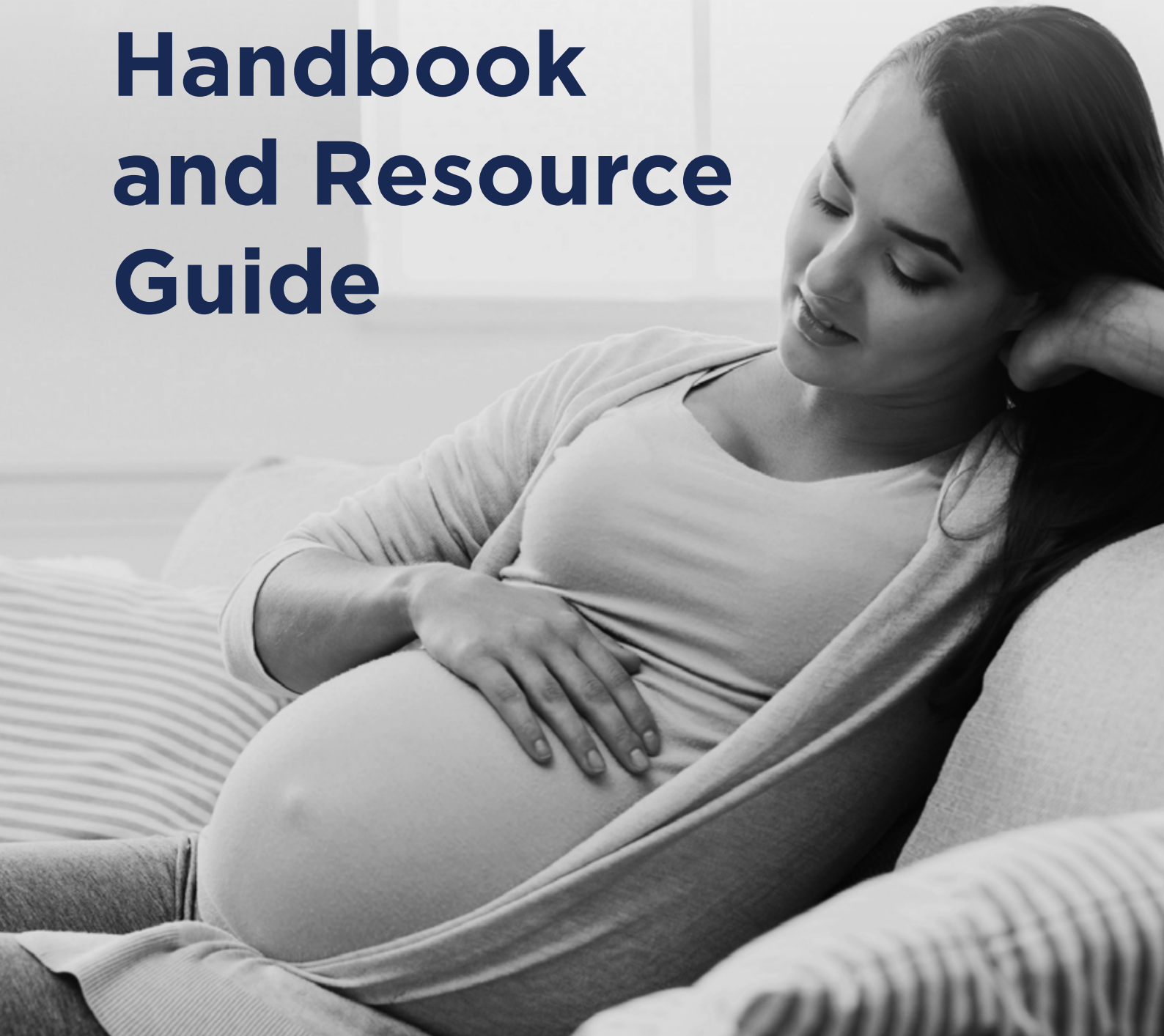


# Safer Baby Bundle

WORKING TOGETHER TO REDUCE STILLBIRTH



## Handbook and Resource Guide





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## Handbook and Resource Guide

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## Preface

The Safer Baby Bundle (SBB or the Bundle) is a collection of change ideas or interventions designed to reduce late pregnancy stillbirth. The SBB interventions are based on the evidence summaries developed in partnership with the Perinatal Society of Australia and New Zealand (PSANZ). Where evidence was limited, best practice guidance was established through consensus of multidisciplinary teams for each of the SBB elements.

The purpose of this SBB Handbook and Resource Guide is to inform, assist, and support healthcare professionals, managers of maternity services, policy makers, government, and women and their families in reducing stillbirth in Australia. Health service managers and leaders are asked to implement the SBB using the educational materials and other resources provided and are encouraged to participate in its evaluation which will inform future improvements to the SBB.

Development of the SBB has drawn from the expertise and experience of international advisors from the UK Saving Babies Lives Bundle of care<sup>1</sup>. The handbook is based on the approach used in the UK Bundle Versions One and Two, with content to address identified priorities for Australian maternity services.

## Foreword

Stillbirth is a serious public health problem with far reaching psychosocial and financial burden for families and societies<sup>2</sup>. The Lancet's stillbirth series of 2011 and 2016 made a strong call to action to address the neglected public health problem of stillbirth<sup>3,4</sup>.

In 2015, the stillbirth rate in Australia was 35% higher than countries with the lowest rates globally<sup>5</sup>, with Australia ranking 15th across the 49 high-income countries. While small reductions in late gestation stillbirth rates have occurred in Australia<sup>6,7</sup>, more needs to be done<sup>5</sup>. In particular, stillbirth is more common amongst Aboriginal and Torres Strait Islander<sup>6,8</sup>, South Asian<sup>9</sup> and African<sup>10</sup> women, and disadvantaged women<sup>5</sup>. Areas for prevention are clear. In up to half of stillbirths, there is evidence of inadequate or inappropriate care, and in 20-30% of stillbirths the death is preventable had care been as it should have been<sup>11</sup>.

The Centre of Research Excellence in Stillbirth (Stillbirth CRE) was established through a National Health and Medical Research Council (NHMRC) grant as a direct response to the call to action from the Lancet's stillbirth series (2016). Working in partnership with parents, health care professionals, professional colleges, parent advocacy organisations, and government agencies, the Stillbirth CRE has identified key evidence-practice gaps in stillbirth prevention. Urgent action is needed to address these gaps between *what is known* and *what is done* in maternity care in Australia. Bundles of care implemented elsewhere have shown reductions in stillbirth rates - including combining recommendations for best practice maternity care in the United Kingdom, through the *Saving Baby's Lives* Bundle<sup>12</sup>, and the Scottish Maternity and Children Quality Improvement Collaborative (MCQIC)<sup>13</sup>. Elements of the UK Bundles included: smoking monitoring and cessation strategies; monitoring fetal growth; reduced fetal movements; and effective fetal monitoring in labour<sup>12</sup>.

The Safer Baby Bundle has drawn on the experience in the UK and, following wide consultation, includes three of the UK Bundle elements (decreased fetal movements, fetal growth restriction and smoking cessation support) plus two additional elements (maternal sleep position and the timing of birth for women with risk factors for stillbirth). Fetal monitoring in labour was not included in the Bundle as training is already widely available through the Royal Australian and New Zealand College of Obstetricians and Gynaecologist's (RANZCOG) Fetal Surveillance Education Program<sup>14</sup> (FSEP) and the Fetal welfare assessment, Obstetric emergencies and Neonatal resuscitation Training (FONT) Program in New South Wales<sup>15</sup>.

As many of the causal pathways to stillbirth are common to adverse maternal and neonatal outcomes<sup>11</sup>, the Bundle has the potential to reduce not only stillbirth rates but also to improve other outcomes for mothers and babies in Australia. However, the Bundle must be accompanied by careful monitoring for potential unintended harm such as increased unnecessary intervention (including induction of labour and/or caesarean section) and associated increased preterm births and adverse neonatal outcomes. These important 'balance' measures are needed to ensure that the change ideas designed to improve processes in one part of the system (e.g. reduce stillbirths) do not cause new problems in other parts of the system (e.g. increased preterm births).



Nationally, to drive improvement in maternity services with the aim of preventing stillbirths and preterm births, alignment between the Safer Baby Bundle and the Australian Preterm Birth Prevention Alliance (APBPA)<sup>16</sup> is important. This approach is similar to the newly established Tommy's National Centre for Maternity Improvement<sup>17</sup> in the UK.

In October 2018 the Stillbirth CRE, in partnership with the Stillbirth Foundation Australia, Still Aware and Health Departments across Queensland, Victoria and New South Wales, received a NHMRC Partnership Grant to implement and evaluate the Safer Baby Bundle. The Select Senate Committee Inquiry into Stillbirth Research and Education tabled its Report ('the Senate Report'<sup>18</sup>) in the Australian Parliament with 16 recommendations and a call for a National Action Plan. A major focus of the report was addressing gaps between evidence and practice to reduce stillbirth by 20% over the next three years. In July 2019, the Minister of Health, through the Medical Research Future Fund (MRFF), provided the Stillbirth CRE with further funding to support upscaling of the Safer Baby Bundle for implementation across all Australian jurisdictions to meet this target.

# Endorsing organisations

Australian College of Midwives



Australian College of Rural and Remote Medicine



Australian College of Neonatal Nurses



Australian and New Zealand Neonatal Network



Bears of Hope



Clinical Excellence Commission, NSW Health



Clinical Excellence Queensland, Queensland Health



CRANApplus



International Stillbirth Alliance



Perinatal Society of Australia and New Zealand



Red Nose Australia



Royal Australia and New Zealand College of Obstetricians and Gynaecologists



Safer Care Victoria, Department of Health and Human Services Victoria



Sands Australia



Still Aware



Stillbirth Centre of Research Excellence



Stillbirth Foundation Australia



Women's Healthcare Australasia



# Abbreviations

Abbreviation	Meaning
<b>AIHW</b>	Australian Institute of Health and Welfare
<b>aOR</b>	adjusted odds ratio
<b>ART</b>	assisted reproductive technologies
<b>CEC</b>	Clinical Excellence Commission
<b>CEQ</b>	Clinical Excellence Queensland
<b>CI</b>	Confidence Interval
<b>CO</b>	carbon monoxide
<b>CS</b>	caesarean section
<b>CTG</b>	Cardiotocography
<b>DFM</b>	decreased fetal movements
<b>FGR</b>	fetal growth restriction
<b>FM</b>	fetal movement
<b>GAP</b>	Growth Assessment Protocol
<b>GP</b>	General Practitioner
<b>IMPROVE</b>	IMproving Perinatal Mortality Review and Outcomes Via Education
<b>IOL</b>	induction of labour
<b>KPIs</b>	Key performance indicators
<b>MBM</b>	My Baby's Movements trial
<b>MCoC</b>	Midwifery continuity of care
<b>MCQIC</b>	Scottish Maternity and Children Quality Improvement Collaborative
<b>MRI-UQ</b>	Mater Research Institute-University of Queensland
<b>NHMRC</b>	National Health and Medical Research Council
<b>NRT</b>	nicotine replacement therapy
<b>PAR</b>	population attributable risk
<b>PMMRC</b>	Perinatal and Maternal Mortality Review Committee
<b>PSANZ</b>	Perinatal Society of Australia and New Zealand
<b>RANZCOG</b>	The Royal Australian and New Zealand College of Obstetricians and Gynaecologists
<b>SCV</b>	Safer Care Victoria
<b>SFH</b>	Symphyseal-fundal height
<b>SGA</b>	Small for gestational age

<b>Abbreviation</b>	<b>Meaning</b>
<b>SSB</b>	Safer Baby Bundle
<b>Stillbirth CRE</b>	The Centre of Research Excellence in Stillbirth
<b>SUDI</b>	sudden unexpected death in infancy
<b>UK</b>	United Kingdom
<b>USS</b>	Ultrasound
<b>VBA</b>	very brief advice
<b>WHO</b>	World Health Organization

# Introduction

## Purpose of the Safer Baby Bundle

The Australian Safer Baby Bundle (the Bundle) is primarily designed to reduce stillbirth rates after 28 weeks' gestation by at least 20% by 2023. The Bundle addresses commonly reported care factors that can be moderated including maternal smoking<sup>19,20</sup>, detection and management of fetal growth restriction (FGR) and for women with decreased fetal movements (DFM), maternal sleep position (a recently reported avoidable risk factor for stillbirth<sup>2</sup>) and an increasing clinical concern regarding decision-making about the timing of birth for women with risk factors for stillbirth. With promotion of woman-centred, respectful care (including shared-decision making) as an integral part of the Bundle, it is expected that this initiative will improve women's and families' experience of maternity care.

## Target audience

The Safer Baby Bundle has been developed primarily for midwives, doctors, health service managers, nurses, and other health care providers (e.g. Aboriginal health care providers) providing maternity care and for women accessing maternity care in Australia.

## The Bundle elements

The 5 elements of the Bundle are:

<b>Element 1:</b>	Supporting women to stop smoking in pregnancy
<b>Element 2:</b>	Improving detection and management of fetal growth restriction
<b>Element 3:</b>	Raising awareness and improving care for women with decreased fetal movements
<b>Element 4:</b>	Improving awareness of maternal safe going-to-sleep position in late pregnancy
<b>Element 5:</b>	Improving decision-making about the timing of birth for women with risk factors for stillbirth

### Resources for each element of the Bundle include:

- Best practice recommendations
- Implementation tools including clinical checklists and care pathways
- A measurement strategy including Key Performance Indicators (KPIs) and audit tools
- An educational program for health care providers (both eLearning and face-to-face training)
- Educational resources for women including a mobile phone app.

# Implementation

## Framework

Implementation of the Bundle will be undertaken by the respective state and territory health departments and their associated improvement agencies. Implementation strategies and approaches will differ across jurisdictions but the intent for all is to progressively embed the Bundle within existing care. The role of the Stillbirth CRE is to develop and provide educational resources for each element of the Bundle, be responsible for national coordination, and to undertake the evaluation.

A key component of the implementation strategy is a dedicated implementation team in each jurisdiction, led by health service executive leadership teams. These teams will provide leadership, generate and sustain motivation for change, provide tools to support practice change through education, audit and feedback, and benchmarking and implementation support forums to facilitate sharing of experiences of the Bundle by clinical champions from across participating hospitals.

In addition to the five Bundle elements, we emphasise the need for maternity services to address other important aspects of best practice care to reduce stillbirth rates. This includes the recommendation that maternity services increase the availability of midwifery continuity of care models to all women (reducing the risk of fragmentation of care), and in particular, for women at increased risk of stillbirth.

## Education and resources

### Educational program for maternity care providers

The Stillbirth CRE's existing highly successful educational programs for health care providers will be incorporated into a comprehensive package of educational resources covering each element of the Bundle; both face-to-face workshops and eLearning. These resources will build on programs which include: a workshop of risk factors for stillbirth<sup>21</sup>; a DFM eLearning program<sup>22</sup>; and a FGR face-to-face and eLearning educational program for clinicians<sup>23</sup> (developed in partnership with Safer Care Victoria). As part of the Bundle, the eLearning will be made available to all clinicians providing maternity care in Australia. As perinatal mortality audit is a fundamental part of best practice and implementation of the Bundle, the IMproving Perinatal Review and Outcomes Via Education (IMPROVE)<sup>24</sup> program on best practice care after a perinatal death will be made available to maternity services. In partnership with the Perinatal Society of Australia and New Zealand (PSANZ), IMPROVE will be available as a face-to-face workshop and eLearning module.

### Care pathways, information materials and resources

A package of educational materials including clinical care pathways form part of the Bundle resources. Using co-design methodology<sup>25</sup>, additional resources for women, including those for Aboriginal and Torres Strait Islander women, are being developed and will be incorporated as they become available.

Existing resources such as the 'Your baby's movements matter'<sup>26</sup> brochure for women and care pathways around DFM and FGR have been incorporated. Materials will be made available through services providing antenatal care, the Stillbirth CRE website and relevant aspects will be promoted through the Bundle's public awareness campaigns e.g. maternal sleep position and DFM.

# Element 1: Supporting women to stop smoking in pregnancy

## Element description

**Stopping smoking in pregnancy by providing support and strategies for women to quit and not resume smoking.**

## Actions

1. **For all health care providers:** When pregnancy is planned or recently confirmed (prior to the antenatal care visit) and the woman is smoking, health care providers should explain the importance of smoking cessation, refer to Quitline and consider offering or arranging nicotine replacement therapy (NRT), and follow-up with the woman at every subsequent visit.
2. **First antenatal care visits: Provide brief advice using the Ask, Advise, Help model (AAH)**
  - i. **Ask-** Screen for and document tobacco use in the antenatal record:
    - regardless of smoking status, offer all women an exhaled breath carbon monoxide (CO) reading (and their partners where available)
    - ask all women about their smoking status (multi-choice format\*).
  - ii. **Advise-** For women who are smokers or recent quitters, provide advice on the benefits of quitting:
    - explain the importance of smoking cessation
    - explain the best way to quit, including support sessions through Quitline, and NRT if appropriate.
  - iii. **Help-** Offer to help:
    - offer personalised advice on how to stop smoking (e.g. setting quit date, making quit plan)
    - refer to Quitline (or other locally appropriate smoking cessation service) if identified as smoker and/or CO level is elevated (4ppm or above)
    - consider offering or arranging prescriptions for NRT, following a discussion of risks and benefits and in consultation with other relevant health workers.
3. **At each subsequent antenatal care visit:**
  - i. for women identified as smokers or recent quitters, use the Ask, Advise and Help brief advice model to:
    - follow-up at every antenatal visit
    - offer personalised advice on how to stop smoking and available behavioural intervention services (e.g. Quitline) to support quitting, including details on when, where and how to access them
    - consider offering or arranging prescriptions for NRT, following a discussion of risk and benefits and in consultation with other relevant health workers
  - ii. for all women, at the 28 weeks' gestation visit, record CO reading
  - iii. at the discharge appointment and/or a six-week postnatal appointment, use the Ask, Advise and Help model, and refer to Quitline service as necessary.

\* Example of multi-choice format of questions: Which of these best describes your experience? a) I smoke more since pregnant, b) I smoke less since pregnant, c) I am smoking the same, d) I used to smoke but quit, e) I have never smoked.



Key performance indicator (KPI)	
Percentage of women who cease smoking between first antenatal care visit and birth	
Numerator	
Women who cease smoking between first antenatal care visit and birth	
Denominator	
Women identified as smoking	

Indicators	
Measure	Numerator and denominator
1. Proportion of women who undertake exhaled breath carbon monoxide analysis at first antenatal care visit and at 28 weeks antenatal appointment.	<p><b>Numerator:</b> Women who undertake exhaled breath carbon monoxide analysis at first antenatal care visit and at 28 weeks antenatal appointment.</p> <p><b>Denominator:</b> All women at first antenatal care visit and at 28 weeks antenatal appointment.</p>
2. Proportion of women, identified as smoking, with documented referral to smoking cessation service (e.g. Quitline).	<p><b>Numerator:</b> Women, identified as smoking, with documented referral to smoking cessation service (e.g. Quitline).</p> <p><b>Denominator:</b> All women, identified as smoking.</p>
3. Proportion of women, identified as smoking, who are provided with information and/or resources about the risks associated with smoking and advised to quit smoking at first antenatal care visit.	<p><b>Numerator:</b> Women, identified as smoking, who are provided with information and/or resources about the risks associated with smoking and advised to quit smoking at first antenatal care visit.</p> <p><b>Denominator:</b> All women, identified as smoking, at first antenatal care visit.</p>
4. Proportion of women, identified as smoking, with documented referral to smoking service who engaged with a smoking cessation service.	<p><b>Numerator:</b> Women, identified as smoking, who engaged with a smoking cessation service.</p> <p><b>Denominator:</b> Women, identified as smoking, with documented referral to smoking cessation service (where such a service is available).</p>

## Rationale

Smoking during pregnancy remains a major public health problem and one of the single most important avoidable causes of stillbirth and other serious adverse pregnancy and child outcomes. While overall smoking rates in pregnancy in Australia have reduced from 14.6% in 2009 to 9.9% in 2017<sup>27</sup>, disadvantaged women have rates 3 times that of their counterparts<sup>28</sup>. About 1 in 10 pregnant women smoke in Australia. In Australia, 44% of Aboriginal women smoke in pregnancy<sup>27</sup>. Women who smoke in pregnancy are more likely to be younger and to live in areas of socioeconomic disadvantage.

Smoking during pregnancy has a far-reaching impact on the health of the woman and her child throughout his or her life. Smoking during pregnancy increases risks of miscarriage, stillbirth, placental abruption, preterm birth, sudden unexpected death in infancy (SUDI) and congenital anomalies<sup>28-32</sup>. Smoking during pregnancy is also associated with low birthweight, and small for gestational age, as well as later impairments of child growth and development<sup>33,34</sup>. Maternal smoking is also associated with doubling of the risk of SUDI<sup>35</sup> and a wide range of other adverse outcomes for the child including childhood cancers, poor respiratory health outcomes (asthma and respiratory infections, visual impairments, neurodevelopmental and behavioural problems). Longer term effects for the child include type 2 diabetes and adiposity in adulthood and cardiovascular disease<sup>36</sup>. Long-term health risks to women who smoke include heart disease, cancer, early death, and links to many other diseases and health problems.

Exposure to second-hand smoke, also known as 'passive smoking' from any type of smoke (e.g. shisha/hookah/nargile, cigarettes, cigars, bidis, marijuana leaf), and the use of smokeless tobacco and e-cigarettes also pose serious health risks to pregnant women and children<sup>32,37,38</sup>.

Smoking in pregnancy affects placental development directly or indirectly by reducing blood flow, creating a pathologically hypoxic environment for the developing fetus<sup>39</sup> resulting in fetal growth restriction, preterm birth and stillbirth. Conservatively, smoking is associated with a 40% increase in stillbirth (adjusted OR 1.36, 95% CI 1.27 to 1.46)<sup>28</sup>. Heavy smoking (more than 10 cigarettes per day) is associated with a doubling of the risk<sup>28</sup>. The population attributable risk (PAR) for smoking and stillbirth is conservatively estimated at around 7%. However, along with higher rates, maternal smoking makes a much larger impact for women living under adverse socioeconomic circumstances. For example, with a smoking prevalence of around 50% to 60% in Indigenous Australian and Canadian women, the PAR for smoking may be 20% or higher. Efforts to support women living under adverse circumstances to stop smoking is crucially important to reduce the unacceptable disparity in pregnancy outcomes for these women<sup>5</sup>.

Women should be encouraged to quit early in pregnancy, during the first trimester if possible<sup>40,41</sup>. In one study<sup>41</sup>, rates of preterm birth were over 20% higher for women quitting in the second trimester compared with women who stopped smoking in the first trimester.

The Stillbirth CRE survey of maternity services<sup>42</sup> found that although recording of smoking status at the first antenatal visit is recommended by the national guidelines, in practice only half of the respondents reported that smoking status was documented all of the time. Similarly, referral to

quitting support services was also suboptimal with 1 in 4 maternity services offering referral only half the time or less, with little follow up from the maternity service.

This evidence-based element provides a practical approach to reducing smoking in pregnancy. It requires screening all pregnant women for smoking exposure and referral to smoking cessation services. Importantly, this element will impact positively on other care Bundle elements. Reducing smoking in pregnancy will reduce instances of fetal growth restriction. This demonstrates the complementary and cumulative nature of the care Bundle approach.

Women who smoke in pregnancy are likely to attend antenatal care later and less often. Pregnant smokers may experience stigma and guilt given the strong anti-smoking social norms in Australia<sup>43</sup>, and thus may withdraw from social networks. There are links between smoking in pregnancy and stressful life events, such as job loss or death of a loved one<sup>44</sup>. A woman is less likely to stop smoking in pregnancy if her partner smokes, so it is important to encourage the partner to also give up smoking<sup>45</sup>.

Advice and support for Aboriginal and Torres Strait Islander women and families and their care providers is a priority area. Aboriginal and Torres Strait Islander women may experience many social issues and pressures which can get in the way of smoking cessation during pregnancy. Culturally responsive approaches and peer support to stop smoking in pregnancy are likely to be more successful than usual care<sup>43</sup>. Support from community (such as Elders and Aunties) to not smoke in pregnancy may be particularly valuable<sup>46</sup> and giving up smoking in pregnancy can be a source of pride for Aboriginal and Torres Strait Islander mothers<sup>47</sup>.

## Smoking Cessation approaches

Evidence has consistently shown that a combination of brief advice from a health professional, behavioural intervention and smoking cessation pharmacotherapy is the most effective approach to successful smoking cessation<sup>48,49</sup>.

Brief advice is intended to promote cessation and facilitate the woman accessing best practice support. The '5A's' brief intervention model is recommended in some settings, notably by general practitioners, however there is strong evidence to suggest that it is not implemented due to lack of time, confidence and skills to undertake motivational interviewing<sup>50</sup>. Another approach is the shorter three-step ('Ask, Advise, Help') brief advice model, which is the model adopted by Cancer Council Australia and QUIT Victoria. The health care environment can be very busy, therefore brief advice through either model is an acceptable approach<sup>51</sup>.

In an Australian study, when women were routinely asked their smoking status at the first antenatal visit, 96% of smokers recalled being asked this<sup>52</sup> and most pregnant women expect to be asked whether they smoke<sup>53</sup>. However, fewer than half the women reported having subsequent discussions about smoking<sup>54</sup> or that they were referred to services such as Quitline<sup>55</sup>.

Smoking is a deeply entrenched behaviour, reinforced by the action of nicotine on reward pathways in the brain<sup>56</sup>. Reframing smoking as an addiction<sup>55</sup>, may be a more effective approach than portraying smoking as a lifestyle choice. A combination of strategies is therefore needed,

including carbon monoxide monitoring, behavioural intervention (or behaviour change counselling), and nicotine replacement therapy<sup>56</sup>.

These strategies can increase the proportion of women who quit smoking in pregnancy and thus reduce the risk of preterm birth and low birthweight<sup>57</sup>; they are also cost effective<sup>56</sup>. Contingency management (financial incentives for abstaining from smoking) have also encouraged smoking cessation in pregnancy<sup>41,58-60</sup>.

A recent evaluation of strategies including CO monitoring, opt-out referral and improved referral pathways showed significant increases in both referrals and quit rates<sup>61</sup>. Given that maternity care provides opportunities to identify and follow up pregnant smokers, CO monitoring has been introduced widely in the UK and Ireland<sup>62</sup>. Qualitative data indicate good acceptance among healthcare practitioners<sup>63-65</sup>. However, other studies describe hesitancy and fear about maternal autonomy when universal CO monitoring is used in maternity care<sup>66</sup>. Further research is required to understand the acceptability of these strategies among women and clinicians in Australia.

### **Nicotine replacement therapy (NRT)**

Two comprehensive reviews of NRT<sup>67,68</sup> indicate that NRT use in pregnancy may increase smoking cessation by 40% without showing adverse effects on pregnancy or birth outcomes. In a UK pregnancy cohort, risk of stillbirth was found to be similar between women who smoked and women who used NRT<sup>69</sup>.

Higher doses of NRT may be required to control withdrawal symptoms or cravings in pregnant women as their nicotine metabolism is higher<sup>70</sup>. Pregnant women can use intermittent NRT (gum, lozenge, mouth spray (mist), and inhalator) and patches from early in pregnancy - this is safer than continuing to smoke<sup>71,72</sup>. Starting doses (gum or lozenges, or inhalator or mist), need to be high, and patches added if abstinence is not achieved or cravings continue. At least a 12-week course should be used.

The prescriber should discuss the risks versus benefits of using NRT compared with continuing to smoke. Both GPs and maternity care providers can prescribe and provide NRT, though access through GPs may be more straightforward for pregnant women who are smoking. Many Aboriginal Health Services also can dispense NRT, at no or low cost. In Australia, lozenges, gum, and patches are included in the Pharmaceutical Benefits Scheme as monotherapies.

## **Implementation**

### **Recommended approach**

Health care professionals providing antenatal care require time and tools to carry out the activities required by this element. They need adequate time at the first antenatal care visit to carry out the CO testing (screening) and to deliver key messages. All health care professionals require up to date knowledge and skills training to maximise their potential to impact positively on women who smoke, their families, and their pregnancy outcomes.

## Education

Maternity services should provide training for all health care professionals providing antenatal care including the following areas:

- Upskilling in the principles of using the 'Ask, Advise, Help' (AAH) model to have appropriate conversations with women about smoking cessation.
- CO testing:
  - How to use CO monitors, including appropriate procurement processes for obtaining CO monitors and associated consumables (for example D piece, mouthpiece and batteries), plus calibration equipment;
  - How to work with infection control services to ensure safe use of CO monitors;
  - How to appropriately and effectively introduce the concept of CO testing, and how to integrate this with brief advice (using the AAH model) to have effective conversations with women about smoking.

## Clinical audit and feedback

Maternity services are encouraged to undertake clinical audits with feedback to relevant staff on:

- Carbon monoxide analysis at first antenatal care visit, and at 28-week visit
- Referral to appropriate smoking cessation services when indicated
- NRT use.

## Element resources

Safer Baby Bundle information and resources for maternity healthcare professionals:

[www.stillbirthcre.org.au](http://www.stillbirthcre.org.au).

- **Position statement:** Smoking – one of the most important things to prevent in pregnancy and beyond
- **Safer Baby Bundle educational program for maternity care providers** (face-to-face workshop and/or eLearning): Smoking cessation chapter
- **Resources and collateral for women and maternity care providers:** Smoking cessation brochure for women, posters, online resources
- **Equipment:** CO monitors plus consumables and training in how to use and maintain them

Note: The working group for this element of the Bundle have developed a care pathway for smoking cessation to support the implementation of this element. This pathway, which maps the process of actions to support women to stop smoking during pregnancy, will be available online and included in future updates of this document.

## Element 2: Improving detection and management of fetal growth restriction

### Element description

#### Risk assessment and surveillance of singleton pregnancies for fetal growth restriction (FGR).

### Actions

1. Assess all women with a singleton pregnancy for risk factors for FGR, and document in the antenatal record:
  - i. at the first antenatal care visit and
  - ii. at every subsequent antenatal visit from 24 weeks' gestation using the FGR care pathway\*.
2. Use the FGR care pathway\* to aid decision-making on surveillance for all women according to risk:
  - i. for women at low risk of FGR (Level 1), assess fetal growth using antenatal symphysis fundal height (SFH) charts by clinicians trained in their use. All staff must be competent in measuring fundal height with a tape measure, plotting measurements on charts, interpreting appropriately and referring when indicated.
  - ii. for women at intermediate risk of FGR (Level 2), consider serial USS 2-4 weekly and/or SFH measurement from 24 weeks' gestation until birth with plotting on a growth chart and low dose aspirin commencing before 16 weeks' gestation. Where serial SFH is not appropriate (high BMI, fibroids) serial ultrasound should be undertaken.
  - iii. for women at high risk of FGR (Level 3), serial USS 2-4 weekly from 24 weeks' gestation with plotting on a growth chart until birth and consider low dose aspirin before 16 weeks' gestation.

\*PSANZ/Stillbirth CRE FGR care pathway for singleton pregnancies (see Appendix)

Key performance indicator (KPI)
Proportion of term births with undetected FGR defined as severely growth restricted singletons (less than 3rd centile) undelivered at 40 weeks' gestation (missed FGR*)
<b>Numerator</b>
Singleton births at 39 completed weeks or more gestation with birthweight less than 3rd centile according to Dobbins et al <sup>73</sup>
<b>Denominator</b>
Singleton births (live and stillborn) with severe FGR born at 32 weeks or more gestation

\*This indicator shows the proportion of severely growth restricted singleton babies (defined as birth weight below the third centile, corrected for gestational age, plurality and sex) who were born at or after 40 weeks' gestation.

Indicators	
Measure	Numerator and denominator
1. Proportion of women with documented risk assessment for FGR at first antenatal care visit.	<b>Numerator:</b> Women with documented risk assessment for FGR at first antenatal care visit. <b>Denominator:</b> All women attending for antenatal care.
2. Proportion of women with documented risk assessment for FGR at every antenatal episode of care from 24 weeks' gestation.	<b>Numerator:</b> Women with documented risk assessment for FGR at every antenatal episode of care from 24 weeks' gestation. <b>Denominator:</b> All women attending for antenatal care.
3. Proportion of women (at any gestation) identified as at risk of FGR whose care was escalated as per the FGR care pathway*.	<b>Numerator:</b> Women (at any gestation) identified as at risk of FGR whose care was escalated as per FGR care pathway*. <b>Denominator:</b> Women (at any gestation) identified as at risk of FGR.
4. Proportion of women with SFH measurement taken and plotted on growth chart at each antenatal visit from 24 weeks' gestation.	<b>Numerator:</b> Women with SFH measurement taken and plotted on growth chart at each antenatal visit from 24 weeks' gestation. <b>Denominator:</b> Women having SFH measurement.
5. Proportion of singleton babies delivered for suspected FGR at 37 weeks' gestation or more who have a birthweight >25th centile.	<b>Numerator:</b> Singleton babies delivered at 37 weeks' gestation or more for suspected FGR who have a birthweight >25th centile. <b>Denominator:</b> All singleton births at 37 weeks' gestation or more

\* PSANZ/Stillbirth CRE FGR care pathway for singleton pregnancies

## Definitions

FGR is best defined as a fetus that has not reached its growth potential. In practice, small for gestational age (SGA) is often used as a proxy for FGR (see Table 1). However, not all SGA fetuses are growth restricted, and some growth restricted fetuses are not SGA<sup>74</sup>. A consensus-based definition for FGR including biometric and functional parameters was published in 2016<sup>75</sup>. Its clinical utility and performance have not been prospectively evaluated.

**Table 1: Definitions relating to FGR**

<b>Fetal Growth Restriction (FGR)</b>	A fetus that has not reached its growth potential
<b>Small for gestational age (SGA)</b>	Estimated fetal weight/birthweight <10th centile
<b>Severe FGR</b>	SGA <3rd centile is often used as a proxy for severe FGR
<b>Early FGR</b>	FGR diagnosed <32 weeks' gestation
<b>Late FGR</b>	FGR diagnosed $\geq$ 32 weeks' gestation

## Rationale

Fetal growth restriction is an important risk factor for stillbirth<sup>76</sup>. The population attributable risk for Small for Gestational Age (SGA) (a proxy for FGR) and stillbirth, of 26%, is higher than other common risk factors<sup>28</sup>. FGR was the major factor identified in the UK MBBRACE report on stillbirths, where one in three term, normally formed, antepartum stillbirths were related to abnormalities of fetal growth<sup>77</sup>. Additionally, FGR is associated with neonatal death, perinatal morbidity and an increased risk of adverse health outcomes into adulthood<sup>74,75</sup>.

Reductions in adverse outcome associated with FGR have been shown with improved risk assessment and antenatal detection combined with careful management and timely birth. Despite this, many growth restricted babies are not detected until birth. Improving detection and management of FGR is relevant to all maternity care providers. Both the Victorian perinatal performance indicators report<sup>78</sup> and the Queensland Maternal and Perinatal Quality Council 2017 report<sup>20</sup> highlight the urgent need to improve antenatal detection rates of severe growth restriction. Educational programs for clinicians in maternity hospitals have been shown to improve detection of FGR and reduce stillbirth in the UK<sup>79</sup>.

## Risk factor assessment

This element provides an evidence-based, standardised FGR risk assessment tool which should be applied to all singleton pregnancies. Effective surveillance of all pregnancies should reflect the level of FGR risk. The care pathway for screening and surveillance of FGR in singleton pregnancies in the PSANZ/Stillbirth CRE FGR position statement is recommended for use. This pathway guides the



surveillance for high and low risk pregnancies. Risk assessment for FGR can be undertaken by healthcare providers prior to conception, in early pregnancy, and at each antenatal visit<sup>80,81</sup> through inquiry about:

1. maternal characteristics and medical history
2. previous obstetric history
3. risk factors that may arise in pregnancy.

It is good practice to inform women about FGR<sup>19</sup> at each antenatal visit (including their booking visit) and, where there is a diagnosis of FGR, ongoing communication on the management of FGR throughout the pregnancy. Where modifiable risk factors for FGR exist, provide advice and support to women (e.g. smoking and drug/alcohol cessation)<sup>19</sup>.

Antenatal surveillance for FGR may be modified according to a woman's individual risk factors at each antenatal visit as detailed in the care pathway.

Women can be stratified into three groups depending on their existing or newly arising risk factors for FGR. Consider low dose aspirin (100-150mg nocte) to commence prior to 16 weeks' gestation for women at increased risk of FGR. Frequency of ultrasound surveillance for suspected FGR should be based on FGR risk factors which will associate with risk of early versus late onset FGR, prior history and the woman's preferences. Women with risk factors at booking should be offered obstetric review according to local guidelines.

## **Symphyseal-fundal height (SFH) measurement**

Measurement of SFH should be undertaken at each antenatal visit starting from 24-28 weeks' gestation<sup>19,74</sup>. SFH measurement may not be reliable in some women with a high body mass index, or who have uterine fibroids, in which case ultrasound can be considered for assessment of fetal size and growth<sup>80</sup>.

The limitations of SFH measurement in the detection of FGR are well described<sup>82</sup>. A standardised approach to SFH measurement may reduce inter and intra-observer error<sup>19,79</sup>. The UK and New Zealand have adopted standardised education for SFH measurement<sup>19</sup>, incorporating measuring from the fundus to the superior margin of the symphysis pubis, using a non-elastic tape measure with numbers on the tape measure facing downwards.

Serially plotting SFH measurements on a growth chart may assist in the detection of FGR. Although evidence is lacking, tracking growth utilising a graph to visually assist detection of change over time is widely used. Programs to improve detection of FGR have used this methodology and have demonstrated an increase in the antenatal detection of FGR<sup>79</sup>. Ultrasound assessment is recommended when a SFH measurement is <10th centile, or if there is clinical suspicion of static or slowing growth on serial SFH measurements<sup>79</sup>.

There are different charts available for plotting SFH e.g. customised<sup>83</sup> or population based<sup>84</sup>. Controversy exists around the most appropriate chart to use clinically. This care Bundle does not stipulate whether providers should use a customised chart or not. However, the benefits of training

in the measurement of SFH and teaching correct plotting on charts to observe growth velocity are acknowledged.

## Implementation

### Recommended approach

This element requires all clinicians providing maternity care to be trained in the use of the risk assessment and management care pathway and to be skilled in standardised SFH measurement. The implementation of this element across maternity services should include offering the FGR educational programs to all clinicians providing maternity care, displaying the FGR care pathway in antenatal clinics, and intermittent clinical audits with feedback to clinicians using the recommended audit form.

Increased numbers of ultrasound scans may be required in services not currently following the PSANZ/Stillbirth CRE guidance on serial ultrasound for pregnancies at high risk of FGR. This may require capacity building in the ultrasonography workforce. Current ultrasound scanning policies vary between maternity units, primarily because of resource issues.

Accurate ultrasound biometry is critical in determining management. Ultrasound providers are therefore encouraged to undertake audits and/or quality assurance processes to ensure ultrasound scans are performed to a high standard. The most effective quality assurance methodology will be shared in future iterations of the Bundle.

### Education

Educational programs for maternity care providers have been shown to improve the detection of SGA/FGR and reduce stillbirth rates in the UK<sup>79</sup>. The 2017 Perinatal and Maternal Mortality Review Committee (PMMRC) report from New Zealand<sup>85</sup> has demonstrated a reduction in perinatal mortality in SGA babies after 26 weeks. This is likely associated with an ongoing education program, a SGA guideline, and more recently the implementation of the Growth Assessment Protocol (GAP) education program. An Australian FGR education program (face to face workshop and eLearning program) has been developed and a pilot program has recently been rolled out across the state of Victoria. The program has been well received by clinicians and is ready for national rollout as part of the Bundle. Maternity services should support training for all health care professionals providing antenatal care on the detection and management of FGR.

### Clinical audit and feedback

Audits against best practice recommendations to be undertaken periodically including:

- compliance with the recommended care pathway for screening and surveillance of FGR
- where practice could be improved in missed cases of FGR (defined as births <3<sup>rd</sup> centile at 40 weeks' gestation).

## Element resources

Safer Baby Bundle information and resources for maternity healthcare professionals:

[www.stillbirthcre.org.au](http://www.stillbirthcre.org.au).

- **Position statement:** Perinatal Society of Australia and New Zealand and Centre of Research Excellence Stillbirth. Position statement: detection and management of fetal growth restriction in singleton pregnancies. Centre of Research Excellence in Stillbirth. Brisbane, Australia, September 2019.
- **Safer Baby Bundle educational program for maternity care providers** (face-to-face workshop and/or eLearning): FGR chapter, FGR training workshop pre and post course questionnaire
- **Resources and collateral for women and maternity care providers:** FGR care pathway for singleton pregnancies
- **Audit Tools:** FGR audit tool, 'missed-case' audit tool (currently undergoing pilot testing and will be supplied in future updates)

## Element 3: Raising awareness and improving care for women with decreased fetal movements

### Element description

**Supporting women to be aware of their baby's movements from 28 weeks' gestation onwards and to contact their health care provider if they are concerned, and ensuring health care providers follow the best available evidence when caring for women who report DFM.**

### Actions

1. Provide information brochure\* and advice on DFM to all pregnant women by the 28th week of pregnancy and remind women of the importance of reporting DFM at subsequent contacts and discuss with women the importance of being aware of DFM and to report concerns without delay.
2. Undertake clinical examination of all women who report DFM according to the DFM care pathway\*\* including risk factor screening for stillbirth/fetal growth restriction, review history of fetal movements, clinical investigations and medical consultation.
3. Investigations should include the following: auscultation of fetal heart rate by handheld Doppler, cardiotocography (CTG), consideration of ultrasound for undetected FGR, consideration of fetomaternal haemorrhage (FMH) test.
4. Ensure informed, shared decision-making about timing of birth based on gestational age, findings of clinical investigations and the presence or absence of stillbirth risk factors.

\*Stillbirth CRE 'Your baby's movements matter' brochure (see Appendix)

\*\*PSANZ & Stillbirth CRE DFM Care Pathway for singleton pregnancies from 28+0 weeks (see Appendix)

Key performance indicator (KPI)
<b>Proportion of women with singleton pregnancies who have a CTG commenced within 2 hours of presenting (in person) at the maternity service with DFM, from 28 weeks' gestation.</b>
Numerator
<b>Number of women with singleton pregnancies who have a CTG commenced within 2 hours of presenting (in person) at the maternity service with DFM, from 28 weeks' gestation.</b>
Denominator
<b>All women with singleton pregnancies presenting (in person) at the maternity service with DFM from 28 weeks' gestation.</b>

Indicators	
Measure	Numerator and denominator
<b>1. Proportion of women provided with DFM information by 28 weeks' gestation.</b>	<p><b>Numerator:</b> Women who were provided with DFM information by 28 weeks' gestation.</p> <p><b>Denominator:</b> All women attending for antenatal care.</p>
<b>2. Percentage of women at 28 weeks' gestation or more who attend a maternity service within 12hrs of DFM concern.</b>	<p><b>Numerator:</b> Women who attend a maternity service within 12hrs of DFM concern from 28 weeks' gestation.</p> <p><b>Denominator:</b> Women who attend a maternity service for DFM concern from 28 weeks' gestation.</p>
<b>3. Proportion of women with singleton pregnancies who present with DFM who undergo induction of labour (IOL) or elective caesarean section (CS) before 39 weeks' gestation for DFM as the only indication.</b>	<p><b>Numerator:</b> Women with singleton pregnancies who present with DFM who undergo induction of labour (IOL) or elective caesarean section (CD) before 39 weeks' gestation for DFM as the only indication.</p> <p><b>Denominator:</b> All women giving birth with singleton pregnancies who present with DFM concern from 28 weeks' gestation.</p>

## Rationale

Maternal perception of fetal movement has long been used as an indicator of fetal wellbeing and vitality<sup>86</sup>. The quality and timing of fetal movements reflects neurobehavioural development and maturation of the fetus, and follows a general pattern with advancing gestation<sup>87,88</sup>. A discussion about how different types of movement may feel as pregnancy progresses may help women learn the way a baby moves in pregnancy prior to the third trimester. Maternal perception of fetal movement tends to commence from 16 to 20 weeks' gestation<sup>89</sup>, with these first movements variably described as a 'flutter', 'butterflies' or 'bubbles'<sup>88</sup>. As pregnancy progresses, description of movements changes to reflect increasing strength, more complex limb and body movements and

greater frequency<sup>88</sup>. In a qualitative study of 40 women with uncomplicated pregnancies within 2 weeks of birth, 39 of the women described their fetal movements at this stage as 'strong and powerful', and half described the fetal movements as 'large'<sup>90,91</sup>. Bradford and colleagues<sup>92</sup> prospectively evaluated maternal perception of fetal movement strength, frequency and pattern from 28 weeks' gestation in pregnancies with normal outcomes and reported a diurnal pattern with strong fetal movements felt by most women in the evening and at night-time. Diurnal pattern of strong or moderate movements in the evening was consistent in both early and late third trimester pregnancies. Around 17.2% of women who had a normal outcome reported decreased frequency of movements after 37 weeks, but only 2.8% who had a normal outcome reported that the baby was quiet in the evening. These data suggest a non-diurnal pattern of fetal movements may be a stronger predictor of adverse outcome than a decrease in the frequency of movements at term. Indeed, Bradford and colleagues found that women who perceived their fetus to be quiet in the evening had an almost four-fold increased odds of late stillbirth. Consistent with this, the STARS case-control study reported a reduced risk of stillbirth where the baby was "active at bedtime"<sup>93</sup>. In any case, women should be encouraged to seek immediate review if concerned about DFM at any time, but especially where DFM occurs in the evening.

A number of factors possibly contribute to this variation including fetal size, specific movement patterns of the baby<sup>89</sup>, gestational age, amniotic fluid volume, medications, fetal sleep state, anterior placentation, maternal BMI, smoking and parity. However, the evidence is conflicting with others showing no relationship between the proportion of movements perceived and placental site or parity<sup>94</sup>, or BMI<sup>95</sup>.

It is a misconception that fetal movements decrease in strength or frequency towards the end of pregnancy because the fetus has 'less room to move'. Healthy fetuses near term have longer periods of activity and rest. As pregnancy progresses, some women report feeling less kicks and more rolling, shuffling and pushing or stretching movements. Healthy fetuses continue to move every day towards the end of pregnancy and have bouts of strong movements right up to and including during labour<sup>91,96</sup>.

Maternal perception of DFM can indicate pregnancies at increased risk of adverse outcomes. Studies have reported associations between DFM and low birth weight<sup>97-105</sup>, oligohydramnios, preterm birth<sup>97,106</sup>, threatened preterm labour<sup>97</sup>, congenital malformations and chromosomal abnormalities<sup>107</sup>, fetal to maternal haemorrhage<sup>108</sup>, perinatal brain injuries and disturbed neurodevelopment<sup>109,110</sup>, intrauterine infections<sup>111</sup>, low Apgar scores and acidaemia<sup>99,101</sup>, hypoglycaemia<sup>97</sup>, umbilical cord complications and placental insufficiency<sup>98,104,112</sup> and increased likelihood that the pregnancy will end in emergency delivery, induction of labour and Caesarean section, stillbirths and neonatal deaths<sup>113-117</sup>.

Fetal growth restriction appears to be a major factor contributing to the increased risk of adverse outcomes in these pregnancies<sup>98,114,118-122</sup>. A case-control study of 18,000 births across 6 maternity services in Queensland, Australia found that of pregnant women in the third trimester who reported DFM, 16% of these women had a baby with FGR<sup>123</sup>. Another case-control study from the UK reported that FGR was present in 11% of women with DFM compared with 0% in the control group<sup>124</sup>, but caution is required in interpreting these findings due to its small sample size.

DFM is a common cause for maternal concern, with 40% of pregnant women expressing concern about DFM one or more times during pregnancy<sup>125</sup>, and 4-16% of women contacting their health care provider because of concern during the third trimester<sup>126-128</sup>. Even in pregnancies that are initially deemed as low risk, DFM is associated with an increased risk of adverse perinatal outcome, including fetal growth restriction, preterm birth and stillbirth<sup>97,98,116,120,126,129,130</sup>. A prospective, population-based study in Norway reported a fetal death rate in women who had a live fetus at time of presentation with DFM was 8.2 per 1000, compared to 2.9 per 1000 in the general population<sup>113</sup>.

## The evidence for interventions to improve outcomes for women with DFM

In 2016, a systematic review of interventions to raise awareness and improve outcomes for women with DFM showed no clear evidence of benefit or harm<sup>131</sup>. Fetal movement counting (where women record the number of movements using a kick chart) has been proposed as an intervention to reduce stillbirth rates through increasing maternal awareness of DFM. However, the Cochrane systematic review on fetal movement (FM) counting showed no statistically significant reduction in stillbirths<sup>132</sup>.

In the largest trial of kick counting, while no reduction was shown in stillbirth rates, the overall late stillbirth ( $\geq 28$  weeks' gestation) rate fell during the study period from 4 per 1,000 to 2.8 per 1,000 births. It was postulated that this reduction was due to an increased awareness and vigilance of DFM<sup>133</sup>. In a non-randomised quality improvement study across 14 hospitals in Norway, a similar reduction was shown for a package of care to raise awareness of DFM (with optional kick counting) and a standardised protocol for clinical management. Importantly, in the Norwegian study women with DFM presented for care earlier during the intervention period<sup>128,134</sup>. A more recent individual participant randomised controlled trial showed that kick counting increased antenatal detection of FGR<sup>135</sup>.

The recent 'Awareness of fetal movements and care package to reduce fetal mortality' (AFFIRM) trial in the UK was designed to evaluate a package of care that included raising awareness of the importance of DFM (in both women and health care providers), along with guidelines for assessing and managing fetal well-being, when women presented with DFM. The specific intervention was an eLearning package for clinical staff and a leaflet for pregnant women, alerting them to the importance of DFM in their pregnancy. The trial involved 33 maternity hospitals and over 400,000 births<sup>136</sup>.

The AFFIRM results showed no significant reduction in the stillbirth rate (24 weeks' or more gestation) and increased obstetric intervention and neonatal morbidity. Although stillbirth rates were lower in the intervention group (4.06 per 1,000 births) compared to the control group (4.40 per 1,000 births), the study was not adequately powered to confirm or refute this finding. There was a decrease in the incidence of SGA babies being born after 40 weeks' gestation (1.5% vs 2.0%, aOR 0.86,  $p=0.0009$ ) in the intervention compared with the control group. This suggests that the AFFIRM intervention identified a population of high-risk babies with placental insufficiency who had a timely birth, thus preventing stillbirths that would have otherwise occurred. The AFFIRM

intervention also showed a reduction in the rate of spontaneous vaginal birth (57.4% vs 59.8%), an increase in induction of labour (40.7% vs 35.8%) and caesarean section (28.3% vs 25.5%), and an increase in admission to a neonatal unit (6.7% vs 6.2%) in the intervention group compared to the controls.

While the AFFIRM trial signalled the potential risk of unintended adverse consequences to mother and baby of management strategies to address DFM, the trial did not assess maternal awareness of DFM or clinician uptake of the intervention, and it is possible that there was wide variation in implementation of the intervention. Therefore, the data do not clearly indicate that raising awareness of DFM causes harm. Further, as there is currently no consensus on the appropriate management of women who report DFM<sup>132</sup>, the general consensus is that practice change should await further studies<sup>137,138</sup> including the findings of ongoing trials in this area (My Baby's Movements trial in Australia and New Zealand (ACTRN12614000291684) and Mindfetalness in Sweden (NCT02865759)) and planned Individual Participant Data Meta-analysis.

## Clinical assessment of fetal movement concerns

The Cochrane review on management of women reporting DFM did not identify any trials for inclusion and has called for further research<sup>139</sup>. Surveys of obstetricians<sup>140</sup> and midwives<sup>141-143</sup> in Australia and New Zealand has shown wide variation in clinical practice. Although monitoring fetal activity through asking women about fetal movements is considered an important part of routine antenatal care, the definition of alarm limits, the level of clinical assessment and the follow-up of women presenting with DFM varies widely. These findings are consistent with similar surveys from the UK and Norway<sup>113,144</sup>.

A number of studies have identified that an inappropriate response to maternal perception of DFM was a common factor contributing to stillbirths<sup>20,117,145-149</sup>.

The care pathway for women with DFM provides guidance on management with a focus on providing individualised care based on gestation, identification of underlying pathology, the presence of risk factors, and the woman's preferences. With limited evidence<sup>139</sup>, the pathway constitutes a consensus-based recommendation. The care pathway relates to care for women after 28 weeks' gestation. Between 20 and 28 weeks of gestation, conditions predisposing to DFM (e.g. fetal neuromuscular abnormalities, fetal anaemia, fetal hydrops, congenital infection and early onset fetal growth restriction) may be unrecognised clinically. Fetal ultrasound to assess fetal biometry and amniotic fluid volume should be considered. CTG prior to 28 weeks' gestation can be difficult to interpret due to fetal immaturity and is not routinely recommended.

## Implementation

### Recommended approach

Implementation of this element across maternity services should include offering the Safer Baby Bundle DFM eLearning educational program chapter to all clinicians providing maternity care, displaying the DFM management care pathway in antenatal clinics, ensuring printed brochures are



made available for all women attending antenatal care, and undertaking intermittent clinical audits with feedback to clinicians using the recommended audit tool. These clinical audits will help maternity services to monitor change and understand and meet any challenges to services.

It is possible that this element of the Bundle may result in an increase in ultrasound scans and obstetric interventions such as induction of labour and caesarean section. Compilation of these data across health districts is recommended to inform the evaluation of this element of the Bundle and future updates to this document.

The MBM trial is examining the impact of increasing maternal awareness of the importance of DFM, both on service demand and on stillbirth rates.

## Education

Maternity services should support clinical staff to attend the SBB educational program eLearning program and/or face-to-face workshop to be upskilled in the detection and management of women with DFM.

## Clinical audit and feedback

Audits against best practice recommendations to be undertaken periodically including:

- audit for the proportion of women receiving an information brochure about DFM by 28 weeks' gestation
- intermittent clinical audits on women presenting with DFM with feedback to clinicians using the recommended audit tool.

## Element resources

Safer Baby Bundle information and resources for maternity healthcare professionals:

[www.stillbirthcre.org.au](http://www.stillbirthcre.org.au).

- **Clinical practice guideline:** Perinatal Society of Australia and New Zealand and Centre of Research Excellence Stillbirth. Clinical practice guideline for the care of women with decreased fetal movements for women with a singleton pregnancy from 28 weeks' gestation. Centre of Research Excellence in Stillbirth. Brisbane, Australia, September 2019.
- **Safer Baby Bundle educational program for maternity care providers:** face-to-face workshop and/or eLearning: DFM chapter
- **Resources and collaterals for women and maternity care providers:** DFM care pathway for singleton pregnancies from 28+0 weeks, DFM brochure for women, posters
- **Audit tools:** DFM audit tool

## Element 4: Improving awareness of maternal safe going-to-sleep position in late pregnancy

### Element description

Raising awareness amongst pregnant women of the importance of going-to-sleep on their side from 28 weeks of pregnancy (last three months of pregnancy).

### Actions

Information brochure on safe going-to-sleep position\* based on current evidence to be provided to all pregnant women by week 28 of pregnancy, and the importance of going to sleep on their side discussed at every subsequent contact.

\*Stillbirth Foundation/Stillbirth CRE 'Sleep on side when baby's inside' brochure (see Appendix)

### Key performance indicator (KPI)

Proportion of women who report safe sleep practices after 28 weeks' gestation.

#### Definition

Proportion of women who report settling to sleep on their side after 28 weeks' gestation for all episodes of sleep including going to sleep at night, returning to sleep after any awakenings and day-time naps.

#### Numerator

Number of women attending for antenatal care after 28 weeks' gestation who report safe sleep practices.

#### Denominator

Number of women attending for antenatal care after 28 weeks' gestation.

Indicators	
Measure	Numerator and denominator
1. Proportion of women who, by 28 weeks' gestation, were given the information brochure on safe going-to-sleep position in late pregnancy.	<p><b>Numerator:</b> Number of women who, by 28 weeks' gestation, were given the information brochure on safe going-to-sleep position in late pregnancy.</p> <p><b>Denominator:</b> Number of women attending for antenatal care after 28 weeks' gestation.</p>
2. Proportion of women after 28 weeks' gestation who can describe safe sleep practices (going to sleep on their side).	<p><b>Numerator:</b> Number of women after 28 weeks' gestation who can describe safe sleep practices (going to sleep on their side).</p> <p><b>Denominator:</b> Number of women attending for antenatal care after 28 weeks' gestation.</p>

## Rationale

Going-to-sleep in the supine position (lying flat on the back) from 28 weeks of pregnancy is an identified and modifiable risk factor for stillbirth.

### Observational data on going-to-sleep position and stillbirth

Accumulating evidence has shown an association between maternal supine going-to-sleep position and stillbirth  $\geq 28$  weeks of pregnancy. Since the first study from New Zealand in 2011<sup>150</sup>, there have been a further three published case control studies<sup>151-153</sup> and one cross sectional study<sup>154</sup> across five countries that have demonstrated an association of supine going-to-sleep position in late pregnancy and stillbirth, with adjusted odds ratios between 2.5 and 8<sup>150-154</sup>. The population attributable risk in the 2017 New Zealand<sup>152</sup> and Australian studies is around 10%<sup>151</sup>. This indicates that 1 in 10 late pregnancy stillbirths could be prevented if all women in the last three months of pregnancy avoided going-to-sleep in the supine position. A 2019 individual participant data meta-analysis (funded in 2016 by a Trans-Tasman grant by RedNose/CureKids), using all available world-wide data on the topic<sup>150-153,155</sup>, demonstrated an adjusted odds ratio of 2.63 (95% CI 1.72-4.04,  $p < 0.0001$ ) for late stillbirth in women who reported a supine going-to-sleep position<sup>156</sup>. Going-to-sleep on the left or right side appeared equally safe<sup>156</sup>.

### Biological rationale for going-to-sleep position and stillbirth

Physiological and anatomical studies demonstrate a biologic rationale for the association between supine going-to-sleep position and stillbirth. An 85% reduction in vena caval diameter and around 30% compression of the aorta<sup>157,158</sup> has been demonstrated by magnetic resonance imaging in healthy women in the late third trimester in the supine position compared with the left lateral position. Using Doppler ultrasound, another study demonstrated that blood flow in the uterine artery was less in the supine position than in the left lateral position<sup>159</sup>. Adverse fetal effects of the

supine position are also suggested by reduced middle cerebral artery Doppler resistance, a fetal response to hypoxia<sup>160</sup> and reduced fetal oxygen saturation during labour in the supine position<sup>161</sup>. Furthermore, a New Zealand study has reported that in healthy late pregnancy, when the mother is in the supine position, the fetus spends more time in behavioural state 1 (fetal quiescence) and less time in fetal behavioural state 4 (active awake-high activity), compared to when the mother is on her left side<sup>162</sup>. An Australian in-home overnight sleep study showed that when the mother was not sleeping in the supine position, there was improved maternal oxygen saturation, fewer maternal oxygen desaturations, and fewer fetal heart rate decelerations<sup>163</sup>. These collective data provide additional evidence to support that when a healthy mother is in the supine position in late pregnancy, this may reduce oxygen delivery to the fetus.

## Public health campaigns and urgent need for intervention evidence

New Zealand, the UK, and Australia have recently released public health messages around going-to-sleep on the side and avoiding supine going-to-sleep position to reduce late pregnancy stillbirth (see 'Element resources' below). Surveys have shown that women report they could modify their going-to-sleep position in late pregnancy if that was recommended<sup>164</sup>. Furthermore, in New Zealand there have been significant changes in going-to-sleep position since the first publication on late stillbirth and supine going-to sleep position<sup>150,152</sup>, and women in Australia who have changed their going-to-sleep position based on advice reported little or no difficulty in doing so<sup>165</sup>. Further research including the Sleep in Pregnancy Pilot Trial (SlIPP; ACTRN12618001462279) will determine whether such public awareness campaigns are effective in supporting women to settle to sleep on their side in late pregnancy, and also whether advice alone is enough.

Meanwhile, the current recommendation is that, from 28 weeks' gestation, women **settle to sleep on either side** for any episode of sleep, including:

- Going to sleep at night
- Returning to sleep after any awakenings
- Day-time naps.

As the going-to-sleep position is the one held longest during the night, women should not worry if they wake up on their back, but should just roll back to sleeping on their side<sup>166</sup>.

## Implementation

### Recommended approach

The implementation of this element across maternity services will require services to utilise the associated resources (brochure, posters, video in the waiting room) and to add a checkbox item to their maternity health record system (electronic and/or handheld).

A public awareness campaign will be undertaken alongside clinician education.

## Education

Maternity services should support clinical staff to be trained in maternal safe going-to-sleep position from 28 weeks of pregnancy.

## Clinical audit and feedback

Audits against best practice recommendations to be undertaken periodically.

- Audit for the proportion of women receiving information brochure on safe going-to-sleep position in late pregnancy

## Element resources

Safer Baby Bundle information and resources for maternity healthcare professionals:

[www.stillbirthcre.org.au](http://www.stillbirthcre.org.au).

- **Position statement:** Perinatal Society of Australia and New Zealand and Centre of Research Excellence Stillbirth. Position statement: Mothers' going-to-sleep position in late pregnancy. Centre of Research Excellence in Stillbirth, Brisbane, Australia, September 2019.
- **Safer Baby Bundle educational program for maternity care providers** (face-to-face workshop and/or eLearning): Maternal going-to-sleep position chapter
- **Resources and collateral for women and maternity care providers:** Maternal going-to-sleep position brochure for women; Maternal going-to-sleep position public awareness campaign

## Element 5: Improving decision-making about the timing of birth for women with risk factors for stillbirth

### Element description

**Improving decision-making about the timing of birth for women with singleton pregnancies with risk factors for stillbirth.**

### Actions

1. Undertake assessment for stillbirth risk factors for all women at the first antenatal care visit and document in the woman's notes.
2. Undertake individualised surveillance and monitoring throughout pregnancy based on risk status.
3. Reassess all women for stillbirth risk at 34 to 36+6 weeks' gestation and document on the woman's notes.
4. Implement increased surveillance at 34 to 36+6 weeks' gestation where indicated following reassessment of risk.
5. Provide women with individualised information based on risk assessment to support informed, shared decision-making on timing of birth.

### Key performance indicator (KPI)

**Proportion of women with singleton pregnancies who undergo induction of labour (IOL) or elective caesarean section (CS) before 39 weeks' gestation.**

#### Numerator

**Number of women with singleton pregnancies undergoing IOL or elective CS before 39 weeks' gestation.**

#### Denominator

**Number of women with singleton pregnancies giving birth at term (37 to 42 weeks) awaiting spontaneous labour.**

Indicators	
Measure	Numerator and denominator
1. Proportion of women assessed for stillbirth risk factors at first antenatal care visit	<b>Numerator:</b> Number of women assessed for stillbirth risk factors at first antenatal care visit <b>Denominator:</b> All women at first antenatal care visit
2. Proportion of women reassessed for stillbirth risk factors at 34-36+6 weeks' gestation	<b>Numerator:</b> Number of women reassessed for stillbirth risk factors at 34-36+6 weeks' gestation <b>Denominator:</b> Number of women giving birth at term
3. Proportion of women who report being involved as much as they wanted in decision-making about timing of birth	<b>Numerator:</b> Number of women who report being involved as much as they wanted in decision-making about timing of birth <b>Denominator:</b> Number of women giving birth at term

## Rationale

The prospective risk of stillbirth increases with gestational age at term, from 0.11 per 1000 births at 37 weeks' gestation to 3.18 per 1000 births at 42 weeks' gestation<sup>167</sup>. As there are no reliable screening tests to identify all babies at risk of stillbirth, antenatal care of women based on the presence of risk factors, followed by appropriate timing of birth, is the mainstay of management to reduce preventable stillbirths. Research has identified factors which increase a woman's risk of stillbirth<sup>28</sup> where closer monitoring to inform the timing of birth is needed to avoid stillbirth. These factors include: maternal age over 35 years; maternal smoking in late pregnancy; overweight and obesity; nulliparity; assisted reproductive technologies (ART); alcohol and other drug use; previous history of stillbirth; social disadvantage;<sup>28</sup> Aboriginal ethnicity<sup>28</sup>; Pacific ethnicity<sup>156</sup>; African ethnicity<sup>10</sup>; and South Asian ethnicity (India, Pakistan, Sri Lanka, Afghanistan and Bangladesh and others)<sup>168</sup>.

High level evidence in support of induction of labour for women who are beyond 41 weeks' gestation to reduce perinatal death<sup>169</sup> has resulted in increasing uptake into practice globally. To date there is little comparable evidence to support the non-targeted use of early or term induction to prevent stillbirth, but knowledge of risk factors should allow for planned birth to be targeted to those at greatest risk.

The benefits of planned birth need to be carefully weighed against the risks of intervention at any given gestation. Avoiding stillbirth is an aim of ending pregnancy early, but there are significant associated morbidities for the baby born too early. While the adverse outcomes of preterm birth at earlier gestations are well understood, it is becoming increasingly apparent that both late preterm (34-36.6 weeks' gestation) and early term birth (37-38.6 weeks' gestation) are also associated with increased short- and longer-term mortality and morbidity<sup>170</sup> and worse developmental outcomes<sup>171</sup>. Some of these consequences of planned birth may not be apparent until later in

childhood and are usually not reported in studies of perinatal outcome. Maternal complications associated with planned birth are also an important consideration<sup>11</sup>. There may also be increased costs for health and educational services associated with increasing the rate of planned birth.

In one tertiary centre in Australia, a policy of earlier monitoring (from 39 weeks) of South Asian-born women, who are at greater risk of stillbirth<sup>168</sup>, has shown promising early results of a reduction in stillbirth without increasing obstetric interventions<sup>9</sup>. A similar approach for women with other risk factors could potentially reduce stillbirth by increasing early birth only when there are appropriate indications, while a universal approach may cause more harm than good by increasing the risk of morbidity associated with early birth, whilst having little or no impact on stillbirth rates.

Informed, shared decision-making is central to high-quality, woman-centred maternity care. Shared decision-making is 'an approach where clinicians and patients share the best available evidence when faced with the task of making decisions, and where patients are supported to consider options, to achieve informed preferences'<sup>172</sup>. A systematic review found decisional conflict, limited information, and limited involvement in decision-making predicted patient regret about medical decisions<sup>173</sup>.

The purpose of this element is to reduce late-gestation stillbirths without increasing unnecessary intervention and associated adverse maternal and neonatal outcomes through:

- Better care of women who have defined risk factors for stillbirth
- Shared decision-making
- A well-considered, balanced approach to planned birth (i.e. birth prior to onset of spontaneous labour, whether via induction of labour or planned caesarean section)

## Implementation

### Recommended approach

The aim is to ensure appropriate screening for stillbirth risk factors at the first antenatal care visit, with additional tests and further investigation as indicated. Each woman's risk status should then be reassessed at 34 to 36+6 weeks to provide risk-appropriate monitoring and care based on shared decision-making.

### Clinical audit and feedback

Audits against best practice recommendations to be undertaken periodically.

### Element resources

- **Position Statement:** Centre of Research Excellence Stillbirth. Position statement: Improving decision-making about the timing of birth for women with risk factors for stillbirth. Centre of Research Excellence in Stillbirth, Brisbane, Australia, September 2019.



- **Safer Baby Bundle educational program for maternity care providers** (face-to-face workshop and/or eLearning): Timing of Birth for women with risk factors for stillbirth chapter

**Element resources (under development) include:**

- Risk assessment guide for care providers
- Resources and collateral for women and maternity care providers: Risk factors for stillbirth brochure for women
- Audit tools: Risk factors for stillbirth audit tool

# Fundamental requirements to reduce stillbirths in Australia

In addition to the five Bundle elements, we emphasise the need for maternity services to address other important aspects of best practice care as fundamental to achieving the target of a 20% reduction in stillbirth rates by 2023.

## Reporting measures to implement the Bundle

Clinical audits and feedback are powerful tools for practice improvement and will be incorporated as part of the jurisdictional and local implementation<sup>174,175</sup>.

To facilitate a cohesive approach to improvement efforts around implementation of the Bundle across sites, a set of suggested measures is provided (in this document) for each element of the bundle. In recognising the challenge of implementing practice change in a busy service with conflicting priorities and finite resources, it is essential to ensure the reporting burden on maternity services is kept to a minimum. Therefore, where possible, measures are derived from routinely collected data. In addition to measures for each individual element, overarching clinical outcome, implementation fidelity, and balance measures are suggested (see table below).

Indicator		
Type	Measure	Numerator and denominator
Outcome measure	Rate of stillbirths 28 weeks' gestation or more excluding congenital abnormality	<b>Numerator:</b> Number of stillbirths at 28 weeks' gestation or more excluding congenital abnormality <b>Denominator:</b> All births
Process measure	Percentage of compliance with all five elements	<b>Numerator:</b> Number of women giving birth who received all bundle elements <b>Denominator:</b> All women giving birth
Balance Measure	Percentage of babies admitted to neonatal intensive care units after 36 completed weeks	<b>Numerator:</b> Number of babies admitted to neonatal intensive care units after 36 completed weeks <b>Denominator:</b> all livebirths

Indicator		
Type	Measure	Numerator and denominator
Balance Measure	Proportion of women with a singleton pregnancy who undergo induction of labour (IOL) or elective caesarean section (CS) before 39 weeks	<p><b>Numerator:</b> Number of women with a singleton pregnancy who undergo induction of labour (IOL) or elective caesarean section (CS) before 39 weeks</p> <p><b>Denominator:</b> All women with a singleton pregnancy giving birth</p>
Balance Measure	Rate of late preterm births	<p><b>Numerator:</b> Number of babies born between 34 and 36+6 weeks' gestation</p> <p><b>Denominator:</b> All births</p>
Balance Measure	Rate of caesarean sections	<p><b>Numerator:</b> Number of births by caesarean section</p> <p><b>Denominator:</b> All births</p>

All maternity services implementing the Bundle are encouraged to undertake clinical audits for each of the Bundle elements according to local and jurisdictional processes. Precise audit targets are under development and will be incorporated into the Bundle as they become available.

## Perinatal mortality and morbidity review and audit

In addition to specific clinical audits on practices for the five elements of care, routine clinical audit of stillbirths and neonatal deaths, missed cases of FGR, and adverse neonatal outcome (e.g. hypoxic ischaemic encephalopathy,) (as per PSANZ Guidelines<sup>176</sup>) is an important aspect of implementation of the Bundle.

Accurately and systematically identifying the causes and substandard care factors in stillbirth and neonatal deaths is vital in understanding and preventing these deaths<sup>5,177</sup>. The recent World Health Organisation (WHO) guidelines (Making every baby count: audit and review of stillbirths and neonatal deaths<sup>177</sup>) describe the importance of high quality perinatal mortality audit which allows for a 'no blame, interdisciplinary setting that has the potential to tell a story about what could have been done differently to unlock the solutions that should have been available for each woman and baby to prevent perinatal deaths'<sup>177</sup>.

In a review of studies across high income country settings published in 2011, sub-standard care factors were identified in up to 50% of stillbirths, with death avoidable in 20-30% had substandard care factors been addressed<sup>11</sup>. Recent results from national audit programs in New Zealand<sup>85</sup>, the Netherlands<sup>178</sup> and the United Kingdom<sup>179</sup> found similar results. Since national perinatal mortality audits were implemented in New Zealand in 2012, there has been a continued decline in stillbirth rates<sup>85</sup>. Similarly, the introduction of perinatal audits in the Netherlands showed a reduction in perinatal mortality rates at term<sup>178</sup>.

In Australia, the Perinatal Society of Australia and New Zealand (PSANZ), in partnership with the Stillbirth CRE, has developed The Clinical Practice Guideline for Care Around Stillbirth and Neonatal Death to support clinicians in the investigation and audit of perinatal deaths<sup>176</sup> and an education workshop for clinicians (IMPROVE). The IMPROVE workshop (IMproving Perinatal Mortality Review and Outcomes Via Education) is a half day workshop that provides clinicians with an interactive and collaborative way to understand care around stillbirths and neonatal deaths<sup>24</sup>.

Although best practice guidelines on perinatal mortality audit exist<sup>176</sup>, implementation across Australia is inconsistent and national reporting is limited. While the majority of state and territory perinatal committees produce regular reports<sup>20,180-186</sup> only two (Victoria<sup>183</sup> and Western Australia<sup>180</sup>) regularly undertake and report findings of perinatal mortality audits into substandard care. However, progress is being made. The recent AIHW report on perinatal deaths<sup>6</sup> reported findings from across three jurisdictions (Victoria, Tasmania, Northern Territory) on audits of a selection of 339 perinatal deaths. The report showed that for 52% of deaths contributing factors could be identified, and of these 32% had contributing factors relating to care with 24% deemed significantly linked to the death. As part of the Stillbirth CRE's program of work with jurisdictional partners around 'Improving knowledge of causes and contributors to stillbirth', the aim is to expand the resources in the bi-national perinatal mortality guidelines<sup>176</sup> to support maternity services in a systematic approach to perinatal mortality audit.

All maternity services implementing the Safer Baby Bundle are strongly encouraged to undertake high quality perinatal mortality audit according to relevant jurisdictional processes and the PSANZ Guidelines<sup>176</sup>.

## Reducing fragmentation of maternity care

Fragmentation of care, as a result of differing care providers, has been identified as a common issue in maternity care, especially within the public system. When care is fragmented, the lack of coordination and the additional burden on women of having to repeat details to different care providers is suboptimal. This situation may increase the risk of stillbirth due to a reduced ability to identify women whose babies are at risk, whether it is to do with risk factors for stillbirth or other complications such as fetal growth restriction or decreased fetal movements.

There are a range of models of care which improve continuity of care. The exemplar is midwifery continuity of care (MCoC), whether it is in the private or public sectors. Private obstetric care, shared antenatal care with a woman's own GP, specialist care through high-risk clinics, and continuity with a GP obstetrician in a rural setting can all lead to better coordination. A feature common to all is the opportunity to develop a strong relationship between the woman and her care provider.

While models that increase continuity of care are likely to be beneficial, high-level evidence that this approach can reduce late-gestation stillbirth is somewhat lacking. The Cochrane systematic review on MCoC shows this model reduces preterm birth and early pregnancy loss (less than 24 weeks' gestation), and improves maternal satisfaction with care<sup>187</sup>. A recent study in Queensland has shown that MCoC in an urban Aboriginal population had a significant impact on preterm birth rates<sup>188</sup>. The WHO Pregnancy Care Guidelines has recommended all women have access to MCoC

throughout the childbirth continuum<sup>189</sup>. The Australian Preterm Birth Prevention Alliance has recently endorsed MCoC as a strategy to address preterm birth rates<sup>190</sup>. Private obstetric care has been associated with lower perinatal mortality rates than generally seen in the public sector<sup>191,192</sup>, but there are difficulties in adequately adjusting for the different populations. Nevertheless, it seems reasonable to conclude that some of the elements of the prevention strategies in the Bundle may already be more common in this private model of care, such as improved detection of FGR with ultrasound and shared decision-making.

Further research is needed to better understand the best model of antenatal care to reduce late gestation stillbirth risk, and there may be more than one way to achieve reduced fragmentation. However, there is little doubt that providing women with optimal care should include the principles of continuity of care and carer where possible, effective information-sharing and care coordination, and a woman-centred approach to decision-making.

Models of maternity care which provide for greater continuity of care, and which therefore reduce the risk of fragmentation, should be provided and, as far as is possible, women should see the same maternity care provider in the later stages of pregnancy.

## Intrapartum fetal monitoring

The UK *Saving Babies Lives Bundle of Care*<sup>1</sup> included an element on improving intrapartum fetal monitoring. Due to the relatively low numbers of intrapartum stillbirths in Australia<sup>11</sup>, the Australian Safer Baby Bundle prioritised elements addressing antenatal care practices, therefore intrapartum fetal monitoring is not included as an element. However, intrapartum stillbirth in late gestation still occurs and ensuring all staff are adequately trained in intrapartum fetal monitoring is an important strategy in preventing these deaths<sup>14</sup>. Since 2004, RANZCOG has provided a fetal surveillance education program (FSEP) to guide maternity care providers in the interpretation and management of both normal and abnormal intrapartum cardiotocography (CTG). Implementation of the FSEP has been associated with reduced rates of term hypoxic ischaemic encephalopathy and intrapartum hypoxic death in Australia, without an increase in the rates of operative delivery<sup>193</sup>. In New South Wales it is mandatory for all maternity care providers to complete the Fetal welfare assessment, Obstetric emergencies and Neonatal resuscitation Training© (FONT) education program, which includes guidance on the interpretation and management of intrapartum fetal monitoring.

For services that have access to intrapartum fetal monitoring, monitoring the proportion of relevant staff who undertake training in intrapartum surveillance is recommended.

## Partnership and Governance

The Safer Baby Bundle Steering Committee, which is made up of leads from each participating jurisdictional health department, Stillbirth CRE representatives, and parent representatives meets quarterly to provide high level oversight for the Bundle program of work. An Operational Committee, made up of jurisdictional implementation team representatives and Stillbirth CRE researchers involved in the evaluation, also meets regularly to ensure successful implementation and evaluation of the Bundle.

Partnership with parent-based advocacy and support organisations will ensure the voices of parents are heard in the development and rollout of resources. These organisations include:

- Stillbirth Foundation Australia
- Still Aware
- Red Nose
- Bears of Hope
- Sands

Partnership with professional organisations will ensure resources are relevant to health care providers across all maternity care settings. Partnering professional organisations include:

- Australian and New Zealand Neonatal Network
- Australian College of Midwives
- Australian College of Neonatal Nurses
- Australian College of Rural and Remote Medicine
- CRANAplus
- International Stillbirth Alliance
- Perinatal Society of Australia and New Zealand
- Royal Australia and New Zealand College of Obstetricians and Gynaecologists
- Women's Healthcare Australasia.

Additional organisations for which endorsement is currently under consideration include: Royal Australian College of General Practitioners and National Rural Health Alliance. The list of partnering professional organisations will be amended in future updates of this document.

Initial implementation as part of the NHMRC Partnerships Grant includes the jurisdictions of New South Wales, Victoria, and Queensland. Each jurisdiction has nominated a division (within their health department) to oversee the implementation process and data collection as follows:

- Safer Care Victoria (SCV, Victorian Government)
- Clinical Excellence Commission (CEC, NSW Health)
- Clinical Excellence Queensland (CEQ, Queensland Government).

The health department partners share a strong desire to reduce stillbirth rates and other adverse pregnancy outcomes by reducing gaps between evidence and practice in maternity care. These partners are the peak authorities for leading quality improvement in maternity healthcare for their jurisdictions. They formulate and disseminate policies that have a significant impact on health care services and delivery and are at the forefront of translation of health and policy practice. In this capacity, our partners will oversee the implementation of the Bundle into practice, embedding the Bundle into existing processes. They will actively promote and support the Bundle's implementation across participating hospitals in their jurisdictions, promoting alignment of the Bundle elements and state-wide guidelines surrounding antenatal care. The Steering Committee looks forward to welcoming other jurisdictions as partners in the implementation of the Bundle.

## Consultation with Aboriginal and Torres Strait Islander and migrant and refugee women

The recent Senate Report on Stillbirth Research and Education<sup>18</sup> called for culturally and linguistically appropriate information and care as a key action to address stillbirth in Australia. Consultation with Aboriginal and Torres Strait Islander and migrant and refugee women (and their care providers) in co-design of the Bundle resources and its evaluation will be through the Stillbirth CRE's Aboriginal and Torres Strait Islander and Migrant and Refugee Advisory Groups.

## Evaluation

The Stillbirth CRE will lead the evaluation of the Bundle. The evaluation will utilise a mixed-method approach comparing pre and post implementation periods. The effect of the Bundle on stillbirth rates and important secondary clinical measures will be tested using time-series analysis. Surveys of women attending participating maternity services and midwives and doctors providing antenatal care will be undertaken to assess knowledge, practices and experiences with care. An economic evaluation will be undertaken. The evaluation will include a detailed analysis of potential unintended consequences such as increased intervention rates, including for example caesarean section, induction of labour and neonatal adverse outcomes.

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# Acknowledgements

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Kirstine Sketcher-Baker	Executive Director, Patient Safety and Quality Improvement Service	Clinical Excellence Queensland, Queensland Health
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## Safer Baby Bundle Operational Committee

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## Working group for Element 1: Supporting women to stop cigarette smoking in pregnancy

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## Working group for Elements 3 and 4: Improving detection and management of DFM, and improving awareness of maternal safe going-to-sleep position in late pregnancy

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## Working group for Element 5: Improving decision-making about the timing of birth for women with risk factors for stillbirth

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## Working group for Education and Resources

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# Appendix

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# Quit smoking for baby

#quit4baby

 **Safer Baby**  
WORKING TOGETHER TO REDUCE STILLBIRTH

## What are the risks for my baby from my smoking?

- **Miscarriage or stillbirth**
- Your baby may be born premature (before 37 weeks' gestation)
- Sudden Unexplained Death of an Infant (SUDI or cot death)
- Low birthweight and breathing problems

## What are the benefits of quitting smoking when pregnant?

- Improved health and wellbeing
- More money in your pocket
- Your baby will get better nourishment
- Less harmful chemicals in your bloodstream

# Smoking in pregnancy is one of the **main causes of stillbirth**

Call Quitline on 13 7848 or visit [quitline.org.au](http://quitline.org.au)



# Quit smoking for baby

#quit4baby



## What can help you quit smoking in pregnancy?

Your midwife, GP or obstetrician can help if you are thinking about quitting. They will suggest:

- Counselling services to help address your triggers
- For some women, quit smoking products may be needed

The most common counselling service for pregnant women is Quitline, which is staffed by specially-trained counsellors who will support you in trying to quit - not make you feel guilty. Contact your local Quitline for free on 13 7848 or download the 'Quit for you - quit for two' app designed for pregnant women.



**Quitting early is best, but stopping at any time in your pregnancy will benefit you and your baby.**

### Myths and facts about smoking in pregnancy

**I'm already three months pregnant. What's the point of stopping now?**

It is never too late to quit. Quitting at any time during pregnancy reduces the harm to you and your baby.

**How about I just cut down?**

Cutting down doesn't reduce the risks to your baby or you.

**Smoking relaxes me when I'm stressed - isn't that better for my baby?**

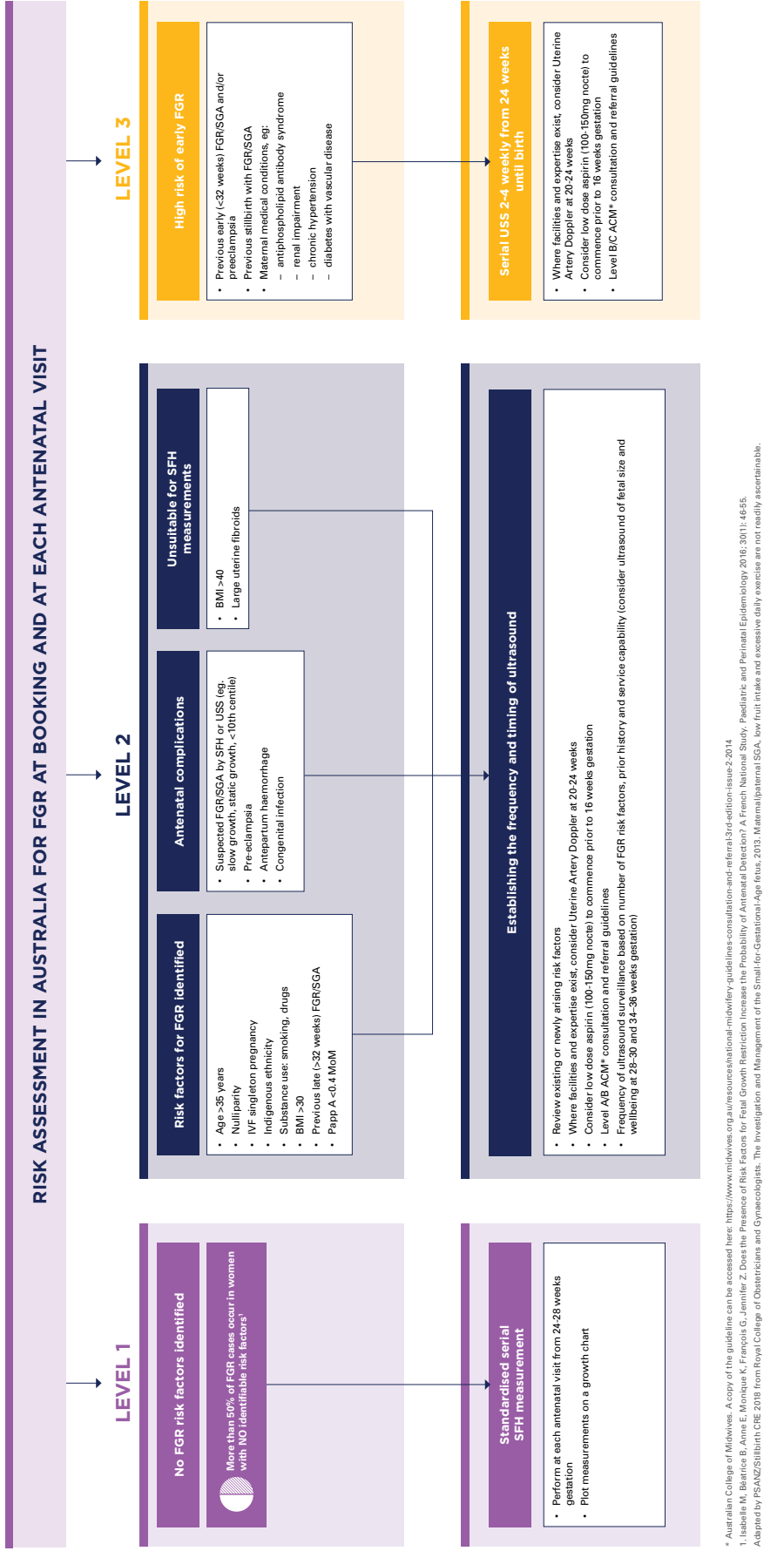
Smoking actually speeds up your heart rate, increases your blood pressure and affects your baby's heart rate. Finding another way to relax is much better and safer for you both.

**Call Quitline on 13 7848 or visit [quitline.org.au](http://quitline.org.au)**



# Fetal Growth Restriction (FGR) Care Pathway

for singleton pregnancies



The Safer Baby Bundle resources are based on five key areas to support healthcare professionals with new strategies to help reduce stillbirths.

**Smoking Cessation**

Supporting women to stop smoking during pregnancy

#Quit4Baby

**Fetal Growth Restriction (FGR)**

Improving screening and surveillance for fetal growth restriction

#GrowingMatters

**Decreased Fetal Movements (DFM)**

Improving awareness and management of decreased fetal movement

#MovementsMatter

**Side Sleeping**

Improving awareness of maternal side sleeping position

#SleepOnSide

**Timing of Birth**

Improving decision making around timing of birth for women with pre-eclampsia

#LetsTalkTiming

\* Australian College of Midwives. A copy of the guideline can be accessed here: <https://www.midwives.org.au/resources/national-midwifery-guidelines-consultation-and-referral-3rd-edition-issue-2-2014>  
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# Your baby's movements matter.

#movementsmatter



WORKING TOGETHER TO REDUCE STILLBIRTH

## Why are my baby's movements important?



**If your baby's movement pattern changes, it may be a sign that they are unwell.**

Around half of all women who had a stillbirth noticed their baby's movements had slowed down or stopped.

## What should I do?

**In any instance, if you are concerned about a change in your baby's movements, contact your midwife or doctor immediately.**



You are **not wasting their time.**

## How often should my baby move?



**There is no set number of normal movements.**

You should get to know your baby's own unique pattern of movements.

Babies movements can be described as anything from a kick or a flutter, to a swish or a roll.

You will start to feel your baby move between **weeks 16 and 24** of pregnancy, regardless of where your placenta lies.

## What may happen next?

Your midwife or doctor should ask you to come into your maternity unit (staff are available 24 hours, 7 days a week).



Investigations may include:

- Checking your baby's heartbeat
- Measuring your baby's growth
- Ultrasound scan
- Blood test

## Common myths about baby movements



**It is not true that babies move less towards the end of pregnancy.**

You should **continue to feel your baby move** right up to the time you go into labour and whilst you are in labour too.



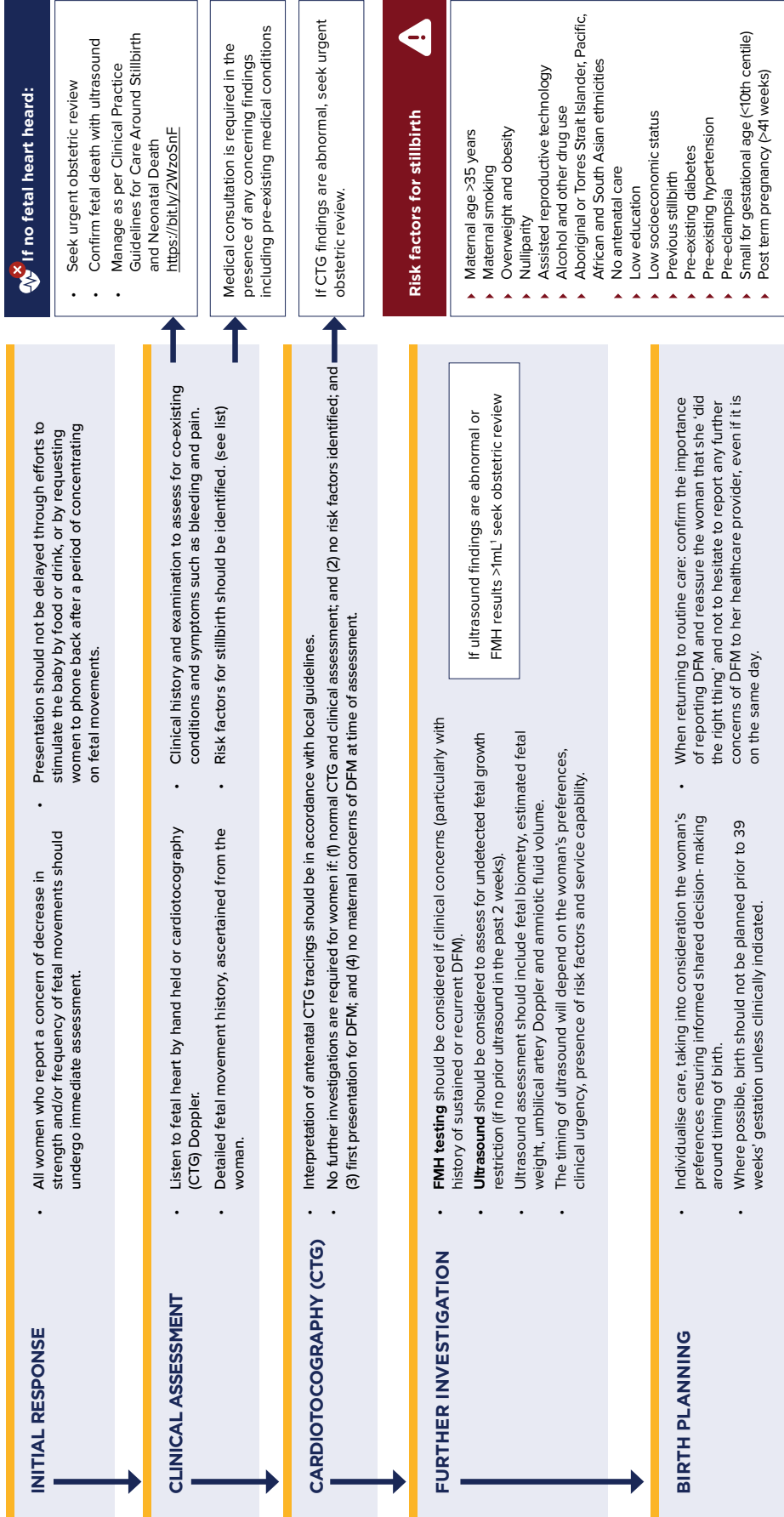
If you are concerned about your baby's movements, **having something to eat or drink to stimulate your baby DOES NOT WORK.**

## FIND OUT MORE: [movementsmatter.org.au](http://movementsmatter.org.au)

Endorsed by: Royal Australian and New Zealand College of Obstetrics and Gynaecology (RANZCOG), Bears of Hope and Sands and organisations below. We thank Tommy's UK for allowing us to adapt their campaign for our purpose. **Contact us at [stillbirthcre@mater.uq.edu.au](mailto:stillbirthcre@mater.uq.edu.au)**



# Decreased Fetal Movement (DFM) Care Pathway for women with singleton pregnancies from 28+0 weeks' gestation



<sup>1</sup> Women have a concern of DFM prior to 28 weeks' gestation, they should be advised to contact their healthcare provider. There is currently insufficient evidence to inform the management of women who report DFM prior to 28 weeks' gestation. 1. Wylie B,LD Alton ME. Fetal movement restriction. Obstet Gynecol 2010; 115(5): 1035-51. Disclaimer: This DFM Care Pathway is for general guidance only and is subject to a clinician's expert judgement. The DFM Care Pathway should not be relied on as a substitute for clinical advice.



The Safer Baby Bundle resources are based on five key areas to support healthcare professionals with new strategies to help reduce stillbirths.

**Smoking Cessation**  
Supporting women to stop smoking in pregnancy  
#Out4Baby

**Fetal Growth Restriction (FGR)**  
Improving screening and surveillance for fetal growth restriction.  
#GrowingMatters

**Decreased Fetal Movements (DFM)**  
Improving awareness and management of decreased fetal movement.  
#MovementsMatter

**Side Sleeping**  
Improving awareness of maternal safe sleeping position.  
#SleepOnSide

**Timing of Birth**  
Improving decision-making around timing of birth for women with risk factors.  
#LetsTalkTiming



#SleepOnSide

# Sleep on your side when baby's inside

New research shows that going to sleep on your side from **28 weeks of pregnancy** halves your risk of stillbirth compared with sleeping on your back.

**Turn over to find out more**



#SleepOnSide

# Sleep on your side when baby's inside



## Why should I sleep on my side?

After 28 weeks of pregnancy, lying on your back presses on major blood vessels which can reduce blood flow to your womb and oxygen supply to your baby.

## What is the risk of stillbirth if I go to sleep on my back?

Stillbirth after 28 weeks of pregnancy affects about one in every 500 babies. However, research has confirmed that going to sleep on your side halves your risk of stillbirth compared with sleeping on your back.

## Is it best to go to sleep on my left or right side?

You can go to sleep on either the left or the right side – either side is fine.

## What if I feel more comfortable going to sleep on my back?

Even if you prefer it, going to sleep on your back is not best for baby after 28 weeks of pregnancy.

## What if I wake up on my back?

It's normal to change position during sleep and many pregnant women wake up on their back. That's OK! The important thing is to start every sleep lying on your side (both for daytime naps and at night). If you wake up on your back, just roll over on your side.

*For more information please contact your midwife, nurse or doctor.*

For information on the side sleep study, visit <https://bit.ly/2PSJhhC>.  
We thank Tommy's UK for allowing us to adapt their campaign for our purpose.

SHPN (HSP) 190488, September 2019 | NH700546

[www.health.nsw.gov.au/reducingstillbirth](http://www.health.nsw.gov.au/reducingstillbirth)



