

POSITION STATEMENT

Smoking – one of the most important things to prevent in pregnancy and beyond

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: Smoking – one of the most important things to prevent in pregnancy and beyond. Centre of Research Excellence in Stillbirth. Brisbane, Australia, September 2019.

Key messages

1. Smoking in pregnancy is one of the main contributors of stillbirth – over 50,000 stillbirths in high income countries would be prevented if women did not smoke during pregnancy.
2. **For a woman attending GP services** (midwives in New Zealand): When pregnancy is planned or confirmed and a woman is smoking, she will expect her GP to explain the importance of smoking cessation, refer her to Quitline in Australia and local stop smoking services in New Zealand, to be followed up at every subsequent visit. She may be offered nicotine replacement therapy.
3. **For a woman attending maternity care providers:** She will expect to be assessed for tobacco use. Regardless of smoking status, offer all women an exhaled breath carbon monoxide (CO) reading

(and their partners where available). If smoking, she will be provided with brief advice on the benefits of quitting; offered help (referral to Quitline or similar services) and to be followed up at every subsequent visit. She may be offered nicotine replacement therapy.

Note: The above steps correspond to the 'Ask, Advise and Help' and similar models in Australia and the 'ABC' approach in New Zealand.

Contents

Key messages.....	1
Contents.....	3
Purpose of this statement.....	3
Smoking rates in pregnancy in Australia and New Zealand.....	3
Risks and exposure to tobacco (and nicotine in other forms).....	3
Influences on smoking in pregnancy.....	4
Smoking cessation approaches.....	4
Nicotine Replacement Therapy (NRT)	5
Other tobacco control measures	6
Education and implementation	6
Emerging areas of ongoing/future evaluation and research.....	6
Further information and resources	7
Working group	7
References	8

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 element of care: supporting women to stop smoking in pregnancy.

The purpose of this statement is to summarise what is known about the risks of smoking in pregnancy and how best to help pregnant women (and their partners) stop smoking.

Smoking rates in pregnancy in Australia and New Zealand

About 1 in 10 pregnant women smoke in Australia, with a rate of 1 in 8 in New Zealand. In Australia, 44% of Aboriginal and Torres Strait Islander women smoke in pregnancy¹ and in New Zealand, 35% of Maori women smoke during pregnancy (www.smokefree.org.nz). Women who smoke in pregnancy are more likely to be younger and to live in areas of socioeconomic disadvantage.¹

Risks and exposure to tobacco (and nicotine in other forms)

Smoking tobacco or anything else during pregnancy increases the risk of stillbirth. It also increases risks of miscarriage, placental abruption, preterm birth, sudden unexpected death in infancy (SUDI) and congenital anomalies.²⁻⁶ Smoking during pregnancy is also associated with low birthweight and small for gestational age babies, as well as later impairments of child growth and development, and increased risk of chronic diseases later in life.^{7,8}

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.^{6,9,10}

Influences on smoking in pregnancy

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 and New Zealand,¹¹ 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.¹² 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.¹³

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.¹¹ Support from community (such as Elders and Aunties) to not smoke in pregnancy may be particularly valuable¹⁴ and giving up smoking in pregnancy can be a source of pride for Aboriginal and Torres Strait Islander mothers.¹⁵ Similarly, many Māori women face a range of challenges and complexities in their lives. Health care workers must be mindful of the lived realities of these women, and their family/whānau, and take care not to further stigmatise women. Services that aim to support women stop smoking need to be responsive to the barriers Māori women face in accessing and engaging with them, and move from a single issue-based one-size fits all approach to a holistic model that takes a strengths-based approach and enhances wellbeing.¹⁶

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.^{17,18}

Brief advice is intended to promote cessation and facilitate the woman accessing best practice support. The “5A’s” (Ask, Advise, Assess, Assist and Arrange) 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.¹⁹ Another approach is the shorter three-step (‘Ask, Advise, Help’) brief advice model, which is the model adopted by Cancer Council Australia. The healthcare environment can be very busy, therefore brief advice through either model is an acceptable approach.²⁰

In an Australian study, when women were routinely asked their smoking status at the first antenatal visit, 96% of smokers recalled being asked this²¹ and most pregnant women expect to be asked whether they smoke.²² However, fewer than half the women reported having subsequent discussions about smoking²³ or that they were referred to services such as Quitline.²⁴

Smoking is a deeply entrenched behaviour,²⁵ reinforced by the action of nicotine on reward pathways in the brain. Reframing smoking as an addiction²⁴ 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.²⁵

These strategies can increase the proportion of women who quit smoking in pregnancy and thus reduce the risk of preterm birth and low birthweight;²⁶ they are also cost effective.²⁵ Contingency management (financial incentives for abstaining from smoking) have also encouraged smoking cessation in pregnancy.²⁷⁻³⁰ Women should be encouraged to quit as early in pregnancy, during the first trimester if possible.^{28,31} In one study,²⁸ 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 following smoking cessation elements (adapted from Jones and colleagues³²) with support from senior leadership and effective champions in maternity services can be effective as below.

Midwifery actions:

- Universal carbon monoxide (CO) monitoring at first antenatal care visit
- Referral to smoking cessation services (if CO above 4 ppm)
- Speeding up referrals
- Making re-referrals as necessary
- Document smoking status of all women at time of birth
- Advise services supporting young children and families (e.g. Child and Family Services) of smoking status on discharge from midwifery care

Smoking cessation specialist actions:

- Face to face contact with stop smoking advisor within a week
- Setting a quit date
- Making a quit plan
- Behavioural support (e.g. motivational interviewing)
- Monthly (or more frequent) follow-up of smokers during pregnancy
- Target quitting completely, not reduction

A recent evaluation of the above strategies (e.g. CO monitoring, opt-out referral and improved referral pathways) showed significant increases in both referrals and quit rates.³³ Given that maternity care provides opportunities to identify and follow up pregnant smokers, CO monitoring has been introduced widely in UK and Ireland.³⁴ Qualitative data indicate good acceptance among healthcare practitioners.³⁵⁻³⁷ However other studies describe hesitancy and fear and about maternal autonomy when universal CO monitoring is used in maternity care.³⁸ Further research is required to understand the acceptability of these strategies among women and clinicians in Australia and New Zealand.

Nicotine Replacement Therapy (NRT)

Two comprehensive reviews of NRT,^{39,40} indicate that NRT use in pregnancy may increase smoking cessation by up to 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.⁴¹

Higher doses of NRT may be required to control withdrawal symptoms or cravings in pregnant women as their nicotine metabolism is higher.⁴² 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.^{43,44} 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.

Other tobacco control measures

There is insufficient evidence regarding the effectiveness and risks of e-cigarettes when used during pregnancy.³⁹ Use of smoking cessation drugs (bupropion or varenicline) during pregnancy has shown neither substantial benefit or harm.⁴⁵

Women who smoke during pregnancy may not respond to more general antismoking approaches such as increased tobacco tax and graphic warnings,⁴⁶ suggesting that more personalised approaches may be particularly important for pregnant women.

Education and implementation

Members of the NHMRC Stillbirth CRE (www.stillbirthcre.org.au), with a NHMRC Partnership Grant and other funding, are implementing the Safer Baby Bundle program throughout participating Australian maternity services. Smoking cessation is one of the five components of the program, which is developing resources and educational programs for health professionals. The Safer Baby Bundle program will also nominate national/regional performance indicators and methods for implementing smoking cessation strategies. The Australian Preterm Birth Prevention Alliance (wirf.com.au/APBP-Alliance) will collaborate with the Stillbirth CRE smoking cessation program to jointly reduce rates of smoking during pregnancy.

Emerging areas of ongoing/future evaluation and research

1. Objective ways of assessing smoking in pregnancy using carbon monoxide meters, and effects of opt-out (rather than opt-in) referral options.
2. The role of self-help support (e.g. text message in increasing the likelihood of women stopping smoking in pregnancy).⁴⁷
3. Concerns about weight gain during and after pregnancy.⁴⁸
4. Vitamin C for women smoking in pregnancy to improve infant airway function.⁴⁹
5. Better ways to assess nicotine dependence e.g. strength and frequency of urges to smoke.⁴⁴
6. Harm reduction for smoking in pregnancy – the role of compensatory smoking, cutting down with NRT, e-cigarette use and antioxidants (vitamins C and E).
7. Assessing effects of toxic constituents of tobacco versus e-cigarettes in pregnancy and risks for the fetus.
8. Effectiveness and safety of higher doses of NRT, and bupropion and varenicline use during pregnancy.
9. Financial incentives in subgroups of pregnant smokers e.g. women who use other drugs.
10. Training needs of health providers and novel approaches to improving implementation of guidelines.
11. Comprehensive and multi-component approaches for pregnant smokers in high-priority groups such as Aboriginal women.

12. Understanding the needs of partners of pregnant smokers especially in Aboriginal populations.

Further information and resources

Stillbirth CRE website: www.stillbirthcre.org.au

Working group

Paula Medway (Co-chair), Alice Rumbold (Co-chair), Christine Andrews, Cheryl Bailey, Wendy Cutchie, David Ellwood, Vicki Flenady, Alison Goodfellow, Gillian Gould, Nicole Hall, Alys Havard, Nusrat Homaira, Ling Li Lim, Elizabeth McCarthy, Hayden McRobbie, Natasha Meredith, Philippa Middleton, Sarah Perkes, Lynn Sinclair, Olivia Spur, Deanna Stuart-Butler, Kirsty Tinsley, Megan Weller, Susan Wooderson, Vicki Xafis.

Special acknowledgement to Gillian Gould for leading the literature review which underpins the evidence for this position statement. Additionally, acknowledging the work of previous chairs for this group, Philippa Middleton and Lynn Sinclair, for their significant contributions.

Funded by PSANZ.

References

1. Australian Institute of Health and Welfare. Australia's mothers and babies 2017—in brief. Perinatal statistics series no. 35. Cat. no. PER 100. Canberra: AIHW, 2019.
2. Anderson TM, Lavista Ferres JM, Ren SY, et al. Maternal smoking before and during pregnancy and the risk of sudden unexpected infant death. *Pediatrics* 2019; **143**(4).
3. 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.
4. Hackshaw A, Rodeck C, Boniface S. Maternal smoking in pregnancy and birth defects: a systematic review based on 173 687 malformed cases and 11.7 million controls. *Human Reproduction Update* 2011; **17**(5): 589-604.
5. Marufu TC, Ahankari A, Coleman T, S L. Maternal smoking and the risk of stillbirth: systematic review and meta-analysis. *BMJ Public Health* 2015; **15**(239).
6. Zhao L, Chen L, Yang T, et al. Parental smoking and the risk of congenital heart defects in offspring: an updated meta-analysis of observational studies. *European journal of preventive cardiology* 2019: 2047487319831367.
7. Lawder R, Whyte B, Wood R, Fischbacher C, Tappin DM. Impact of maternal smoking on early childhood health: a retrospective cohort linked dataset analysis of 697 003 children born in Scotland 1997–2009. *BMJ open* 2019; **9**(3): e023213.
8. Quelhas D, Kompala C, Wittenbrink B, et al. The association between active tobacco use during pregnancy and growth outcomes of children under five years of age: a systematic review and meta-analysis. *BMC public health* 2018; **18**(1): 1372.
9. Inamdar AS, Croucher RE, Chokhandre MK, Mashyakhy MH, Marinho VC. Maternal Smokeless Tobacco Use in Pregnancy and Adverse Health Outcomes in Newborns: A Systematic Review. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco* 2015; **17**(9): 1058-66.
10. Whittington JR, Simmons PM, Phillips AM, et al. The use of electronic cigarettes in pregnancy: a review of the literature. *Obstetrical & gynecological survey* 2018; **73**(9): 544-9.
11. Walker RC, Graham A, Palmer SC, Jagroop A, Tipene-Leach DC. Understanding the experiences, perspectives and values of Indigenous women around smoking cessation in pregnancy: systematic review and thematic synthesis of qualitative studies. *International journal for equity in health* 2019; **18**(1): 74.
12. Allen AM, Jung AM, Lemieux AM, et al. Stressful life events are associated with perinatal cigarette smoking. *Preventive medicine* 2019; **118**: 264-71.
13. Román-Gálvez R, Amezcua-Prieto C, Olmedo-Requena R, Lewis-Mikhael Saad A, Martínez-Galiano J, Bueno-Cavanillas A. Partner smoking influences whether mothers quit smoking during pregnancy: a prospective cohort study. 2018; **125**(7): 820-7.
14. Bovill M, Gruppetta M, Cadet-James Y, Clarke M, Bonevski B, Gould GS. Wula (Voices) of Aboriginal women on barriers to accepting smoking cessation support during pregnancy: Findings from a qualitative study. *Women and birth : journal of the Australian College of Midwives* 2018; **31**(1): 10-6.
15. Gould GS, Bovill M, Clarke MJ, Gruppetta M, Cadet-James Y, Bonevski B. Chronological narratives from smoking initiation through to pregnancy of Indigenous Australian women: A qualitative study. *Midwifery* 2017; **52**: 27-33.
16. Wehipeihana N, Were L, Goodwin D, Pipi K. Addressing the challenges of young Māori women who smoke: a developmental evaluation of the phase two demonstration project. Evaluation report. Wellington: Ministry of Health, 2018.
17. Kotz D, Brown J, West R. Prospective cohort study of the effectiveness of smoking cessation treatments used in the "real world". *Mayo Clinic proceedings* 2014; **89**(10): 1360-7.

18. West R, Raw M, McNeill A, et al. Health-care interventions to promote and assist tobacco cessation: a review of efficacy, effectiveness and affordability for use in national guideline development. *Addiction (Abingdon, England)* 2015; **110**(9): 1388-403.
19. Bartsch AL, Harter M, Niedrich J, Brutt AL, Buchholz A. A systematic literature review of self-reported smoking cessation counseling by primary care physicians. *PLoS One* 2016; **11**(12): e0168482.
20. World Health Organization (WHO). Framework convention on tobacco control. Geneva: World Health Organization, 2003.
21. Perlen S, Brown SJ, Yelland J. Have guidelines about smoking cessation support in pregnancy changed practice in Victoria, Australia? *Birth* 2013; **40**(2): 81-7.
22. Herberts C, Sykes C. Midwives' perceptions of providing stop-smoking advice and pregnant smokers' perceptions of stop-smoking services within the same deprived area of London. *J Midwifery Womens Health* 2012; **57**(1): 67-73.
23. Chamberlain C, O'Mara-Eves A, Oliver S, et al. Psychosocial interventions for supporting women to stop smoking in pregnancy. *Cochrane Database Syst Rev* 2013; (10): CD001055.
24. Longman JM, Adams CM, Johnston JJ, Passey ME. Improving implementation of the smoking cessation guidelines with pregnant women: How to support clinicians? *Midwifery* 2018; **58**: 137-44.
25. Jones M, Smith M, Lewis S, Parrott S, Coleman T. A dynamic, modifiable model for estimating cost-effectiveness of smoking cessation interventions in pregnancy: application to an RCT of self-help delivered by text message. *Addiction (Abingdon, England)* 2019; **114**(2): 353-65.
26. Chamberlain C, O'Mara-Eves A, Porter J, et al. Psychosocial interventions for supporting women to stop smoking in pregnancy. *Cochrane Database of Systematic Reviews* 2017; (2): CD001055.
27. Tappin D, Bauld L, Purves D, et al. Financial incentives for smoking cessation in pregnancy: randomised controlled trial. *British Medical Journal* 2015; **350**: h134.
28. Soneji S, Beltran-Sanchez H. Association of maternal cigarette smoking and smoking cessation with preterm birth. *JAMA network open* 2019; **2**(4): e192514.
29. Wilson SM, Newins AR, Medenblik AM, et al. Contingency management versus psychotherapy for prenatal smoking cessation: a meta-analysis of randomized controlled trials. *Women's health issues : official publication of the Jacobs Institute of Women's Health* 2018; **28**(6): 514-23.
30. Notley C, Gentry S, Livingstone-Banks J, Bauld L, Perera R, Hartmann-Boyce J. Incentives for smoking cessation. *Cochrane Database Syst Rev* 2019; **7**: Cd004307.
31. Kondracki AJ, Hofferth SL. A gestational vulnerability window for smoking exposure and the increased risk of preterm birth: how timing and intensity of maternal smoking matter. *Reproductive Health* 2019; **16**(1): 43.
32. Jones S, Hamilton S, Bell R, et al. What helped and hindered implementation of an intervention package to reduce smoking in pregnancy: process evaluation guided by normalization process theory. *BMC Health Services Research* 2019; **19**(1): 297.
33. Bell R, Glinianaia SV, Waal Zvd, et al. Evaluation of a complex healthcare intervention to increase smoking cessation in pregnant women: interrupted time series analysis with economic evaluation. *Tobacco control* 2018; **27**(1): 90-8.
34. Reynolds CME, Egan B, Kennedy RA, O'Malley EG, Sheehan SR, Turner MJ. A prospective, observational study investigating the use of carbon monoxide screening to identify maternal smoking in a large university hospital in Ireland. 2018; **8**(7): e022089.
35. Campbell KA, Bowker KA, Naughton F, Sloan M, Cooper S, Coleman T. Antenatal clinic and stop smoking services staff views on "opt-out" referrals for smoking cessation in pregnancy: a framework analysis. *International journal of environmental research and public health* 2016; **13**(10).

36. Naughton F, Hopewell S, Sinclair L, McCaughan D, McKell J, Bauld L. Barriers and facilitators to smoking cessation in pregnancy and in the post-partum period: The health care professionals' perspective. *Br J Health Psychol* 2018; **23**(3): 741-57.
37. Gould GS, Bovill M, Pollock L, et al. Feasibility and acceptability of Indigenous Counselling and Nicotine (ICAN) QUIT in Pregnancy multicomponent implementation intervention and study design for Australian Indigenous pregnant women: a pilot cluster randomised step-wedge trial. *Addict Behaviors* 2019; **90**: 176-90.
38. Bowden C. Are we justified in introducing carbon monoxide testing to encourage smoking cessation in pregnant women? *Health Care Analysis* 2019; **27**(2): 128-45.
39. Coleman T, Chamberlain C, Davey M-A, Cooper SE, Leonardi-Bee J. Pharmacological interventions for promoting smoking cessation during pregnancy. *Cochrane Database of Systematic Reviews* 2015; (12).
40. Hickson C, Lewis S, Campbell KA, et al. Comparison of nicotine exposure during pregnancy when smoking and abstinent with nicotine replacement therapy: systematic review and meta-analysis. *Addiction (Abingdon, England)* 2019; **114**(3): 406-24.
41. Dhalwani NN, Szatkowski L, Coleman T, Fiaschi L, Tata LJ. Stillbirth Among Women Prescribed Nicotine Replacement Therapy in Pregnancy: Analysis of a Large UK Pregnancy Cohort. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco* 2019; **21**(4): 409-15.
42. Oncken C, Dornelas EA, Kuo C-L, et al. Randomized trial of nicotine inhaler for pregnant smokers. *American Journal of Obstetrics & Gynecology MFM* 2019; **1**(1): 10-8.
43. Zwar NA, Richmond RL, Forlonge G, Hasan I. Feasibility and effectiveness of nurse-delivered smoking cessation counselling combined with nicotine replacement in Australian general practice. *Drug and alcohol review* 2011; **30**(6): 583-8.
44. Bar-Zeev Y, Li Lim L, Bonevski B, Gruppetta M, Gould G. Nicotine replacement therapy for smoking cessation during pregnancy. *The Medical journal of Australia* 2018; **208**(1): 46-51.
45. Turner E, Jones M, Vaz LR, Coleman T. Systematic review and meta-analysis to assess the safety of bupropion and varenicline in pregnancy. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco* 2019; **21**(8): 1001-10.
46. Havard A, Tran DT, Kemp-Casey A, Einarsdottir K, Preen DB, Jorm LR. Tobacco policy reform and population-wide antismoking activities in Australia: the impact on smoking during pregnancy. *Tobacco control* 2018; **27**(5): 552-9.
47. Whitemore R, Leonardi-Bee J, Naughton F, et al. Effectiveness and cost-effectiveness of a tailored text-message programme (MiQuit) for smoking cessation in pregnancy: study protocol for a randomised controlled trial (RCT) and meta-analysis. *Trials* 2019; **20**(1): 280.
48. Bauld L, Graham H, Sinclair L, et al. Barriers to and facilitators of smoking cessation in pregnancy and following childbirth: literature review and qualitative study. *Health Technol Assessment* 2017; **21**(36): 1-158.
49. McEvoy CT, Milner KF, Scherman AJ, et al. Vitamin C to decrease the effects of smoking in pregnancy on infant lung function (VCSIP): rationale, design, and methods of a randomized, controlled trial of Vitamin C supplementation in pregnancy for the primary prevention of effects of in utero tobacco smoke exposure on infant lung function and respiratory health. *Contemp Clin Trials* 2017; **58**: 66-77.