Before we begin please take 10 minutes to complete this survey for research purposes

Pre workshop survey

stillaware.org/usa1

Stillbirth Awareness + Education = Action = Prevention
Stillbirth

Is it rare?
Is it common?

**Stillbirth Definition**

A stillbirth is the death or loss of a baby before or during delivery. In the United States, a stillbirth is usually defined as the loss of a baby after 20 weeks of pregnancy.

(CDC)
Part 1:
Why we exist
Stillbirth

Everyday in the USA
70 babies are stillborn

Stillbirth

it is not inevitable
Stillbirth

it is not inevitable
it is often preventable

Stillbirth

little lives
never little losses
What do you need?
Still Aware and Star Legacy are here to help facilitate Conversation & Communication for Prevention of stillbirth With your expertise

We’re not here to talk at you or tell you what to do We’re here to work with you Discovering what’s best for your women to give them the best chance of avoiding stillbirth
Part 2: Considering the independent risk factors

Research-based information in laymans terms.

How to communicate evidence-based advice with understanding & women’s perception of her fetal movements

Help improve outcomes for women and their babies
Mother:
Leticia Jones
36 years old

Details of pregnancy:
Singleton, first time pregnancy, conceived through IVF
35 weeks pregnant with baby boy

Health notes:
BMI 33, non-smoker, no medication, takes prenatal vitamins daily attends prenatal yoga

How many risk factors, if any?

How do you manage this pregnancy?
Stillbirth: leading causes USA

- Unknown
- Placental issues
- Cord issues
- Genetic/anatomic issues
- Infection
- Maternal health issues

Stillbirth cause: unknown

Just because there is no cause does not mean there is no risk
Stillbirth

What are the independent risk factors?

Global characteristics of at risk mothers in high income countries may include:

- Primiparity (first time mothers)
- Maternal age (less than 18 or 35 years+)
- Assisted reproduction (IVF) pregnancy
- BMI (30 or above)
- Maternal ethnic origin (South Asian descent, African American, indigenous & new immigrant group)
- Previous Stillbirth
- Previous Caesarean section
- Diabetes (pre-existing & Gestational)
- Smoking
- Alcohol
- Illicit drug use
- Lack of folic acid
- High blood pressure (Pre-existing and Pre-eclampsia)
- Multiple Pregnancy
- Infection
- Low socio economic status
- Poor prenatal attendance (less than 50% of planned visits attended)
Global Characteristics of the at risk baby in high income countries may include:
- Decreased fetal movement
  (irregular from what’s normal for the individual baby)
- Erratic increased fetal movement
  (crazy, insane or out-of-control movement from what is normal for the individual baby)
- Fetal growth restriction
  (crossing centiles from the expected growth curve for that baby)
- Low amniotic fluid
- Placental blood flow restriction
- Gestational age 41 weeks or more
- Male

Stillbirth: leading risk factors USA
- Maternal age
- Maternal obesity
- Post-term pregnancy
- African American mother
- IVF pregnancy
- Maternal smoking/substance use
- Lack of prenatal care
- Low socioeconomic status
- Maternal health conditions (pre-eclampsia, gestational diabetes, autoimmune disorders)
- Multiple gestation
Let’s talk: Movements

**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
3 characteristics of fetal wellbeing

Why are strength and pattern also important?
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.
### STARS Study: Historical cohort

#### Frequency of unusual fetal movement

<table>
<thead>
<tr>
<th>Response</th>
<th>Cases</th>
<th>Controls</th>
<th>All</th>
<th>Crude OR (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No change in fetal movement</td>
<td>480</td>
<td>1,234</td>
<td>1,714</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A little bit less movement</td>
<td>273</td>
<td>736</td>
<td>1,009</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significantly less movement</td>
<td>522</td>
<td>1,358</td>
<td>1,880</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A little bit more movement</td>
<td>136</td>
<td>352</td>
<td>488</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significantly more movement</td>
<td>146</td>
<td>400</td>
<td>546</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don’t remember</td>
<td>103</td>
<td>293</td>
<td>396</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>54</td>
<td>132</td>
<td>186</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Warland et al. BMC-Pregnancy and Childbirth 2015*

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### STARS Study

#### Change in usual pattern of movement case control

<table>
<thead>
<tr>
<th>Response</th>
<th>Group</th>
<th>All</th>
<th>Crude OR (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>cases</td>
<td>controls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>27</td>
<td>193</td>
<td>220</td>
<td>227</td>
</tr>
<tr>
<td>Yes, a little bit less movement</td>
<td>35</td>
<td>25</td>
<td>96</td>
<td>131</td>
</tr>
<tr>
<td>Yes, significantly less</td>
<td>56</td>
<td>40</td>
<td>32</td>
<td>88</td>
</tr>
<tr>
<td>Yes, a little bit more</td>
<td>15</td>
<td>10.7</td>
<td>44</td>
<td>59</td>
</tr>
<tr>
<td>Yes, significantly more</td>
<td>7</td>
<td>5</td>
<td>9</td>
<td>16</td>
</tr>
</tbody>
</table>

*Heazell et al. 2017*
### Fetal movement at bedtime: case v control

<table>
<thead>
<tr>
<th>Group</th>
<th>All</th>
<th>Crude OR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>cases</td>
<td>controls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>%</td>
<td>Total</td>
<td>%</td>
</tr>
<tr>
<td>Did you usually feel your baby move at bedtime during this pregnancy?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>3.42</td>
<td>16</td>
</tr>
<tr>
<td>Yes</td>
<td>141</td>
<td>96.6</td>
<td>370</td>
</tr>
<tr>
<td>Did you feel your baby move at bedtime on the last night of this pregnancy?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>49</td>
<td>39.8</td>
<td>23</td>
</tr>
<tr>
<td>Yes</td>
<td>74</td>
<td>60.2</td>
<td>322</td>
</tr>
</tbody>
</table>

### Change in strength: case v control

<table>
<thead>
<tr>
<th>Response</th>
<th>Group</th>
<th>All</th>
<th>Crude OR (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>cases</td>
<td>controls</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>%</td>
<td>Total</td>
<td>%</td>
<td>Total</td>
</tr>
<tr>
<td>During the last two weeks of this pregnancy, did the strength of your baby’s movements...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stay the same</td>
<td>66</td>
<td>46.5</td>
<td>180</td>
<td>49.2</td>
</tr>
<tr>
<td>Decrease</td>
<td>58</td>
<td>40.9</td>
<td>56</td>
<td>15.3</td>
</tr>
<tr>
<td>Increase</td>
<td>18</td>
<td>12.7</td>
<td>130</td>
<td>35.5</td>
</tr>
</tbody>
</table>
**STARS Study**

### Change in vigor: case v control

<table>
<thead>
<tr>
<th>Response</th>
<th>Group</th>
<th>All</th>
<th>Crude OR (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>cases</td>
<td>controls</td>
<td>Total  %</td>
<td>Total %</td>
</tr>
<tr>
<td>No</td>
<td>59</td>
<td>143</td>
<td>202   40.9</td>
<td>Reference</td>
</tr>
<tr>
<td>Yes, once.</td>
<td>42</td>
<td>24</td>
<td>66    13.4</td>
<td>4.24 (2.36, 7.62)</td>
</tr>
<tr>
<td>Yes, sometimes.</td>
<td>30</td>
<td>158</td>
<td>188   38.1</td>
<td>0.46 (0.28, 0.75)</td>
</tr>
<tr>
<td>Yes, often.</td>
<td>7</td>
<td>31</td>
<td>38    7.69</td>
<td>0.55 (0.23, 1.31)</td>
</tr>
</tbody>
</table>

During the last two weeks of this pregnancy, did you notice any time that your baby was more vigorous than usual?

**Hiccups: case v control**

<table>
<thead>
<tr>
<th>Response</th>
<th>Group</th>
<th>All</th>
<th>Crude OR (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>cases</td>
<td>controls</td>
<td>Total  %</td>
<td>Total %</td>
</tr>
<tr>
<td>Did you experience?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>28</td>
<td>20</td>
<td>48    18.6</td>
<td>Reference</td>
</tr>
<tr>
<td>Yes</td>
<td>112</td>
<td>80</td>
<td>192   81.4</td>
<td>0.88 (0.54, 1.43)</td>
</tr>
<tr>
<td>How long were the episodes?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 5 minutes</td>
<td>44</td>
<td>160</td>
<td>204   52.5</td>
<td>Reference</td>
</tr>
<tr>
<td>≥ 5 minutes</td>
<td>64</td>
<td>145</td>
<td>209   47.5</td>
<td>1.60 (1.02, 2.50)</td>
</tr>
<tr>
<td>How often were the episodes?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Once or twice in total</td>
<td>12</td>
<td>59</td>
<td>71    19.3</td>
<td>Reference</td>
</tr>
<tr>
<td>Weekly</td>
<td>33</td>
<td>113</td>
<td>146   37.1</td>
<td>1.43 (0.69, 2.98)</td>
</tr>
<tr>
<td>Daily</td>
<td>62</td>
<td>133</td>
<td>195   47.3</td>
<td>2.29 (1.15, 4.56)</td>
</tr>
</tbody>
</table>
**STARS Study**

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 or crazy) (aOR 4.30, 95%CI (2.25-8.24))
- Change in pattern at bedtime and prolonged periods of daily hiccups

**Case control: Fetal Movements (FMs) summary**

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).

Heazell et al 2017

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**Auckland stillbirth study (FMs)**

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.

Stacey et al 2011
### MINESS: case-control study

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

### Heazell et al: 2018 PSANZ

### MINESS: case-control study

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

### Heazell et al: 2018 PSANZ
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.

Fetal movements and time of day

Bradford et al 2018 PSANZ

Bradford et al 2018 PSANZ
In the last 2 weeks of pregnancy they are more likely to:

- Increase (or stay the same) in Strength
- Increase (or stay same) frequency
- Be more vigorous multiple times
- Occasionally Hiccup
- Have multiple “busy” times during the day
- Strongest movement in the evening or night time

Get to know who? your baby is

how? your baby is
Movements

What is common practice?

Is your baby moving?

Yes No
Dads & partners can get to know movements too
Not just mums
Myths?

MYTH

IF I HAVE SOMETHING TO EAT OR DRINK WILL IT GET MY BABY MOVING?

FACT: If you are wanting to make your baby move because you are concerned about movements, it is best not to waste time but instead contact your care provider immediately.
MYTH IS AN INCREASE IN MOVEMENTS A GOOD SIGN?

FACT: A slow increase probably indicates that your baby is getting stronger and is healthy and well, but a sudden increase, particularly if you feel the baby going "crazy" should be immediately checked out by your care provider, do not wait.

MYTH DOESN'T A BABY SLOW DOWN BEFORE IT'S BORN?

FACT: A baby will keep moving throughout pregnancy, even during labour. In fact, a healthy baby usually gets stronger. Particularly in the last few weeks of pregnancy, be conscious of your baby's movements and call for a checkup if anything seems irregular or different.

Never wait until the next day to seek advice.
MYTH

Isn’t it okay if my baby moves 10 times a day?

FACT: Every baby is different. Sure, some might move 10 times in a day, but others will move 10 times in 10 minutes! Baby’s movements can vary from 4 to over 100 every hour. It is important to know what is normal for you and your baby and report any change in that.
MYTH

MY PLACENTA IS AT THE FRONT, DOES IT MEAN I WONT FEEL MY BABY'S MOVEMENTS

FACT: You will be able to feel your baby's movements within you regardless of where your placenta lies.

Get to know your baby's individual movements.

Counting to 10
Why or why not?
Mother:
Caitlin Ward
30 years old

Details of pregnancy:
Singleton,
first time pregnancy
39 weeks pregnant

Scenario:
She has recently stopped working. She has had a busy day. She has just gotten ready for bed and after lying down for a few minutes she realises her baby isn’t moving. This is concerning because she knows her baby always moves when she goes to bed. She rings you, (after you have determined her age, gravidy, parity, gestational week and what has triggered her recent concern)
**What do you do?**

A. Reassure her, it sounds like she has been busy today and hasn’t noticed her baby’s movements

B. Ask her how many times her baby has moved today? (your next response will depend on the answer to that question)

C. Suggest she have something sugary to eat or cold to drink to “wake the baby” and ring back if she is still concerned

D. Suggest she concentrate on her baby’s movements for the next hour and ring back if she is still concerned

E. Invite her in to be assessed

**Phone advice regarding fetal movements?**
**What have you noticed?**
**What would you do?**
Should she be assessed?

If a women rings concerned shouldn’t we always invite her in? Why?

She has noticed a change in her baby’s pattern of activity
Conclusions:

• Pregnant women require education about the importance of quickly reporting ANY concerning alteration in their baby’s activity to their maternity health professional.

• In order to properly assess fell wellbeing maternity health professionals need to respond to ANY concerns the mother has about alterations in her baby’s behaviour not just a reduction in frequency.
Let's talk: 
Sleep position

<table>
<thead>
<tr>
<th>Authors</th>
<th>Country</th>
<th>Method</th>
<th>OR</th>
<th>PAR</th>
</tr>
</thead>
</table>
| Stacey et al 2011| NZ      | Case Control    | aOR = 2.54, 95% CI: 1.04–6.18, and p = 0.005. | PAR for non-left-sided sleep position night before for stillbirth to be 37%.
| Owusu et al 2013 | Ghana   | Cross sectional | aOR = 8.0, 95% CI: 1.5-43.2, and p = 0.016). | PAR of ‘typical’ supine sleep position for stillbirth was 25%.
| Gordon et al 2015| Australia| Case-Control    | aOR = 6.26, 95% CI: 1.2-34 | The PAR for self-reported supine sleep position in last month of pregnancy was 9.88%.
| Lakshmi et al 2017| India   | Case-control    | OR 2.27 (1.37-3.75) | Not reported |
| McCowan et al 2017| NZ      | Case-Control    | aOR 3.67, 95% CI 1.74-7.78. | The PAR of supine sleep position for late stillbirth was 9.4%.
| Heazell et al 2017| UK      | Case-Control    | aOR 2.31, 95% CI 1.04-5.11 | The PAR of supine going to sleep position 3.7% |
| O’Brien et al 2019| Internet| Case-Control    | n.s.               | N/A |

Current Primary Research: position
STARS results: Sleep Practices

Cases (n=153) Controls (n=480)
- No association for SR Snoring
- Long sleep duration (> 9 hours) aOR 1.75 (95% CI 1.10-2.79)
- Increased risk of stillbirth for:
  - Getting up less than once (aOR 2.03 95% CI 1.24-3.34)
  - Good/Very Good sleep quality (aOR 1.69 95% CI 1.04-2.75)
- 74% of cases believed their baby died overnight

Lit review with meta-analysis

<table>
<thead>
<tr>
<th>Sleep Position and Stillbirth</th>
<th>ES (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusted Off</td>
<td></td>
</tr>
<tr>
<td>Hazzell 72</td>
<td></td>
</tr>
<tr>
<td>C-C supine</td>
<td></td>
</tr>
<tr>
<td>Stacey 44</td>
<td></td>
</tr>
<tr>
<td>C-C supine</td>
<td></td>
</tr>
<tr>
<td>Lakshmi 102</td>
<td></td>
</tr>
<tr>
<td>C-C non-left lateral</td>
<td></td>
</tr>
<tr>
<td>McCona 73</td>
<td></td>
</tr>
<tr>
<td>C-C supine</td>
<td></td>
</tr>
<tr>
<td>Gordon 45</td>
<td></td>
</tr>
<tr>
<td>C-C supine</td>
<td></td>
</tr>
<tr>
<td>Owusu 18</td>
<td></td>
</tr>
<tr>
<td>C-C supine/supine = side</td>
<td></td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
</tr>
<tr>
<td>(I^2 = 0.0%; p = 0.776)</td>
<td>3.1 (2.2, 4.5)</td>
</tr>
</tbody>
</table>

Warland et al Sleep medicine review 2018
• Individual participant Data (IPD) meta-analysis of:
  
  - NZ (TASS) 155 cases, 310 control
  - Australia (SSS) 103, 192 controls
  - NZ (MCSS) 164 cases, 569 controls
  - UK (MINESS) 297 cases, 742 controls
  - International (STARS) 153 cases and 480 controls
  
  • TOTAL 872 Cases 2293 Controls

CRIBBS

• Going to sleep in the supine position compared with all other positions is associated with a pooled odds ratio OR of 2.59 (95% CI 1.76-3.80) I² of 0

Heazell et al 2018
Putting it into perspective

• In meta-analysis smoking during pregnancy was significantly associated with increase in the odds of stillbirth (OR 1.47, 95% CI 1.37, 1.57, p < 0.0001) (Marufu et al 2015)

• Binge drinking later in pregnancy increased odds of stillbirth (OR: 1.62, 95% CI: 1.09, 2.41, p=0.02) (Cornman-Homonoff et al 2014)

• Settling to sleep on your side is a simple measure that, if adopted by every pregnant woman has the potential to reduce stillbirth by up to 10%, in Australia that’s 220 babies each year

• Will telling women to settle to sleep on their side work?
What happened in New Zealand in 2011?

- Stillbirth Rate

2007-08: N=609
2009-2010: N=748
2011-2012: N=756
2013-2014: N=652
2015-2016: N=634

BMJ RESEARCH

Association between maternal sleep practices and risk of late stillbirth: a case-control study

Tomasina Stacey, midwifery lecturer, PhD student,1 John M D Thompson, senior research fellow,2 Ed A Mitchell, professor of child health research,2 Alec Elbourne, senior lecturer, obstetrics and gynaecology,3 Jane M Zuricchio, senior lecturer, perinatal pathology,3 Lesley M E McCowan, professor of obstetrics and gynaecology3

Could Sleeping on Left Side Help Prevent Stillbirth?

Stillbirth study suggests sleep position important

Expecting? Sleep on your left -- just in case

Expecting? Sleep on your left -- just in case

THE CONVERSATION

Sleeping on left side may reduce risk of stillbirth

N=789
N=979

After 20 weeks of pregnancy, it is safe to sleep on your back or side. Your placenta will grow to cover the opening in your uterus. This may help reduce the risk of stillbirth. Sleep on your side later in pregnancy.
Despite urging caution, midwives appear to have accepted the findings and are advising their patients to sleep on the left side.

This has resulted in a significant increase in left sided sleep position, from 35.9% in the Auckland stillbirth study (2006-9) to 62.5% in late 2011 (unpublished Findings).

This has been associated with a reduction in late stillbirth for New Zealand.

Although we cannot exclude other reasons for the decline, it is tempting to believe that the decline is a consequence of more pregnant women sleeping on their left. (Mitchell 2014)

Plausible Physiology?

- IVC compression
- Physiology
- Clinical experience
- Routine practice
**IVC compression**

86.5% reduction in IVC flow

**Clinical experience**

Clinical experience
Routine Practice

Maternal position during caesarean section for preventing maternal and neonatal complications (Review)

Cleaver C, Novikova N, Hofmeyr GJ, Hall DR

Current Research:
Understanding fetal response
• 29 healthy singleton pregnancies
• 35-38 weeks
• 4 positions: supine, right, left lateral (30° tilt), & semi-recumbent
• FHR via AN24
### FBS in according to maternal position when awake

<table>
<thead>
<tr>
<th>Variable</th>
<th>1F</th>
<th>2F</th>
<th>4F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left</td>
<td>11.3</td>
<td>79.1</td>
<td>9.6</td>
</tr>
<tr>
<td>Right</td>
<td>22.0</td>
<td>71.7</td>
<td>6.3</td>
</tr>
<tr>
<td>Semi-recumbent</td>
<td>16.7</td>
<td>81.9</td>
<td>1.5</td>
</tr>
<tr>
<td>Supine</td>
<td>34.4</td>
<td>63.4</td>
<td>2.3</td>
</tr>
</tbody>
</table>

Chi-Sq: 32.2 (p<0.0001)

- 46% of all 4F in left-lateral,
- 41% of all 1F in supine
- Intra-observer Kappa 0.8

### FBS in according to maternal position when asleep

<table>
<thead>
<tr>
<th>Variable</th>
<th>1F</th>
<th>2F</th>
<th>4F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left</td>
<td>13.4</td>
<td>82.2</td>
<td>4.4</td>
</tr>
<tr>
<td>Right</td>
<td>11.3</td>
<td>83.5</td>
<td>5.2</td>
</tr>
<tr>
<td>Supine</td>
<td>14.0</td>
<td>85.2</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Chi-Sq: 81.53 (p<0.0001)

- 4F occurred almost exclusively when mother was on her side,
- 1F was more common when mother was supine (OR 1.30, 95% CI, 1.11-1.52)
PrenaBelt trial


Maternal $O_2$ indicators With Prenabelt

- Prenabelt $p < 0.01$
- SDB $p > 0.05$
- No interaction
- Decrease 52%
- No change 24%
- Increase 24%

Fetal heart rate changes with Prenabelt:

- Prenabelt $p = 0.02$
- SDB $p > 0.05$
- No interaction
- Decrease 67%
- No change 5%
- Increase 28%

What does all this mean?

Most babies adapt to the mum sleeping on her back

But some babies may be more vulnerable than others

If all mums settle to sleep on their side then the vulnerable baby will be protected

‘Mabel’ by Jane Warland
Triples risk in pregnancy

- Altered Fetal activity
- Placental / Fetal Vulnerability
- FGR, SGA, LBW
- Stillbirth
- IVC compression
- SDB Supine sleep
- Age
- Maternal Factors
- Obesity
- Parity

How do we bring this into practice?

Practice  Research
Public awareness campaigns

Safest sleep position in pregnancy
In the third trimester of pregnancy going to sleep on your side has been shown to help prevent late stillbirth.

In the third trimester our advice is to go sleep on your side because research has shown that this is safer for baby. This includes night sleep and day time naps.

https://www.tommys.org/pregnancy-information/sleep-side-pregnancy-campaign
Tips for helping a woman sleep on her side in late pregnancy

• Put pillows behind her back to reduce falling on her back and between knees for comfort. It won’t prevent being on your back for certain but is likely to make it more uncomfortable.

• If she has long hair, try tying it in a low bun, which may make it uncomfortable to sleep on her back for any length of time.

• If she wakes up for any reason during the night, don’t worry about being on back but go back to sleep on her side.

• If she naps during the day pay the same attention to sleep position during the day as she would during the night.

• For women with pain on side sleeping the important thing is that she is not lying flat on her back as this is what the research is related to.
health professionals educating pregnant women

- Say something like:
- Research has shown that settling to sleep on your back is not best for baby. I’d like you to try to settle to sleep on your side from 28 weeks. Don’t worry if you wake up in the middle of the night on your back, that’s normal, just settle back to sleep on your side?

Remaining Questions:
How much?

How much supine sleep is needed to cause harm?

Who do we tell?

• EVERYONE
Won’t we make women anxious?

- Online survey of 537 women, analyses are presented of 176 women who reported being currently pregnant (mean age=27.9, SD=5.5y). For 37%, this was their first pregnancy.
Summary

- Settling to sleep supine is associated with increased stillbirth risk
- Public health campaigns have been launched or are being considered
- Maternity health professionals (MCPs) can influence women’s knowledge and practices during pregnancy AND...telling women to settle to sleep on their side from 28 weeks may save a baby’s life.
What is maternal intuition?

Mother’s intuition is the natural, inborn intelligence that guides and supports her to deeply know, without external influence, what is truly right, and correct for her child’s best interest and wellbeing.” (Simone Wright)

Intuition in practice

“A mother’s intuition is worth more than a medical degree.”

-Dr. Susan Martin

“a smart mother often makes a better diagnosis than a poor doctor” (Dr August Bier 1861–1949).
Do we currently use intuition in practice?

• Dr. Michael Howard, a pediatrician with more than 30 years in practice. “A mother bears a child for nine months and seems to possess a sixth sense like no other when things don’t align correctly with their child,” says Howard. “One thing I learned was to always listen to a mother when she told me something was amiss or not right with her child, despite the fact I may not have revealed anything on my physical exam.”

WHY?

We ask the mother because we cannot ask the child so the mother provides the voice for the child until the child can speak for themselves.
• Online survey
• 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.
**Highlights**

- The risk of stillbirth is 22.5 fold higher when mums report a “gut instinct” that something is wrong than those who do not report this.
- The gut feeling is most likely to be reported as enduring from the beginning of the pregnancy or in response to perceived changes in fetal movements.
- Some women reported they had difficulty in expressing their concerns and “being heard” (Warland et al Midwifery 2018).

**Gut Instinct**

*During this pregnancy did you ever have a “gut instinct” that something was wrong?*

- No, 34.5%
- Yes, 65.5%

Cohort study  
n=1,650 responses

No clear relationship with time since stillbirth
- 73.4% of women <6 months before survey
- 63.6% 6–11.9 months post-stillbirth (p = 0.002)
- 63.1% at 12–17.9 months
- 61.7% at 18–23.9 months
- 63.6% >24 months

No relationship with parity
- 521 (46.4%) were multiparous
- 601 (53.6%) were nulliparous
110 (75.3%) of the 146 stillborn cases (stillbirth less than 3 weeks prior) and only 28 (12.0%) of 234 live born controls (livebirth less than 3 weeks prior) answered yes to this question.

Comment data analysis

‘summative content analysis’ (Hsieh and Shannon 2005)
- data set searched for recurrence of certain words or content.
- Recurring words were then identified and quantified
- 2 Authors JW and JB separately coded the data and then reached agreement on the common recurring words.
‘Themes’

1. When the Gut feeling occurred
2. How the gut feeling made the woman feel
3. Dreams and other related phenomena
4. Telling someone.

When he was so quiet the last few days I was uneasy about it but my doctor didn’t seem concerned. It is hard to explain - I just had this overwhelming sense that something was not right from early on. My OB said it was not uncommon to worry. The last night of pregnancy I mentioned to husband that I “didn’t feel right” but couldn’t explain the feeling.
How the “gut feeling” made her feel

Being that this was my first pregnancy and she (Doctor) reassured me that everything was fine,

I tried to put it to the back of my head and blamed the "gut instinct" on my hormones.

I thought every pregnant mother would worry to some extent about anything going wrong.

Dreams and related phenomena

I had a funny dream which made no sense, and so I ignored it. In the dream I was in labour in the hospital but I was crying. I thought it was because I was scared of labour. I wish I’d paid attention TO MYSELF!

I often had nightmares really bad ones that my baby died. There was always the gut instinct and it gutted me when it happened.

I couldn’t picture myself bringing the baby home.
Telling someone

Instead of acting on my worries, I tried to suppress them in order to accommodate family who told me to just stop worrying and that everything would be okay.

I knew something was wrong but when I went to see the midwife, she found a heartbeat and told me everything was ok and not to worry. Worst mistake of my life. I should have listened to my body to know something was wrong, not her [the midwife].

when she stopped moving as much I was worried. But, my husband was very reassuring. He reminded me how my babies usually “settle in” and move less at the end. That put my mind at ease a little.

Limitations:
Discussion

What is stopping us from using this in practice?

• Stigma?
• Perception?
• Concerns about Anxiety?
We could use this, but would we see this?

Request form
Admission for maternal intuition
IOL for maternal intuition

How might the story be different?
I worried throughout my entire pregnancy. But I seemed to be having an absolutely perfect, healthy pregnancy so I kept telling myself not to worry. When we hit 37 weeks I pretty much stopped worrying because I figured if anything went wrong they’d cut me open and my baby would be fine. I never even knew stillbirth was a possibility – I’d done TONS of research on pregnancy, read all the books, took the classes and it NEVER came up anywhere. I thought stillbirth had ended in the 1800s– I never knew how common it was until it happened to me. So even though I sensed something was a little off, I was very reassured by everyone’s confidence in my pregnancy– I thought it was just normal worries. If I’d really felt like anything was wrong, I would have trusted my instincts– but whatever instincts I might have had were mild enough to be easily dismissed.

It’s hard to gauge in retrospect – I’d like to think I knew something was wrong, but really, nothing felt wrong enough for me to act on it. It seemed normal….

Yes, right from the beginning!

"Not listening to my gut will always haunt me"
Part 3: Implementing into practice
• 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 health professional about fetal movement between weeks 18 and 24 of pregnancy.

https://tinyurl.com/yawlaf65
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 health professional about fetal movement between weeks 18 and 24 of pregnancy.

In 2015, the stillbirth rate was 3.8 per thousand versus 4.9 in 2010.

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

UK: Saving babies lives care bundle

What is the Saving Babies’ Lives care bundle?

Saving Babies’ Lives is designed to tackle stillbirth and early neonatal death. It brings together four elements of care that are recognised as evidence-based and/or best practice:

1. Reducing smoking in pregnancy
2. Risk assessment and surveillance for fetal growth restriction
3. Raising awareness of reduced fetal movement
4. Effective fetal monitoring during labour

“This large scale evaluation of the NHS England Saving Babies Lives Care Bundle shows that the interventions to reduce cigarette smoking, detect small for gestational age babies, inform women about reduced fetal movements and improve monitoring of babies during labour, have been increasingly implemented in the early adopter maternity units. Over the same time period stillbirths have fallen by 20%, meaning 161 fewer stillbirths in the participating units.
Case-control: Health professional Information

<table>
<thead>
<tr>
<th>Response</th>
<th>Group</th>
<th>All</th>
<th>OR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cases</td>
<td>Controls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>%</td>
<td>Total</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>%</td>
<td>Total</td>
<td>%</td>
<td></td>
</tr>
</tbody>
</table>

During this pregnancy did your healthcare provider tell you about or ask you to keep track of your baby's movement?

<table>
<thead>
<tr>
<th></th>
<th>Cases</th>
<th>Controls</th>
<th>All</th>
<th>OR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>79</td>
<td>161</td>
<td>240</td>
<td>Reference</td>
<td>0.0066</td>
</tr>
<tr>
<td>Yes</td>
<td>65</td>
<td>226</td>
<td>291</td>
<td>0.59 (0.4, 0.86)</td>
<td></td>
</tr>
</tbody>
</table>

Heazell et al 2017

The question got routinely asked by my midwife during both pregnancies, but the importance of it was never explained... With Bridget I did voice at 35w+ that my belly isn't growing...'you look fine to me' was the response I got.... And I did say that movements are starting to decrease, especially at night time... Bridget was stillborn

Angelica Fricot
I remember questioning my midwife about feeling less movement and she said don’t worry it’s normal.

I later went to the hospital the nurse told me that I was over reacting and that it was normal.

I delivered my daughter sleeping

Sarah Hudson

For 2 weeks I noticed decreased movement.

I went and got checked 3 times only to be told each time she was fine.

Isabella was born still.

Chrissy George
What was your response to the change?  

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

Warland et al 2015

DAILY ACTIONS FOR A SAFER PREGNANCY

- Avoid comparing your pregnancy to others
- Monitor baby movement pattern
- Monitor baby movement strength
- Monitor baby movement frequency
- From 28 weeks, settle to sleep on your side
- Trust your intuition
- Any changes, call straight away

These daily actions may help prevent a stillbirth from happening to you
Why isn’t stillbirth and preventative measures shared as part of common pregnancy advice?

Why the reluctance?
Fear?
Who?
"I am so glad I got your brochure, I have not seen or heard of this information before, so thank you.

Is the message hard to deliver?"
Why the importance?

Empowerment
The Power of Words

Stillbirth

Does it worry you?
Do you think?

Putting the responsibility on moms during pregnancy relating to side sleep, monitoring movement, honoring maternal intuition, etc – will cause parents who experience loss to blame themselves or you?

Open for discussion

Will I be sued?

The risk of malpractice. The reality is that parents seem to only consider that route if they feel like they were brushed off, their provider didn’t take their concerns seriously, or specifically said they wouldn’t do something the family asked for (ie - delivery before 39 weeks). Even then, the system is set up to protect the providers - so it is very rare for a family to be successful in suing their doctor for a stillbirth - but most families and physicians don’t realize this.

Open for discussion
Implementing open conversation about stillbirth into practice
Talk SAFE Pregnancy

Sleep
Awareness of stillbirth
Fetal Wellbeing; movements & intuition
Empowered care

to help prevent Stillbirth

Talk SAFE Pregnancy

Open communication is key
Talk SAFE Pregnancy

Tell me about your baby’s movements.

AIM High

Activate
Implement
Monitor

to help prevent Stillbirth
SAFE PREGNANCY
EMPowered CARE
TIMELINE

FIRST APPOINTMENT
ACTIVATION

- Start the conversation
- Give women SAFE Pregnancy brochure and magnet
- Say: "This is important information take the time to read it. Suggest woman put the magnet on her fridge. You, your baby and I are a team and we will work together in your pregnancy. So if anything feels different or you have any questions I need to know, trust your instincts and don't be afraid to call 24/7."
SAFE PREGNANCY
EMPOWERED CARE TIMELINE

MID PREGNANCY IMPLEMENTATION

- Discuss and open the dialogue on
  Sleep, Movements &
  the importance of Intuition
- Take women through SAFE Pregnancy
  brochure and magnet
- Say: “Did you know your baby can
  communicate with you through its
  movements? Get to know who your baby
  is so together we can know how your
  baby is. Spend time daily learning your
  baby’s personality (is baby a morning
  person, does baby like to hear your
  voice). Find your baby’s routine,
  strength and frequency of movement
  and you will find what’s normal for your
  baby’s movements. We are a team, you,
  your baby and I. I need to know if
  anything feels different or if you feel
  uneasy in anyway.”
- Say: “It’s important to start to settle to
  sleep on your side. This helps oxygen flow
  to you and your baby’s placenta. Don’t
  worry if you wake up on your back just
  settle back to sleep on your side.”

SAFE PREGNANCY
EMPOWERED CARE TIMELINE

MID PREGNANCY IMPLEMENTATION

- Discuss why: “Monitoring movements
  and sleeping on your side in pregnancy
  are best practice to keep your baby safe
  and help prevent a stillbirth from
  happening to you.”
- Explain: “Early movements may feel
  like a flutter or a tickle, only mum can
  feel these. As baby gets bigger, so do
  the mid pregnancy movements. After
  about 20 weeks baby is gradually getting
  stronger and you will feel kicks and
  punches, other people will be able to
  feel this too. Regularity of movements in
  late pregnancy shouldn’t change. As
  your due date draws near baby won’t
  slow down or run out of space but you
  might feel different types of movement
  such as rolling and strong sweeping
  movements. You may even see a hand or
  foot. Anything feels different to normal,
  as your clinician, I need to know,
  straight away.”
SAFE PREGNANCY
EMPowered CARE
TIMELINE

MID PREGNANCY
IMPLEMENTATION

○ Ask & Listen: Do you have any questions? How are you feeling?
○ Place sticker on the rear of the handheld record or your clinic's own pregnancy folder for mothers

SAFE PREGNANCY
EMPowered CARE
TIMELINE

LATE PREGNANCY
MONITORING

○ Ask: Tell me about your baby's movements? Have you noticed any change in your baby's movements?
○ Anytime a woman presents, follow the relevant clinical guidelines and if you feel all is OK to send away ALWAYS ask "How do you and baby feel? Do you feel comfortable leaving? Has everything returned to your normal?" ALWAYS say "Remember if something feels different or you feel uneasy, you can come back at anytime, even if its today"
Still Aware & Star Legacy are committed to ending preventable stillbirth. Stillbirth is the leading cause of infant death in Australia and in the United States of America.

Listeria 260 deaths per year (all listeria including in pregnancy)
Pertussis 20 deaths per year (under 1 years old)

Stillbirth more than 25,000 per year

Source CDC
Stillbirth
Awareness + Education = Action = Prevention
Before you leave or at home please take 10 minutes to complete this survey for research purposes

Post workshop survey

stillaware.org/usa2

When you should contact your health professional or visit the hospital immediately?

ANY change in your baby’s movement, behavior, or patterns or have a sense that something is different or wrong,

Fever

Bleeding

New, changed, or worsening pain

Headache Fainting/dizziness Painless urination

Vomiting more than once a day, especially if accompanied by pain or fever

Sudden or significant swelling of hands, feet, or face

Constant itching

Overwhelming concern that something is wrong
From parents
Stories of remembrance
Stories of hope
We value your feedback
stillaware.org/clinician-evaluation
Links & references:

(i) Supplement to: Flenady V et al (2016) Lancet ending preventable stillbirths series 2016; published online Jan 18. [Link](http://dx.doi.org/10.1016/S0140-6736(15)01029-X)


(xi) Australia And New Zealand Fact Sheet. Australian and New Zealand Stillbirth Alliance. Web. [Link](http://www.stillbirthalliance.org/doc/ANZSAFS.pdf)


