Recommended cessation counselling for pregnant women who smoke: a review of the evidence

Cathy L Melvin, Patricia Dolan-Mullen, Richard A Windsor, H Pennington Whiteside, Jr, Robert L Goldenberg

Abstract
Objective—To review the evidence base underlying recommended cessation counselling for pregnant women who smoke, as it applies to the steps identified in the Agency for Healthcare Research and Quality’s publication, Treating tobacco use and dependence: a clinical practice guideline.

Data sources—Secondary analysis of literature reviews and meta-analyses.

Data synthesis—A brief cessation counselling session of 5–15 minutes, when delivered by a trained provider with the provision of pregnancy specific, self help materials, significantly increases rates of cessation among pregnant smokers. This low intensity intervention achieves a modest but clinically significant effect on cessation rates, with an average risk ratio of 1.7 (95% confidence interval 1.3 to 2.2). There are five components of the recommended method—“ask, advise, assess, assist, and arrange”.

Conclusions—We recommend these evidence based procedures be adopted by all prenatal care providers. The use of this evidence based intervention is feasible in most office or clinic settings offering prenatal care and can be implemented without inhibiting other important aspects of prenatal care or disrupting patient flow. If implemented widely, this approach has the potential to achieve an important reduction in a number of adverse maternal, infant, and pregnancy outcomes and to reduce associated, excess health care costs.

Keywords: smoking cessation; pregnancy

Data sources
To develop consensus on a best practice intervention for pregnant smokers, we reviewed the evidence related to cessation counselling during pregnancy in the published literature (table 1), including the evidence supporting the Agency for Health Care Policy and Research’s (AHCPR) clinical practice guideline, Smoking cessation, and its recent update, Treating tobacco use and dependence: a clinical practice guideline, by the Agency for Healthcare Research and Quality (AHRQ, formerly AHCPR). A panel of experts also considered this literature and its implications for a best practice intervention at the 1998 consensus workshop on smoking cessation in pregnancy, sponsored by the Robert Wood Johnson Foundation’s Smoke-Free Families Program, the Health Resources and Services Administration, and the Centers for Disease Control and Prevention. Participants included representatives from the American Cancer Society, the National Cancer Institute, the National Heart, Lung, and Blood Institute, the Association of Maternal and Child Health Programs, the Oklahoma Health Care Authority, the Partnership for Prevention, and the Addressing Tobacco in Managed Care initiative. The panel considered three questions: (1) is pregnancy an appropriate time for smoking cessation efforts?; (2) are interventions effective?; and (3) how can smoking cessation interventions be introduced into health systems?

The panel concluded that pregnancy is an appropriate time to achieve smoking cessation and that successful interventions produce clear, short term, and cost effective benefits. They also concluded that a brief cessation counselling session can improve cessation rates as compared to usual advice to quit, and that more intensive counselling has not been documented to increase cessation rates among pregnant smokers. Furthermore, they found that almost all benefits of brief counselling occur in light to moderate smokers.

Data synthesis
Based on these reviews of the evidence, we recommend a simple approach that has been shown to increase cessation in prenatal populations as compared to usual advice to stop smoking. A brief cessation counselling session of 5–15 minutes, when delivered by a trained provider with the provision of pregnancy specific, self help materials,
### Table 1: Settings, interventions, smoking cessation and risk ratios (95% confidence intervals) for 16 trials

<table>
<thead>
<tr>
<th>Trial</th>
<th>Setting</th>
<th>Intervention</th>
<th>Treatment</th>
<th>Control</th>
<th>Risk ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexton, Hebel</td>
<td>Private + university</td>
<td>One or more personal visits, monthly phone contact with master’s level educator + biweekly mailed materials</td>
<td>389</td>
<td>392</td>
<td>4.6 (3.1 to 6.8)</td>
</tr>
<tr>
<td>Winsor et al</td>
<td>Public clinics (US)</td>
<td>10 minute session with bachelor’s level counsellor + materials + manual</td>
<td>102</td>
<td>104</td>
<td>7.1 (1.7 to 30.6)</td>
</tr>
<tr>
<td>Ersho et al</td>
<td>HMO (US)</td>
<td>Brief counselling by health educator + 8 booklets mailed weekly</td>
<td>126</td>
<td>116</td>
<td>1.5 (0.9 to 2.5)</td>
</tr>
<tr>
<td>Burling et al</td>
<td>Urban hospital clinic (US)</td>
<td>Personal letter from chief of prenatal clinic + pamphlet</td>
<td>70</td>
<td>69</td>
<td>2.2 (0.7 to 6.8)</td>
</tr>
<tr>
<td>Hjalmarson et al</td>
<td>Public clinics (Sweden)</td>
<td>Self help manual distributed by obstetrician</td>
<td>444</td>
<td>209</td>
<td>1.5 (0.9 to 2.4)</td>
</tr>
<tr>
<td>Price et al</td>
<td>University clinic (US)</td>
<td>Videotape + pamphlet + brief counselling with health educator or booklet + counselling</td>
<td>123</td>
<td>70</td>
<td>3.4 (0.4 to 27.8)</td>
</tr>
<tr>
<td>O’Connor et al</td>
<td>Group practice (Canada)</td>
<td>20 minute counselling by public health nurse + manual + phone contact</td>
<td>90</td>
<td>84</td>
<td>2.2 (0.8 to 6.1)</td>
</tr>
<tr>
<td>Peterson et al</td>
<td>HMO (US)</td>
<td>Mailed manual + audiotape</td>
<td>43</td>
<td>63</td>
<td>1.0 (0.4 to 2.4)</td>
</tr>
<tr>
<td>Windsor et al</td>
<td>Public clinics (US)</td>
<td>15 minute counselling by educator + manual + clinic reinforcement + mailed letter + “buddy” support methods + quarterly newsletter</td>
<td>400</td>
<td>414</td>
<td>1.7 (1.1 to 2.5)</td>
</tr>
<tr>
<td>Secker-Walker et al</td>
<td>University clinic (US)</td>
<td>Counselling by trained counsellors at 1st 3 visits and at 36 weeks + booklet</td>
<td>136</td>
<td>176</td>
<td>1.2 (0.6 to 2.6)</td>
</tr>
<tr>
<td>Kendrick et al</td>
<td>Public clinics (US)</td>
<td>1-5 minute counselling at multiple visits</td>
<td>233</td>
<td>284</td>
<td>0.9 (0.5 to 1.6)</td>
</tr>
<tr>
<td>Kendrick et al</td>
<td>Public clinics + WIC sites (US)</td>
<td>Brief counselling + material</td>
<td>307</td>
<td>546</td>
<td>1.4 (0.8 to 2.4)</td>
</tr>
<tr>
<td>Kendrick et al</td>
<td>Public clinics + WIC sites (US)</td>
<td>6 minute counselling in prenatal visits; 1–2 minute counselling at WIC sites</td>
<td>348</td>
<td>347</td>
<td>0.9 (0.4 to 1.8)</td>
</tr>
<tr>
<td>Hartmann et al</td>
<td>University clinic (US)</td>
<td>Brief counselling by resident trained to set goals + material + CO testing; goal setters contacted by volunteer</td>
<td>107</td>
<td>100</td>
<td>2.0 (1.0 to 4.0)</td>
</tr>
<tr>
<td>Walsh et al</td>
<td>Public clinic (Australia)</td>
<td>Brief advice by doctor + 14 minute videotape + 10 minute counselling by midwife + manual</td>
<td>127</td>
<td>125</td>
<td>2.4 (1.0 to 5.6)</td>
</tr>
<tr>
<td>Gielen et al</td>
<td>University clinic (US)</td>
<td>Guide + 15 minute counselling by trained layperson + materials for support person + clinic staff reinforcement and support</td>
<td>193</td>
<td>198</td>
<td>5.6 (1.5 to 2.5)</td>
</tr>
</tbody>
</table>

Summary risk ratio (random effects model) = 1.7 (1.3 to 2.2)

The AHRQ smoking cessation guideline panel update used studies of general populations to assess the impact of total contact time for this type of cessation intervention, using six time categories, ranging from zero to > 300 minutes. The guideline panel concluded that there was a dose response effect up through the category 31–90 minutes, but that lengthier contact time did not improve rates of cessation. Yet, because of the relatively brief total contact time evaluated in the trials with pregnant women assessed by the guideline panel and the participants in the consensus conference, we recommend total contact time of 5–15 minutes plus self help materials. A similar idea is expressed in the updated AHRQ guideline recommendation as “interventions that exceed minimal advice” — defined as <3 minutes.15

Many pregnant women are reluctant to disclose their smoking status at their first prenatal visit. Deception rates as high as 23% among Medicaid insured29 and 14% among privately insured pregnant women30 have been biochemically confirmed. Non-disclosure can be reduced using the multiple choice question shown above in either written or oral formats. Tests of similar questions in both written and oral formats have improved disclosure as compared with the yes/no question typically used, “Do you smoke?”.31

While biochemical methods to validate smoking status are becoming more widely available and affordable—for example, cotinine dipsticks for urine—the acceptability of such testing is not known. Therefore, at present, we do not recommend biochemical testing as part of routine screening of all pregnant women for smoking. Anonymous testing for a period of

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Step 1: ASK
• Ask the patient about her smoking status
  A. I have NEVER smoked, or I have smoked less than 100 cigarettes in my lifetime.
  B. I stopped smoking BEFORE I found out I was pregnant, and I am not smoking now.
  C. I stopped smoking AFTER I found out I was pregnant, and I am not smoking now.
  D. I smoke some now, but I cut down on the number of cigarettes I smoke SINCE I found out I was pregnant.
  E. I smoke regularly now, about the same as BEFORE I found out I was pregnant.

If patient responds to B or C, reinforce her decision to quit, congratulate her on success in quitting, and encourage her to stay quit.
If patient responds D or E, she should be classified as a smoker. Document smoking status on her clinic chart, and proceed to ADVISE, ASSESS, ASSIST and ARRANGE.

The guideline recommends that clinicians urge every smoker to quit in “a clear, strong and personalised manner.”

Step 2: ADVISE—1 minute
• Provide clear, strong advice to quit with personalised messages about the impact of smoking and quitting on mother and fetus.

The revised AHRQ guideline recommends that clinicians assess a patient’s willingness to make a quit attempt before proceeding to the “assist” and “arrange” steps. Specifically, each pregnant smoker should be asked if she is willing to make a quit attempt within the next 30 days. One approach to this assessment is: “Quitting smoking is one of the most important things you can do for your health and your baby’s health. If we can give you some help, are you willing to give it a try?” If she is willing to make a quit attempt at this time, the provider should move to step 4. For patients who are unwilling to attempt cessation, quitting advice, assessment and assistance can be offered in future visits in much the same way they are with smokers who are ready to quit. Most pregnancy tailored self help materials contain special messages to build motivation and confidence in support of a cessation attempt.

The benefits of “cutting down” are difficult to measure or verify, so women who ask if cutting down is helpful should be reinforced for taking this step, but reminded that quitting entirely brings the best results for their own and their baby’s health.

Step 3: ASSESS
• Assess the willingness of the patient to make a quit attempt within the next 30 days.

Step 4: ASSIST—3 minutes +
• Provide pregnancy specific, self help smoking cessation materials.
• Suggest and encourage the use of problem solving methods and skills for cessation.
• Arrange social support in the smoker’s environment.
• Provide social support as part of the treatment.

The guideline recommends that clinicians implement systems to identify and document smoking status of pregnant women, this should include discussions of the multiple risks to mother and fetus and infant from maternal smoking, and the benefits of quitting for both. Advice should stress that quitting smoking is one of the most important actions a woman can take to improve the outcome of her pregnancy, and that specific harms for her and the baby can be reduced by quitting. Women who stop smoking before becoming pregnant or during the first four months of pregnancy have the same risk of having a low birth weight baby as women who never smoked.

It should also be noted that smoking cessation has immediate health benefits for women of all ages, whether or not they suffer from smoking related diseases. Not only does cessation before or during pregnancy reduce the risk of maternal complications and adverse pregnancy outcomes, it can also, if sustained, benefit the woman and her health status long term.
Analysis of the interventions tested with pregnant women (table 1) indicate the effectiveness of providing pregnancy specific patient education materials. Studies with general samples of smokers also suggest that teaching problem solving methods and skills, arranging social support from family, friends and co-workers, and receiving support from the clinician are helpful, whereas contingency contracting, relaxation/breathing, cigarette fading, and exercise/fitness content are not.

The following specific strategies are recommended as part of providing assistance to pregnant women who smoke:

**Provide pregnancy specific, self help smoking cessation materials**—An early study showed that pregnancy related messages significantly increased the likelihood of cessation. The cessation rate of the group receiving the brief counselling with a pregnancy tailored manual was twice that of the group receiving the brief counselling with a general cessation manual. Since then, all of the tested interventions have used pregnancy specific information (table 1). Materials should be relevant to pregnancy and prenatal care as described above. Numerous self help quitting guides tailored for pregnancy have been tested and found effective with pregnant smokers of varied demographic groups (for example, ethnicity, income, education). Information on pregnancy materials may be found in the prenatal smoking cessation combined health information database on the web at http://chid.nih.gov.

**Problem solving**—Problem solving includes recognition of danger situations, relapse prevention, coping and stress management, and basic information about addiction and the time course of withdrawal.

**Social support in the smoker’s environment**—The counsellor should prompt support seeking and help the patient develop support solicitation skills as approaches to gaining outside support (for example, from family, friends, and co-workers) for her decision to make a quit attempt.

**Social support as part of treatment**—Social support from the counsellor means that the counsellor is encouraging, communicates caring and concern, and encourages the patient to talk about the process of quitting.

Addiction in the general population of smokers is addressed in the guideline by strong recommendations for the use of pharmacotherapies (for example, bupropion and nicotine replacement therapy). Nicotine replacement therapy as an adjunct to counselling has been shown to increase cessation rates. More recently, bupropion, in conjunction with nicotine replacement plus counselling, has also shown a strong positive effect in a sample of non-depressed smokers.

To date, no study has evaluated the efficacy and safety of these therapies during pregnancy. Thus, the evidence, at this point, is not conclusive about the ratio of potential harm to benefit for use during pregnancy and supports the need to consider pharmacotherapies only after psychosocial intervention has failed.

More research is needed on this topic before specific recommendations can be made about the use of pharmacotherapies during pregnancy. Optimally, smokers can be treated with these pharmacotherapies before conception.

Research findings indicate that the type of behavioural counselling assistance described above may not be sufficient for pregnant women who are heavy smokers. While the research is not clear on the best intensive behavioural treatment for pregnant, heavy smokers, referral to the types of counselling recommended as more effective in the AHRQ Guideline should be considered.

**Step 5: ARRANGE—1 minute +**

- Periodically assess smoking status and, if she is a continuing smoker, encourage cessation.

While quitting early in pregnancy is best, smoking cessation brings benefits throughout the pregnancy for the mother, fetus, and infant. Smoking status should be monitored throughout pregnancy providing opportunities to congratulate and support success, reinforce steps taken towards quitting, and advise those still considering a cessation attempt.

**Conclusions**

In summary, data from randomised clinical trials and from the meta-analyses used to update the AHCPR clinical practice guideline on smoking cessation show that a 5–15 minute cessation counselling intervention delivered by a trained provider, in conjunction with the provision of pregnancy specific self help materials, can achieve a significant increase in cessation during pregnancy. Thus, we recommend these evidence based procedures be adopted by all prenatal care providers.

We believe that the use of this intervention is feasible in most office or clinic settings without inhibiting other important aspects of prenatal care or disrupting patient flow. If implemented widely, this approach has the potential to achieve an important reduction in a number of adverse maternal, infant, and pregnancy outcomes and to reduce associated, excess health care costs.


Windsor RA. Health care delivery issues and systems. Presentation at consensus workshop on smoking cessation in pregnancy, Health Resources and Services Administration, Rockville, Maryland, 9–10 April 1998.


