

More Than Just Decreased Fetal Movements

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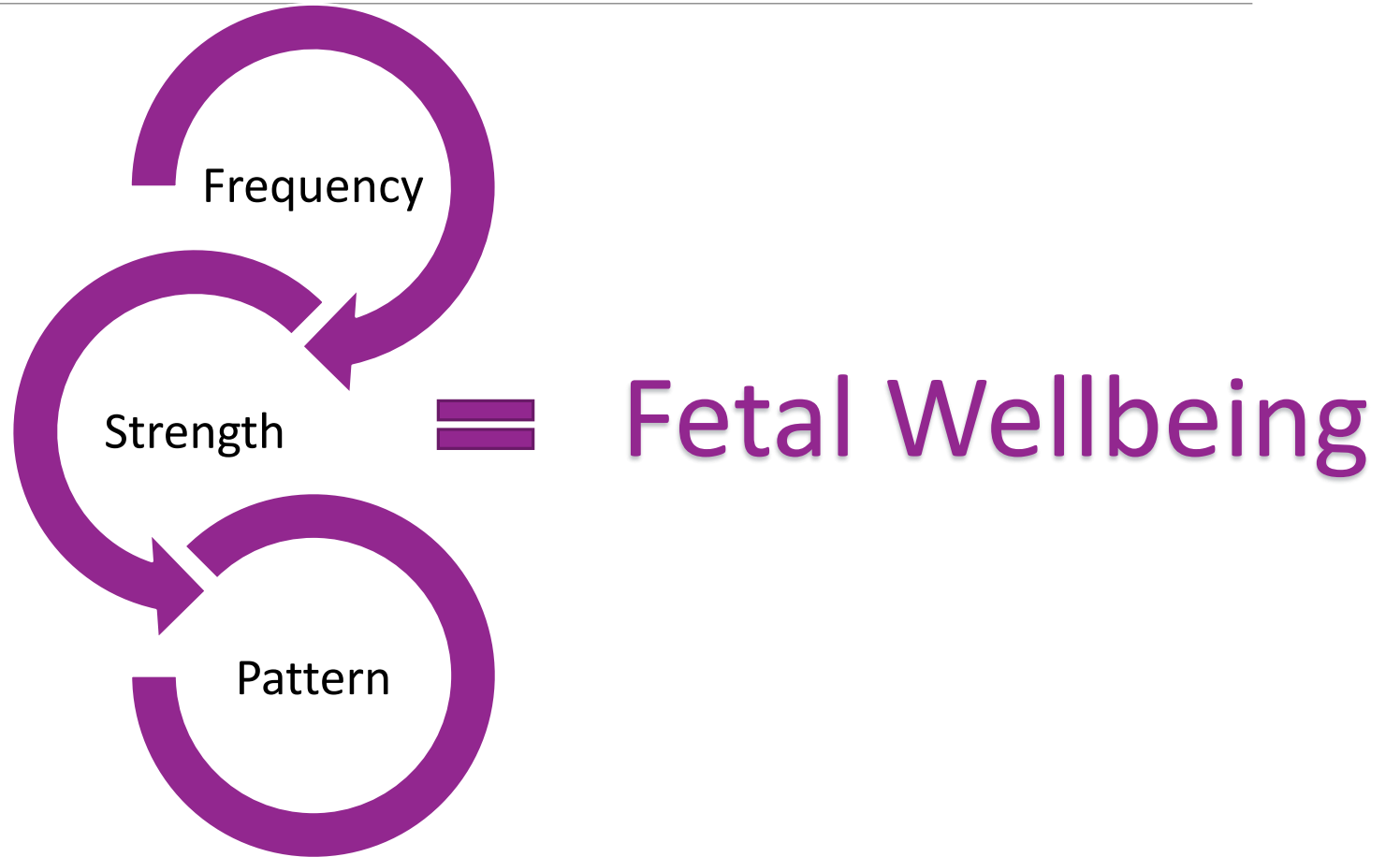


**University of
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Background

- It is well recognised that maternal perception of a decrease in frequency of fetal movements is associated with poor pregnancy outcomes including stillbirth.
- Mechanism: conserving energy

Fetal wellbeing is made up of....



Why are strength and pattern also important?





STARS Study

Online survey conducted between September 2012 and August 2014.

Cohort study design with nested case-control arm

- Cohort - 1,714 women who had experienced a stillbirth >3 weeks prior to enrolment completed the survey
- Case-control - 153 cases who had a stillbirth ≤ 3 weeks prior and 480 controls who had had a recent live birth or who were still pregnant.



[RESEARCH ARTICLE](#) | [OPEN ACCESS](#) | [OPEN PEER REVIEW](#)

An international internet survey of the experiences of 1,714 mothers with a late stillbirth: the STARS cohort study

Jane Warland , Louise M. O'Brien, Alexander E. P. Heazell, Edwin A. Mitchell and the STARS consortium



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Stillbirth is associated with perceived alterations in fetal activity – findings from an international case control study

Alexander E. P. Heazell  , Jane Warland, Tomasina Stacey, Christin Coomarasamy, Jayne Budd, Edwin A. Mitchell and Louise M. O'Brien

BMC Pregnancy and Childbirth BMC series – open, inclusive and trusted 2017 **17**:369

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STARS Study: historical cohort

Frequency of unusual fetal movement

	N (%)
	<i>N = 1,714</i>
No change in fetal movement	480 (28.0 %)
A little bit less movement	273 (15.9 %)
Significantly less movement	522 (30.5 %)
A little bit more movement	136 (7.9 %)
Significantly more movement	146 (8.5 %)
Don't remember	103 (6.0 %)
Missing	54 (3.2 %)

Change in usual pattern of movement case control



Response	Group				All		Crude OR (95% CI)	P-value
	Cases		Controls		Total	%		
	Total	%	Total	%				
Once you were aware of your baby's usual pattern of movement, was there any time your baby's movements were unusual?								
No	27	19.3	200	52.5	227	43.6	Reference	<.0001
Yes, a little bit less	35	25	96	25.2	131	25.1	2.7 (1.55, 4.72)	
Yes, significantly less	56	40	32	8.4	88	16.9	12.9 (7.17, 23.4)	
Yes, a little bit more	15	10.7	44	11.6	59	11.3	2.53 (1.24, 5.14)	
Yes, significantly more	7	5	9	2.36	16	3.07	5.76 (1.98, 16.7)	

Fetal movement at bedtime: case v control



	Group				All		Crude OR (95% CI)	p-value
	Cases		Controls					
	Total	%	Total	%	Total	%		
Did you usually feel your baby move at bedtime during this pregnancy?								
No	5	3.42	16	4.15	21	3.95	Reference	0.704
Yes	141	96.6	370	95.9	511	96.1	1.22 (0.44, 3.39)	
Did you feel your baby move at bedtime on the last night of this pregnancy?								
No	49	39.8	23	6.67	72	15.4	Reference	<.0001
Yes	74	60.2	322	93.3	396	84.6	0.11 (0.06, 0.19)	

Both stillborn mums and liveborn mums usually felt their baby move at bedtime BUT the liveborn mums were 10 times more likely to say they felt their baby moving normally on the last night of the pregnancy



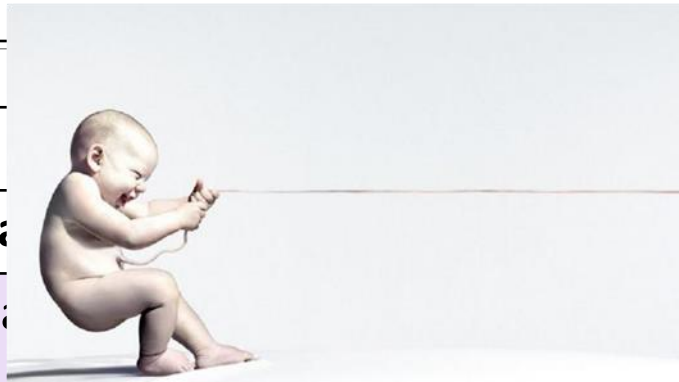
Change in strength: case v control

Response	Group				All		Crude OR (95% CI)	P-value
	Cases		Controls		Total	%		
	Total	%	Total	%				
During the last two weeks of this pregnancy, did the STRENGTH of your baby's movements...								
Stay the same	66	46.5	180	49.2	246	48.4	Reference	<.0001
Decrease	58	40.9	56	15.3	114	22.4	2.83 (1.78, 4.49)	
Increase	18	12.7	130	35.5	148	29.1	0.38 (0.21, 0.67)	

Cases were nearly 3 times more likely to report a decrease in strength whereas controls were 9 times more likely to report an increase in strength

Change in strength: case v control

"Less strong",
"Weak" 40%



"Stronger",
"Harder" 40%

Response	Cases		Controls		Total	OR	95% CI	P-value
Stay the same	66	46.5	180	49.2	246	48.4	Reference	<.0001
Decrease	58	40.9	56	15.3	114	22.4	2.83 (1.78, 4.49)	
Increase	18	12.7	130	35.5	148	29.1	0.38 (0.21, 0.67)	

Cases were nearly 3 times more likely to report a decrease in strength whereas controls were 9 times more likely to report an increase in strength



Change in vigor: case v control

Response	Group				All		Crude OR (95% CI)	P-value
	Cases		Controls					
	Total	%	Total	%	Total	%		
During the last two weeks of this pregnancy, did you notice any time that your baby was more vigorous than usual)?								
No	59	42.8	143	40.2	202	40.9	Reference	<.0001
Yes, once.	42	30.4	24	6.74	66	13.4	4.24 (2.36, 7.62)	
Yes, sometimes.	30	21.7	158	44.4	188	38.1	0.46 (0.28, 0.75)	
Yes, often.	7	5.07	31	8.71	38	7.69	0.55 (0.23, 1.31)	

Cases were 4 times more likely to report ONE episode of vigor whereas controls were more likely to report more than one

Change in vigor: cases vs controls

"Crazy", "Wild"
48% (v 1%)



"Powerful",
"Aggressive"
15% (v nil)

Response	Cases				Controls				OR (95% CI)
	n	%	Total	%	n	%	Total	%	
During the last two weeks of this pregnancy (or immediately after birth) did you notice that your baby was more vigorous than usual)?									
No	59	42.8	143	40.2	66	13.4	66	13.4	4.24 (2.36, 7.62)
Yes, once.	42	30.4	24	6.74	66	13.4	66	13.4	4.24 (2.36, 7.62)
Yes, sometimes.	30	21.7	158	44.4	188	38.1	188	38.1	0.46 (0.28, 0.75)
Yes, often.	7	5.07	31	8.71	38	7.69	38	7.69	0.55 (0.23, 1.31)
									<.0001

Cases were 4 times more likely to report ONE episode of vigor whereas controls were more likely to report more than one

Hiccups: Case v control

Response	Group				All		Crude OR (95% CI)	P-value
	Cases		Controls					
	Total	%	Total	%	Total	%		
Did you experience?								
No	28	20	69	18.1	97	18.6	Reference	0.61
Yes	112	80	313	81.9	425	81.4	0.88 (0.54, 1.43)	
How long were the episodes?								
< 5 minutes	44	40.7	160	52.5	204	49.4	Reference	0.037
≥ 5 minutes	64	59.3	145	47.5	209	50.6	1.60 (1.02, 2.50)	
How often were the episodes?								
Once or twice in total	12	11.2	59	19.3	71	17.2	Reference	0.027
Weekly	33	30.8	113	37.1	146	35.4	1.43 (0.69, 2.98)	
Daily	62	57.9	133	43.6	195	47.3	2.29 (1.15, 4.56)	

Hiccups were felt by both cases and controls BUT cases reported prolonged daily episodes

CASE-CONTROL: FETAL MOVEMENTS (FMS) (SUMMARY)



Stillborn cases more likely to report in the last 2 weeks of the pregnancy:

- perception of **decreased frequency** (aOR 14.1, 95%CI (7.27-27.45)
- **Weak strength** (aOR 2.86 95% CI (1.72, 4.75) ,
- A single episode of **excessive vigorous** fetal activity (described as frantic, maniac or crazy) (aOR 4.30, 95%CI (2.25-8.24)
- Change in pattern at **bedtime and prolonged periods of daily hiccups**

Controls more likely to:

- Reports of **increased strength and frequency** of fetal movements and **“sometimes” vigorous** FMs were all protective.
- **Usual pattern of movement** at bedtime last night (aOR 0.11, 95% CI (0.06-0.21).

AUCKLAND STILLBIRTH STUDY(FMS) (SUMMARY)

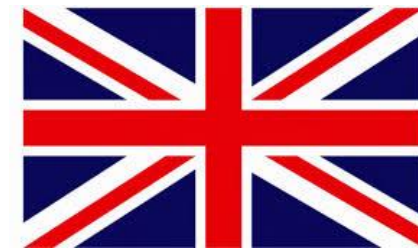


Stillborn cases more likely to report in the last 2 weeks of the pregnancy:

- perception of **decreased frequency** (aOR: 2.37; 95% CI: 1.29–4.35)
- **Weak strength** (aOR 2.37 95% CI (1.29- 4.35),
- A single episode of **excessive vigorous** fetal activity (aOR 6.81, 95%CI (3.01-15.41)

Controls reported:

- **increased strength and frequency** of fetal movements, and “**sometimes**” **vigorous** FMs were all protective.



MINESS: case-control study

	Cases (n=291)	Controls (n=733)	OR (95% CI)
In the last two weeks did the strength of your baby's movements			
Increase	53 (18.3%)	455 (62.8%)	0.15 (0.11-0.22)
Decrease	62 (21.4%)	50 (6.9%)	1.61 (1.05 -2.46)
Stay the same	153 (52.8%)	198 (27.3%)	Reference
Unsure	22 (2.6%)	22 (3.0%)	1.29 (0.69 -2.42)



MINESS: case-control study

	aOR (95% CI)
During the last 2 weeks did you notice anytime that your baby was more vigorous than usual?	
No	Reference
Once	2.10 (1.06, 4.17)
More than once	0.59 (0.37, 0.96)

NZ: MULTI-CENTER (SUMMARY)



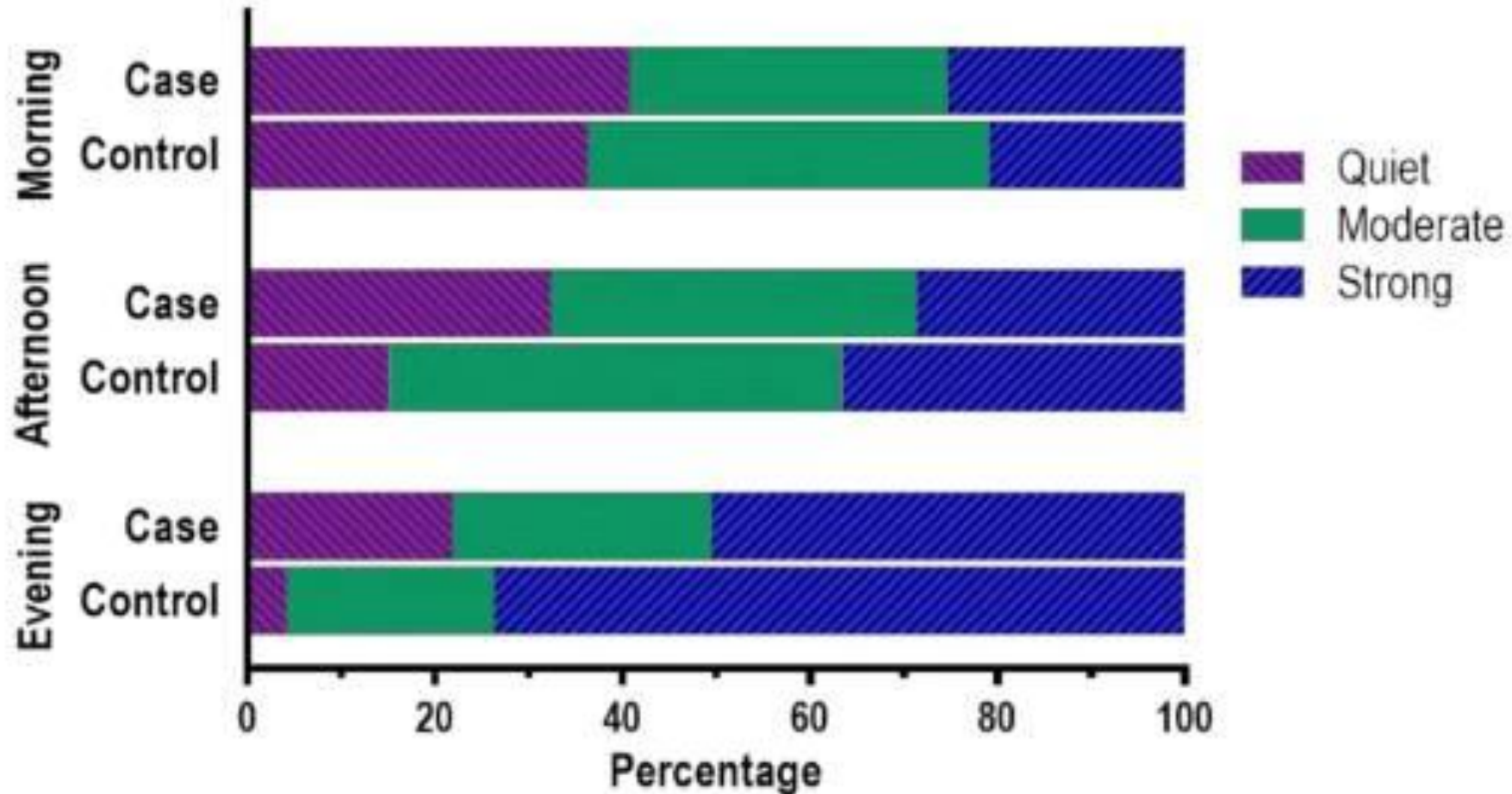
Stillborn cases (n=164) more likely to report in the last 2 weeks of the pregnancy:

- perception of **decreased frequency** (aOR: 2.41; 95% CI: 1.59–3.36)
- **Weak strength** (aOR: 2.35, 95% CI 1.44 -3.82)
- “Quiet in the evening” (aOR 3.41, 95%CI (1.34 – 8.72))

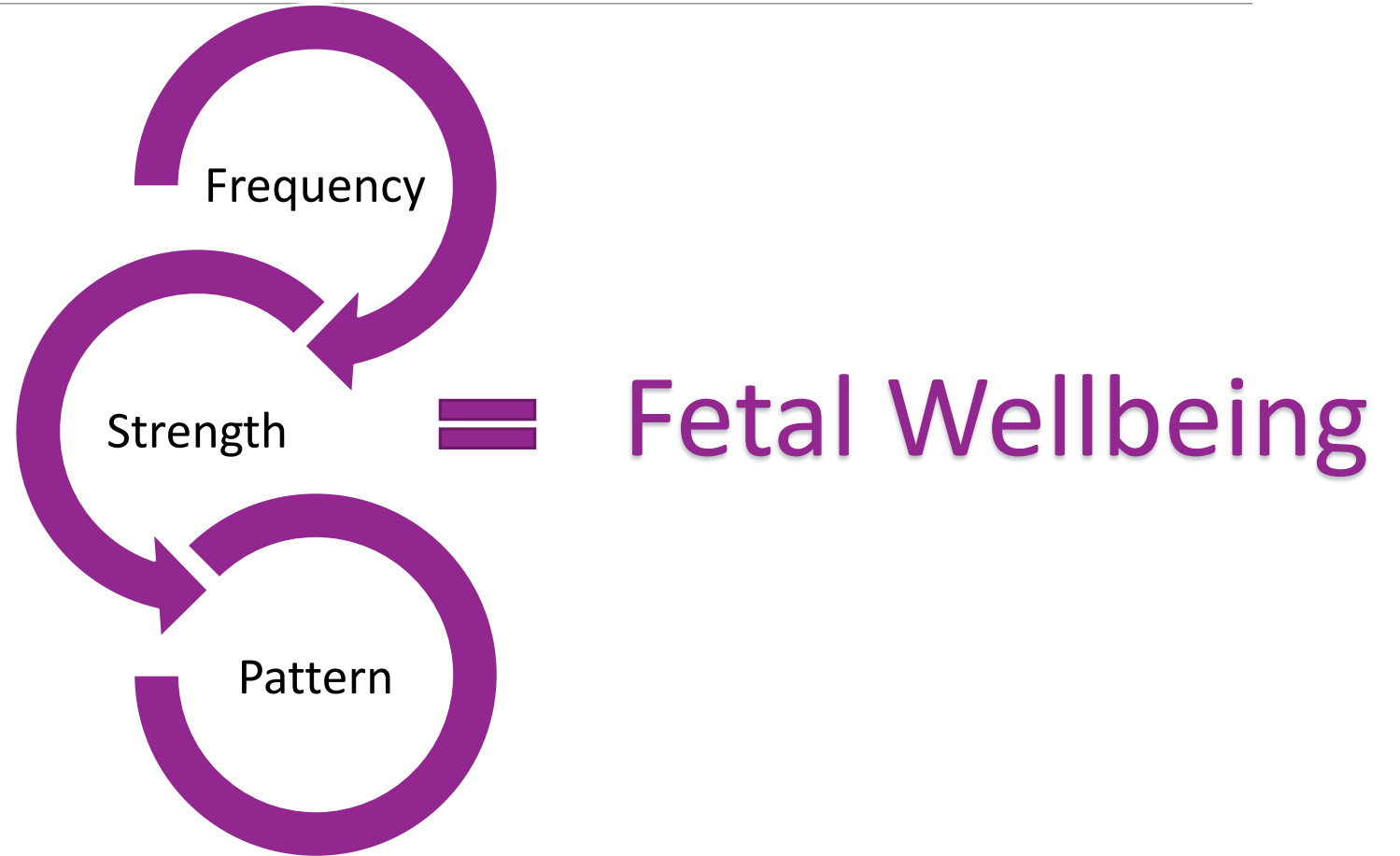
Controls (n=569) :

- 74% of controls reported “strong” FM in the evening
- Also **increased strength and frequency** of fetal movements, and “**clusters or longer busy times**” were all protective.

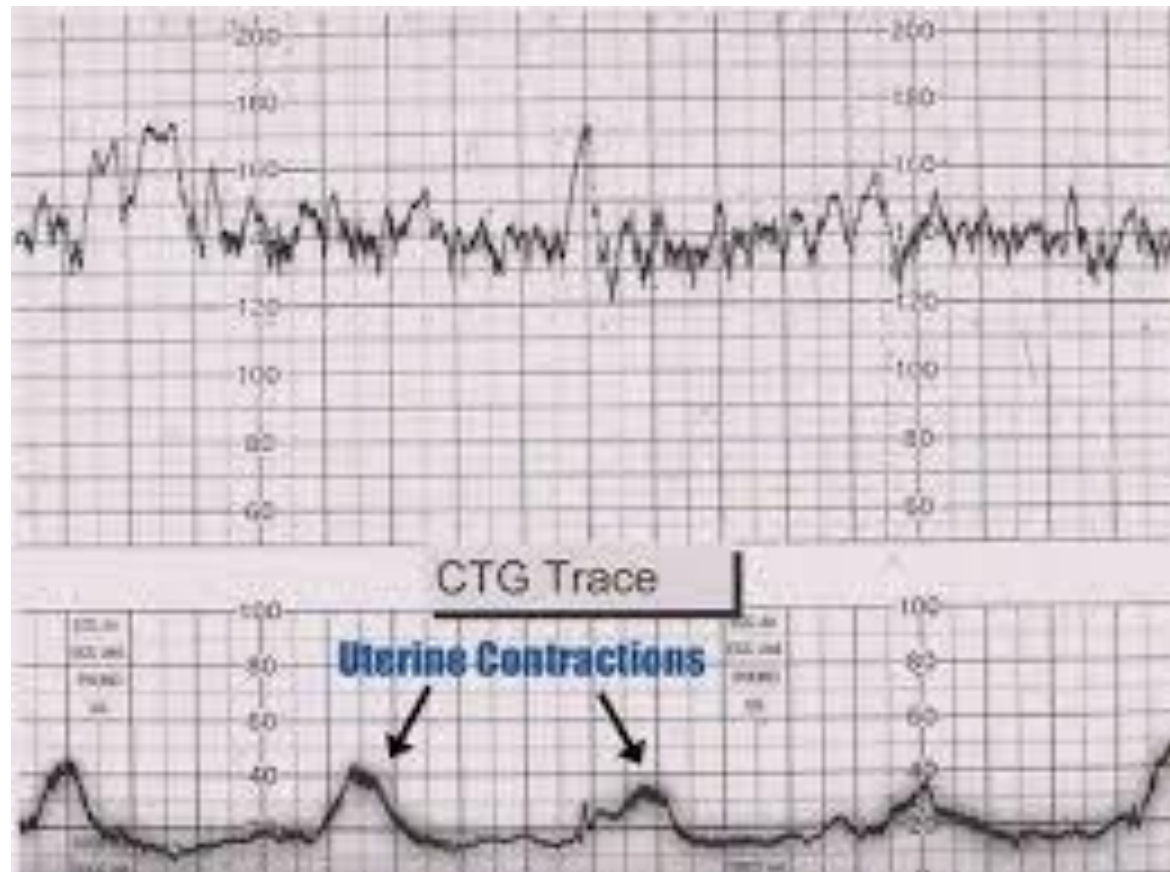
NZ: MULTICENTERED CASE-CONTROL



3 Elements to fetal wellbeing



Easy way to remember



The FM conversation?



Provide written information at booking (gives importance)

16-20 weeks: talk about importance of FMs and getting to know the baby. Reintroduce brochure

Suggest sticker on Hand Held Record (notes) to alert everyone that the conversation has happened

EVERY visit thereafter ask about baby's movements and document the detail of the conversation (Strength frequency pattern)

How do you ask about FMs?

Is your baby moving?

OR

Tell me about your baby's movements?

Asking the woman to tell you about FMs:

Empowers **her** to get to know her baby:

- Be aware of who her baby is,
- how her baby is and
- Immediately report ANY change

Allows **you** to assess strength, frequency and pattern, document and then notice changes

Ways she can get to know her baby:

Structure:

Mindfetalness

A method for focusing upon fetal movements

Get started



During Mindfetalness you focus upon

The intensity of the movements

The way in which the baby moves

How much the baby moves

The questions to be answered are

Can the movements be felt distinctly?

Are the movements of the same intensity as usual?

Does the fetus move as much as usual?

How do you document FMs?



south australian

d

Progress notes • Plot the fundal height on the Symphysis-fundal chart. **NOTE:** Patient BP cuff size:

Date & Time	Weeks	Fundal height (cms)	Weight kg	BP (seated)	Urine (if required)	Presentation	Fifths above brim	Fetal movements	Fetal heart	Next visit	Name & designation (maternity care provider)

NOTES

FMF

Cate is currently feeling the baby move “all the time” and notices strong movement when she goes to bed in evening.

MBRRACE-UK
Perinatal Confidential Enquiry

**Term, singleton, intrapartum stillbirth and
intrapartum-related neonatal death**



November 2017

Midwives and obstetricians should emphasise the importance of fetal movements from the middle of pregnancy to women **at each antenatal contact** as a method of fetal surveillance, and document the detail of this conversation.

Why do you ask about FMs?

Its important because.....

Throughout I was always asked "is baby moving" but never told to monitor kicks or told that babies have their own pattern of movements. I was also told baby might slow down when getting ready for labor so did not focus or put my attention on fetal movements which may have saved my baby's life. (Pollock PhD study participant)



Fetal Movement Awareness:
Reducing Stillbirth in Scotland

Aim

The Maternity and Children Quality Improvement Collaborative (MCQIC) is one of a number of programmes under way across Scotland which aims to reduce the rate of stillbirth. In 2012, 274 babies were stillborn in Scotland (rate of 4.7 per 1000 births).¹ A key aim of MCQIC is to reduce the Scottish rate of stillbirth by 15%.

The cause of stillbirth is complex, but it is recognised that the need to monitor fetal movement throughout pregnancy is an important health message for women. MCQIC set an aim that by December 2015, 95% of all pregnant women would have a documented discussion with a midwife about fetal movement between weeks 18 and 24 of pregnancy.

Methods

Test teams were given tools to support measurement which included a sampling strategy, tools to display data in time sequence and a clear definition of a fetal movement discussion. The discussion with women highlighted:

- (1) the importance of being aware of your baby's fetal movements, and that every baby's movements are unique
- (2) to contact the maternity unit immediately if fetal movements decrease or stop, and
- (3) the link between fetal movement and fetal wellbeing, and that a decrease or cessation of fetal movement may be associated with the risk of stillbirth.

Baseline data was collected from maternity notes on a monthly basis from March 2014 onwards. Using the Model for Improvement, maternity teams tested ideas on a small scale and collected data to confirm if the changes resulted in an improvement.

Outcomes/Results

National aggregated data from 12 of 17 teams which have reported consistently from March 2014 to September 2015 show discussion of fetal movement improved by 11% from the baseline period, but deterioration in late 2015 suggests further work is needed (Figure 1).

Local level data from the Pennywell team, NHS Lothian, shows how the process has improved by 21% from baseline (Figure 2). In 2014, 228 babies were stillborn, a 14.80% reduction in the rate of stillbirth compared to 2012 (rate of 4 per 1000 births) (Figure 3).¹

Conclusions

Although no one factor can be attributed to the reduction, it is encouraging that the rate of stillbirth is now at the lowest level ever recorded in Scotland.

Reference:

¹ National Records of Scotland still events reference table 2014. Available at www.nrscotland.gov.uk/files/pdf/2014stillbirths.pdf



Figure 1: Women with a documented discussion about fetal movements from 12 teams reporting consistently

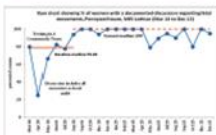


Figure 2: Women with a documented discussion about fetal movements in NHS Lothian

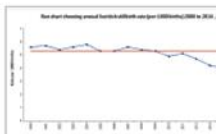


Figure 3: Scottish stillbirth rate

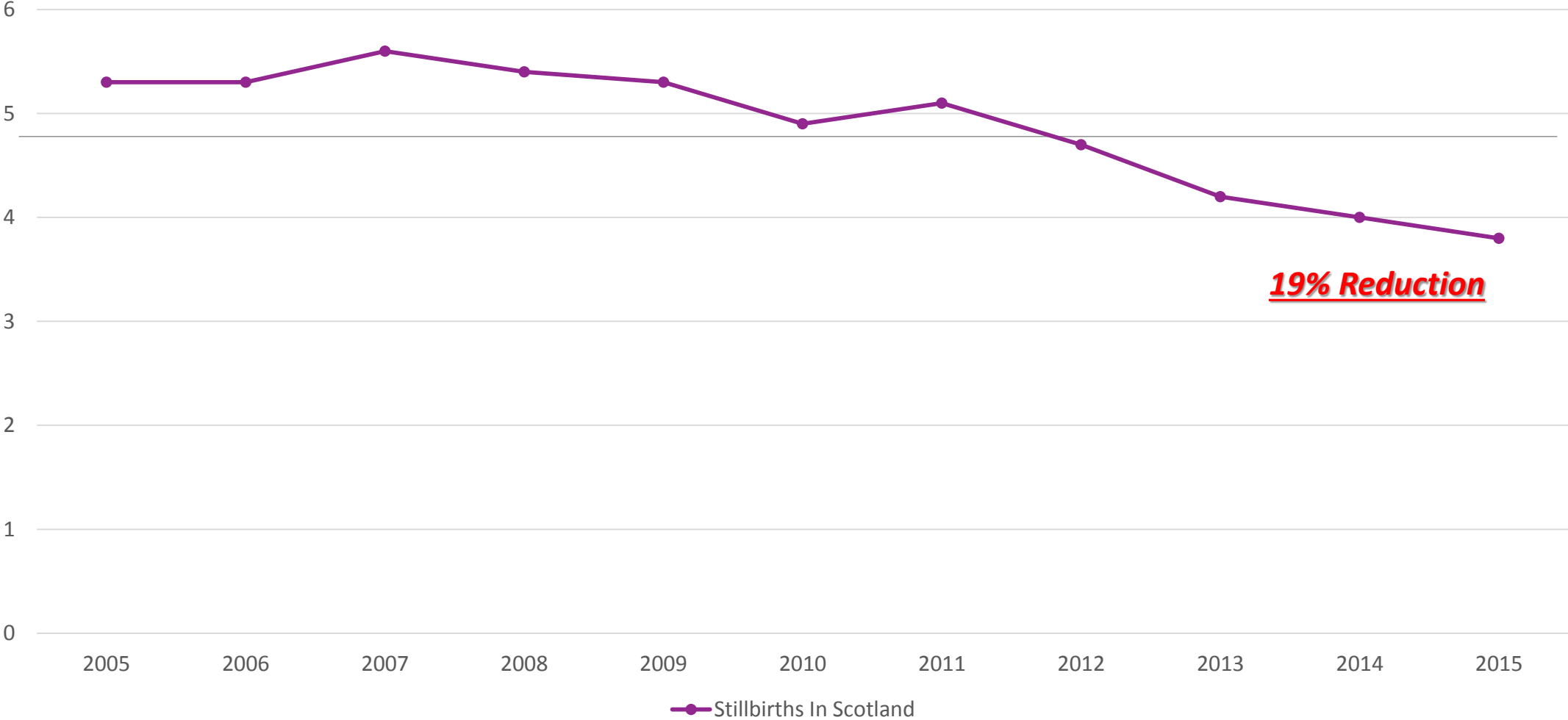
Does talking about fetal movements save lives?

The Maternity and Children Quality Improvement Collaborative (MCQIC) formed in 2010

MCQIC set an aim that by December 2015, 95% of all pregnant women would have a documented discussion with a midwife about fetal movement between weeks 18 and 24 of pregnancy.

Target set for 15% reduction in Stillbirth

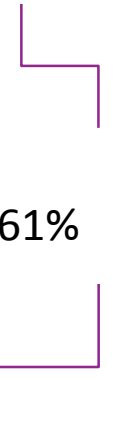
Stillbirths In Scotland



BUT



What was your response to the change in frequency ?	Reduced n=795 (%)	Increased n=282 (%)
Did not worry	51 (6.4%)	39 (13.8%)
Mentioned to family and friends but did not worry further	105 (13.2%)	59 (20.9%)
Mentioned to healthcare provider and was reassured	244 (30.7%)	76 (27.0%)
Mentioned to healthcare provider and was told to monitor at home for symptoms and call back if still concerned	65 (8.1%)	21 (7.4%)
Mentioned to healthcare provider and had general evaluation (fetal heart rate, cervical status etc)	59 (7.4%)	16 (5.6%)
Mentioned to healthcare provider and outpatient testing	80 (10.1%)	23 (8.1%)
Mentioned to healthcare provider and was admitted	45 (5.7%)	12 (4.5%)
Went to hospital and was admitted	75 (9.4%)	13 (4.6%)
Went to hospital and was sent home	37 (4.7%)	10 (3.5%)
Did not provide response to question	34 (4.3%)	13 (4.6%)



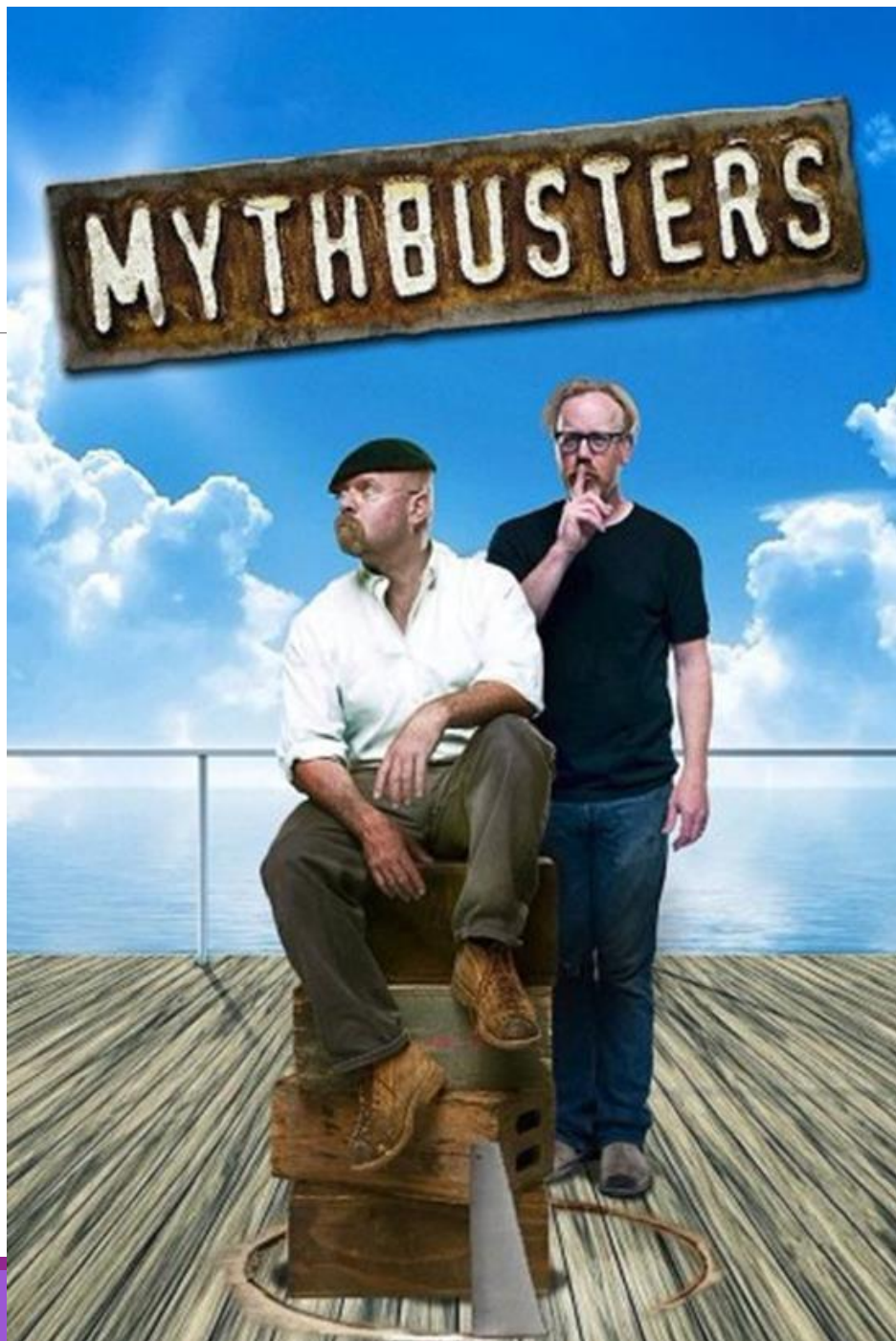
Women don't know to be concerned

Case-control: Healthcare Provider Information



Response	Group				All		OR (95% CI)	p-value
	Cases		Controls					
	Total	%	Total	%	Total	%		
During this pregnancy did your healthcare provider tell you about or ask you to keep track of your baby's movement?								
No	79	54.9	161	41.6	240	45.2	Reference	0.0066
Yes	65	45.1	226	58.4	291	54.8	0.59 (0.4, 0.86)	

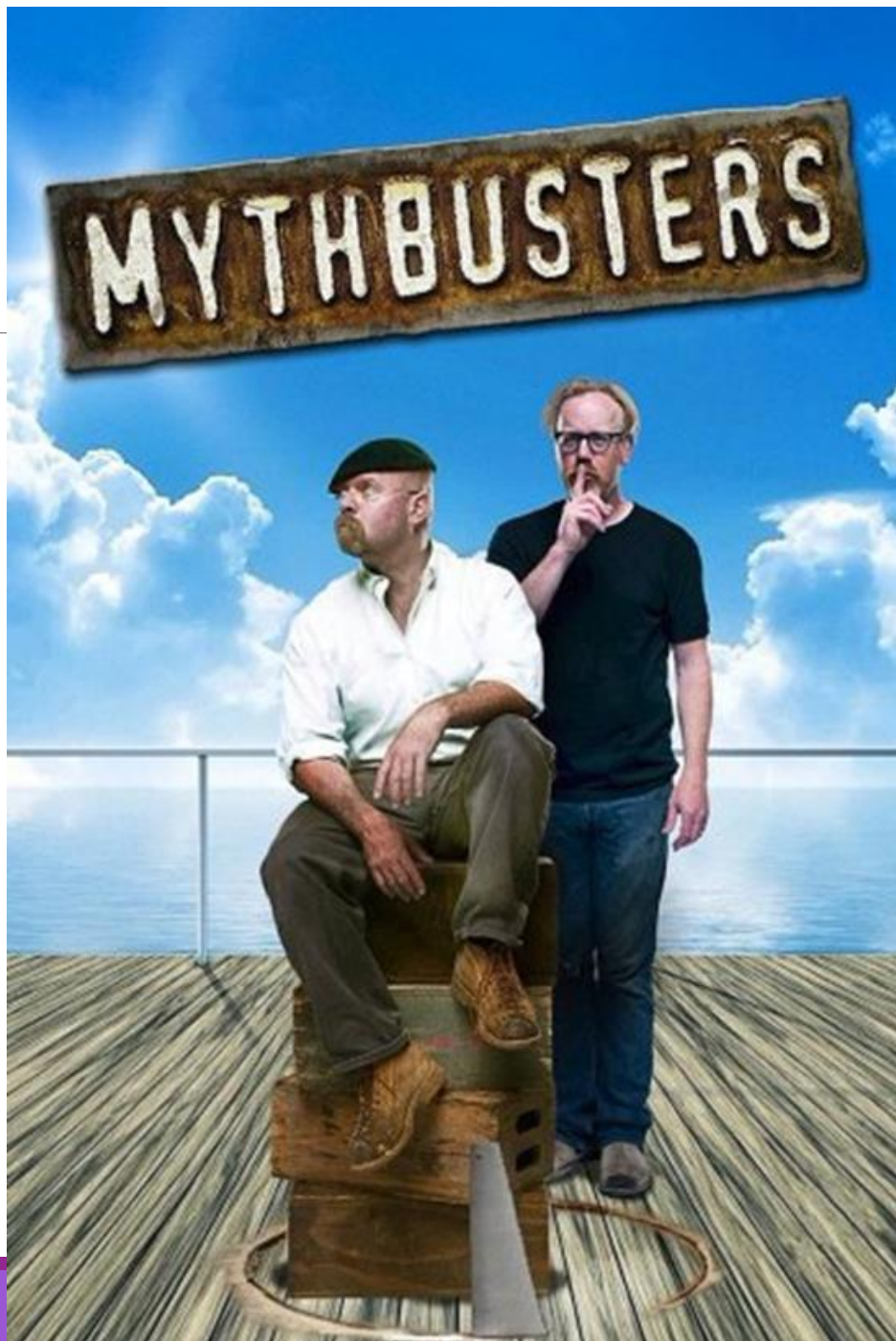
Care providers are not telling women



It is normal to feel less movement towards the end of pregnancy



Fetal movements do not normally decrease close to term. In fact decreased fetal movement at or near term places the pregnancy at substantial increased risk (Tviet et al 2006, O'Sullivan et al 2009)



Women who experience DFM should be told to sit down and drink a cold or sweet drink before coming in



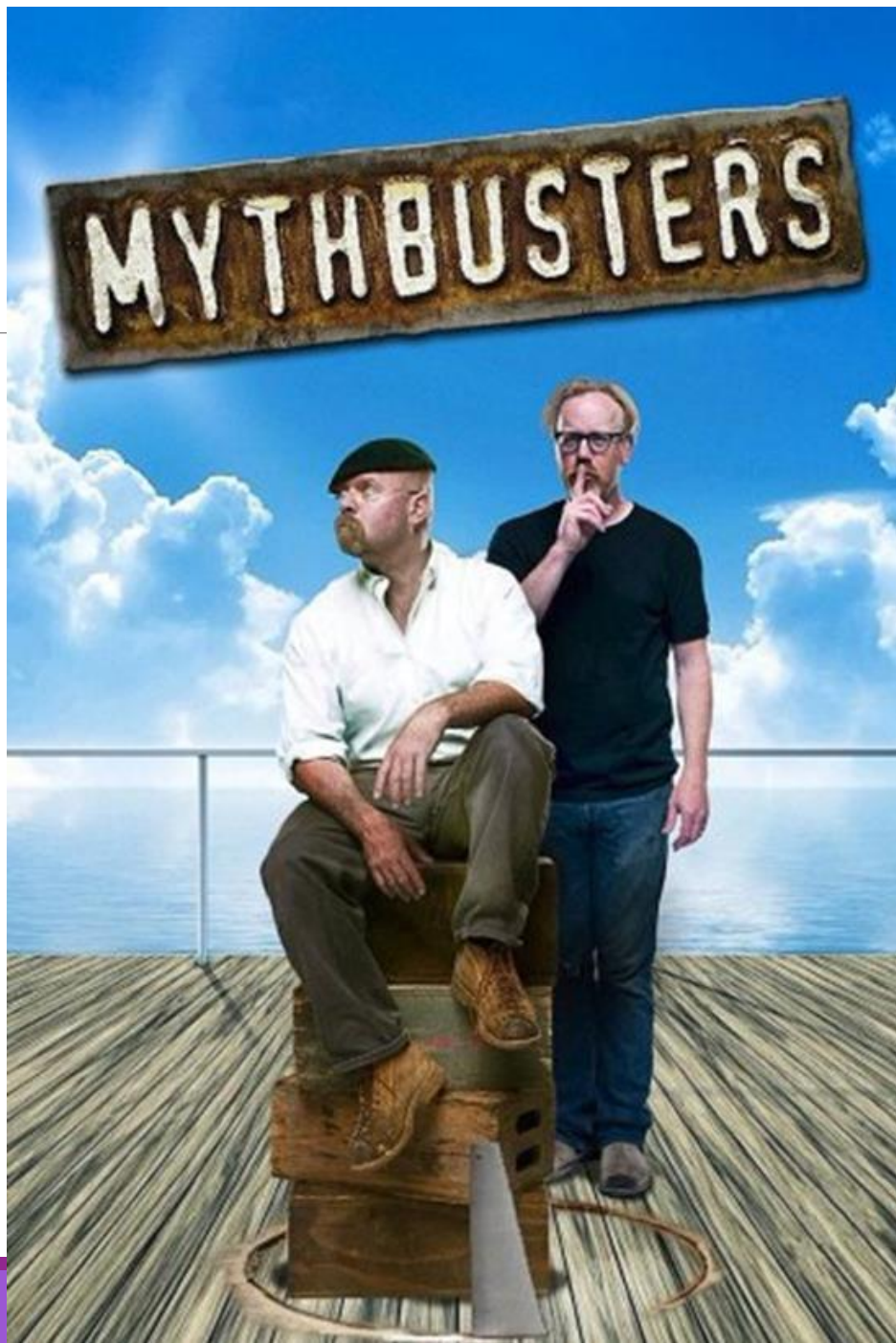
Eating, Drinking a Cold or sweet Drink or even Glucose infusion doesn't improve fetal wellbeing

(Druzin et al 1993, Esin et al 2013, Michaan et al 2016)

Mothers are telling each other

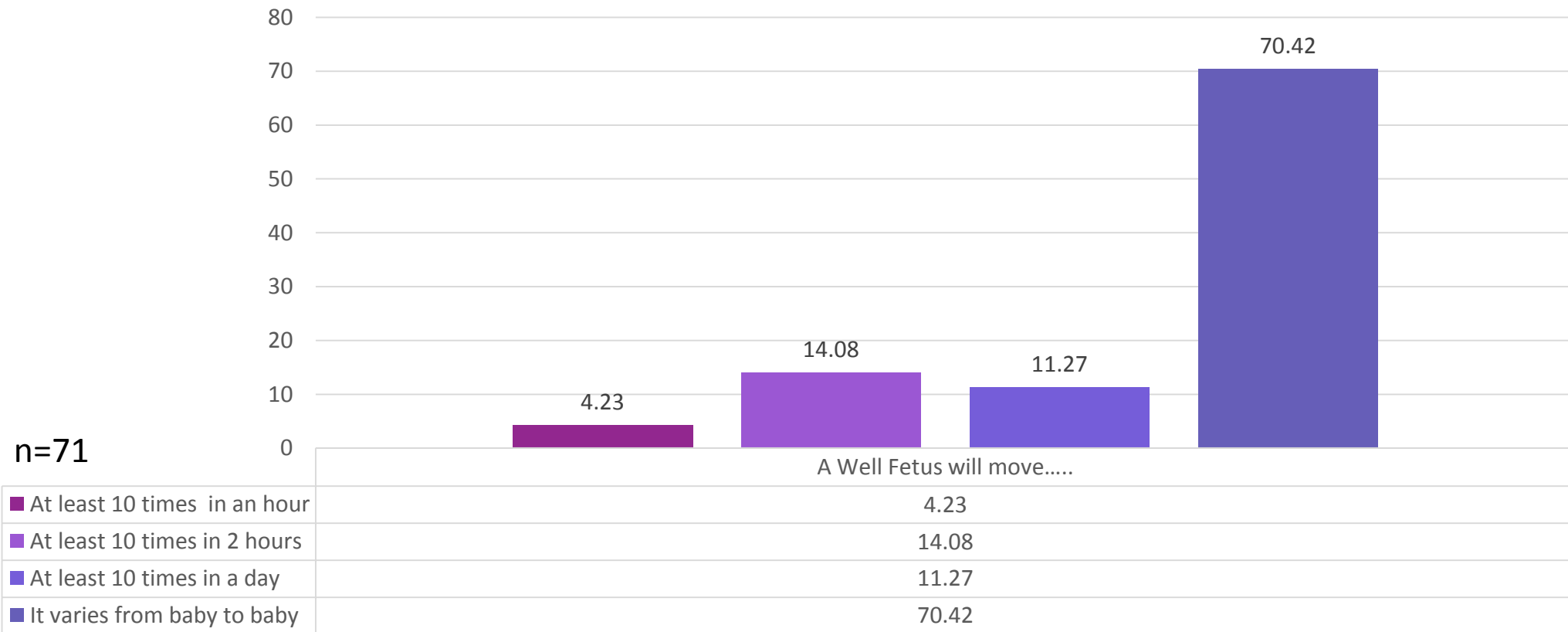
Okay mummas. Weird movements. Yesterday bubs was over active, i had mild painful and irregular contractions. Today i have not felt her move yet. Ive had ice water. Juice. And ate something. About to lay down and see if that helps. Also for the first time in 3 weeks the contractions have stopped..... thoughts?? Any other ideas on getting her moving.

I had similar on Wednesday but baby had reduced movements not stopped all together, even with reduced movements they got me in for monitoring. Just to be safe. If you haven't felt baby at all today I would give your midwife a call and go get checked out.



*A well fetus moves
10 times in.....*

Australian midwives were asked..... “A well fetus will move.....”:

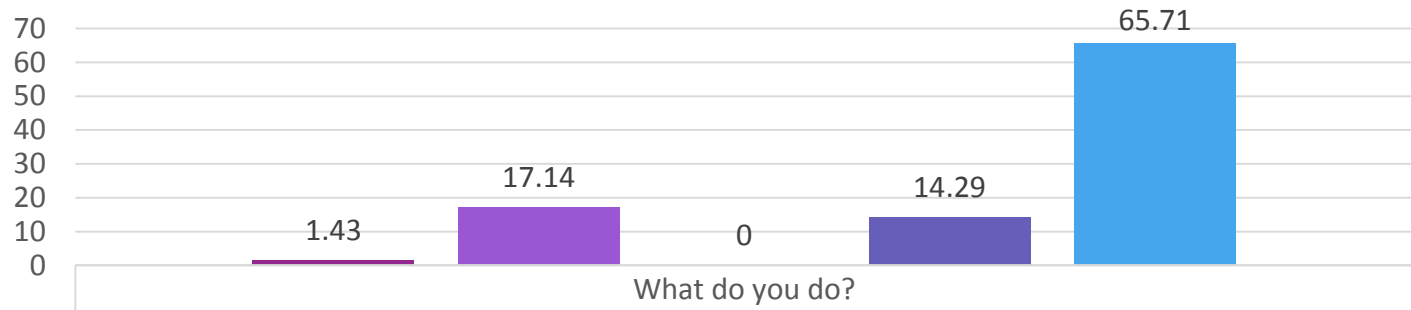


Case Study

Caitlin is a 30 year old woman who is 39 weeks pregnant with her first baby. She has recently stopped working. She has just come home from her baby shower and felt her baby moving as usual while she was there. She has sat down to watch some television and after a few minutes realises her baby isn't moving. This is concerning because she knows her baby always moves when she sits down. She rings you, (after you have determined her age, gravidy, parity, gestational week and what has triggered her recent concern) what is your most likely first response:

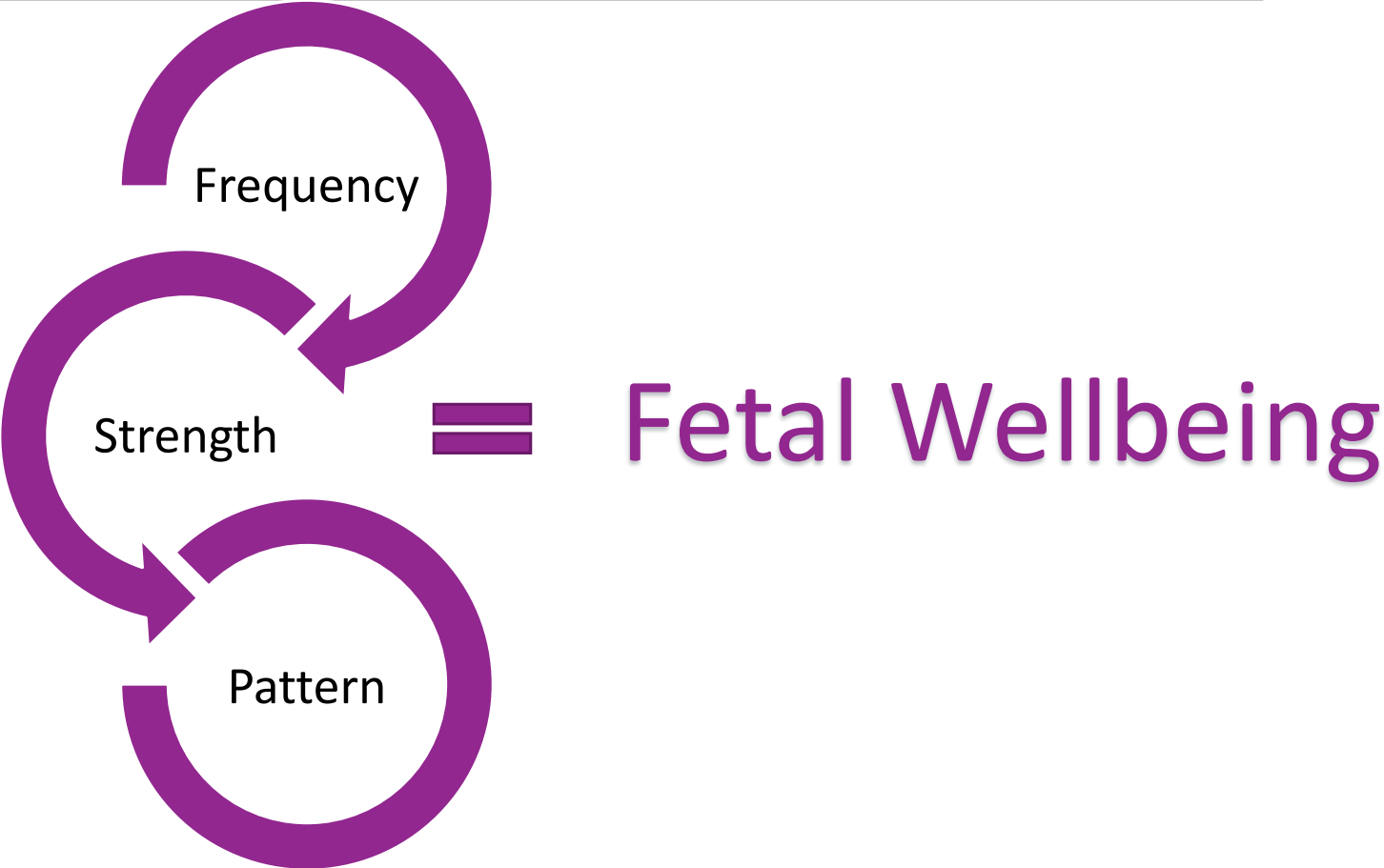
What do you do?

n=70



	What do you do?
■ Reassure her. It sounds like she has been busy today and probably hasn't noticed her baby's movements.	1.43
■ Ask her how many times her baby has moved today? (your next response will depend on her answer to that question)	17.14
■ Suggest she have a cold drink to "wake the baby" and ring back if that doesn't work	0
■ Suggest she "concentrate on fetal movements" for another hour to see if her baby "wakes up" and ring back if she is still concerned	14.29
■ Invite her in to be assessed	65.71

She has noticed a change in her baby's pattern of activity



She should be assessed?



Lets compare heart attack

20% of people having chest pain are actually having a heart attack whereas 30% of women who present with DFM have a poor pregnancy outcome

How should she be assessed?

PERINATAL SOCIETY
of Australia &
New Zealand
PSANZ

Stillbirth
CENTRE OF RESEARCH EXCELLENCE

Clinical Practice Guideline
for the Care of Women with
Decreased Fetal Movements

Developed in partnership with:

Stillbirth Foundation
AUSTRALIA
Research and education to prevent stillbirth

Endorsed by:

The Royal Australian
and New Zealand
College of
Obstetricians
and Gynaecologists

acm
Australian College of
Midwives

**WOMEN'S
HEALTHCARE**
AUSTRALASIA

**STILL
AWARE**
1.ORG

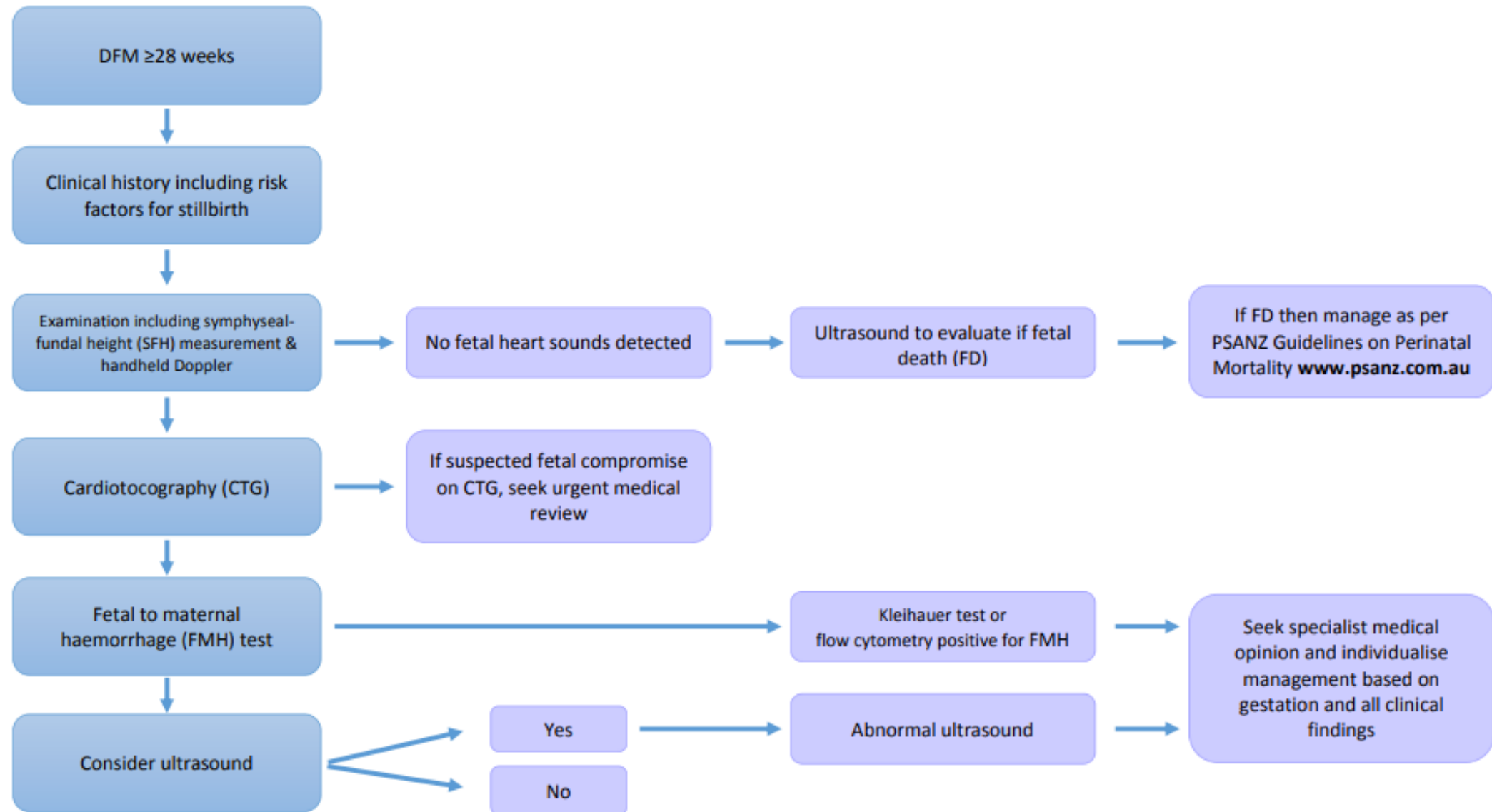
**red
nose**
saving little lives

sands
pregnancy, birth & newborn care support

10 August 2017

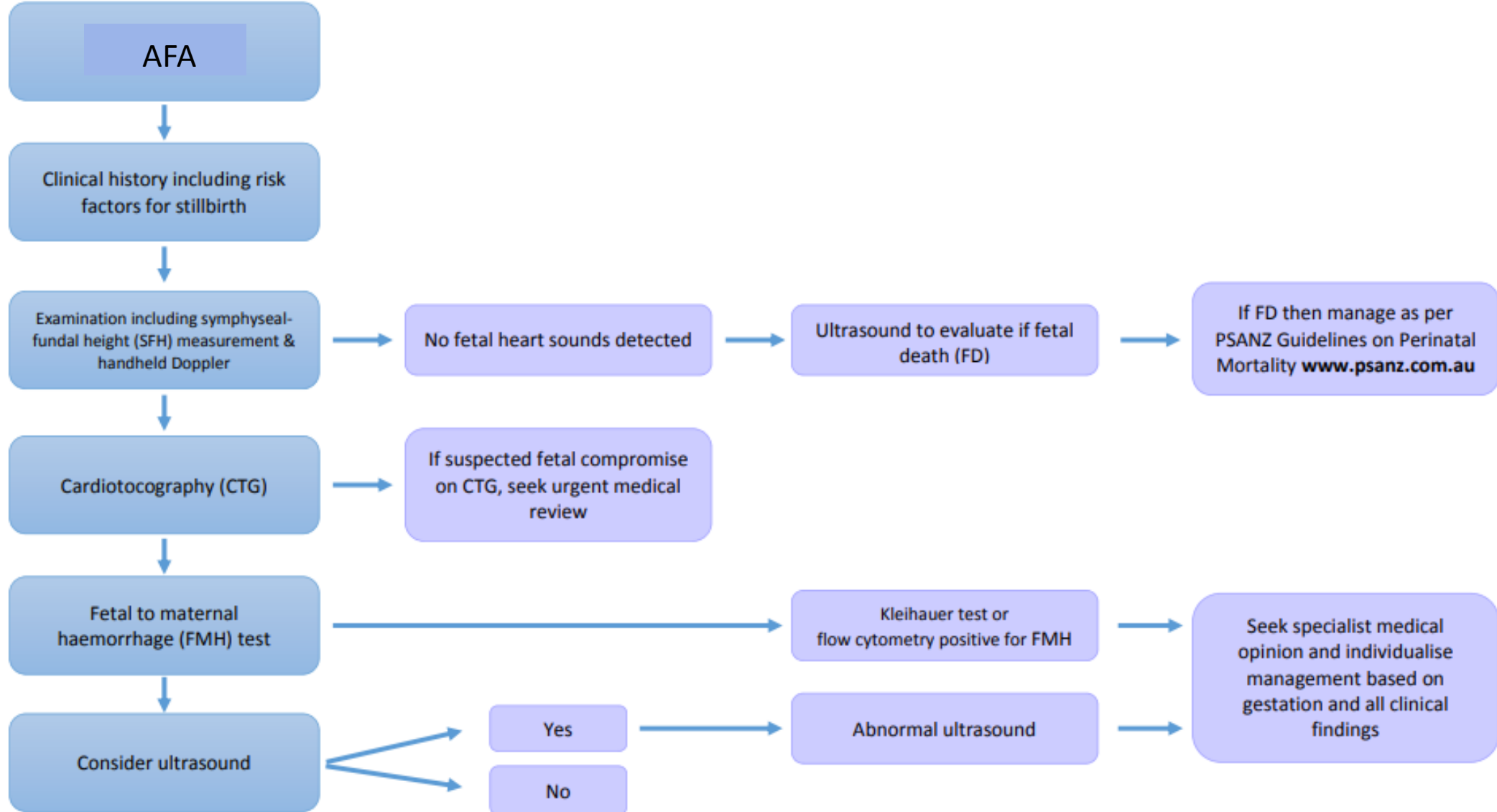
2.3 Care pathway for women presenting with decreased fetal movements from 28 weeks' gestation

Disclaimer: This algorithm is for general guidance only and is subject to a clinician's expert judgement. The algorithm should not be relied on as a substitute for clinical advice.



2.3 Care pathway for women presenting with altered fetal activity

Disclaimer: This algorithm is for general guidance only and is subject to a clinician's expert judgement. The algorithm should not be relied on as a substitute for clinical advice.



Conclusions:

- Pregnant women require education about the importance of quickly reporting ANY concerning alteration in their baby's activity to their maternity care provider.
- In order to properly assess fetal wellbeing maternity care providers need to respond to ANY concerns the mother has about alterations in her baby's behaviour not just a reduction in frequency
- Having an ongoing conversation saves baby's lives.

Acknowledgements



STAR LEGACY
FOUNDATION

www.starlegacyfoundation.org

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