Current and Emerging Issues in Tobacco Cessation During Pregnancy

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American College of Nurse-Midwives
National Harbor, MD

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CDC Tobacco and Pregnancy Activities

- Monitor trends of tobacco use before, during, and after pregnancy
- Conduct and review research on health outcomes
- Evaluate interventions and promote effective interventions and policies
- Provide technical assistance to organizations
- Collaboration with partners

http://www.cdc.gov/reproductivehealth/TobaccoUsePregnancy/
Presentation outline

- Epidemiology of tobacco use and pregnancy
- Effective clinical interventions for smoking cessation
- Highlight tobacco cessation resources
- Discuss emerging tobacco products
- Describe CDC’s national media campaign *Tips from Former Smokers*
Maternal Smoking: Health Effects

- Reduced fertility
- Preterm delivery
- Restricted fetal growth
- Sudden Infant Deaths (SIDS)
- Ectopic pregnancy
- Cleft lip/palate

Public Health Impact

- Adverse infant outcomes attributable to prenatal smoking (based on 2002 data)¹:
  - 5%–8% of preterm deliveries
  - 13%–19% of term low birth weight deliveries
  - 5%–7% of preterm-related deaths
  - 23%–34% of SIDS cases

- In the US, about 1000 infant deaths a year were attributable to prenatal smoking (2005-2009)²

- Hospitalization costs in the first year of life for all preterm low birth weight infant admissions total $5.8 billion in 2001³

2) 2014 SGR
Trends in smoking before, during, and after pregnancy, PRAMS 2000-2010

http://www.cdc.gov/mmwr/preview/mmwrhtml/ss6206a1.htm

+ Significant linear trend over time (p<0.05)
Trends of smoking during pregnancy by state, 2000-2010

*States with at least 3 years of data during 2000-2010.
SOURCE: http://www.cdc.gov/mmwr/preview/mmwrhtml/ss6206a1.htm.

- **Increased**
- **Decreased**
- **No change**
- **Insufficient data**
- **No PRAMS**
Prevalence of smoking during pregnancy in 27 sites, PRAMS 2010

Mean prevalence of smoking during pregnancy (10.7%)

HP 2020 goal (1.4%)
Prevalence of smoking during the last 3 months of pregnancy - 24 PRAMS states, 2011

![Bar graph showing prevalence of smoking by maternal race/ethnicity and maternal age.]
Prevalence of smoking during the last 3 months of pregnancy - 24 PRAMS states, 2011

<table>
<thead>
<tr>
<th>Health insurance coverage</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Private</td>
<td>5%</td>
</tr>
<tr>
<td>Medicaid</td>
<td>18%</td>
</tr>
<tr>
<td>Other insurance</td>
<td>5%</td>
</tr>
<tr>
<td>Uninsured</td>
<td>6%</td>
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<table>
<thead>
<tr>
<th>Education</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>&lt;12 years</td>
<td>17%</td>
</tr>
<tr>
<td>12 years</td>
<td>16%</td>
</tr>
<tr>
<td>&gt;12 years</td>
<td>6%</td>
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Smoking patterns among women who smoked 3 months before pregnancy

Cessation Interventions used among Smokers in Last 3 Months of Pregnancy (n=848)

- Self-help: 6.3%
- Medications: 3.9%
- Face-to-face Counseling: 1.7%
- Quitline: 1.5%

EFFECTIVE CLINICAL INTERVENTIONS
2008 USPHS Recommendations for Pregnant Smokers

- “…Pregnant smokers should be offered person-to-person psychosocial interventions that exceed minimal advice to quit”

- Although abstinence early in pregnancy will produce the greatest benefits to the fetus and expectant mother, quitting at any point in pregnancy can yield benefits. Therefore, clinicians should offer effective tobacco dependence interventions to pregnant smokers at the first prenatal visit as well as throughout the course of pregnancy.

Clinical Recommendations

- Prenatal care providers deliver a brief counseling session for patients who are willing to try to quit smoking.

- Counseling approaches, such as the 5A’s intervention (ask, advise, assess, assist, and arrange), have been shown to be effective when initiated by health care providers.
  - Quitlines can be used as adjunct to counseling.

- Nicotine Replacement Therapy (NRT) could be considered if behavioral therapy failed; however, providers are cautioned to provide “close supervision” and weigh the risks of smoking vs. the risks of NRT.

Behavioral Interventions

Cochrane Review: Chamberlain 2013

- 86 randomized controlled trials of interventions for smoking cessation during pregnancy
- Overall, psychosocial interventions increase the proportion of women who stop smoking in late pregnancy
- In a subset of trials (n=14), women who received psychosocial interventions had an 18% reduction in both low birthweight infants and preterm births
  - Number needed to treat (71 for preterm birth; 61 for low birth weight)

## Cochrane review: Chamberlain, 2013

<table>
<thead>
<tr>
<th>Behavioral Intervention</th>
<th># of studies</th>
<th>Risk Ratio/Effect size (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counseling</td>
<td>45</td>
<td>1.37 (1.17, 1.59)</td>
</tr>
<tr>
<td>Health Education</td>
<td>5</td>
<td>1.47 (1.02, 2.13)</td>
</tr>
<tr>
<td>Social Support</td>
<td>10</td>
<td>1.29 (0.97, 1.73)</td>
</tr>
<tr>
<td>Feedback</td>
<td>5</td>
<td>2.09 (1.17, 3.72)</td>
</tr>
<tr>
<td>Incentives</td>
<td>2</td>
<td>3.09 (1.34, 7.15)</td>
</tr>
</tbody>
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Contingency Management

- Biochemically verified quitting reinforced with financial incentives
  - Quit rate of up to 34% of women who received the intervention (compared to 7.1% in the group who received standard of care)
  - Improvements in infant birth weight (202 g difference) and breastfeeding duration
  - Promising effects on preventing early postpartum relapse

- Cost-effectiveness of these interventions unknown
Telephone Quitlines

- Telephone quitlines (QL) offer effective, free smoking cessation services
  - Pregnant women may be aware of the QLs but many prefer to try to quit on their own
  - Among those who are referred to QLs, adherence to call schedule and reaching pregnant smokers are major challenges
  - High satisfaction among women who participated in counseling

- It is important to educate patients about what quitlines are and what they should expect during the calls

http://www.naquitline.org/?page=qiiissuepapers
Provider Experience Referring to Quitlines

“I had a client, she was pregnant...because it was like her third baby. And she really, really wanted to quit...if she was having a really hard time not wanting to light up, she would call and they’d talk her down. Talk her out of it and talk her through that initial craving. And so she said they’re my best friends ever.”

“I use the cards and just ask them. Say do you know about the Quit Line? And then I say it’s a wonderful, free resource for you. Emphasize the free, emphasize the wonderful and that it’s person-to-person contact with them when they call.”
Pharmacotherapy

Systematic Review: Colman et al. 2012

- Six trials of nicotine replacement therapy (NRT)
  - *No trials of bupropion or varenicline*
- No difference in cessation after using NRT as compared to control, RR=1.33 [0.93 to 1.91].
- No difference in rates of poor birth outcomes (i.e. low birth weight, preterm) between NRT and control
- In one trial, adherence in NRT low (e.g., 7% on therapy at 4 weeks)

*Coleman. Pharmacological interventions for promoting smoking cessation during pregnancy. Cochrane Database Syst Rev. 2012 Sep 12;9:CD010078*
Pharmacotherapy

- Insufficient evidence on efficacy and safety of NRT
- More research is needed to better define the benefit/risk ratio
  - Nicotine is a known teratogen
  - Smoking includes nicotine plus numerous other chemicals that are injurious to the woman and fetus
- It is unclear whether providers are recommending NRT for use during pregnancy, nor how many women are willing to use it
  - 30% of women reported discussing a cessation medication with their obstetric providers
  - 3% of NJ pregnant smokers reported using NRT

1. Rigotti et al. Smoking cessation medication use among pregnant and postpartum smokers. Obst Gynec 2008
2. Tong et al. Smoking Patterns and Use of Cessation Interventions. AJPM 2008
Community Guide Recommendations:

Increasing Cessation

- Increase price of tobacco products
- Mass media campaigns
- Smoke-free policies
- Telephone cessation quitlines
- Reduce out-of-pocket costs of treatment
- Health care system changes
  - Provider reminders with and without education
Coverage of Cessation Treatment

- As of Oct 2010, the Affordable Care Act (ACA) mandated that state Medicaid programs cover comprehensive tobacco treatment for pregnant women without cost-sharing
- Effective January 2014, the ACA bars state Medicaid programs from excluding FDA-approved cessation medications from coverage
- Promotion of coverage among providers and enrollees are needed
RESOURCES
This free web-based training is designed for health care professionals to effectively assist pregnant women and women in the childbearing years to quit smoking

- Physicians, midwives, nurses, health educators, pharmacists, etc…

The training program teaches a best practice approach for smoking cessation, the 5A’s, and is based on current clinical recommendations from the USPHS and ACOG

Program endorsed by ACOG

www.smokingcessationandpregnancy.org/
The Virtual Clinic Overview

Room A
Examination Room
Interact with 3 simulated patients over the course of 5 visits.

Room B
Smoking Cessation Counseling Demonstrations
Model sessions with simulated patients.

Conference Room
Case Discussions
Experts in smoking cessation discuss the simulated patient visits.

Learning Resources
- Lectures Kiosk
  6 mini-lectures by smoking cessation experts.
- Internet Kiosk
  Links to relevant websites about smoking cessation.
- Interviews Kiosk
  Video interviews with 4 real people affected by smoking during pregnancy.

Credits
Feedback from users

> 1300 users and 850 received CE credits

- “I appreciated the self-study format and being able to do it in different intervals to adjust to my schedule.”
- “Having clients have negative comebacks made me think about what I was saying to them.”
- “I have done a few CE's in tobacco cessation and some of the info here was info I hadn't run across before so it was very helpful.”
Resources

For consumers

- Info on smoking and pregnancy: [http://www.cdc.gov/Features/PregnantDontSmoke/](http://www.cdc.gov/Features/PregnantDontSmoke/)
- Smoke free home pledge: [http://www.epa.gov/smokefree/](http://www.epa.gov/smokefree/)

For clinicians and public health practitioners

- ACOG Clinician guide to helping pregnant women quit smoking: [http://www.acog.org/departments/dept_web.cfm?recno=13](http://www.acog.org/departments/dept_web.cfm?recno=13)
- Clean Air for Healthy Children: [www.cleanairforhealthychildren.org](http://www.cleanairforhealthychildren.org)
- Smoking Cessation for Pregnancy & Beyond: Virtual Practicum [www.smokingcessationandpregnancy.org/](http://www.smokingcessationandpregnancy.org/)

For both:

- CDC TIPS website: [www.cdc.gov/tips](http://www.cdc.gov/tips)
EMERGING TOBACCO PRODUCTS
Diverse Tobacco Products

Photos courtesy of Michele Bloch
Snus, Dissolvables

OLD → NEW
WHAT ARE ENDS?
Electronic Nicotine Delivery Systems

Electronic Cigarettes and Vaping Devices

- Disposable
- Rechargeable
- Tank
- Novelty
ENDS Aerosol is not “Harmless Water Vapor”

- Introduced to US markets in 2007
- Delivers nicotine-containing aerosol by heating a solution (typically propylene glycol, glycerin, nicotine, flavoring agents, and other additives)
- Long-term health effects of inhaled propylene glycol and glycerin are unknown

ENDS Aerosol is not "Harmless Water Vapor"

- Nicotine: 0-36 mg/ml
- Flavorings/additives often not disclosed
- Some analyses show presence of potentially allergenic compounds such as cinnamic aldehyde (also highly toxic to human embryonic stem cells)
- Overheating can lead to production of carcinogens, such as formaldehyde, acetaldehyde, acrolein

ENDS Other Purposes

- Some ENDS can be used to deliver other substances, like marijuana and caffeine
In 8 years companies have not approached FDA for approval.

**Original Article**

**Electronic Cigarette Use Among Patients With Cancer**

*Characteristics of Electronic Cigarette Users and Their Smoking Cessation Outcomes*

Sarah P. Borderud, MPH,1 Yulin Li, PhD,2 Jack E. Burkhalter, PhD,2 Christine E. Sheffer, PhD,2 and Jamie S. Ostroff, PhD2

**BACKGROUND:** Given that continued smoking after a cancer diagnosis increases the risk of adverse health outcomes, patients with cancer are strongly advised to quit. Despite a current lack of evidence regarding their safety and effectiveness as a cessation tool, electronic cigarettes (E-cigarettes) are becoming increasingly popular. To guide oncologists in their communication with their patients about E-cigarette use, this article provides what the authors believe is the first published clinical data regarding E-cigarette use and cessation outcomes among patients with cancer. **METHODS:** A total of 100 participants included smokers (patients with cancer who recently enrolled in a tobacco treatment program at a comprehensive cancer center). Standard demographics, tobacco use history, and follow-up cessation outcomes were assessed. **RESULTS:** A small increase in E-cigarette use was observed from 2012 to 2013 (5.6% vs. 38.5%). E-cigarette users were more nicotine dependent than nonusers, had more prior quit attempts, and were more likely to be diagnosed with chronic and head or neck cancer. Using a complete case analysis, E-cigarette users were as likely to be smoking at the time of follow-up as nonusers (odds ratio, 1.0; 95% confidence interval, 0.65-1.7). Using an intention-to-treat analysis, E-cigarette users were twice as likely to be smoking at the time of follow-up as nonusers (odds ratio, 2.0; 95% confidence interval, 1.3-3.2). **CONCLUSION:** The high rate of E-cigarette use observed is consistent with recent articles highlighting increased E-cigarette use in the general population. The current longitudinal findings raise doubts concerning the value of E-cigarettes for facilitating smoking cessation among patients with cancer. Further research is needed to evaluate the safety and efficacy of E-cigarettes as a cessation treatment for patients with cancer. Cancer. 2014;000:000-000. © 2014 American Cancer Society.

New research on the dangers of smoking to young women and their unborn babies can send chills down any woman’s spine. We now have several more compelling reasons to help women realize how important it is to quit smoking or switch to e-cigarettes - ideally e-cigarettes with no nicotine.

Quit smoking at any point during pregnancy reduces the chance of complications. Of course, the sooner, the better!
ENDS Potential for Harm

- Expose children and adolescents, pregnant women, and non-smokers to 2nd hand aerosol
- Poisonings among users or non-users
- Uncertain health effects of long term exposure
  - Pulmonary delivery of propylene glycol, glycerin, nicotine
  - Lower toxin burden than cigarettes, but not water vapor
Nicotine
2014 Surgeon General’s Report

- At high enough doses, nicotine causes **acute toxicity**
- Nicotine **activates** multiple biological pathways through which smoking increases risk for disease
- Nicotine exposure during fetal development has lasting adverse consequences for **brain development**
- Nicotine adversely affects maternal and fetal health during pregnancy, contributing to multiple adverse outcomes including **preterm delivery and stillbirth**
- The evidence is suggestive that nicotine exposure during **adolescence** may have lasting adverse consequences for brain development
Number of calls to poison centers for cigarette or e-cigarette exposures, by month — United States, September 2010–February 2014

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6313a4.htm
E-cigarettes and Federal Regulation

- April 2014 — FDA issued a proposed rule to deem jurisdiction over all products made or derived from tobacco
- FDA is reviewing public comments on the proposed rule
Recommendations

- Screen pregnant women for use of any type of tobacco product—cigarettes, cigarillos, cigars, snus, dissolvables, and ENDS

- Women who are pregnant can be advised
  - ENDS contain nicotine, which is harmful for their pregnancy and for their baby
  - ENDS have not been shown to be an effective cessation aid
  - Other cessation aids approved by the FDA are available. Women can discuss these options with their health care provider.
TIPS FROM FORMER SMOKERS
Tips From Former Smokers Campaign

Some of the reasons to quit smoking are very small.

Amanda, age 30, Wisconsin

Amanda smoked while she was pregnant. Her baby was born 2 months early and weighed only 3 pounds. She was put in an incubator and led through a tube. Amanda could only hold her twice a day. If you're pregnant or thinking about having a baby and you smoke, please call 1-800-QUIT-NOW.
Amanda’s Story

Some of the reasons to quit smoking are very small.

Amanda, age 30, Wisconsin

Amanda smoked while she was pregnant. Her baby was born 2 months early and weighed only 1 pound. She was put in an incubator and fed through a tube. Amanda could only hold her twice a day. If you’re pregnant or thinking about having a baby and you smoke, please call 1-800-QUIT-NOW.

CDC Tips

www.cdc.gov/tips
2015 Partner Organizations

AMERICAN COLLEGE of NURSE-MIDWIVES

Prevent Blindness®
Our Vision Is Vision®

American Pharmacists Association
Improving medication use. Advancing patient care.

American Academy of Physician Assistants

NATIONAL COMMUNITY PHARMACISTS ASSOCIATION

American Gastroenterological Association
Advancing the Science and Practice of Gastroenterology

the foundation for HEALTH SMART CONSUMERS
Health Care Providers: How You Can Help Patients Quit

In its first year, the Tips From Former Smokers campaign motivated 1.6 million smokers to try to quit. As the campaign continues, many of your patients will hear the messages from former smokers about the toll that smoking-related disease can take. These messages may cause some of your smoking patients to think about quitting. They may seek your professional advice on how to get started. For those patients who are ready to quit, you can be the motivation they need to become former smokers themselves.

DENTAL PROFESSIONALS
For dentists, dental hygienists, and other oral health professionals.

HEALTH CARE PROFESSIONALS
For anyone who works to improve patient health.

PHARMACISTS
For pharmacists and pharmacy professionals.
Tips Resources Available to You!

- Campaign Web Site: [www.cdc.gov/tips](http://www.cdc.gov/tips)
- Campaign Download Center: [www.plowsharegroup.com/cdctips](http://www.plowsharegroup.com/cdctips)
- Media Campaign Resource Center: [www.cdc.gov/tobacco/mcrc](http://www.cdc.gov/tobacco/mcrc)

- Note: Most of our materials are also available in Spanish
Summary

- 1 out of 10 pregnant women continue to smoke during pregnancy
- Screen all women for any tobacco products
- Provide effective interventions to help women quit smoking (e.g., 5As, quitlines)
- Resources are available for both pregnant women and providers
Tobacco Use and Pregnancy Website:
http://www.cdc.gov/reproductivehealth/TobaccoUsePregnancy/index.htm

Booth 423

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333
Telephone, 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
E-mail: cdcinfo@cdc.gov  Web: www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.