

Tobacco: Health Hazard Information

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Objectives:

- **Current Tobacco Facts**
- **Medical Concerns**
- **Dental Concerns**
- **Cessation Information**

Tobacco Facts

- More than 4,000 chemical compounds in tobacco
- 60 compounds are known carcinogens, tumor initiators, and tumor promoters
- The 60 chemicals include: hydrocarbons (tar), cyanide, phenols, benzene, nitrosamine(s)

Tobacco Facts

- Tobacco plant concentrates two naturally occurring radioisotopes: radium and polonium
- Nicotine is as addictive as opiates

Tobacco Facts

- 1.1 billion smokers worldwide
- Developed countries:
 - 41 % males smoke
 - 21 % females smoke
- Developing countries
 - 50 % males
 - 8 % females

Tobacco Facts

- 3 million deaths per year worldwide
- Smoking causes 20% of all deaths in developed countries
- Every 10 seconds someone dies from smoking related disease
- Current trends show 10 million dying per year by 2020

Tobacco Facts

- China faces 2 to 3 million deaths per year due to tobacco use
- Equates to 50 million Chinese alive today will die prematurely due to tobacco use by the year 2020

Tobacco Facts

- 3,000 US teens become regular smokers each day
- 90% of new smokers are under 18
- 17.2% of HS seniors smoked in 1992; 21.6% in 1995

Tobacco Facts

- Teen smokers more likely to have at-risk lifestyle
- One in five deaths in US tobacco related
- Teens have 73% success rate in buying tobacco

Tobacco Facts

- 50 million smokers in U.S.
- 400,000 tobacco related deaths each year in U.S.
- 20% U.S. mortality
- 1.5 million adults quit each year
- 1.5 million teens start each year

Tobacco Facts

- From 1984 to 1993
 - 19 % decrease of tobacco use among adults
 - 2 % increased use among adolescents
 - 90 % tried before 18th birthday
 - 70 % daily use before 18

Tobacco Facts

- 1995 data
 - 64 % of High School graduates use tobacco
 - 57.6 % 10th graders use
 - 46.4 % 8th graders use
 - 4 : 1 ratio of Caucasians starting tobacco use over other races

Tobacco Facts

- **Smokeless Tobacco:**
 - 2/3rds of male high school seniors have tried it
 - More use in rural areas
 - Majority tried it first in grade school

Tobacco Facts

- **Smokeless Tobacco:**
 - 30% rapid absorption through oral mucosa
 - Increased heart rate and blood pressure
 - More addictive (more nicotine by weight than smoked tobacco)
 - Reduced performance

Tobacco Facts

- Smokeless tobacco produces additional carcinogens when combined with saliva
- 91% of oral cancer patients had used smokeless tobacco

Medical Concerns

- Tobacco is directly related to:
 - cancer
 - low birth weight
 - pulmonary disease
 - coronary disease
 - gastrointestinal disease

Medical Concerns

- Smoking is responsible for 33% of all cancer deaths in men and 23% in women
- Tobacco use is the single major cause of cancer mortality in US and single most important environmental hazard

Medical Concerns

- Smokers 10x more likely to develop lung cancer
- Female smokers have 3 to 4x greater risk of breast cancer

Medical Concerns

- In 1985 tobacco use was attributed to 21% of all mortality in US
- Major tobacco related diseases are lung cancer, COPD, emphysema, and coronary artery disease

Medical Concerns

- Smoking costs the US \$50 billion annually in health care costs alone
- Risk of disease linked to total lifetime exposure

Medical Concerns

- SIDS
 - 1/2 to 2/3 incidence (decreased adrenal catecholamines)
- Placenta abrupta
- Spontaneous abortion
- Nicotine dependence in offspring

Medical Concerns

- Nicotine patch now Category D during pregnancy
- Nicotine is a neurotoxin
- Fetal levels of nicotine higher than for mother

Medical Concerns

- Cigarette smoke causes abnormal genes in eggs of female smokers
- Higher levels of cadmium in fluid surrounding eggs
- Largest number of defects associated with heavy smoking
- Second hand smoke also affects eggs

Medical Concerns

- 4 : 1 ratio of depression in smokers
- More pronounced for females
- May require adjunctive therapy with mood elevators / anti-depressants
- Studies underway with Elavil, Prozac
- 20 % rate of major depression after cessation

Medical Concerns

- Second hand (passive) smoke is harmful
- AHA states 37,000 to 40,000 die annually from second hand smoke in US
- CDC / EPA state approximately 3,000 lung cancer deaths each year in US blamed on second hand smoke

Medical Concerns

- 4 million children are sick each year due to second hand smoke
- Each year 284 die from lung disease and fires from smoke / smoking materials
- 307,000 cases of asthma
- 354,000 cases of middle ear infections

Medical Concerns

- Head and Neck Carcinoma
 - Disease of men 50 to 70 years old
 - Disease of women 60 to 80 years
 - High risk of head and neck cancer with tobacco and alcohol use
 - Nondrinking smokers 2 to 4x risk
 - Drinking smokers 6 to 15x risk

Medical Concerns

- **Head and neck carcinoma:**
 - Spreads in conjunction with lowered immune competence
 - Heavy smokers/drinkers more prone to field cancerization

Medical Concerns

- High risk sites for Head and Neck Carcinoma are:
 - Floor of the mouth (FOM)
 - Ventrolateral tongue
 - Soft palate complex
- US study showed soft palate lesions associated with heavy tobacco use

Dental Concerns

- Tobacco has a role in:
 - prevalence of periodontal disease
 - severity of periodontal disease
 - increased tooth loss
- May be one of the single most risk factors in periodontal disease

Dental Concerns

- Association between ANUG and smoking shown in 1946
- Early research in other areas was sometimes contradictory
- Current research shows direct relationship between tobacco use and periodontal disease

Dental Concerns

- **Recent studies conclude tobacco users have:**
 - **greater bone loss**
 - **increased number of deep pockets**
 - **increased calculus formation**
 - **same or less gingival inflammation**

Dental Concerns

- **Current and former tobacco users are more prevalent treatment groups in US periodontal practices**
- **Severity of disease linked to both amount and number of years of tobacco use**

Dental Concerns

- Smoking adversely alters response to periodontal therapy
- Smokers show (post-surgical) deeper post therapy probing depths and less gain in attachment
- Less reduction in disease in anterior areas

Dental Concerns

- Smokers have a poorer success rate for:
 - soft tissue graft procedures
 - bone graft procedures
 - implants

Dental Concerns

- Tobacco use plays a significant role in refractory periodontitis
 - tobacco users 90% refractory
 - non-users 30% refractory
- No conclusive studies to show tobacco use alters flora

Dental Concerns

- Smoking has been linked to an altered host response to disease:
 - impair host response to neutralizing infection
 - alter host response resulting in destruction of surrounding tissues

Dental Concerns

- Smokers have:
 - decreased levels of salivary IgA
 - decreased serum IgG antibodies to *P. intermedia* and *F. nucleatum*
 - decreased levels of helper lymphocytes

Dental Concerns

- Tobacco has the following effects on neutrophils:
 - impair chemotaxis of neutrophils
 - impair phagocytosis of neutrophils
 - altered oxidative outbursts of neutrophils

Dental Concerns

- Presence of nicotine:
 - alters re-attachment of fibroblasts
 - suppresses proliferation of osteoblasts
 - alters blood flow in gingiva

Dental Concerns

- **Smokeless tobacco (ST) use:**
 - well documented link to oral carcinoma
 - linked to cardiovascular mortality
 - high level of oral leukoplakia
 - users have more severe attachment loss

Cessation Success Rates

- 5 % self quit rate
- 10 % with advice
- 20 % with Group Behavioral Therapy (GBT)
- 20 % with Nicotine Replacement Therapy (NRT)
- 30 % with NRT and GBT

Nicotine Replacement Therapy (NRT)

- 1 : 2 Risk of death related to tobacco use with collateral disease (without NRT)
- 1 : 1 million of death risk with NRT
- Negative evidence of side effects with healthy patients
- Nicotine has not been found to be a carcinogen or a co-carcinogen

Nicotine Replacement Therapy (NRT)

- NRT may have positive effects on:
 - Ulcerative Colitis
 - Alzheimer's
 - Crohn's Disease
- 40 to 50 % decrease in Peptic Ulcer Disease with NRT

Adjunctive Medications

- Nicotine nasal spray
 - 10 mg/ml
 - 0.5 mg per nostril
 - 1.0 mg total dose
 - 1 to 2 doses per hour

Adjunctive Medications

- **Mecamylamine**
 - nicotinic agonist
 - 5 mg BID
 - compensates for decreased nicotine uptake
- **Bupropion**
 - increased quit rates

Bibliography

- Society for Research on Nicotine and Tobacco
- American Cancer Society
- American Heart Association
- National Cancer Institute
- American Academy of Periodontology
- Internet (NicNet)