



Evolution of the Theses



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\ 'thē-səs:

“an idea or proposition for consideration, especially one to be discussed, explored or investigated...”

Monitoring fetal movement to assess fetal well-being

The ‘Evolution of the Theses’ series aims to explore the evolution of knowledge in different areas of midwifery and maternal health care, and consider the published research evidence which has led to practices, recommendations and interventions in a variety of areas. We have used avatars and a conversational style of writing to compare the perspectives of a midwife and an information professional.

Introduction

Historically, fetal movement has been used by women and health professionals to assess and monitor the well-being of babies *in utero*, and it has been reported that written reference was made to an absence of fetal movement as an indicator of fetal death as early as 1545 (Frøen 2004), by Thomas Raynalde in his book *The Byrth of Mankynde*. Before ultrasound technology was developed, midwives would ask women about ‘quickening’ — the first time they had felt the baby move — and date the

woman’s pregnancy from information that only the woman could provide (Duden 1993). In the 1970s the development of ultrasound techniques allowed for examination of fetal movement, among many other elements of fetal well-being, and various movements have recently been classified into different groups, such as: sideways bending; startle reflexes; leg, arm and head movements; twitches; jaw movements including sucking and swallowing; hand-to-face contact; stretching; and rotation of the fetus (Rådestad & Lindgren 2012:113).



During 2012 I noticed an increase in research studies, papers and commentaries on monitoring fetal movement to assess fetal well-being. Following their Green-top Guideline on reduced fetal movement (Whitworth *et al* 2011), the UK's Royal College of Obstetricians and Gynaecologists (RCOG) published a 'patient' information leaflet (RCOG 2012) for women, offering guidance on what to expect from their baby's movements; a new Cochrane review was released examining the management of decreased fetal movement in pregnancy (Hofmeyr & Novikova 2012); and a large RCT on fetal movement counting was completed, which resulted in three separate papers (Saastad *et al* 2011a, 2011b, 2012). Once I began to examine the literature more closely, I could see that this research interest seemed more like a resurgence, after a few years of decline.



I'm also interested in the idea within the literature that there is value in using women's perceptions of their baby's movements as a way of monitoring fetal well-being. Contextually, it is likely that even women in ancient times may have linked feeling their baby move to a sense of well-being about their baby's health *in utero*. There isn't any evidence that I know of, but it is hard to imagine that fetal movement wouldn't have been a major feature of conversation during pregnancy, especially in pre-literate societies. As many social scientists (Oakley 1984, Murphy-Lawless 1998, Kitzinger 2005) have discussed, before the relatively recent advent of pregnancy testing, ultrasound and similar technologies, a woman's experience of physical sensations and symptoms was the main source of information that caregivers could access about pregnancy; which meant that women were an important source of knowledge. It might sound obvious to say, but the pregnancy was hidden away inside the woman. While midwives could feel the baby's position with their fingers or hands, and listen with their ears, if a midwife really wanted to know how the baby was moving, or what the woman could feel, she had to ask the woman about her experience. These days, the necessity and arguably the value of a woman's own experience of pregnancy has been vastly reduced by these technologies, which have exposed many aspects of fetal development.



But has the technology actually reduced a woman's experience of pregnancy, or do women see it as complementary to their own feelings and sensations? Perhaps a scan photo provides a visual image that strengthens women's connection to their baby, rather than devaluing it? A small-scale research study from the US earlier this year (de Jong-Pleij *et al* 2013) suggested that the use of ultrasound, whether it was two-, three-, or four-dimensional, did improve maternal bonding during the third trimester of pregnancy.



I take your point, but I'm not sure we will ever know that for sure. I'm not necessarily saying that we should go back to the days before those technologies and I understand that most women like and want them and see the positive consequences of them, but our focus on them does have the potential to devalue women's intuitive and bodily knowledge. I still think we should be mindful of the disadvantages (and, frankly, disconnections) that are the result of our increased reliance on technology as well as the advantages.

The evolution of the research

Within the literature, interest in the counting of fetal movements peaked in the 1970s and 1980s, after several research papers suggested that the use of counting charts reduced the rate of stillbirth (Mathews 1973, Sadovsky & Yaffe 1973, Pearson & Weaver 1976, Moore & Piacquadio 1989). It was thought that, because women whose babies had died *in utero* often said that they hadn't felt their baby move for a day or more, it might be possible to save some of these babies if women monitored their baby's movements and reported any decrease immediately.

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From talking to colleagues I understand that, during the 1970s and 1980s, many midwives would ask women to count their baby's movements as pregnancy progressed, and to call the midwife if they were concerned (a number of different methods of counting were in use, and these are outlined in Table 1). Yet, in the UK at least, the movement towards evidence-based practice was underway, and people began to question and seek to evaluate the practice of formal fetal movement counting, which was effectively a screening test for fetal well-being. Although it is comparatively non-invasive as a screening test, we didn't know if counting charts actually prevented stillbirth (and if so, how they needed to be used in order to maximise their effectiveness) and there were (and continue to be) concerns that they may increase anxiety in some women, so it was important to establish whether formal fetal movement counting was of worth.

Some of the early studies (Neldam 1980, 1983) showed promising results, while another non-randomised trial showed no effect (Lobb *et al* 1985). None of these trials employed methods which would later meet the standard for inclusion in the Cochrane review (Mangesi *et al* 2007). In 1989 a large randomised controlled trial was published in *The Lancet* (Grant *et al* 1989) which concluded that the use of fetal movement counting charts **did not** reduce rates of perinatal mortality.

The results of the Grant *et al* (1989) study have been held responsible — by some — for the waning research interest in using fetal movement to assess fetal well-being (Frøen 2004). The number of original research studies on the use of fetal movement counting began to drop off during the 1990s. Most of the published research started to suggest that assessment of fetal well-being through the monitoring of movements should be based more on qualitative maternal perception (Fai *et al* 1996) and less on a quantitative recording method; that concerns should be taken seriously from the first maternal report of decreased fetal movement (Dubiel *et al* 1997); and that further research should consider other methods of monitoring fetal well-being.

However, during the first decade of the new century, the researcher J. Frederik Frøen, a prolific publisher within the field, suggested more than once that further research activity was required to further optimise the potential benefits of fetal movement counting. Others have suggested that the wide variations found within clinical practice for the management of decreased or reduced fetal movement is a neglected research topic (Marchant 2008). In 2007 a Cochrane review was published (Mangesi *et al* 2007) which examined four trials of fetal movement counting (Grant *et al* 1989, Thomsen 1990, Freda 1993, Gomez 2003) and concluded that:

'This review does not provide enough evidence to influence practice. In particular, no trials compared fetal movement counting with no fetal movement counting. Robust research is needed in this area' (Mangesi *et al* 2007:1).

However, the age of the Cochrane review means that research published since 2007 has not been included, particularly that of Saastad *et al* and Frøen. Frøen (2004) in particular has published prolifically on why the Grant *et al* (1989) study was methodologically flawed and does not deserve to be as influential as it is, arguing that:

- The focus of the Grant *et al* study was on fetal death, while more common adverse obstetric and neonatal outcomes were left unreported.
- The cluster randomisation method used raised a number of questions, including that most clusters were paired 'within-hospital'. Frøen argued that, as 60% of women within the control group were informed about their inclusion in a study on fetal movement counting, this could have caused them to focus more on their baby's movement than they might have done, which would mean that it could be difficult to see any difference between the two groups.
- In the counting group, about 10% of unexplained late fetal deaths were successfully predicted by the charts, but none of the babies were rescued in hospital due to false reassurance from cardiotocography or clinical error. Frøen contends that an alternative conclusion to this finding would be: *'10% of unexplained late fetal deaths were successfully predicted by the chart and the baby admitted to the hospital alive'* (2004:15).
- Frøen argues that the RCT drew huge attention to the importance of fetal movements from hospitals, community midwives and general practitioners, which meant that increased vigilance within a population could not be accurately recorded — as vigilance was increased *throughout* the population. It may also be important to note that, while women in the control group were not asked to count movements as a matter of routine, obstetricians caring for women in the control group could still give charts to those women who they felt might benefit from counting fetal movements.

The current position

In the first Green-top Guideline on reduced fetal movements (Whitworth *et al* 2011), the RCOG acknowledged the paucity of evidence on fetal movement counting and the limitations of the evidence that was used to produce the guidelines. Whitworth *et al* (2011) cite research which has shown that fetal movement can be affected by a number of factors: the position of the placenta, the woman's activity levels, opioid-type drugs, the level of carbon dioxide in maternal blood, the presence of fetal abnormalities, and fetal position in the womb. It has been widely accepted that women perceive the most fetal movements when lying down, fewer when sitting and fewest while standing (Whitworth *et al* 2011:3). All these factors, and the wide variation in how babies move in the womb, have made it difficult to specifically quantify how often and in what way babies 'should' be moving *in utero*.

Nearly all of the most recent studies have thus suggested that there is not a specific limit for identifying decreased fetal movements, but that health care professionals should instead rely upon the woman's perception and awareness of fetal movements to identify any cause for concern (Berbey *et al* 2001, Frøen 2004, Heazell & Frøen 2008, Frøen *et al* 2009, Tveit *et al* 2009). Reviewing Tveit *et al* 2009, a commentary in *MIDIRS Midwifery Digest* suggested that: '*Formal movement counting is no longer considered of value, and this study, like others (Heazell & Froen 2008), suggests a beneficial need for raising maternal awareness of fetal movements*' (Ford 2010:196).

The importance of raising maternal awareness of fetal movements was formalised last year in a 'patient' information leaflet from the RCOG, which emphasised that (their bold, not ours):

*'There is no specific number of movements which is normal. During your pregnancy, you need to be aware of **your** baby's individual pattern of movements. A reduction or a change in **your** baby's movements is what is important'* (RCOG 2012:2).

Table 1. Descriptions of formal fetal movement counting

Various methods of counting were proposed by different researchers, most of which could be divided into two main schools of thought: the 'daily fetal movement count' (often called the Sadovsky method, where women were asked to count fetal movements within a fixed time period) and the 'count-to-ten' method (where women were asked to record the number of times their baby moved and at what time this movement occurred). Confusingly for all it seems, attempts were made to refine and/or combine these methods, and a Cochrane review (Mangesi *et al* 2007) made a valiant effort to clarify the various methods used in the published literature:

Method	Description
Cardiff Method	A method of fetal movement counting where a woman monitors the first 10 movements and indicates when the movements were felt (Freda <i>et al</i> 1993).
Modified Cardiff Method	1. Women were to record the time taken to feel 10 fetal movements on a modified Cardiff 'count to ten' chart. Women had to count as early in the day as was convenient for them (Grant <i>et al</i> 1989). 2. Women were counting fetal movements daily on a modified 'count to ten' chart indicating the time required to experience 10 consecutive movements. All women were to count in the evening (Thomsen <i>et al</i> 1990).
Sadovsky Method	Women were requested to count the first four movements after each meal, indicate each movement with an X and stop counting (Freda <i>et al</i> 1993).
Fetal Movement Chart	Fetal movements are recorded during 30 minutes after meals and before bedtime at night. Ten or more fetal movements per day are considered normal (Gomez <i>et al</i> 2003).
'Count-to-ten' Chart	A chart that a woman uses to record the number of times and the times of day her baby moved (Freda <i>et al</i> 1993).

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When a midwife asks a woman during an antenatal appointment, 'are you experiencing good fetal movement?', how is a woman supposed to know what that means? It's a very subjective measure which leaves a lot to interpretation.



Exactly. It's a bit like when we say to a woman in a booking visit, 'was that a normal period?' How on earth do we know that our idea of a 'normal period' is the same as that woman's?! So we have to be very clear on what we mean, but if we are to follow the model outlined above then we also need to make sure we're not being too prescriptive.



So how could this be phrased more appropriately?



One phrase I use sometimes is 'normal for you and your baby' and I might talk to some women about how they might observe what is normal for their baby and then use that as a kind of baseline, but then I also talk about how normal is a range, not a set point. This is where anxiety can occur if we're not careful, I think, because we need to make sure we're being clear and specific (where possible) but it is easy to go overboard and say so much that women get worried that they're not doing it 'right'.



But is it ok for the RCOG to shift responsibility for monitoring fetal movement on to the woman? Is this part of a wider trend within health care to make individuals responsible for their own health and therefore that of their unborn child?



Well I understand your first question, and it's a very valid one, but I think we need to look at it from a slightly different angle, because it's not about professional laziness. The move towards informing women of the importance of monitoring movement (Warland 2013) is partly because we know that, in many cases where babies had died *in utero*, the woman had not felt the baby move for a day or two beforehand. It isn't possible for midwives to see women every day (and I imagine women wouldn't want that either!) so the only way to have the baby's movement monitored on a daily basis is to ask women to do it themselves. But we do, as mentioned above, need to evaluate this kind of monitoring properly and determine whether it is actually beneficial. We also need to bear the wider context in mind while we strive to find better approaches in this area. For instance, as Frøen (2004) showed, many women whose babies die had already expressed concern to a health professional or taken themselves to hospital because they were worried, so we need to prioritise the importance of listening to women's intuition, even (or perhaps especially) when it is at odds with the result of technological monitoring. But at the same time, we must make sure we do not fall into the trap of thinking that the loss of a baby is a woman's fault or responsibility because, sadly, some babies just cannot be saved no matter what we, as midwives, or women, do — or however carefully we monitor pregnancy.

Since the RCOG guideline was published, a large RCT has been completed by Saastad *et al* and has resulted in three published papers — exploring the effects of fetal movement counting on maternal-fetal attachment (Saastad *et al* 2011a), exploring whether fetal movement counting increases maternal concern (Saastad *et al* 2012), and exploring whether fetal movement counting improves the identification of fetal risk (Saastad *et al* 2011b).

Saastad *et al* concluded that fetal movement counting, performed by women in the third trimester of pregnancy, did not improve maternal-fetal attachment in the antenatal period (Saastad *et al* 2011a:282) but — contrary to previous suggestions elsewhere in the literature (Mikhail *et al* 1991) — fetal movement counting did not increase maternal concern levels (Saastad *et al* 2012:10). Saastad *et al* (2012) also found that 79% of the women in their study considered the use of a counting chart to be positive.



So the results from Saastad *et al* (2012) suggest to me that enhancing maternal awareness of what to expect from their baby's movements actually proved reassuring for the women in the study.



Yes, although I can't help but think we need to do more research where we sit down with lots of women — from a range of geographical and sociodemographic areas — and really explore this with them, starting with a very open question from the perspective of 'what would you like in this area?' rather than 'this is what we want to do, how does it make you feel?'. It's all well and good to ask women about 'what is' but it is even more important to ask about 'what could be'.



In their second published paper, Saastad *et al* (2011b) found that more growth-restricted babies were identified by women who performed fetal movement counting from 28 weeks' gestation onwards. They argued that: '*identification of fetal growth restriction is of great importance; as growth restricted fetuses who are undetected antenatally have a higher mortality than those that are detected prior to delivery*' (2011b:7). Saastad *et al* argued that giving uniform information to the women in their study also reduced the incidence of delayed reporting of decreased fetal movement.



This again raises the rather obvious question of whether women need a specific quantitative test to perform on their baby's movement or whether simply finding ways to (a) facilitate a woman's connection with her baby (which may have been affected by the modern emphasis on using technology to assess fetal well-being), and (b) let a woman know, without causing undue anxiety, that she needs to contact her care provider immediately if she has any concerns with regard to a change in fetal movement.



Yes, I agree — I remember that a study from last year (Erlandsson *et al* 2012) found that 64% of women who suffered a stillbirth had had a 'feeling' that their unborn baby may be unwell, which reinforces the importance of taking women's concerns seriously.



As I mentioned earlier, it may also be important to modify the language that we are using. Rådestad & Lindgren (2012) explored women's perceptions of fetal movements in full-term pregnancy and found within their study population a widespread myth that fetal movements will decrease towards the end of a pregnancy. They suggest that this myth may not be helped by health care professionals asking 'have you felt the baby kicking?' when the movements towards the end of a pregnancy may feel more like large rolls, glides or internal pressure. Rådestad & Lindgren defined seven categories of fetal movement: '*strong and powerful, large, slow, stretching, side to side, light and startled*' (2012:114). Equally, women with babies in certain positions may feel very different kinds of movement so again, we need to retain an emphasis on individual experience.



Perhaps we should be moving away from a quantitative recording of fetal 'kicks', or a tick in the 'good' fetal movement box of the antenatal appointment booklet, and towards a qualitative recording of how a woman experiences her baby's movement.



Well this is the big question that, unfortunately, the current research doesn't answer. But from another angle and to follow on from my comments at the beginning of this article, I think it's really important for us as midwives to acknowledge and honour that women have knowledge about their baby's well-being which we may never be able to access or measure, but that just because something isn't available for external monitoring doesn't mean it isn't important.



I know the concept of 'mindfulness' has been around in modern psychology since the 1970s and it was also recently explored in connection to antenatal education (Fisher *et al* 2012), but I am also interested in Rådestad's proposal that, by encouraging women to connect with their babies during pregnancy, this would also enable them to be more sensitive towards any changes in movement that deviates from their normal. She acknowledges that such a change in thinking would not happen quickly, stating: '*To learn to develop self confidence and to dare to rely on what one feels and on one's own intuition, takes time*' (Rådestad 2012:59).

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“On a wider level, and given that women may be picking up the underlying message from society that technology is better at assessing their baby’s well-being than they are, this kind of approach may serve to increase women’s confidence in their own knowledge, which may have subsequent beneficial effects for their experience of labour, birth and parenting”

Conclusion

As is often the case within maternal health services, one piece of research has had a profound and lasting effect which is quite out of proportion to its quality and usefulness. The well-intentioned but methodologically lacking Grant *et al* (1989) study has somehow been taken as the last word by many and its results have been taken as showing ‘evidence of no effect’ when it is more appropriate to say that there was ‘no evidence of effect’. At the current time, we do not have enough evidence to say that kick charts and other methods of formal fetal movement counting **don’t** work. It may be that more rigorously designed studies would help us to explore that question, although it is important to consider that it would be hard for any new study to get around the fact that many women are aware of the value of monitoring their baby’s movements, and so it would be hard (and potentially unethical) to put in place a control group that paid no attention to fetal well-being. Although a recent study by Pakenham *et al* (2013) found some variation in the professional advice given on fetal movement, most of the women (who were between 37 and 40 weeks’ gestation when asked) were aware of the use of fetal movement counting. It is also very difficult to imagine such a trial taking place in today’s risk-based climate.

Whatever the future may hold for the use of formal fetal movement counting as a screening test, studying the evolution of this particular thesis has led us to the related conclusion that a shift away from quantitative recording of fetal movement and towards a qualitative understanding of ‘mindfetalness’ — which includes raising awareness without causing undue anxiety amongst women about the importance of reporting any change in fetal movement — could be a good way forward. This may be one of those cases where — for the reasons described in the previous paragraph — quantitative trials are not an appropriate method of knowledge-generation and we instead need to rely on the more common-sense approach of assuming that greater maternal awareness may make a difference. It is unlikely to be harmful if we can enable women to be mindful of their baby’s well-being without doing so in such a way that provokes anxiety and stress. On a wider level, and given that women may be picking up the underlying message from society that technology is better at assessing their baby’s well-being than they are, this kind of approach may serve to increase women’s confidence in their own knowledge, which may have subsequent beneficial effects for their experience of labour, birth and parenting. Whatever their approach to talking about fetal movement, midwives are ideally placed to send positive messages about the value and usefulness of women’s knowledge about their pregnancy, body and baby.

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