

The Clinical Case for Smoking Cessation for PREGNANT WOMEN

What is this initiative aiming to achieve?

The aim of this initiative is to provide clinical support for temporary abstinence with a view to prompting a permanent quit. To gain maximum benefit, a quit attempt needs to begin at the beginning of pregnancy and lead to permanent quitting. However, temporary abstinence beginning in the first trimester or even the third trimester and lasting until a mother has finished breastfeeding will still have worthwhile benefits.¹

Why intervene in secondary care?

Hospitalisation offers an opportune time to encourage patients to stop smoking for four main reasons.

- Firstly, this time is often a “teachable moment” where patients are more receptive to intervention and are more motivated to quit.
- Secondly, the hospital’s no smoking environment creates an external force to support abstinence.
- Thirdly, patients are ideally placed to be given information about treatment options, support through withdrawal and signposted to specialist services.
- Fourthly, abstaining from smoking at this time can lead to significant health benefits.

What is the relationship between smoking and pregnancy?

Smoking has been identified as the most significant modifiable cause of adverse pregnancy outcomes.² Although the specific mechanisms involved in the adverse affects of smoking on pregnancy are not clear, the major components of cigarette smoke that are thought to cause harm are nicotine, carbon monoxide and cyanide.³ All three toxins freely cross the placenta and reduce oxygen transfer to foetal tissues.⁴ Smoking also damages the placenta, causing reduced vascularisation, internal edema of the capillaries and broadening of the basement membrane of the placental villi.⁵ Compared to non-smokers, women who smoke during pregnancy have an increased risk of:³⁻⁵

- Low birth weight baby (<2500g)
- Preterm birth
- Ectopic pregnancy
- Spontaneous abortion
- Premature rupture of membranes (PROM)
- Perinatal mortality (still birth and neonatal death)
- Intrauterine growth restriction (IUGR)
- Placenta previa
- Placental abruption
- Sudden infant death syndrome (SIDS)

What are the benefits of quitting for pregnant women?

Successful quitting will not only benefit a mother’s long term health by reducing the risk of disease development⁶ but there is evidence that quitting smoking during pregnancy reduces the risk of unfavourable pregnancy outcomes (see below).

Main acute effects of smoking on the body (estimated time of recovery, if known)

- Increase in sympathetic tone leading to increase in blood pressure, heart rate and peripheral vasoconstriction leading to an increased demand for oxygen and cardiac function ⁷ (24-48 hrs)
- Formation of carboxyhaemoglobin leading to reduction in oxygen delivery to the tissues ⁸ (8-24 hrs)
- Formation of carboxymyoglobin leading to reduction in oxygen storage in the muscles ⁹ (8-24hrs)
- Increase in red cell production which leads to increase in blood viscosity, a decrease tissue perfusion and decrease in oxygen delivery to the tissues ¹⁰
- Hypersecretion of mucus, narrowing of the small airways, decrease in ciliary function and change in mucus rheology leading to a decrease in mucociliary transport ¹⁰ (12-72 hours)
- Changes in functioning of a range of immune cells (pro- and anti-inflammatory cytokines, white blood cells, immunoglobulins) which lead to decreased immunity ¹⁰ (1week-2 months)
- Induction of hepatic enzymes which increases drug metabolism through both pharmacokinetic and pharmacodynamic mechanisms ¹¹ (6-8 weeks)

Smoking abstinence during early pregnancy has been associated with the following outcomes:

- A Cochrane review has shown that smoking cessation interventions reduce low birth weight by 17% (RR 0.83 (95%CI 0.73, 0.95) and preterm birth by 14% (RR 0.86 (95%CI 0.74,0.98) and there was a 53.91g increase in mean birth weight (95% CI 10.44g, 95.38g).¹² Earlier quitting in pregnancy has been associated with greater risk reduction of low birth weight.¹³
- 37% reduced odds of placenta previa (OR 0.63(95% CI 0.47-0.96)) and placental abruption (OR 0.63 (0.47-0.96)).¹⁴
- 44% reduced odds of ectopic pregnancy (OR 0.56 (0.45-0.76)).¹⁴
- 41% reduced odds of preterm PROM (OR 0.59 (0.44-0.85)).¹⁴
- 41% reduced odds in occurrence of colic (OR 0.59 (0.36-0.98)).¹⁵
- Reduced incidence of SIDS.¹⁶

The 3A's

How to approach smoking cessation with pregnant women

Smoking cessation interventions have been proven effective for pregnant women.¹² Pregnant smokers have an increased chance of quitting if they use some form of pharmacotherapy delivered with a high level of behavioural support.¹² There has been some debate over the risks of nicotine replacement therapy (NRT) during pregnancy due to the effects that nicotine can have on the developing foetus. However, compared to cigarette smoking, NRT results in lower peak blood levels and is not likely to compromise the foetus.¹⁷

The DH guidance “Stop Smoking Interventions in Secondary Care”¹⁸ outlines a care pathway for supporting smoking cessation, which may be adopted for pregnant smokers in inpatient settings. In essence, the care pathway incorporates a very brief intervention using the 3A's:

ASK and record smoking status

ADVISE the patient of the personal health benefits of quitting

ACT on the patient response

- prescribe NRT for patients in withdrawal
- monitor withdrawal and adjust pharmacotherapy accordingly
- refer to local NHS Stop Smoking Service

How was this information sheet put together?

This information is a summary of the current scientific evidence on the association between cigarette smoking and maternity outcomes. Studies were found by searching MEDLINE and EMBASE using combined exploded subject headings of “maternity complications”, “reproductive physiological phenomena” and “tobacco use cessation” from 01/1990 – 10/2009 and by searching the Report of the US surgeon general on the health benefits of smoking cessation.¹ Evidence has been included in this summary from cohort studies, randomised controlled trials and reviews only.

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