



Non Cigarette Tobacco Products (NCTP) and Electronic cigarettes (e-cigs)

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Goals & Objectives

- Review NCTP definitions & products
- Discuss prevalence/trends of NCTP
- Discuss NCTP and addiction
- Review recommended treatments for NCTP





NCTP Definitions & Products

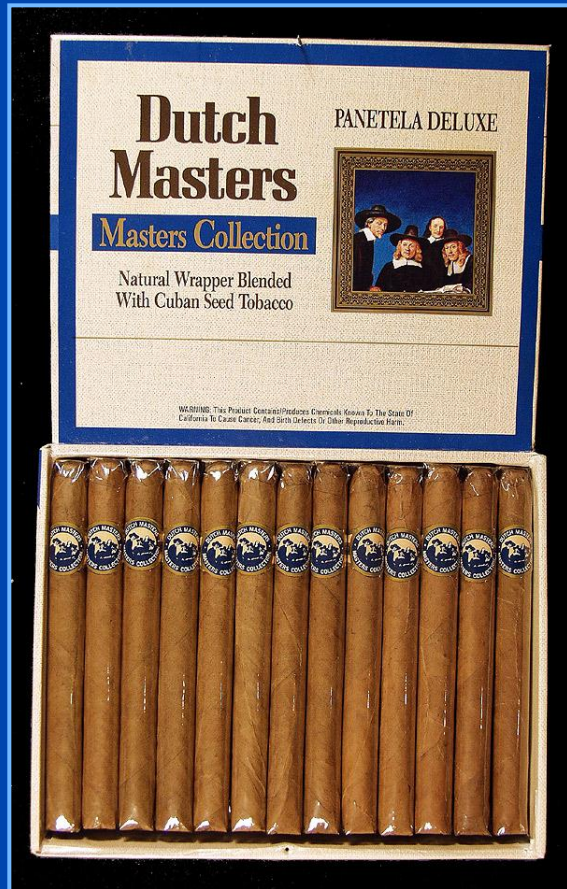


Pipes



© 1993 Smithsonian Institution

Cigars

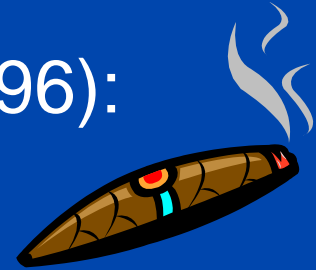


Images from www.trinketsandtrash.org

Cigar Definition

U.S. Department of Treasury (1996):

Cigar



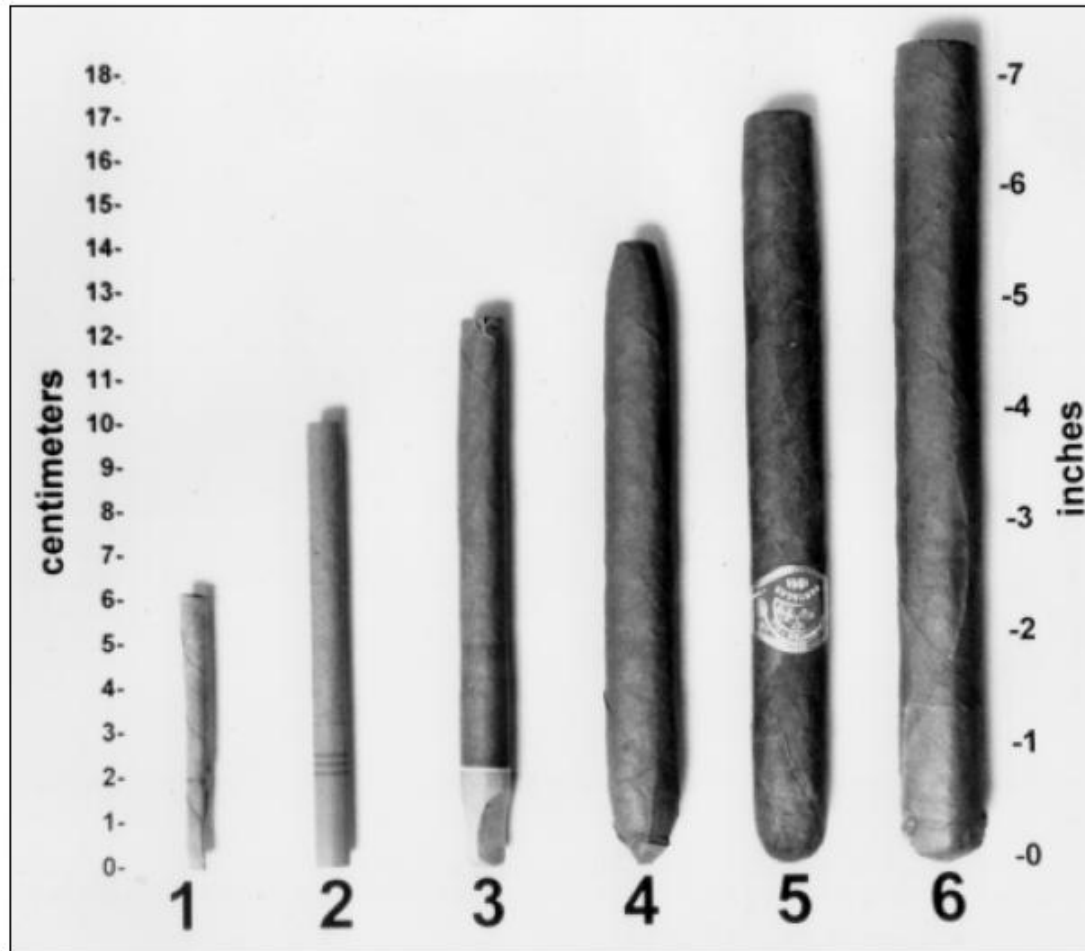
“Any roll of tobacco wrapped in leaf tobacco or any substance containing tobacco.”

VS.

Cigarette

“Any roll of tobacco wrapped in paper or in any substance not containing tobacco.”

Types of cigars on the U.S. Market in 1996: (1) bidi (imported from India), (2) little cigar with filter tip, (3) small cigar with plastic mouth piece, (4) regular cigar, (5) and (6) premium cigar.



NCI Monograph 9. Cigars: Health Effects and Trends.



Smokeless Tobacco

Chewing tobacco

- Loose leaf (i.e., Redman)
- Plugs
- Twists



Snuff

- Moist (i.e., Copenhagen, Skoal)
- Dry (i.e., Honest, Honey bee, Navy, Square)

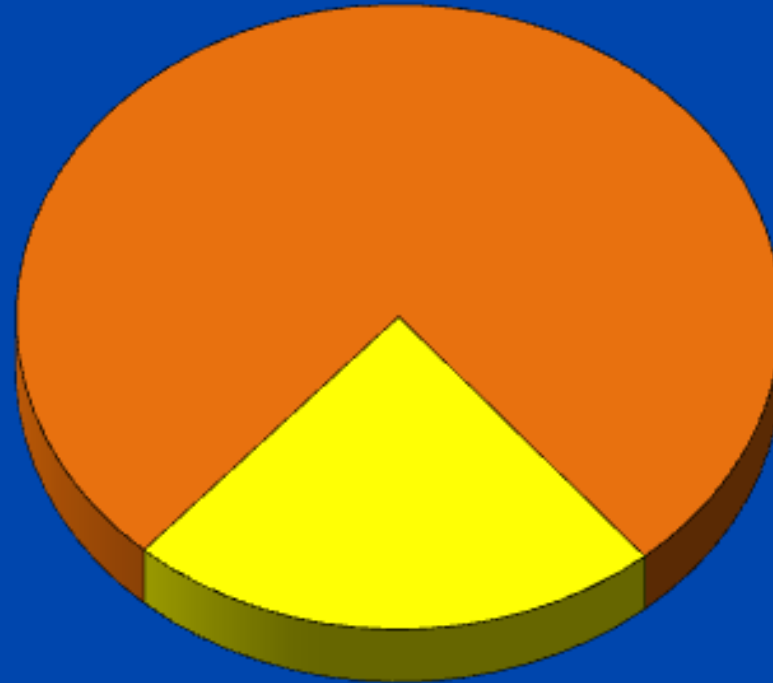
“Chewing Tobacco” = Cut tobacco leaves



“Snuff” = Moist ground tobacco



Type of ST Used in U.S.



- Chewing Tobacco
- Snuff

National Survey on Drug Use and Health (NSDUH)

“Spitless Tobacco” – Star Scientific



RJ Reynold's



“Swedish Style” ST

RJReynolds



Phillip Morris (Altria)



New Product: "Fully Dissolvables"

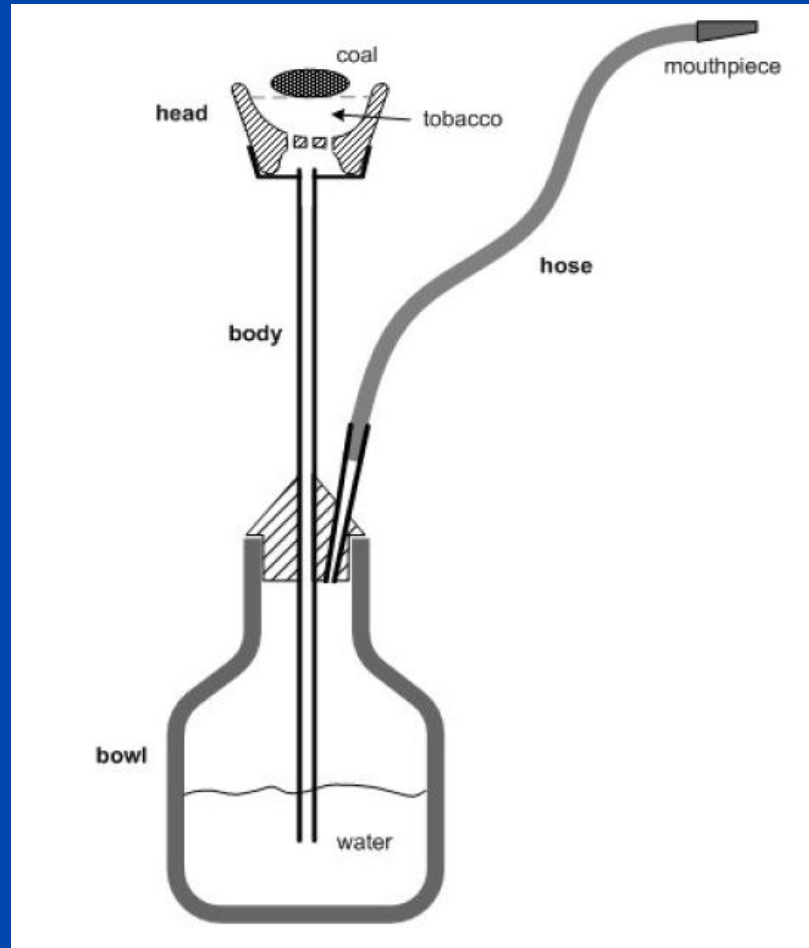


Waterpipe

- Use dates back 4 centuries in Asia & Africa
- Typically consumed socially with friends and family
- Becoming trendy in US among youth
- Hookah “cafes” gaining popularity
- Smoke described as smoother and more flavorful
- Often (mis)perceived as healthier alternative due to water filtration, cooler mouth feel, and reduced irritation



Anatomy of a Waterpipe



Types of Waterpipe Tobacco

- **Maasel/Mu'essel**
Combination of tobacco and molasses, honey or fruit
- **Tumbak/Ajami**
Dark tobacco paste
- **Jurak**
Combination of tobacco and fruits, oils, honey or molasses. May be flavored or flavorless
- Moist tobacco → requires charcoal to keep burning



Hookah tobacco



Charcoal

Source: Knishkowy & Amitai. (2005). [Pediatrics, 116](#), e113-e119.

“Vaping”



...shop.com
ior, non-flammable,
venient and cheaper
than traditional
cigarettes.

Looks like a cigarette, feels like a cigarette,
taste like a cigarette, but it isn't a cigarette.
It's just a much better way to smoke!
Better & healthier!

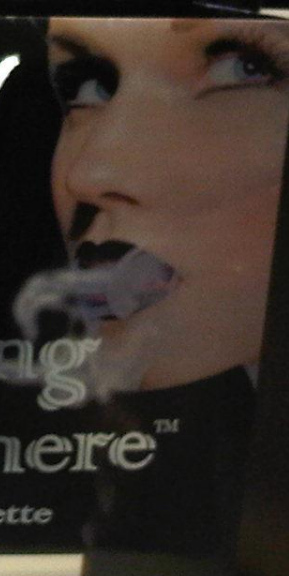


Smoking Everywhere™

Electronic Cigarette



www.SmokingEverywhere.com
1-800-613-0337



GIFT
CERTIFICATES
AVAILABLE
FOR PURCHASE



LIBERTY

STIX BRAND

It looks like a traditional cigarette,
It tastes like a traditional cigarette,
but it's not a traditional cigarette

Same, Same, But Different

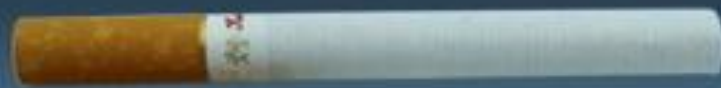
With Liberty Stix, You Have the Freedom To
Smoke Anywhere, No Carbon Monoxide, No Tar,
No Cancer causing agents!

ENDS

A battery-powered device that provides inhaled doses of vaporized nicotine solution. It is used as an alternative to smoked tobacco products, such as cigarettes, cigars, or pipes.

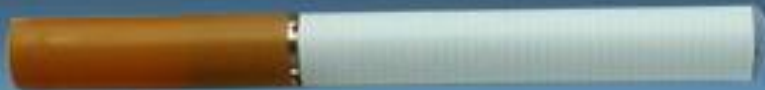
ENDS: Basic Structure





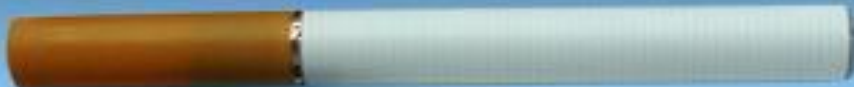
Cigarette

8.5(D)*89(L)mm



KR-808A

8.5(D)*98(L)mm



KR-808

9.2(D)*110(L)mm



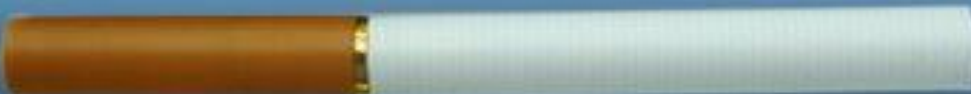
KR-308

9.2(D)*110(L)mm



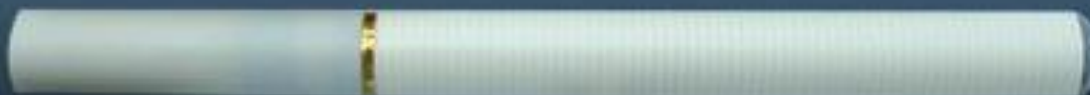
KR-308

9.2(D)*110(L)mm



KR-308

9.2(D)*119(L)mm



KR-208

9.2(D)*153(L)mm



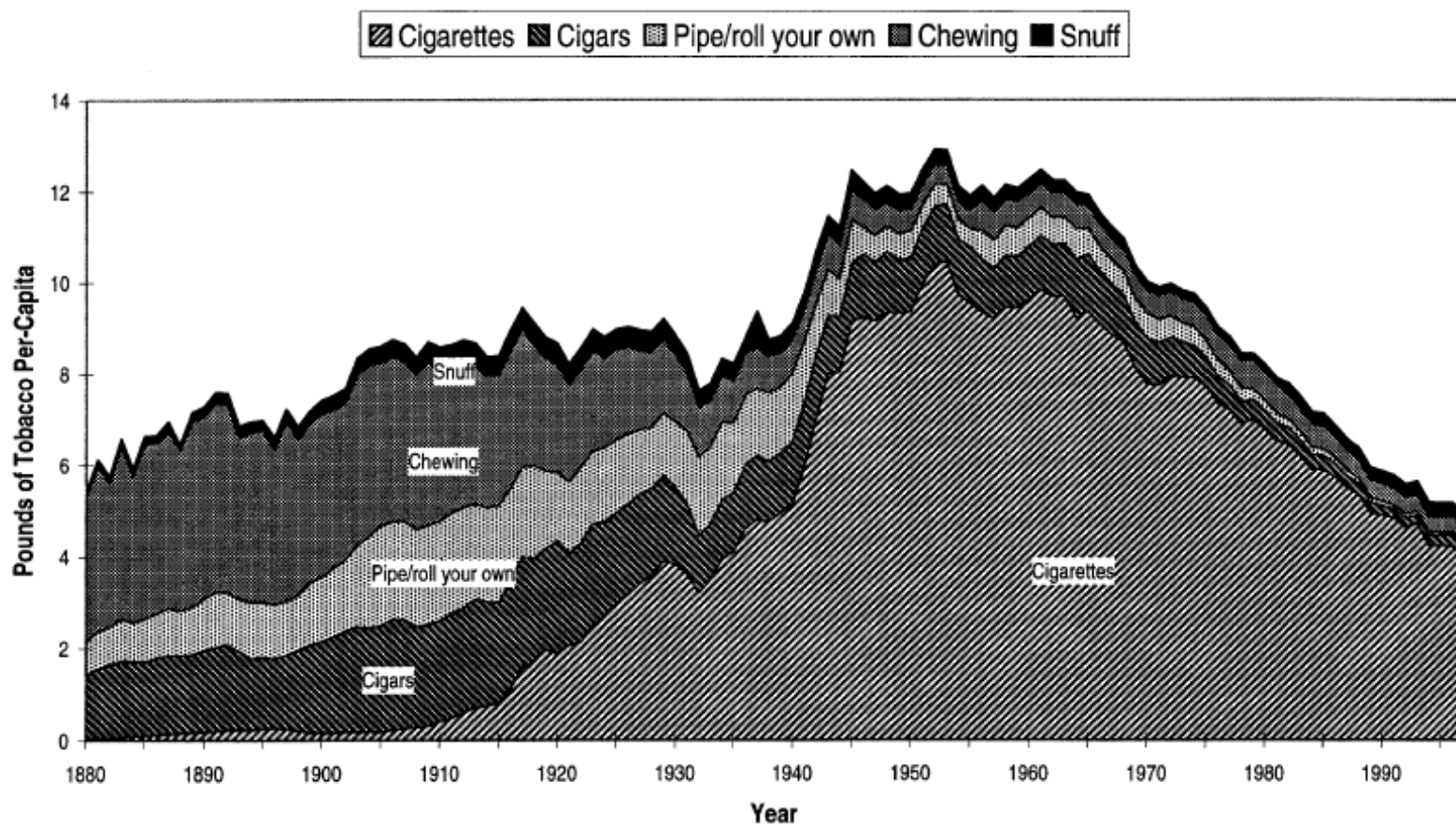
KR-108



NCTP: Trends & Prevalence

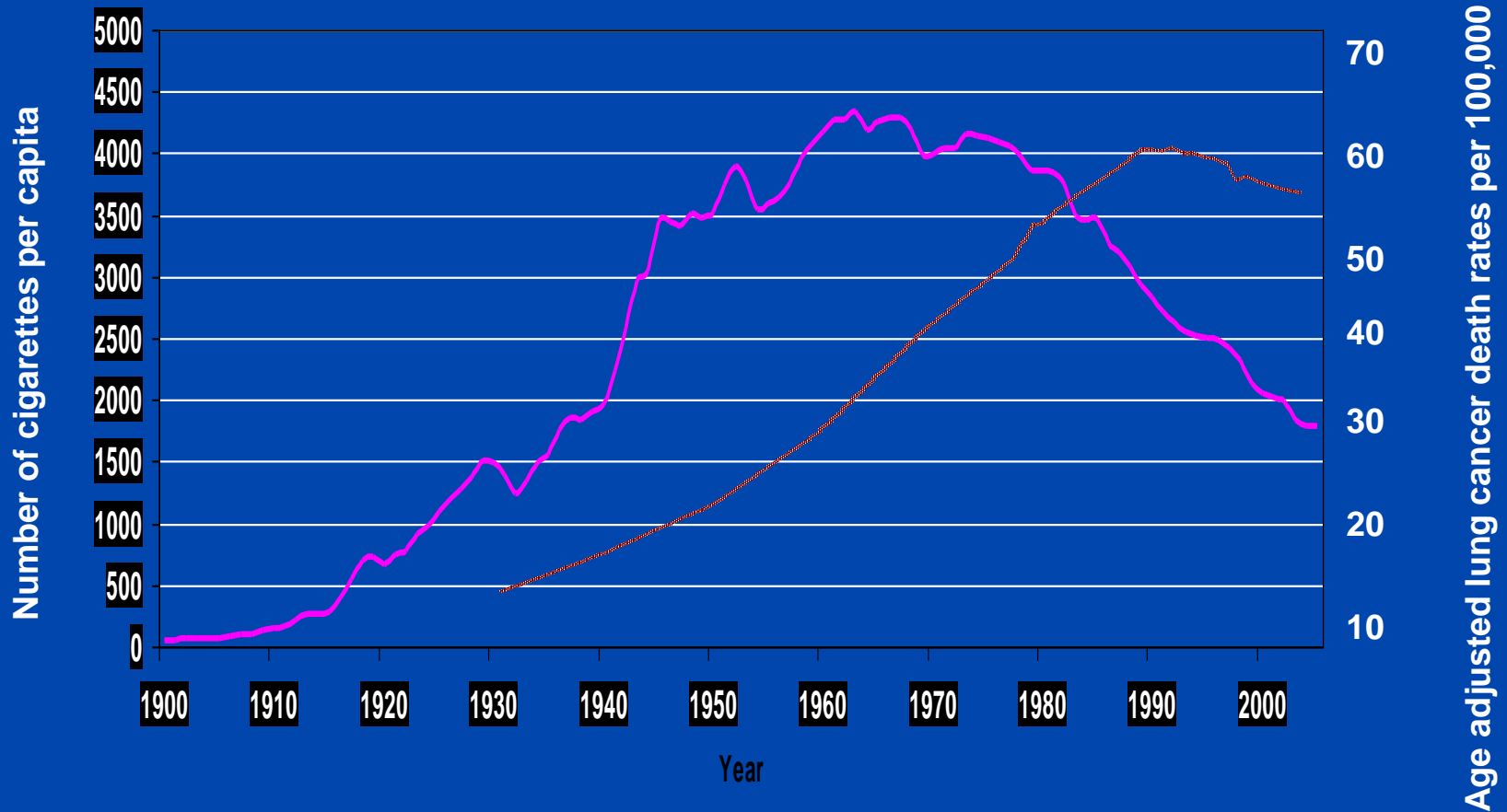


Per-capita consumption of different forms of tobacco in the US 1880-1997



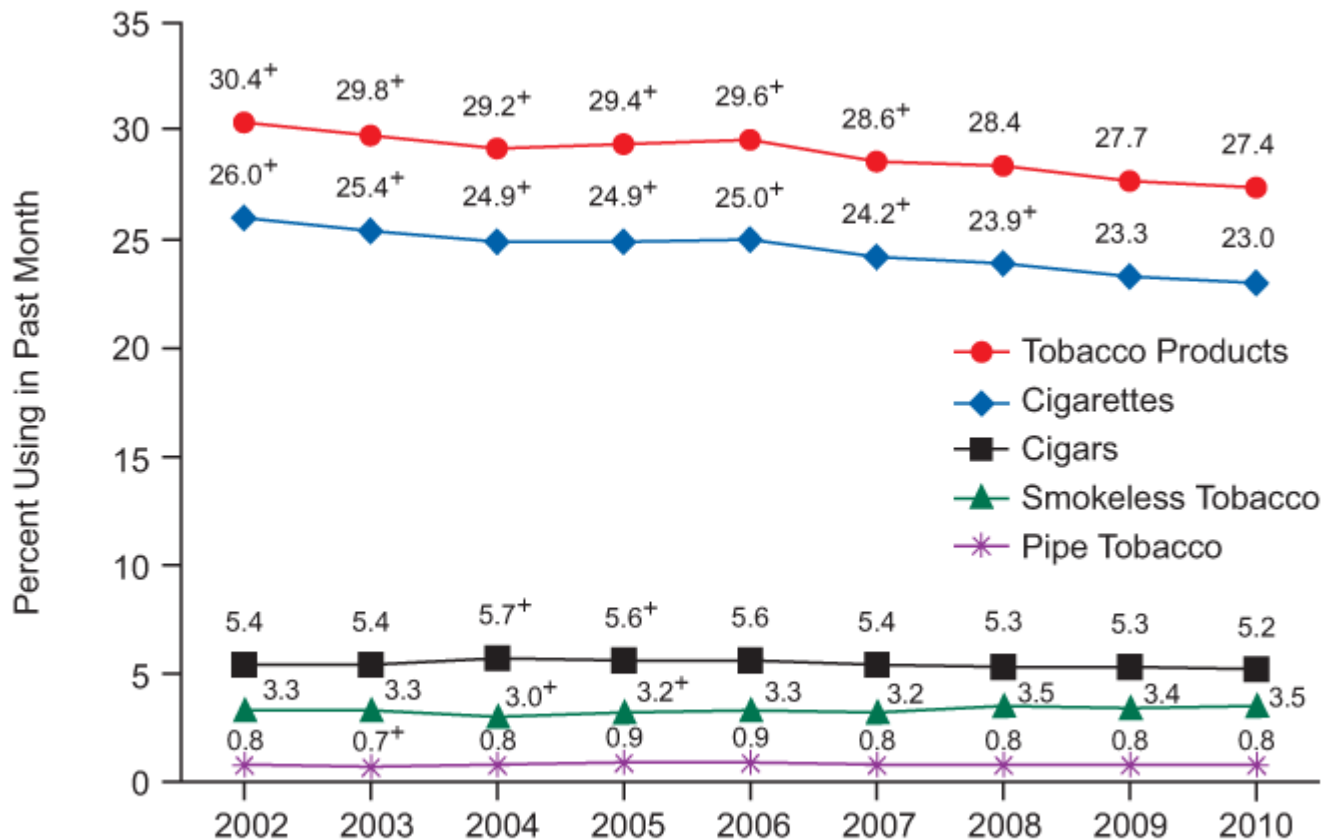
NCI Monograph 9. Cigars: Health Effects and Trends.

1900-2005 U.S. Per Capita Cigarette Consumption and 1930-2005 Age Adjusted Lung Cancer Death Rate per 100,000



NCHS Vital Statistics; death rates are age-adjusted to 2000 US standard population

Past Month Tobacco Use among Persons Aged 12 or Older



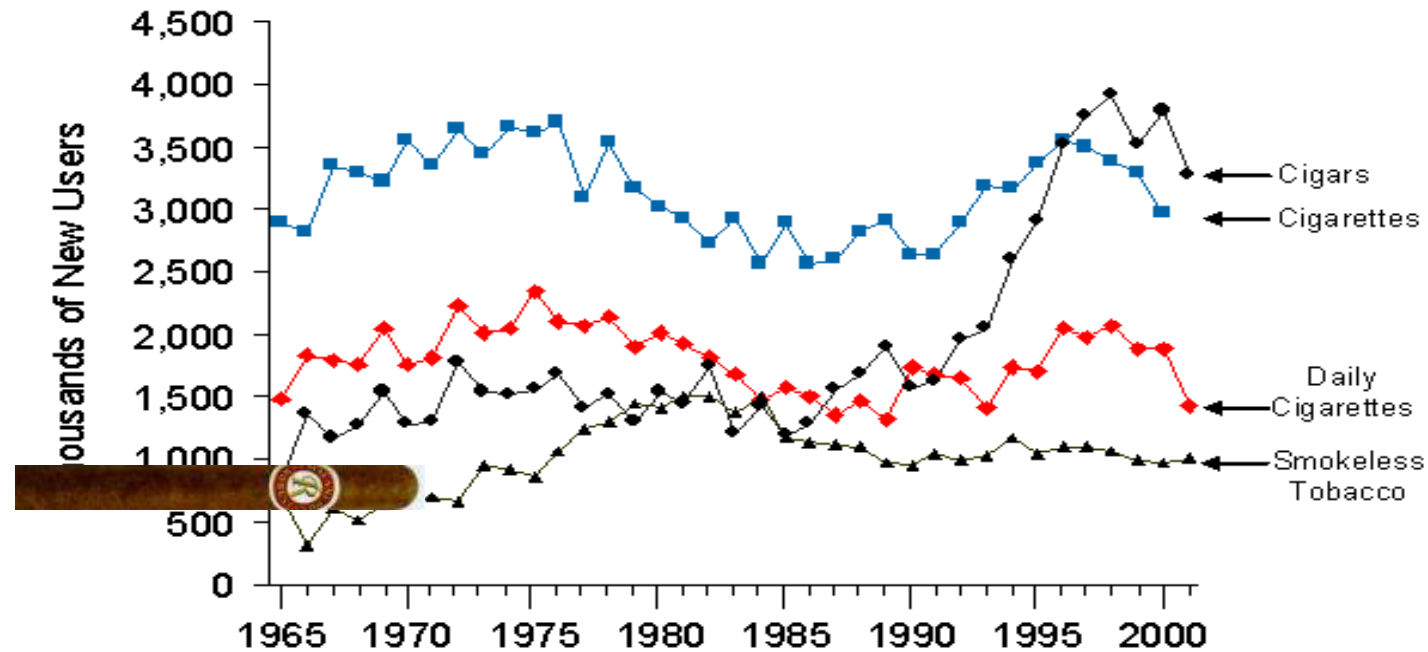
estimate is statistically significant at the .05 level.



Cigar Smoking



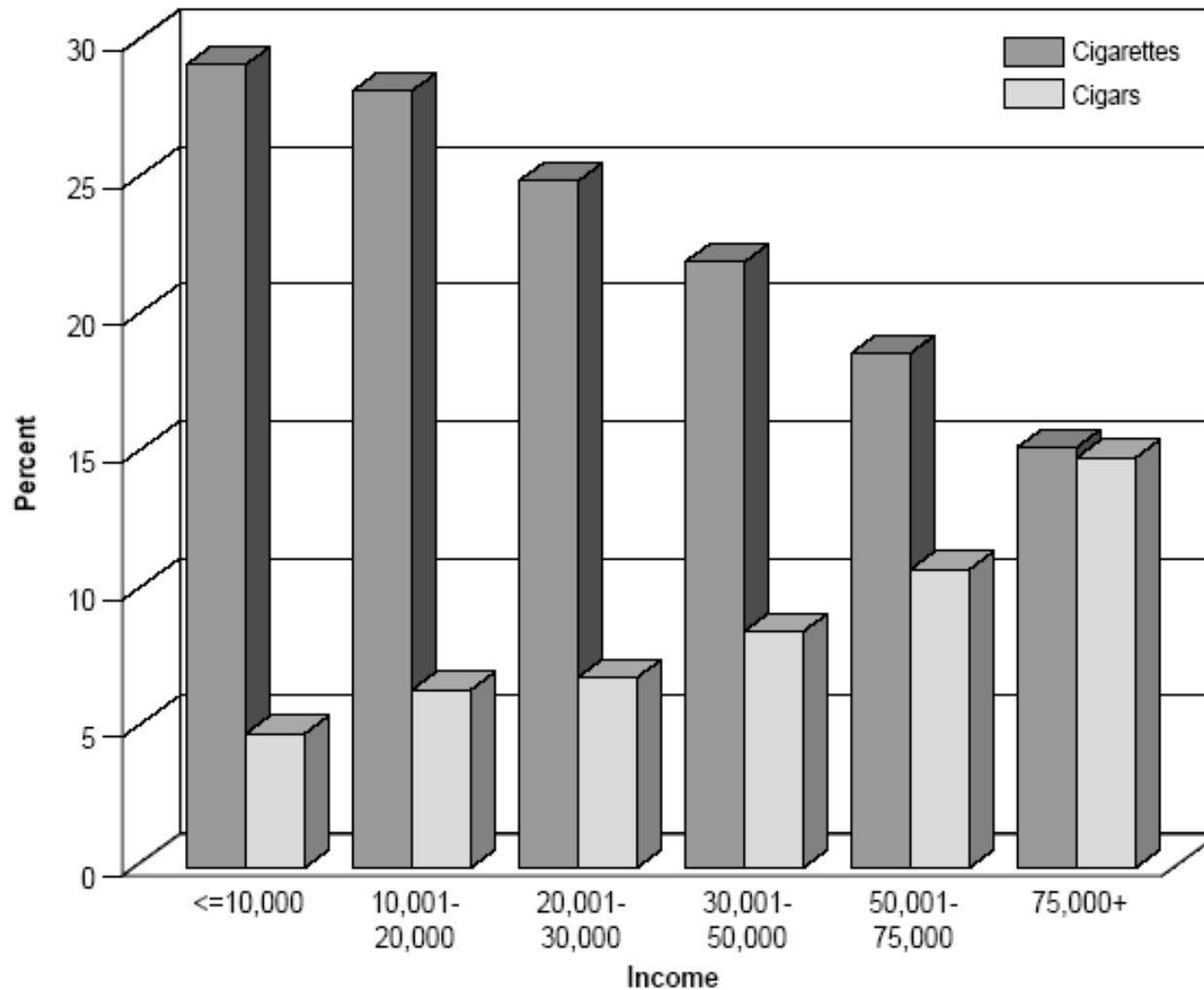
Figure 6.4 Annual Numbers of New Users of Tobacco: 1965–2001



< 18 years of age group constituted an increasingly greater proportion of the number of new cigar smokers:

SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 2002.
The Monitoring the Future Study, University of Michigan, 2001 and 2002.

Prevalence of current cigarette and cigar smoking among California males of different incomes, 1996

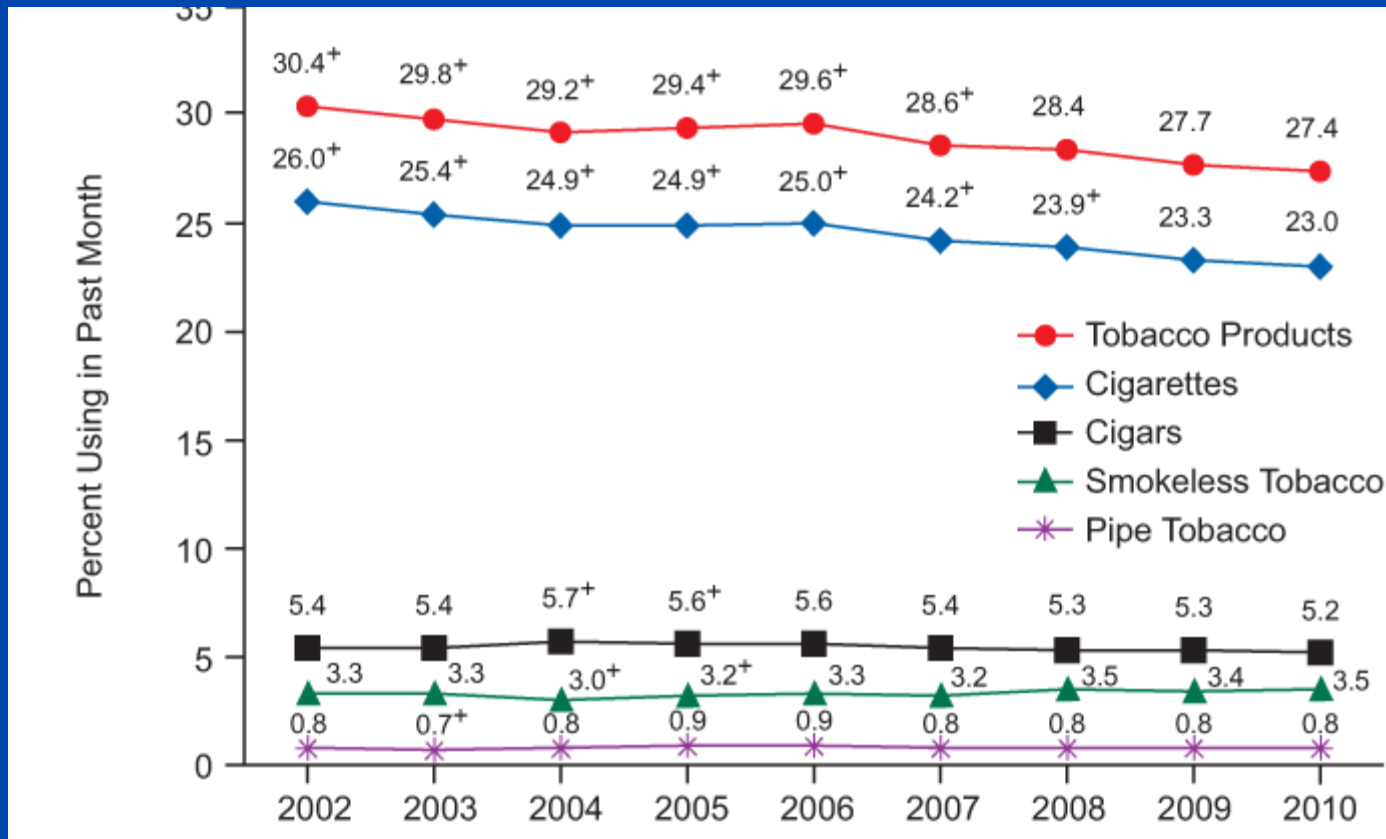


NCI Monograph 9. Cigars: Health Effects and Trends.



Prevalence of ST Use

- In 2010, 8.9 million (3.5%) used smokeless tobacco



Results from the 2010 National Survey on Drug Use and Health: National Findings

SAMSHA

Percentages of Persons Aged 12 or Older Using Smokeless Tobacco in the Past Month, by Demographic and Geographic Characteristics: 2002 to 2007



Demographic and Geographic Characteristic	Past Month
Age Group in Years	
12 to 17	2.2%
18 to 25	5.0%
26 or Older	3.0%
Gender	
Male	6.2%
Female	0.4%
Race/Ethnicity	
White	4.1%
Black or African American	1.4%
American Indian or Alaska Native	7.1%
Native Hawaiian or Other Pacific Islander	2.9%
Asian	0.6%
Hispanic or Latino	0.9%
Two or More Races	2.9%
County Type	
Large Metropolitan	1.9%
Small Metropolitan	3.7%
250,000 to 1 Million Population	3.2%
<250,000 Population	4.7%
Non-Metropolitan	6.6%
Urbanized	5.5%
Less Urbanized	7.1%
Completely Rural	8.4%
Region	
Northeast	1.7%
Midwest	3.7%
South	4.2%
West	2.4%

Waterpipe

- After cigarettes, waterpipe use is the most common form of tobacco use among university students
- Predominantly young, males
- 30% ever use & 8.4% current use
- Used in a social context
 - More common in fraternities/sororities
- Most smoked < 2 years
 - 10% daily
- Most perceive less addictive and harmful
 - 67% said “cigarettes more harmful”



Ward KD, et al. *Nicotine Tob Res.* 2007 Dec;9(12):1339-46.

Primack BA, et al. *Nicotine Tob Res.* 2012 May 28.

Odds of Trying Waterpipe, Snus, or ENDDs (n = 3158)

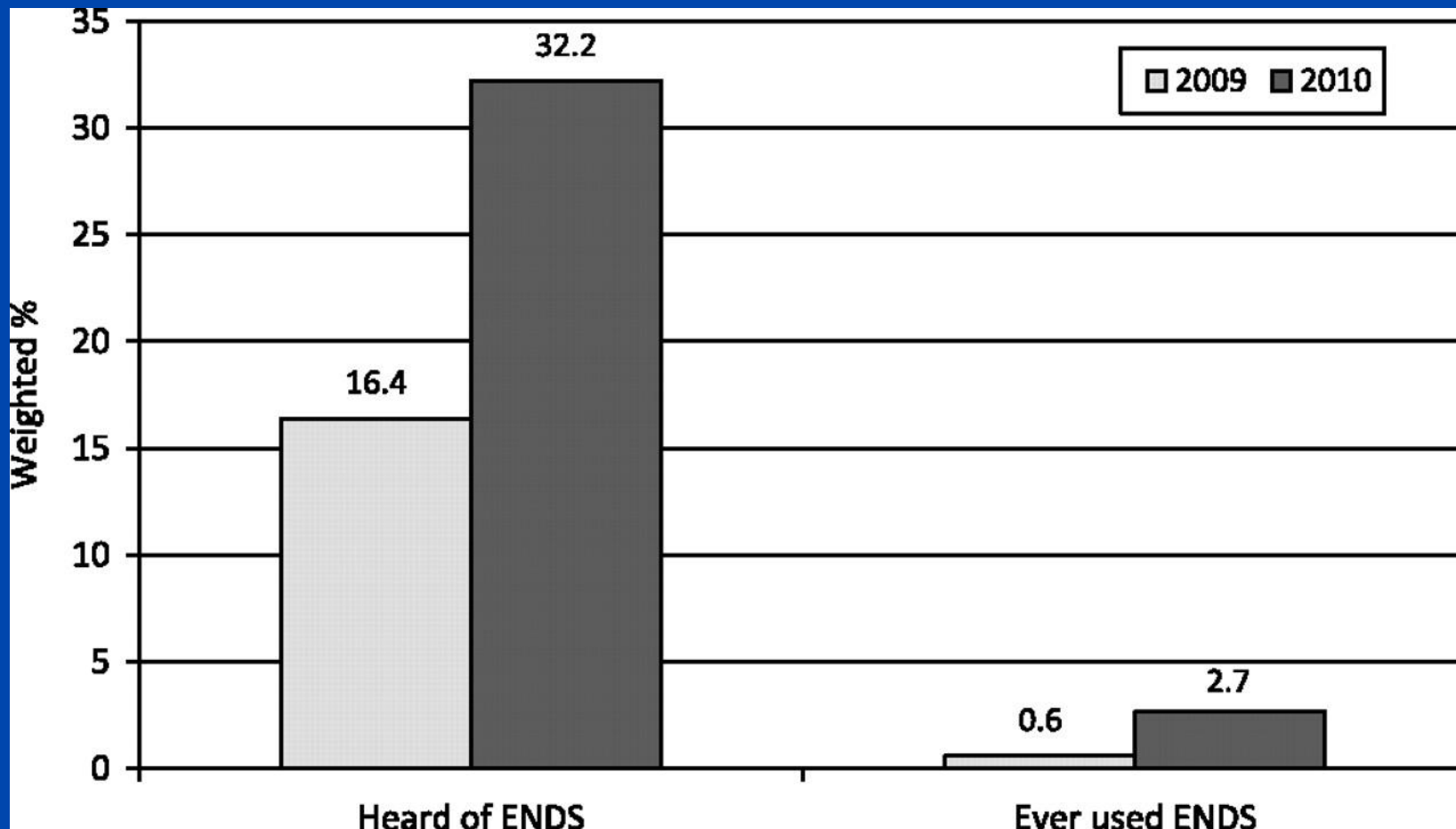
*Lifetime Use

Predictors	Have tried one of these products adjusted OR (95% confidence interval)
Smoking status	
Former smoker	2.71 (2.06, 3.56)
Nondaily smoker	6.13 (4.02, 9.33)
Daily smoker	5.53 (4.03, 7.58)
Region	
Northeast	1.68 (1.16, 2.42)
Midwest	1.65 (1.20, 2.28)
West	1.80 (1.36, 2.39)
Age	
18–24	2.18 (1.60, 2.97)
Sex	
Males	3.51 (2.77, 4.45)
Education	
High school	1.58 (.99, 2.51)
Some college	2.67 (1.69, 4.22)
College degree	2.04 (1.26, 3.30)

Model also included race, not significant. Reference groups were as follows: never smokers, south region, 25 years of age and older, females, and no high school degree.

McMillen R, et al. Use of emerging tobacco products in the United States. *J Environ Public Health*. 2012;2012:989474.

Percentage of adults (≥18 years) who have heard of and used electronic nicotine delivery systems (ENDS)—2009 and 2010 ConsumerStyles.



Regan A K et al. Tob Control doi:10.1136/tobaccocontrol-2011-050044

How are People Using ENDDs?

- Internet-administered survey
- Men 77%
- Smoking status
 - Former smokers 63%
 - Daily smokers 23%
 - Occasional (non-daily) smokers 13%
- Smokers: 12 cpd



How are People Using ENDDs?

	Number of comments
To quit smoking	53
For health, as e-cigarettes were perceived to be less toxic than tobacco	49
Less expensive than regular cigarettes	26
Can be smoked everywhere, including smoke-free places	21
To avoid disturbing other people, or producing environmental tobacco smoke or the smell of stale smoke	20
For the pleasure of smoking, including the pleasure of inhaling and smoking-related actions	19
To reduce cigarette consumption	14
Curious to test a new product	10
Ecigarettes taste and smell good	8
Previously failed to quit with either nicotine patch or bupropion	3
To get nicotine	2
<i>Total (from three open-ended fields)</i>	<i>225</i>



Etter JF. BMC Public Health. 2010 May 4;10:231.



Health Impact of NCTP



Adjusted relative risk* (95% CI) of death

Sustainer = No switching



Deaths from	'Sustainers'		
	Never smoked	Pipe only	Cigarettes only
Men (n=16 932 aged 20–49 years)			
All causes	1.00	1.99 (1.73 to 2.27)	2.44 (2.27 to 2.62)
Ischaemic heart disease	1.00	3.07 (2.35 to 4.00)	3.17 (2.69 to 3.73)
Stroke	1.00	1.54 (0.84 to 2.82)	2.30 (1.71 to 3.11)
Cardiovascular disease	1.00	2.49 (1.99 to 3.10)	2.81 (2.48 to 3.20)
Lung cancer	1.00	10.32 (5.55 to 19.18)	16.78 (10.31 to 27.33)
Other smoking related cancer	1.00	1.47 (0.99 to 2.18)	1.95 (1.59 to 2.38)

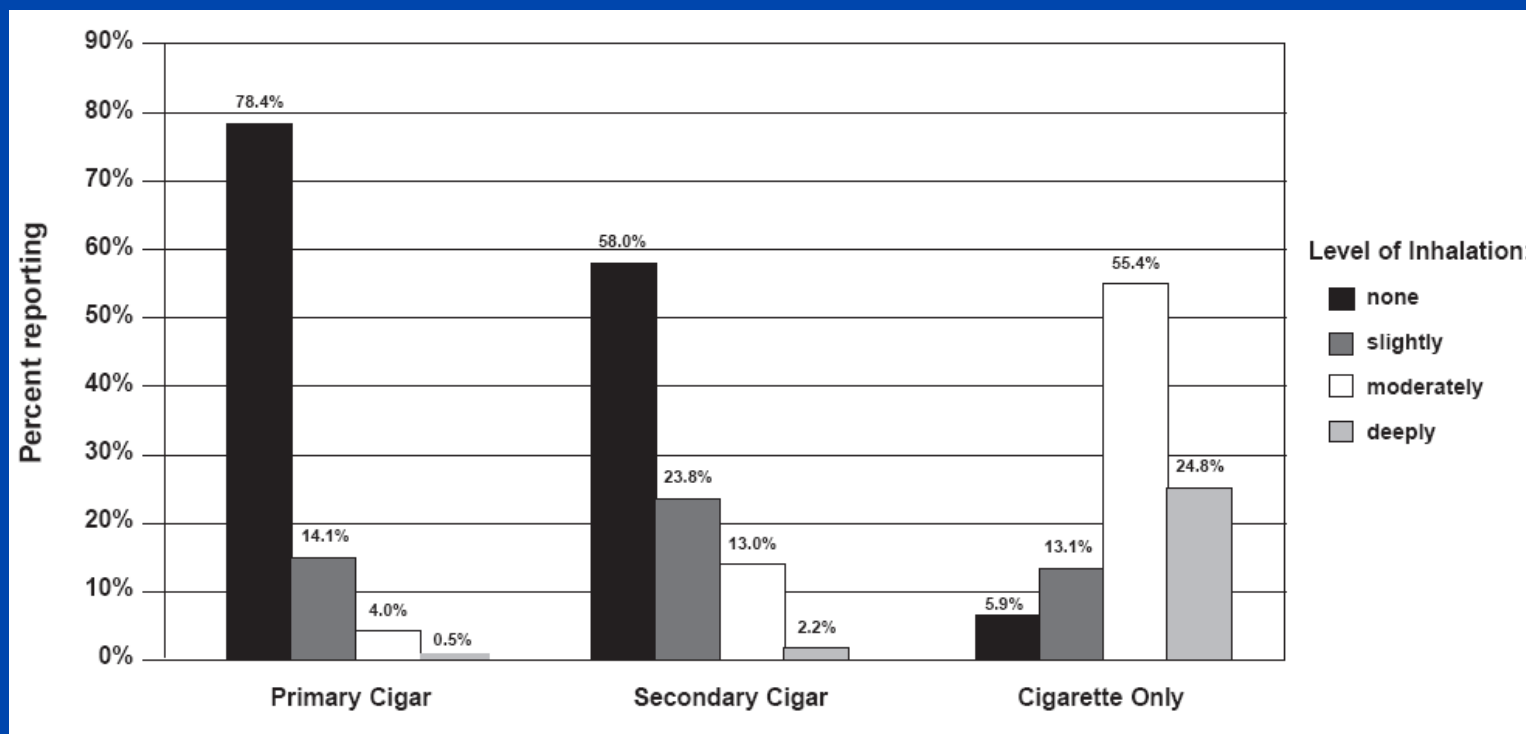
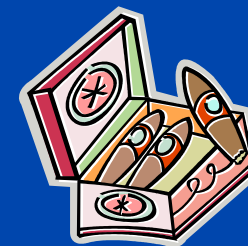
Tverdal et al. Tob Control 2011;20 123-130

Disease Risks



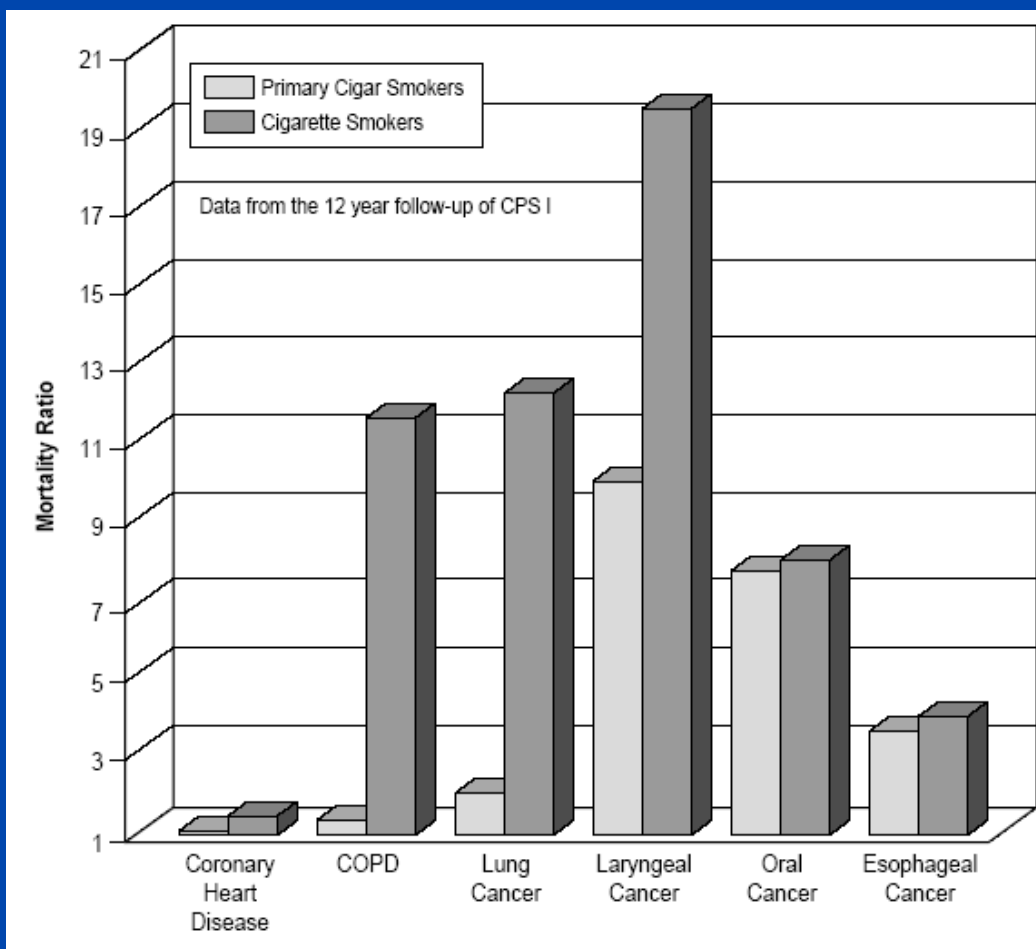
- Tar of cigar is more carcinogenic than cigarette smoke tar
- Morbidity and mortality correlates with:
 - +/- inhalation
 - depth of inhalation
 - number of cigars they smoke

Levels of Inhalation, CPS-1 Study

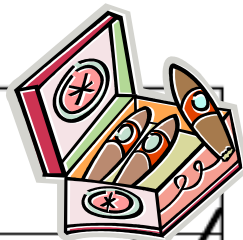
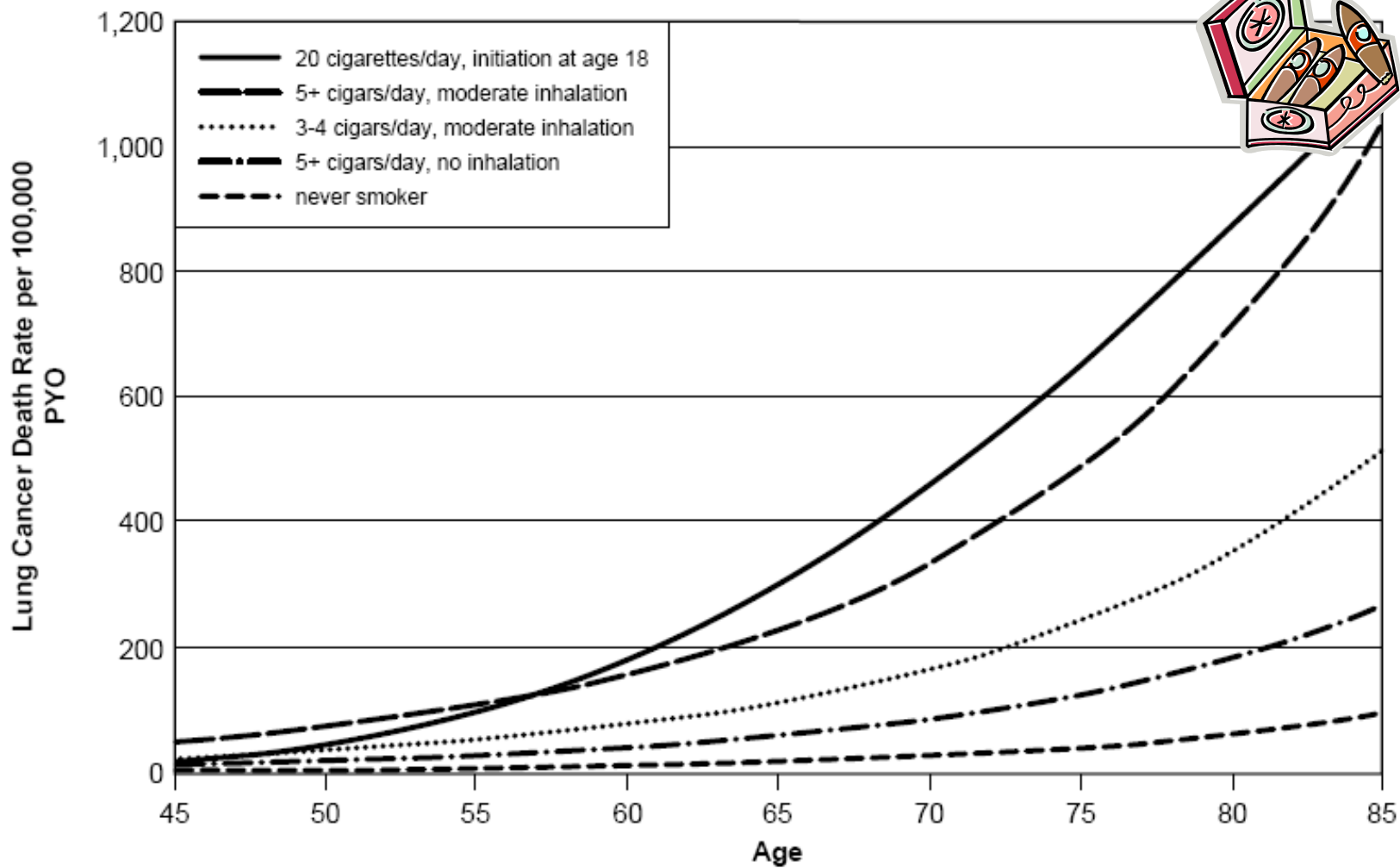


NCI Monograph 9. Cigars: Health Effects and Trends.

Mortality Ratios for Cigar & Cigarette Smokers vs. Never Smokers

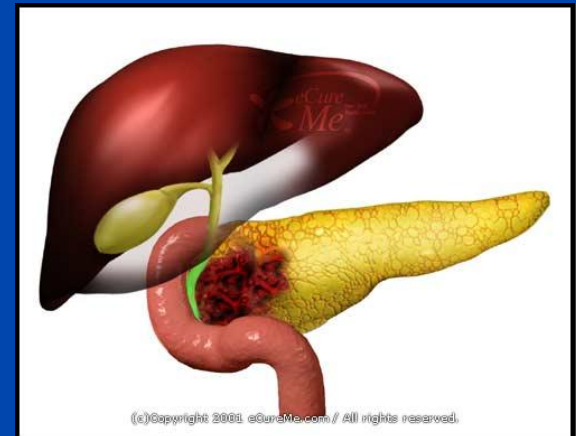


Lung cancer death rates for cigar smokers with different patterns of inhalation and number of cigars per day compared with one pack per day cigarette smokers



Cigar Smoking – Pancreatic Cancer Risk

- Compared with never tobacco users, cigar-only smokers have an increased risk for pancreatic cancer
 - OR 1.6 (95% CI: 1.2-2.3)
- Comparable to that of cigarette-only smokers
 - OR 1.5 (95% CI 1.4-1.6)



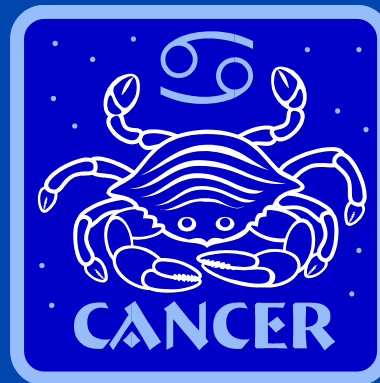
Bertuccio P, et al Ann Oncol. 2011 Jan 18. PubMed PMID: 21245160.

ST – Health Consequences

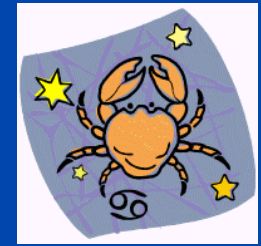
Report on Carcinogens, 10th Edition, National
Toxicology Program, USDHHS

Smokeless tobacco

“Known to be a human carcinogen”



28 Known Carcinogens in ST



- Including.....

- β -Angelica lactone
- Coumarin
- Ethyl carbamate (urethane)
- Formaldehyde
- Acetaldehyde
- Crotonaldehyde

Smokeless Tobacco and Some Tobacco-specific N-Nitrosamines. IARC Working Group on the Evaluation of Carcinogenic Risks to Humans (2004)

- Tobacco-specific N-nitrosamines (TSNA)
 - N'-Nitrosonornicotine (NNN)
 - 4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK)
 - 4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL)
 - N'-Nitrosoanabasine (NAB)
- Arsenic
- Nickel compounds
- Polonium-210
- Uranium-235
- Uranium-238

Health Effects: Cancers – U.S. Data

Location	OR (95% CI)
Cancer, Mouth and Gum	11.2 (4.1-30.7) ^A
Gum & Buccal Mucosa	4.2 (2.6-6.7) ^B
Larynx	7.3 (2.9-18.3) ^A
Salivary gland	5.3 (1.2-23.4) ^A
Kidney	4.0 (1.2-12.9) ^C
Pancreatic	3.6 (1.0-12.8) ^D

A - Stockwell HG, et al. Head Neck Surg. 1986 Nov-Dec;9(2):104-10.

B - Winn DM, et al. N Engl J Med. 1981 Mar 26;304(13):745-9.

C - Goodman MT, et al. Am J Epidemiol. 1986 Dec;124(6):926-41.

D - Muscat JE, et al. Cancer Epidemiol Biomarkers Prev. 1997 Jan; 6(1):15-9.



ST Health Effects: CV Disease



CPS-II

- **Current ST use vs. never* associated with death from:
 - All causes: HR 1.18 (95% CI: 1.08-1.29)
 - CHD: HR 1.26 (95% CI: 1.08-1.47)
 - Cerebrovascular dz: HR 1.40 (95% CI: 1.10-1.79)
- No difference between snuff and chewing tobacco
- Former use did increase the risk of death in any category

*Multivariate-adjusted

Henley et al., Canc Cause Control. 2005; 16: 347-358.

ST – Oral Lesions

- Leukoplakia
- Oral cancer
- Dental disease
 - erosion of enamel
 - dental caries
- Periodontal Disease
 - gingival recession
 - soft tissue/hard tissue loss
 - gingivitis



Waterpipe – Health Effects

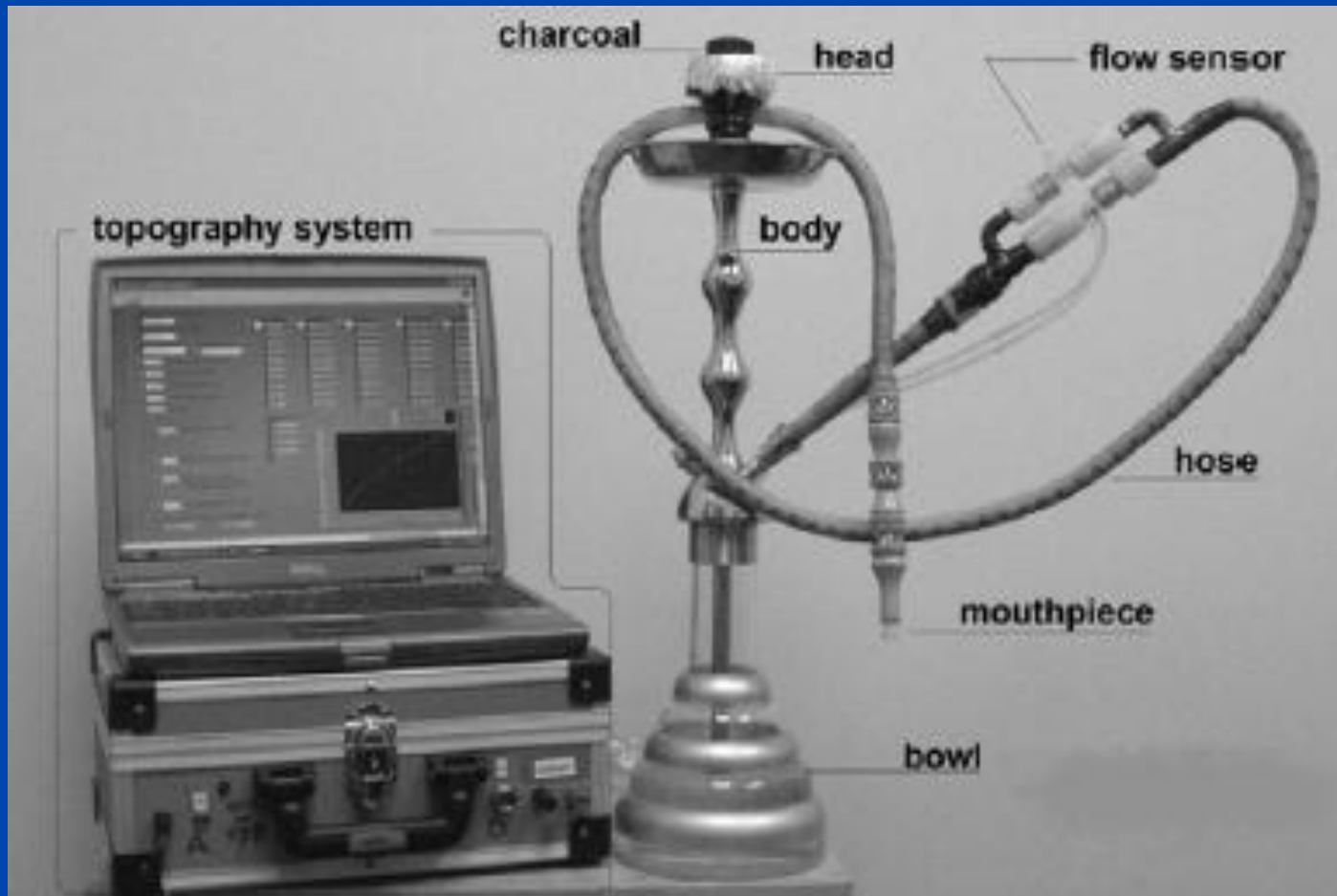
- 1-hour session involves inhaling 100-200 times volume of smoke from a single cigarette
- Smoke contains CO, heavy metals, and carcinogens
- Charcoal added to keep tobacco burning increases health risks
- Sharing = tuberculosis & hepatitis

WHO. TobReg Advisory Note. Waterpipe Tobacco Smoking

Google: “who tobreg water pipe”



Waterpipe Analysis



Eissenberg T, et al. American journal of preventive medicine. 2009 Dec;37(6):518-23.

Waterpipe vs. Cigarette

- Directly compare waterpipe use & cigarette smoking
- 31 participants reporting monthly waterpipe use & weekly cigarette smoking
- Cross-over: 45 minutes with waterpipe (WP) and 1 cigarette
- CO (carbon monoxide): 23.9 ppm WP vs. 2.7 C
- COHb (carboxyhemoglobin): 3.9% WP vs. 1.3% C
- Puff volume: 48.6 L WP vs. 1.0 L C
- Peak nicotine levels were comparable
 - 1.7 times the nicotine exposure



Eissenberg T, et al. American journal of preventive medicine. 2009 Dec;37(6):518-23.

Disease Risks

- Burning charcoal is normally placed atop the tobacco to smoke the narghile waterpipe
- Waterpipe smokers thus also inhale large quantities of combustion-generated toxicants



Waterpipe – Health Effects



Single narghile smoking session:

- 50 times the quantities of carcinogens as one cigarette^A
- Many times the formaldehyde, acetaldehyde and acrolein typically found in a cigarette^B
- 2.25 mg nicotine^C
- 242 mg nicotine-free dry particulate matter (NFDPM)^C
- Higher levels of arsenic, chromium and lead than a cigarette^C

A - Sepetdjian E, et al. Food Chem Toxicol. 2008 May;46(5):1582-90.

B - Al Rashidi et al. Volatile aldehydes in the mainstream smoke of the narghile waterpipe. Food Chem Toxicol. 2008 Nov;46(11):3546-9.

C - Shihadeh A. Investigation of mainstream smoke aerosol of the argileh water pipe. Food Chem Toxicol. 2003 Jan;41(1):143-52.

Waterpipe

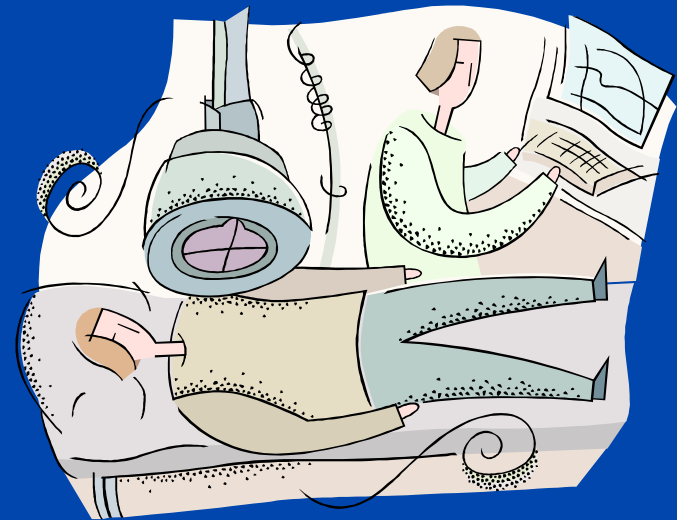
- Waterpipe tobacco smoking negatively affects lung function
 - Significant reduction in FEV1 compared to no smoking (4% lower FEV1)
 - Trend toward lower FVC (1.38% lower FVC) compared to no smoking
 - No statistically significant difference in FEV(1), FVC, and FEV(1)/FVC compared to cigarette smoking
- May be as harmful as cigarette smoking
- Likely to be a cause of COPD



Raad D, et al. Chest. 2010 Jul 29. PubMed PMID: 20671057.

Waterpipe

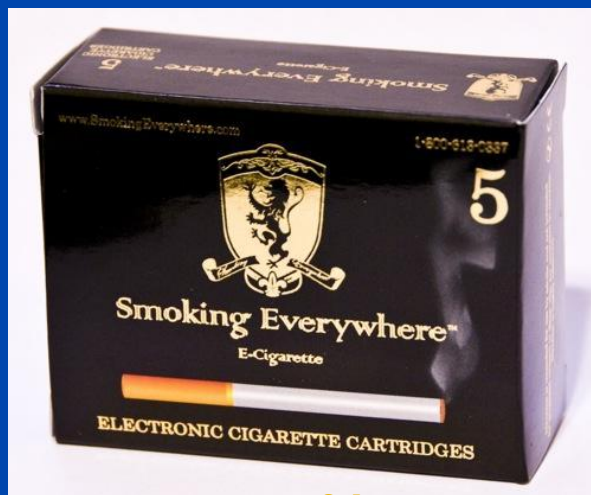
- Literature review
 - Cohort, case-control and cross-sectional studies
- Increased risk for
 - Lung cancer
 - Respiratory illness
 - Low birth-weight
 - Periodontal disease



Warnakulasuriya S. Evid Based Dent. 2011;12(2):44-5. PubMed PMID: 21701545.



- In 2009, FDA's Center for Drug Evaluation, Division of Pharmaceutical Analysis (DPA) analyzed:
 - 2 samples of electronic cigarettes & components from two leading brands
 - 18 of the flavored, nicotine, and no-nicotine cartridges
 - Nicotine inhaler (control)



www.fda.gov







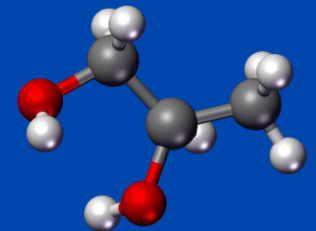
- DPA's analysis:
 - Diethylene glycol in one cartridge @ 1%
 - Ingredient used in antifreeze & toxic to humans
 - Tobacco-specific nitrosamines (TSNA's) in 1/2 of samples
 - Human carcinogen
 - Tobacco-specific impurities detected in a majority of the samples tested
 - May be harmful to humans
 - Anabasine
 - Myosmine
 - β -nicotyrine



ENDS – Liquid Solution Composition

Substance	Recipe 1	Recipe 2	Recipe 3	Recipe 4	Recipe 5
Propylene glycol	85%	80%	90%	80%	<65%
Nicotine	6%	4%	2%	0.1%	<3%
Glycerol	2%	5%	-	5%	<20%
Tobacco essence	-	4%	4.5%	1%	<5%
Essence	2%	-	1%	1%	<5%
Organic acid	1%	-	-	2%	<1%

Propylene glycol: pharmaceutical solvent, food additive, moisturizer (cosmetics & toothpaste), hand sanitizer, non-toxic antifreeze, deodorants, aircraft de-icer.



en.wikipedia.org



Propylene glycol

Vegetable glycerine

“E-Juice” or “Smoke Juice”

- Total nicotine = 720 mg
- Lethal nicotine dose =
- 40–60 mg (0.5-1.0 mg/kg)



ENDDs: Health Effects

- 30 healthy smokers (Athens, Greece)
 - Minimum of 5 pack-years
 - Aged 19-56 years
 - 14 male
- E-cigarette for 5 minutes
- ENDDs associated with a significant increase in airway resistance



Vardavas CI, et al. Chest. 2011 Dec 22. PubMed PMID: 22194587.

ENDDs Properties

- E-cigarettes required stronger suction to smoke than conventional brands
- Amount of aerosol produced by e-cigarettes decreased during smoking
 - Necessitated increasing puff strength to produce aerosol.
- “Decreased efficiency of aerosol production during e-cigarette smoking makes dosing nonuniform over time and calls into question their usefulness as nicotine delivery devices.”



Trtchounian A,. Nicotine Tob Res. 2010 Sep;12(9):905-12.



Pharmacology



NCTP Bioavailability of Nicotine (aka “Smoke Yields”)

<u>Type</u>	<u>Nicotine (mg)</u>
Cigarette (filter)	1.1
Pipe	5.2
Smokeless tobacco	
Chewing tobacco	4.5
Moist snuff	3.6
Cigars	
Little cigars, Swishers	3.8
Premium, Macanudo	13.3
4 mg nicotine gum	1.9



Smokeless Tobacco Nicotine “Content”

- 4.8 mg nicotine/gm of moist snuff x 30 gm/can = 144 mg
- 144 mg nicotine/(1.8 mg nicotine/cigarette) = 80 cigarettes
- 80 cigarettes/(20 cigarettes/pack) = 4 packs
- 1 can snuff = 4 packs of cigarettes
- ST Users are exposed to as much, and possibly more, daily nicotine than cigarette smokers



=



Table 1. Tobacco-specific nitrosamines, pH, total and unprotonated nicotine, and minor tobacco alkaloids in smokeless tobacco products.

Product	TSNAs ^a , µg/g dry weight					pH	Alkaloids, mg/g dry weight				
							Nicotine				
	NNN ^a	NNK ^a	NAT ^a	NAB ^a	Total		Total	Free	Nornicotine	Anatabine	Anabasine
<i>New products</i>											
Taboka											
Original	1.05	0.077	0.370	ND ^b	1.50	6.64	21.1	0.844	1.04	3.78	0.149
Green	0.948	0.092	0.292	0.002	1.33	6.85	19.9	1.26	1.02	4.03	0.197
Marlboro Snus											
Rich	1.27	0.259	0.455	ND	1.98	6.83	17.8	1.08	0.438	2.60	0.111
Mild	1.52	0.229	0.234	ND	1.98	6.47	12.8	0.350	0.484	1.82	0.072
Spice	1.56	0.257	0.246	ND	2.06	6.85	17.9	1.13	0.411	2.17	0.097
Mint	3.28	0.215	0.221	ND	3.72	6.58	20.0	0.701	0.454	1.97	0.063
Camel Snus											
Original	1.15	0.270	0.297	0.012	1.73	7.46	28.2	6.09	0.353	1.39	0.164
Spice	1.27	0.157	0.305	0.015	1.75	7.75	25.4	9.16	0.314	1.09	0.183
Frost	1.20	0.267	0.204	0.009	1.68	7.59	23.7	6.40	0.313	0.741	0.103
Skoal Dry											
Regular	3.57	0.360	0.478	ND	4.41	7.23	11.3	1.57	0.345	1.41	0.117
Cinnamon	5.30	0.313	0.572	0.002	6.19	6.85	11.9	0.751	0.324	1.02	0.130
Menthol	2.53	0.279	0.203	ND	3.01	7.18	11.9	1.51	0.386	1.37	0.127
<i>Mean for new products</i>	2.05	0.231	0.323	0.008	2.61		18.5	2.57	0.490	1.95	0.126
<i>Traditional products</i>											
General Snus	1.66	0.464	0.969	0.008	3.10	7.95	16.7	7.69	0.223	0.367	0.072
Copenhagen Snuff	5.12	1.40	1.12	0.152	7.79	7.45	23.0	4.88	0.248	1.43	0.150
Copenhagen Long Cut	3.76	1.10	1.35	0.062	6.27	7.53	26.7	7.14	0.157	0.770	0.037
Skoal Long Cut	4.66	1.64	1.59	0.074	7.96	7.51	25.6	6.03	0.233	1.02	0.049
Kodiak Wintergreen	6.86	1.41	3.58	0.179	12.0	8.23	19.6	12.1	0.164	0.438	0.055
<i>Mean for traditional products</i>	4.41	1.20	1.72	0.095	7.42		22.3	7.57	0.205	0.805	0.073

Note. ^aAbbreviations: TSNAs, tobacco-specific N-nitrosamines; NNN, N'-nitrosoanabasine; NNK, 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NAT, N'-nitrosoanatabine; NAB, N'-nitrosoanabasine. ^bND, not detected.

ST Characteristics Affecting Nicotine Blood Concentrations

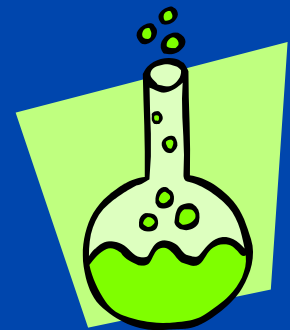
- Concentration of nicotine in ST product
- Size of the tobacco cuttings
 - Long cut
 - Fine cut (higher)
- Ammonium bicarbonate (additive)
 - Lower acid level of product = higher free nicotine
- Acetic acid (additive)
 - Increases salivation – enhances absorption



Richter P, et al. Nicotine Tob Res. 2003 Dec;5(6):885-9.

pH Manipulation by Industry

- October 1994, Wall Street Journal:
- “US Tobacco routinely adds chemicals to its snuff to deliver the free nicotine faster and to make the product stronger.”
 - Larry Story, former UST chemist
- “It (Copenhagen) was brought up to a pH of 7.8 by adding more sodium bicarbonate and ammonium carbonate.”
 - Larry Story, former UST chemist²⁶



Connolly, G. N. Tob Control 4: 73-79.

Impact of pH Manipulation: Long-Term

- Likelihood of choosing a brand with higher nicotine content is related to:
 - Increasing duration of use
 - Increasing intensity of use
 - Frequency of ST use
- ST users who have used higher nicotine-containing products are more likely to report:
 - More nicotine withdrawal symptoms
 - Continued use because of difficulty quitting



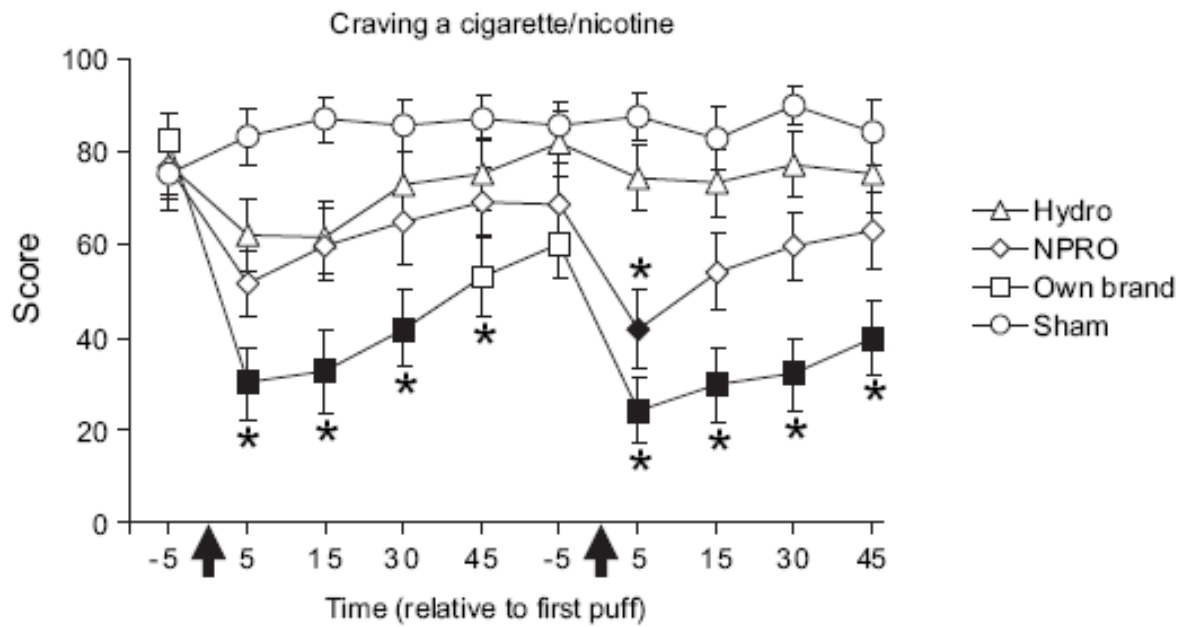
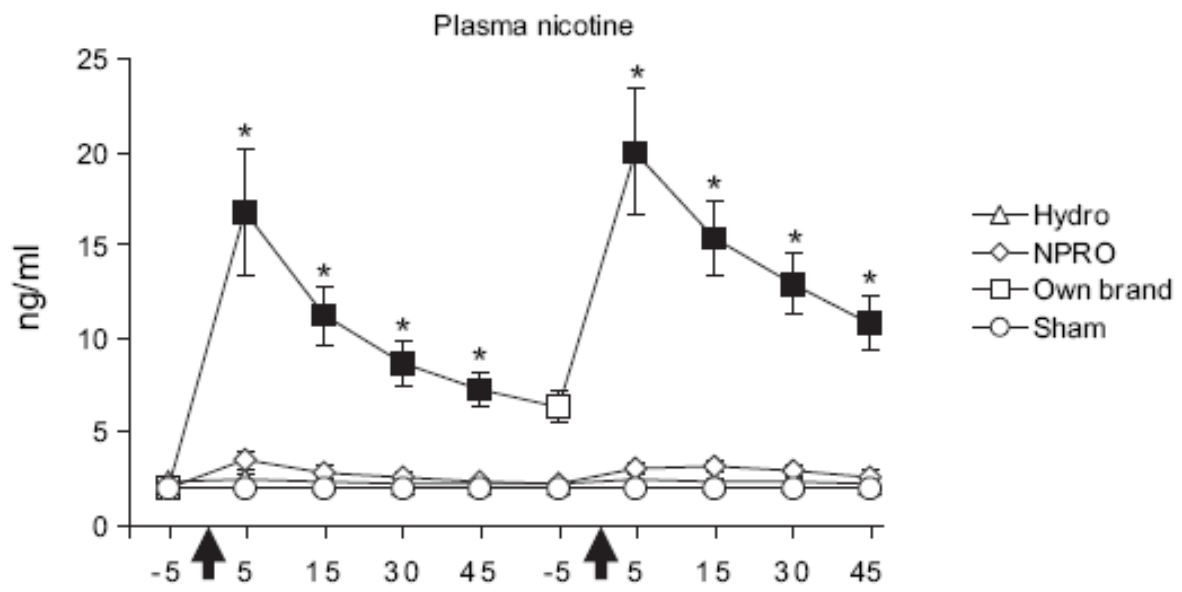
Waterpipe

- Data indicates that daily waterpipe use of the produced a 24-hr urinary cotinine level of: 0.785 microg/ml (95% CI = 0.578-0.991 microg/ml)
- Daily waterpipe smoking is equivalent to smoking 10 cigarettes (95% CI: 7-13)



Neergaard J, et al. *Nicotine Tob Res.* 2007 Oct;9(10):987-94. Review.

Crown 7 Hydro



Njoy NPRO



Eissenberg T. Tob Control. 2010 Feb;19(1):87-8..

ENDDs – Are the “Addicting”?

- 20 participants
 - Smoked >15 cigarettes per day
 - Aged 18-55 years
- ENDDs were associated with:
 - Significant nicotine delivery
 - Tobacco abstinence symptom suppression
 - Increased product acceptability ratings



vaporking[®]
Electronic Cigarette

Vansickel AR, *et al.* *Addiction*. 2012 Jan 9. PubMed PMID: 22229871.



Current Recommendations for Treatment



Pipes, Cigars, & Waterpipe



Treatment Options

Non-daily users

- Nicotine gum
- Nicotine lozenge
- Nicotine inhaler
- Nicotine nasal spray

Daily users

- Nicotine patch
- Bupropion SR
- Varenicline





Smokeless Tobacco (ST)



Assessing Dependence in ST Users

Number of cans per week

- Strongest correlation with nicotine/cotinine blood concentrations
- Used for dosing guidelines



Nicotine Patch Dosing Algorithm for ST Users

	Peak serum nicotine concentrations (ng/mL)	Cans or pouches per week	Patch dose
Low	0-10	< 2	14 mg/d
Intermediate	11-20	2-3	21mg/d
High	> 20	> 3	42 mg/d



Ebbert. JSAT. 2004

Bupropion SR: Dosing

150 mg daily for 3-4 days

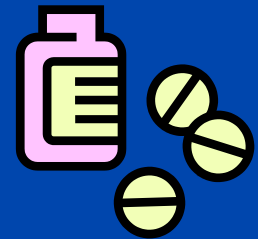
then

150 mg twice a day for 3-4 days

THEN

STOP CHEWING

3 to 12 months – No taper needed



Snuff Substitutes

- Smokey Mountain®
- Golden Eagle®
- Oregon Mint®
- KIK IT®
- Jerky®
- Bacc-Off®



Nicotine Lozenge

- 2 mg & 4 mg
- Dissolves in mouth over 20-30 minutes
- Delivers 25% more nicotine than the gum





Nicorette “Mini” – 2 mg/4 mg

Generic (large) lozenge



Nicotine Lozenge: Dosing

- Not to be chewed or swallowed whole
- Avoid eating or drinking food during and 15 minutes prior to use
- Monotherapy
 - 2 mg
 - First dip \geq 30 min
 - \leq 3 cans/week
 - 4 mg
 - First dip < 30 min
 - > 3 cans/week
- Combination may be optimal (patch)
- 1-2 lozenges every 1-2 hours
- Minimum of 9/day
- Taper over 12 weeks



Nicotine Gum

- Monotherapy
 - 2 mg
 - First dip \geq 30 min
 - \leq 2 cans/week
 - 4 mg
 - First dip $<$ 30 min
 - $>$ 2 cans/week
- “Chew and Park”
- Combination with nicotine patch may be optimal



Scandinavian Snus



32% of men aged
16-35 use snus daily

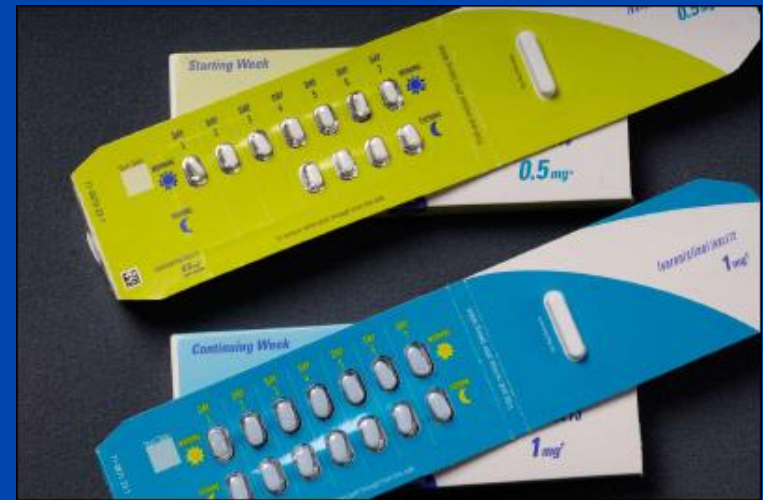


19% adult snus
use prevalence

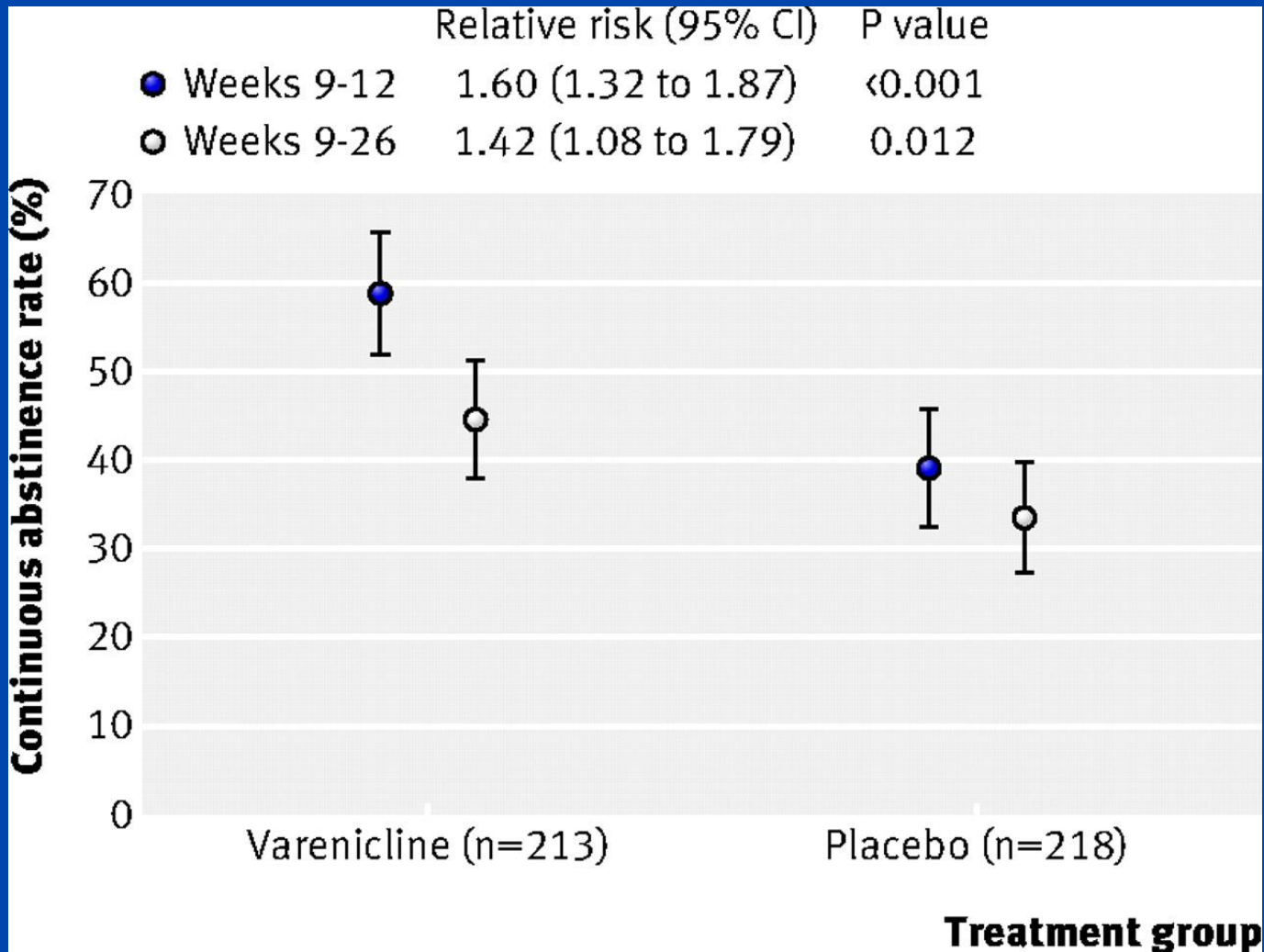


Varenicline (Chantix™) for Snus Users

- Norway (7 sites) & Sweden (9 sites)
- Male/female daily ST users
 - Use at least 8 times/day
- Randomized to:
 - Varenicline for 12 weeks
 - Placebo
- Biochemical confirmation of abstinence
 - Salivary cotinine > 15 ng/mL



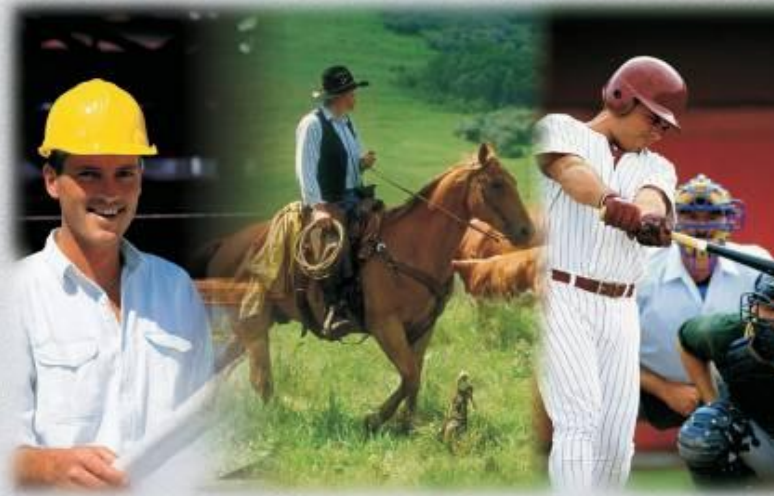
Fagerström K, et al. BMJ. 2010 Dec 6;341.



Fagerström K, et al. BMJ. 2010 Dec 6;341.

Facilitator Guide

Your Path to Smokeless Tobacco Freedom

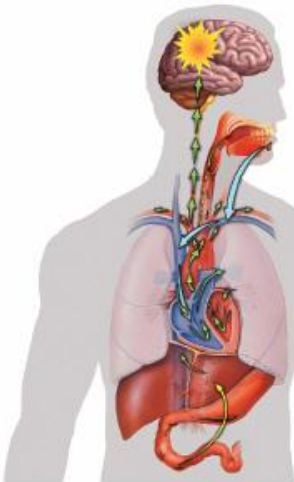


MAYO CLINIC
NICOTINE DEPENDENCE CENTER

Y

Your brain and nicotine: The physical challenge of quitting

You use **chew** for many reasons. One main reason is because smokeless tobacco contains an addicting drug called nicotine. This is the substance that makes it so difficult to stop, even though you want to.



Nicotine from chewing tobacco is absorbed into your bloodstream through your mouth (blue arrows). Nicotine from swallowed tobacco juice is absorbed into your small intestine and then passes through your liver before entering your bloodstream (red arrows). Your heart pumps nicotine to your brain and the rest of your body.

8

You're prepared! It's your quit day!

It's the start of your tobacco-free life

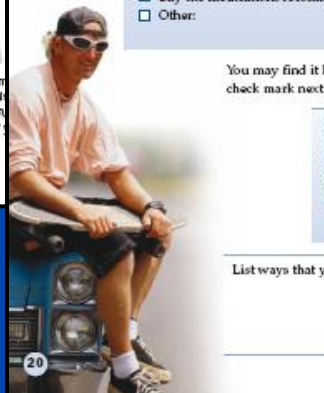
My Quit Date is:

In preparation for today, I will:

- Clean out my car
- Make plans with my support people
- Plan activities or projects
- Dispose of all tobacco (check my gym bag, glove compartment and other storage areas)
- Make an appointment to see a dentist to clean my teeth
- Make an appointment to see a doctor for any prescriptions
- Buy the medications recommended by my doctor
- Other:

You may find it helpful to check mark next to each item.

List ways that you will stay tobacco-free.



20

CHEW CHECKS: Use these "chew checks" attached to your tin or pouch with a rubberband. Remove these cards by tugging and waiting along the perforated lines. Carry these with you and record each time you take a chew — see page 17 for instructions.

A Adapted by a tobacco retailer, Leigh Greenstein, © 2011

DATE:						DATE:						DATE:								
No.	Time of day	New dip/ chew	Add more chew	Need S = strong M = moderate L = light	Mood Chewed (angry and happy content)	Activity What you were doing at the time	No.	Time of day	New dip/ chew	Add more chew	Need S = strong M = moderate L = light	Mood Chewed (angry and happy content)	Activity What you were doing at the time	No.	Time of day	New dip/ chew	Add more chew	Need S = strong M = moderate L = light	Mood Chewed (angry and happy content)	Activity What you were doing at the time
1							1							1						
2							2							2						
3							3							3						
4							4							4						
5							5							5						
6							6							6						
7							7							7						
8							8							8						
9							9							9						
10							10							10						



Bupropion
Available doses:
150 mg

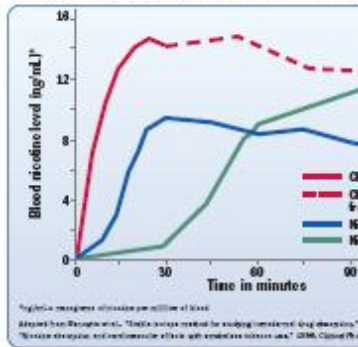
Comments:



Varenicline
Available doses:
0.5 mg
1 mg

Comments:

Blood nicotine levels of chewing tobacco vs. nicotine gum



Nicotine in chewing tobacco is absorbed very rapidly and peaks within 30 minutes of placement. Even after the chew is removed, nicotine is absorbed through the mouth and small intestine. In comparison, the nicotine absorbed through the mouth (from gum) is absorbed much more slowly and often results in lower levels than obtained with chewing tobacco.



Normal inside cheek

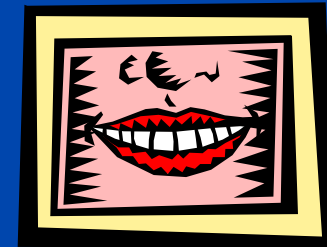


Snuff dipper pouch (where chew is placed)



Recommended ST Treatment Approach

- Bupropion SR
 - Weight gain prevention
 - Craving reduction
- Tailored nicotine patch therapy
 - Craving reduction
 - Short-term (end-of-treatment) abstinence
- Nicotine lozenge (short-term abstinence)
- Nicotine gum (craving reduction)
- Varenicline



Treatment **Not** Recommended for ST Users

- Nicotine inhaler
 - Designed to replicate the tactile sensation of a cigarette
- Nicotine nasal spray
 - Speed of intranasal delivery designed to the speed of delivery of a cigarette



ENDDs – Are the “Addicting”?

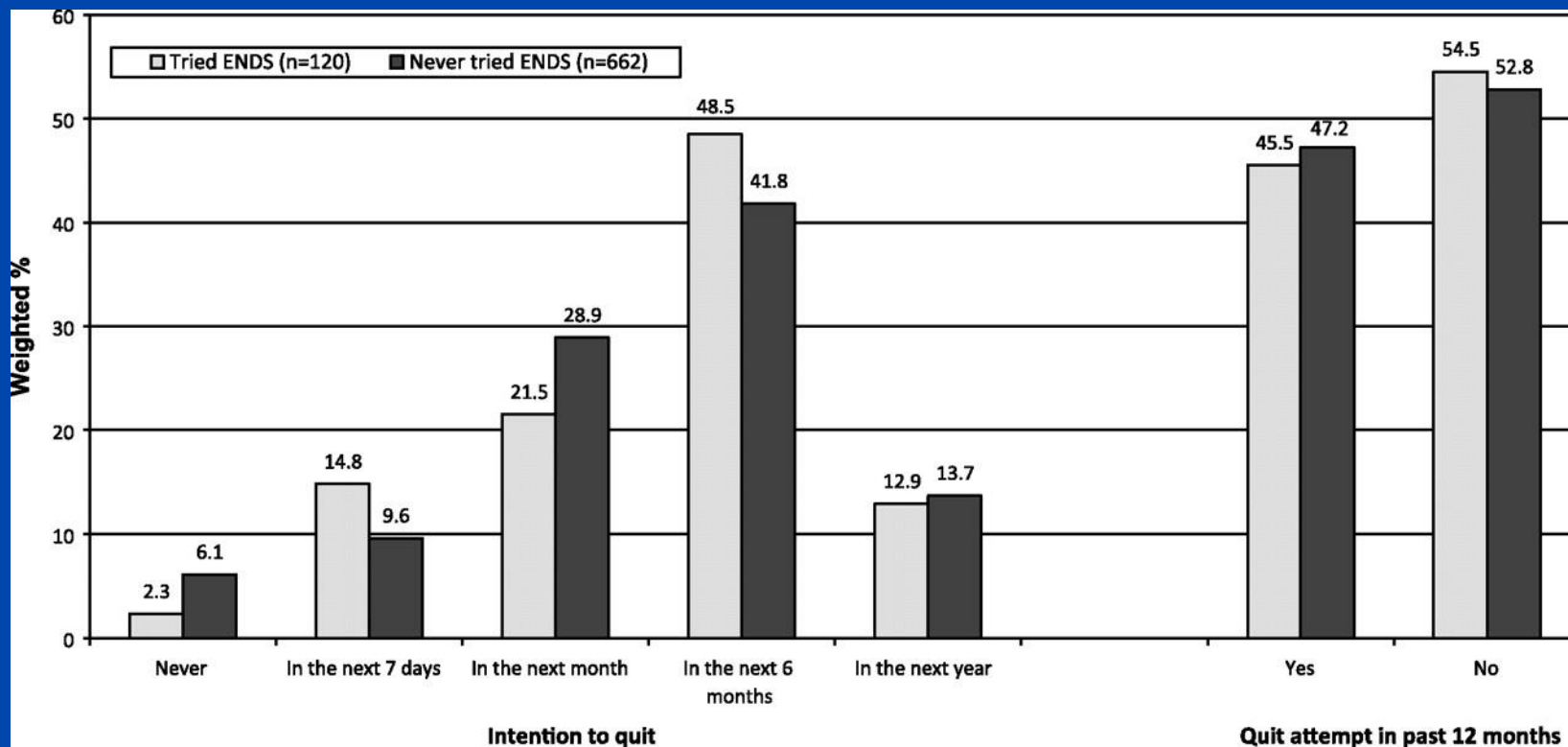
- 20 participants
 - Smoked >15 cigarettes per day
 - Aged 18-55 years
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 - Significant nicotine delivery
 - Tobacco abstinence symptom suppression
 - Increased product acceptability ratings



vaporking[®]
Electronic Cigarette

Vansickel AR, *et al.* *Addiction*. 2012 Jan 9. PubMed PMID: 22229871.

Comparison of intention to quit smoking and past year quit attempts among US smokers (adults who reported having smoked 100 cigarettes in their lifetime and currently smoke everyday or on some days) who have tried an electronic nicotine delivery system (ENDS) and smokers who have not—ConsumerStyles 2010.



Regan A K et al. Tob Control doi:10.1136/tobaccocontrol-2011-050044

Goals & Objectives

- Review NCTP definitions & products
- Discuss prevalence/trends of NCTP
- Describe NCTP pharmacology
- Discuss NCTP addiction
- Review recommended treatments for NCTP

