85], but there was no alteration to the management of RFM. This study found no reduction in stillbirth in the general population, but there was a reduction in SGA births and caesarean births in women using the Mindfetalness method. *[Evidence level 1+]*

Moore and Piacquadio used a retrospective case–control design [36]. In a 7-month period when women counted fetal movements for 2 h a day, but were not given any alarm limits, the perinatal mortality rate was 8.7 per 1000 ($n = 2519$). The study was then extended to 5758 women who were instructed to present for further investigation if they had not felt ten movements after 2 h of focussed counting [86]. During this period the perinatal mortality was 3.6 per 1000. This was associated with increased hospital attendances, induction of labour rates (7.9% versus 4.4%), and emergency caesarean birth for fetal distress (2.4% versus 0.8%). *[Evidence level 2–]*

Westgate and Jamieson compared the rates of stillbirth before and after the introduction of 'count to ten' charts in New Zealand [87]. They report a significant reduction in stillbirth rates from 10.8 to 8.2 per 1000 total births. Other service improvements introduced over this period may also have had an impact on the perinatal mortality rate. *[Evidence level 2–]*

Tveit et al. [69, 88] compared the incidence of stillbirth in Eastern Norway before and after women were given written information about decreased fetal movements and a standard protocol for the management of RFM was introduced. The incidence of stillbirth fell from 3 to 2 per 1000 during the intervention period. In women perceiving RFM, the rate dropped from 4.2% to 2.4%. *[Evidence level 2+]*

A small crossover trial [89] investigating the experiences of women at low risk via observation and questionnaires found that the majority preferred the Mindfetalness method to the modified count to ten method described by Winje et al. [70], suggesting that concentration on the quality rather than quantity of movements increased the opportunity for women to connect with their fetus. Women found both methods reassuring and

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safe; however, two RCTs in a systematic review [90] noted significantly higher maternal–fetal attachment scores (indicating greater attachment between the woman and her fetus) if fetal movements were counted. While perception of fetal movements is associated with a positive effect on maternal–fetal attachment [91, 92], the effect of monitoring fetal movements is equivocal. Two studies [93, 94] (including one RCT discussed earlier) reported no adverse effects. A small retrospective cohort [95] found 23% of women reported anxiety and a further 16% described completing fetal movement charts as useless and a nuisance. Clinicians should be aware that perception of RFM itself is associated with increased maternal anxiety [96, 97]. Three RCTs in a systematic review [90] showed no evidence of increased maternal concern or anxiety resulting from fetal movement counting. An updated systematic review [19] including three studies found a reduction in maternal anxiety and an increase in maternal–fetal attachment. *[Evidence level 1–]*

Clinicians should be aware that the risk of stillbirth (in the absence of congenital anomaly) in the UK is approximately 1 in 300 births (data from 2022) [15]. When considering the utility of fetal movements as a screening test, clinicians must take account of potentially negative effects of maternal stress and anxiety. *[Evidence level 2+]*

8 | What is the Optimal Care of Women With Reduced Fetal Movements?

A care pathway is shown in Appendix C.

When a woman presents with RFM the initial goal is to exclude fetal death, which occurs in less than 1% of these instances [16, 17]. Subsequent to this, the aim is to exclude fetal compromise and to identify pregnancies at risk of adverse pregnancy outcome, while avoiding unnecessary interventions. Cross-sectional surveys [98, 99] revealed wide variations in knowledge and practice for both obstetricians and midwives regarding care of women presenting with RFM. Although most clinicians recognised the association with FGR, this did not translate into practice as professionals seldom undertook further assessment to identify FGR. Subsequent evaluation of the implementation of the first iteration of this guideline found significant variation in adherence to different recommendations, with all guidelines recommending a CTG be performed and fewer recommending USS for women at greatest risk of stillbirth [100, 101].

8.1 | What Should Be Included in the Clinical History?

Recommendation	Evidence quality	Strength	Rationale for the recommendation
Upon presenting with RFM, a relevant history should be taken to assess a woman's risk factors for stillbirth and FGR.	2+	C	Several cohort studies have identified factors that increase the risk of adverse outcomes after maternal perception of RFM.
All clinicians should be aware of the association of RFM with key risk factors for adverse pregnancy outcomes such as FGR, SGA fetus, placental insufficiency and congenital anomalies.	2+	C	Observational studies have consistently shown association between RFM, SGA infants and placental anomalies.
If after discussion with the clinician it is clear that a woman does not have RFM, there are no other risk factors for stillbirth and the fetal heart is present on auscultation, they can be reassured. However, if they are in the community setting and still has concerns, she should be advised to attend their maternity unit.	2+	C	Absent fetal movements or RFM are associated with adverse pregnancy outcomes.
Women noticing a reduction in fetal activity where other risk factors for stillbirth are identified should attend their maternity unit for further investigation (see Section 8.3).	4	GPP	Women who have risk factors for stillbirth need further investigation (see Section 8.3).

A history of RFM should be taken, including the duration of RFM, whether there have been absent fetal movements and whether this is the first occasion a woman has perceived RFM. Assessment should include a comprehensive stillbirth risk evaluation, including a review of the presence of other risk factors that are associated with an increased risk of stillbirth, that is, multiple consultations for RFM, known FGR, hypertension, diabetes, extremes of maternal age, smoking, placental insufficiency, congenital anomaly, obesity, racial/ethnic factors, significant past obstetric history (e.g., prior SGA birth or stillbirth), genetic factors and access to care issues (see Table 3) [8, 102–103]. *[Evidence level 2+]* An individual participant data meta-analysis of 1175 pregnant women [104] found that cigarette smoking (aOR 2.96, 95% CI 1.36–6.44) and maternal past medical history (aOR 2.35, 95% CI 1.14–4.82) were the strongest associations for adverse outcomes. *[Evidence level 2++]*

In a systematic review of women presenting with RFM [68], one study found that increased BMI was linked to an increased risk of stillbirth (OR 1.8, 95% CI 1.0–3.2) and FGR (OR 1.6, 95% CI 1.2–2.1), whereas three smaller studies did not show an association between BMI and risk of adverse outcome. *[Evidence level 2++]*

Clinicians should be aware that a woman's risk status is fluid throughout pregnancy and she should be transferred from low risk to high risk care programmes if complications occur. If, after discussion with the clinician, it is clear that a woman does not have RFM in the absence of further risk factors and the

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TABLE 2 | Summary of seven quantitative studies evaluating the impact of maternal awareness of fetal movements.

Author	Study type	Intervention	Main finding	Evidence level
Akselsson et al. 2020	Cluster randomised trial	Mindfetalness technique	Apgar score ≤ seven at 5 min: control 1.1% versus intervention 1.1%. SGA: control 10.7% versus 10.2% intervention. Caesarean birth: control 19% versus intervention 20%. NICU admission: control 6.8% versus intervention 6.3%.	1+
Saastad et al. 2011	Individual RCT	Fetal movement counting versus not counting	No stillbirths in study Apgar < four at 1 min: control 2.3% versus intervention 0.4%. Caesarean birth: control 6.5% versus intervention 7.1%. SGA: control 8.7% versus intervention 8.5%.	1+
Grant et al.1989	Cluster randomised trial	Count to ten charts. Attend if < ten movements in 12 h	Perinatal mortality: control 0.28% versus Intervention 0.31%	1–
Neldam 1983	Individual quasi-RCT	Focus on fetal movements for 2 h. Attend maternity unit if < three movements	Stillbirths: control 0.71% versus intervention 0%	1–
Tveit et al. 2009	Prospective case–control	Fetal movement counting package of care	Perinatal mortality rate: control 0.3% versus intervention 0.2%.	2+
Moore and Picaquadio 1989	Retrospective case–control	Counting movements 2 h/day	Perinatal mortality rate: control 0.87% versus intervention 0.36%. Caesarean birth: control 0.8% versus intervention 2.4%.	2–
Westgate and Jamieson 1986	Retrospective case–control	Count to ten charts	Stillbirth rate: control 1.1% versus intervention 0.8%.	2–

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presence of a normal FHR on auscultation, there should not be a need to follow up with further investigations.

8.2 | What Should Be Covered in the Initial Clinical Examination?

Recommendation	Evidence quality	Strength	Rationale for the recommendation
If a woman presents with RFM in the community setting with no facility to auscultate the fetal heart, the woman should be immediately referred to their maternity unit for auscultation.	2–	C	RFM is the presenting symptom for approximately half of IUFDs. Auscultation of the fetal heart is needed to confirm fetal viability.
When a woman presents with RFM in the community or hospital setting an attempt should be made to auscultate the fetal heart using a handheld Doppler device to exclude fetal death.	3	C	Fetal viability can be determined by auscultating the fetal heart in the community.
Clinical assessment of a woman with RFM should include assessment of fetal size by measuring symphysis–fundal height, blood pressure and urinalysis.	3	C	RFM can be a symptom of placental dysfunction which may also present as an SGA infant or pre-eclampsia. Adverse outcomes are more common if the fetus is SGA or the woman has increased blood pressure.

The key priority when a woman presents with RFM is to confirm the presence of fetal cardiac activity. A handheld Doppler device should be used to assess the presence of the fetal heartbeat, which should be available in most community settings in which a pregnant woman would be seen by a midwife or general practitioner. In the majority of cases this will immediately confirm viability. In order to differentiate the fetal heartbeat from the maternal heartbeat, the difference between the FHR and the maternal pulse rate must be noted. If the presence of a fetal heartbeat is not confirmed, then immediate referral for USS assessment of fetal cardiac activity must be undertaken. If the encounter with a woman is virtual or by telephone and is without the additional reassurance of auscultation of the fetal heart, the woman should be advised to attend their maternity unit for further assessment. *[Evidence level 2+]*

Methods employed to detect the SGA fetus include abdominal palpation, measurement of symphysis–fundal height and ultrasound biometry. Where symphysis–fundal height is measured, it should be plotted on a growth chart (please refer to the RCOG Green-top Guideline No. 31 *Small for Gestational Age, Management and Investigation*) [105]. Consideration should be given to the judicious use of USS to assess fetal size in those women for whom clinical assessment is likely to be less accurate, for example, with a raised BMI. As pre-eclampsia is also associated with placental dysfunction, it is prudent to measure blood pressure and test for proteinuria in women with RFM.

8.3 | What Is the Role of Cardiotocography?

Recommendation	Evidence quality	Strength	Rationale for the recommendation
In women with RFM, after fetal viability has been confirmed, arrangements should be made for them to have a computerised cardiotocograph (CTG) to exclude acute fetal compromise if the pregnancy is 26^{+0} weeks of gestation or later (see Section 14 for recommendations prior to this gestation).	2++ to 1–	B	Abnormal CTG is associated with adverse perinatal outcome after RFM. Computerised CTG appears to improve perinatal outcome.

Cardiotocography (CTG) monitoring of the FHR, initially for at least 20 min, provides an easily accessible means of detecting suspected fetal compromise. The presence of a normal FHR pattern (i.e., showing accelerations of FHR coinciding with fetal movements – a 'reactive' CTG) is indicative of a healthy fetus with a properly functioning autonomic nervous system. The FHR accelerates with 92%–97% of all gross body movements felt by the mother [106, 107]. Several studies have concluded that if the term fetus does not experience a FHR acceleration for more than 80 min, fetal compromise is likely to be present [108–110]. However, a systematic review did not confirm or refute any benefits for routine CTG monitoring of 'at risk' pregnancies after 26 weeks [111]. However, several limitations were acknowledged, including limited numbers of women (six trials and 2105 women), and serious methodological concerns such as the fact that the trials were conducted in the early 1980s when CTG monitoring was being introduced into routine clinical practice. *[Evidence level 1–]*

Compared to traditional CTG interpretation, computer systems for interpretation of CTG after 26 weeks of pregnancy reduce perinatal mortality, predicting umbilical acidosis and depressed Apgar scores [111]. *[Evidence level 1–]*

Another systematic review of randomised and non-randomised studies of computerised CTG (cCTG) found no statistically significant reduction in perinatal mortality, but study design prevented pooling of data. The review reports that cCTG provides rapid objective data, reduces intra-observer and inter-observer variation, and all of the non-randomised studies showed reduced investigation and better neonatal outcomes with cCTG [112]. *[Evidence level 1–]*

In a Norwegian study of 3014 women who presented with RFM [97], a CTG was performed in 97.5% of cases, with a CTG anomaly detected in 3.2% of cases. In a different observational study of women presenting with RFM who had an initial CTG and an USS [113], 21% had an anomaly detected that required action and 4.4% were admitted for immediate birth. Another study showed

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TABLE 3 | Risk factors for adverse outcomes after maternal presentation with RFM.[a]

Factor	OR (95% CI)	Reference
Cigarette smoking	2.96 (1.36–6.44)	Liu et al. 2025
Past obstetric history of SGA baby or stillbirth	2.10 (1.17–4.14)	O'Sullivan et al. 2009
Past medical history (e.g., diabetes/hypertension)	2.35 (1.14–4.82)	Liu et al. 2025
Recurrent presentation with RFM (two or more times)	1.60 (1.05–2.44)	O'Sullivan et al. 2009
	8.04 (4.63–13.98)[b]	Scala et al. 2015
Symphysis-fundal height < 10th centile	15.43 (4.20–56.75)	O'Sullivan et al. 2009
Raised uterine artery pulsitivity index in second trimester	5.73 (2.42–13.55)[b]	Scala et al. 2015

[a]Some risk factors for stillbirth in the general population, for example, nulliparity, are not included in this list because they were not associated with increased risk of adverse outcomes after RFM. Professionals should still assess each case individually.
[b]OR for the birth of a SGA infant.

that stillbirth rates (corrected for lethal congenital anomalies), after a reactive or non-reactive CTG, were 1.9 and 26 per 1000 births, respectively [114]. Lastly, a small study [39] reported that 56% of women in a high-risk pregnancy who reported RFM had an abnormal CTG. This was associated with an unfavourable perinatal outcome in nine out of ten cases. A retrospective cohort study [115] of 524 women with RFM found 497 (95%) had a normal CTG at presentation or a normal CTG after an initially non-reassuring CTG. There was no increase in adverse neonatal outcome in these infants. Conversely, 5% of infants had a persistently non-reassuring CTG and these infants had evidence of adverse neonatal outcome. A prospective cohort study [102] of 305 women found that 4% had an abnormal CTG at presentation, and abnormal CTG increased the risk of adverse outcome by seven-fold (aOR 7.1, 95% CI 1.3–38.2). *[Evidence level 2+]*

When combined with individual participant data meta-analysis [104], the presence of an abnormal CTG remained significantly associated with adverse outcome (aOR 3.65, 95% CI 1.84–7.23). *[Evidence level 2++]*

Recommendation	Evidence quality	Strength	Rationale for the recommendation
If an USS assessment is deemed necessary, it should be performed at the earliest available opportunity.	4	GPP	A diagnosis of SGA should be made in a timely manner.
USS assessment should include the assessment of abdominal circumference and/or estimated fetal weight to detect an SGA fetus, assessment of amniotic fluid volume and umbilical artery Doppler.	2+	C	Adverse perinatal outcome after maternal presentation with RFM is increased if the fetus is SGA, there is oligohydramnios or abnormal umbilical artery Doppler waveform.
Ultrasound should include assessment of fetal morphology if this has not previously been performed.	1+	A	RFM is associated with neurological and musculoskeletal anomalies.

8.4 | What Is the Role of Ultrasound Assessment of Fetal Biometry, Liquor Volume and Umbilical Artery Doppler?

Recommendation	Evidence quality	Strength	Rationale for the recommendation
Ultrasound scan (USS) assessment should be undertaken as a part of the preliminary investigations of a woman presenting with RFM after 28^{+0} weeks of gestation if the perception of RFM persists despite a normal CTG, if there are any additional risk factors for FGR and/or stillbirth and if an USS has not been performed in the preceding 2 weeks.	2+	B	The most common adverse outcome identified following RFM is the presence of an SGA fetus. USS is the best means to detect an SGA fetus.

There are no RCTs of USS versus no USS in women with RFM. Frøen et al. conducted a prospective population-based cohort study [96] of 46 132 births in eastern Norway and Bergen over a 17-month period from 2006 to 2007. In the prospective cohort of 3014 women presenting with RFM, USS was performed in 94% of cases and detection of an anomaly such as FGR, reduced amniotic fluid volume, or abnormal fetal morphology or Doppler of the umbilical artery was reported in 11.6% of cases [116]. *[Evidence level 2+]*

A quality improvement programme in Norway, a prospective 'before and after' study design, was used to evaluate the combined impact of providing women with information on RFM, and clinicians with clinical practice guidelines [69, 88]. After an initial period of study ($n = 19\,407$), an investigation protocol of CTG and USS was introduced in the care of women with RFM ($n = 46\,143$). The guideline recommended that both investigations be performed within 2 h if women reported no fetal movements, and within 12 h if they reported RFM. The USS was conducted to assess amniotic fluid volume, fetal size and fetal anatomy; the addition of Doppler studies

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to the investigation protocol did not show any additional benefit. There was a significant reduction in all stillbirths from 3 to 2 per 1000, and from 4.2% to 2.4% of women presenting with RFM. The study reported no increase in the number of preterm births, infants requiring transfer to neonatal care, or infants with severe neonatal depression or FGR. There was more than a doubling in the number of USSs (OR 2.64; 95% CI 2.02–3.45), but this seemed to be compensated by a reduction in additional follow-up consultations and admissions for induction of labour. *[Evidence level 2–]*

The AFFIRM (Promoting Awareness Fetal Movements and Focussing Interventions Reduce Fetal Mortality Stillbirth, a Stepped Wedge Cluster Randomised Trial) study [117] was a cluster randomised trial of 385 552 women in 33 hospitals. This study included giving women an information leaflet about fetal movements, education for staff, and a protocol for the management of RFM that included an USS for all women who reported RFM (for liquor volume using deepest vertical pocket within 2 h and fetal biometry ideally on the next working day). This intervention did not significantly reduce stillbirth compared to standard care as defined in the study, but reduced the proportion of women who gave birth to an SGA infant after 39 weeks of gestation, and increased the proportion of women having induction of labour and giving birth by caesarean (see Section 11 for further information about the effects of the AFFIRM intervention). Therefore, USS for all women presenting with RFM is not recommended. *[Evidence level 1–]*

When compared to other indications for USS, a case–control study [17] found that women having USS for RFM were no more likely to have an abnormal scan parameter (increased umbilical artery pulsatility index [PI], decreased middle cerebral artery [MCA] PI or cerebroplacental ratio [CPR] less than 10th centile, estimated fetal weight less than 10th centile or abnormal liquor volume); and 48 scans were needed to detect one new case of SGA. However, USSs were more likely to be abnormal when women had two or more episodes of RFM. This suggests that ultrasound is indicated when there are multiple presentations with RFM. *[Evidence level 2+]*

In a study of 489 women with RFM, Ahn et al. [118] demonstrated that women with RFM but no additional pregnancy risk factor did not require further follow-up once the CTG and the amniotic fluid volume were confirmed to be normal. However, the study found a 3.7 times greater likelihood of a diminished amniotic fluid volume on scan in their study population. *[Evidence level 2–]*

Two studies [119, 120] have investigated the role of fetal and maternal artery Doppler assessment in women presenting with RFM. Korszun et al. [119] reported 888 women, of whom 12 had abnormal umbilical artery Doppler (1.4%), including one infant that later died in utero. Dubiel et al. [120] found only one abnormal umbilical artery Doppler waveform in 580 infants (0.2%). Although umbilical artery Doppler is rarely abnormal, it may be a significant anomaly when present. Further studies of the value of umbilical artery Doppler alone or in combination with other measurements are needed. *[Evidence level 2+]*

Newer studies have investigated the role of MCA Doppler in determining fetal wellbeing following maternal presentation with RFM. A study of 100 women with RFM [121] and matched controls after 30 weeks of gestation found those with RFM had lower MCA PI and CPR than unaffected controls; this difference was greatest in women with recurrent RFM. Another study of 150 pregnant women [122] between 37 and 41 weeks of gestation confirmed that those with RFM had higher umbilical artery PI, lower MCA PI and CPR. CPR was related to birthweight centile and duration of neonatal unit stay. A small study [123], which included ten women with adverse outcome after RFM, and 86 with a normal outcome, did not find a difference in MCA or CPR between the two groups. *[Evidence level 2–]*

An RCT of 1676 women [124] with RFM after 37 weeks of gestation and a normally grown baby were allocated to expedited delivery for CPR less than 1.1 or concealed CPR result found lower composite adverse outcome (driven by reduced severe neonatal morbidity) in women who had the revealed CPR result (RR 0.76, 95% CI 0.58–0.99). CPR could be considered to identify fetuses that would benefit from expedited birth. *[Evidence level 1–]*

8.5 | Is There Any Role for Using the Biophysical Profile?

Recommendation	Evidence quality	Strength	Rationale for the recommendation
There is insufficient evidence to recommend a biophysical profile (BPP) in all women with RFM.	1–	B	The role of BPP in the management or investigation of RFM is uncertain, but fetal death is rare after a normal BPP.

The basis of a BPP is the observed association between hypoxia (low levels of oxygen) and alterations of measures of central nervous system performance such as FHR patterns, fetal movement and fetal tone, which have been observed in both human and animal fetuses [125]. A systematic review [126] of the use of BPP in women with high risk pregnancies, including women with RFM, comprised five low quality studies with fewer than 3000 patients. The systematic review concluded that there is insufficient evidence from RCTs to support the use of BPP as a test of fetal wellbeing in high-risk pregnancies. *[Evidence level 1–]*

It should be noted, however, that there is evidence from uncontrolled observational studies that BPP in women at high risk has a low false negative rate (0.07%), that is, fetal death is rare in women in the presence of a normal BPP [127]. *[Evidence level 2–]*

A small study of 96 women with RFM [123] between 28 and 40 weeks of gestation, of whom ten had an adverse outcome (defined as 5-min Apgar score less than 7, admission to NICU, non-reassuring FHR trace in labour, umbilical artery pH less than 7.16

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or fetal death) found no difference in BPP score between those with an adverse outcome and those without. *[Evidence level 2–]*

8.6 | Is There Any Role for Assessment for Fetomaternal Haemorrhage?

Recommendation	Evidence quality	Strength	Rationale for the recommendation
Fetomaternal haemorrhage (FMH) is a rare cause of RFM, but should be considered in the presence of a non-reassuring or sinusoidal CTG.	3	C	RFM is reported as a presenting symptom of FMH.
If CTG is normal and there is clinical suspicion of FMH or fetal anaemia, this can be assessed by Doppler velocimetry of the MCA or Kleihauer.	2–	C	Not all FMH is sufficiently large to cause CTG changes. Other tests may be used to identify FMH.

Large fetomaternal haemorrhage (FMH) is a rare event in pregnancy (estimated to occur in less than 0.5% of all pregnancies). It can lead to stillbirth or neonatal death. FMH can present with RFM [128]. The majority of cases of large FMH had an abnormal CTG (non-reassuring or sinusoidal trace) [128, 129]. *[Evidence level 3]*

If FMH is suspected, the case should be discussed with a senior obstetrician to determine whether birth is appropriate. If there is uncertainty about whether FMH is present, the Kleihauer–Betke test and Doppler velocimetry of the MCA are reported to have sensitivity of 76%–100% and 100%, respectively, in this context, but specificity was lower at 80%–99% and 99%, respectively [130, 131]. As Doppler velocimetry can be performed more promptly this would be preferred. *[Evidence level 2–]*

9 | What Actions Should Be Taken if Anomalies in Fetal Growth or Heart Rate Monitoring are Detected During the Assessment?

Recommendation	Evidence quality	Strength	Rationale for the recommendation
If anomalies are present on antenatal CTG, intervention should be discussed with a senior obstetrician and decisions about birth should consider gestation and the degree of anomaly.	4	GPP	Intervention is dependent upon the nature and magnitude of the anomaly, and the pregnancy gestation.
If the fetus is found to be SGA and/or there are anomalies of umbilical artery Doppler or liquor volume, care should be in accordance with RCOG Green-Top Guideline No. 31 *Investigation and care of a Small for Gestational Age Fetus and a Growth Restricted Fetus.*	4	GPP	When a fetus is found to have FGR or is SGA the pregnancy should be managed according to the recommendations for the relevant clinical scenario.

If there is evidence of suspected acute compromise on the CTG, immediate steps should be taken to expedite birth. In cases where there are lesser degrees of concern, based on CTG interpretation following NICE guidance [132], further CTG monitoring may be instituted with a plan for frequent reassessment.

Given the association between RFM and histological evidence of placental anomalies being evidence of an SGA fetus, oligohydramnios or anomalies of the umbilical artery Doppler may indicate underlying placental dysfunction [102]. The management of this should be in accordance with the RCOG Green-Top Guideline No. 31 *Investigation and care of a Small for Gestational Age Fetus and a Growth Restricted Fetus* [105].

10 | What is the Optimal Surveillance Method for Women Who Have Presented With RFM in Whom Investigations Are Normal?

Recommendation	Evidence quality	Strength	Rationale for the recommendation
Women should be advised about the normal physiological changes in fetal movement throughout pregnancy and actions to take if concerned.	4	GPP	As fetal movements are assessed subjectively women need to receive accurate information about normal fetal movement.
Healthcare professionals can reassure women with a single episode of RFM that they are unlikely to have an adverse perinatal outcome.	2+	B	Women may be concerned about their baby's/babies' wellbeing after reporting a single episode of RFM.
There are no data to support formal fetal movement counting (kick charts) after women have perceived RFM and have normal investigations.	3	C	There are no data that indicate kick counting is superior to maternal awareness of fetal movements.

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Recommendation	Evidence quality	Strength	Rationale for the recommendation
If women who have normal investigations after one presentation with RFM have another episode of RFM, they should be advised to contact their maternity unit for further assessment as indicated in Section 8 of this guideline.	2+	B	Women with recurrent episodes of RFMs have an increased risk of adverse outcome.

Most women (approximately 70%) who perceive a reduction in fetal movements will have a good outcome to their pregnancy (i.e., above 10th centile, uncompromised baby). The commonest finding was birth to a SGA baby in 14.3%–23% of women. The frequency of adverse outcomes varies between studies, but stillbirths remained low, ranging between 0.3% and 1% of women with RFM, NICU admission between 0.7% and 3.0% of births after RFM, and 1.6%–2% of infants had an Apgar score less than 7. There have been no studies to follow-up on women who had normal investigations. Some practitioners would advocate commencing formal fetal movement counting in spite of normal investigations, but there is no evidence to support this strategy. Moreover, formal fetal movement counting for this cohort is subject to the same difficulties as in the general obstetric population. *[Evidence level 2+]*

In several (but not all) cohort and case–control studies perinatal outcome was worse in women who had presented on more than one occasion with RFM [8, 102–103]. If a woman experiences a further episode of definite RFM she should be referred for hospital assessment to exclude signs of compromise through the use of CTG and ultrasound as outlined in Section 8. *[Evidence level 2+]*

Education of women is important. This should include explanation of the normal physiological changes in fetal movement and encouragement to be aware of their own individual pattern of activity. Qualitative studies have indicated the intuitive feelings women may experience that all is not well [73]. Some women have described premonitions, feelings of discomfort and unease, and a subconscious understanding that there was a change in the pregnancy. Some have reported a feeling of emptiness and lack of contact with their baby. Their perception has been of a flatter, shrunken abdomen that had lost its shape, noting that the baby did not keep changing position. One qualitative study also included reports of the baby having moved excessively [73]. This reiterates the importance of women being encouraged to report any sudden change in their normal fetal movements—whether an increase, decrease, or cessation, and this should not be delayed. Clear information is needed that fetal movements do not decrease towards the end of pregnancy. Awareness of frequency, intensity, character, and duration of fetal movements is needed, as women reporting RFM have experienced a range of differences in each of these patterns [71, 133]. *[Evidence level 2–]*

Provision of information through accessible printed or digital information can be helpful in enhancing maternal knowledge; evidence-based information having been shown to increase the likelihood of women presenting within 24 h of RFM [133–135]. *[Evidence level 2–]*

This has been most influential with nulliparous women [69]. An important finding in two studies [133, 136] was that in Norway and Sweden, women from minority populations (e.g., women from Black African populations) had lower rates of awareness of fetal activity, but showed less changes in maternal behaviour regarding presenting to maternity care with RFM and stillbirth rates despite provision of information about fetal movements in a range of languages. Consequently, the researchers emphasised the importance of considering a wider range of communication, including involvement of role models and influential family members in their care.

Healthcare staff also need to be aware of the reasons women may not disclose their concerns; this includes a reluctance to question professional judgement or a fear of not being taken seriously [73, 90]. Women may also have been influenced by friends, relatives, the internet or the media [72, 134]. Staff need to be aware of their institutional clinical practice guidelines as standardised care has been shown to be beneficial.

11 | What are the Indications for Intervention if Investigations are Normal?

Recommendation	Evidence quality	Strength	Rationale for the recommendation
Where there is no objective evidence of fetal compromise (no CTG anomalies, no evidence of reduced fetal growth, oligohydramnios or umbilical artery Doppler anomalies) women should be reassured there is no indication for expediting birth.	1+	A	The AFFIRM study offered early term birth for women with RFM and demonstrated increased rates of induction of labour and birth by caesarean without improving neonatal outcomes.
A decision to expedite birth should be made on an individual basis in partnership with the woman. If women present with RFM after 39 weeks of gestation, expediting birth does not appear to be associated with increased risk to mother or baby.	1+	A	Induction of labour after 39 weeks of gestation does not increase the risk of birth by caesarean or adverse fetal or neonatal outcomes.

One component of the intervention tested in the AFFIRM study (see Section 9) was an offer of induction of labour for women presenting with recurrent RFM after 37 weeks of gestation. The AFFIRM intervention [117] was associated with an increase in induction of labour and birth by caesarean. This may result from induction of labour commencing at early term gestations [137]. In contrast, observational and intervention studies [137, 138] have shown that induction of labour at or after 39 weeks of gestation is not associated with an increase in the proportion of births by caesarean or adverse maternal or fetal outcomes. Neither Mindfetalness nor My Baby's Movements and Me studies [84, 139] showed increased rates of caesarean birth.

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12 | What is the Optimal Care of Women Who Present Recurrently With RFM?

Recommendation	Evidence quality	Strength	Rationale for the recommendation
When a woman recurrently perceives RFM her case should be reviewed to exclude predisposing causes.	3	C	Various factors can be associated with reduced perception of fetal movements which may lead to recurrent presentations (see Section 5).
When a woman recurrently perceives RFM, USS assessment should be undertaken as a part of the investigations.	2+	B	Adverse outcomes including stillbirth and the birth of an SGA baby are more common in women with recurrent RFM.
Clinicians should be aware of the increased risk of poor perinatal outcome in women presenting with recurrent RFM.	4	GPP	Women who present with recurrent RFM have a greater risk of adverse neonatal outcome

There is no universal definition of what recurrent RFM means; one region of the UK has adopted a consensus definition of two or more episodes of RFM occurring within a 21-day period after 26 weeks of gestation. Women who present on two or more occasions with RFM after 28 weeks are at increased risk of a poor perinatal outcome (stillbirth [1.4% versus 0.6% in women with one episode of RFM], FGR [44.2% versus 9.8% in women with one episode of RFM] or preterm birth) compared with those who only attend on one occasion (OR 8.04; 95% CI 4.63–13.98) [78, 103]. There are no studies to determine whether intervention (e.g., expediting birth or further investigation) alters perinatal morbidity or mortality in women presenting with recurrent RFM. Therefore, the decision whether to induce labour at term in a woman who presents recurrently with RFM, when the growth, liquor volume and CTG appear normal, must be done after careful consideration by an experienced obstetrician on an individualised basis and in partnership with the woman. *[Evidence level 2+]*

13 | What is the Optimal Care for RFM in a Multiple Pregnancy?

Recommendation	Evidence quality	Strength	Rationale for the recommendation
When a woman presents with RFM in a multiple pregnancy, care should be taken to determine the chorionicity of the twin pregnancy.	3	C	RFM was noted in an MBRRACE-UK Confidential Enquiry to be a presenting symptom of twin-to-twin transfusion syndrome.
When a woman presents with RFM in a multiple pregnancy, investigations to identify developing fetal compromise should be undertaken, including CTG, assessment of fetal growth, liquor volume and umbilical artery Doppler.	3	C	Limited data suggest RFM in twin pregnancies may be associated with adverse neonatal outcomes.

Very few studies report on the significance of RFM in multiple pregnancy, and no studies of care for RFM in multiple pregnancy were identified. Levy et al. conducted a retrospective case–control study of dichorionic twin pregnancies presenting with an isolated presentation of RFM after 34 weeks of gestation and who gave birth within 2 weeks [140]. Cases of RFM were matched (by maternal age and gestation) to those with normal fetal activity. Women with RFM were more likely to have a perinatal death (5/166 versus 0/166), neonatal admission or an infant with cerebral morbidity (defined as intraventricular haemorrhage, seizures or hypoxic-ischaemic encephalopathy; 10/166 versus 2/166). *[Evidence level 2–]*

A prospective study of 181 twin pregnancies from the UK [141] found no association between reduced strength or frequency of fetal movements and a composite adverse outcome (perinatal death, birth before recommended gestation, Apgar score less than 7, or admission to neonatal intensive care after 37 weeks of gestation). *[Evidence level 2+]*

The MBRRACE-UK Confidential Enquiry into Stillbirths and Neonatal Deaths In Twin Pregnancies [142] described cases where RFM was the presenting symptom of fetal compromise in twin-to-twin transfusion syndrome in monochorionic twins or fetal compromise in dichorionic twins. *[Evidence level 3]*

A small prospective study [143] compared fetal behavioural development in healthy dichorionic twins and singletons. Key findings were that twin fetuses were less active than singletons throughout pregnancy, although breathing activity was higher in twins in the third trimester. There was no evidence of there being a consistently more active 'dominant' twin. Poor synchrony of movements was noted. Twins demonstrated independent occurrence of rest–activity cycles. As in singleton pregnancies, general body movements decreased with advancing gestation. *[Evidence level 2–]*

14 | What is the Optimal Care for RFM Before 28^{+0} Weeks of Gestation?

Recommendation	Evidence quality	Strength	Rationale for the recommendation
If a woman presents with RFM between 24^{+0} weeks of gestation and 26^{+0} weeks of gestation, the presence of a fetal heartbeat should be confirmed by auscultation with a Doppler handheld device and a history taken to determine other risk factors for stillbirth or early-onset FGR.	4	GPP	Most data regarding RFM are from studies after 28 weeks of pregnancy (and asked about the preceding 2 weeks of fetal activity). Fetal viability needs to be confirmed and early-onset FGR should be considered.

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Recommendation	Evidence quality	Strength	Rationale for the recommendation
If a woman presents with RFM prior to 24^{+0} weeks of gestation the presence of a fetal heartbeat should be confirmed by auscultation with a Doppler handheld device.	4	GPP	RFM is the presenting symptom for approximately half of IUFDs. Auscultation of the fetal heart is needed to exclude fetal death.
If fetal movements have never been felt by 24 weeks of gestation, an anomaly scan should be performed if not already completed. Referral to a fetal medicine specialist should be considered if concerns remain.	4	GPP	Absent or reduced fetal movements are associated with neurological or musculoskeletal anomalies in the fetus.

There are no studies looking at the outcome of women who present with RFM between 24^{+0} and 28^{+0} weeks of gestation. The fetal heartbeat should be confirmed to check fetal viability. History must include a comprehensive stillbirth risk evaluation, including a review of the presence of other risk factors that are associated with an increased risk of stillbirth. Clinicians should be aware that placental insufficiency may present at this gestation. There is no evidence to recommend the routine use of CTG surveillance in this group. If there is clinical suspicion of FGR, consideration should be given to the need for USS assessment. There is no evidence on which to recommend the routine use of USS assessment in this group.

There are no studies looking at the outcomes of women who present with RFM before 24^{+0} weeks of gestation. While placental insufficiency rarely presents before the end of the second trimester, the fetal heartbeat should be auscultated to exclude IUFD. There is limited evidence from a number of case reports [144–147] that women who present having not experienced fetal movements at all may have a fetus with an underlying neuromuscular condition. *[Evidence level 3]*

15 | What is the Appropriate Action Following Maternal Perception of Excessive Fetal Movements?

Recommendation	Evidence quality	Strength	Rationale for the recommendation
Clinicians should be aware of an association between a single period of exaggerated or excessive fetal movements and stillbirth after 28 weeks of gestation.	2+	B	Observational studies have shown an association between a single period of excessive fetal movements, followed by absent fetal movements and stillbirth.
If women are concerned about excessive or exaggerated fetal activity after 28 weeks, fetal wellbeing should be assessed by CTG. If the CTG is normal, women can be reassured. CTG anomalies should be reviewed by a senior clinician.	3	C	Case series have demonstrated CTG anomalies in women perceiving abnormally increased fetal movements.

Several case–control studies have reported an association between a single episode of increased fetal movement and stillbirth after 28 weeks of gestation [9, 13]. Examples of language used to describe a period of exaggerated activity are 'intense', 'frantic', 'wild' or 'crazy' compared with 'powerful' or 'strong'. The cause for such a pattern of movements is not known, but has been speculated to represent seizures or relate to cord entanglement [148]. Three prospective studies [149–151] ($n = 219$, $n = 154$ and $n = 64$) did not find an association between maternal perception of increased fetal movements and adverse neonatal outcome. *[Evidence level 2+]*

Huang et al. [149] found that large-for-gestational-age infants were more frequent in women with increased fetal movements. This study did not report the results of any investigations after presentation to maternity service. A smaller study found anomalies of the CTG in 6.3% (4/64) of women, and five women had anomalies detected on USS (two oligohydramnios and three were SGA) [151]. There is no indication for intervention for increased fetal movements unless there is objective evidence of fetal compromise on the CTG.

16 | Recommendations for Future Research

- Determine whether other tests of fetal wellbeing (e.g., CPR, umbilical artery Doppler) or placental compromise (e.g., placental growth factor) identify fetal compromise in women presenting with RFM.
- Prospective studies of women experiencing a single period of exaggerated fetal activity to confirm or refute an association with adverse neonatal outcome.
- Qualitative studies to describe changes in fetal movements in late pregnancy, in order to optimise information given to pregnant women.
- Studies to determine whether objective measures of fetal activity can be reliably obtained and whether these relate to fetal compromise.
- Studies to determine the risk of adverse outcome with absent or reduced fetal movements in pregnancies prior to 28 weeks of gestation.

17 | Auditable Topics

- Existence of a unit guideline on RFM and evidence of local compliance of practice with guideline (compliance 100%).
- Percentage of women with a confirmed history of RFM after 28^{+0} weeks of gestation having a CTG performed to exclude fetal compromise (compliance 100%).
- Percentage of women presenting with confirmed RFM after 28^{+0} weeks of gestation having USS assessment performed as part of the preliminary investigations, if the perception of RFM persists despite a normal CTG or if there are any additional risk factors for FGR/stillbirth (compliance 100%).
- Percentage of women presenting with recurrent RFM after 28^{+0} weeks of gestation referred for a growth scan

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(fetal biometry) and liquor volume assessment (compliance 100%).

– Percentage of women with uncomplicated RFM (investigation results normal) with no other indication for induction of labour before 39 weeks of gestation (compliance 95%).

18 | Useful Links and Support Groups

Tommy's: Feeling your baby move is a sign that they are well [www.tommys.org/pregnancy-information/health-professionals/free-pregnancy-resources/leaflet-and-banner-feeling-your-baby-move-sign-they-are-well].

Kicks Count: Your Baby's Movements [www.kickscount.org.uk/your-babys-movements].

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Conflicts of Interest

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Appendix S1:** bjo70198-sup-0001-AppendixS1.docx. **Appendix S2:** bjo70198-sup-0002-AppendixS2.docx.

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Committee lead reviewers were: Dr. M Savvidou FRCOG, London;[1] Dr. A Ali FRCOG, Kingston;[1]
Dr. R Bahl MRCOG, Bristol;[2] Mr. A McKelvey, Norwich;[2] and Dr. MA Ledingham MRCOG, Glasgow[3].

[1]from June 2024; [2]until May 2024 [3]until December 2021.

The Co-Chairs of the Guidelines Committee were: Dr. A Campbell FRCOG, Edinburgh;[1] Miss L Knight MRCOG, Devon;[1] Dr. N Potdar FRCOG, Leicester;[2] Mr. A McKelvey MRCOG, Norwich;[2] Dr. MA Ledingham FRCOG, Glasgow;[3] and Dr. B Magowan FRCOG, Melrose.[4]

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The final version is the responsibility of the Guidelines Committee of the RCOG.

The guideline will be considered for update 3 years after publication, with an intermediate assessment of the need to update 2 years after publication.

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This means that RCOG Guidelines are unlike protocols or guidelines issued by employers, as they are not intended to be prescriptive directions defining a single course of management. Departure from the local prescriptive protocols or guidelines should be fully documented in the patient's case notes at the time the relevant decision is taken.

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Appendix A

Explanation of Grades and Evidence Levels

Classification of evidence levels	
1++	High-quality meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a very low risk of bias
1+	Well-conducted meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a low risk of bias
1–	Meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a high risk of bias
2++	High-quality systematic reviews of case–control or cohort studies or high-quality case–control or cohort studies with a very low risk of confounding, bias or chance and a high probability that the relationship is causal
2+	Well-conducted case–control or cohort studies with a low risk of confounding, bias or chance and a moderate probability that the relationship is causal
2–	Case–control or cohort studies with a high risk of confounding, bias or chance and a significant risk that the relationship is not causal
3	Non-analytical studies, e.g., case reports, case series
4	Expert opinion
Grades of Recommendation	
A	At least one meta-analysis, systematic review or RCT rated as 1++, and directly applicable to the target population; or a systematic review of RCTs or a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population and demonstrating overall consistency of results
B	A body of evidence including studies rated as 2++ directly applicable to the target population, and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 1++ or 1+
C	A body of evidence including studies rated as 2+ directly applicable to the target population, and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 2++
D	Evidence level 3 or 4; or Extrapolated evidence from studies rated as 2+
Good Practice Points	
GPP	Recommended best practice based on the clinical experience of the guideline development group.[a]

[a] On the occasion when the guideline development group find there is an important practical point that they wish to emphasise but for which there is not, nor is there likely to be any research evidence. This will typically be where some aspect of treatment is regarded as such sound clinical practice that nobody is likely to question it. These are marked in the guideline, and are indicated by GPP. It must be emphasised that these are NOT an alternative to evidence-based recommendations, and should only be used where there is no alternative means of highlighting the issue.

Appendix B

Examples of Methods to Objectively Measure Fetal Movements

At the time of writing, methods to objectively measure fetal movements are in their infancy but continue to develop with the aim of quantifying fetal activity.

Actography—Doppler ultrasound (as used for cardiotocography) detects high and low-frequency signals. The low frequency signals are interpreted as coming from fetal movements. Some computerised CTG machines plot the actograph trace. There is a relationship between the actograph score (proportion of time the actograph records fetal activity) and fetal heart rate accelerations.

Accelerometry—An accelerometer is an electromechanical device that is used to measure acceleration forces, so when applied to the maternal abdomen, accelerometers can detect maternal and fetal movements. These have been attached to the maternal abdomen by adhesive tape or within a garment.

Acoustic sensors (microphones)—have been combined with accelerometers to identify different types of fetal movements by combining the inputs from both modalities [152].

Vector electrocardiography—The fetal electrocardiogram is recorded via the maternal abdomen using adhesive electrodes. Using an array of electrodes in different places on the maternal abdomen, changes in the amplitude of the QRS complex can be used to identify when the fetus has moved, producing a vectocardiogram. The disadvantage of this approach is that this only detects movements of the fetal trunk, not limbs [153].

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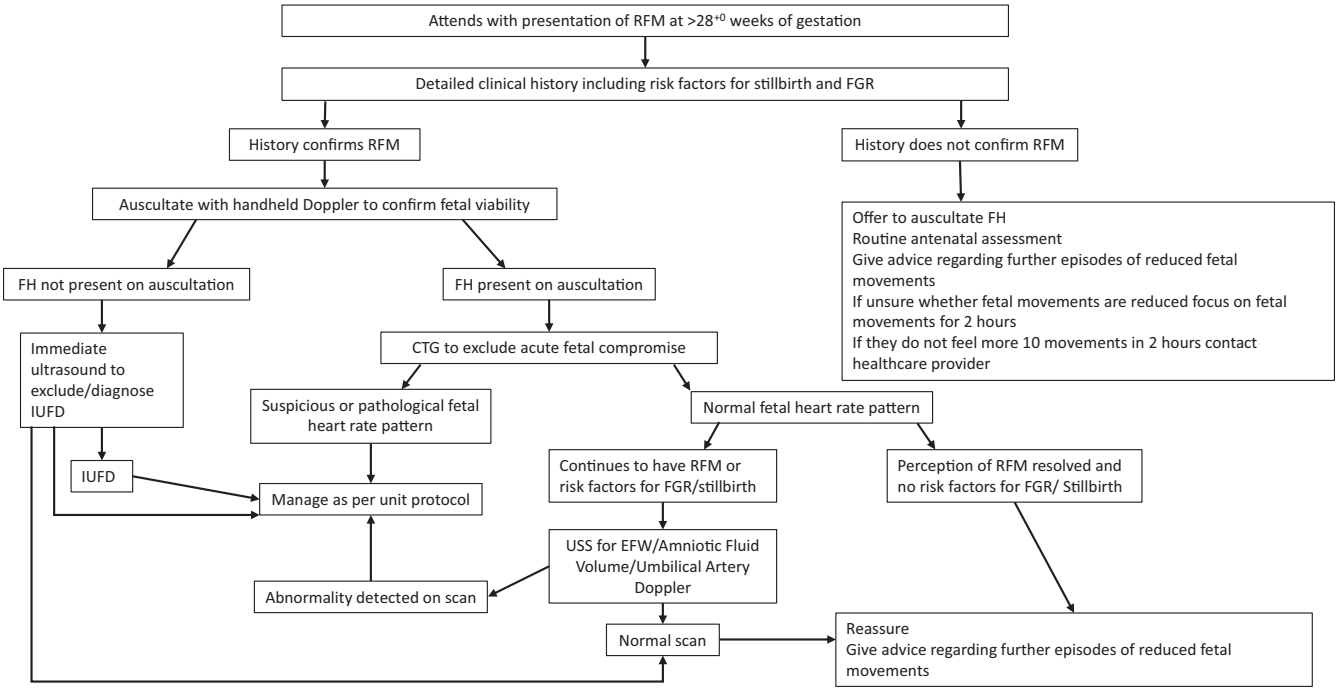
Appendix C

Care Pathway for Women With RFM



RFM, reduced fetal movements; FGR, fetal growth restrictions; IUFD, intrauterine fetal death; FH, fetal heart; CTG, computerised cardiotocograph; EFW, estimate fetal weight; USS, ultrasound scan.

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