



Child Exposure to Other People's Tobacco Smoke

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A position statement of the Thoracic Society of Australia and New Zealand

“The prevention of disease today is one of the most important factors in the line of human endeavour” Charles Mayo, 1913

The United Nations Convention on the Rights of the Child advocates for “...the right of the child to the enjoyment of the highest attainable standard of health...” (1). The Thoracic Society strives to prevent the harm to children caused by exposure to tobacco smoke pollution.

1. Background

Australia is among the world's leaders in the field of reducing public exposure to tobacco smoke pollution (TSP, smoke from other people's cigarettes.). For example, adults are protected from TSP at workplaces. Public health authorities are empowered to act on behalf of employees with often little control over their environments who are therefore powerless to effect change themselves.

Reducing the exposure of individuals to TSP in private places, such as homes and cars, receives less attention than exposure in public places, even though the potential harm of exposure is no different. Thus, children exposed to



tobacco smoke in private places have very little control over their home environment.

Respiratory disease is intimately associated with social determinants of health. Early respiratory physicians battling with endemic tuberculosis worked closely with public health authorities, welfare and community support organisations, and legislative authorities. Respiratory physicians must play a similar role and endeavour to protect children from exposure to tobacco smoke pollution.

2. Definitions

Tobacco smoke pollution (TSP) describes exposure to the smoke from cigarettes, cigars and pipes smoked by someone else. It is an umbrella term that includes environmental tobacco smoke (ETS), second hand smoke and passive smoking.

Exposure: The medical and scientific literature does not distinguish between the effects of exposure to TSP in the home and exposure elsewhere (eg shopping centres). Children of parents who smoke tobacco have higher levels of biomarkers of tobacco smoke absorption than children of non-smokers (2, 3). Parental smoking can therefore be used as a proxy for child exposure to tobacco.

3. The effects of child exposure to tobacco smoke.

Since the first papers describing the effect of parental smoking on child health in the mid 1970s, there has been a plethora of papers in the scientific literature describing many different associations.

Parental smoking is associated with an increased risk of the following for their children:

Respiratory tract disease:



Acute respiratory infection: A meta-analysis by Li *et al.* in 1999 drew together evidence from 21 studies to quantify the risk of serious lower respiratory tract infections from exposure to tobacco smoke (4). They found that the child of a parent who smoked had an odds ratio of 1.93 for a respiratory tract infection in early life that required hospitalisation. The risk was higher for younger children.

Asthma: This field has been reviewed in a systematic manner by Strachan and Cook in 1998, who found wheezing to be more common among children of mothers who smoked (especially for children under the age of 6) (5). The odds ratio for asthma if either parent smoked was 1.4. In addition, they found asthma to be more severe among children of smoking parents.

Non-specific respiratory symptoms: Many studies find non-specific respiratory symptoms to be more common among children of smoking parents, including a large cross sectional survey of 3964 children aged 8-13 in Hong Kong by Lam *et al* (6). This study found cough (odds ratio 1.54), phlegm production (1.43) and upper respiratory tract symptoms (1.17- 1.35) to be more common among children of smoking parents.

Middle ear disease, tonsillitis: Strachan and Cook systematically reviewed evidence from 45 studies relating parental smoking to acute otitis media, recurrent otitis media, middle ear effusion, and adenoidectomy and/or tonsillectomy (7). They found parental smoking conferred roughly double the risk for these conditions. They also commented that parental smoking “is likely to be causative” of acute and chronic middle ear disease in children.

Other disease

Increased risks from general anaesthesia: Two well designed studies have found TSP exposure to be a risk factor for airway complications during anaesthesia in children. Lakshmi *et al* found the risk of laryngospasm to be increased 10-fold among children exposed to ETS at home (8). In this study investigators, blinded to the occurrence of laryngospasm, administered



a questionnaire to over 300 children undergoing day surgery who were otherwise well. Skolnick *et al.* replicated these findings and additionally found an exposure-response relationship between parental smoking and child laryngospasm (9).

Meningococcal disease and other serious bacterial infections: In a case control study Fischer *et al.* examined risk factors for meningococcal disease in young children. They found children under five with meningococcal disease 8.4 times more likely to have a mother who smoked than matched controls (10). For children five to 17 years, the risk was 3.7 fold. The risk persisted after controlling for other factors. In a case-control study examining risk factors for any bacterial meningitis in Adelaide, Australia, Iles *et al.* found parental smoking to be a significant risk factor (11). This study also found a difference between smoking indoors and outside as a risk factor for child disease. In households where parents smoked, children who had meningitis were significantly more likely to have parents who smoked indoors than children who did not have meningitis (66% vs 28%, $P = 0.005$). Having two parents who smoked more than doubled the risk of meningitis, as did smoking inside.

Sudden Infant Death Syndrome (SIDS): In countries where men and women have almost equal rates of smoking, it is difficult to determine the relative contribution to child disease from prenatal maternal smoking and postnatal exposure. This is especially true for research into risk factors for SIDS. Schoendorf *et al.* analysed the USA National Maternal and Infant Health Survey and found that for infants of normal birth weight, combined in utero and postnatal exposure from maternal smoking led to approximately triple the risk of SIDS, while postnatal exposure alone led to double the risk (12). Importantly, Blair *et al.* have found that paternal smoking, in the absence of maternal smoking, is an independent risk factor for SIDS (13).

Increased risk of children becoming smokers: Commencement of smoking is largely an adolescent phenomenon. The earlier in life a young person



begins to smoke, the more likely they are to be a long-term smoker (14). The influence of parental smoking on their child's risk of uptake is significant. Farkas *et al.* describe an interesting cross sectional survey of 15-17 year olds in the USA which yielded a linear exposure-response relationship between parental smoking and uptake in adolescence (15). The likelihood of uptake was about 5.5% for the child of two never-smokers and increased by about 5% in order in each of the following categories: the child of one non-smoker and one ex-smoker, of one non-smoker and one current smoker, two ex-smokers, one ex-smoker and one current smoker, to two current smokers (30% risk). They found the risk of child uptake to increase by approximately 0.6% for every year the parent continued to smoke after the child's birth. The contribution to this risk was greatest once the child had reached the age of nine. Optimistically, they found the overall increased risk from parental smoking to diminish by one third if the parent quit smoking. While the attitude of parents may moderate the influence of role modelling, it appears that if parent actions are consistent with anti-smoking messages, the child is less likely to try smoking (16).

Thus, while limiting exposure to parental smoking is desirable as a child health promotion strategy, parents giving up smoking is a key means to reducing smoking by adolescents.

The effect of parental smoking on child health is generally greater for younger children who, it is speculated (17) live in closer proximity to their parents.

4. The prevalence of child exposure to tobacco smoke

Although the prevalence of smoking in Australia is a little above 20% of the population over the age of 15, recent estimates suggest that over 45% of Australian children live in a home with a parent who smokes (2, 18). In the USA lower socioeconomic status confers increased risk of tobacco smoke exposure for children (3). Given the distribution of smoking in Australasia, there is no reason to suppose the situation is different for children here. There may be other groups with similarly increased risk of exposure.



5. Parental smoking and cessation interventions.

The association between smoking by parents and poor health outcomes for their children is beyond question. A systematic review finds a paucity of evidence from controlled trials to support interventions which have been successful in reducing children's exposure (19). Few Intervention studies take into account potential differences between adult smokers and adult smokers in the setting of parenthood or child health.

6. Maternal smoking relapse after cessation in pregnancy

Although there are significant numbers of women who cease smoking during pregnancy, it is common to relapse postnatally. For example, Walsh *et al* found that after an intervention to help pregnant women quit smoking, by three months postnatally over half the 24 mothers in Newcastle, Australia, who had quit had started smoking again (20). Soyseth underscores this point with a cross-sectional study of 1995 finding the prevalence of maternal smoking to increase from 38% during pregnancy to 45% seven years later (21). Prevention of relapse for mothers who quit smoking in pregnancy would be a valuable research and public health strategy. Those who have relapsed postnatally, or perhaps not quit at all during pregnancy, may represent a "hard core" of committed smokers.

7. Aspects not addressed

This paper does not address maternal smoking in pregnancy, exposure of children to the promotion of cigarette smoking, nor other influences on uptake and continuation of smoking.

8. Conclusions:

The Thoracic Society of Australia and New Zealand holds that:

Exposure of children to tobacco smoke pollution is a major preventable cause of disease. Therefore,



1. Governments should take a lead role in protecting children from other people's tobacco smoke via policy and legislation. Protecting children from exposure to tobacco smoke is a responsibility of the entire spectrum of society, including health professionals, parents and others who care for children (schools, child care etc.), smokers and other individuals.
2. There is now a wealth of observational data associating exposure to tobacco smoke pollution and child morbidity. Further epidemiological studies on child exposure to TSP are only warranted if they are researching new knowledge areas or if they may provide data to use for advocating smoke-free environments for children.
3. Research is needed to determine the most effective strategies to reduce child exposure to tobacco smoke pollution. This includes strategies in community and clinical settings.
4. In addition to reducing their children's exposure to TSP, parents who smoke must be encouraged to quit smoking for their own health as well as to reduce the uptake of active smoking in their children.
5. If parents will not quit smoking or reduce the number of cigarettes they smoke, they should be encouraged to keep homes and cars smoke-free. While this is an improved situation for children, this compromise position still exposes parents and children to significant health risks compared with nonsmokers and their children.



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