

# Current and Emerging Issues in Tobacco Cessation During Pregnancy

*June 29, 2015  
American College of Nurse-Midwives  
National Harbor, MD*

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*National Center for Chronic Disease Prevention and Health Promotion  
Division of Reproductive Health*



## 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

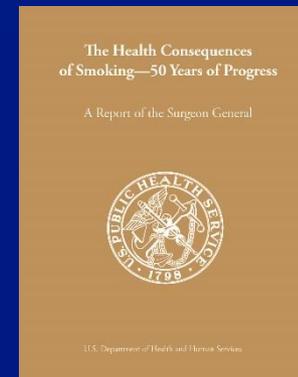
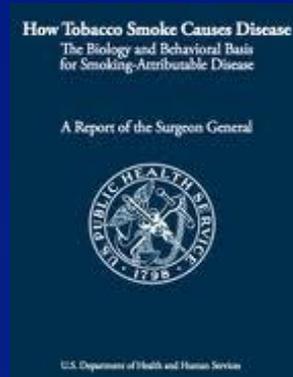
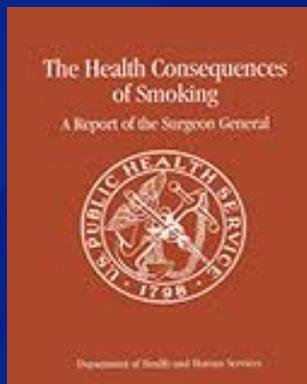


## Presentation outline

- ❑ **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



Source: Surgeon General's Report: *The Health Consequences of Smoking*, 2004 ;*How Tobacco Smoke Causes Disease*, 2010; *The Health Consequences of Smoking – 50 Years of Progress*, 2014

## Public Health Impact

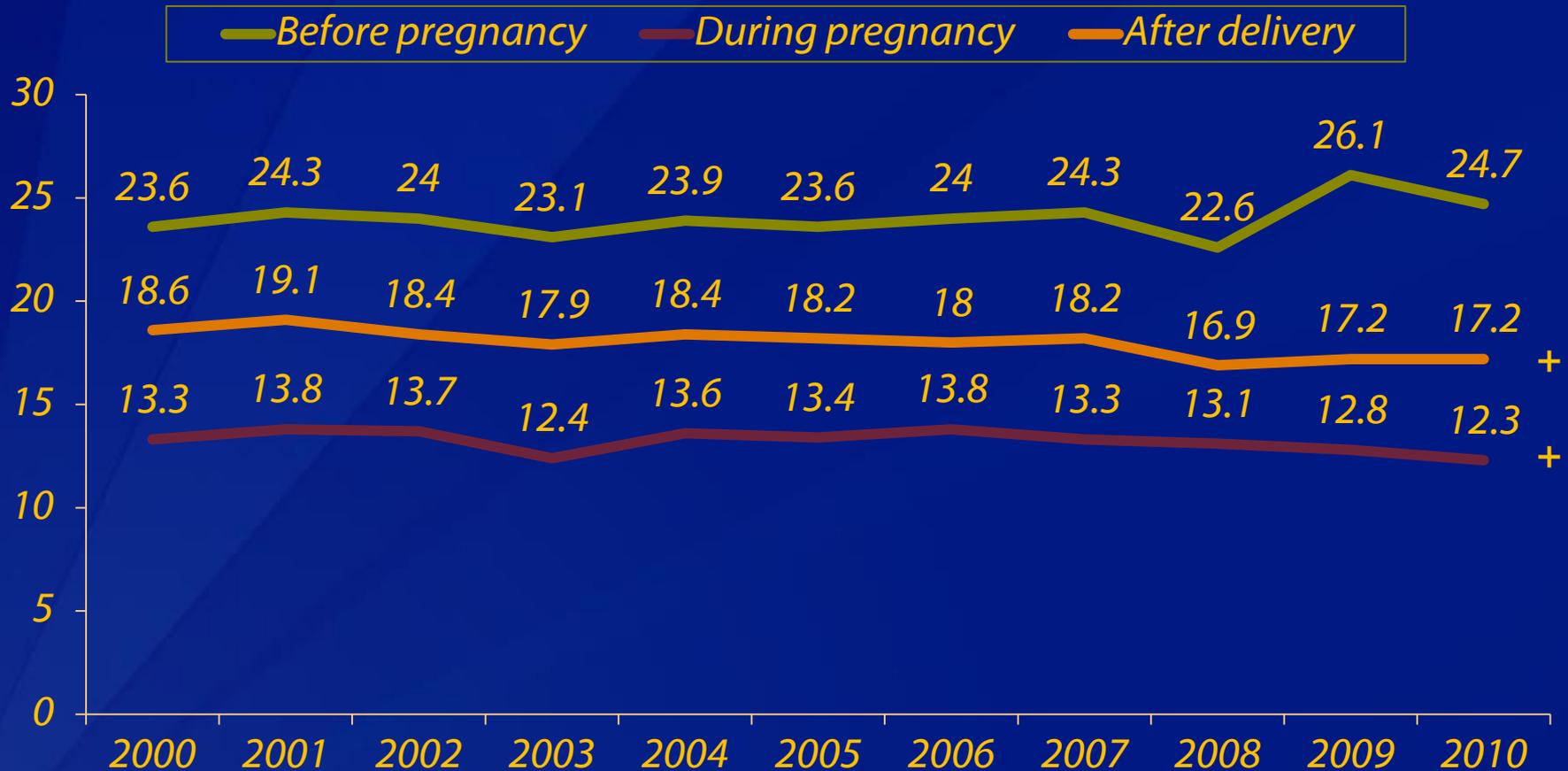
- ❑ **Adverse infant outcomes attributable to prenatal smoking (based on 2002 data)<sup>1</sup>:**
  - *5%–8% of preterm deliveries*
  - *13%–19% of term low birth weight deliveries*
  - *5%–7% of preterm-related deaths*
  - *23%–34% of SIDS cases*
- ❑ **In the US, about 1 000 infant deaths a year were attributable to prenatal smoking (2005-2009)<sup>2</sup>**
- ❑ **Hospitalization costs in the first year of life for all preterm low birth weight infant admissions total \$5.8 billion in 2001<sup>3</sup>**

Source: 1) Dietz PM et al. Infant morbidity and mortality attributable to prenatal smoking in the U.S. *Am J Prev Med.* 2010 Jul;39(1):45-52.

2) 2014 SGR

3) Russell RB, et al. Cost of hospitalization for preterm and low birth weight infants in the U.S. *Pediatrics* 2007; 120(1):e1–9.

# Trends in smoking before, during, and after pregnancy, PRAMS 2000-2010

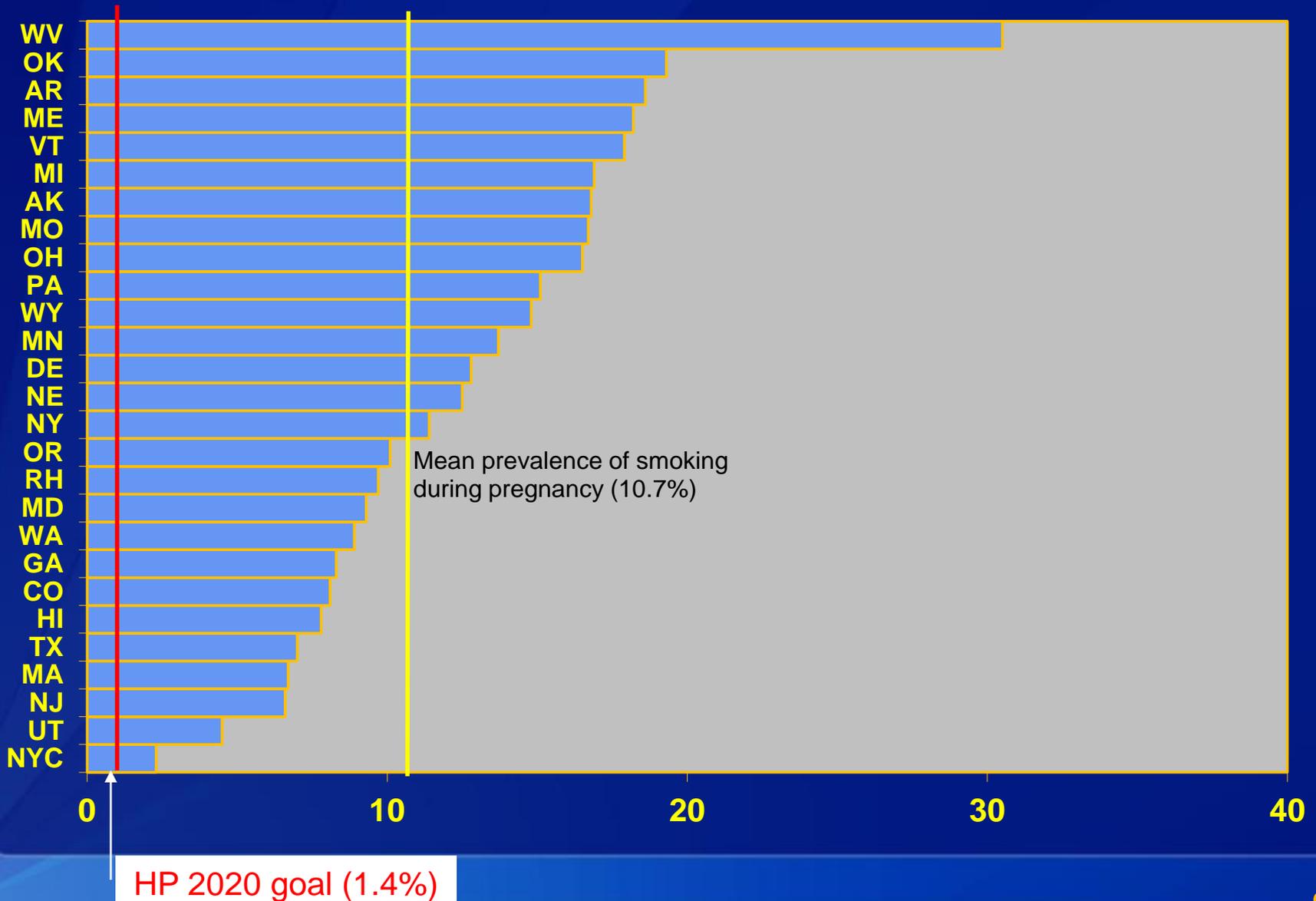


\* <http://www.cdc.gov/mmwr/preview/mmwrhtml/ss6206a1.htm>

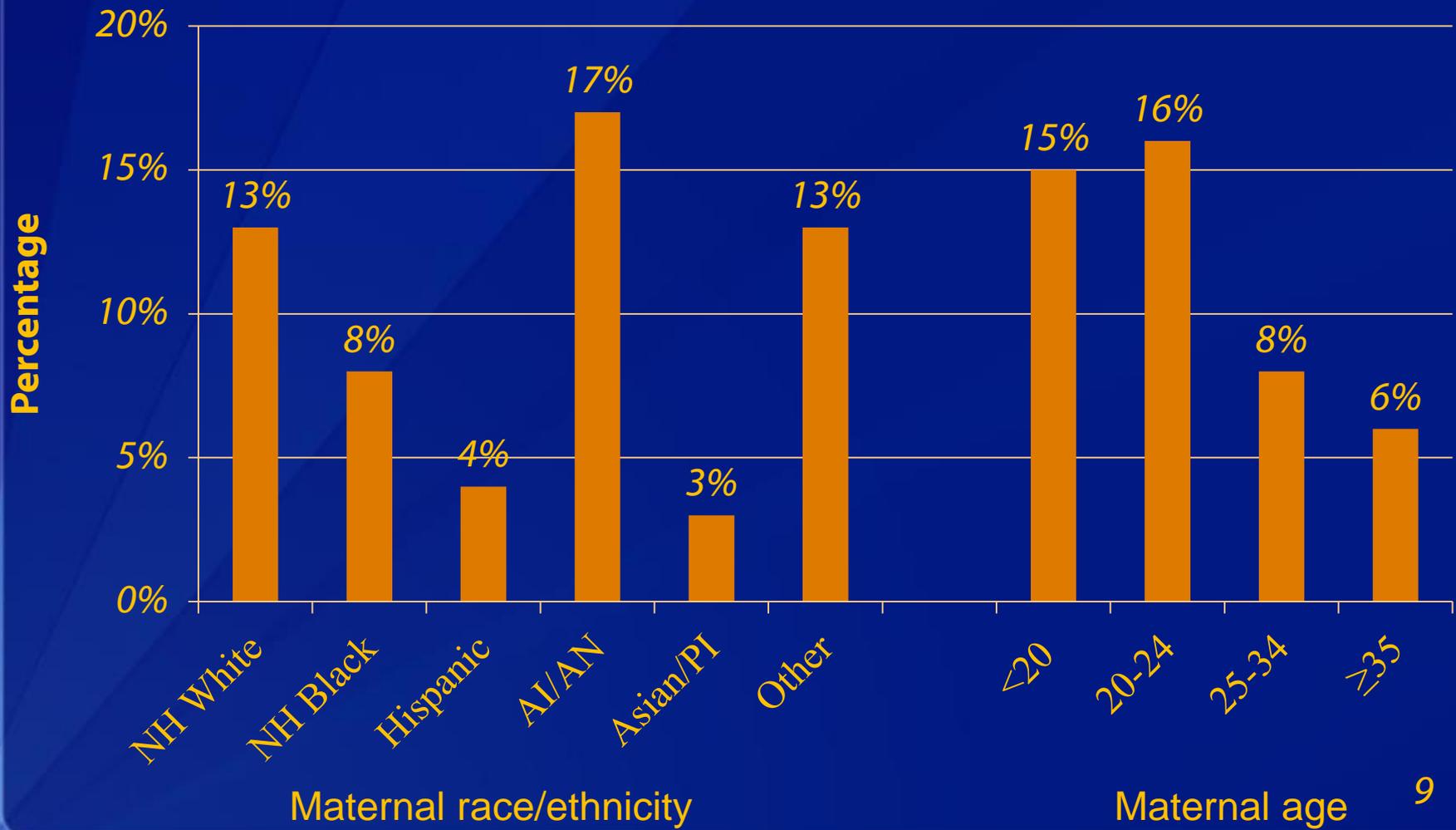
+ Significant linear trend over time ( $p < 0.05$ )



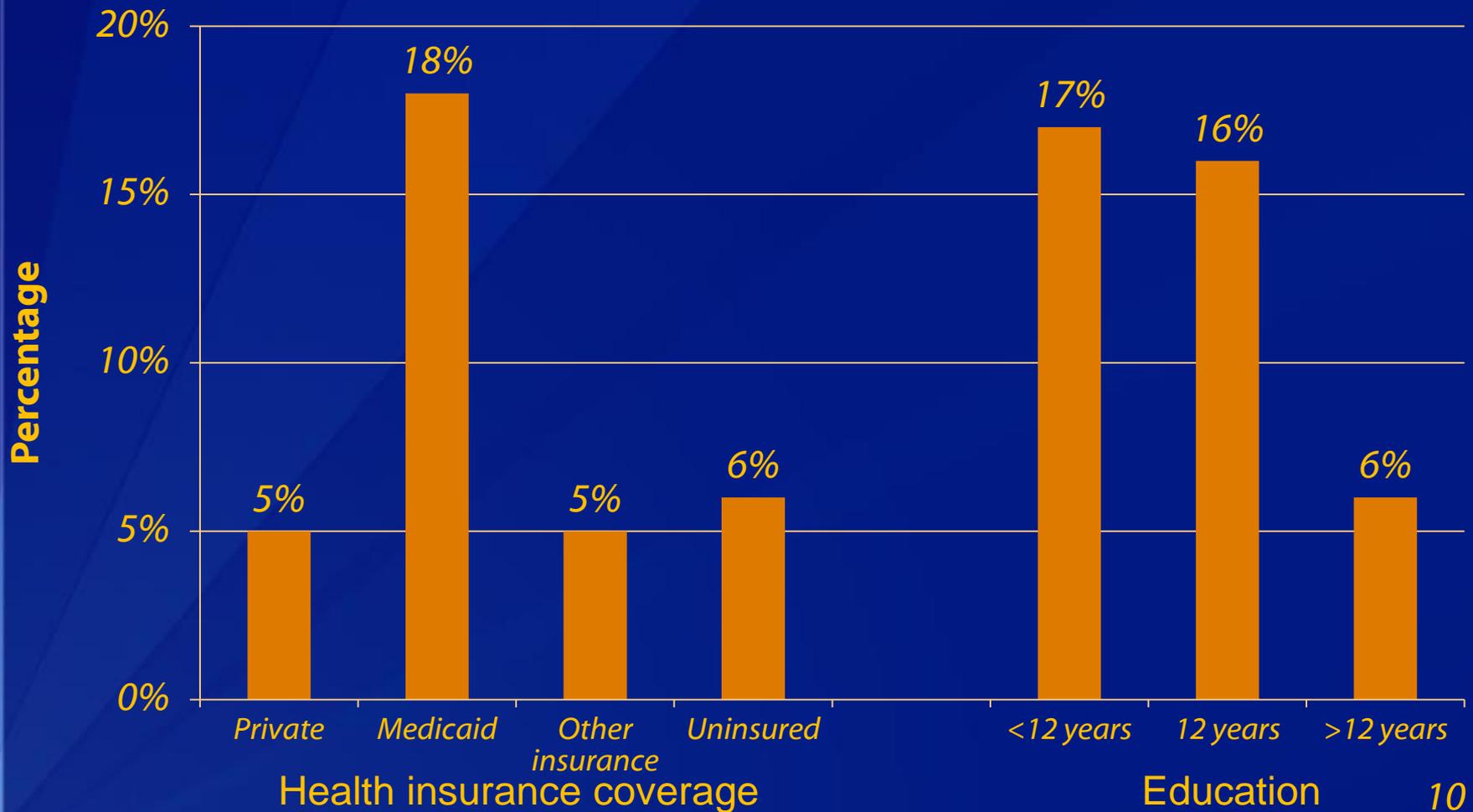
# Prevalence of smoking during pregnancy in 27 sites, PRAMS 2010



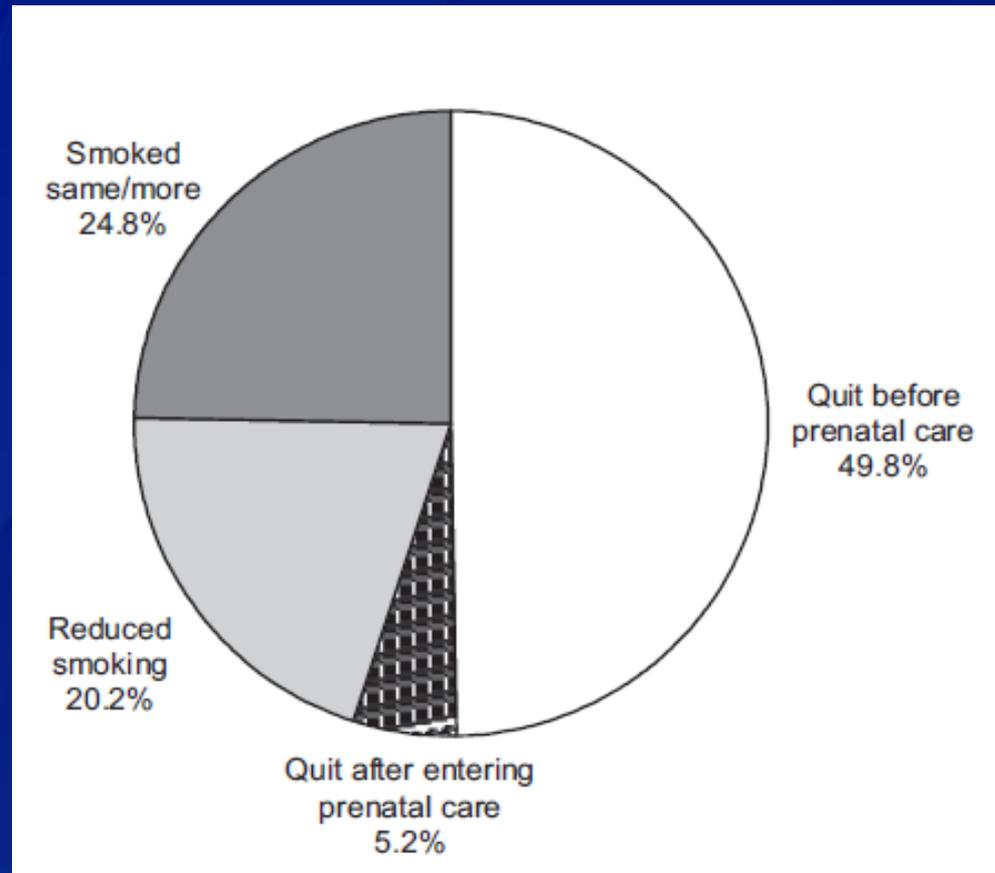
# Prevalence of smoking during the last 3 months of pregnancy - 24 PRAMS states, 2011



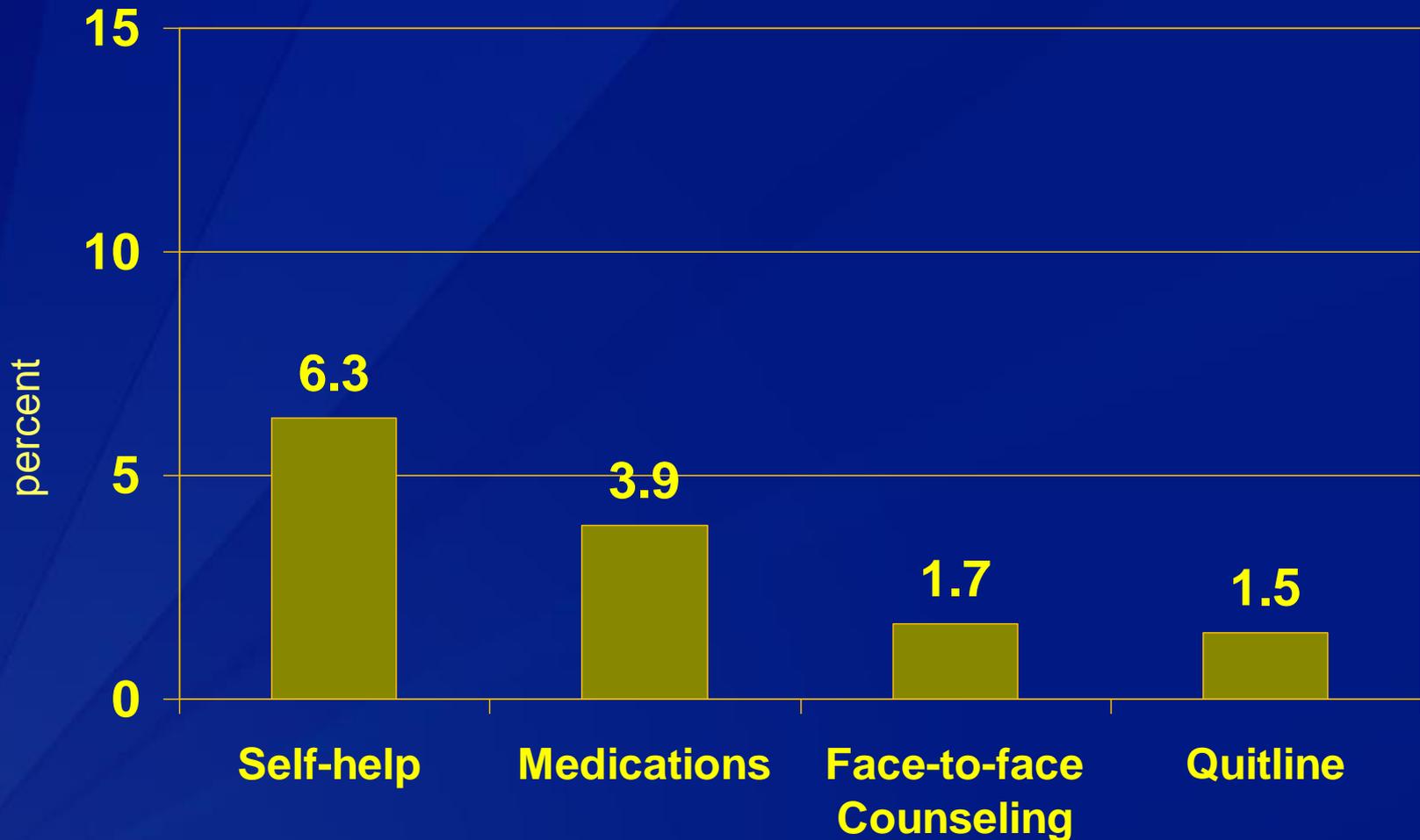
# Prevalence of smoking during the last 3 months of pregnancy - 24 PRAMS states, 2011



# Smoking patterns among women who smoked 3 months before pregnancy



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



# 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

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

## 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**

1-800-QUIT-NOW 

Free Call.

Free Quit Coach.

Free Quit Plan.

## 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**

## **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)**

# 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<sup>1</sup>*
  - *3% of NJ pregnant smokers reported using NRT<sup>2</sup>*

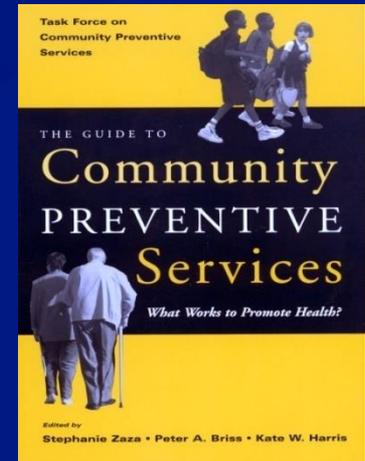
1. Rigotti et al. Smoking cessation medication use among pregnant and postpartum smokers. *Obst Gynec* 2008

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

# Smoking Cessation For Pregnancy And Beyond: A Virtual Clinic



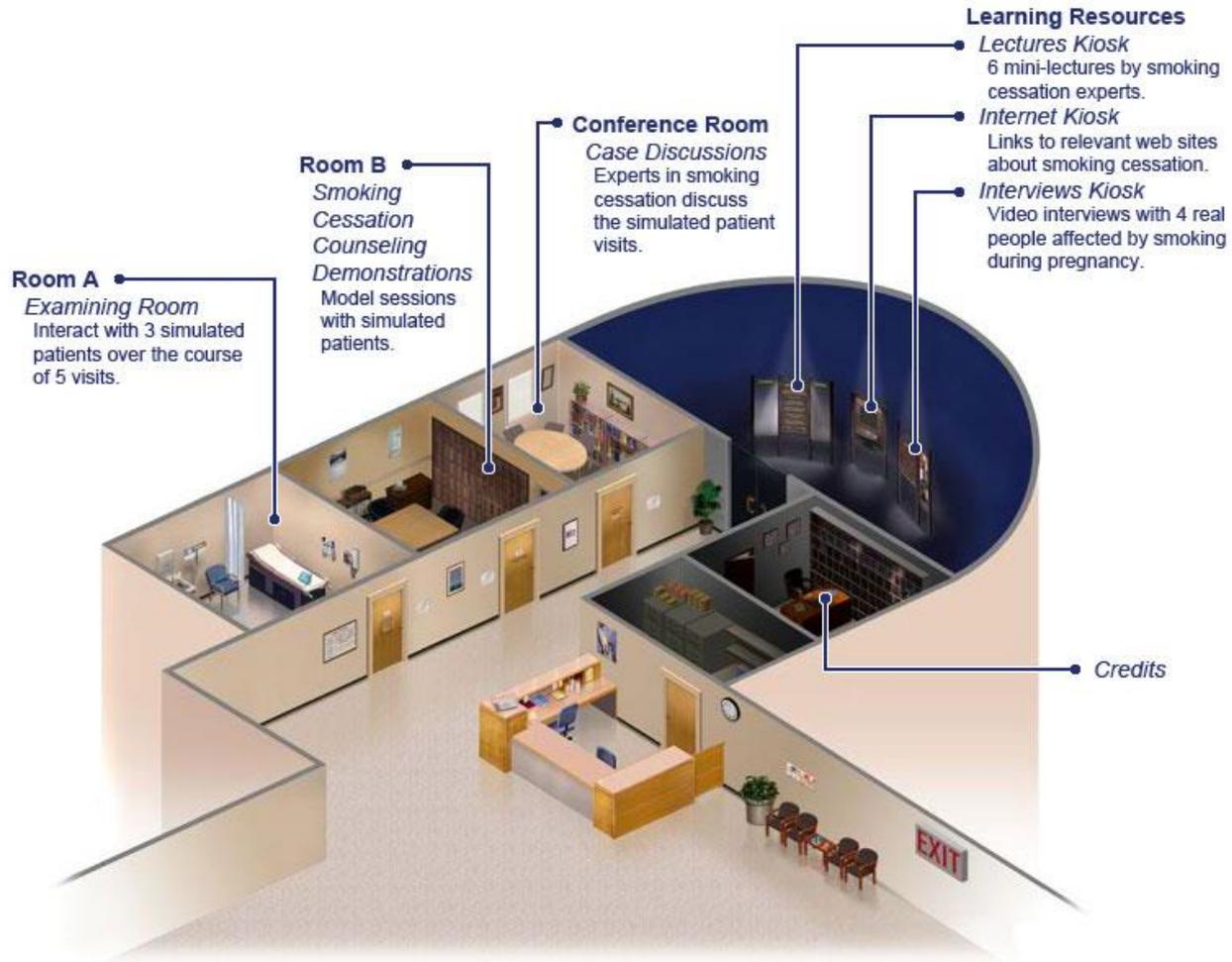
- ❑ **This free web-based training is designed for health care professionals to effectively assist pregnant women and women in the childbearing years to quit smoking**
  - *Physicians, midwives, nurses, health educators, pharmacists, etc...*
- ❑ **The training program teaches a best practice approach 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/](http://www.smokingcessationandpregnancy.org/)**



Dartmouth Medical School



## The Virtual Clinic Overview



## 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/>
- ❑ Tips on quitting: <http://women.smokefree.gov/>
- ❑ Smoke free home pledge: <http://www.epa.gov/smokefree/>
- ❑ 1-800-QUIT-NOW: <http://1800quitnow.cancer.gov/>
- ❑ Text4baby: <http://www.text4baby.org/>

## For clinicians and public health practitioners

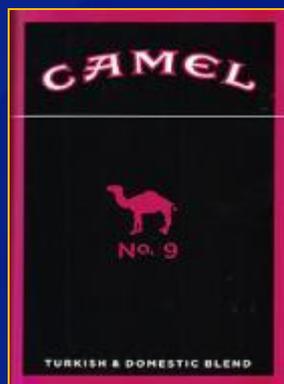
- ❑ ACOG Clinician guide to helping pregnant women quit smoking: [http://www.acog.org/departments/dept\\_web.cfm?recno=13](http://www.acog.org/departments/dept_web.cfm?recno=13)
- ❑ Clean Air for Healthy Children: [www.cleanairforhealthychildren.org](http://www.cleanairforhealthychildren.org)
- ❑ Smoking 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 - Combustible



Photos courtesy of Michele Bloch

# Snus, Dissolvables



# WHAT ARE ENDS?

## Electronic Nicotine Delivery Systems



Disposable



Rechargeable



Tank

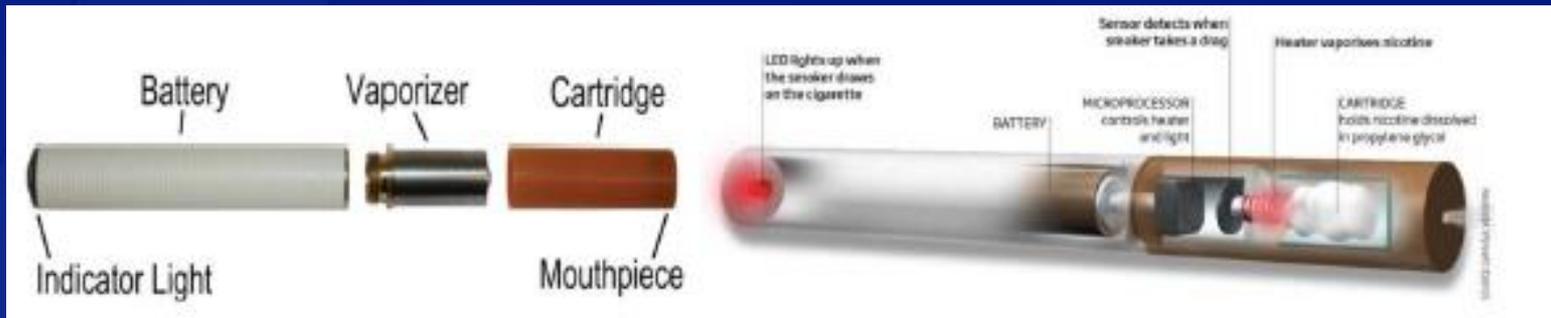


Novelty

*Electronic Cigarettes and Vaping Devices*

# 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*



Hutzler, Paschke, Kruschinski, et al. Chemical hazards present in liquids and vapors of electronic cigarettes. Arch Toxicol 2014

## 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*

Bhatnagar et al. Electronic cigarettes: a policy statement from the American Heart Association. *Circulation*. 2014;130:1418-36.

Behar, Davis, Wang, et al. Identification of toxicants in cinnamon flavored electronic cigarette refill fluids. *Toxicology in vitro* 2014.

Hutzler, Paschke, Kruschinski, et al. Chemical hazards present in liquids and vapors of electronic cigarettes. *Arch Toxicol* 2014



## ENDS Other Purposes

- Some ENDS can be used to deliver other substances, like marijuana and caffeine

A screenshot of a website banner for "Lehigh Vapor". The banner has a dark background with a white and red logo on the left. The logo consists of a stylized red and white shape resembling a flame or a bird. To the right of the logo, the text "Lehigh Vapor" is written in a red, cursive font, with the phone number "484-429-6978" below it. Further right, there are links for "Blog", "Home", "About Us", "Liquid", and "A". Below the banner, the word "Caffeitine" is written in a large, bold, black font. Underneath that, a paragraph of text describes the product: "A line of eLiquid that added pure extract caffeine to the traditional nicotine based liquid blend version and that of a pure caffeine, no nicotine version for customers to choose from. Caffeitine US trademark registration pending." At the bottom left, the word "WARNINGS:" is partially visible.

# Not Approved as a Cessation Device Center for Drug Evaluation and Research

❑ 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<sup>1</sup>; Yuelin Li, PhD<sup>1</sup>; Jack E. Burkhalter, PhD<sup>1</sup>; Christine E. Sheffer, PhD<sup>2</sup>; and Jamie S. Ostroff, PhD<sup>1\*</sup>

**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' communication with their patients about E-cigarette use, this article provides what to the authors' knowledge is the first published clinical data regarding E-cigarette use and cessation outcomes among patients with cancer. **METHODS:** A total of 1074 participants included smokers (patients with cancer) who recently enrolled in a tobacco treatment program at a comprehensive cancer center. Standard demographic, tobacco use history, and follow-up cessation outcomes were assessed. **RESULTS:** A 3-fold increase in E-cigarette use was observed from 2012 to 2013 (10.6% 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 thoracic and head or neck cancers. 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, 0.5-1.7). 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, 1.2-3.3). **CONCLUSIONS:** 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 usefulness 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.

Borderud, S. P., Li, Y., Burkhalter, J. E., Sheffer, C. E. and Ostroff, J. S. (2014), *Electronic cigarette use among patients with cancer: Characteristics of electronic cigarette users and their smoking cessation outcomes*. *Cancer*. doi: 10.1002/cncr.28811

# Health Claims

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**.



Quitting smoking at any point during pregnancy reduces the chance of complications. Of course, the sooner, the better!



Slide courtesy Pam Ling, UCSF

## ENDS Potential for Harm

- ❑ Expose children and adolescents, pregnant women, and non-smokers to 2<sup>nd</sup> 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

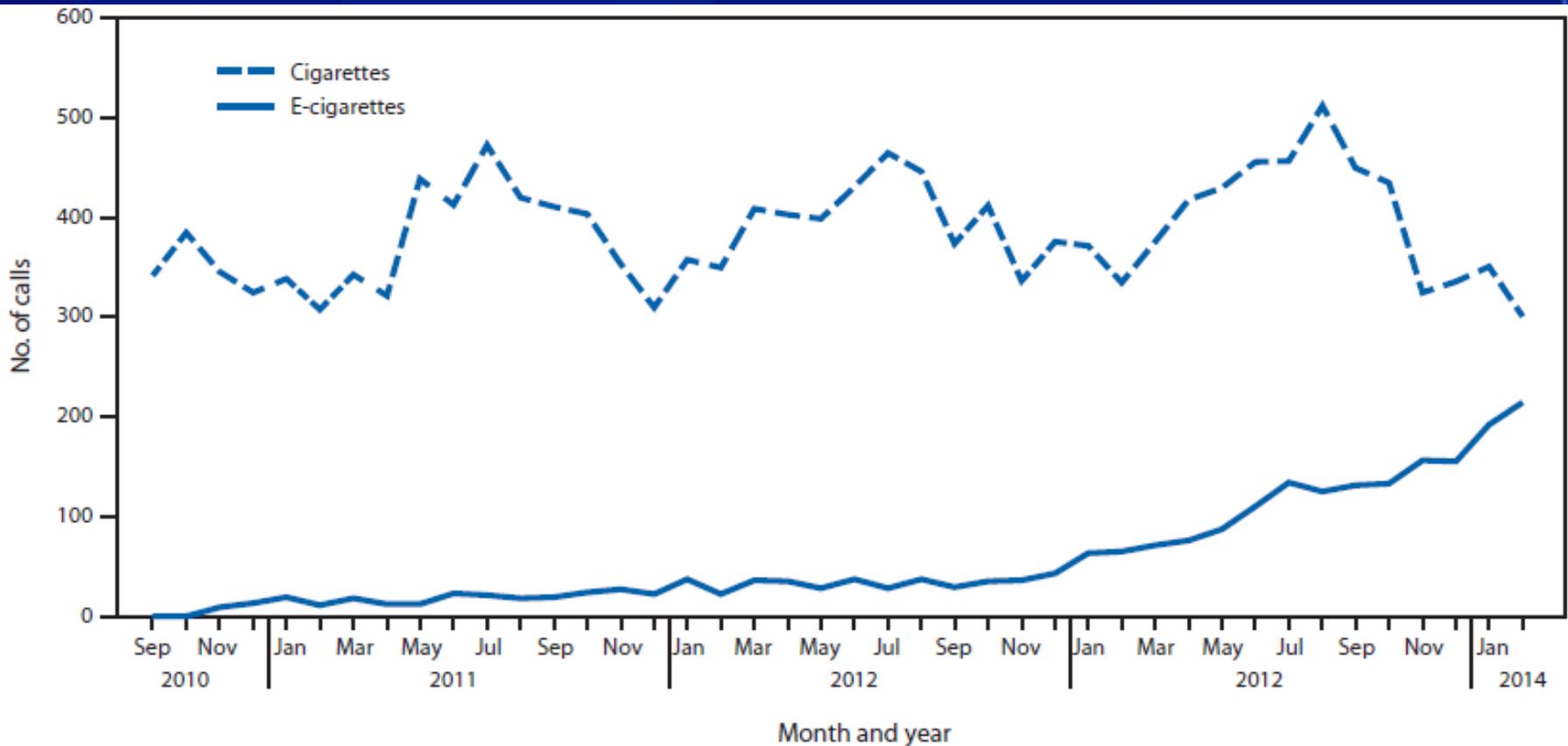


# Nicotine

## 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



## **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

 U.S. Department of Health and Human Services  
 Centers for Disease Control and Prevention  
 c/o FlowShare Group  
 One Dock Street  
 Stamford, CT 06902

FIRST CLASS MAIL  
 US POSTAGE  
 PMO  
 STAMFORD, CT  
 PERMIT NO 616



**A TIP FROM A  
 FORMER  
 SMOKER**



**Some of the reasons to  
 quit smoking are very small.**

Amanda, age 30, Wisconsin

**A TIP FROM A  
 FORMER  
 SMOKER**

**DO YOUR HEART  
 A FAVOR.  
 QUIT SMOKING.**

Roosevelt, Heart attack at age 45  
 Virginia



Smoking causes immediate damage to your body. For Roosevelt, it caused his heart attack. Your heart attack risk drops as soon as you quit smoking. For free help, call 1-800-QUIT-NOW.

 U.S. Department of Health and Human Services  
 Centers for Disease Control and Prevention  
[www.QUIT-NOW.gov](http://www.QUIT-NOW.gov)

**A TIP FROM A  
 FORMER  
 SMOKER**

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 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.**

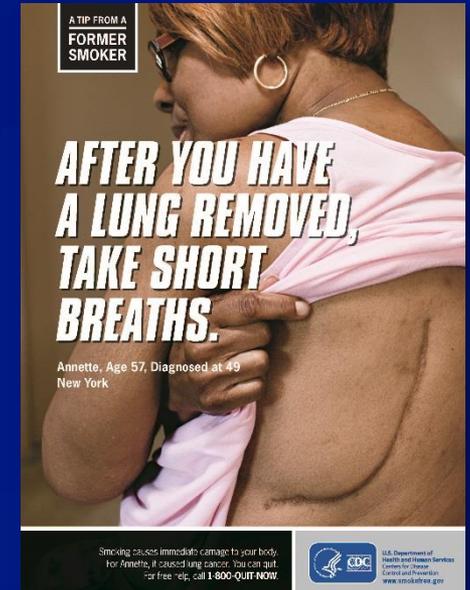
 U.S. Department of Health and Human Services  
 Centers for Disease Control and Prevention  
 CDC.gov/tips

#CDCTips

**A TIP FROM A  
 FORMER  
 SMOKER**

**AFTER YOU HAVE  
 A LUNG REMOVED,  
 TAKE SHORT  
 BREATHS.**

Annette, Age 57, Diagnosed at 49  
 New York



Smoking causes immediate damage to your body. For Annette, it caused lung cancer. You can quit. For free help, call 1-800-QUIT-NOW.

 U.S. Department of Health and Human Services  
 Centers for Disease Control and Prevention  
[www.QUIT-NOW.gov](http://www.QUIT-NOW.gov)

**A TIP FROM A  
 FORMER  
 SMOKER**

**After a Stroke from  
 Smoking, Get Used  
 to Losing Your  
 Independence.**

Nancy, Age 68, Diagnosed at 67  
 New York

**Bloomberg  
 Businessweek**

**Newsweek**

**America Is Winning—  
 and Why**



Smoking causes immediate damage to your body. For Nancy, it caused a stroke. You can quit. For free help, 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 3 pounds. 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.**



U.S. Department of Health and Human Services  
Centers for Disease Control and Prevention  
[CDC.gov/tips](http://CDC.gov/tips)

#CDCTips

[www.cdc.gov/tips](http://www.cdc.gov/tips)

# 2015 Partner Organizations



# Tips Website – Health Care Professionals Page

## Tips From Former Smokers

### Tips From Former Smokers

- About the Campaign +
- I'm Ready to Quit! +
- Real Stories +
- Diseases/Conditions Featured in the Campaign +
- For Specific Groups +
- Partners -
- Faith-Based Organizations +
- Health Care Providers -**
- Dental Professionals
- Health Care Professionals
- Pharmacists
- Vision Professionals
- FAQs for Health Care Providers
- Quitline FAQs for Health Care Providers
- "Talk With Your Health Care Team" Posters
- Partners and Public Health Professionals
- Campaign Resources +
- Stay Connected +
- Newsroom +

CDC > [Tips From Former Smokers](#) > [Partners](#)

## Health Care Providers: How You Can Help Patients Quit



Language: English ▾

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)
- ❑ Health Care Professionals Web page:  
<http://www.cdc.gov/tobacco/campaign/tips/partners/health/hcp/index.html>
- ❑ 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](mailto:cdcinfo@cdc.gov) Web: [www.cdc.gov](http://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.*

National Center for Chronic Disease Prevention and Health Promotion  
Division of Reproductive Health

