Thirdhand Smoke: Clinical and Policy Approaches

Thursday, September 27, 2012 - 1:00 pm ET

Welcome Pioneers for Smoking Cessation

During the Webinar

Tip: If you do not see the “Join Teleconference” popup box, please click on the “Audio” tab, then click “Join Teleconference”.

- All phone lines will be muted during the presentation
- Do NOT put phone on hold
- Turn OFF your webcam by clicking on the camera icon
- Webinar is being recorded
- Questions are encouraged throughout via the chat box
Webinar Objectives:

- Provide a brief overview of secondhand and thirdhand smoke
- Learn ways to promote a smoke-free home and work environment
- Discuss strategies providers can use to address exposure to both secondhand and thirdhand smoke among patients

Moderator

- Catherine Saucedo
  - Moderator
  - Deputy Director
  - Smoking Cessation Leadership Center, University of California, San Francisco
  - csaucedo@medicine.ucsf.edu
Welcome and Greetings
- Catherine Saucedo, Deputy Director, SCLC, moderator
- Alicia Smith, xxx, CADCA
- Steve Schroeder, Director, SCLC

Presentation from Jonathan Winickoff, MD, MPH
- Associate Professor of Pediatrics, Harvard Medical School

Questions & Answers

Technical Assistance and Closing Remarks

Disclosure: Faculty speaker, moderator, and planning committee members have disclosed no financial interest/arrangement or affiliation with any commercial companies who have provided products or services relating to their presentation or commercial support for this continuing medical education activity.

Greetings from CADCA

- Alicia D. Smith, MPH
  - Project Manager, Tobacco Programs, CADCA
  - asmith@cadca.org
Welcome

- Steven A. Schroeder, MD
  - Director, Smoking Cessation Leadership Center
  - Distinguished Professor of Health and Health Care, Department of Medicine, UCSF

Today’s Presenter

- Jonathan P. Winickoff, MD, MPH
  - Associate Professor of Pediatrics, Harvard Medical School
  - MGH Center for Child and Adolescent Health Policy
Thirdhand Smoke: Clinical and Policy Approaches

Jonathan P. Winickoff, MD, MPH
Associate Professor in Pediatrics
Harvard Medical School
September 27, 2012

...dedicated to eliminating children’s exposure to secondhand smoke and tobacco

And

...ensuring that all clinicians ask the right questions about tobacco and secondhand smoke exposure
Comparative Causes of Annual Preventable Deaths in the United States

<table>
<thead>
<tr>
<th>Cause</th>
<th>Annual Preventable Deaths (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suicide</td>
<td>38</td>
</tr>
<tr>
<td>Alcohol</td>
<td>92</td>
</tr>
<tr>
<td>Motor Vehicle</td>
<td>112</td>
</tr>
<tr>
<td>Homicide Induced</td>
<td>98</td>
</tr>
<tr>
<td>Drug Induced</td>
<td>110</td>
</tr>
<tr>
<td>Obesity</td>
<td>152</td>
</tr>
<tr>
<td>Smoking</td>
<td>320</td>
</tr>
</tbody>
</table>

Tobacco Smoke Ingredients

There is **NO** risk-free level of exposure to tobacco smoke.

**Children and Tobacco Smoke**

- Asthma, RSV pneumonia, SIDS, Otitis media, Metabolic Syndrome, Dental caries
- School absenteeism
- Sleep problems
- Hospitalizations
- Developmental delay
The Life Cycle Effects of Smoking

- Asthma
- Otitis Media
- Fire-related Injuries
- Cognitive Problems

Influences to Start Smoking

Low Birth Weight
Stillbirth

SIDS
RSV/Bronchiolitis
Meningitis

Infancy

Adolescence

In utero

Cancer
Cardiovascular Disease
COPD


Even at Low Levels of Exposure? Yes

Yolton et al; using NHANES,
- Demonstrated a significant inverse relationship between a biomarker of tobacco smoke (cotinine) and block design, reading, and math scores

Wilson, et al; also using NHANES,
- Relationship between cotinine levels and serum levels of antioxidants, vitamin C, and carotenoids
What is Third-hand Smoke?

- Third-hand smoke is the left-over contamination in a room/car/clothing that persists after the cigarette is extinguished
  - The condensate on the glass from a smoking chamber was used in one of the first studies linking smoking and cancer (Wynder, 1953)
  - Homes and cars in which people have smoked may smell of cigarettes for long periods

Third-Hand Smoke: The 3 R’s

Remain on surfaces, in dust

Re-emitted into gas phase

React with oxidants to yield secondary pollutants

Burton (2011)
Third-Hand Smoke

Second-Hand Smoke

Nicotine + Nitrous acid/ozone = Tobacco-specific nitrosamines


Thirdhand Smoke
The Media has Popularized the Third-Hand Smoke Concept

Environments with Potential THS Exposure

- Homes of smokers
- Apartments & homes previously occupied by smokers
- Multi-unit housing where smoking is permitted
- Automobiles of smokers (used cars)
- Hotel rooms
Evidence of THS Exposure Indoors

- House dust & surfaces contain:
  - nicotine
  - 3-ethenylpyridine (3-EP)
  - polycyclic aromatic hydrocarbons
  - NNK
  - nicotelline

- Depending on the compound, rates of these compounds may be 50 times higher in homes where people smoke

Possible Routes of Exposure—Dermal uptake

- Effective exposure depends on area of skin in contact with contaminated surfaces/body volume
- Sources: surfaces, dust, clothes, bedding—Thirdhand smoke dominates
- Children>adults
- Proof of concept
  1. Nicotine toxicity in child harvesters of tobacco
  2. Wynder, painting tobacco condensate on mice
Dermal Absorption of TSNAs

- Manuela Martins-Green (UC Riverside) and Peyton Jacob III
- Dermal application of NNK in mice
- NNAL and iso-NNAL measured in urine with positive exposure time–urine concentration relationship

Pathophysiological Implications

- Low level cumulative exposure over long periods of time
- Potential exposure to irritants, oxidants, pro-inflammatory chemicals, carcinogens, vascular toxins
Possible Routes of Exposure—Ingestion

- Effective Exposure depends on quantity of contaminated dust ingested/body weight
- Sources: dust, toys, food, mouthing behaviors—thirdhand smoke dominates
- Children>adults...might be 20 times greater
- Proof of concept
  1. Children in homes where smoking has occurred in the past have detectable cotinine levels
  2. Level of contamination in dust of bedroom correlates with cotinine levels

Possible Routes of Exposure—Inhalation

- Effective exposure depends on respiratory exchange rate and body weight
- Source: air—Secondhand smoke usually dominates but THS may dominate when spaces are heavily contaminated and active smoking occurs when child not present
- Children>adults
- Proof of concept: passive air monitoring
Biomarker Ratios as a Better Tool to Identify THS Exposure

NNK/nicotine – environmental assessment
Urine NNAL/cotinine – human exposure

• Rationale
  – As smoke ages nicotine levels decline and TSNA levels rise
  – Metabolism converts nicotine to cotinine and NNK to NNAL

The NNAL/Cotinine Ratio in Active and Passive Smokers and in Kids

<table>
<thead>
<tr>
<th></th>
<th>Active Smokers</th>
<th>Passive Smokers</th>
<th>Tots$^1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>NNAL/Cotinine Ratio</td>
<td>1.2</td>
<td>6.6</td>
<td>74</td>
</tr>
</tbody>
</table>

This suggests that measuring cotinine only would underestimate NNK exposure, and is consistent with our hypothesis that the ratio is higher in people exposed to THS as compared to SHS (Hand to mouth behavior in toddlers)

1. Healthy Tots Project - San Diego State University, Mel Hovell and Joy Zakarian
Thirdhand Smoke Accumulates

• THS accumulates in the homes of people who smoke

• Matt et. al. showed that even after a home remain vacant for 2 months and a prepared for the new residents, THS contamination remains on surfaces and in house dust.

• Non-smokers living in former smokers homes are exposed to tobacco smoke toxins.

Reason for Concern

• Exposure through shared ventilation, along air ducts, leaky walls.

• The numbers add up quickly, if just 5 people in a building smoke ½ pack of cigarettes in their apartment each day—5 X 10 X 365; the load to the building is over 18,000 cigarettes each year.
Effect of a Single Cigarette on Indoor Air Quality


...it takes TWO hours for the air quality to return to minimum federal safety standard for fine particles and particulate aromatic hydrocarbons..

Can smoking in one unit contaminate another unit?

- Kraev et al. (2009) demonstrated, using “Hammond” filters, that air in 89% of non-smoking units was contaminated with nicotine.

- When another resident smelled cigarette smoke the levels in that apartment were higher.

- But people didn’t need to smell cigarette smoke to be contaminated.
Does this Exposure Get into Children?

• Whatever the combination of involuntary (SHS+THS) exposure…

Do children who live in multiunit housing have higher cotinine levels than children who live in detached housing

Cotinine levels in children

• 2001-2006 National Health and Nutrition Examination Survey (NHANES)

• Hypothesized and found that among 4,782 children ages 6 to 18 years, in households that do not allow smoking in their own home, children who live in apartments have a 140% higher cotinine level than children living in detached homes,

• This relationship persists when controlling for poverty and race/ethnicity
Cotinine levels in children by housing type

Legal and ethical framework

- 7% of housing authorities smokefree and increasing.

- Due to legal and regulatory precedent, the health consequences of tobacco smoke, and the inability of non-smokers to escape exposure… a recent NEJM paper argues that principles of social justice can only be met by smokefree housing policies. (Winickoff et al NEJM 2010)

- Policies could proceed as leases are renewed, and safe forms of nicotine replacement therapy could be offered to support addicted individuals.
Completely Smokefree

• Although no safe level of tobacco smoke exposure, quantifying the relative exposure due to SHS and THS is difficult
• Especially across different age ranges in the human life cycle
• However, the state of the science supports completely smokefree environments for all children—even at times when children are not present

Use social strategies

• Social strategies can be very effective when you put a human face on the problem of parental smoking.
• Public support – for protecting those at risk
• The press and the media can help
The Cessation Imperative

The only way to protect non-smoking family members completely is for all family smokers to quit completely.
Cessation is the Goal

• Eliminate the #1 cause of preventable morbidity and mortality
• Eliminate tobacco smoke exposure of all household members
• Decrease economic impact
  – Average cost per pack across US > $5.75
• Decrease teen smoking rates

Tobacco Users Want to Quit

• 70% of tobacco users report wanting to quit
• 44% have made at least one quit attempt in the past year
• Users say expert advice is important to their decision to quit
  – The expert can be a physician, clinician, health care worker - any member of your practice!
Research in Child Healthcare Settings

- Majority of parents would accept medications to help them quit—only 7% get it (Winickoff et al 2005)

- Majority of parents want to be enrolled in a telephone quitline—only 1% get enrolled (Winickoff et al 2005)

- Majority of parents would be more satisfied with visit if child’s doctor addressed their smoking (Cluss 2002; Frankowski 1993; Groner 1998; Klein 1995)

Pediatric Visit Creates a Teachable Moment for Smoking Cessation

- Many parents see their child’s health care provider more often than their own

- Interventions in the pediatric office setting have been successful:
  - Decreased number of cigarettes smoked and home nicotine levels
  - Increases in parent-reported smoke-free homes and quit rates (Rosen et al Pediatrics 2012)
Principles of Tobacco Dependence Treatment

• Tobacco dependence is a chronic, relapsing condition
  – Nicotine is addictive
  – Effective treatments exist
  – Every person who uses tobacco should be offered treatment

Three Easy Steps

Step 1: Ask
Step 2: Assist
Step 3: Refer
Step One: Ask

Ask families about tobacco use and rules about smoking in the home and car

Every year, ask families:

“Does any member of the household use tobacco?”

Step One: Ask

If the parent/patient you’re speaking with uses tobacco, ask if they are

• Interested in quitting?
• Would they like a medication to help them quit?
• Want to be enrolled in the free quitline?
Step Two: Assist

- Use the responses on Step One to guide how you assist with addressing tobacco use.
  - Interested in Quitting?
    - Set a quit date in the next 30 days
    - Prescribe or recommend medication for assisting quit
    - Enroll in Quitline
- Document services delivered to enhance complexity of visit to level 4— code 989.84

A New Health Message:
Tobacco Smoke Contamination, or Third-Hand Smoke…

- Sometimes it’s easy to see what can hurt your kids...
- But sometimes it’s not.
- Tobacco smoke stays around in your clothes, house and car long after you put out the cigarette.
- Quit smoking today.
- Keep your home and car smoke-free at all times.
- Talk to your child’s doctor or nurse for help.
- Call the quitline or visit www.ceasetobacco.org for more help.
Step Three: Refer

Refer families who use tobacco to outside help

- Use your state’s “fax to quit” quitline enrollment form
- Arrange follow-up with tobacco users
- Record in the child’s medical record
Quitlines

Quitlines are free and confidential programs providing evidence-based stop smoking services to U.S. residents who want to stop smoking or using other forms of tobacco.

1-800-QUIT-NOW

State-Specific Fax-to-Quit Form for Pediatrics (CA form pictured)
Quitline Services

• Upon receipt of enrollment form
  • Trained counselor conducts 10-minute telephone interview
  • Mails Quitline materials
  • Offers multiple counseling options

• Free telephone counseling sessions

In pediatrics there are easy (and proven) ways to put it all together....

www.ceasetobacco.org
CEASE intervention materials
(www.ceasetobacco.org)

CEASE brochure
Home halflet
Car halflet

CEASE Action Sheet Front

CEASE Action Sheet Back

Pre-printed prescription for NRT patch
Pre-printed prescription for NRT gum

CEASE direct to consumer marketing

If your child has one of these...

then you should have one of these.

Your child’s doctor can help you quit smoking and have a completely smoke-free home and ear.

Asthma poster

Medications poster
Practice initiated materials

Do the math.

- 4 weeks of the nicotine patch
- 100 pieces of nicotine gum

That’s enough for a week.

- 34 gallons of gas

It pays to quit smoking.

Press release about CEASE participation

Link to Video

- Demonstration
- 5 available pediatric tobacco control scenarios

- Full training video is available on the website www.ceasetobacco.org

- EQIPP module: “Eliminate tobacco use and Exposure” helps train the office in CEASE
But How?

• Clinical Staff: Can ASK, ASSIST, and REFER
• Administrative Staff: Can keep materials stocked and administer screening questionnaires
• Management: Need to support the “cause”
Pediatricians as Partners

- AAP policy recommends that pediatricians help every parent quit smoking and help eliminate tobacco use and exposure of all household members; support clean-air and smoke-free environment ordinances and legislation in their community and state.

- To aid in accomplishing smoke-free goals you can work with pediatricians and child healthcare clinicians to:
  - Develop a state-wide strategy to ensure that every pediatrician is trained to deliver the three steps: Ask, Assist, Enroll
  - Work with AAP chapters to pass state legislation or local ordinances requiring that multi-unit housing be smoke-free
US Department of Housing and Urban Development (HUD) Smoke Free Toolkit –

AAP Resources

• Clinical and Community Effort Against Secondhand Smoke Exposure

Ceasetobacco on Facebook

• Maintenance of Certification-Tobacco Control Module

http://www.pedialink.org/cme/eqipptc
Team Effort

• MGH: Susan Regan, Bethany Hipple, Janelle Dempsey, Nancy Rigotti, Yuchiao Chang, Emara Nabi, Jim Perrin, Blair Dickinson.

• PROS: Stacia Finch, Eric Slora, Victoria Weiley, Mort Wasserman, Hiedi Woo, Jeremy Drehmer, PROS Coordinators, PROS Steering

• AAP/Tobacco Consortium/Richmond Center: Jonathan Klein, Debbie Ossip-Klein; Regina Schaffer, Kiran Patel

• National Advisory: Sue Curry, Michael Fiore, Don Berwick, Mel Hovell, Karen Emmons, David Abrams.

• MA DPH: Donna Warner; Indiana DPH: Karla Sneegas

Summary

• Outpatient settings should be used to deliver tobacco dependence treatments to all patients and household members

• Parents and families should be the number one priority population for tobacco control efforts
Changing the World

• Start with the science
• Tell anecdotes and get media support as part of creating a social strategy
• Use child healthcare clinician partners to mobilize political will for societal change
Contact Information

Jonathan P. Winickoff MD, MPH

Director, Pediatric Tobacco Control Research
MGH Tobacco Research and Treatment Center
Harvard Medical School

American Academy of Pediatrics
Director, Translational Research
Julius B. Richmond Center of Excellence

jwinickoff@partners.org
References


References


References


Questions & Answers

- Feel free to ask questions via the chat box.
Contact the SCLC
Visit us online:
http://smokingcessationleadership.ucsf.edu
Call us toll-free:
1-877-509-3786

Closing Remarks
Please help us by completing the post-webinar survey.

Thank you for your continued efforts to combat tobacco.

SAVE THE DATE!
Tuesday, October 23rd, 1 pm ET
“Tobacco Free State Psychiatric Hospitals: From Policy to Practice”,
with panelists from NRI, the research arm of the National Association of State Mental Health Program Directors (NASMHPD)
Dr. Winickoff’s Bio:

Dr. Winickoff is a member of the Center for Child and Adolescent Health Policy, a practicing pediatrician at MGH and Associate Professor of Pediatrics at Harvard Medical School. He has training and experience in health services research, medical ethics, neurobiology, statistics, and behavioral theory. Dr. Winickoff has received numerous awards including the Secretary’s Award for Distinguished Service for “protecting the health of the United States public,” and the 2011 Academic Pediatric Association Health Policy Award in recognition of cumulative public policy and advocacy efforts that have improved the health and well-being of infants, children, and adolescents. He served for 7 years as the Chair of the American Academy of Pediatrics (AAP) Julius Richmond Center of Excellence Tobacco Consortium, a national group of researchers who take a family-centered approach to tobacco control issues that affect children. He has authored over 70 peer-reviewed papers, 40 addressing tobacco control in child healthcare settings. Two of these studies were the first to evaluate the delivery of smoking cessation pharmacotherapies to parents in the pediatric setting.

He has drafted key tobacco control policy for the AMA, AAP, and the APA and served as a scientific advisor for the CDC Communities Putting Prevention to Work (CPPW grants), the Massachusetts Tobacco Control Program, Indiana Tobacco Control Program, Head Start, WIC, the Food and Drug Administration, Department of Housing and Urban Development, and the U.S. Surgeon General through the Interagency Committee on Smoking and Health. The national program his team developed out of their research known as CEASE, the Clinical and Community Effort Against Secondhand Smoke Exposure, is available for free at www.ceasetobacco.org. A $4 million dollar award from NIH‐NCI/NIDA/AHRQ (R01‐CA127127‐01) is funding a national dissemination trial of CEASE through the PROS network of the AAP. Recently, his team completed an online CME tobacco control module for Pedialink, an online learning platform of the AAP. With NIH ARRA funding, he collaborated with several AAP committees and the learning division to build a tobacco control maintenance of certification module—Eliminating Tobacco Use and Exposure, which launched March 1, 2011.

He and his team is researching the issue of smoking in multi‐unit housing. With colleagues at the AAP Richmond Center, Harvard School of Public Health, and Massachusetts General Hospital, he pursues public education, legal, ethical and social justice analyses, and biochemical analysis of those living in multi‐unit housing, and national attitudes of indoor smokefree policies among multi‐unit housing residents.