What to Do With a Patient Who Smokes: Bridging the Gap Between the Clinic and the Community

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The Smoking Cessation Leadership Center

and Rx for Change
Topics for Today

- Facts about smoking and health
- Tobacco use epidemiology
- Smoking cessation
  -- Nicotine and dependence
  -- Aids for cessation
  -- Telephone quitlines
- Conclusion and next steps
Facts About Smoking and Health
Tobacco’s Deadly Toll

- 443,000 deaths in the U.S. each year
- 4.8 million deaths worldwide each year
- 10 million deaths estimated by year 2030
- 50,000 deaths in the U.S. due to second-hand smoke exposure
- 8.6 million disabled from tobacco in the U.S. alone
- 45.3 million smokers in U.S. (78% daily smokers, averaging 15 cigarettes/day, 2010)
Tobacco’s Deadly Toll

- 443,000 deaths in the U.S. each year
- 4.8 million deaths worldwide each year
- 10 million deaths estimated by year 2030
- 50,000 deaths in the U.S. due to second-hand smoke exposure
- 8.6 million disabled from tobacco in the U.S. alone
- 43.8 million smokers in U.S. (77.8% daily smokers, averaging 15.1 cigarettes/day, 2011)
Behavioral Causes of Annual Deaths in the United States, 2000

Source: Mokdad et al; JAMA. 2005; 293:293

* Also suffer from mental illness and/or substance abuse
# Annual U.S. Deaths Attributable to Smoking, 2000–2004

<table>
<thead>
<tr>
<th>Disease</th>
<th>Deaths Annually</th>
<th>Percent of All Smoking-attributable Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular diseases</td>
<td>128,497</td>
<td>29%</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>125,522</td>
<td>28%</td>
</tr>
<tr>
<td>Respiratory diseases</td>
<td>103,338</td>
<td>23%</td>
</tr>
<tr>
<td>Second-hand smoke</td>
<td>49,400</td>
<td>11%</td>
</tr>
<tr>
<td>Cancers other than lung</td>
<td>35,326</td>
<td>8%</td>
</tr>
<tr>
<td>Other</td>
<td>1,512</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

**TOTAL: 443,595 deaths annually**

Health Consequences of Smoking

- **Cancers**
  - Acute myeloid leukemia
  - Bladder and kidney
  - Cervical
  - Esophageal
  - Gastric
  - Laryngeal
  - Lung
  - Oral cavity and pharyngeal
  - Pancreatic
  - **Prostate** (↑incidence and ↓survival)

- **Pulmonary diseases**
  - Acute (e.g., pneumonia)
  - Chronic (e.g., COPD)

- **Cardiovascular diseases**
  - Abdominal aortic aneurysm
  - Coronary heart disease
  - Cerebro-vascular disease
  - Peripheral arterial disease
  - **Type 2 diabetes mellitus**

- **Reproductive effects**
  - Reduced fertility in women
  - Poor pregnancy outcomes (e.g., low birth weight, preterm delivery)
  - Infant mortality; **childhood obesity**

- **Other effects:** cataract, osteoporosis, periodontitis, poor surgical outcomes, **Alzheimers; rheumatoid arthritis; less sleep**
QUITTING: HEALTH BENEFITS

Time Since Quit Date

- **2 weeks to 3 months**
  - Circulation improves, walking becomes easier
  - Lung function increases up to 30%

- **1 to 9 months**
  - Excess risk of CHD decreases to half that of a continuing smoker

- **1 year**
  - Lung cancer death rate drops to half that of a continuing smoker
  - Risk of cancer of mouth, throat, esophagus, bladder, kidney, pancreas decrease

- **5 years**
  - Risk of stroke is reduced to that of people who have never smoked

- **10 years**
  - Excess risk of CHD decreases to half that of a continuing smoker

- **after 15 years**
  - Risk of CHD is similar to that of people who have never smoked

- **Lung cilia regain normal function**
- **Ability to clear lungs of mucus increases**
- **Coughing, fatigue, shortness of breath decrease**
Never Too Late to Quit*

<table>
<thead>
<tr>
<th>Age of quitting smoking</th>
<th>Years of life saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-34</td>
<td>10</td>
</tr>
<tr>
<td>35-44</td>
<td>9</td>
</tr>
<tr>
<td>45-54</td>
<td>8</td>
</tr>
<tr>
<td>55-64</td>
<td>4</td>
</tr>
</tbody>
</table>

* Jha, NEJM Jan 24, 2013
Smoking and Mental Illness: The Heavy Burden

- 200,000 annual deaths from smoking occur among patients with CMI and/or substance abuse
- This population consumes 44% of all cigarettes sold in the United States
  -- higher prevalence
  -- smoke more
  -- more likely to smoke down to the butt
- People with CMI die on average 25 years earlier than others, and smoking is a large contributor to that early mortality
- Social isolation from smoking compounds the social stigma
Smoking Prevalence by MH Diagnosis

**2007 NHIS data**
- Schizophrenia: 59.1%
- Bipolar disorder: 46.4%
- ADD/ADHD: 37.2%

Current smoking:
- 1 MH: 31.9%
- 2 MH: 41.8%
- 3+ MH: 61.4%

Grant et al., 2004, Lasser et al., 2000
- Major depression: 45-50%
- Bipolar disorder: 50-70%
- Schizophrenia: 70-90%
Causal Associations with Second-hand Smoke

- **Developmental**
  - Low birth weight
  - Sudden infant death syndrome (SIDS)
  - Pre-term delivery
  -- Childhood depression

- **Respiratory**
  - Asthma induction and exacerbation
  - Eye and nasal irritation
  - Bronchitis, pneumonia, otitis media, bruxism in children
  - Decreased hearing in teens

- **Carcinogenic**
  - Lung cancer
  - Nasal sinus cancer
  - Breast cancer (younger, premenopausal women)

- **Cardiovascular**
  - Heart disease mortality
  - Acute and chronic coronary heart disease morbidity
  - Altered vascular properties


There is no safe level of second-hand smoke.
Compounds in Tobacco Smoke

An estimated 7,000 compounds in tobacco smoke, including 69 proven human carcinogens

**Gases**
- Carbon monoxide
- Hydrogen cyanide
- Ammonia
- Benzene
- Formaldehyde

**Particles**
- Nicotine
- Nitrosamines
- Lead
- Cadmium
- Polonium-210

Nicotine does NOT cause the ill health effects of tobacco use.
Epidemiology of Tobacco Use

Trends in cigarette current smoking among persons aged 18 or older

Graph provided by the Centers for Disease Control and Prevention. 1955 Current Population Survey; 1965–2011 NHIS. Estimates since 1992 include some-day smoking.

70% want to quit
Smoking Prevalence and Average Number of Cigarettes Smoked per Day per Current Smoker 1965-2010

Source: Centers for Disease Control and Prevention (1965-2010). NHIS
National Youth Smoking
1997 - 2011

- 39.8% decline
- 17.3% decline
- 41.9% decline
- 34.0% decline

Current cigarette use (smoked cigarettes on at least 1 day during the 30 days before the survey)
Current frequent cigarette use (smoked cigarettes on 20 or more days during the 30 days before the survey)

Data are from the Youth Risk Behavior Surveillance Survey
Past Month Use of Cigarettes and Marijuana among US 12th Grade Students, 1975-2012

PREVALENCE of ADULT SMOKING, by RACE/ETHNICITY—U.S., 2011

- 31.5% American Indian/Alaska Native*
- 20.6% White*
- 19.4% Black*
- 12.9% Hispanic
- 9.9% Asian*

* non-Hispanic.

PREVALENCE of ADULT SMOKING, by EDUCATION—U.S., 2011

- 25.1% No high school diploma
- 45.3% GED diploma
- 23.8% High school graduate
- 22.3% Some college
- 9.3% Undergraduate degree
- 5.0% Graduate degree

Centers for Disease Control and Prevention. (2012). *MMWR* 61(44);889-894.
PREVALENCE of SMOKING, by AGE GROUP—U.S., 2011

- 25.1%, 18 – 24 yrs
- 45.3%, 25 – 44 yrs
- 23.8%, 45 – 64 yrs
- 22.3%, ≥ 65 yrs

Number of Smokers =
New Smokers + Old Smokers - Quitters
Number of Quitters =

Number of Quit Attempts \times \% \text{ of Quitters}

- Price
- Clean indoor air
- Clinician advice
- Counter-Marketing
- Counseling
- Medications
Clinical Issues
Physicians Under-treat Smokers*

- AAMC survey of 3012 physicians representing FM, GIM, Ob-Gyn, Psych
- Only 1% were current smokers
- 84% asked about smoking
- 86% advised to quit
- 31% recommended NRT
- 17% arranged follow-up
- 7% referred to quitlines

Health Professionals’ Smoking Rates, 2004 *

- Primary Care Physicians - 1.7%
- Emergency Physicians - 5.7%
- Psychiatrists - 3.2%
- RN’s - 13.2%
- Dentists - 5.8%
- Dental Hygienists - 5.4%
- Pharmacists – 4.5%

* E. Tong et al, Nicotine & Tobacco Research (Nicotine and Tobacco Research, May 27, 2010)
Responses to Patient Who Smokes

- **Unacceptable:** “I don’t have time.”

- **Acceptable**
  - Refer to a quit line and/or web program
  - Establish systems in your office and hospital
  - Become a cessation expert
TOBACCO DEPENDENCE:
A 2-PART PROBLEM

Tobacco Dependence

Physiologic

The addiction to nicotine
Treatment
Medications for cessation

Behavioral

The habit of using tobacco
Treatment
Behavior change program

Treatment should address the physiologic and the behavioral aspects of dependence.
The 5 A’s: Review

- **ASK** about tobacco USE
- **ADVISE** tobacco users to QUIT
- **ASSESS** readiness to make a QUIT attempt
- **ASSIST** with the QUIT ATTEMPT
- **ARRANGE** FOLLOW-UP care

Measurements of Smoking Intensity

- Fagerström Test for Nicotine Dependence
- Biochemical
  - Serum, urinary, or saliva cotinine testing
  - Carbon monoxide testing
Nicotine enters the brain by stimulating nicotine receptors. This stimulation leads to dopamine release. Dopamine is released in the Prefrontal cortex and Nucleus accumbens. It also releases in the Ventral tegmental area. This dopamine release is part of the Dopamine Reward Pathway, which is involved in reward and motivation. Nicotine enters the brain through the Ventral tegmental area.
Nicotine Addiction Cycle

The Real Culprit

- It is the smoke, tar, and additives that make people sicken and die.

- Nicotine is dangerous because it leads to addiction, and therefore increased exposure to tobacco constituents.

- Therefore, nicotine replacement therapy is helpful, not harmful. It is a “clean” form of nicotine.
Cognitive Strategies for Cessation

- Review commitment to quit, focus on downsides of tobacco use
- Reframe the way a patient thinks about smoking
- Distractive thinking
- Positive self-talks, “pep talks”
- Relaxation through imagery
- Mental rehearsal, visualization
Behavioral Strategies for Cessation (Avoiding Stimuli that Trigger Smoking)

- **Stress**
  - Anticipate future challenges
  - Develop substitutes for tobacco

- **Alcohol**
  - Limit or abstain during early stages of quitting

- **Other tobacco users**
  - Stay away
  - Ask for cooperation from family and friends
Behavioral Strategies for Cessation (Part 2)

- Oral gratification needs
  - Use substitutes: water, sugar-free chewing gum or hard candies

- Automatic smoking routines
  - Anticipate routines and develop alternative plans, e.g., with morning coffee

- Weight gain after cessation
  - Anticipate; use gum or bupropion; exercise

- Cravings
  - Distractive thinking; change activities
SOCIAL SUPPORT for QUITTING

- Key ingredients for successful quitting:
  - Social support as part of treatment (intra-treatment)
  - Social support outside of treatment (extra-treatment)

PATIENTS SHOULD BE ADVISED TO:
- Ask family, friends, and coworkers for support – ask them not to smoke around you and not to leave cigarettes out
- Get individual, group, or telephone counseling

Patients who receive social support and encouragement are more successful in quitting
“Clinicians should encourage all patients attempting to quit to use effective medications for tobacco dependence treatment, except where contraindicated or for specific populations* for which there is insufficient evidence of effectiveness.”

* Includes pregnant women, smokeless tobacco users, light smokers, and adolescents.

**Medications significantly improve success rates.**

Pharmacologic Methods: First-line Therapies*

Three general classes of FDA-approved medications for smoking cessation:

- Nicotine replacement therapy (NRT)
  -- nicotine gum, patch, lozenge, nasal spray, inhaler
- Partial nicotine receptor agonist
  -- varenicline
- Psychotropics
  -- sustained-release bupropion

* Counseling plus meds better than either alone

Currently, no medications have an FDA indication for use in spit tobacco cessation.
VARENICLINE

- Chantix, marketed by Pfizer
- Partial nicotinic receptor agonist
  - Approved by the FDA May 2006, hit the market in the fall of 2006
  - Much DTC marketing in fall of 2007
- Good results as seen with quit rates
- Lessens withdrawal symptoms and inhibits the “buzz” from a smoke
- But may have rare though serious side affects: suicides and heart episodes
- In March 2013, Pfizer settled suicide law suits for $288 million
Combination Therapy

- **Combination NRT**
  - Long-acting formulation (patch)
    - Produces relatively constant levels of nicotine
  - Short-acting formulation (gum, lozenge, inhaler, nasal spray)
    - Allows for acute dose titration as needed for withdrawal symptoms

- **Bupropion SR + NRT**

- The safety and efficacy of combination of varenicline with NRT or bupropion has not been established.

*Because many of the remaining smokers are very addicted, use of combination therapies is becoming normalized.*
Combination Therapy for the Heavily Addicted Smoker—Mayo Clinic Style

- Nicotine patch
  - Strongest dose, can use more than one
- Shorter acting nicotine replacement
- Bupropion SR
COMPARATIVE DAILY COSTS of PHARMACOTHERAPY

<table>
<thead>
<tr>
<th></th>
<th>Trade</th>
<th>Generic</th>
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<tbody>
<tr>
<td>Gum</td>
<td>$6.58</td>
<td>$3.28</td>
</tr>
<tr>
<td>Lozenge</td>
<td>$5.26</td>
<td>$3.66</td>
</tr>
<tr>
<td>Patch</td>
<td>$3.89</td>
<td>$1.90</td>
</tr>
<tr>
<td>Inhaler</td>
<td>$5.29</td>
<td>-</td>
</tr>
<tr>
<td>Nasal spray</td>
<td>$3.72</td>
<td>-</td>
</tr>
<tr>
<td>Bupropion SR</td>
<td>$7.40</td>
<td>$3.62</td>
</tr>
<tr>
<td>Varenicline</td>
<td>$4.75</td>
<td>-</td>
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</tbody>
</table>

Average $/pack of cigarettes, $5.56

Graph reprinted with permission, Rx for Change, The Regents of the University of California.
Caveats About Cessation Literature

- Smoking should be thought of as a chronic condition, yet drug treatment often short (12 weeks) in contrast to methadone maintenance
- Great spectrum of severity and addiction; treatment should be tailored accordingly
- Volunteers for studies likely to be more motivated to quit
- Placebo and drug groups tend to have more intensive counseling than found in real practice world; and counseling is not a monolithic black box
- Most drug trials exclude patients with mental illness
LONG-TERM (≥6 month) QUIT RATES for AVAILABLE CESSATION MEDICATIONS

Questions About Light Smokers

- Do smoking cessation medications work? Probably, at least for those who smoke more than 5 per day.
- Nicotine addiction not as important. So why can’t they quit, what are the reinforcers?
- Why are they concentrated among young adults?
Myths About Smoking and Mental Illness*

- Tobacco is necessary self-medication (industry has supported this myth)
- They are not interested in quitting (same % wish to quit as general population)
- They can’t quit (quit rates same or slightly lower than general population)
- Quitting worsens recovery from the mental illness (not so; and quitting increases sobriety for alcoholics)
- It is a low priority problem (smoking is the biggest killer for those with mental illness or substance abuse issues)

* Prochaska, NEJM, July 21, 2011
What Are “Tobacco Quitlines”?

- Tobacco cessation counseling, provided at no cost via telephone to all Americans
- Staffed by trained specialists
- Up to 4–6 personalized sessions (varies by state)
- Some state quitlines offer nicotine replacement therapy at no cost (or reduced cost)
- Up to 30% success rate for patients who complete sessions

Most health-care providers, and most patients, are not familiar with tobacco quitlines.
California’s 1-800-NO BUTTS
The National Quitline Card

Take Control
1-800-QUIT-NOW

Call. It's free. It works.
1-800-784-8669
www.smokefree.gov

MONEY SAVED

$150
$1325
$9,125

1 day 1 week 1 month 1 year 5 years

NOTE: 1 pack/day @ $5/pack

Take Control
Kick Tobacco. Call Today!
1-800-QUIT-NOW
1-800-784-8669
www.Smokefree.gov
www.BecomeAnEx.org

To order Quit Now cards visit: http://smokingcessationleadership.ucsf.edu
### Efficacy and Average Sample Size of Tobacco Cessation Studies Reviewed by the Cochrane Library†

<table>
<thead>
<tr>
<th>Type of Intervention</th>
<th>Odds Ratio (95% CI*)</th>
<th>Average Sample Size, per trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nicotine Replacement Therapy (NRT, n=98*)</td>
<td>1.74 (1.64, 1.86)</td>
<td>385</td>
</tr>
<tr>
<td>Telephone Counseling (TC, n=13*)</td>
<td>1.56 (1.38, 1.77)</td>
<td>1,100</td>
</tr>
</tbody>
</table>

*n indicates number of studies; CI. Confidence interval.
†Based on Silagy et al. (2004) and Stead et al. (2004). *The Cochrane Library.*
TIPS Campaign 2012

1-800-QUIT NOW Call Volume by Week

Source: CDC & North American Quitline Consortium

Photos from: http://www.cdc.gov/tobacco/campaign/tips/
Online Smoking Cessation Assistance

- Online smoking cessation services now available for smokers who prefer using computers over telephones.
- Anonymity is a plus, as with telephone quitlines.
- Early studies show promising efficacy.
  - www.quitnet.com
  - www.smokefree.gov
  - www.becomeanex.org

www.becomeanex.org

Smoking Cessation Leadership Center
Conclusion and Next Steps
Tips for Your Office

- Referral forms to the quitline (1-800-QUITNOW)
- Carbon monoxide breathalyzer (cost about $500 plus disposal mouthpieces)
- One key question to ask: “When do you have your first cigarette of the day?”
- Approach smoking as a chronic illness
Tobacco Tipping Point?

- California 11.9% adult smoking prevalence in 2010
- National prevalence at modern low—19%!
- Smokers smoke fewer cigarettes
- Northern California Kaiser Permanente at 9%
- Physician smoking prevalence at 1%
Tobacco Tipping Point (2)

- Proliferation of smoke-free areas
- Higher insurance premiums for smokers
- April 2009 62 cent/pack federal tax increase
- Lung cancer deaths in women start to fall
- Increasing stigmatization of smoking
- National mass media campaigns—FDA and CDC—in 2012
Australian Health Minister

“We are killing people by not acting.”
Nicola Roxon, 2009
The Electronic Cigarette *

- Aerosolizes nicotine in propylene glycol soluent
- Cartridges contain about 20 mg nicotine
- Safety unproven, but >cigarette smoke
- Bridge use or starter product?
- Probably deliver < nicotine than promised
- Not approved by FDA
- My advice: avoid unless patient insists

* Cobb & Abrams. NEJM July 21, 2011
Power of Intervention

- $\frac{1}{3}$ to $\frac{1}{2}$ of the 46.6 million smokers will die from the habit. Of the 31.1 million who want to quit, 10.3 to 15.5 million will die from smoking.
- Increasing the 3% baseline cessation rate to 10% would save 1 million additional lives.
- If cessation rates rose to 15%, 1.5 million additional lives would be saved.
- No other health intervention could make such a difference!