



Region of Waterloo
PUBLIC HEALTH

Fourth Annual Hot Topics

TOBACCO USE IN THE PRECONCEPTION AND PRENATAL PERIODS

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Outline

- Introduction to the CAN-ADAPTT guidelines and the Expecting to Quit recommendations
- Effects of tobacco use in the preconception and prenatal periods
- Strategies to support women and their partners
- Relapse prevention
- Community resources

CAN-ADAPTT

- Canadian Action Network for the Advancement, Dissemination and Adoption of Practice-informed Tobacco Treatment (CAN-ADAPTT)
- Guideline specific to "Pregnant and Breastfeeding Women", 2012

<https://www.nicotinedependenceclinic.com/English/CANADAPTT/Pages/Home.aspx>

Best Practices Review – "Expecting to Quit"

- Greaves, L., Poole, N., Okoli, C.T.C., Hemsing, N., Qu, A., Bialystok, L., & O'Leary, R. (2011). *Expecting to Quit: A best practices review of smoking cessation interventions for pregnant and post-partum women* (2nd ed.). Vancouver: British Columbia Centre of Excellence for Women's Health.

<http://www.expectingtoquit.ca/>

Expecting to Quit - Recommendations

1. Ensure public health messages are framed in a sensitive, non-judgemental way that is relevant to the social and economic circumstances of women's daily lives.
2. Encourage harm reduction among pregnant smokers by recommending a decrease in the number of cigarettes they smoke, brief periods of cessation at any point in pregnancy and around delivery, and health-promoting behaviours such as exercising and addressing partner smoking.

Expecting to Quit - Recommendations

3. Recognize that motivation to quit is a dynamic factor that changes throughout any period of cessation and incorporate increased support for women throughout the postpartum period.
4. Integrate tailored treatment of nicotine addiction for pregnant smokers into substance-use-treatment programs in recognition of women's identification of nicotine as a problem drug.

Expecting to Quit - Recommendations

5. Encourage women to use behavioural methods before pharmacotherapy in order to avoid potential teratogenic side effects that can result from the use of drugs such as Bupropion and NRTs.
6. Offer NRT to women who are unable to quit smoking during pregnancy after twelve weeks gestation to reduce damage caused by inhaled smoke to both the woman and the fetus.

Expecting to Quit - Recommendations

7. Encourage women to continue breastfeeding even if they smoke or are using NRTs to aid their cessation.
8. Increase surveillance and tracking of tobacco-use patterns, including spontaneous quitting, in clinical settings.
9. Use individualized information on smoking patterns to construct highly tailored cessation strategies.

Expecting to Quit - Recommendations

10. Assess smokers for concurrent mental health issues/other diagnoses, since many smokers experience multiple forms of substance use and/or other mental health issues.
11. Emphasize cessation and the importance of the woman's own health, rather than primarily the health of her fetus, to foster motivation to remain smoke-free pre and post partum.

Expecting to Quit - Recommendations

12. Create specific interventions for the postpartum period that address motivational and stress-related issues for postpartum women.
13. Create specific interventions for women who quit spontaneously during pregnancy and postpartum.
14. Screen all women and girls of childbearing age for tobacco use.



CAN-ADAPTT Summary Statement

- 1) Smoking cessation should be encouraged for all pregnant, breastfeeding and postpartum women.

(CAN-ADAPTT. (2011). Canadian Smoking Cessation Clinical Practice Guideline. Toronto, Canada: Canadian Action Network for the Advancement, Dissemination and Adoption of Practice-informed Tobacco Treatment, Centre for Addiction and Mental Health).

Smoking and Pregnancy, Woman aged 20-44, Canada 2011

Age group (years)	Pop. est. ('000)	Smoked regularly during most recent pregnancy **%	Spouse smoked regularly at home during most recent pregnancy*** (%)
20-44	1,960	6.9 [4.7-9.0]	2.3* [1.2-3.4]
20-24	195	18.6* [12.2-25.0]	11.5* [5.5-17.4]
25-44	1,766	5.6* [3.3-7.8]	#

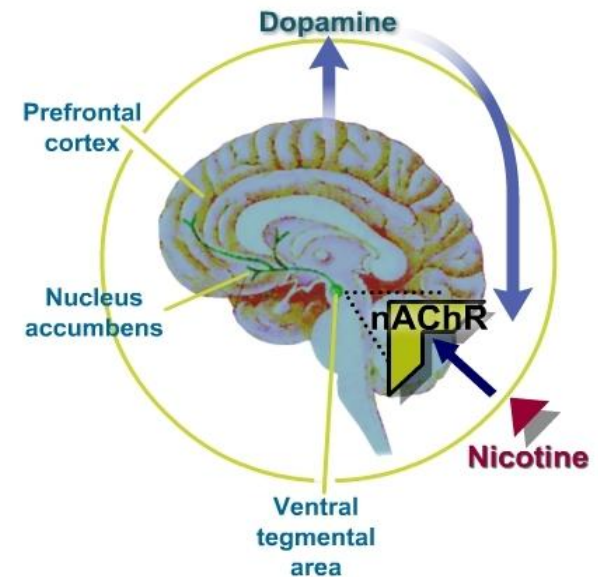


Why Do Women Smoke?

- Social determinants of health
- Controlling weight
- Concurrent mental health problems
- Means of coping with stress
- Social factors
- Trauma
- Fitting in, sense of belonging
- Self-image

Addiction

- Smoking sends nicotine to the brain within a few seconds
- Nicotine increases the levels of dopamine in the reward pathway
- Between cigarettes, the level of dopamine declines, and the smoker can experience withdrawal symptoms such as depression and irritability
- Chronic exposure to nicotine causes desensitization so the smoker needs more nicotine to get the same response
- These symptoms cause the smoker to crave cigarette to boost nicotine levels back to a level where they no longer have withdrawal symptoms



The Pregnant Smoker

- A small proportion of pregnant women may smoke more
 - Increased circulating fluid volume which dilutes nicotine concentrations
 - Increased metabolic clearance of nicotine by a factor of 1.6 (Dempsey & Benowitz, 2001).
- May require a higher dosage of nicotine replacement therapy (Dempsey & Benowitz, 2004).

Effects of Cigarette Smoking on Reproduction

- Exposure to cigarette smoke impairs every stage of reproduction:
 - Folliculogenesis
 - Steroidogenesis
 - Embryonic development and transport
 - Endometrial maturation, implantation and early placentation
 - Uterine vascular velocity and myometrial activity
- Earlier onset of menopause (low estrogen levels)
- Lower IVF success

(Dechanet, C., Anahory, T., Mathieu Daude, J.C., Quantin, X., Reyftmann, L., Hamamah, S., Hedon, B., and Dechaud, H. (2011). Effects of cigarette smoking on reproduction. *Human Reproduction Update*, 17(1); pp. 76-95).

How Smoking Affects Pregnancy

- **Nicotine**
 - Vasoconstriction – decrease in blood flow, oxygen and other nutrients to the fetus (uteroplacental insufficiency)
 - Neuroteratogen/cellular toxin – affects nervous system and cellular development (brain)
 - Promotes platelet activity
- **Carbon Monoxide**
 - Binds to hemoglobin decreasing the blood's oxygen carrying capacity reducing the amount of oxygen delivered to the fetus
 - Increases blood viscosity
- **Oxidizing Agents**
 - Maternal and placental vasoconstriction
 - Placental thrombosis and infarction

Fiore MC, Jaén CR, Baker TB, et al. *Treating Tobacco Use and Dependence: 2008 Update*. Clinical Practice Guideline. Rockville, MD: U.S. Department of Health and Human Services. Public Health Service. May 2008.

Potential Adverse Outcomes

- **Placenta previa** (Chelmow et al., 1996; Faiz & Ananth, 2003; Hung et al., 2007)
- **Placental abruption** (Ananth et al., 1999)
- **Spontaneous abortion** (George et al., 2006)
- **Fetal growth restriction** (Hammoud et al., 2005; Nordentoft et al., 1996), **low birth weight** (Bernstein et al., 2005; Jaddoe et al., 2008)
- **Preterm birth** (Fantuzzi et al., 2007; Kolas et al., 2000)
- **Stillbirth** (Hogberg & Cnattingius, 2007'; Wisborg et al., 2001)
- **Sudden Infant Death Syndrome** (Mitchell & Milerad, 2006).

(Bruin, J.E., Gerstein, H. C., Holloway, A.C. (2010). Long-term consequences of fetal and neonatal nicotine exposure: a critical review. *Toxicological Sciences* 116(2); 364-374).

Maternal Smoking - Risk Factor for Negative Health Outcomes in Offspring

- Nausea, vomiting, abdominal cramps, and diarrhea
- SIDS
- Respiratory illnesses – asthma, pneumonia, bronchitis
- Obesity
- Hypertension
- Type 2 diabetes
- Childhood cancers
- Attention-Deficit Hyperactivity Disorder, learning disabilities, behavioural problems
- Reduced fertility (females)
- Child more likely to be a smoker in the future
- Other childhood medical problems (ear infections)

(Bruin, J.E., Gerstein, H. C., Holloway, A.C. (2010). Long-term consequences of fetal and neonatal nicotine exposure: a critical review. *Toxicological Sciences* 116(2); 364-374); Schatz, B.S., (1998). Nicotine replacement products: Implications for the breastfeeding mother. *Journal of Human Lactation*, 14(2); 161).

Breastfeeding

- Breastfeeding is the best option!
- Minimal amounts found in breast milk - peaks 30-60 minutes after smoking (half-life 60-90 min.), can change the taste
- Encourage mom to avoid smoking 2-3 hours before or during breastfeeding
- Heavy smoking can contribute to:
 - Early weaning
 - Lower prolactin levels result in decreased milk production
 - Inhibited let down reflex
 - Less motivation to breastfeed

(Julie A. Menella, Lauren M. Yourshaw and Lindsay K. Morgan. Breastfeeding and Smoking : Short-term Effects on Infant Feeding and Sleep. *Pediatrics* 2007; 120; 497-502; Schatz, B.S., (1998). Nicotine replacement products: Implications for the breastfeeding mother. *Journal of Human Lactation*, 14(2); 161).

Cessation

- Majority of people who quit report doing it on their own without formal intervention
- Quit rates vary – about 25-50%
- Significant reduction in smoking in late pregnancy, post-intervention (RR 0.94%, 95% CI)
- Interventions were effective in helping women quit smoking (overall by 6%)

(Anderka et al., 2010; Crawford, et al., 2008; DiFrnaza et al., 2004; Salmasi et al., 2010); Lumley, J., Chamberlain, C., Dowswell, T., Oliver, S., Oakley, L., Watson, L. (2009). Interventions for promoting smoking cessation during pregnancy (Review). *The Cochrane Collaboration*. John Wiley & Sons, Ltd.).

Cessation

- Smoking cessation interventions reduced :
 - Low birth weight (RR 0.83, 95% CI 0.73 to 0.95)
 - Preterm birth (RR 0.86, 95% CI 0.74 to 0.98)
- Quitting smoking contributed to a 53.91 g increase in mean birth weight (95% CI 10.44 g to 95.39 g)

(Lumley, J., Chamberlain, C., Dowswell, T., Oliver, S., Oakley, L., Watson, L. (2009). Interventions for promoting smoking cessation during pregnancy (Review). *The Cochrane Collaboration*. John Wiley & Sons, Ltd.)

Relapse is High

- Cessation interventions - eight trials (over 1000 women) showed no statistically significant reduction in relapse

(Lumley, J., Chamberlain, C., Dowswell, T., Oliver, S., Oakley, L., Watson, L. (2009). Interventions for promoting smoking cessation during pregnancy (Review). *The Cochrane Collaboration*. John Wiley & Sons, Ltd.) .

- 25% relapse prior to delivery
- 50% within four months postpartum
- 70-90% within one year post delivery

(Klesges, Johnson, Ward & Barnard, 2001).



CAN-ADAPTT Summary Statement

2) During pregnancy and breastfeeding, counselling is recommended as first line treatment for smoking cessation.

(CAN-ADAPTT. (2011). Canadian Smoking Cessation Clinical Practice Guideline. Toronto, Canada: Canadian Action Network for the Advancement, Dissemination and Adoption of Practice-informed Tobacco Treatment, Centre for Addiction and Mental Health).

Evidence-based Cessation Interventions for Pregnant Women

1. Self-help quit guides
2. Counselling (brief and intensive)
3. Peer support
4. Partner Counselling/Social Context
5. Information
6. Nicotine replacement therapy
7. Personal follow-up
8. Non-human follow-up
9. Incentives*
10. Biofeedback
11. Support groups

(Greaves, L., Poole, N., Okoli, C.T.C., Hemsing, N., Qu, A., Bialystok, L., & O'Leary, R. (2011). *Expecting to British Columbia Centre of Excellence for Women's Health*).



Tips for Helping Women Quit

- Women-centered care - embed in regular health care processes
- Tailor to the individual
- Positive approach
- Stigma reduction
- Integration of demographics, social and physiological issues
- Partner and family support
- Relapse prevention
- Harm reduction

The 5 A's - ASK

- Always ask about tobacco use at every point of contact
- Get more accurate information with a multiple choice question. Women are more likely to underestimate their smoking with a yes or no question
 - e.g. Would you say you...
 - Smoke regularly
 - Smoke once in a while
 - Recently cut down
 - Used to smoke but quit
 - Never smoked more than 100 cigarettes

The 5 A's - ADVISE

- The simple message: not smoking is one of the best things you can do – for yourself, as well as for those around you.
- Keep it brief and make it positive
- Relate message to her current smoking status
- Watch for misinformation about quitting and pregnancy

The 5 A's - ASSESS

- Assess amount smoked/day
- Ask every tobacco user if they are ready to make a quit attempt at this point in time
- Stages of change
- Assess how important it is for them, and how confident and ready they are to make a change



The 5 A's - ASSIST

- Assist all tobacco users who are interested in quitting
- Help them make a quit plan:
 - Set a quit date
 - Discuss stop smoking options, medications
 - Review past quit experiences
 - Identify triggers and brainstorm strategies
 - Identify support systems
 - Discuss other issues: stress, substance abuse, mental health

The 5 A's - ARRANGE

- Arrange for follow-up supports
- Smokers' Helpline – specific protocols to support pregnant and postpartum women
- Provide 3rd party translation services
 1. Fax referral form
 2. 1-877-513-5333
 3. www.smokershelpline.ca
 4. Pamphlet – "If you want to help a smoker quit"
 5. Pregnancy specific fact sheets



Resources for Pregnant Women and Health Care Professionals

- Pregnets www.pregnets.org
- Motherisk www.motherisk.org
- STARSS www.aware.on.ca/starss
- Expecting to Quit www.expectingtoquit.ca
- Smoke free Women www.women.smokefree.gov

Post-Partum Relapse

- Viewed as temporary abstinence
- No actual shift in identity
- Relapse viewed as a reward
- Prevention:
 - Discuss early in quitting process
 - Plan before the baby arrives
 - Distinguish between slips and relapse
 - Expect temptations
 - Identify and plan for high risk situations



CAN-ADAPTT

Summary Statement

- 3) If counselling is found ineffective, intermittent dosing nicotine replacement therapies (such as lozenges, gum) are preferred over continuous dosing of the patch after a risk-benefit analysis.

(CAN-ADAPTT. (2011). Canadian Smoking Cessation Clinical Practice Guideline. Toronto, Canada: Canadian Action Network for the Advancement, Dissemination and Adoption of Practice-informed Tobacco Treatment, Centre for Addiction and Mental Health).



Nicotine Replacement Therapies

- Always try behavioural interventions first
- Available over-the-counter
- Use lowest effective dose
- Gum, lozenge, inhaler or mouth spray recommended first because of intermittent doses
- Delivers lower levels of nicotine at slower rates than smoking
- Protects fetus from 3,999 chemicals including CO – minimizes prevent hypoxic effects
- Efficacy in pregnancy - has not been shown to increase quit rates (limited data) (Lumley et al., 2004).

(Bruin, J.E., Gerstein, H. C., Holloway, A.C. (2010). Long-term consequences of fetal and neonatal nicotine exposure: a critical review. *Toxicological Sciences* 116(2); 364-374).

Nicotine Replacement Therapy

Medication	Dose(s)	Instructions	Cost	Advantages
NRT Gum	-2 mg < 24 cig/day -4 mg > 25 cig/day	-1 piece per 1-2 hours -Max. 24/day -Chew, chew, park	105 pieces - \$30-\$40	-Cheaper ↓Weight gain -Oral stimulus -Intermittent dosing
NRT Lozenge	-1mg & 2 mg > 30 min after waking - 4 mg < 30 min after waking	-1 piece every 1-2 hours -Max. 24 day	Package of 24 = \$15-\$25 Package of 96 =\$40	-Oral stimulus -Intermittent dosing
NRT Inhaler	-6-16 cartridges/day -80 puffs/cartridge	-Puff, don't inhale	Starter kit = \$40-\$45 Replacement cartridges = \$30	-Oral stimulus -Intermittent dosing
NRT Patch	- > 10 cig/day: 21 mg (4 weeks) 14 mg (2 weeks) 7 mg (2 weeks)	-Use new patch every day - Apply above the waist	One week supply (7 patches)= \$18-\$30	-One time application -24 hour dosing -Can be hidden

Encourage to Discuss...

- The benefits and risks
 - Nicotine exposure is not "no risk" for mom, fetus and offspring
- Best time to introduce NRT
 - After first trimester
 - 25% of all pregnancies will end in miscarriage during first trimester
 - 2-3% of all pregnancies have a birth defect

Nicotine Replacement Therapies – Breastfeeding

- Amount of nicotine found in breast milk is lower than levels when smoking
- Slower method of delivery vs. smoking (less harmful)
- Only one chemical vs. other 3,999 chemicals found in tobacco smoke
- Benefits of using NRT greater than continuing to smoke while breastfeeding
- NRT poses no additional problems for the breastfeeding infant – milk intake is not affected
- Breastfeed before using NRT

Zyban/Bupropion SR

- Safe to use in pregnancy, but efficacy still needs to be established
- Requires risk/benefit analysis by a physician or nurse practitioner
- May have good effect if woman suffers from depression
- Not associated with increased risk of major congenital malformations (Motherisk Update, 2012)
- No evidence of a higher risk of spontaneous abortion compared to other antidepressants (Motherisk Update, 2012)
- Some contraindications: seizures, eating disorders, MAOI inhibitors, and alcohol dependency
- One 12 week prescription available for free for Ontario Drug Benefit recipients

(Cressman, A.M., Pupco, A., Kim, E., Koren, G., Bozzo, P. (2012). Smoking cessation therapy during pregnancy. Motherisk Update. *Canadian Family Physician*, 58; 525-527; Chun-Fai-Chan B, Koren G, Fayed I, Kalra S, Voyer-Lavigne S, Boshier A, Shakir S, Einarsen A. (2005). Pregnancy outcomes of women exposed to bupropion during pregnancy: A prospective comparative study. *Am J Obstet Gynecol*. Mar;192(3):932-6).

Champix/Varenicline

- Not recommended in pregnancy - limited human data available
- Non-pregnant - increased abstinence rates at 6 months compared to:
 - Bupropion (RR - 1.52; 95% CI 1.22 to 1.88)
 - NRT (RR – 1.13; 95% CI 0.94 to 1.35)
 - Placebo (RR – 2.31; 95% CI 2.01to 2.66)
- Preclinical animal studies have reported no increased risk of congenital anomalies at greater than 36 times the human dose
- One 12 week prescription available for free for Ontario Drug Benefit recipients. If not covered, 12 weeks of treatment = \$300+



CAN-ADAPTT Summary Statement

4) Partners, friends and family members should also be offered smoking cessation interventions.

(CAN-ADAPTT. (2011). Canadian Smoking Cessation Clinical Practice Guideline. Toronto, Canada: Canadian Action Network for the Advancement, Dissemination and Adoption of Practice-informed Tobacco Treatment, Centre for Addiction and Mental Health).

Partner Support

- Explore her relationship with her partner
- Explore how their relationship will change as a result of her quitting smoking
- Tobacco Related Interaction Patterns (TRIPS)
 - The way you talk about smoking with your partner
 - Where you do/do not smoke
 - When you smoke/don't smoke
 - Situations that are O.K/not O.K
 - Rituals you and your partner have



Resources for Support People

1. "Couples and Smoking"
<http://www.hcip-bc.org/resources-for-practice/documents/CouplesandSmoking.pdf>
2. "The Right Time...The Right Reasons – Dads Talk about Reducing and Quitting Smoking"
<http://www.facet.ubc.ca/Downloads/DadsQuitSmoking.pdf>



CAN-ADAPTT

Summary Statement

5) A smoke-free home environment should be encouraged for pregnant and breastfeeding women to avoid exposure to second-hand smoke.

(CAN-ADAPTT. (2011). Canadian Smoking Cessation Clinical Practice Guideline. Toronto, Canada: Canadian Action Network for the Advancement, Dissemination and Adoption of Practice-informed Tobacco Treatment, Centre for Addiction and Mental Health).

Second-hand Smoke

In Children (causal):

- Sudden infant death syndrome (SIDS)
- Asthma and allergies
- Respiratory problems – bronchitis, pneumonia, chronic cough, phlegm, wheezing and breathlessness
- Middle ear infections
- Negative effects on the development of cognition and behaviour
- Cranky/colicky babies

In children (associated with):

- Negative impact on learning and development
- Decreased lung function
- Exacerbation of cystic fibrosis
- Childhood cancers – leukemia's, lymphoma's and brain tumours

Pregnant Women (causal) –
low birth weight babies

Third Hand Smoke

- Residual tobacco smoke contamination that remains after the lit tobacco has been put out
- Smoking tobacco in the home can be associated with high levels of tobacco toxins long after active smoking
- Toxins blanket all surfaces and begin to "off-gas" over days, weeks, months
- Contains carcinogens – Carbon monoxide, butane, ammonia, arsenic, etc.
- Best Start resource – "A Smoke-free Environment for Your Children"

(Tob Control. 2004 Mar;13(1):29-37. See also Winickoff JP et al. ([Beliefs about the health effects of "third hand" smoke and home smoking bans](#). Pediatrics, 2009: 123(1):e74 -9).



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