

Tobacco Use and Prevention

Earl Dowdy, PhD
Executive Director
Virginia Youth Tobacco Project
Virginia Commonwealth University

Tobacco Control

- Scope of the Problem
- Etiological Factors
- Approaches to Prevention

Tobacco: A Public Health Menace

- Tobacco use causes, according to the CDC, >440,000 deaths per year
 - greater toll in human life than that exacted by car accidents, murders, suicides, fires, other drug and alcohol use, and HIV/AIDS, combined
 - without improvements in use prevention, more than 6 million people now 18 and under will die from tobacco's effects
- Over \$75 billion in public and private healthcare costs each year
- Reduces the productivity of Americans by more than \$80 billion per year

Costs of Tobacco Use in Virginia

- \$1.9 billion per year in healthcare expenses
- \$2.3 billion per year in lost productivity
- ~14% of state Medicaid costs go for tobacco attributable diseases – may top \$600 million this year
- ~9,000 Virginians die each year of tobacco attributable diseases
- More that 150,000 Virginians now under 18 will eventually die as a result of tobacco use

Tobacco Use: A Pediatric Disease

- Between 1/2 and 2/3 of Americans under age 19 try cigarettes at least once
- Adolescents who continue to smoke suffer mild airway obstruction and slowed growth of lung function
- Adolescent smokers, on average, have 10% elevation in triglyceride and low density lipoprotein levels, and 8% suppression in HDL levels
- Laboratory studies have shown adolescent age mammals to be more vulnerable than adults to neurological impairment from nicotine exposure, particularly in systems associated with learning and reward
- ~1/3 of people who become regular smokers as adolescents will die of diseases caused by smoking
 - Lung Cancer
 - Coronary Heart Disease
 - Chronic Obstructive Pulmonary Disease

Health Effects

- 90% of cancers of the lung, trachea, and bronchus are caused by tobacco smoke.
- Other cancers associated with tobacco use include those of the mouth, throat, esophagus, larynx, pancreas, bladder, and cervix.

Health Effects

- Smoking also causes coronary heart disease and chronic obstructive pulmonary disease, and it contributes significantly to high blood pressure, stroke, congestive heart failure, and atherosclerosis.

Tobacco effects in unborn babies, infants, young children, and adolescents.

- Mothers who smoke during pregnancy increase the risk of pregnancy complications, premature delivery, low-birth-weight infants, stillbirth, and sudden infant death syndrome (SIDS).
- Nicotine constricts the blood vessels of the umbilical cord and uterus, reducing oxygen flow to the fetus, and maternal prenatal smoking leads to reduced lung function among newborns.
- Nicotine passes to infants through breast milk, even in mothers exposed only to environmental tobacco smoke, such as in a home where the spouse is a smoker.
- A number of studies have produced evidence of lasting neurological effects on children from prenatal nicotine exposure.
- Children and adolescents who smoke or are exposed to environmental tobacco smoke suffer impaired lung function and increased respiratory problems, including coughing, phlegm, and wheezing, and worsened symptoms of asthma.

Tobacco effects in unborn babies, infants, young children, and adolescents.

- Evidence is emerging from animal studies that nicotine causes specific, enduring effects on an array of neurological factors that can result in deficits in adolescent-age brain development and function.
- A recent study of human adolescents found that daily tobacco users suffer impairments in memory and decrements in cognitive performance, and that these neuro-toxic effects are more severe among those who begin to smoke at younger ages.

Tobacco Use Behavior Develops in Stages

Stages-of-Change in Tobacco-Use Initiation and Dependence

- 1) Preparation / contemplation
 - knowledge, beliefs, attitudes, normative expectations are formed
- 2) Initial trying – usually family or peer associated
- 3) Experimentation – irregular use over time
- 4) Regular use – often associated with alcohol use
- 5) Nicotine dependence/addiction
 - often associated with use of 10 or more cigarettes/day
 - dependence-producing dose varies considerably among individuals
 - signs of dependence may occur at a smoking rate of as little as 2 cigarettes/week
 - addiction typically develops within 2 years of first use
 - signs of dependence may appear within two months of first use

Stages-of-Change in Tobacco-Use and Nicotine Dependence

- Different prevention approaches are appropriate at different stages and ages of onset
- Empirical research is underway to understand the complex etiology of tobacco use, and to develop and evaluate prevention and cessation best practices in a range of situations
- An array of variables affects probability of tobacco use and nicotine dependence in individual adolescents, including
 - genotypes, differential gene expression in various neural tissues, and gene-environment interactions
 - gender / body image
 - ethnicity
 - SES, education

Etiological factors: Physiological

- A large part of the propensity of people to initiate tobacco use and to become nicotine dependent is attributable to genetic inheritance - respectively, 75% and 60%, in a recent study.
- Tobacco products, especially tobacco smoke, produce gene-mediated physiological changes in the body that underlie the development of tobacco addiction and various diseases.
- The genetic causes of tobacco use and associated diseases are complex – often governed by multiple, interacting genetic alleles, and hinging upon the expression of certain genes in very specific tissues and at critical periods of development.

Etiological factors: Psychological

- Data from a national sample in the US estimated that 44.3% of cigarette smokers have a mental disorder.
- Another study concluded that nicotine-dependent and psychiatrically ill individuals consume about 70% of all cigarettes smoked in the United States.
- High correlation of tobacco use with alcohol abuse, anxiety, and depression.
- Other factors associated with youth smoking include risk taking, rebelliousness, and poor school performance.

Etiological factors: Socio-cultural

- Use of tobacco by one's family members and age peers contributes significantly to the probability that an individual will initiate tobacco use.
 - Females and body image
- Cultural norms and expectations – as represented in and fostered by community activities, school curricula, entertainment media, and various forms of advertising – also affect individual attitudes and intentions regarding tobacco use.
 - African-American identity as a protective factor
- Exposure to all these influences varies considerably across segments of the population and across time, making prevention efforts that aim to influence attitudes, norms, intentions, and behaviors – such as counter-advertising and individual counseling – complicated undertakings that must adapt to sometimes rapidly changing cultural circumstances.

The Etiology of Tobacco Use
is Complex

Adult smoking incidence in Virginia, 2003

African American	21.0
Amerindian	41.4
Asian/Pacific Islander	21.1
Hispanic	25.6
White	23.2
Men	26.4
Women	18.0
<12 Years Education	40.2
12 Years Education	30.8
>12 Years Education	15.7
18-24 Years of Age	25.6
25-44 Years of Age	25.1
45-64 Years of Age	22.9
65+ Years of Age	9.5

Tobacco Use: Risk Factors in Adolescents

- Parents, siblings, peers who use tobacco
- Favorable views of smoking
- Experimentation with tobacco
- Poor academic achievement
- Risk-taking, rebelliousness
- Depression, anxiety, ADHD
- Male
- Age 10-18 years

Tobacco Use: Patterns of Incidence Among Youth

- First use of tobacco usually occurs between the ages of 11 and 13 (6th-8th grade)
- By the end of high school, 1/2 - 2/3 have experimented with tobacco
- By the end of high school, about 1/3 of experimenters have become regular, daily smokers
 - higher ratio of regular tobacco users to experimenters than that seen with alcohol, marijuana, or cocaine
 - signs of nicotine dependence (craving, irritability or anxiety, unsuccessful quit attempts) can appear within days or weeks of first use, and before daily use is established

Youth Tobacco Use: Patterns of Incidence (Monitoring the Future Study)

- ~3/4 of high-school grads who are regular, daily smokers have tried to quit and failed
- Less than 1 in 7 high-school regular smokers have successfully stopped smoking for 30 days or more
- 3% of high-school daily smokers say they will be smoking in 5 years
- More than 60% of those who are regular smokers at high school graduation are still smokers 7-9 years later

Tobacco Use by High School Students (2003 Youth Risk Behavior Survey)

- 58% have ever tried smoking
- 22% smoked at least once in past 30 days
- 10% smoked on 20 or more of past 30 days
- 16% smoked every day for past 30 days
- 3% smoke more than 10 cigarettes a day
- 20% males, 16% females have smoked a whole cigarette before age 13

Tobacco Use by High School Students (2003 Youth Risk Behavior Survey)

- 30% of males, 25% of females have engaged in some form of tobacco use in the last 30 days
- 11% males, 2% females used smokeless tobacco in past 30 days
- 20% males, 2% females smoked cigars in past 30 days
- 21% have purchased cigarettes before turning 18
- 8% report smoking on school property
- 6% report using smokeless tobacco on school property

Incidence by Gender & Ethnicity (2003 Youth Risk Behavior Survey)

- 25% of white, non-Hispanic high school students report current cigarette use (in the past 30 days)
 - 26.6% white females
 - 23.3% white males
- 15% of black, non-Hispanic high school students report current cigarette use
 - 10.8% black females
 - 19.3% black males
- 18.4% of Hispanic high school students report current cigarette use
 - 17.7% Hispanic females
 - 19.1% Hispanic males

Tobacco Use by School Grade (2004 Monitoring the Future Study %)

Grade	8th	10th	12th
Any Use	28	41	53
Past 30 Days	9	16	25
Daily Use	4	8	16
½ Pack / Day	2	3	8
Any Smokeless	11	14	17
Daily Smokeless	1.0	1.6	2.8

Cigarette Use by School Grade by Year (Monitoring the Future Study %)

Grade		8th	10th	12th
Any Use	1999	44	58	65
	2001	37	53	61
	2004	28	41	53
Daily Use	1999	8	16	23
	2001	6	12	19
	2004	4	8	16

Reasons for Recent Decline in Tobacco Use Among Youth

- Intense adverse publicity
- Rise in prices and taxes
- Change in marketing due to Master Settlement
 - End of Joe Camel logo
 - Cessation of billboard advertising
 - Anti-smoking advertising

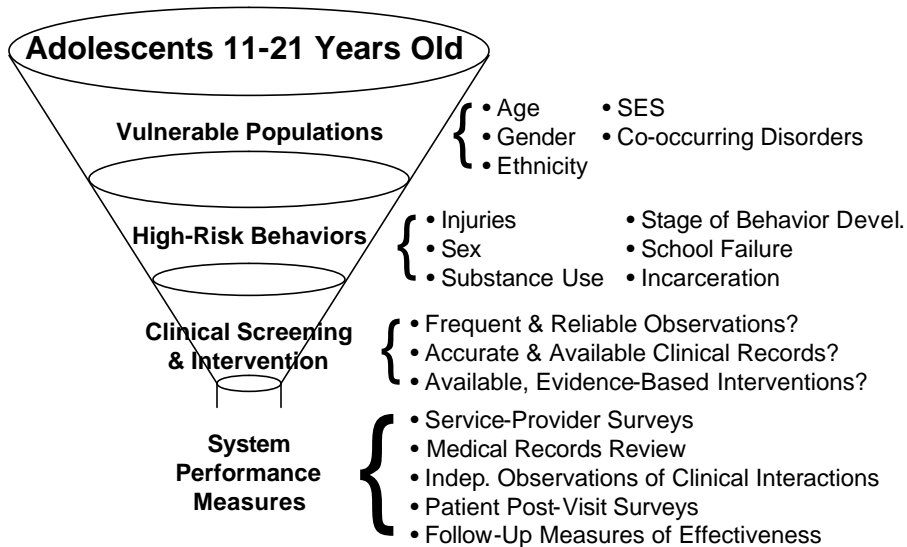
Prevention Practice Environments

- Health clinics
- Schools
- Community-based organizations
- Mass media
- Government Policies

Inadequate Healthcare System Response

- ~70% of adolescents see a physician yearly
- ~30% of these are asked about their tobacco use
- <10% are asked about parent, sibling or peer tobacco use
- Inadequate rates of counseling for adolescents who present with tobacco use
- Studies show inadequate charting of tobacco use and other types of behavioral screening for adolescents
- Medicinal therapies are particularly effective among some adult smokers who want to quit, especially when combined with cessation counseling and quit-help lines, and supported by subsidy or health insurance reimbursement for the medication and associated medical treatment.

Tobacco Use: Entrée to Methods of Evidence-Based Adolescent Clinical Practice



Most School-based Programs Don't Work Very Well

- Many programs focus on a single issue – tobacco use – and use aversive association
 - Maybe counterproductive among older adolescents
- Life-skills based programs seem to work better
 - Goal setting
 - Refusal skills
- Need to better integrate anti-tobacco education in school curricula and community
 - Health education
 - Social studies
 - Peer-directed programs

Mass media

- Tobacco counter-advertising appears to work best for young people in pre-adolescence and early adolescence by preventing initiation of tobacco use.
- Advertising programs aimed at older teenagers, depicting negative health or social consequences or portraying tobacco industry manipulation, have demonstrated inconsistent influence.

Government policies

- Product labeling
- Sales to minors restrictions
- Counter-advertising
- Sales or excise taxes
- Clean air laws

Cigarette Excise Tax Increases and Projected Effects on Demand in Virginia

Cigarette Excise Tax Increase (¢)	Cigarette Retail Price Increase (%)	Adult Cigarette Total Demand Decrease (%)	Youth Cigarette Total Demand Decrease (%)	# of Youth Smokers Decrease
20	6.8	2.7	8.2	3,590
30	10.2	4.1	12.2	5,386
50	17.0	6.8	20.4	8,976
75	25.4	10.2	30.5	13,411
100	33.9	13.6	40.7	17,899

A Comprehensive Integrated Approach to Tobacco Use Prevention

- Evidence suggests that there may be significant synergies among various policy approaches, as the individual cost of tobacco use behavior in terms of money, inconvenience, and health problems is seen to rise, as support for individual quitting and abstinence increases, and as the general climate of opinion against tobacco use is reinforced across the culture.

A Comprehensive Integrated Approach to Tobacco Use Prevention

- Community Programs to Reduce Tobacco Use
- Chronic Disease Programs to Reduce the Burden of Tobacco-Related Diseases
- School Programs
- Enforcement
- Statewide Programs
- Counter-Marketing
- Cessation Programs
- Surveillance and Evaluation
- Administration and Management