



FORMS of TOBACCO




AMERICAN CIGARETTES

- Most common form of tobacco used in U.S.
- Sold in packs (20 cigarettes/pack)
- Total nicotine content, per cigarette:
 - Average 13.3 mg (range, 12.4 to 14.2 mg)
- Nicotine yield, per cigarette:
 - Approximately 1 to 2 mg




Marlboro is a registered trademark of Philip Morris, Inc.



FORMS of TOBACCO

- Cigarettes
- Smokeless tobacco
 - Chewing tobacco
 - Snuff
 - Snus
- Cigars
- Pipes
- Hookah (waterpipe smoking)
- Electronic nicotine delivery systems (ENDS)*



*e-cigarettes are devices that deliver nicotine and are not a form of tobacco.
Image courtesy of the Centers for Disease Control and Prevention / Rick Ward

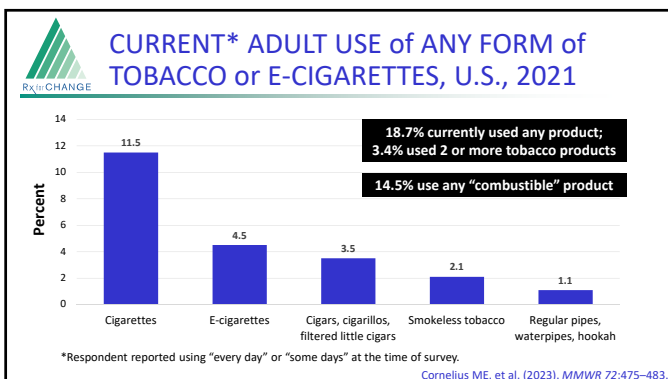



SMOKELESS TOBACCO

- Chewing tobacco
 - Loose-leaf
 - Plug
 - Twist
- Snuff
 - Moist (cut)
 - Loose
 - Pouch
 - Dry
- Snus



The Copenhagen and Skoal logos are registered trademarks of U.S. Smokeless Tobacco Company.
Red Man and General Snus are registered trademarks of Swedish Match.

SMOKELESS FORMS of TOBACCO

Estimated 5.9 million users in the U.S. in 2019 (2.4%)

- Adult males (4.7%) more likely than adult females (0.3%) to be current users
- Prevalence highest among
 - White, Non-Hispanic
 - Adults aged 25-44 years
 - Residents of the Midwest and Southern U.S.
 - Those having less than a college degree

Significant health risks

- Numerous carcinogens
- Nicotine exposure comparable to that of smokers, leading to:
 - Physical dependence
 - Withdrawal symptoms after abstinence



HEALTH CONSEQUENCES of SMOKELESS TOBACCO USE

- Periodontal effects
 - Gingival recession
 - Periodontitis
 - Dental attrition/abrasion
 - Root surface caries
- Oral leukoplakia
 - Oral cancer
 - Pharyngeal cancer



Oral Leukoplakia
Image courtesy of Dr. Sol Silverman -
University of California San Francisco



HOOKAH (WATERPIPE SMOKING)

- Tobacco flavored with fruit pulp, honey, and molasses; users inhale smoke that is passed through water via a "waterpipe"
 - Also known as shisha, narghile, goza, hubble bubble
- Popular among young adults in coffee houses, bars, and lounges
 - In 2013–2014, 31.9% of adults reported use during the past year
- Nicotine, tar and carbon monoxide levels comparable to or higher than those in cigarette smoke
- Long-term use associated with increased risk of:
 - Coronary artery disease
 - Obstructive lung disease
 - Cancers (lung, head/neck, esophagus, stomach)



Image courtesy of Mr. Sami Romman / www.hookah-shisha.com



CIGARS

- Cigar products
 - Traditional (premium or large)
 - Cigarillos
 - Filtered (little) cigars
- Estimated 8.7 million cigar smokers in the U.S. in 2019 (3.6%)
 - Prevalence higher among black, non-Hispanics
- Tobacco content of cigars varies greatly
- One cigar can deliver enough nicotine to establish and maintain dependence
- Cigar smoking is not a safe alternative to cigarette smoking



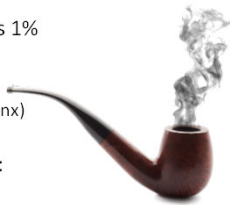
ELECTRONIC CIGARETTES: Components

- Power source
 - Rechargeable or disposable battery
- Cartridge containing liquid solution
 - Propylene glycol
 - Glycerin
 - Flavorings (fruit, chocolate, mint, cola, candy, etc.)
 - Nicotine; typically 0-36 mg/mL
- Electronic atomizer/vaporizer heats (not burns) solution
- POD devices use nicotine salts (protonated form) derived from tobacco



PIPE TOBACCO

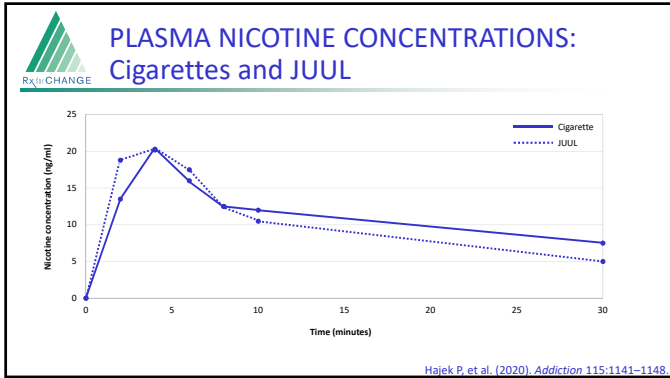
- Prevalence of pipe smoking in the US is 1%
- Pipe smokers have an increased risk of death due to:
 - Cancer (lung, oral cavity, esophagus, larynx)
 - Chronic obstructive pulmonary disease
- Risk of smoking tobacco-related death: cigarettes > pipes ≈ cigars



ELECTRONIC NICOTINE DELIVERY SYSTEMS: CONSIDERATIONS

- Lack of product regulation and standardization can lead to variability in aerosol production and nicotine delivery¹
- Nicotine yield can vary as much as 50-fold due to puff topography and device design features²
- Stated nicotine content on e-liquids often inaccurate³
- Plasma nicotine concentrations achieved with Juul devices are comparable to those achieved with cigarettes^{4,5}

1. Walton et al., *Nicotine Tob Res.* 2015;17:259–269.
 2. Tallis et al., *Nicotine Tob Res.* 2015;17:150–157.
 3. Davis et al., *Nicotine Tob Res.* 2015;17:134–14.
 4. Hajek et al., *Addiction.* 2020;115:1141–1148.
 5. Prochaska et al., *Tob Control.* 2022;31:e88–e93.



TOBACCO HARM REDUCTION

“Minimizing harms and decreasing total morbidity & mortality, without completely eliminating tobacco and nicotine use.”

- Acknowledges that complete abstinence is the ideal outcome, but accepts alternative ways to reduce harm among tobacco users
- Continuum of health risk:

Combustible tobacco	ENDS IQOS (tobacco heating system; Phillip Morris International) Smokeless tobacco (chewing, snuff) Snus	Nicotine replacement therapy
Most risk		Least risk

Institute of Medicine. (2011). Committee to Assess the Science Base for Tobacco Harm Reduction. Clearing the Smoke: Assessing the Science Base for Tobacco Harm Reduction. Washington (DC): National Academies Press (US).

FORMS of TOBACCO: SUMMARY

- Cigarettes are, by far, the most common form of tobacco used in the U.S.
- Other forms of tobacco and nicotine delivery devices exist, and some are increasing in popularity.
- All forms of tobacco are harmful.
- The safety/efficacy of e-cigarettes/ENDS not been not established.
- Attention to all forms of tobacco is needed.