



POSITION STATEMENT

Mothers' going-to-sleep position in late pregnancy

Endorsed by:



Please note: This is a position statement and should not replace local guidelines. It is intended to provide a consensus view and a current summary of available evidence in an area of uncertainty.

Suggested citation:

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.

Key messages

1. Stillbirth is a serious public health problem with far reaching psychosocial and financial burden for families and society, and with little improvement in rates in Australia and New Zealand for more than two decades.
2. Better attention to modifiable risk factors may reduce the risk of late pregnancy stillbirth (≥ 28 weeks' gestation).
3. Supine going-to-sleep position in late pregnancy is a recently identified and modifiable stillbirth risk factor.
4. Women report a willingness to change their going-to-sleep position to reduce the risk.
5. **From 28 weeks of pregnancy, women are advised to settle to sleep on their 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.¹

6. Further research is needed to determine whether advice about going-to-sleep position changes women's behaviour and improves pregnancy outcomes.

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Purpose of this statement

This position statement is part of the National ‘Safer Baby Bundle’, comprising five elements to reduce late-gestation stillbirths in Australia. This statement addresses the fourth element of care: Mothers’ going-to-sleep position in late pregnancy.

The purpose of this position statement is to summarise the latest evidence on maternal going-to-sleep position from 28 weeks of gestation and provide appropriate advice for women to reduce the risk of stillbirth.

Target audience

Midwives, obstetricians, general practitioners, childbirth educators, and other health professionals who provide pregnancy care across Australia and New Zealand.

Background

Stillbirth rates and risk factors

Despite great advance in the care of women and their babies in the past century an estimated 2.6 million babies die before birth globally each year.² The burden of stillbirth has far-reaching psychosocial impacts on women, families, caregivers and communities, and wide-ranging economic impact on health systems and society.³ Stillbirth in late pregnancy (≥ 28 weeks) can occur unexpectedly in normally developed babies whose mothers have had uncomplicated pregnancies, thus offering real potential for prevention. There is now a global health focus on prevention of stillbirth.⁴ The 2016 Lancet Ending Preventable Stillbirths series highlighted differences in rates of late stillbirth (≥ 28

weeks) between high-income countries ranging from 1.7/1,000 to 8.8/1,000 births, with Australia and New Zealand at 2.7 and 2.3/1,000 births respectively.⁵

Late pregnancy stillbirth (≥ 28 weeks of pregnancy) currently results in the loss of around 1,000 babies every year in Australia and New Zealand.^{6,7} While rates in New Zealand are slightly lower than Australia, both countries have rates double that of the best performing countries.⁵ The between country variations suggest it is possible to further reduce late-gestation stillbirth. Such reductions can only be achieved by identifying readily modifiable risk factors.⁸

Many such modifiable risk factors for late pregnancy stillbirth rely on clinical management in a health care setting such as induction of labour for post-dates pregnancy or third trimester ultrasound surveillance to identify babies who are growth restricted.

Going-to-sleep in the supine position from 28 weeks of pregnancy is a recently identified and modifiable risk factor.

Observational data on going-to-sleep position and stillbirth

Accumulating evidence has shown an association between maternal supine going-to-sleep position and stillbirth ≥ 28 weeks of pregnancy. Since the first study from New Zealand in 2011,⁹ there have been a further three published case control studies¹⁰⁻¹² and one cross sectional study¹³ 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 8.⁹⁻¹³ The population attributable risk in the 2017 New Zealand¹¹ and Australian studies is around 10%.¹⁰ 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 Trans-Tasman grant by RedNose/CureKids), using all the available world-wide data on the topic,^{9-12,14} 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.¹⁵ Going-to-sleep on the left or right side appeared equally safe.¹⁵

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^{16,17} 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.¹⁸ Adverse fetal effects of the supine position are also suggested by reduced middle cerebral artery Doppler resistance - a fetal response to hypoxia¹⁹ - and reduced fetal oxygen saturation during labour in the supine position.²⁰ 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.²¹ 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.²² 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

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 'Further information and resources' below). Surveys have shown that women report they could modify their going-to-sleep position in late pregnancy if that was recommended.²³ 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,^{9,11} and women in Australia who have changed their going-to-sleep position based on advice reported little or no difficulty in doing so.²⁴ 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.

Key recommendations

All midwives, obstetricians, general practitioners, childbirth educators, and other health professionals who provide pregnancy care should provide women with written and verbal advice about late pregnancy going-to-sleep position as follows:

From 28 weeks of gestation, 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

Further information and resources

Australia

Stillbirth CRE website: www.stillbirthcre.org.au

Safer Baby Bundle website and resources: <https://saferbabybundle.org.au> (publicly available from 15th October 2019)

New Zealand

'Sleep on side when baby's inside' campaign: www.sleeponside.org.nz

The UK

Tommy's Sleep on Side pregnancy campaign: www.tommys.org/pregnancy-information/sleep-side-pregnancy-campaign

Working group

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References

1. McIntyre JPR, Ingham CM, Hutchinson BL, et al. A description of sleep behaviour in healthy late pregnancy, and the accuracy of self-reports. 2016; **16**(1): 115.
2. Blencowe H, Cousens S, Jassir FB, et al. National, regional, and worldwide estimates of stillbirth rates in 2015, with trends from 2000: a systematic analysis. *The Lancet Global health* 2016; **4**(2): e98-e108.
3. Heazell AEP, Siassakos D, Blencowe H, et al. Stillbirths: economic and psychosocial consequences. *Lancet* 2016; **387**(10018): 604-16.
4. Every Woman Every Child. The global strategy for women's, children's and adolescents' health (2016-2030): survive, thrive, transform. Every Woman Every Child. 2015. Available from: <http://www.who.int/life-course/publications/global-strategy-2016-2030/en/>.
5. Flenady V, Wojcieszek AM, Middleton P, et al. Stillbirths: recall to action in high-income countries. *Lancet* 2016; **387**(10019): 691-702.
6. AIHW: Monk A, Harris K, Donnelly N, et al. Perinatal deaths in Australia, 1993–2012. Perinatal deaths. Series no. 1. Cat. no. PER 86. Canberra AIHW, 2016.
7. Perinatal and Maternal Mortality Review Committee (PMMRC). Twelfth annual report of the Perinatal and Maternal Mortality Review Committee: reporting mortality 2016: Health Quality & Safety Commission, New Zealand Government, 2018.
8. Flenady V, Koopmans L, Middleton P, et al. Major risk factors for stillbirth in high-income countries: A systematic review and meta-analysis. *Lancet* 2011; **377**(9774): 1331-40.
9. Stacey T, Thompson JMD, Mitchell EA, Ekeroma AJ, Zuccollo JM, McCowan LME. Association between maternal sleep practices and risk of late stillbirth: a case-control study. *BMJ* 2011; **342**.
10. Gordon A, Raynes-Greenow C, Bond D, Morris J, Rawlinson W, Jeffery H. Sleep position, fetal growth restriction, and late-pregnancy stillbirth: the Sydney stillbirth study. *Obstet Gynecol* 2015; **125**(2): 347-55.
11. McCowan LME, Thompson JMD, Cronin RS, et al. Going to sleep in the supine position is a modifiable risk factor for late pregnancy stillbirth; Findings from the New Zealand multicentre stillbirth case-control study. *PLOS ONE* 2017; **12**(6): e0179396.
12. Heazell A, Li M, Budd J, et al. Association between maternal sleep practices and late stillbirth - findings from a stillbirth case-control study. *BJOG* 2018; **125**(2): 254-62.
13. Owusu JT, Anderson FJ, Coleman J, Oppong S, Seffah JD, Aikins A. Association of maternal sleep practices with pre-eclampsia, low birth weight, and stillbirth among Ghanaian women. *Int J Gynecol Obstet* 2013; **121**.
14. O'Brien LM, Warland J, Stacey T, Heazell AEP, Mitchell EA. Maternal sleep practices and stillbirth: findings from an international case-control study. *Birth* 2019; **46**(2): 344-54.
15. Cronin RS, Li M, Thompson JMD, et al. An individual participant data meta-analysis of maternal going-to-sleep position, interactions with fetal vulnerability, and the risk of late stillbirth. *EClinicalMedicine* 2019; **10**: 49-57.
16. Milsom I, Forssman L. Factors influencing aortocaval compression in late pregnancy. *American journal of obstetrics and gynecology* 1984; **148**(6): 764-71.
17. Humphries A, Mirjalili SA, Tarr GP, Thompson JMD, Stone P. The effect of supine positioning on maternal hemodynamics during late pregnancy. *J Matern Fetal Neonatal Med* 2018: 1-8.
18. Jeffreys RM, Stepanchak W, Lopez B, Hardis J, Clapp JF, 3rd. Uterine blood flow during supine rest and exercise after 28 weeks of gestation. *BJOG* 2006; **113**(11): 1239-47.
19. Khatib N, Weiner Z, Beloosesky R, Vitner D, Thaler I. The effect of maternal supine position on umbilical and cerebral blood flow indices. *Eur J Obstet Gynecol Reprod Biol* 2014; **175**: 112-4.

20. Carbonne B, Benachi A, Leveque ML, Cabrol D, Papiernik E. Maternal position during labor: effects on fetal oxygen saturation measured by pulse oximetry. *Obstet Gynecol* 1996; **88**(5): 797-800.
21. Stone PR, Burgess W, McIntyre JP, et al. Effect of maternal position on fetal behavioural state and heart rate variability in healthy late gestation pregnancy. *The Journal of physiology* 2017; **595**(4): 1213-21.
22. Warland J, Dorrian J, Kember AJ, et al. Modifying maternal sleep position in late pregnancy through positional therapy: a feasibility study. *Journal of clinical sleep medicine (JCSM): official publication of the American Academy of Sleep Medicine* 2018; **14**(8): 1387-97.
23. Cronin RS, Chelimo C, Mitchell EA, et al. Survey of maternal sleep practices in late pregnancy in a multi-ethnic sample in South Auckland, New Zealand. *BMC pregnancy and childbirth* 2017; **17**(1): 190.
24. Warrilow K, Gordon A, McCudden L, et al. Australian women's perspectives on sleeping position in late pregnancy. Perinatal Society of Australia and New Zealand (PSANZ) Annual Congress. Gold Coast, QLD, Australia; 2019.