international stillbirth alliance

ISA Position Statement: Fetal Movement Monitoring

Version 2, June 2017

Prenatal surveillance by detection and management of decreased (reduced) fetal movements[1]

1. The aim of prenatal surveillance

The aim of prenatal surveillance is to identify women at increased risk for stillbirth and other complications in order to improve the baby's chances of survival, while encouraging a balanced approach to testing and intervention.

2. Purpose of this statement

Stillbirth is a tragedy for parents and families with far reaching psychosocial impact[1], affecting over 2.6 million families worldwide annually[2]. Stillbirths are often preceded by maternal perception of decreased fetal movement (DFM) either in strength or frequency. DFM is also strongly linked to other adverse perinatal outcomes such as neurodevelopmental disability, infection, feto-maternal haemorrhage (FMH), emergency delivery, umbilical cord complications, small for gestational age (SGA) and fetal growth restriction (FGR)[3].

The purpose of this statement is to assist countries around the world in reducing stillbirth after 28 weeks gestation through better detection and management of women with decreased fetal movements.

While DFM is a common cause for concern for women during pregnancy[4] most women experiencing DFM will have a healthy baby and the majority without the need for obstetric intervention. While early delivery may be warranted for some women depending on the outcome of the clinical evaluation, the risks and benefits of early delivery for the baby and the mother need to be carefully considered.

3. Summary of what is known about the detection and management of decreased fetal movements

DFM has long been proposed as a screening tool for stillbirth[5]. While the vast majority of women who perceive DFM do not experience adverse pregnancy outcomes, in general, the risk of stillbirth is increased and may be four times that of women who do not report DFM after 28 weeks gestation[6].

Many women who have concerns about DFM delay telling their health care provider; therefore, a critical window is lost to intervene and potentially avoid adverse outcome. In a recent international survey, women who had a stillbirth were less likely to be informed about the importance of being

[1] In some countries, "decreased" fetal movement is referred to as "reduced" fetal movement.

aware of their baby's movements and of the significance of DFM[7]. Women need to be informed about the importance of being aware of baby's movements and reminded at each antenatal visit. In a recent survey of women in late gestation, around 40% did not recall receiving any information about DFM, and they wanted written as well as verbal information which was trustworthy[8]. Raising awareness of DFM is an essential part of antenatal care which may in fact reduce a woman's anxiety[9].

Research to date has not identified a robust definition of DFM based on the number of movements the woman feels over a certain time period[10]. While the most accepted definition is 10 movements in 2 hours[10], fetal movement counting where the woman records the number of kicks felt over a period of time (kick counting) has not been shown to reduce stillbirth[9]. Still, a woman may find kick counting helpful to become more aware of her own baby's movement patterns.

A woman's perception of a reduction in either strength or frequency of movements remains the best definition of DFM (overriding any definition using counting of movements) and should be regarded as a sign of a potentially at-risk pregnancy[3]. Some women also report other changes in movements before their baby was stillborn, such as sudden fluttering or brisk, almost violent, movements[7,11,12]. While there is limited research on the association with such movements and subsequent stillbirth, health care providers should consider further clinical evaluation to investigate a woman's concerns about any changes in her baby's movements.

Since most women hear from others that the baby "slows down before birth", it is natural for them to believe that a slowing of fetal movement toward the end of pregnancy is normal. However, while the nature of fetal movements may change due to restricted space at term, an actual reduction in the strength or frequency is not considered normal[10].

While further research to identify the optimal management of women with DFM is needed[13], a detailed clinical evaluation should be undertaken as soon as possible. Unfortunately, the clinical management of women with DFM is often insufficient[6], and advice to women may be inconsistent or outdated[14]. There is no evidence base to the advice commonly given to women to have a sweet drink and call back if still concerned. Women who are concerned about fetal movements should always be asked to come into hospital to be assessed.

While most women experiencing DFM will have a healthy baby without the need for obstetric intervention, early delivery may be warranted for some women depending on the outcome of the clinical evaluation. However, the risks of increased morbidity and mortality associated with iatrogenic preterm birth are well documented[15,16]. Even at term, there is an increased risk of short- and longer-term health[17] and neuro developmental[18] problems for the baby with planned early birth without medical indication (i.e. 37-38 weeks compared with 39-40 weeks). Therefore the need for planning birth before 39 weeks should be carefully considered. Maternal complications associated with obstetric intervention (induction of labour or planned caesarean section) are an important consideration[18].

There is indirect evidence that the stillbirth rate decreases in populations where mothers are informed about DFM and clinicians are encouraged to follow a management protocol[19]. It is hoped that the results of ongoing large-scale controlled trials in this area will clarify the role of raising awareness combined with clinical management protocols for DFM (see Item 6 below).

For a full synthesis of the evidence, please refer to the clinical practice guidelines from the Royal College of Obstetricians and Gynaecologists (RCOG) and the Perinatal Society of Australia and New Zealand (PSANZ).

4. Best practice points

- All women should be given written and verbal information about normal fetal activity during the prenatal period and advised to get to know their baby's daily movement patterns. If a woman perceives reduction in the strength or frequency of her baby's movements, she should contact her health care provider that day or night. Most babies have developed a pattern of movement by 28 weeks (start of the third trimester), which helps the pregnant mother to notice changes. Please refer to information brochures for women from RCOG and PSANZ (which have been translated into multiple languages).

- Women with DFM should be seen promptly by their health care provider, who should undertake a thorough evaluation, and on the basis of findings, formulate a plan of care. The goal of the evaluation is to rule out urgently, imminent or recent fetal demise (stillbirth) and to assess for common risk factors such as fetal growth restriction and decreasing placental function. The following assessment is recommended for all women with DFM:
  - Identify maternal risk factors for stillbirth or fetal growth restriction and follow local protocols for care if these are present (See Table 1);
  - Exclude pathology through testing: fetal death (Ultrasound/Doppler) or non-reassuring fetal status (CTG), fetal growth restriction and other abnormalities (clinical or ultrasound assessment);
  - On the basis of the above, formulate an individualized management plan using principles of shared-decision making;
  - After review, women who do not have abnormalities detected, and if the baby's movements return to normal, should be informed to attend again if concerned about her baby's movements.

  If a diagnosis of fetal death is made, the woman should be provided compassionate, respectful care[1,20,21]. Please refer to PSANZ Perinatal Mortality guidelines.

- Ongoing management will depend on the individual clinical situation but includes:
  - Specific care where complications are identified;
  - Closer surveillance and consideration of the risks and benefits of early delivery, particularly for women with persistent DFM where no cause is identified. Women should be given appropriate information to enhance shared decision making.

- Women should be encouraged to trust their instincts; if concerned about a reduction in the strength or frequency movements, women should tell their health care provider that day or night. Women with continued DFM require ongoing evaluation and should not hesitate to continue to report their concerns about DFM to their health care provider.

- Some women may find kick counting helpful in keeping track of the baby's movements. For women who decide to do so, the following is provided as a guide: Wait until the baby begins a "wake cycle", lie down on your side and count how long it takes the baby to move 10 times; rolling and wiggling count, not counting hiccups. This should usually take only 10-30 minutes. If she perceives decreased fetal movements and it takes longer than 2 hours to count 10 movements, she should contact her health care provider immediately, not waiting until the next day. However, regardless of the results of counting the kicks, if a woman is concerned about a reduction in the strength or frequency of fetal movements, she should contact her health care provider immediately.

5. Research gaps

We concur with the recommendation from the Cochrane review authors[9] on future research in the area of fetal movement monitoring, including: assessing the sensitivity and specificity of fetal movement counting in detecting fetal compromise; its effectiveness in decreasing perinatal mortality in high-risk and low-risk women; and its acceptability and ease of use by women.

Further research is also needed to determine the optimal management strategy for women with DFM[13] and the role of strategies to raise awareness of DFM and to increase understanding about the significance of a sudden increase in fetal movements.

6. Ongoing research

A number of studies are underway internationally to contribute to the body of knowledge on DFM. The AFFIRM study based in the UK is addressing whether standardized information and management for DFM can reduce stillbirth. (Trial registration number NCT01777022). The My Baby's Movements study in Australia and New Zealand is assessing whether a mobile phone intervention for women and an educational program for clinicians can reduce stillbirths (Trial registration number ACTRN12614000291684).

7. Further reading

For further reading please see guidelines from the Royal College of Obstetricians and Gynaecologists (RCOG) and the Perinatal Society of Australia and New Zealand (PSANZ).

8. Development of this Statement and Consultation

This is the first update of the statement first produced in December 2009 after broad consultation with ISA member organizations.

9. What has changed in this update

The major recommendations from the previous version of this position statement (December 2009) remain unchanged. The statement has been updated to include current evidence.

10. Planned revisions

This position statement will be revised in 2018 or earlier, if required, based on new evidence becoming available.

11. Feedback welcome

Please click here to send comments to ISA for consideration in the next update, or contact Prof Vicki Flenady: vicki.flenady@mater.uq.edu.au.

12. Acknowledgements

This position statement was developed by a working party of the ISA Scientific Committee including parents, health care providers and researchers, as follows: Victoria Bowring (Stillbirth Foundation Australia; PSANZ), Jillian Cassidy (Umamanita; ISA), Lisa McArthur Daly (Stillbirth CRE), Guilherme de Jesús (Universidade do Estado do Rio de Janeiro), David Ellwood (Griffith University; ISA), Jan Jaap Erwich (University of Groningen; ISA), Fernando Maia Peixoto Filho (Universidade do Estado do Rio de Janeiro), Vicki Flenady (Stillbirth CRE; ISA), Ruth Fretts (Harvard Medical School; ISA), Frederik Frøen (Norwegian Institute of Public Health) Glenn Gardener (Mater Mothers' Hospital; ISA), Katy Gold (University of Michigan; ISA), Mechthild M. Gross (Hannover Medical School), Alexander Heazell (University of Manchester; ISA), Sarah Henry (Stillbirth CRE), Susannah Leisher (Columbia University; ISA), Margaret Murphy (University College Cork; ISA), Veronica Pingray (Hospital Posadas, Buenos Aires), Dimitrios Siassakos (Bristol University; ISA), Robert Silver (University of Utah; ISA), Jessica Ruidiaz (Era en Abril; ISA), Claire Storey (Bristol University; ISA), Jane Warland (University of South Australia), and Aleena Wojcieszek (Stillbirth CRE; ISA). We acknowledge those who contributed to the previous version of the statement released in 2009, as follows: Stephanie Fukui, Sherokee Ilse, Anais Gschwind.

13. Contributing organizations

NHMRC Centre of Research Excellence in Stillbirth
www.stillbirth.centre.uq.edu.au

Stillbirth Foundation Australia
www.stillbirthfoundation.org.au

Mater Research Institute - The University of Queensland
www.research.mater.org.au

Perinatal Society of Australia and New Zealand
https://psanz.com.au/

Umamanita
http://www.umamanita.es/

Norwegian Institute of Public Health
https://www.fhi.no/en/

North Bristol NHS Trust
https://www.nbt.nhs.uk/

University of Bristol
http://www.bristol.ac.uk/

PErinatal And Reproductive Loss research hub

University of South Australia
https://www.unisa.edu.au/

Hannover Medical School
https://www.mh-hannover.de/

University College Cork, Ireland
https://www.ucc.ie/

Ciao Lapo Onlus
http://www.ciaolapo.it/

Table 1. Risk factors for stillbirth

	High Income Countries[β]		Globally[±]	
Factor	**aOR (95% CI)[Σ]**	**PAR % ***	**aOR range**	**PAR %***
Demographic and fertility				
Maternal age (reference <35)[¥]				
35-39	1.5 (1.2-1.7)	-	-	-
40-44	1.8 (1.4-2.3)	-	-	-
≥45	2.9 (1.9-4.4)	-	-	-
>35	1.7 (1.6-1.7)	12	1.7 (1.6-1.7)[β]	6.7
Low education	1.7 (1.4-2.0)	4.9	-	-
Low socioeconomic status	1.2 (1.0-1.4)	9.0	-	-
No antenatal care	3.3 (3.1-3.6)	0.7	-	-
ART (singleton pregnancy)	2.7 (1.6-4.7)	3.1	-	-
Primiparity	1.4 (1.3-1.4)	15	-	-
Previous stillbirth	3.4 (2.6–4.4)[π]	1[π]		
Ethnicity. While an important risk factor for women (often double the risk their counterparts), reported aOR vary (please refer to footnote)[±]				
Non-communicable disease and obesity				
BMI (kg/m^2)[€]				
25-30	1.2 (1.1-1.4)	-	1.2 (1.1-1.4)[β]	-
>40	2.1 (1.6–2.7			
>30	1.6 (1.4-2.0)	-	1.6 (1.4-2.0)[β]	-
>25		8-18		10
Pre-existing diabetes	2.9 (2.1-4.1)	2-3	2.9 (2.1-4.1)[β]	7.6
Pre-existing hypertension	2.6 (2.1-3.1)	5-10	2.6 (2.1-3.1)[β]	10.4
Pre-eclampsia	1.6 (1.1-2.2)	3.1	1.6 (1.1-2.2)[β]	2.6
Eclampsia	2.2 (1.5-3.2)	0.1	2.2 (1.5-3.2)[β]	2.1
Fetal factors				
SGA (<10 centile)	3.9 (3.0-5.1)	23.3	-	-
Post-term pregnancy (≥42 weeks)	1.3 (1.1-1.7)	0.3	3.3 (1.0-11.1)	14.0
Rhesus disease	2.6 (2.0-3.2)[±]	0.6[±]	2.6 (2.0-3.2)	0.7
Infection	-	-		
Malaria	-	-	2.3 (0.8-6.7)	8
Syphilis	-	-	10.9 (6.6-17.9)	7.7
HIV	-	-	1.2 (1.2-2.2)	0.3
Lifestyle factors				
Smoking	1.4 (1.4-1.3)	4-7	1.5 (1.4-1.6)	1.6
Illicit drug use	1.9 (1.2-3.0)	2.1	-	-

Notes:
[Σ]adjusted odds ratio (95% Confidence Interval); *Population Attributable Risk (indicates the proportion of cases that would not occur *in a population* if the factor were eliminated); [¥] Reference < 35 years of age; [€] Reference BMI < 25. Source: Unless otherwise stated: [β] Flenady V, Koopmans L, Middleton P, et al. Major risk factors for stillbirth in high-income countries: a systematic review and meta-analysis. The Lancet 2011; 377(9774): 1331-40;

and ±Lawn JE, Blencowe H, Waiswa P et al. Stillbirths: Stillbirths: rates, risk factors and potential for progress towards 2030. Lancet 2016; 387: 587–603; π sourced from Lamont K, Scott NW, Jones GT, Bhattacharya S. Risk of recurrent stillbirth: systematic review and meta-analysis. BMJ 2015; 350: h3080. PAR calculated by chapter authors using a prevalence of 0.05%.(V Flenady).

± Excerpt from Flenady V, Koopmans L, Middleton P, et al. Major risk factors for stillbirth in high-income countries: a systematic review and meta-analysis. The Lancet 2011; 377(9774): 1331-40. Supplementary webappendix

Ethnicity:

While population estimates show that Indigenous Australian women have almost twice the rate of stillbirth of non-Indigenous women[22], meta-analysis of three studies[23-25] showed that Australian Indigenous status (Aboriginal & Torres Strait Islander) was not independently associated with stillbirth (aOR 1.03, 95% CI 0.88-1.21) (Web Figure 2). Similarly, no association was found in two studies on unexplained stillbirth in Australia[24,26]. One study from New Zealand[27] found no association between Maori status and stillbirth. However, Pacific women in this study did have an increased risk of stillbirth of almost 30% (aOR 1.26, 95% CI 1.01-1.60). One study[28] showed that Indigenous status in the US was an independent predictor of stillbirth (aOR 1.50, 95% CI 1.29-1.75). A number of studies have shown the independent association of African American race and stillbirth in the United States[28-34]. In four studies[33,35-37] which fulfilled our inclusion criteria there were conflicting results. Guendelman *et al*[33] reported an aOR of 2.40 (95% CI 1.77-3.26) in a large study of 80431 women conducted from 1984 to 1989, whereas Wingate *et al*[35] reporting a series over the years 1995 to 1999 reported no association (aOR 1.01, 95% CI 0.98-1.04). An increased risk of stillbirth (aOR 2.02, 95% CI 1.63-2.51) in the second pregnancy in women over 30 years was reported by Nabukera *et al*[37] and Salihu *et al*[36] found a difference in the effects of low prepregnancy BMI (<18.5) on late stillbirth (> 28 weeks) risk between African American and White women compared to their normal weight counterparts. Similar to overall stillbirth, meta-analysis of two Australian studies[24,26] showed Indigenous status was not associated with unexplained stillbirth (aOR 1.08, 95% CI 0.57 – 2.02).

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