Tobacco Dependence Treatment, COPD, Cardiovascular Disease and Diabetes

October 9th 2013

Geoffrey Williams, MD, PhD

Motivation Research Group
Healthy Living Center, University of Rochester
Objectives

- Identify strategies to motivate patients to stop smoking
- Explain how tobacco use compromises health of those with COPD, CVD, or DM, and benefits of cessation.
- Demonstrate an interview with a smoker with chronic disease.
- Review suggestions for a team approach to help patients stop smoking
Case

- 53 y/o male farmer who smokes 30 cigs/day. Referred to stop smoking and to manage his CVD risk.

He has history of:

- depression
- peripheral artery disease
- pre-Diabetes,
- hypertension
- high cholesterol
- Rheumatoid and osteoarthritis - disabling

- Meds: for hypertension, pre-diabetes, cholesterol, RA
- Soc Hx: lives with his wife. They have one son 25 y/o.
Case

- Tobacco history:
  - Smoked since 15 y/o.
  - He enjoys smoking – reduces irritability with son - others
  - Withdrawal Symptoms: irritability, diff conc, craving, depression
  - Want to stop =10/10  Able to stop 5/10

- Physical exam:  BP 172/88  P 80  BMI 40.0  Walks slowly with cane – multiple arthritic joints.

- Total Chol 232  LDL 146  (goal < 70)
  Trig 261  HDL 34  Non-HDL = 198
Follow-up Case

- Cholesterol on Crestor 20 mg
  - Tot Chol 146 (232)
  - Trig 229 (261)
  - LDL 74 (146)
  - HDL 28 (34)
  - NonHDL 118 (198)

BP 132/78  Weight 315  BMI = 38.3  Stopped smoking 10 m
On Chlothalidone, Crestor, Avapro, Metoprolol Bupropion Metformin + other meds as before

Summary 53 y/o man who smokes to manage anger. Stopped smoking, BP controlled, LDL chol near goal
Identify strategies to motivate patients to stop smoking
How Can a Motivation Theory help?

- 30% of all prescriptions are never filled
- Only 40% of patients
  - Persist with lifestyle change for > 1 year
  - stay on medications as intended
  - Are able to stop smoking in best of treatments
Motivation & Health Behavior

- What is motivation?
Motivation & Health Behavior

• Motivation is human energy (psychological energy) directed at a particular goal

• Energy and goals need to be accounted for to understand motivation and how to facilitate maintenance of the desired behavior or change.

• Motivation for growth and health is intrinsic
Motivation & Health Behavior

• You have just learned that your bad (LDL) cholesterol is high, raising your risk for having a stroke or heart attack.

• What interpersonal qualities would you want in your health care practitioner to begin to deal with this information about your health?
Psychological Needs: Supporting Optimal Motivation

- **Autonomy**
  - the need to feel choiceful and volitional in one’s behavior

- **Competence**
  - the need to feel optimally challenged and capable of achieving outcomes

- **Relatedness**
  - the need to feel connected to and understood by important others

Ryan & Deci, 2000
### Table 1
A list of need-supportive behaviors derived from self-determination theory.

<table>
<thead>
<tr>
<th>Autonomy Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Elicit and acknowledge the patient's perspectives and feelings</td>
</tr>
<tr>
<td>2. Explore the patient's values and how they relate to the behavior being addressed</td>
</tr>
<tr>
<td>3. Provide a clear rationale for advice given</td>
</tr>
<tr>
<td>4. Provide effective options for change and acknowledge the option of not changing</td>
</tr>
<tr>
<td>5. Support the patient's self-initiation for change</td>
</tr>
<tr>
<td>6. Minimize pressure and control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Competence Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Be positive that the patient can succeed</td>
</tr>
<tr>
<td>2. Provide accurate, effectance-relevant feedback</td>
</tr>
<tr>
<td>3. Identify barriers to change</td>
</tr>
<tr>
<td>4. Engage the patient in skills-building and problem-solving</td>
</tr>
<tr>
<td>5. Develop a plan that is appropriate for the patient's abilities</td>
</tr>
<tr>
<td>6. Reframe failures as short successes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relatedness Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Develop empathy</td>
</tr>
<tr>
<td>2. Develop a warm, positive interpersonal relationship</td>
</tr>
<tr>
<td>3. Remain non-judgmental and provide unconditional positive regard</td>
</tr>
</tbody>
</table>

Psychological Needs

- Needs are defined as:

  “psychological nutriments that are essential for ongoing psychological growth, integrity, and well-being”

Internalization

- an inherent, proactive process by which autonomous and competence motivations are increased naturally over time
Medical Professionalism – A Physician Charter & Biomedical Ethics

- Primacy of patient welfare: a dedication to serving patients’ interests

- Patient autonomy: to empower patients to make informed decisions

- Social justice: to eliminate discrimination
US Preventive Services Task Force also adds patient autonomy in 2002

- USPSTF added ‘Agree’ to 5A’s model
  - **Assess** – patient history
  - **Advise** – provide clear advice and rationale
  - **AGREE-is patient willing to adopt treatment**
  - **Assist-** skills build, problem solve, prescribe
  - **Arrange** follow-up

Whitlock et al., Amer J. Prevent Med 2002
SDT Meta-Analysis

Figure 3. Path diagram of Williams et al.’s (2002, 2006) model using meta-analyzed correlations ($n = 13,356$). All paths are significant at $p < .05$; residual variances are omitted for presentation simplicity.

$\chi^2 (3) = 76.25$, $p < .01$, $CFI = .98$, $RMSEA = .07$, $SRMR = .03$. 
Smoker’s Health Study Design

Randomized controlled trial of 30 mo.

Questionnaire assessments:
* autonomous motivation
* perceived competence
* autonomy support

Outcomes:
* Took Medication
* Tobacco Abstinence at 6, 18, and 30 months
* Reduction in % calories from fat, LDL-C

SDT + Tobacco and Cholesterol Guideline

- Intensive Treatment included (4 visits/6 months)
  - 10 year risk for CVD and benefit of stopping
  - Need support and information giving
  - Explore barriers and values
  - Shared decision making used to set plan
  - Problem solving/skills building
  - Pharmacotherapy (smoking only)

- Control: Community care, encourage MD visit

Williams et al., Health Psych 2006
The Intervention

- The clinical endpoint of the intervention was to guide the patient to making a clear choice about whether he wanted to change or not.

- If the patient wanted to stop smoking or change diet then the clinician provided competence training on how to reach that
### Motivation and Medication Use in Intervention and Control Groups

<table>
<thead>
<tr>
<th></th>
<th>Intensive Intervention</th>
<th>Community Care</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomy Support</td>
<td>6.26</td>
<td>5.66</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Autonomous Motivation</td>
<td>5.86</td>
<td>5.64</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Perceived Competence</td>
<td>4.76</td>
<td>4.22</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Days on Medication</td>
<td>29.90</td>
<td>7.78</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>

# Health Outcomes at 6-months and 18-months

<table>
<thead>
<tr>
<th></th>
<th>All Patients</th>
<th>Odds Ratio</th>
<th>PHS Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-month 7-day Point Prevalence</td>
<td></td>
<td>2.9</td>
<td>2.5</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>Patients who Did Not Want to Quit</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-month 7-day Point Prevalence</td>
<td></td>
<td>2.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>All Patients</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-month Prolonged Abstinence at 18-months</td>
<td></td>
<td>2.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Patients with Elevated LDL-C</th>
<th>Intervention</th>
<th>Control</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-month Change in LDL-C</td>
<td></td>
<td>8.0 mg/dl</td>
<td>4.0 mg/dl</td>
<td>&lt; 0.05</td>
</tr>
</tbody>
</table>
Explain how tobacco use compromises health of those with COPD, CVD, or DM, and benefits of cessation.
Smoking in Perspective

- Kills more than 435,000 Amer. each year
- 21% of adult Americans smoke
- 4,000 12-17 y/o smoke first cig. every day
- 1,200 become daily cig smokers
- Causes cancer, CHD, stroke, pulmonary disease, and adverse preg. outcomes - shortens life expectancy 14 years
- Adds $193 billion in costs per year
- One-third of all tobacco users in U.S. will die prematurely
Tobacco is Carcinogenic
Nicotine, Although Addictive, is Not Carcinogenic

- Tobacco smoke contains greater than 60 carcinogenic agents and approximately 200 known toxins
- Smoking cigarettes with lower yields of tar has not been proven to decrease associated risks
- Nicotine is not carcinogenic
- Nicotine is the substance in cigarettes that causes addiction

<table>
<thead>
<tr>
<th>Carcinogenic/Toxic Chemicals in Tobacco Smoke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia</td>
</tr>
<tr>
<td>Arsenic</td>
</tr>
<tr>
<td>Cadmium</td>
</tr>
<tr>
<td>Carbon monoxide</td>
</tr>
<tr>
<td>Formaldehyde</td>
</tr>
<tr>
<td>Hydrogen cyanide</td>
</tr>
<tr>
<td>Toluene</td>
</tr>
</tbody>
</table>

Environmental Tobacco Smoke

- Kills 1 person, for every 8 killed by primary smoke
- 50,000 premature deaths each year
  - Conclusion of 3 independent scientific reports
  - 1 million ER visits for asthma each year
  - Platelet activation is predominate mechanism
    - Exp. to 1% of smoke has RR for CVD is 1.5
    - Exposure to smoking 20 cigs per day RR is 2.0
  - Banning ETS led to a 10-40% reduction in MI’s
- Causes all diseases that primary smoke does
- Tobacco industry spends billions arguing this point

Surgeon Gen Report 2006
Health Benefits of Cessation

- **After 20 minutes**, your heart rate drops
- **After 12 hrs**, carbon monoxide level in your blood returns to normal
- **At 2 wks - 3 months**, your lung function begins to improve & your heart attack risks begin to drop
- **After 1 year**, CHD & stroke risk is half of a continued smoker’s
- **After 5 years**, oral & esophageal cancer risks are halved
- **After 10 years**, lung cancer death rate is half of a smoker’s

InterHeart Study

Case Control Study of 27,000 for AMI

- Tobacco use smoking OR = 2.95
- Tobacco use chewing OR = 2.23
- Tobacco use both OR = 4.09
- Tobacco use former OR = 1.87 wi 3 yr

Tob use and MI Lancet
2006; 368:647-58
The Cycle of Nicotine Addiction in Smokers
Is Reinforcing and Progressive

Nicotine in Cigarettes Is Used for:
- Pleasure
- Enhanced performance
- Self-medication of withdrawal symptoms
- Mood regulation

Tolerance and Physical Dependence
- Tolerance related to both upregulation (increased number) and desensitization of nicotine receptors
- 2-hour half-life of nicotine and rapid clearance from CNS in combination with upregulation and decreased sensitivity can result in withdrawal symptoms and urge to smoke

Abstinence May Produce Nicotine Withdrawal Symptoms
- Dysphoric or Depressed Mood
- Irritability, Frustration, or Anger
- Increased Appetite or Weight Gain
- Difficulty Concentrating
- Urge to Smoke
- Insomnia
- Anxiety
- Restlessness
- Decreased Heart Rate
- Lightheadedness

Tobacco Dependence as a Chronic Disease

- Tobacco dependence demonstrates features of a chronic disease:
  - Long-term disorder
  - Periods of relapse and remission
  - Requires ongoing rather than acute care
Ten Key Guideline Recommendations

4. Brief tobacco dependence treatment is effective. Clinicians should offer every patient who uses tobacco at least the brief treatments shown to be effective in this Guideline.

*2008 Clinical Practice Guideline. Treating Tobacco Use and Dependence
# Efficacy of Interventions Delivered by Various Types of Clinicians ($n = 29$ studies)

<table>
<thead>
<tr>
<th>Type of Clinician</th>
<th>Odds Ratio (95%) CI</th>
<th>Estimated Abstinence Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>No clinician (reference group)</td>
<td>1.0</td>
<td>10.2%</td>
</tr>
<tr>
<td>Self-help</td>
<td>1.1 (0.9-1.3)</td>
<td>10.9%</td>
</tr>
<tr>
<td>Non-physician clinician</td>
<td>1.7 (1.3-2.1)</td>
<td>15.8%</td>
</tr>
<tr>
<td>Physician clinician</td>
<td>2.2 (1.5-3.2)</td>
<td>19.9%</td>
</tr>
</tbody>
</table>
### Efficacy of Interventions for Total contact Time ($n = 35$ studies)

<table>
<thead>
<tr>
<th>Type of Clinician</th>
<th>Odds Ratio (95%) CI</th>
<th>Estimated Abstinence Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>No minutes (reference group)</td>
<td>1.0 (1.0)</td>
<td>11%</td>
</tr>
<tr>
<td>4-30 min</td>
<td>1.9 (1.5-2.3)</td>
<td>18.8%</td>
</tr>
<tr>
<td>31-90 min</td>
<td>3.0 (2.3-3.8)</td>
<td>26.5%</td>
</tr>
<tr>
<td>91-300 min</td>
<td>3.2 (2.3-4.6)</td>
<td>28.4%</td>
</tr>
</tbody>
</table>
Ten Key Guideline Recommendations

5. Individual, group, and telephone counseling are effective, and their effectiveness increases with treatment intensity. Two components of counseling are especially effective, and clinicians should use these when counseling patients making a quit attempt:

- Practical counseling (problem-solving/skills training)
- Social support delivered as part of treatment

*2008 Clinical Practice Guideline. Treating Tobacco Use and Dependence
Ten Key Guideline Recommendations

- Seven first-line medications (5 nicotine and 2 non-nicotine) reliably increase long-term smoking abstinence rates:

  - Bupropion SR
  - Nicotine gum
  - Nicotine inhaler
  - Nicotine lozenge
  - Nicotine nasal spray
  - Nicotine patch
  - Varenicline

- Clinicians also should consider the use of certain combinations of medications identified as effective in this Guideline.

2008 Clinical Practice Guideline. Treating Tobacco Use and Dependence
Meta-analysis (2008): Effectiveness for various medications compared to placebo at 6-months postquit (n= 83 studies) Table 6.26

<table>
<thead>
<tr>
<th>Medication</th>
<th>Number of arms</th>
<th>Estimated odds ratio (95% C.I.)</th>
<th>Estimated abstinence rate (95% C.I.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placebo</td>
<td>80</td>
<td>1.0</td>
<td>13.8</td>
</tr>
</tbody>
</table>

**Monotherapies**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Number of arms</th>
<th>Estimated odds ratio (95% C.I.)</th>
<th>Estimated abstinence rate (95% C.I.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varenicline (2 mg/day)</td>
<td>5</td>
<td>3.1 (2.5-3.8)</td>
<td>33.2 (28.9-37.8)</td>
</tr>
<tr>
<td>Nicotine Nasal Spray</td>
<td>4</td>
<td>2.3 (1.7-3.0)</td>
<td>26.7 (21.5-32.7)</td>
</tr>
<tr>
<td>High-Dose Nicotine Patch (&gt;25 mg) (included both standard or long-term duration)</td>
<td>4</td>
<td>2.3 (1.7-3.0)</td>
<td>26.5 (21.3-32.5)</td>
</tr>
<tr>
<td>Long-Term Nicotine Gum (&gt;14 weeks)</td>
<td>6</td>
<td>2.2 (1.5-3.2)</td>
<td>26.1 (19.7-33.6)</td>
</tr>
<tr>
<td>Varenicline (1 mg/day)</td>
<td>3</td>
<td>2.1 (1.5-3.0)</td>
<td>25.4 (19.6-32.2)</td>
</tr>
<tr>
<td>Nicotine Inhaler</td>
<td>6</td>
<td>2.1 (1.5-2.9)</td>
<td>24.8 (19.1-31.6)</td>
</tr>
<tr>
<td>Clonidine</td>
<td>3</td>
<td>2.1 (1.2-3.7)</td>
<td>25.0 (15.7-37.3)</td>
</tr>
<tr>
<td>Bupropion SR</td>
<td>26</td>
<td>2.0 (1.8-2.2)</td>
<td>24.2 (22.2-26.4)</td>
</tr>
<tr>
<td>Nicotine Patch (6-14 weeks)</td>
<td>32</td>
<td>1.9 (1.7-2.2)</td>
<td>23.4 (21.3-25.8)</td>
</tr>
<tr>
<td>Long-Term Nicotine Patch (&gt;14 weeks)</td>
<td>10</td>
<td>1.9 (1.7-2.3)</td>
<td>23.7 (21.0-26.6)</td>
</tr>
<tr>
<td>Nortriptyline</td>
<td>5</td>
<td>1.8 (1.3-2.6)</td>
<td>22.5 (16.8-29.4)</td>
</tr>
<tr>
<td>Nicotine Gum (6-14 weeks)</td>
<td>15</td>
<td>1.5 (1.2-1.7)</td>
<td>19.0 (16.5-21.9)</td>
</tr>
</tbody>
</table>

From PHS 2008 guidelines pg 109
Nicotine Delivery by Cigarettes and Nicotine Replacement Therapy (NRT)

- Cigarette (nicotine delivery, 1-2mg)
- Gum (nicotine delivery, 4mg)
- Nasal spray (nicotine delivery, 1mg)
- Transdermal patch (nicotine delivery, 15-21mg)

Plasma Nicotine Concentration (μg/L)

Time Post-administration (minutes)

- NRT has rates of delivery which are all less than that of cigarette smoking
- NRT acts as an agonist alone, mimicking nicotine in its mechanism of action
- Peak levels achieved by NRT are about 30-50% of those achieved by smoking

Adapted from:
Ten Key Guideline Recommendations

7. Counseling and medication are effective when used by themselves for treating tobacco dependence. The combination of counseling and medication, however, is more effective than either alone. Thus, clinicians should encourage all individuals making a quit attempt to use both counseling and medication.

*2008 Clinical Practice Guideline. Treating Tobacco Use and Dependence
Meta-analysis (2008): Effectiveness of and estimated abstinence rates for the combination of counseling and medication vs. counseling alone (n= 9 studies). Table 6.24

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Number of arms</th>
<th>Estimated odds ratio (95% C.I.)</th>
<th>Estimated abstinence rate (95% C.I.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counseling alone</td>
<td>11</td>
<td>1.0</td>
<td>14.6</td>
</tr>
<tr>
<td>Medication and counseling</td>
<td>13</td>
<td>1.7 (1.3-2.1)</td>
<td>22.1 (18.1-26.8)</td>
</tr>
</tbody>
</table>

From PHS 2008 guidelines pg 103
Pharmacotherapeutic Interventions

- All patients attempting to quit smoking should be encouraged to use pharmacotherapy except under special circumstances such as:
  - Medical contraindications
  - Smoking fewer than 10 cigarettes/day
  - Pregnant/breastfeeding women
  - Adolescents
COPD and Smoking
Amer. Lung Association Fact Sheet 9-2013

Mortality

- COPD is the third leading cause of death in America, claiming the lives of 133,965 Americans in 2009.

Prevalence (2011)

- 12.7 million U.S. adults (aged 18 and over) were estimated to have COPD. However, close to 24 million U.S. adults have evidence of impaired lung function, indicating an under diagnosis of COPD.

- COPD prevalence ranged from less than 4 percent in Washington and Minnesota to more than 9 percent in Alabama and Kentucky.
COPD and Smoking
Amer. Lung Association Fact Sheet 9-2013

Gender Differences
- For 10 years women have exceeded men in the number of deaths attributable to COPD. In 2009, more than 70,000 females died compared to almost 64,000 males.

Causes
- Smoking is the primary risk factor for COPD. Approximately 85 to 90 percent of COPD deaths are caused by smoking.

- Other risks: exposure to air pollution, secondhand smoke and occupational dusts and chemicals, heredity, and a history of childhood respiratory infections and socioeconomic status.

- Alpha1 antitrypsin deficiency-related (ATT) emphysema accounts for 2-3% of emphysema in US. Smoking + ATT results in emphysema between 32 and 41 years of age on average.
COPD and Smoking
2010 Report of the Surgeon General

Conclusions

1. Oxidative stress from exposure to tobacco smoke has a role in the pathogenetic process leading to chronic obstructive pulmonary disease.

2. Smoking cessation remains the only proven strategy for reducing the pathogenetic processes leading to chronic obstructive pulmonary disease.

The CDC recommends those with COPD not be exposed to any form of smoke

- Primary or second smoke from tobacco
- Campfires
- Cooking or grilling
Diabetes and Smoking
CDC 10-2013

- 8.3% of population has diabetes in the US and the prevalence is increasing.
- Adults who are Black, poor, less educated, low income, and unemployed – the same groups that have higher smoking rates – have higher diabetes prevalence rates.
- Smoking increases insulin resistance.
  - Smoking is a cause of Type 2 Diabetes -12% of cases in the US.
  - Smoking or chewing tobacco worsens diabetes control
  - Smokers who stop have better control of diabetes within 8 weeks
- Smoking and Diabetes are synergistic in causing atherosclerosis (8-10 times faster)
  - Increased rates of stroke, heart attack, and kidney disease
  - Increased rates of peripheral vascular disease
- Smoking and Diabetes increase the risk for microvascular complications of DM
  - Retinopathy
  - Peripheral neuropathy
Diabetes and Smoking

Smoking, Pregnancy and Diabetes

- Women who smoked heavily during pregnancy increased the likelihood of their children later developing Type 2 diabetes as adults by almost five-fold.

Benefits of Quitting Smoking

- People with diabetes who quit regain control over their blood glucose levels and achieve better A1c levels over time. Other benefits: less insulin resistance, fewer diabetes complications, better blood circulation, lower blood pressure, lower blood cholesterol levels, and subsequently lower risk for heart disease.

- Former smokers reduce their risk of diabetes to that of never smokers after 5 years for women and after 10 years for men.
CVD Risk

- 40% of men and 45% of women will get CVD in their lifetime (25% die from it).

- This is our biggest single risk all of us face over a lifetime.

- Tobacco use, and chol. account for 66% of first heart attacks, and 9 risk factors > 90%.

Yusuf et al., INTERHEART Lancet 2004;364:953-962
CVD and Smoking

AHA Lloyd- Jones et al., Circulation. 2010; 121: e46-e215

Mortality

- Current cigarette smoking is a powerful independent predictor of cardiac arrest in patients with CHD.

- After up to 14.5 years of follow-up of participants in the Lung Health Study of the NHLBI, the all-cause death rate among participants in a smoking-cessation intervention was significantly lower (15%) than among those given usual care.

Aftermath

- Among ever-smokers who had 1 circulatory disorder, 52.1% were current smokers, and among those who reported that they had 3 circulatory disorders, 28% were current smokers at the time of the interview.
Conclusions

1. There is a nonlinear dose response between exposure to tobacco smoke and cardiovascular risk, with a sharp increase at low levels of exposure (including exposures from secondhand smoke or infrequent cigarette smoking) and a shallower dose-response relationship as the number of cigarettes smoked per day increases.

2. Cigarette smoking leads to endothelial injury and dysfunction in both coronary and peripheral arteries. There is consistent evidence that oxidizing chemicals and nicotine are responsible for endothelial dysfunction.

3. Tobacco smoke exposure leads to an increased risk of thrombosis, a major factor in the pathogenesis of smoking-induced cardiovascular events.

4. Cigarette smoking produces a chronic inflammatory state that contributes to the atherogenic disease processes and elevates levels of biomarkers of inflammation, known powerful predictors of cardiovascular events.
5. Cigarette smoking produces an atherogenic lipid profile, primarily due to an increase in triglycerides and a decrease in high-density lipoprotein cholesterol.

6. **Smoking cessation reduces the risk of cardiovascular morbidity and mortality for smokers with or without coronary heart disease.** (50% reduction in 1 year).

7. The use of nicotine or other medications to facilitate smoking cessation in people with known cardiovascular disease produces far less risk than the risk of continued smoking.

8. **The evidence to date does not establish that a reduction of cigarette consumption (that is, smoking fewer cigarettes per day) reduces the risks of cardiovascular disease.**

9. Cigarette smoking produces insulin resistance and chronic inflammation, which can accelerate macrovascular and microvascular complications, including nephropathy.
International Atherosclerosis Society Guideline 2013

- New lipids goals for those on Statins:
  - Without CVD: LDL < 100 mg/dl
  - With CVD: LDL < 70 mg/dl
Identifying Persons at Long-term Risk for ASCVD

- Long-term risk takes precedence over short-term risk for decisions about dyslipidemia intervention
- Long-term risk = risk to age 80 years
Levels of Long-term Risk for ASCVD (up to age 80)

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Total Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>≥ 45%</td>
</tr>
<tr>
<td>Moderately high</td>
<td>30-44%</td>
</tr>
<tr>
<td>Moderate</td>
<td>15-29%</td>
</tr>
<tr>
<td>Low</td>
<td>&lt; 15%</td>
</tr>
</tbody>
</table>
Framingham Heart Study
10 and 30 year risk for CVD

<table>
<thead>
<tr>
<th></th>
<th>10 year risk (optimal)</th>
<th>30 year risk (optimal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 y/o Male</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TC=170; HDL 36 SBP 125</td>
<td>9% (4%)</td>
<td>34% (18%)</td>
</tr>
<tr>
<td>With Diabetes</td>
<td>15%</td>
<td>54%</td>
</tr>
<tr>
<td>With Smoking</td>
<td>16%</td>
<td>47%</td>
</tr>
<tr>
<td>With Smoking and Diabetes</td>
<td>27%</td>
<td>63%</td>
</tr>
</tbody>
</table>
Framingham Heart Study
10 and 30 year risk for CVD

<table>
<thead>
<tr>
<th>50 y/o Female</th>
<th>10 year risk (optimal)</th>
<th>30 year risk (optimal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC=220; HDL 50; SBP 130</td>
<td>4% (2%)</td>
<td>23% (11%)</td>
</tr>
<tr>
<td>With Diabetes</td>
<td>8.5%</td>
<td>39%</td>
</tr>
<tr>
<td>With Smoking</td>
<td>7.3%</td>
<td>47%</td>
</tr>
<tr>
<td>With Smoking and Diabetes</td>
<td>14%</td>
<td>53%</td>
</tr>
</tbody>
</table>
Effects of Treatment

- Statin medications lower risk by 40%
- Therapeutic Lifestyle Change 10%
- Physical activity 20%
- Blood pressure medications 25%
- Aspirin 20%
- Statins + physical activity 70%
- Stopping smoking 50%

Yusuf et al., INTERHEART Lancet 2004;364:953-962
Summary Chronic Disease

- Both primary smoke and second smoke significantly worsen COPD, CVD, DM

- Stopping smoking completely and avoiding exposure provide significant improvement

- Intensive treatment is recommended
Demonstrate an interview with a smoker with chronic disease.
Role Play – Heart Disease Risk

- A 53 yo female with Tot chol = 220:
  - HDL Chol of 50 mg/dl; LDL = 150 mg/dl
  - No family history of CVD
- HTN (BP=131/84) on treatment
- DM - ; Smoking +
- 30 yr = 61% (16%); 10 yr = 15% (2.5%)
- How is she motivated about her health?
- Do I support her needs?
TAKE HOME POINT
The “5 A’s”

- ASSESS tobacco use and relevant risks
- ADVISE to quit
- AGREE collaboratively set goals
  - willingness to go for intensive treatment
- ASSIST in quit attempt
- ARRANGE for follow-up
Elements of a Counseling Intervention

STAR

- **Set** a quit date - negotiate within 2 weeks ideally

- **Tell** others about your plan - family, friends, and ask for support

- **Anticipate** challenges, including withdrawal

- **Remove** all tobacco products. Before quitting, avoid smoking in places where you spend a lot of time (house, work, and car)
For Discussion

- Choice points – different paths?
- Was autonomy supported?
- How was advice provided?
- Was my treatment ethical?
- Did I support competence?
- Were you motivated?
- Other comments?
Review suggestions for a team approach to help patients stop smoking.
Assessment of Tobacco Use

Patient Presents to a Health Care Setting

Does Patient Now Use Tobacco?

YES

Is Patient Now Willing To Quit?

YES

Provide Appropriate Treatments

NO

Promote Motivation To Quit

YES

Prevent Relapse

NO

Encourage Continued Abstinence

NO

Did Patient Once Use?

NO

Prevent Relapse

YES

Encourage Continued Abstinence
VITAL SIGNS

Blood Pressure: ________________________________

Pulse: ______________________ Weight: ________________

Temperature: ______________________________________

Respiratory Rate: ________________________________

Tobacco Use: Current Former Never

(circle one)
The “5 A’s”
For Patients Willing to Quit

- **ASSESS** tobacco use and related risks
- **ADVISE** to quit
- **AGREE** collaboratively set goals
  - willingness to go for intensive treatment
- **ASSIST** in quit attempt
- **ARRANGE** for follow-up
Clinical Implications

- Health Care Practitioners who learn to support psychological needs:
  - Elicit perspectives (listen)
  - Acknowledge affect (reflect)
  - Provide effective options for change
  - Provide clear advice (rationale) for change
  - Support initiative for change
  - Minimize control and remain non-judgmental
  - Skills build/problem solve with those willing
  - Provide a positive relationship

- May be more likely to motivate change, health, and improve quality of life for their patients.
In Summary

- Brief tobacco dependence treatment is effective and every patient who uses tobacco should be identified, urged to quit, and offered at least one of these treatments:
  - Patients willing to quit should be provided treatments identified as effective
  - Patients unwilling to quit should be provided an intervention to increase their motivation to quit
Intensive interventions should be provided whenever possible.

Systems level interventions including reimbursement for effective treatments are essential.
Conclusion

- Research regarding the treatment of tobacco use and dependence continues to grow exponentially.

- The challenge is translation—ensuring that the practice of treating tobacco use and dependence keeps pace with the research.
References

References

Case - Threshold

- 56 y/o male who doesn’t smoke or have family history of CVD. No diabetes BMI = 24
  - Never smoked
  - BP 115/72
  - Total Chol = 165 LDL = 100 HDL = 35
    - Vascular age = 57 y/o
    - 10 year risk = 11.4% Optimal = 5%
    - 30 year risk = 37% Optimal = 13%

- Do you recommend this person start medication?
Factors to Consider When Prescribing a Pharmacotherapy

- Medications can double or triple quit rates
- Contraindications for selected patients
- Previous patient experiences with NRT
- Patient characteristics: weight, depression
- Patient preference: gum vs. patch

Clinical Guidelines, 2000
Role Play 1a – Heart Disease Risk

- A 50 yo male with Hx chol = 300:
  - Tot Chol of 250 mg/dl (LDL = 170 mg/dl)
  - Brother with angina at age 55 1 year ago
- HDL = 42
- BP = 138/82
- Do I support his needs?
Role Play 1b – Heart Disease Risk

- A 50 yo male with Hx chol = 300:
  - Tot Chol of 250 mg/dl (LDL = 170 mg/dl)
  - Brother with angina at age 55 1 year ago
- Trying for 1 year to lower with lifestyle
- 10 year risk is 10%
- 30 year risk is 56%
- He returns …
- Do I support his needs?
Weight Gain

Clinicians should openly address postcessation weight gain concerns:

- Acknowledge weight gain is likely but typically limited
- Encourage concentration on smoking cessation now, weight control later
- Recommend healthy diet and physical activity
- Consider pharmacotherapy, particularly bupropion SR and nicotine gum, shown to delay (but not prevent) weight gain
Preventing Relapse

- Relapse prevention interventions should be provided with every smoker who has recently quit.
- Crucial to address relapse the first 3 months after quitting.
- Strategies to use with recent quitters:
  - Encourage continued abstinence.
  - Invite discussion of benefits, success milestones, problems encountered or anticipated.
  - Use or refer to an intensive intervention as appropriate.
Barriers to Quitting

- Healthcare providers do not frequently ask their diabetic patients if they smoke nor advise them to quit.

- Patients think that quitting smoking is less important than avoiding certain foods or limiting intake of alcohol.

- Because smoking suppresses appetite for some, people with diabetes may view smoking as a strategy for controlling their weight and better managing their diabetes. People with diabetes are concerned about possible weight gain associated with quitting.

- People with diabetes are at greater risk for depression. Because nicotine is a mood-altering drug (acts as a sedative and alleviates anxiety when it first reaches the brain), smokers with diabetes may be using cigarettes as a way of coping with depression.
CVD and Smoking
The CDC “Health Effects of Cigarette Smoking” fact sheet

— Cigarette smokers are 2 to 4 times more likely to develop CHD than are nonsmokers.

— Cigarette smoking approximately doubles a person’s risk for stroke.

— Cigarette smokers are 10 times as likely as nonsmokers to develop peripheral vas. ds.

— Smoking increases the risk of abdominal aortic aneurysm.

— Cigarette smoking results in a 2- to 3-fold increased risk of dying of CHD.
Optimal Levels of Atherogenic Cholesterol vs. Goals of Therapy

- Optimal levels represent those that produce a maximal risk reduction through reasonably available therapies.
- Goals of therapy depend on clinical judgment and are based on projected efficacy, cost-effectiveness, and safety of available therapies.
- When drug therapies are employed, optimal levels usually represent a reasonable goal of therapy.
## IAS Recommendations for Cholesterol-Lowering Therapy at Different Risk Levels

<table>
<thead>
<tr>
<th>Risk Level to Age 80s</th>
<th>Low (&lt;15%)</th>
<th>Moderate (15-24%)</th>
<th>Moderately High (25-40%)</th>
<th>High (&gt;40%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapeutic Intensity</td>
<td>Moderate</td>
<td>Moderately High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Specific Therapy</td>
<td>Public health guidelines + CLD optional</td>
<td>MLT + CLD consideration</td>
<td>MLT + CLD indication</td>
<td></td>
</tr>
</tbody>
</table>

**MLT** = Maximal lifestyle therapy  
**CLD** = Cholesterol-lowering drugs