

# Smoking During Pregnancy

## Red Nose recommends keeping baby smoke free before and after birth

- Smoking is a major modifiable risk factor for stillbirth. If all smoking women ceased smoking by 16 weeks' gestation, the rate of stillbirth would be reduced by 25%.
- Every puff of a cigarette has an immediate negative effect on the baby. Carbon monoxide replaces some of the oxygen in the blood, and nicotine also reduces the flow of blood through the umbilical cord.
- About 1 in 10 Australian women still smoke during pregnancy.
- Second hand or passive smoke also increases the risk of stillbirth.

## Stillbirth

Stillbirth is the tragic loss of a baby born after 20 weeks gestational age (or weighing greater than 400 grams at birth if gestational age is unknown).

Around 1 in every 130 pregnancies in Australia tragically ends in stillbirth – that is six babies each day dying suddenly before they have even had a chance to take their first breath.

The major causes of stillbirth in Australia are congenital abnormality, perinatal conditions and maternal conditions. Tragically around 20% of stillbirths have no explanation, and almost half of unexplained stillbirths occur near full-term.<sup>1</sup> This lack of diagnosis or cause can add to grieving parents' distress, as they struggle to understand what went wrong and are left wondering if it will happen again in a subsequent pregnancy.

## Exposure to Smoking and Stillbirth

Mothers who smoke in pregnancy have increased vasoconstriction (narrowing of the vessels carrying blood around the body) which causes decreased blood flow to the unborn baby, placing them at an increased risk of

stillbirth.<sup>8</sup> Smoking also increases the risk of miscarriage, placental abruption, preterm birth, sudden unexpected death in infancy (SUDI) and congenital anomalies.<sup>2-6</sup> 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.<sup>7,8</sup>

Nicotine and carbon monoxide (CO) are two main derivatives of tobacco smoke that have a negative effect on pregnancy outcomes.<sup>10</sup> Exposure to nicotine, a known neurotoxin (toxins that are destructive to nerve tissue), interferes with normal neurotransmitter function and is harmful to a developing unborn baby. Carbon monoxide, a very toxic gas contained in cigarette smoke, is inhaled when you smoke cigarettes and other tobacco products. When CO encounters red blood cells, carboxyhemoglobin (COHb) is formed. This adversely affects the unborn baby because the oxygen carrying capacity in the maternal blood supply is reduced. This leads to fetal hypoxia (deprives the unborn baby of oxygen) causing cellular damage and potentially death.<sup>10</sup>

Smoking is a major modifiable risk factor for stillbirth. It is essential that women and their partners<sup>17</sup> consider stopping to ensure a safer and healthier pregnancy.

## Smoking Cessation Approaches

Smoking is a deeply entrenched behaviour<sup>18</sup> and is reinforced by the action of nicotine on the reward pathways in the brain. There is extensive literature concerning the difficulties associated with smoking cessation and which interventions are most effective. The evidence suggests that a combination of strategies to support women to quit smoking is needed. This combination includes CO monitoring, behavioural intervention (behaviour change counselling) and nicotine replacement therapy (NRT).<sup>19-20</sup>

The evidence consistently shows that a combination of face to face advice from a health professional, behavioural intervention and smoking cessation pharmacotherapy such as NRT is the most effective approach to successful smoking cessation.

NRT use in pregnancy has been shown to increase smoking cessation by up to 40% without showing adverse effects on pregnancy outcomes.<sup>21-22</sup> A large UK study in 2019, did not find a protective or harmful effect of NRT prescribed during pregnancy in relation to stillbirth. There may be no true association between NRT exposure and stillbirth, however, the authors recommended further research to determine this more definitively.<sup>23</sup>

For further advice on smoking cessation approaches refer to Safer Baby Bundle resources <https://www.saferbaby.org.au>

## E-cigarettes

The use of electronic nicotine devices during pregnancy is of great concern in the absence of safety and efficacy data.<sup>13</sup> The emerging evidence suggests that using e-cigarettes containing nicotine during pregnancy is at least as harmful for the unborn baby as smoking conventional cigarettes.<sup>14</sup> Researchers have stated that e-cigarettes are not safer than cigarettes, they are less dangerous, which is a subtle but important difference.<sup>15-16</sup> Whilst they avoid the toxins associated with the inhalation of smoke, the safety of the propellants, such as propylene glycol, is unknown. This chemical is commonly used in food and cosmetics to retain moisture and is not marketed for products that are inhaled.

## What Should I do if I'm Pregnant and a Smoker?

Quitting at any time during pregnancy reduces the harm to your baby. Planning to quit as early as you can means a better start in life for your baby. Red Nose recommends talking with your health care provider and working together to help you quit smoking.

Your health care professional will ask you about smoking and offer you a CO screening breath test to measure if you have been exposed to unsafe levels of CO from smoke or other sources, including faulty cooking or heating appliances.

Although hard, quitting smoking means you and your baby will get more oxygen. By quitting smoking any time during your pregnancy, you and baby will benefit, it is never too late to quit smoking.

## What Should I Do If I am Pregnant and My Partner Smokes?

Limiting your exposure to cigarette smoke, including second-hand smoke, reduces the harm to your baby and gives your baby a better start in life.

Your health care professional will be able to provide you with free advice and support to encourage your partner to safely quit smoking as well.

## Quit Resources

For free advice and support to help you quit smoking, contact Quitline on **13 78 48** or visit [www.health.gov.au/contacts/quitline](http://www.health.gov.au/contacts/quitline)

## Where Can I Find Further Information and Resources about Stillbirth Prevention?

Red Nose is proud to partner with the NHMRC Stillbirth Centre for Research Excellence in the National Safer Baby Bundle Initiative.

Stillbirth Centre for Research Excellence: <https://www.stillbirthcre.org.au/safer-baby-bundle/>

Safer baby resources for women and healthcare settings: <https://www.saferbaby.org.au>

Safer baby bundle sleep position resources and position statement: <https://www.stillbirthcre.org.au/safer-baby-bundle/quit-smoking/>

## State/Territory Health Department Safer Baby Information

**New South Wales:** <http://cec.health.nsw.gov.au/keep-patients-safe/maternity-safety-program/safer-baby-bundle>

**Victoria:** <https://www.bettersafecare.vic.gov.au/our-work/clinical-improvement-and-innovation/reducing-stillbirth>

**Queensland:** <https://clinicalexcellence.qld.gov.au/priority-areas/safety-and-quality/safer-baby-bundle>

## References

- <sup>1</sup> Australian Institute of Health and Welfare (2019). *Australia's mothers and babies 2017—in brief*. Perinatal statistics series no. 35. Cat. no. PER 100. Canberra: AIHW.
- <sup>2</sup> Flenady, V., Koopmans, L., Middleton, P., Frøen, J. F., Smith, G. C., Gibbons, K., ... & Fretts, R. (2011). Major risk factors for stillbirth in high-income countries: a systematic review and meta-analysis. *The Lancet*, 377(9774), 1331-1340. doi: 10.1016/S0140-6736(10)62233-7
- <sup>3</sup> Flenady, V., Wojcieszek, A. M., Middleton, P., Ellwood, D., Erwich, J. J., Coory, M., ... & Lawn, J. E. (2016). Stillbirths: recall to action in high-income countries. *The Lancet*, 387(10019), 691-702. doi: 10.1016/S0140-6736(15)01020-X
- <sup>4</sup> Mozooni, M., Preen, D. B., & Pennell, C. E. (2018). Stillbirth in Western Australia, 2005-2013: the influence of maternal migration and ethnic origin. *The Medical Journal of Australia*, 209(9), 394-400.
- <sup>5</sup> Gould, G. S., Watt, K., McEwen, A., Cadet-James, Y., & Clough, A. R. (2015). Predictors of intentions to quit smoking in Aboriginal tobacco smokers of reproductive age in regional New South Wales (NSW), Australia: quantitative and qualitative findings of a cross-sectional survey. *BMJ Open*, 5(3), e007020. doi: 10.1136/bmjopen-2014-007020
- <sup>6</sup> Salihi, H. M., & Wilson, R. E. (2007). Epidemiology of prenatal smoking and perinatal outcomes. *Early Human Development*, 83(11), 713-720. doi: 10.1016/j.earlhumdev.2007.08.002
- <sup>7</sup> Zhang, K., & Wang, X. (2013). Maternal smoking and increased risk of sudden infant death syndrome: a meta-analysis. *Legal medicine*, 15(3), 115-121. doi: 10.1016/j.legalmed.2012.10.007
- <sup>8</sup> Phelan, S. (2014). Smoking cessation in pregnancy. *Obstetrics and Gynecology Clinics*, 41(2), 255-266. doi: 10.1016/j.ogc.2014.02.007
- <sup>9</sup> US Department of Health and Human Services. (2006). *The health consequences of involuntary exposure to tobacco smoke: a report of the Surgeon General*. Atlanta (GA): Centers for Disease Control and Prevention (US)
- <sup>10</sup> Diamanti, A., Papadakis, S., Schoretsaniti, S., Rovina, N., Vivilaki, V., Gratzou, C., & Katsaounou, P. A. (2019). Smoking cessation in pregnancy: An update for maternity care practitioners. *Tobacco Induced Diseases*, 17: 57. doi: 10.18332/tid/109906
- <sup>11</sup> Australian Institute of Health and Welfare. (2019). *National Core Maternity Indicators*. Retrieved from <https://www.aihw.gov.au/reports/mothers-babies/ncmi-data-visualisations>
- <sup>12</sup> Australian Institute of Health and Welfare (2019). *Australia's Mothers and Babies 2017—In Brief*. Perinatal statistics series no. 35. Cat. no. PER 100. Canberra: AIHW.
- <sup>13</sup> Gould, G. S., Lim, L. L., & Mattes, J. (2017). Prevention and Treatment of Smoking and Tobacco Use During Pregnancy in Selected Indigenous Communities in High-Income Countries of the United States, Canada, Australia, and New Zealand: An Evidence-Based Review. *Chest*, 152(4), 853-866. doi: /10.1016/j.chest.2017.06.033
- <sup>14</sup> E-cigarettes. (c2019). Tackling Indigenous Smoking. Retrieved April 9, 2020, from <https://tacklingsmoking.org.au/e-cigarettes/>
- <sup>15</sup> Fiore, M. C., Schroeder, S. A., & Baker, T. B. (2014). Smoke, the chief killer—strategies for targeting combustible tobacco use. *New England Journal of Medicine*, 370(4), 297-299. doi: 10.1056/NEJMp1314942
- <sup>16</sup> Meier, E., Tackett, A. P., & Wagener, T. L. (2013). Effectiveness of electronic aids for smoking cessation. *Current Cardiovascular Risk Reports*, 7(6). doi: 10.1007/s12170-013-0343-8 doi: 10.1007/s12170-013-0343-8
- <sup>17</sup> Román-Gálvez, R. M., Amezcua-Prieto, C., Olmedo-Requena, R., Lewis-Mikhael Saad, A. M., Martínez-Galiano, J. M., & Bueno-Cavanillas, A. (2018). Partner smoking influences whether mothers quit smoking during pregnancy: A prospective cohort study. *BJOG*, 125(7), 820-827. doi:10.1111/1471-0528.14986
- <sup>18</sup> Jones, S., Hamilton, S., Bell, R., Araújo-Soares, V., Glinianaia, S. V., Milne, E. M., ... & Shucksmith, J. (2019). 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*, 19(1), 297. doi: 10.1186/s12913-019-4122-1
- <sup>19</sup> Kotz, D., Brown, J., & West, R. (2014). Prospective cohort study of the effectiveness of varenicline versus nicotine replacement therapy for smoking cessation in the "real world". *BMC Public Health*, 14(1), 1163. doi: 10.1186/1471-2458-14-1163
- <sup>20</sup> West, R., Raw, M., McNeill, A., Stead, L., Aveyard, P., Bitton, J., ... & Borland, R. (2015). Health-care interventions to promote and assist tobacco cessation: a review of efficacy, effectiveness and affordability for use in national guideline development. *Addiction*, 110(9), 1388-1403. doi: 10.1111/add.12998
- <sup>21</sup> Coleman, T., Chamberlain, C., Davey, M.-A., Cooper, S. E., & Leonardi-Bee, J. (2015). Pharmacological interventions for promoting smoking cessation during pregnancy. *The Cochrane Database of Systematic Reviews*, (12), CD010078. doi: 10.1002/14651858.CD010078.pub2
- <sup>22</sup> Hickson, C., Lewis, S., Campbell, K. A., Cooper, S., Berlin, I., Claire, R., ... & Coleman, T. (2019). Comparison of nicotine exposure during pregnancy when smoking and abstinent with nicotine replacement therapy: systematic review and meta-analysis. *Addiction*, 114(3), 406-424. doi: 10.1111/add.14473
- <sup>23</sup> Dhalwani, N. N., Szatkowski, L., Coleman, T., Fiaschi, L., & Tata, L. J. (2019). Stillbirth Among Women Prescribed Nicotine Replacement Therapy in Pregnancy: Analysis of a Large UK Pregnancy Cohort. *Nicotine & Tobacco Research*, 21(4), 409-415. doi: 10.1093/ntr/nty019
- <sup>24</sup> Bartsch, A. L., Härter, M., Niedrich, J., Brütt, A. L., & Buchholz, A. (2016). A systematic literature review of self-reported smoking cessation counseling by primary care physicians. *PloS One*, 11(12). doi: 10.1371/journal.pone.0168482
- <sup>25</sup> World Health Organization (WHO) (2003). *Framework Convention on Tobacco Control*. Geneva: WHO.

**Publication date:** May 2021

**Suggested Citation:** Red Nose. National Scientific Advisory Group (NSAG). 2021 May. Information Statement: Smoking during pregnancy. Melbourne, Red Nose Australia.

Red Nose Safe Sleep & Safer Pregnancy Advice Hub

1300 998 698 (during business hours)

[education@rednose.org.au](mailto:education@rednose.org.au)

[rednose.org.au/advice](https://rednose.org.au/advice)