Tobacco Related Diseases and Your Employees

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Tobacco use is still the leading cause of preventable death in Maryland

- Smoking kills an average of 6,861 Marylanders’ every year
- Another 145,000 suffer from a smoking-related illness
- $2 billion in annual medical expenses
- $1.8 billion in lost productivity
Smoking-Attributable Health Care Expenditures: Maryland

% of Health Care Expenditures - Smoking

- Hospitalization: 10.28%
- Prescription Drugs: 9.10%
- Nursing Home: 7.45%
- Ambulatory Care: 4.58%
- Other Expenses: 3.26%
Tobacco Use is the Single Largest Preventable Cause of Death and Disease in the United States

- Health consequences of tobacco use
  - Heart disease
  - Multiple types of cancer
  - Pulmonary disease
  - Adverse reproductive effect
  - Chronic health conditions

- 443,000 Americans die each year

- Smoking costs United States $193 billion in medical expenses and lost productivity
Percentage of Daily Smokers Aged ≥18 years, by Number of Cigarettes Smoked Per Day (CPD), 2005-2010
Tobacco use damages virtually every part of the body

**Smoking**

- **Cancers**
  - Larynx
  - Oropharynx
  - Oesophagus
  - Trachea, bronchus or lung
  - Acute myeloid leukemia
  - Stomach
  - Pancreas
  - Kidney and Ureter
  - Colon
  - Cervix
  - Bladder

- **Chronic Diseases**
  - Stroke
  - Blindness, Cataracts
  - Periodontitis
  - Aortic aneurysm
  - Coronary heart disease
  - Pneumonia
  - Atherosclerotic peripheral vascular disease
  - Chronic obstructive pulmonary disease (COPD), asthma, and other respiratory effects
  - Hip fractures
  - Reproductive effects in women (including reduced fertility)

**Secondhand Smoke**

- **Children**
  - Brain tumours*
  - Middle ear disease
  - Lymphoma*
  - Respiratory symptoms, impaired lung function
  - Asthma*
  - Sudden Infant Death Syndrome (SIDS)
  - Leukemia*
  - Lower respiratory illness

- **Adults**
  - Stroke*
  - Nasal irritation, Nasal sinus cancer*
  - Breast cancer*
  - Coronary heart disease
  - Lung cancer
  - Atherosclerosis*
  - Chronic obstructive pulmonary disease (COPD)*, Chronic respiratory symptoms*, Asthma*, Impaired lung function*
  - Reproductive effects in women: Low birth weight; Pre-term delivery*

* Evidence of causation: suggestive
Evidence of causation: sufficient
Data – Understanding the Burden of Tobacco

• Tobacco use causes
  – Cancer
  – Heart disease
  – Lung diseases
  – Premature birth, low birth weight, stillbirth, and infant death

• Secondhand smoke causes
  – Heart disease and lung cancer
  – Severe asthma attacks
  – Respiratory infections
  – Ear infections
  – Sudden infant death syndrome (SIDS)

• Tobacco use is the single most preventable cause of death and disease in the United States

• Each year, approximately 443,000 Americans die from tobacco-related illnesses

• Tobacco use costs the U.S. $193 billion annually in direct medical expenses and lost productivity
Impact of Reducing Cigarette Smoking On Chronic Disease

**COPD**
- 90% of Chronic Obstructive Pulmonary Disease

**Cancers**
- 80-90% of lung
- 30-50% of colon
- 75% of oral (w/ alcohol)
- Cancers of the bladder, cervix, esophagus, larynx, kidney & pancreas

**Diabetes**
- Leads to neuropathy & peripheral artery disease
- Smoking increases the risk of amputation by 2 – 10 times

**CVD**
- 2-4 x risk of coronary heart disease
- 2 x risk of sudden cardiac death
- Abdominal aortic aneurysm
- Strokes
- Atherosclerosis & congestive heart failure

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Tobacco
Mechanisms of Disease Production

• There is no risk free level of exposure to tobacco smoke

• Inhalation of tobacco smokes complex chemical mixture of combustion compounds causes adverse health outcomes through:
  – DNA damage
  – Inflammation
  – Oxidative stress
  – Risk and severity directly related to duration and level of exposure
Tobacco
Mechanisms of Disease Production

• Insufficient evidence that product modification strategies to lower toxicant emissions in tobacco:
  – Reduce risk for major adverse health outcomes

• Sustained use and long term exposure to tobacco smoke:
  – Mediated by diverse actions of nicotine at multiple nicotinic receptors in the brain
    • Powerfully addictive
Tobacco and Cancer
Mechanisms of Disease Production

- Carcinogen exposure and resultant DNA damage in smokers direct result of numerous cytogenetic changes present in lung cancer
  - Mutations in TP53 and KRAS in lung cancer
  - Promoter methylation of key tumor suppressor genes such as P16 in smoking-caused cancers
  - Nicotine and 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone activate signal transduction
    - Receptor mediated events
    - Allow survival of damaged epithelial cells that would normally die
Tobacco and Cancer
Mechanisms of Disease Production

- Metabolic activation of cigarette smoke carcinogens by cytochrome P-450 enzymes has a direct effect on the formation of DNA adducts.
- Consistent evidence for an inherited susceptibility of lung cancer.
  - Some less common genotypes are unrelated to familial clustering of smoking behaviors.
- Smoking cessation is the only proven strategy to reduce the pathogenic process leading to cancer.
Tobacco and Pulmonary Mechanisms of Disease Production

• COPD
  – Oxidative stress from tobacco smoke exposure has a role in the pathogenic process
  – Inherited genetic variations in genes such as SER-PINA3 is involved in pathogenesis
• Protease-antiprotease imbalance has a role in the pathogenesis of emphysema
• Smoking cessation is the only proven strategy for reducing the pathogenic process leading to COPD
Summary

Tobacco Mechanisms of Disease

• Smoking cessation:
  – The only proven strategy to reduce the pathogenic process leading to cancer
  – reduces the risk of cardiovascular morbidity and mortality for smokers with or without coronary heart disease
  – the only proven strategy for reducing the pathogenic process leading to COPD

• Use of nicotine or other medications in patients with known cardiovascular disease produces far less cardiovascular risk than continued smoking