

Foundations of Cardiometabolic Health Certification Course

Certified Cardiometabolic Health Professional (CCHP)



A Practical Approach to Treating Smoking

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and Lifestyle

Vanderbilt University Medical Center
Nashville, TN

Disclosures

- Principal Investigator for NIH-supported smoking cessation trials that used smoking cessation medication donated by manufacturer
- Consultant to NCI for Tobacco Control Monograph Series, to CDC for U.S. Surgeon General's Reports on Smoking and Tobacco Use
- Volunteered (unpaid) scientific input to design of a Phase 3 trial for an emerging smoking cessation medication proposed for FDA approval
- Currently volunteer as panel member for:
 - National Comprehensive Cancer Center (NCCN) Smoking Cessation Guidelines
 - Cochrane Review Guidelines for Treating Hospitalized Smokers (2022 Update)

Overview

- Epidemiology: Smoking rates are declining but still threaten cardiometabolic health
- Smoking cessation decreases cardiometabolic risk (and other health risks, too!)
- Screen and Intervene
- Future directions in treatment of smoking and tobacco use

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Smoking: Epidemiology and Connection to Cardiometabolic Risk

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FALLING RATES

By AMERICAN HEART ASSOCIATION NEWS

The cigarette smoking rate among U.S. adults has hit an all-time low, federal data show.

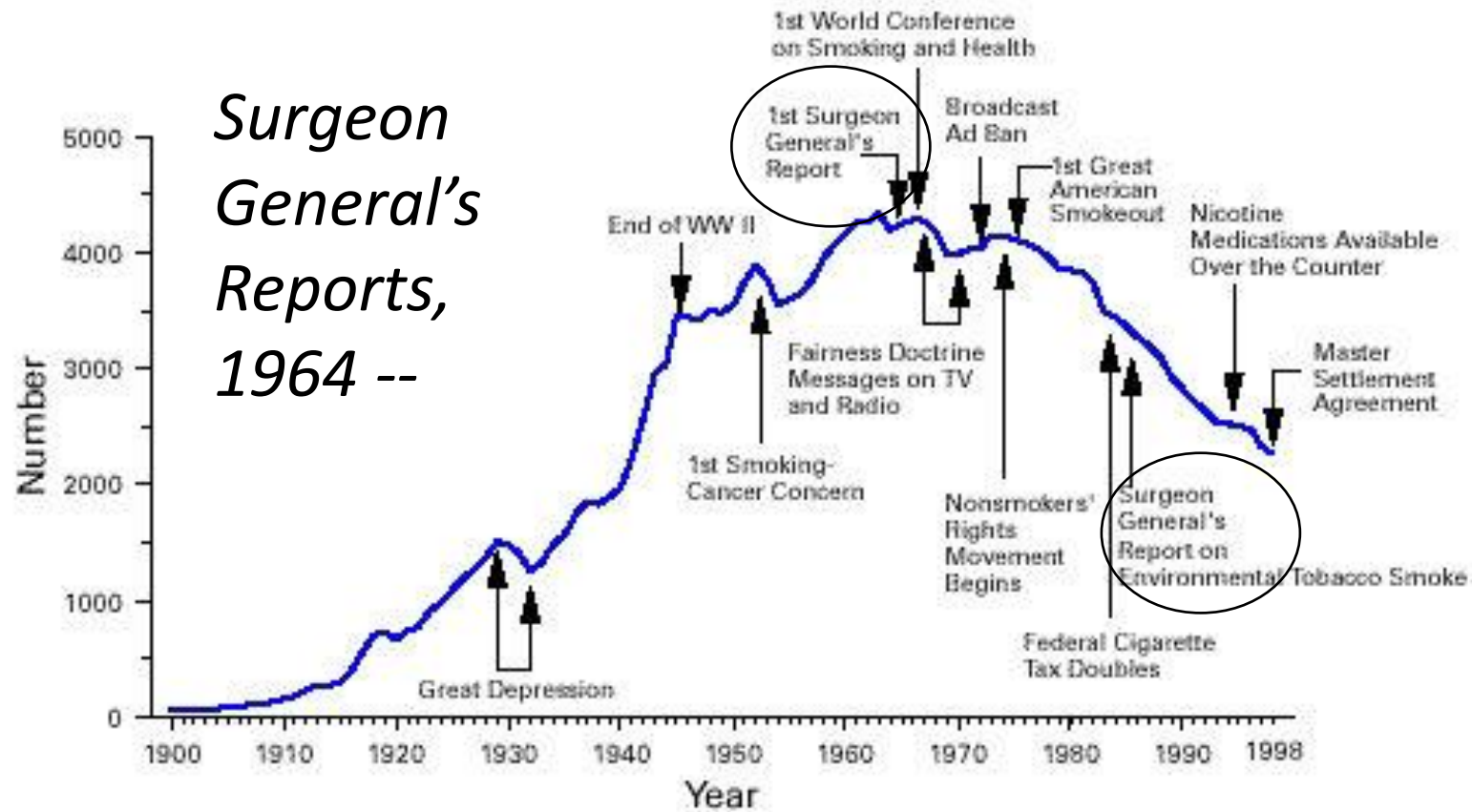
In the U.S., smoking cessation is a public health success story. . .



Source: Centers for Disease Control and Prevention

Published Aug. 30, 2018

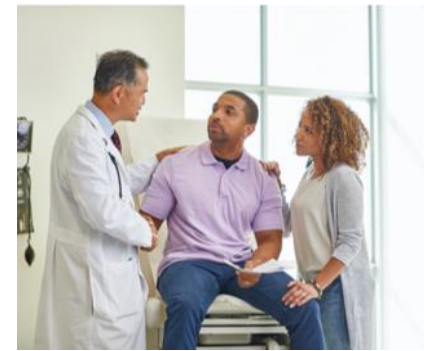
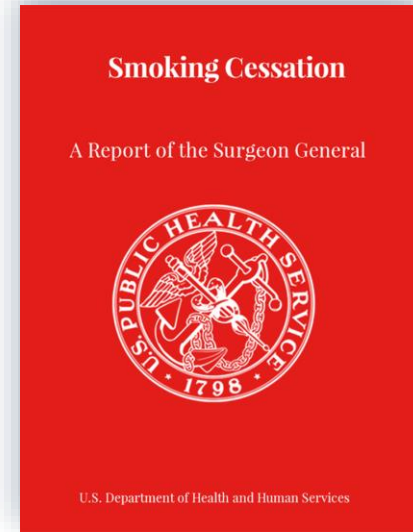
Annual Adult per Capita Cigarette Consumption and Major Smoking and Health Events- the United States, 1900-1998



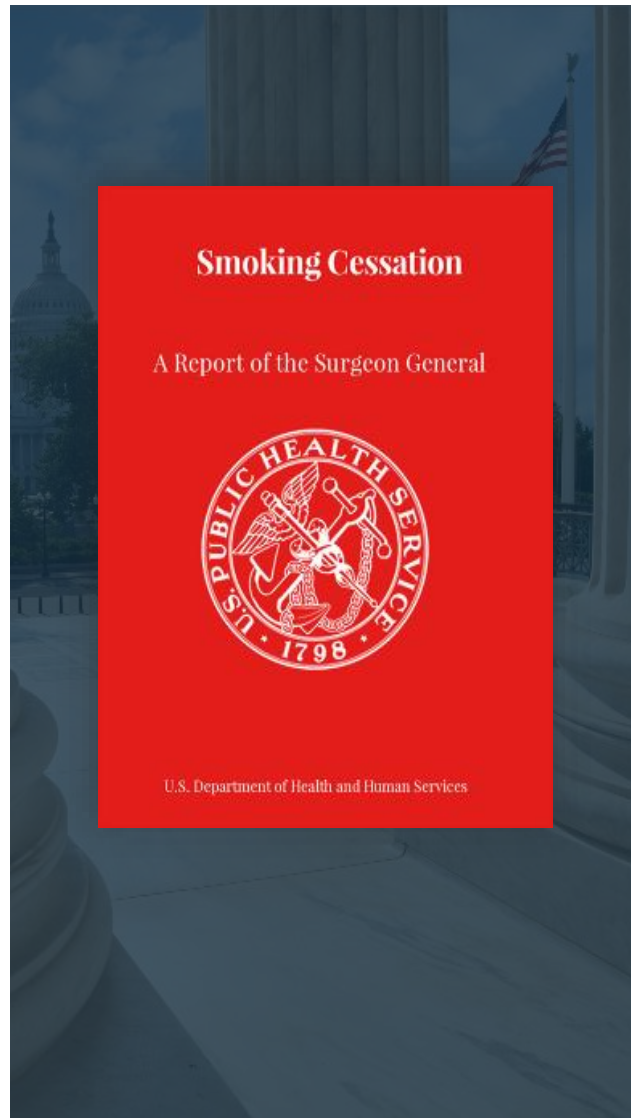
SMOKING CESSATION

A REPORT OF THE SURGEON GENERAL

HIGHLIGHTS FOR CMHC CCHP 2022



10 Major Conclusions



1. Smoking cessation is beneficial at any age. Smoking cessation improves health status and enhances quality of life.

2. Smoking cessation reduces the risk of premature death and can add as much as a decade to life expectancy.

3. Smoking places a substantial financial burden on smokers, healthcare systems, and society. Smoking cessation reduces this burden, including smoking-attributable healthcare expenditures.

4. Smoking cessation reduces risk for many adverse health effects, including reproductive health outcomes, cardiovascular diseases, chronic obstructive pulmonary disease, and cancer. Quitting smoking is also beneficial to those who have been diagnosed with heart disease and chronic obstructive pulmonary disease.

10 Major Conclusions

Smoking Cessation Age	Years of Life Gained
25-34	10
35-44	9
45-54	6
55-64	4
Before age 40: reduces risk of death associated with continued smoking by 90%, but is <u>effective at any age, including > 65</u>	

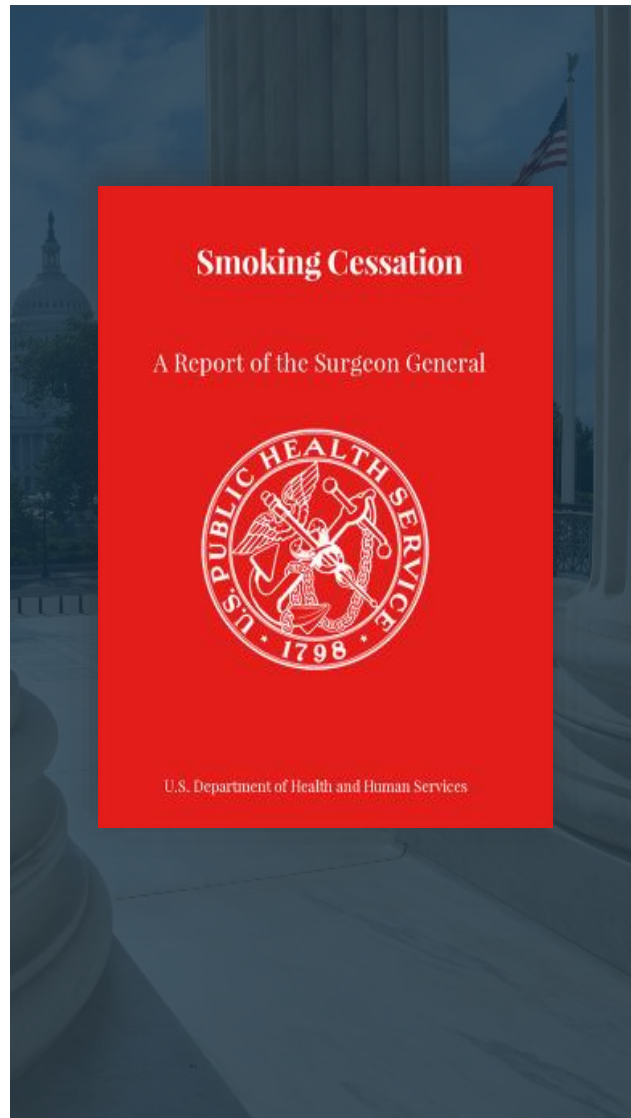
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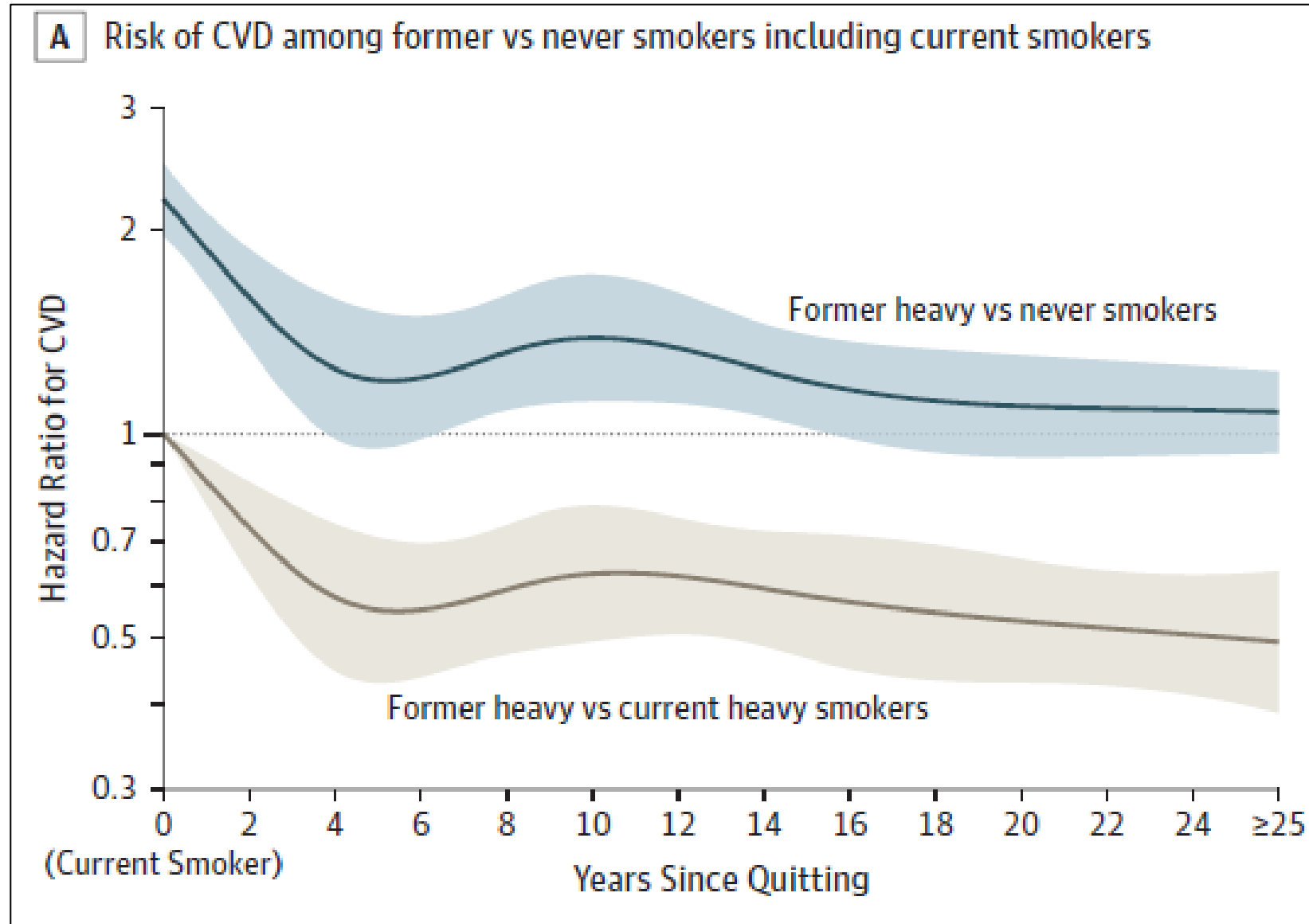
Where Does Treatment of Smoking Fit In to Prevention?

Intervention	Outcome	NNT
Statins	Prevent 1 death over 5 years	107
Aspirin	Prevent 1 MI over 5 years	118
Antihypertensive therapy	Prevent 1 stroke, MI, death over 1 year	700
Cervical cancer screening	Prevent 1 death over 10 years	1140
MD 5 min advice to stop smoking	Prevent 1 premature death	80
+ cessation medication	Prevent 1 premature death	38-56
+ behavioral support	Prevent 1 premature death	16-40

NNT = Number Needed to Treat

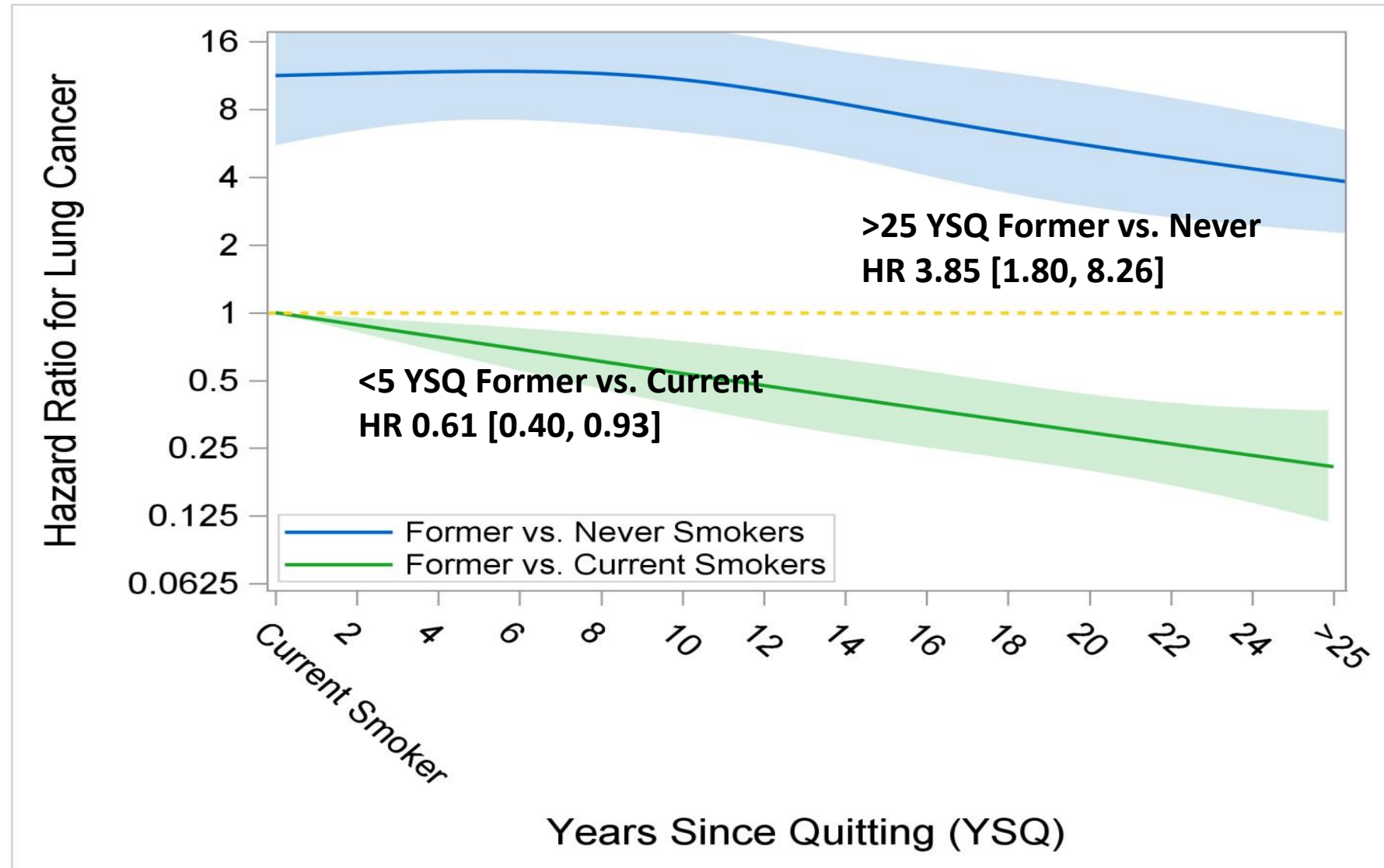
Quitting Smoking Reduces Risk of CVD

- In the Framingham Heart Study, **heavy former vs. current smokers have 39% lower CVD risk in 5 years but remain at higher risk of CVD for 16+ years vs. never smokers.**
- Adding pack years, years since quitting, and smoking status (former vs. never) to the ASCVD risk calculator improves risk prediction.

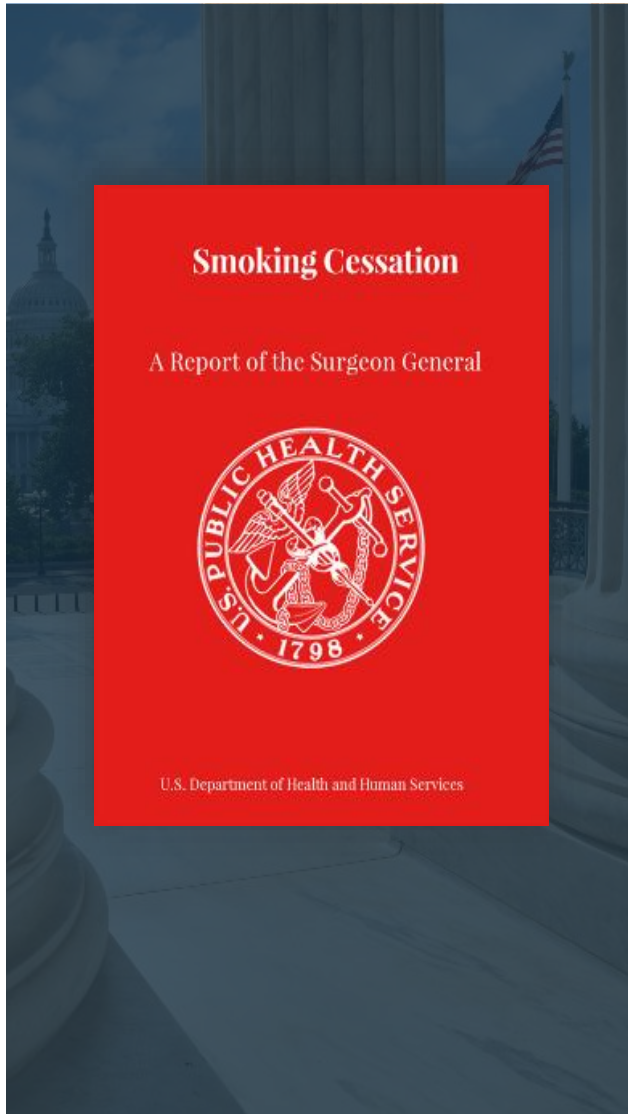


Quitting Smoking Reduces Risk of Lung Cancer

- **Heavy former vs. current smokers have 39% lower risk of lung cancer with in 5 yrs**
- **Former remain at 3 fold higher risk for up to 25+ years vs. never smokers.**
- 41% of lung cancers occurred in former smokers who quit > 15 years ago



10 Major Conclusions - *highlights*

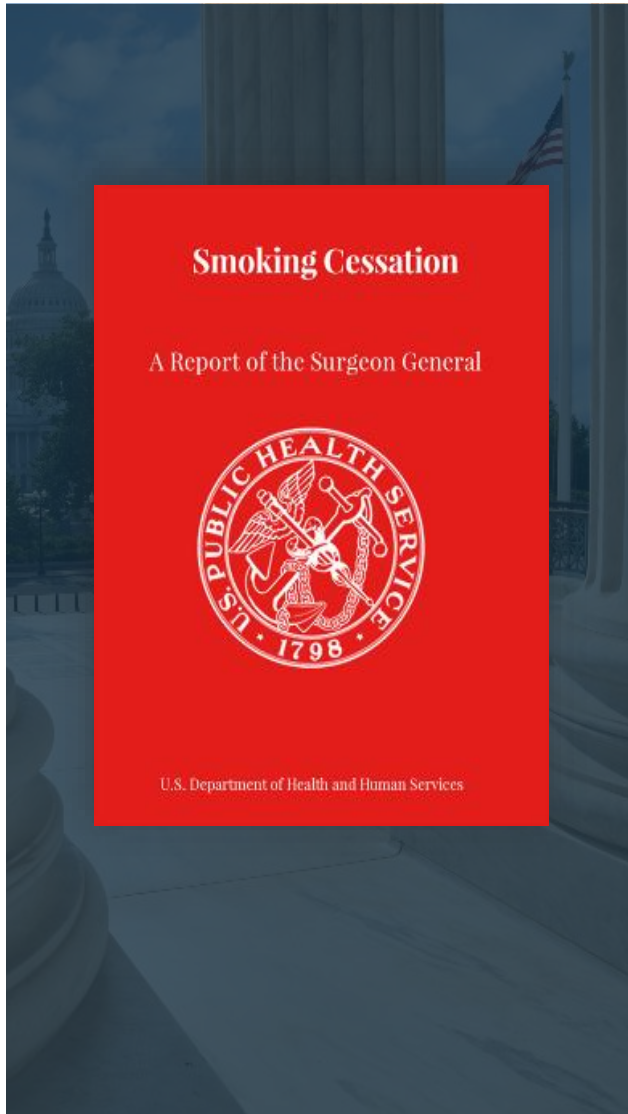


5. More than three out of five U.S. adults who have ever smoked cigarettes have quit. Although a majority of cigarette smokers make a quit attempt each year, less than one-third use cessation medications approved by the U.S. Food and Drug Administration (FDA) or behavioral counseling to support quit attempts.

6. Considerable disparities exist in the prevalence of smoking across the U.S. population, with higher prevalence in some subgroups. Similarly, the prevalence of key indicators of smoking cessation—quit attempts, receiving advice to quit from a health professional, and using cessation therapies—also varies across the population, with lower prevalence in some subgroups.

7. Smoking cessation medications approved by the U.S. Food and Drug Administration (FDA) and behavioral counseling are cost-effective cessation strategies. Cessation medications approved by the FDA and behavioral counseling increase the likelihood of successfully quitting smoking, particularly when used in combination. Using combinations of nicotine replacement therapies can further increase the likelihood of quitting.

10 Major Conclusions - *highlights*

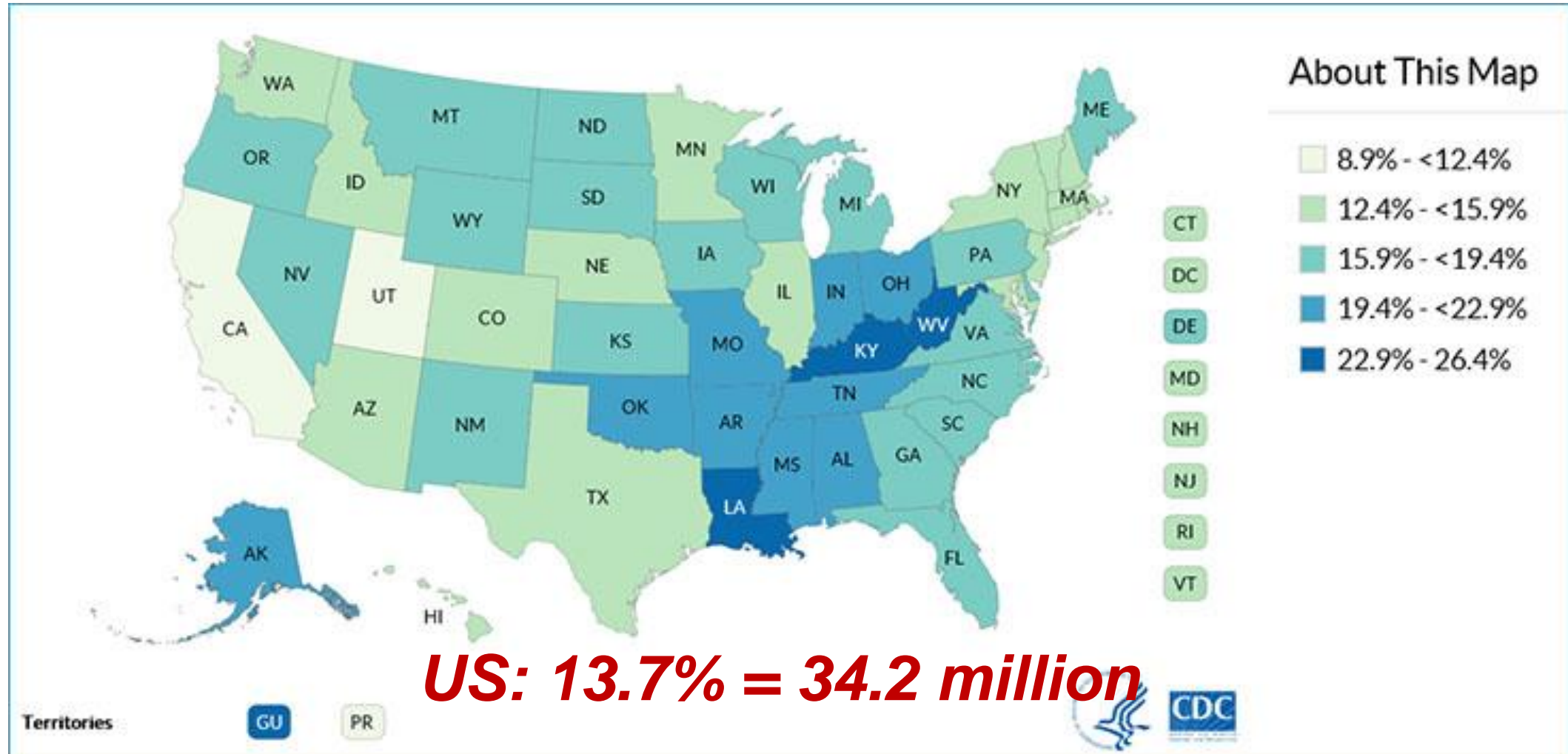


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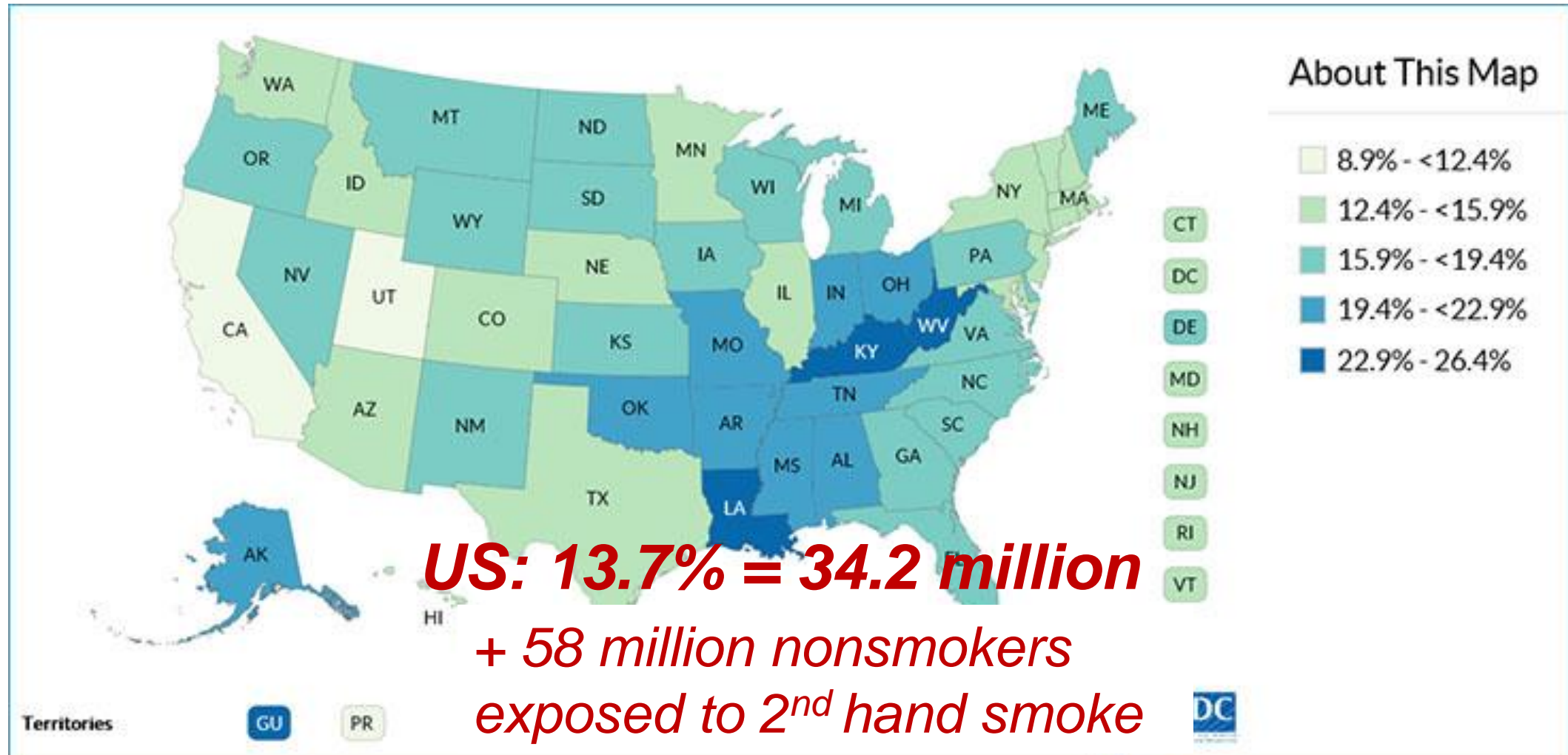
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Current Smoking Among Adults



Current Smoking Among Adults



Cigarette smoking is down, but almost
34 MILLION
American adults still smoke

Cigarette smoking remains high among certain groups



Men



Adults 25-64
years old



Lower education



Below
poverty level



Midwest
and South



Uninsured
or Medicaid



Disabled



Serious
psychological
distress

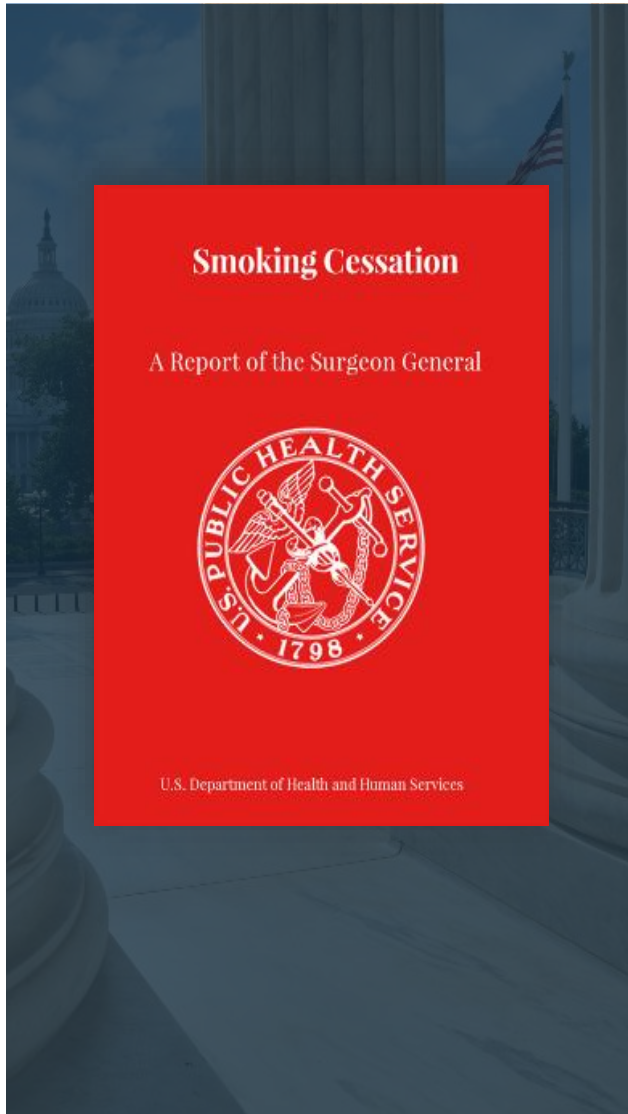


American Indians,
Alaska Natives and
Multiracial



Lesbians, gays,
and bisexuals

10 Major Conclusions - *highlights*



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Smoking Cessation: Screen and Intervene

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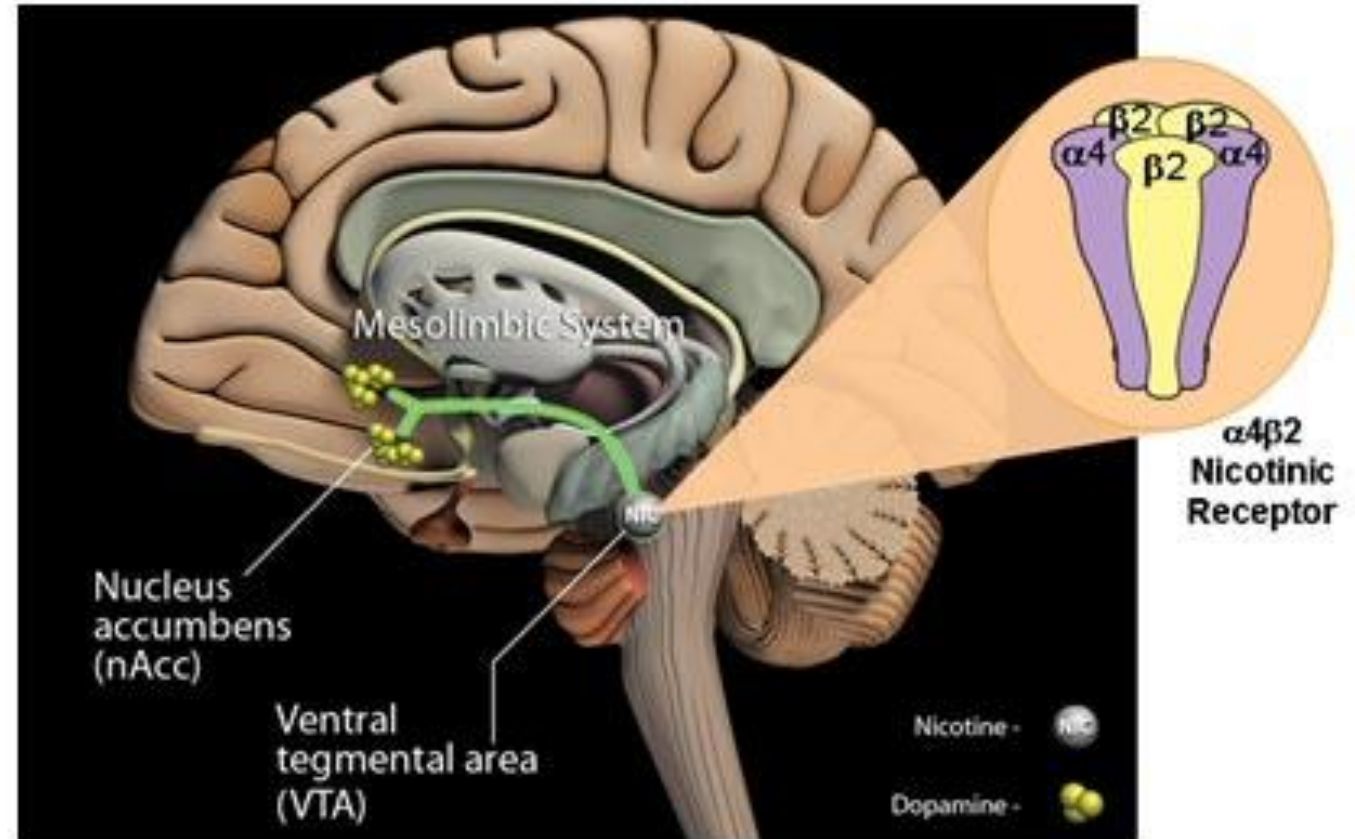
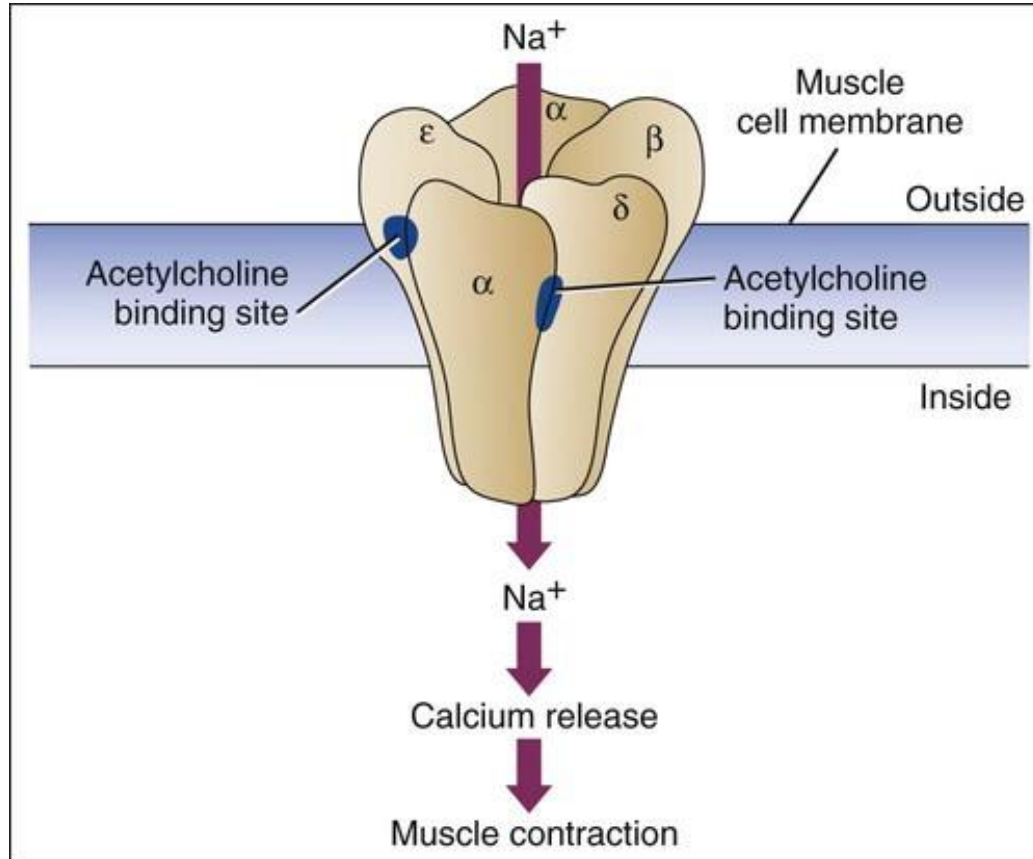
- Epidemiology: Smoking rates are declining but still threaten cardiometabolic health
- Smoking cessation decreases cardiometabolic risk (and other health risks, too!)
- **Screen and Intervene**
- Future directions in treatment of smoking and tobacco use

NEUROCHEMICAL and RELATED EFFECTS of NICOTINE

**N
I
C
O
T
I
N
E**

- | | |
|----------------------|---|
| → Dopamine | → Pleasure, appetite suppression |
| → Norepinephrine | → Arousal, appetite suppression |
| → Acetylcholine | → Arousal, cognitive enhancement |
| → Glutamate | → Learning, memory enhancement |
| → Serotonin | → Mood modulation, appetite suppression |
| → β -Endorphin | → Reduction of anxiety and tension |
| → GABA | → Reduction of anxiety and tension |

Nicotinic Acetylcholine Receptors



■ Nicotine binds predominantly to nicotinic acetylcholine (nACh) receptors in the CNS; the primary is the α4β2 nicotinic receptor in the Ventral Tegmental Area (VTA)

■ After nicotine binds to the α4β2 nicotinic receptor in the VTA, it results in a release of dopamine in the Nucleus Accumbens (nAcc) which is linked to reward

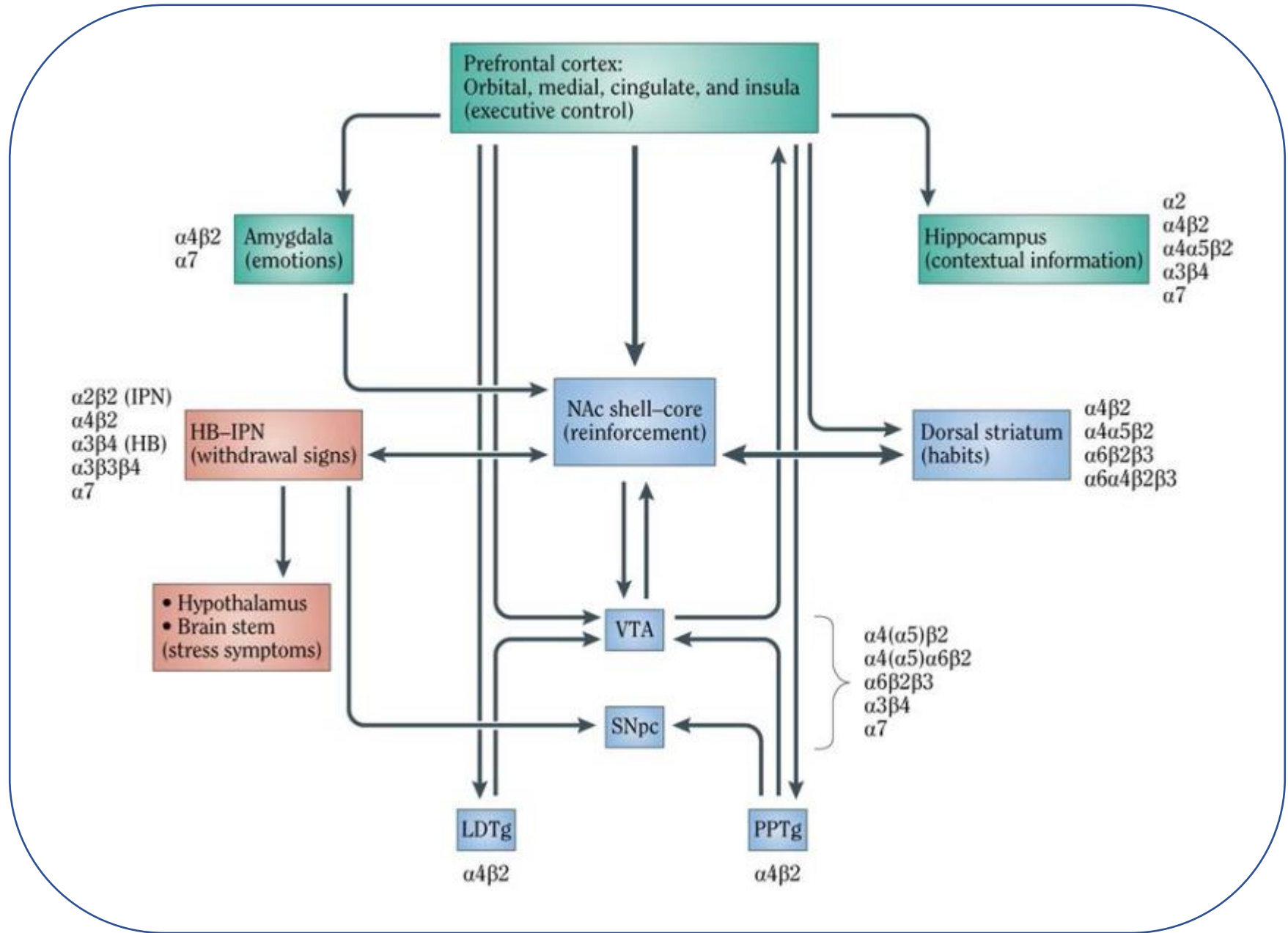
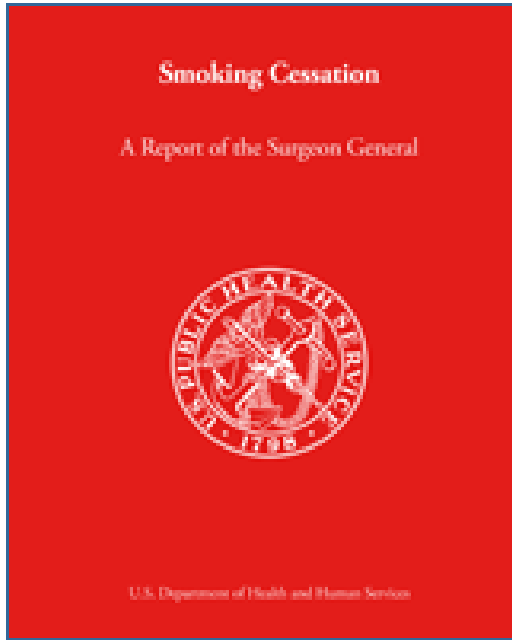
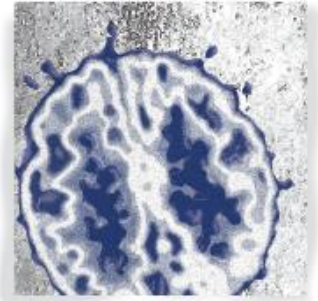


Figure 3.3 Neuronal mechanisms involved in nicotine addiction: A model

Cellular Basis of Memory for Addiction

Eric J. Nestler, MD, PhD



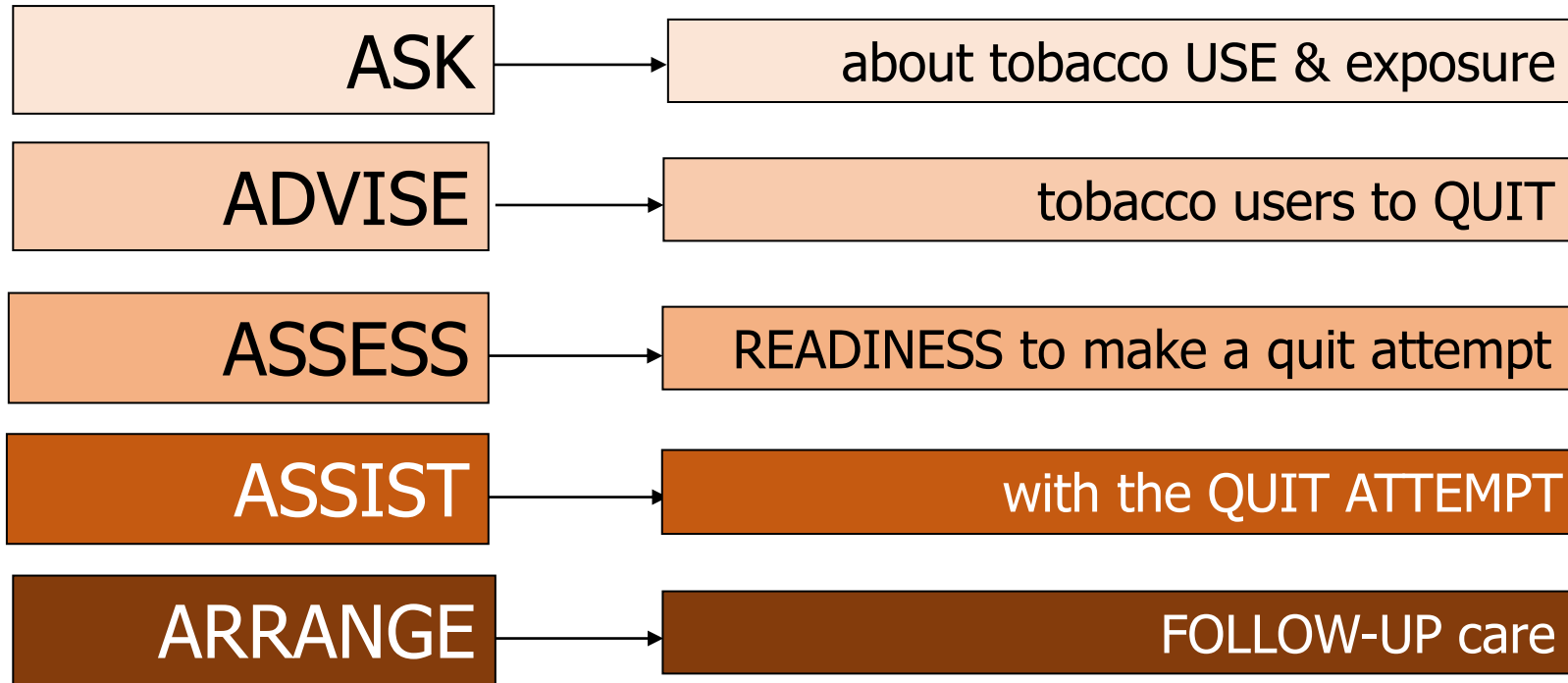
“Despite the importance of numerous psychological factors, at its core, drug addiction involves a biological process: the ability of repeated exposure to a drug of abuse to induce changes in a vulnerable brain that drive the compulsive seeking and taking of drugs, and loss of control over drug use, that define a state of addiction. . . . the types of molecular and cellular adaptations that occur in specific brain regions to mediate addiction-associated behavioral abnormalities. . . include alterations in gene expression achieved in part via epigenetic mechanisms, plasticity in the neurophysiologic functioning of neurons and synapses, and associated plasticity in neuronal and synaptic morphology, mediated in part by altered neurotrophic factor signaling. . . drug induced modifications can be viewed as a form of ‘cellular or molecular memory.’”

Smoking Cessation Treatment Guidelines

2008 US Public Health Service, 2015 US Preventive Services Task Force, 2020 SGR

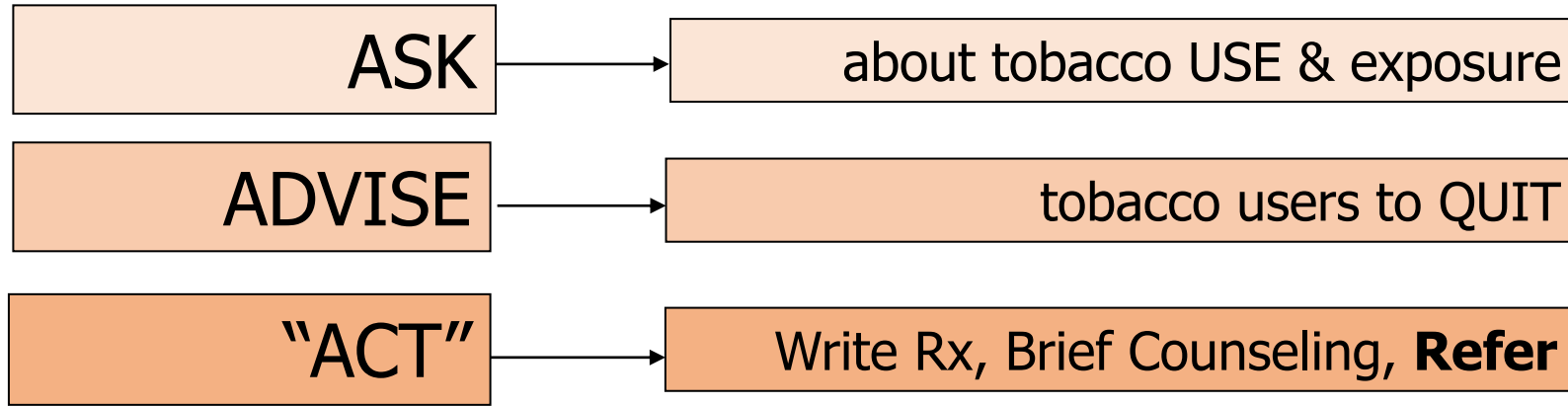
- Effective treatments exist
- Pharmacotherapy – *targets nicotine addiction*
- Behavioral support – *targets behavioral components*
– *delivery: in-person, by phone, web, apps*
- **Combination** is superior to either alone
- More intensive treatment is better, but brief intervention is effective

Screening and Intervening: The 5 A's



EVERY PATIENT, EVERY TIME!

Screening and Intervening - The 5 A's: Modified



QUIT NOW
...it's free!
Tobacco is expensive.
Quitting doesn't have to be.

1-800-QUIT-NOW

The advertisement features a green and white background with a graphic of a pack of cigarettes and two white pills.



The screenshot shows the EX Community website interface. At the top, there is a navigation bar with the 'ex' logo, 'EX Community', 'Register Now', and 'Log In' buttons. Below the navigation bar, there are tabs for 'Decide to Quit', 'Prepare to Quit', 'Recently Quit', 'Stay Quit', and 'Make a Change with EX'. The main content area features a large image of a man and a woman kissing, with the text 'Imagine your life without tobacco looks great, right?' and a 'Get Started (it's Free!)' button. Below this, there is a section titled 'Join BecomeAnEX for Quick Access' with five icons and descriptions: a calendar icon for 'A customized quit plan that learns and grows with you.', a smartphone icon for 'New Text messages for support quitting smoking or vaping.', a location pin icon for 'Smart, interactive guides and tools for you to navigate your tobacco-free journey.', a lightbulb icon for 'Expert advice and tips from Mayo Clinic.', and a speech bubble icon for 'An active, supportive EX Community of real tobacco users who have been through it all.'

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Smoking Cessation Pharmacotherapy: Guidelines and Evidence

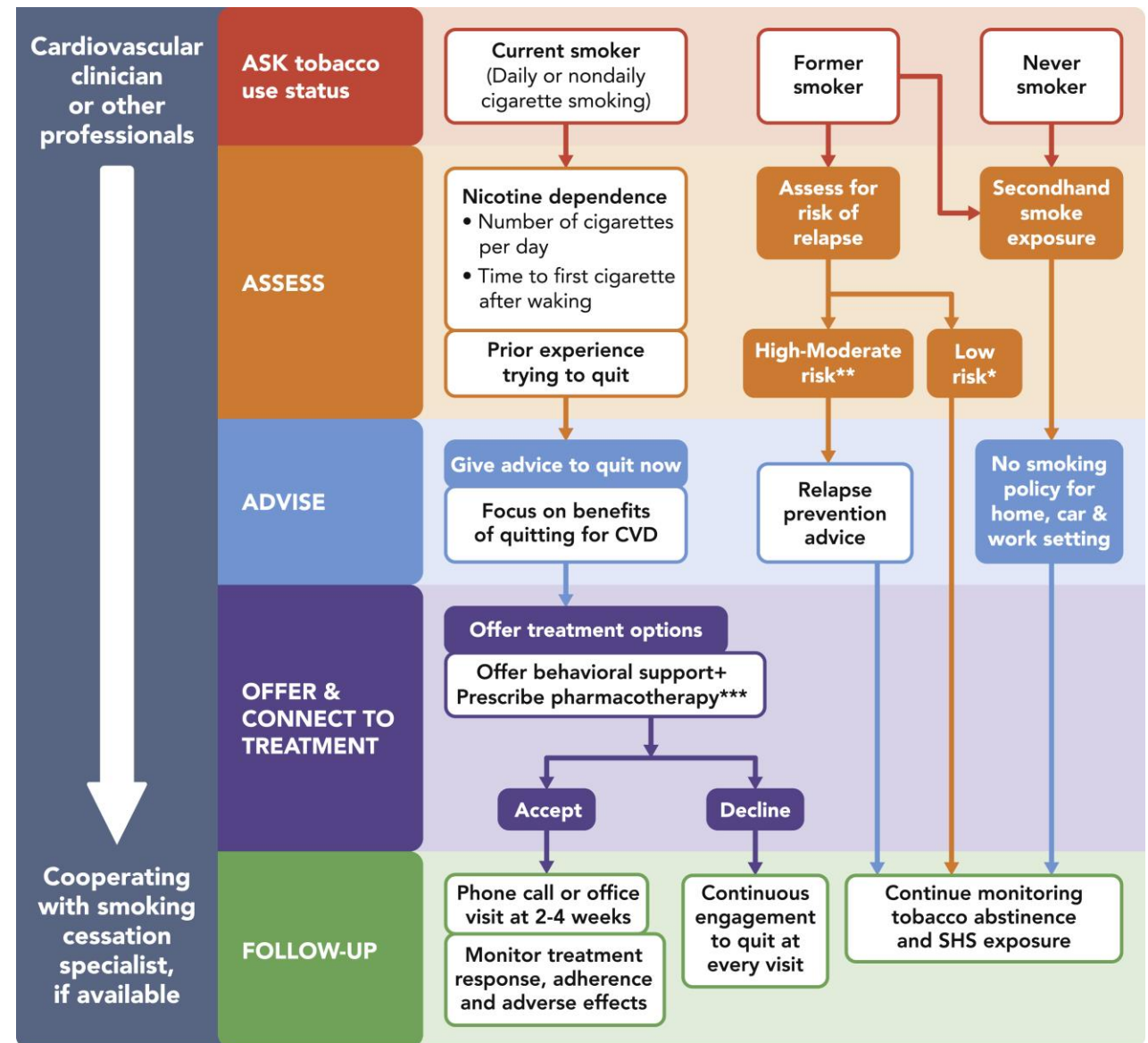
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2018 ACC Expert Consensus Decision Pathway on Tobacco Cessation Treatment: A Report of the American College of Cardiology Task Force on Clinical Expert Consensus Documents



ABBREVIATIONS:	
CVD	= cardiovascular disease
SHS	= secondhand smoke

*	More than 1 year since last cigarette
**	Refer to Figures 2 and 3
***	If not contraindicated
+	Refer to Tables 1 and 2

Pharmacotherapy

2008 US Public Health Service, 2015 USPSTF, 2020 Surgeon General's Report

- Nicotine replacement

Skin patch (OTC)

Gum (OTC)

Lozenge (OTC)

Oral inhaler (Rx)

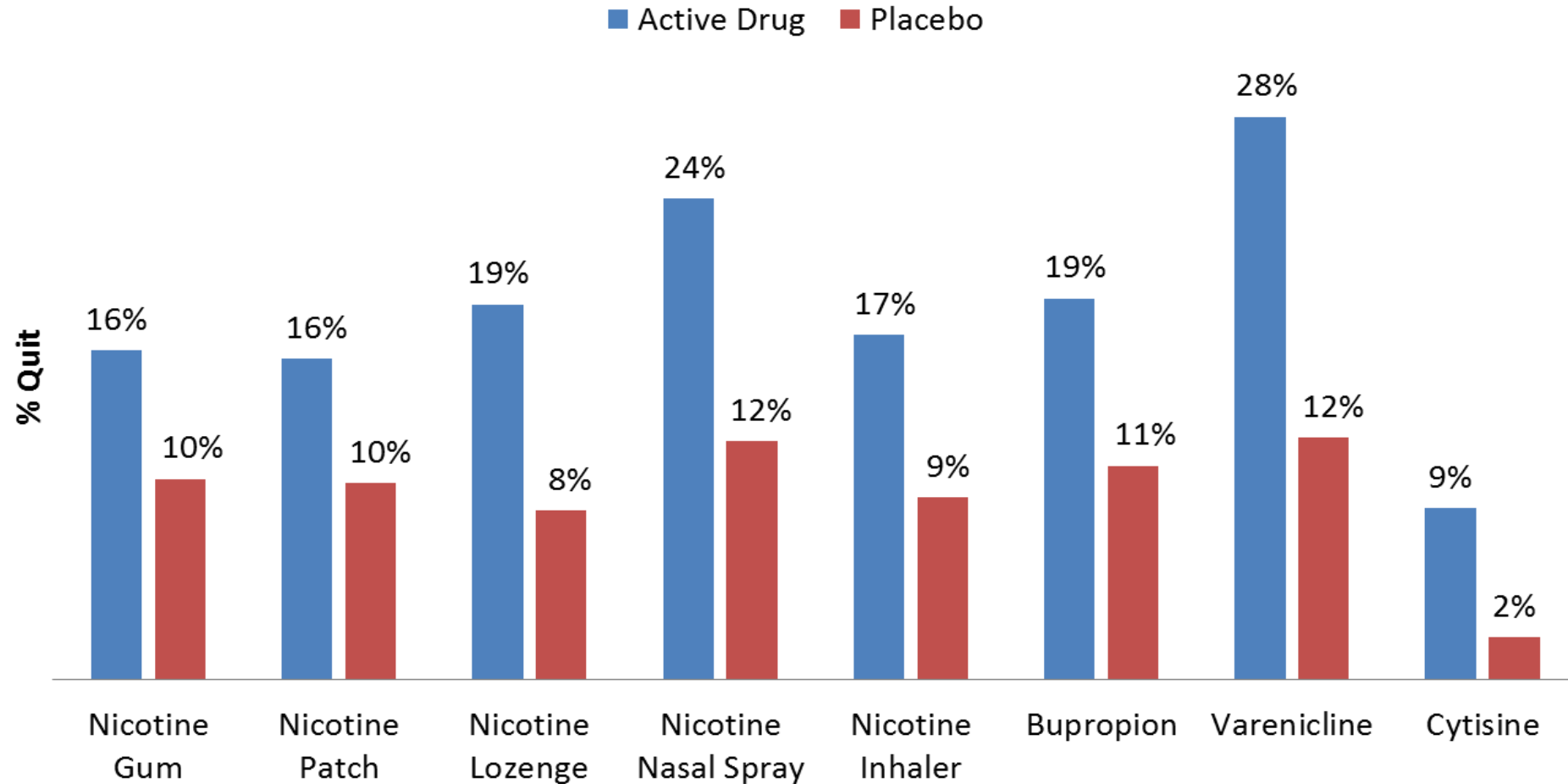
Nasal spray (Rx)

*FDA approved for cessation,
2X quit rate vs. placebo*

- Bupropion SR

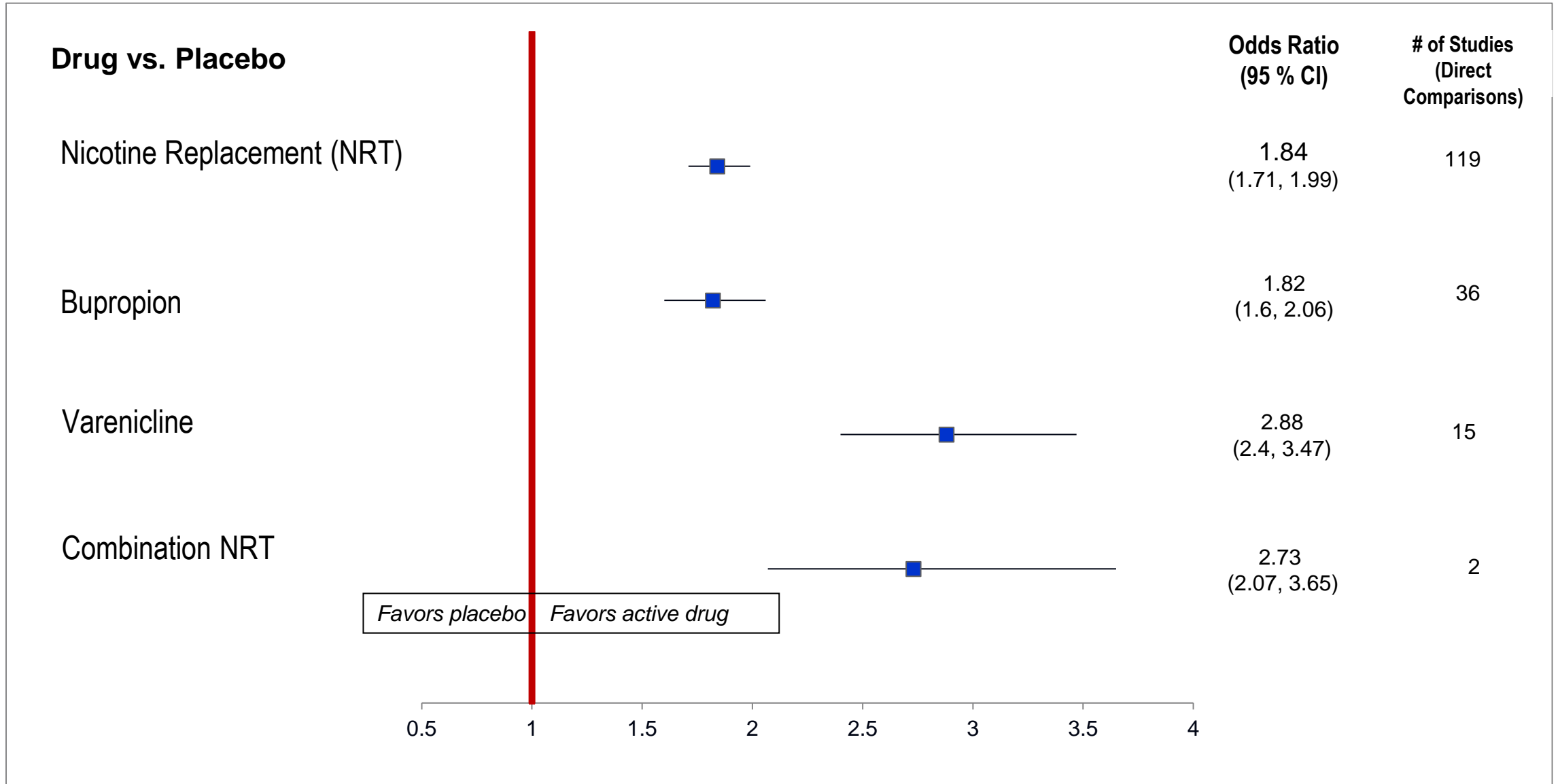
- Varenicline (*Since the global recall in 2021, other generic forms have become relevant*)

Long-term (≥ 6 month) Quit Rates for Available Cessation Medications



Current Pharmacotherapy Options

Cochrane meta-analysis



National Guidelines: Pharmacotherapy

- 2018 American College of Cardiology (ACC)
- 2020 National Comprehensive Cancer Network (NCCN)
- 2020 SPAQI (Perioperative)
- 2020 American Thoracic Society (ATS)

Begin with:

Varenicline

or

Combination NRT

Nicotine Replacement Options

Long-acting, slow onset nicotine delivery → *patch*

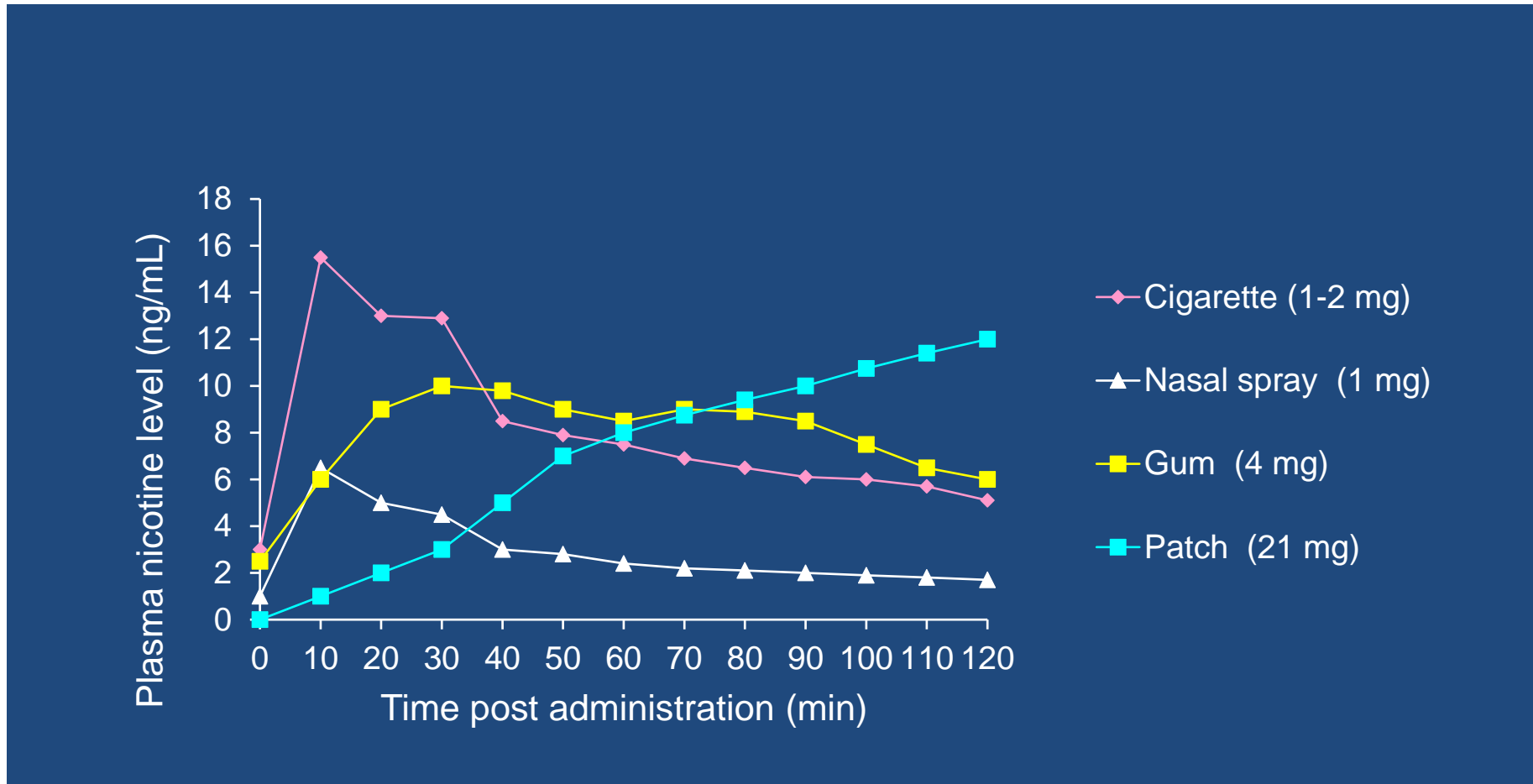
- + Constant nicotine level to avoid withdrawal
- + Simplest to use
- User has no control of dose

Short-acting, faster onset → *gum, lozenge, inhaler, spray*

- + User controls dose
- Nicotine blood levels fluctuate more
- Many smokers do not use enough

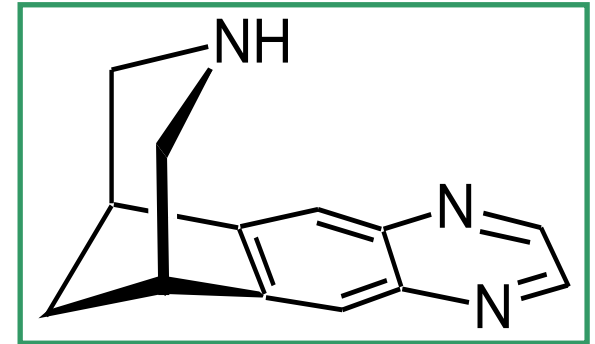
Plasma Nicotine Levels

Cigarettes vs. Nicotine Replacement Products



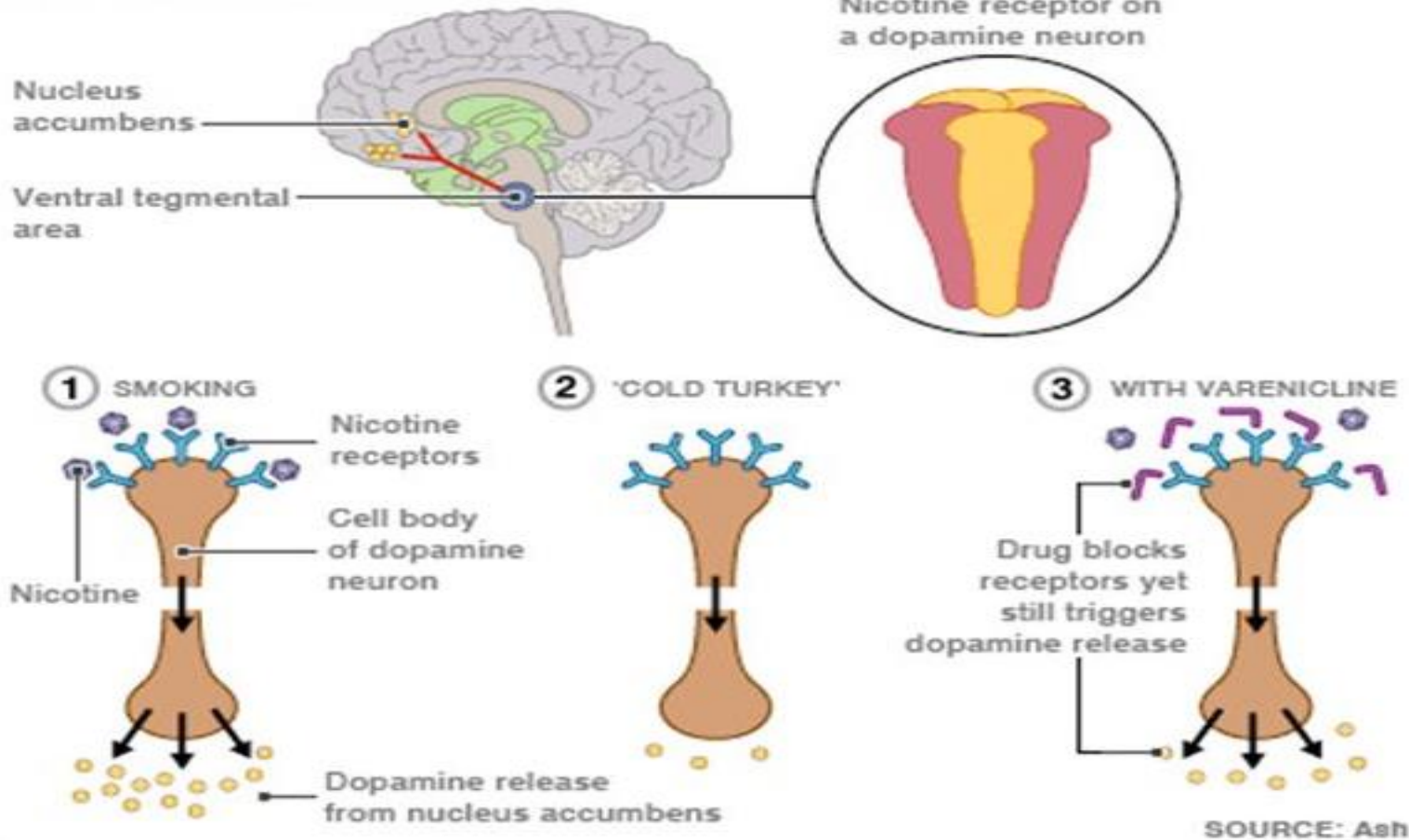
Varenicline

- Partial agonist at $\alpha 4\beta 2$ nicotinic receptor
- Dual mechanism of action
 - **Partial agonist**
Stimulates receptor to treat craving, withdrawal
 - **Antagonist**
Prevents nicotine from binding to the receptor → Blocks reward, reinforcement of smoking
- Most common side effects: nausea/GI, vivid dreams
- Avoid in pregnancy, unstable mental illness; dose reduce in severe renal impairment



Varenicline

HOW VARENICLINE WORKS



Varenicline = partial agonist of the $\alpha 4\beta 2$ nAChR

What to say to patients

- Varenicline works by reducing craving for cigarettes making quitting smoking a little easier and increases the chances of stopping for good.
- However it's no magic cure and effort is still required.

Varenicline: Safety Concerns

FDA Public Health Advisory - July 2009

- “[*Varenicline*] or [*bupropion*] has been associated with reports of changes in behavior such as hostility, agitation, depressed mood, and suicidal thoughts or actions.”
- “FDA is requiring the manufacturers of both products to add a new ***Boxed Warning***”

EAGLES Trial – Methods

- Double blind, placebo-controlled trial of motivated smokers (≥ 10 CPD) +/- psychiatric disorders randomized 1:1:1:1 (V:B:NRT:P)
 - *3984 without psychiatric disorders*
 - *4074 with psychiatric disorders: 70% affective, 19% anxiety, 9.5% psychotic, 0.6% personality; 1/3 stable psychotropic meds*
 - *Safety: Composite endpoint of 16 NPS AEs including*
 - *anxiety, depression, feeling abnormal, and hostility (all rated as severe), and agitation, aggression, delusions, hallucinations, homicidal ideation, mania, panic, paranoia, psychosis, suicidal ideation, suicidal behavior, and completed suicide (all rated as moderate or severe)*
- *Efficacy: abstinence wks 9-24, CO-confirmed*

EAGLES Trial – Safety

Composite neuropsychiatric event endpoint

Non-psychiatric cohort	Non-psychiatric cohort* (n=3984)			
	Varenicline (n=990)	Bupropion (n=989)	Nicotine patch (n=1006)	Placebo (n=999)
Primary composite neuropsychiatric endpoint	13 (1.3%)	22 (2.2%)	25 (2.5%)	24 (2.4%)
Estimated primary composite neuropsychiatric adverse events (% [95% CI])	1.25% (0.60 to 1.90)	2.44% (1.52 to 3.36)	2.31% (1.37 to 3.25)	2.52% (1.58 to 3.46)
Difference in risk of composite primary endpoint (RD% [95% CI])				
Versus placebo	-1.28 (-2.40 to -0.15)	-0.08 (-1.37 to 1.21)	-0.21 (-1.54 to 1.12)	..
Versus nicotine patch	-1.07 (-2.21 to 0.08)	0.13 (-1.19 to 1.45)	..	..
Versus bupropion	-1.19 (-2.30 to -0.09)	..	..	..

No difference among drugs in rates of psychiatric adverse events in either stratum

As a consequence of EAGLES, the FDA removed Black Box warnings December 2016

Psychiatric cohort	Psychiatric cohort* (n=4074)			
	Varenicline (n=1026)	Bupropion (n=1017)	Nicotine patch (n=1016)	Placebo (n=1015)
Primary composite neuropsychiatric endpoint	67 (6.5%)	68 (6.7%)	53 (5.2%)†	50 (4.9%)
Estimated primary composite neuropsychiatric adverse events (% [95% CI])	6.42% (4.91 to 7.93)	6.62% (5.09 to 8.15)	5.20% (3.84 to 6.56)	4.83% (3.51 to 6.16)
Difference in risk of composite primary endpoint (RD% [95% CI])				
Versus placebo	1.59 (-0.42 to 3.59)	1.78 (-0.24 to 3.81)	0.37 (-1.53 to 2.26)	..
Versus nicotine patch	1.22 (-0.81 to 3.25)	1.42 (-0.63 to 3.46)	..	..
Versus bupropion	-0.20 (-2.34 to 1.95)	..	..	..

EAGLES - Efficacy Results

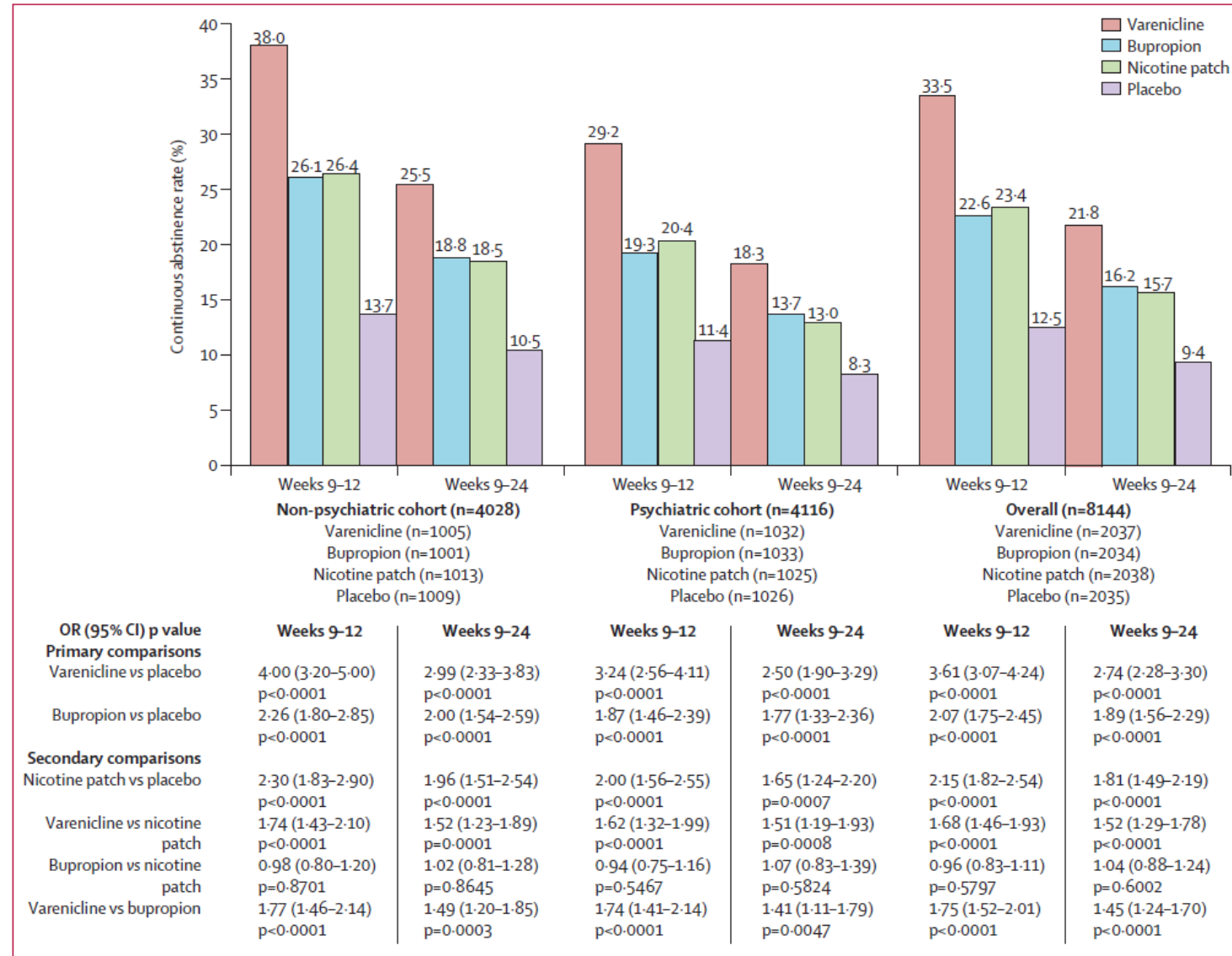


Figure 3: Continuous abstinence rates for weeks 9-12 and 9-24
Analyses based on the all-randomised population. OR=odds ratio.

Quitting Stats: Every Year in the US . . .

- 8/10 smokers see a health care provider
- 7/10 smokers want to quit, over ½ attempt
- Only **5%** receive recommended care: medication and counseling
- 95% of unaided quit attempts “fail”, so quit rates remain low.

- *Why the disconnect between evidence and treatment?*

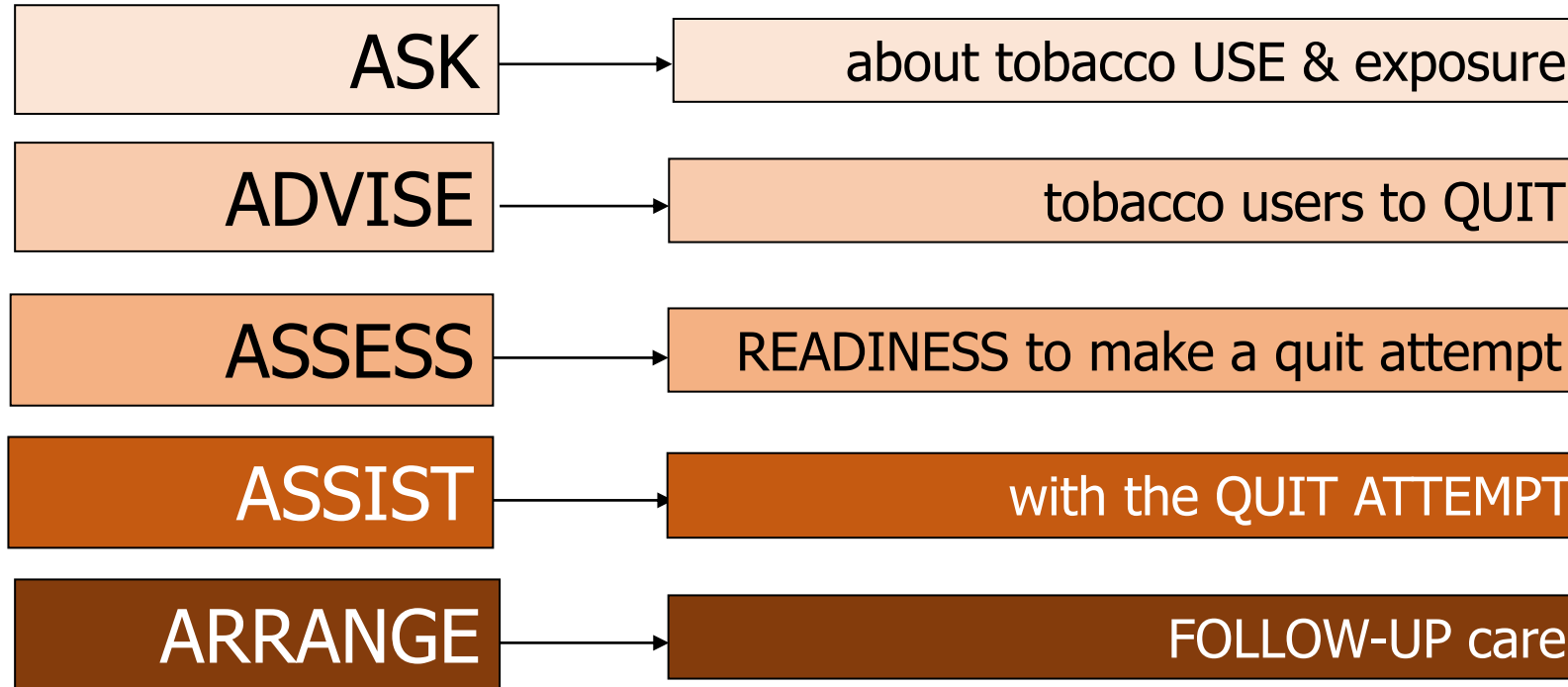
Misconceptions: Health Care Providers

- *I don't have enough time*
- *The patient:*
 - Is not going to quit
 - has too much going on right now
 - is too high risk for smoking cessation meds/meds dangerous (varenicline)
- *I might alienate my patients if I bring it up*
- *We don't have a smoking program at my hospital/clinic*

Misconceptions: Patients

- *I can't quit*
- *Quitting doesn't matter- damage is done/I'm too old*
- *I have too much going on right now*
- *Quit smoking medicines don't work*
- *Quit smoking medicines are dangerous*
- *Using medicines is just trading one addiction for another*
- *Using medicines is a crutch*

The 5 A's



EVERY PATIENT, EVERY TIME!

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Smoking Cessation: Patient Case

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Case

- **58 yo man w/HTN, HIV+, stable depression on SSRI, + AUDIT-C, presents with pneumonia**
- Smokes 20 cigarettes/d since age 18
- Drinks 3 beers/d, more on weekends
- Wants to smoke now but feels too weak
- In the past tried “everything” to quit, including e-cigs

Case

- **58 yo man w/HTN, HIV+, stable depression on SSRI, + AUDIT-C, presents with pneumonia**
- Your initial assessment and thoughts:
 - High risk for smoking related disease (age, male, HIV status, depression, alcohol use)
 - High risk for other diseases, including lung cancer. Smoked 40 years x 1 ppd = 40 pack years (eligible for LCS - > 55, > 30 pk yrs)

Case: Advise

- **58 yo man w/HTN, HIV+, stable depression on SSRI, + AUDIT-C, presents with pneumonia**
- ***Advise:*** “Quitting smoking is the best thing you can do for your health right now, and is especially important as you heal from pneumonia”

Case: Assess

- **58 yo man w/HTN, HIV+, stable depression on SSRI, + AUDIT-C, presents with pneumonia**
- **Assess:** Says he knows he needs to quit, has tried “everything.” (What does this mean?)
- How much is he smoking now?

Case: Assess, continued

- **58 yo man w/HTN, HIV+, stable depression on SSRI, + AUDIT-C, presents with pneumonia, smoking 1 pack per day**
 - nicotine patch – used 1 week, craved, relapsed
 - bupropion – cut down, did not quit
 - electronic cigarette – used for 3 months but kept smoked. Eventually didn't like it and resumed smoking.
 - Varenicline - quit 3 years ago but relapsed after divorce. He adds that his neighbor told him, “this is the worst drug” but his friend said it was the best drug to quit smoking.” He asks what you think.

Case: Next Steps

- **58 yo man w/HTN, HIV+, stable depression on SSRI, + AUDIT-C, admitted with pneumonia**
- Your updated assessment - motivated to quit now and seems willing to consider medication
- What should you do next?

Case: Assist

- **58 yo man w/HTN, HIV+, stable depression on SSRI, + AUDIT-C, admitted with pneumonia, smokes 1 ppd**
- ***Assist:***
 - **Set a Target Quit Date** – ideally within 2 weeks
 - **Combine pharmacologic & behavioral support**
 - Most national guidelines recommend beginning with varenicline or two forms of NRT
 - **What about for this patient?**

Question 1: True or False

- This patient's history of depression makes him ineligible for smoking cessation medication.
 - a. True*
 - b. False*

Question 1: True or False

- This patient's history of depression makes him ineligible for smoking cessation medication.

False - This patient CAN use FDA-approved smoking cessation medications: nicotine replacement therapy, varenicline, and bupropion. He has stable depression. In the EAGLES trial, 70% of the 4074 participants in the cohort with pre-existing psychiatric diagnoses had mood disorders, including major depression and bipolar depression. Individuals were considered stable if they had not had any recent worsening of symptoms prompting medication or dosage changes, ED visits, hospitalizations, etc. Today in clinical practice, a period of about 3 months is reasonable, but this varies case-by-case.

Varenicline has also been studied in several RCTs in patients with HIV and can be safely and effectively used in this population. Varenicline has also been studied in people with SUD (alcohol and opioid use disorder).

Case: Assist

- **58 yo man w/HTN, HIV+, stable depression on SSRI, + AUDIT-C, admitted with pneumonia, smokes 1 ppd**
- ***Assist:***
 - **Set a Target Quit Date** – ideally within 2 weeks
 - **Combine pharmacologic & behavioral support**
 - What smoking cessation prescription should you write?

Question 2:

- What is an appropriate first step for medication? (What prescription should you write?)
 - A. Nicotine replacement therapy (NRT) monotherapy (e.g., patch)
 - B. Nicotine replacement therapy (NRT) combination therapy (“patch plus”)
 - C. Varenicline
 - D. A only
 - E. B only
 - F. C only
 - G. B or C

Question 2:

- What is an appropriate first step for medication? (What prescription should you write?)
 - A. Nicotine replacement therapy (NRT) monotherapy (such as patch)
 - B. Nicotine replacement therapy (NRT) combination therapy (such as patch plus oral lozenges)
 - C. Varenicline
 - D. A only
 - E. B only
 - F. C only
 - G. **B or C – Correct Answer. Most treatment guidelines recommend starting with either combination NRT or varenicline as an initial choice for pharmacotherapy. Varenicline is the most effective monotherapy, and combination (2 forms) NRT is generally considered to be more effective (and more comfortable for patients) than 1 form of NRT alone. Recall the pharmacokinetics of different NRT products: patch yields a slow rise in blood concentration (4-6+ hours), while oral/inhaled NRT has faster increase in blood levels (15-30 minutes). Note: NRT product approaches the fast delivery of cigarettes (seconds).**

Case: Assist

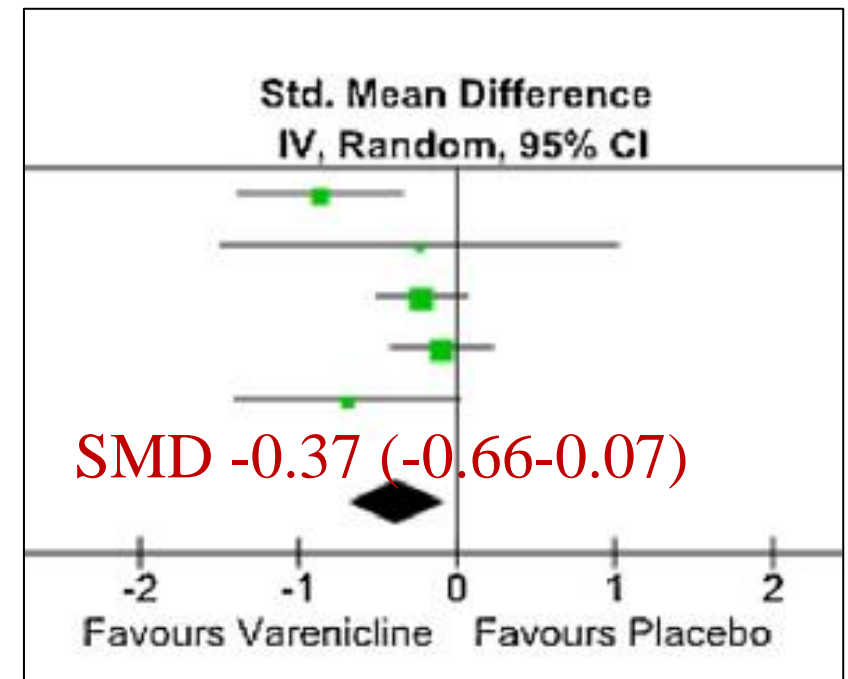
- **58 yo man w/HTN, HIV+, stable depression on SSRI, + AUDIT-C, admitted with pneumonia, smokes 1 ppd**
- ***Assist:***
 - **Set a Target Quit Date** – ideally within 2 weeks
 - **Combine pharmacologic & behavioral support**
 - Varenicline or two forms of NRT
 - Brief counseling – triggers, what has worked before, anticipating rough spots (temptations), etc
 - Referral

Case: Assist - Selecting Pharmacotherapy

- **58 yo man w/HTN, HIV+, stable depression on SSRI, + AUDIT-C, admitted with pneumonia. Smokes 1 ppd**
- Any advantage to varenicline or combination NRT?
 - Medically eligible to take either
 - Both are effective but varenicline is most effective monotherapy
 - Patient preference, coverage, out-of-pocket cost
 - What about the alcohol?

Varenicline for smoking – and alcohol?

- Smoking and heavy drinking co-occur, and each independently increase health risk. Polypharmacy: mitigate with 1 drug for 2 diseases
- Meta-analysis of varenicline vs. placebo (5-9 studies)
 - Moderate effect size for drinks/unit time
 - No difference for heavy drinking, drinking days, dropouts



Varenicline for smoking – and alcohol?

- Effects of varenicline for alcohol consumption may be more pronounced among men and among depressed individuals
- Meta-analysis of 10 studies in alcohol use disorder: varenicline reduces craving, but not consumption

Case: Begin with Combo NRT or Varenicline

- **NRT:** combine long acting 21 mg patch + short-acting oral - titrate to comfort
 - Most common dosing is “Step down” 21 mg x 1 month, 14 mg x 1 month, then 7 mg x 1 month, but dosing is flexible and should be guided by patient’s symptoms
- **Varenicline – 12 weeks**
 - “starter pack” – 1 month, then “maintenance pack” – 2 months
 - **Note: prolonged global shortage** of may require alternative manufacturers other than Pfizer: “Par” and “Apotex” brand varenicline are available in some regions of the US and providers may need to work with pharmacists to obtain varenicline

Nicotinic Receptors are Upregulated in Smokers, Take Weeks to Normalize

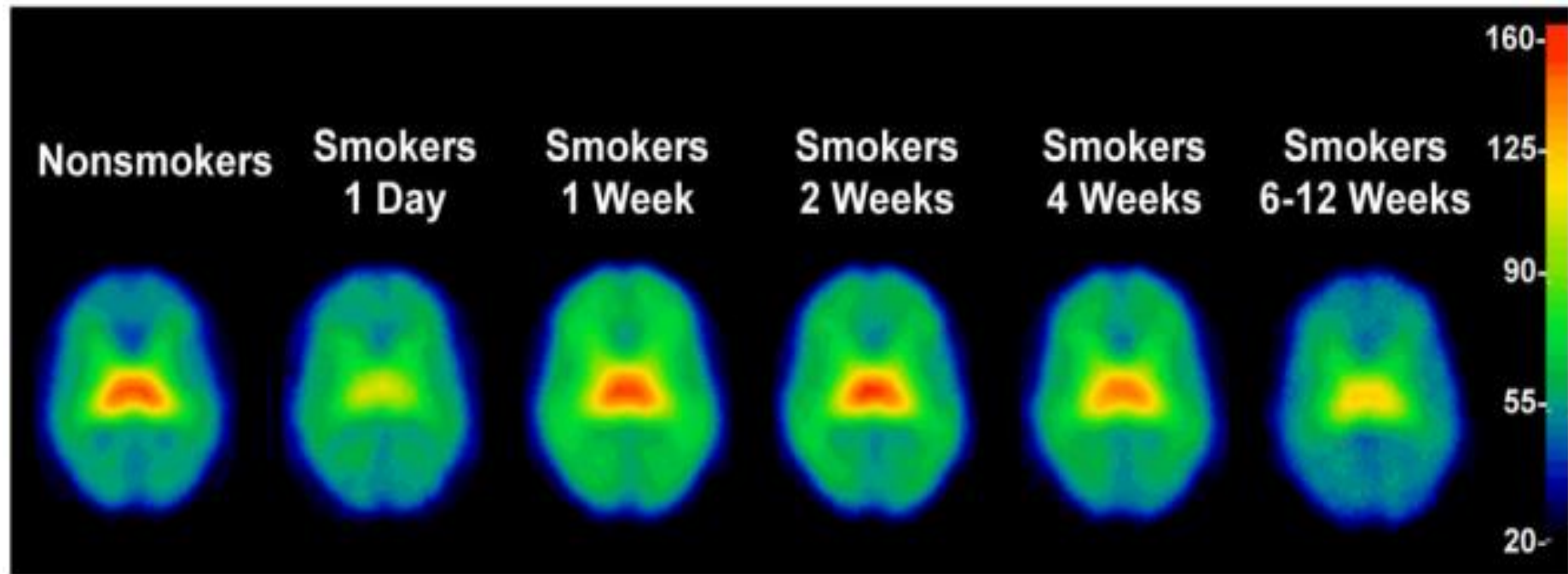


Figure 2.

Mean parametric images illustrating β_2^* -nAChR availability in nonsmokers and tobacco smokers at 1 day, 1 week, 2 weeks, 4 weeks, and 6-12 weeks of abstinence at similar transaxial levels of brain. The color scale is shown with red, yellow, green and blue corresponding to V_T/f_p values.

Do Electronic Cigarettes Have a Role in Smoking Cessation?

Electronic cigarettes for smoking cessation (Review)

Hartmann-Boyce J, McRobbie H, Lindson N, Bullen C, Begh R, Theodoulou A, Notley C, Rigotti NA, Turner T, Butler AR, Fanshawe TR, Hajek P

- 2020 Cochrane review: 50 studies, 26 RCTs in over 12,000 people
- Limited by imprecision due to few large trials
 - e-cigs with nicotine increases quit rates at 6+ months compared to e-cigs without nicotine and compared to NRT (Moderate certainty)
 - e-cigs with nicotine increased quit rates compared to behavior support alone/no support (Low certainty)
- Controversial conclusions – in the Hajek et al RCT (NEJM, 2019) 80% of those assigned to e-cigs were still using them at 1 year, and some of those who did not quit smoking became dual users
- Important context: in the US, e-cigs are not approved by FDA for treatment

Case: Arrange

Refer/Connect for ongoing support

- **Internal program**
 - inpatient/outpatient tobacco treatment service
- **External program**
 - State quitline – 1-800-QUIT NOW
 - Web: Smokefree.gov, BecomeanEx.org
 - Local community programs

Foundations of Cardiometabolic Health Certification Course

Certified Cardiometabolic Health Professional (CCHP)



Smoking Cessation: Tips and Resources

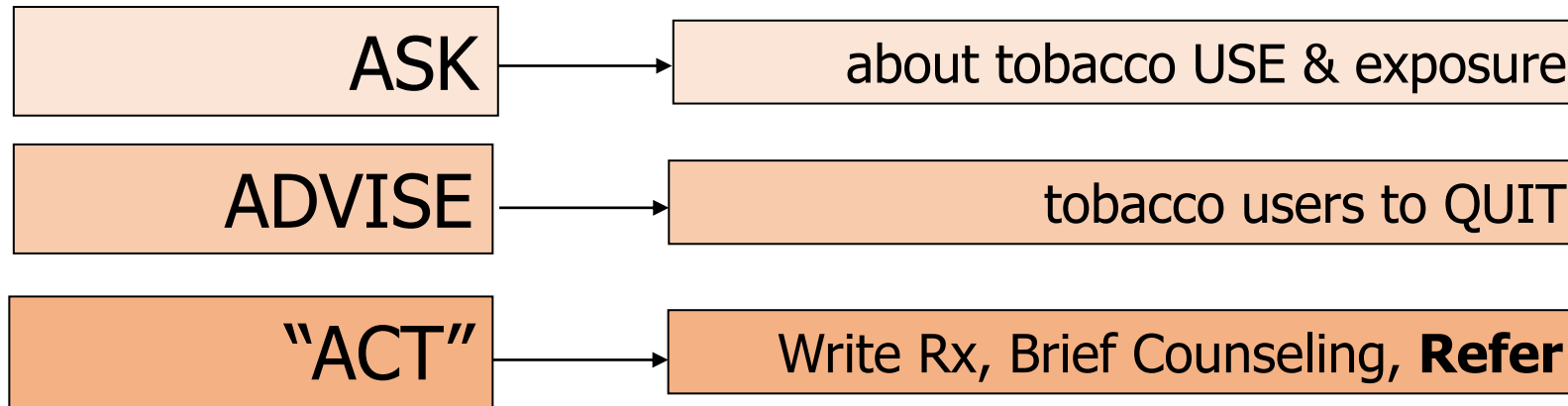
Hilary A. Tindle, MD, MPH

Associate Professor of Medicine

William Anderson Spickard, Jr., MD, Chair in Medicine
Director of ViTAL: Vanderbilt Center for Tobacco, Addiction
and Lifestyle

Vanderbilt University Medical Center
Nashville, TN

Screening and Intervening - The 5 A's: Modified



www.Smokefree.gov

→ ↻ 🔒 https://smokefree.gov | ☆ ○ ✨

smokefree.gov smokefreevet smokefreewomen smokefree^{teen} smokefreeespañol smokefree60+

HOME TOOLS & TIPS QUIT SMOKING CHALLENGES WHEN QUITTING STAY SMOKEFREE FOR GOOD HELP OTHERS QUIT 🔍

I Want to Quit

Get prepared.

Preparation is the first step to being smokefree. Boost your chances of success by making a quit plan.

Make a Plan

Start Now



My Quit Day

I Recently Quit

Staying Quit



Smokefree
Texting
Programs



Build Your Quit
Plan



Using Nicotine
Replacement
Therapy

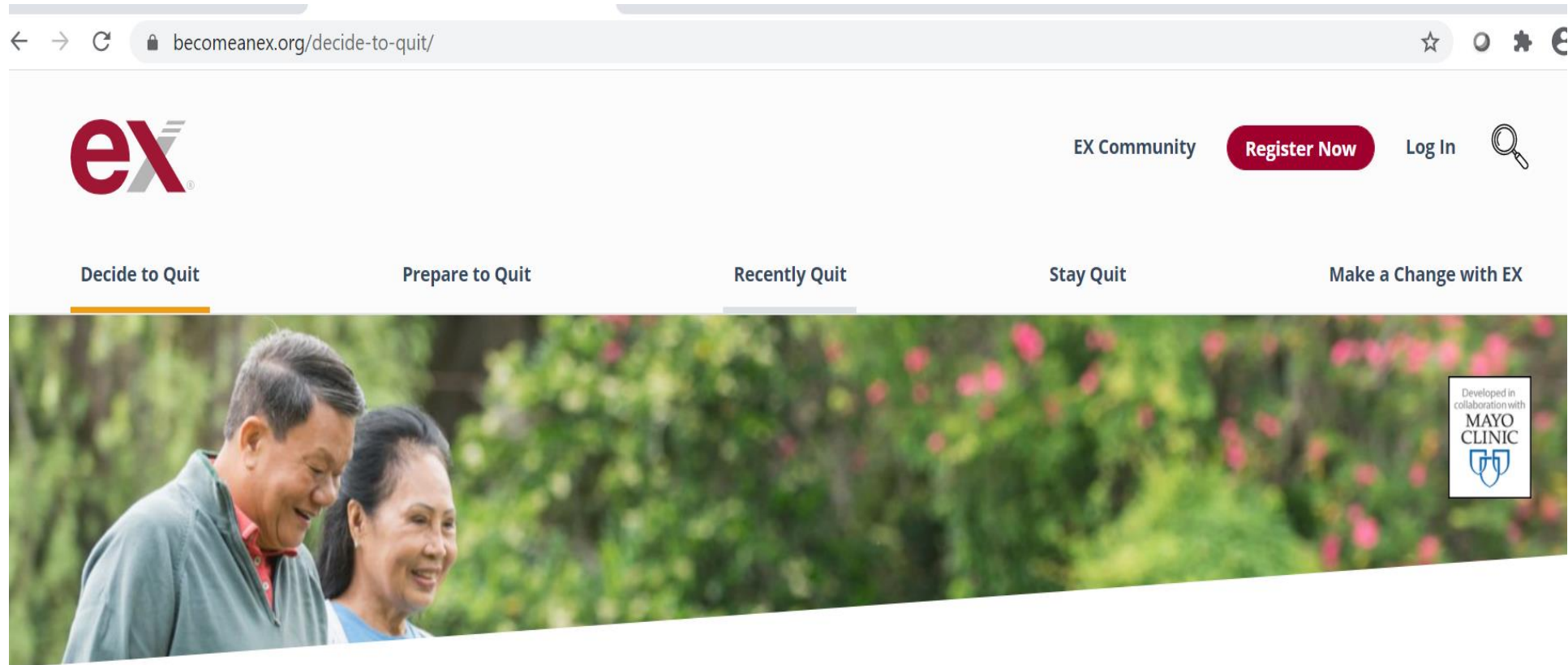


Smokefree
Social Media



Smokefree
Apps

Becomeanex.org - Truth Initiative + Mayo Clinic



Decide to Quit

Quitting can seem overwhelming. Tobacco is part of your life and change is hard. We know.

We also know amazing change can happen when you have the right support and tools to guide you.

BecomeAnEX works because it was built for you—with expert knowledge from Mayo Clinic and real tobacco users who understand the struggle and how

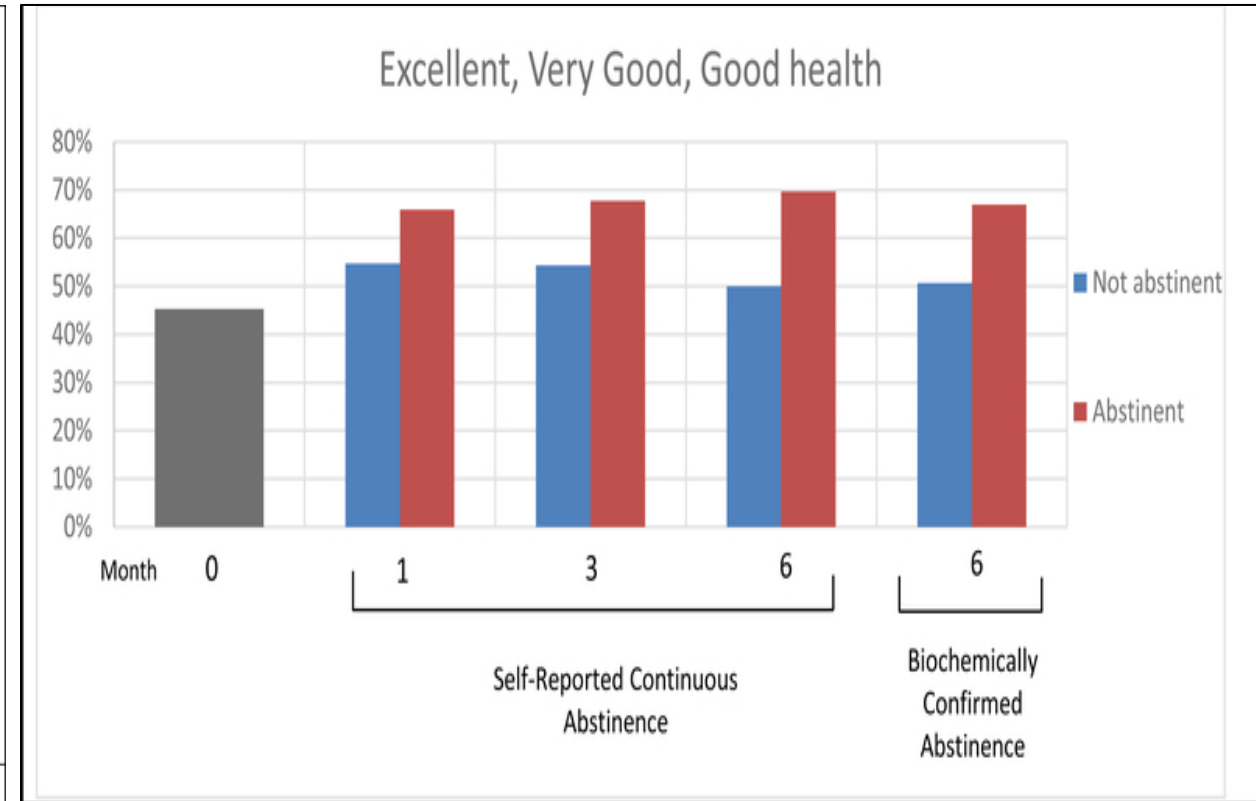
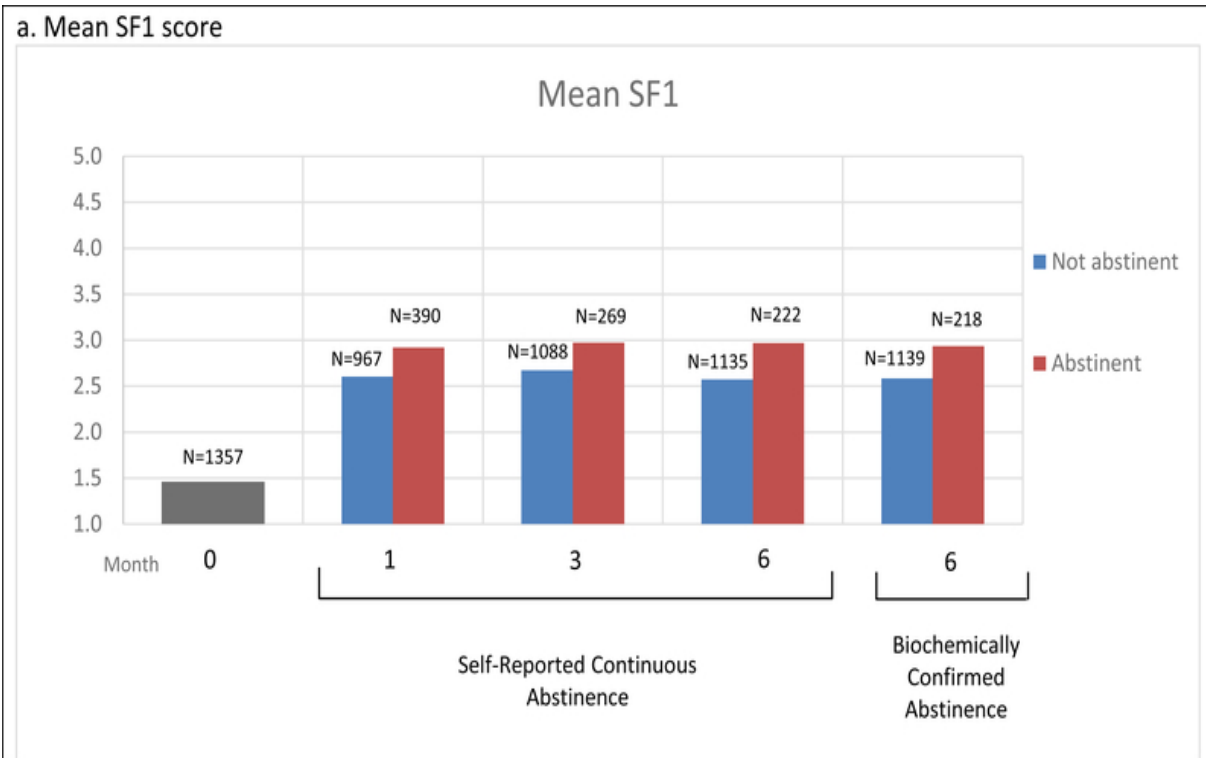
<https://www.becomeanex.org/recently-quit/>

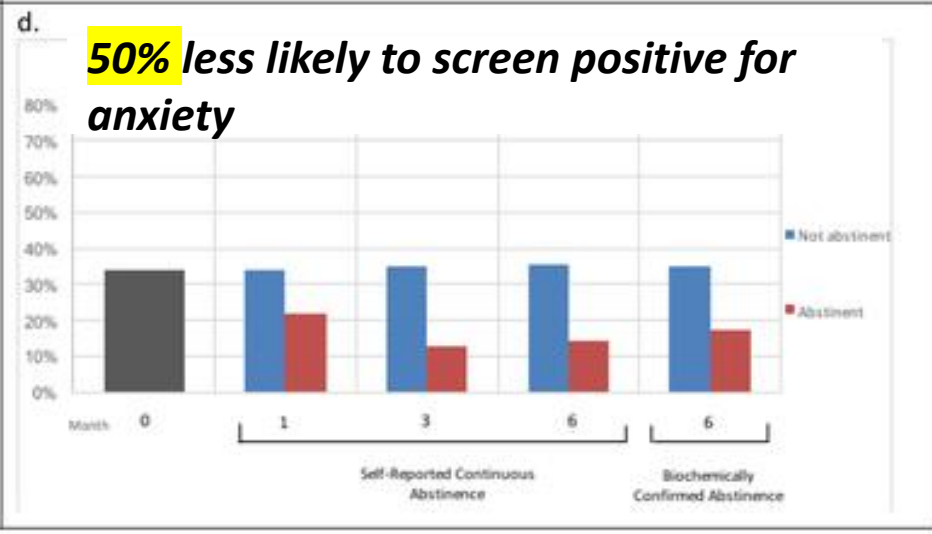
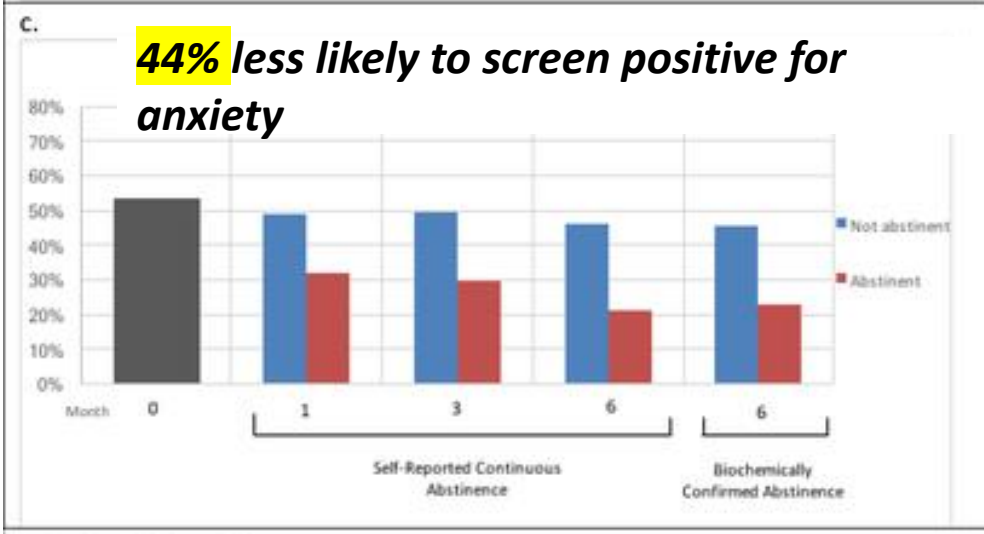
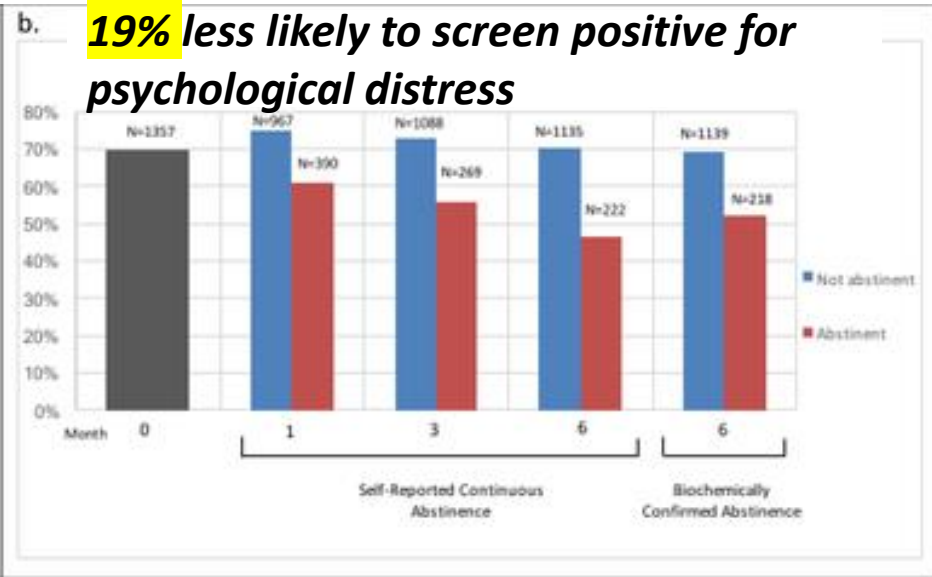
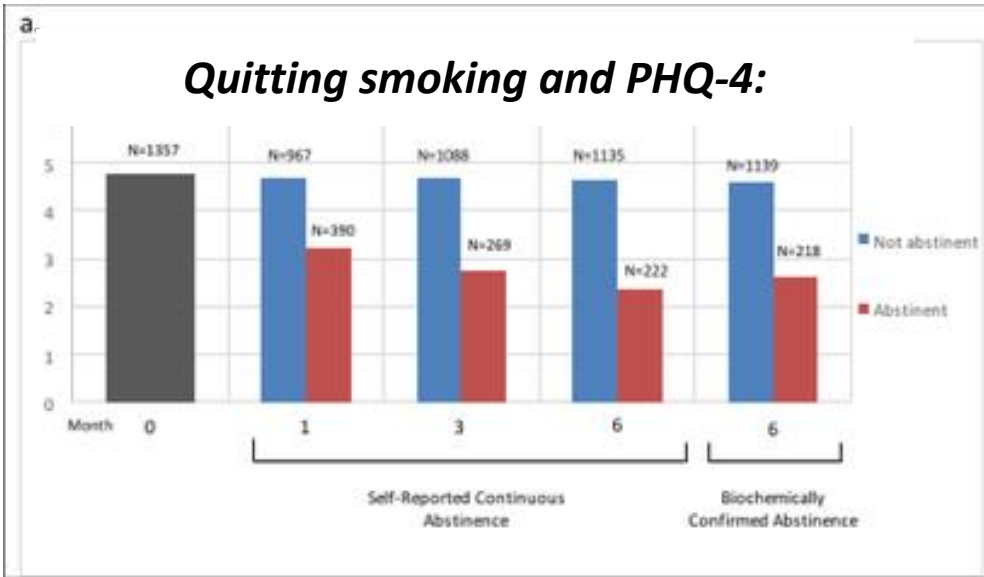
An Important Discussion Point When Talking With Patients: People who quit smoking often *feel better*

- There is a growing body of research on the impact of smoking and quitting smoking on mood and health related quality of life
- Levy et al conducted a longitudinal assessment of health-related quality of life (HRQoL) changes among recently-hospitalized patients who smoke
- Compared change in HRQoL between those who did or did not quit smoking 6 months after hospital discharge
 - Single-item global health measure (SF-1)
 - Patient Health Questionnaire for Depression and Anxiety (PHQ-4)
 - EQ-5D-5L health utilities measure

Quitting Smoking After Hospitalization Associated With Better HRQoL

*Abstinent patients at 6 months:
30% more likely to report at least good health on SF1 (aRR 95% CI 1.14–1.45)*





Quitting Smoking After Hospitalization is Associated With Better HRQoL on the EQ-5D-5L

- Overall increase in mean score of 0.05 (0.02, 0.08)
- Higher odds of improvement in:

<u>Subscale interval</u>	<u>Adjusted odds ratio & 95% confidence</u>
• Mobility – 12%	1.12 (0.82, 1.53)
• Self-care – 69%	1.69 (1.01, 2.83)
• Pain/discomfort – 71%	1.71 (1.28, 2.30)
• Anxiety/depression – 62%	1.62 (1.18, 2.21)

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Future Directions in Treatment of Smoking

Hilary A. Tindle, MD, MPH

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Vanderbilt University Medical Center
Nashville, TN

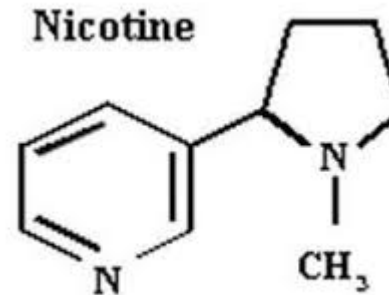
Overview

- Epidemiology: Smoking rates are declining but still threaten cardiometabolic health
- Smoking cessation decreases cardiometabolic risk (and other health risks, too!)
- Screen and Intervene
- **Future directions in treatment of smoking**

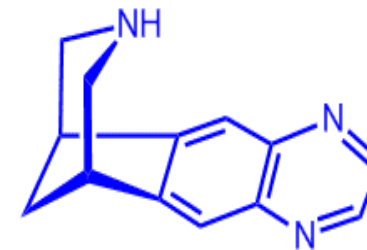
Cytisine



- Naturally occurring botanic alkaloid; nicotine receptor partial agonist
- Effective for tobacco cessation
- \$\$ - lower expense
- Not yet FDA approved

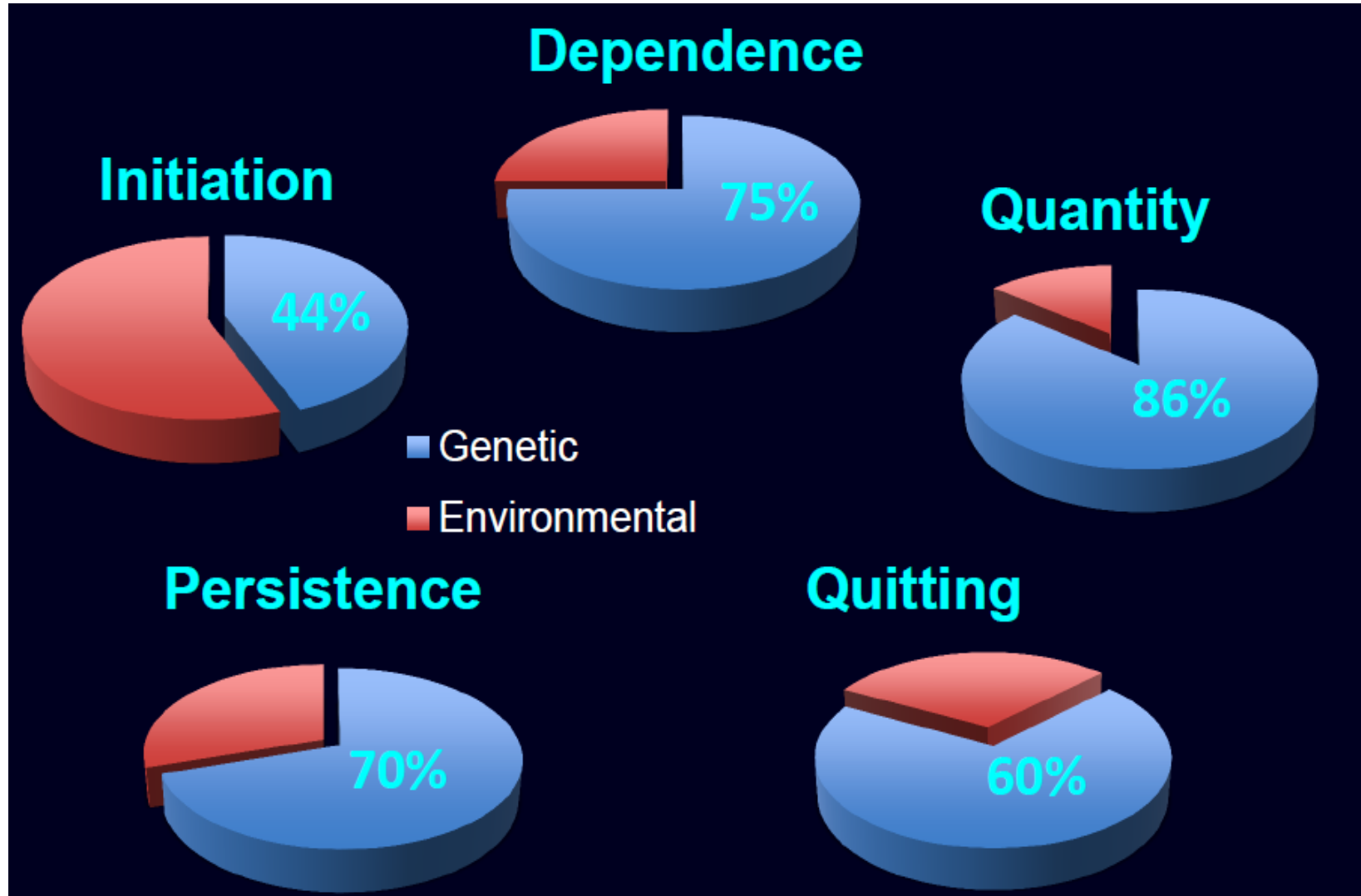


Cytisine



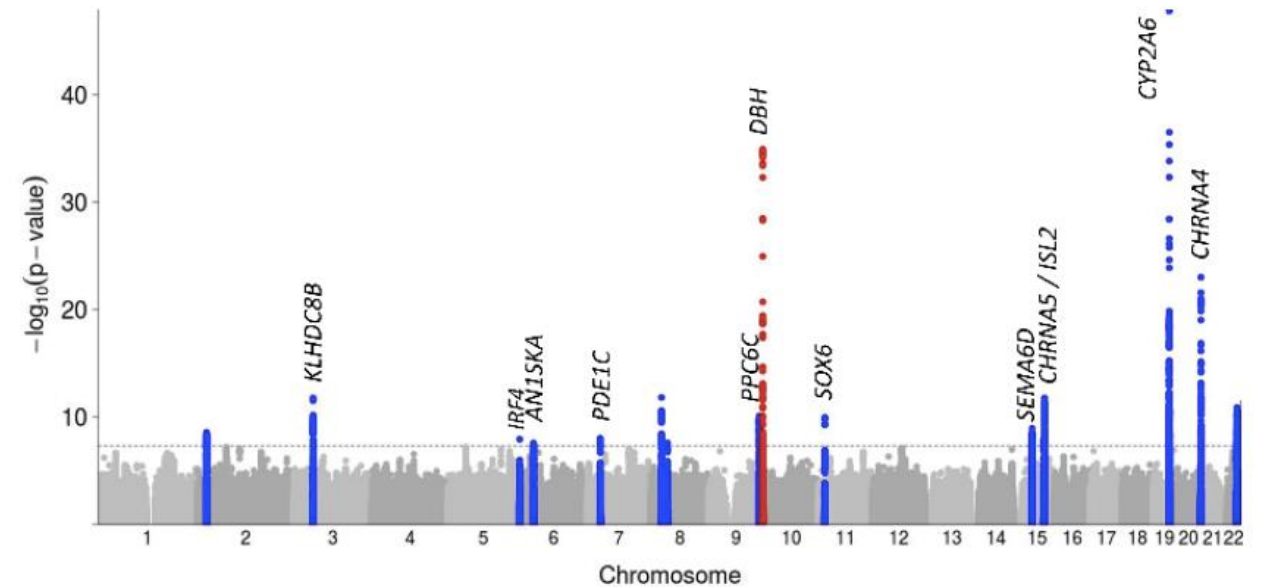
Varenicline
(Chantix™)

Genetics of Smoking



Association studies of up to 1.2 million individuals yield new insights into the genetic etiology of tobacco and alcohol use

c) Smoking Cessation (SmkCes)

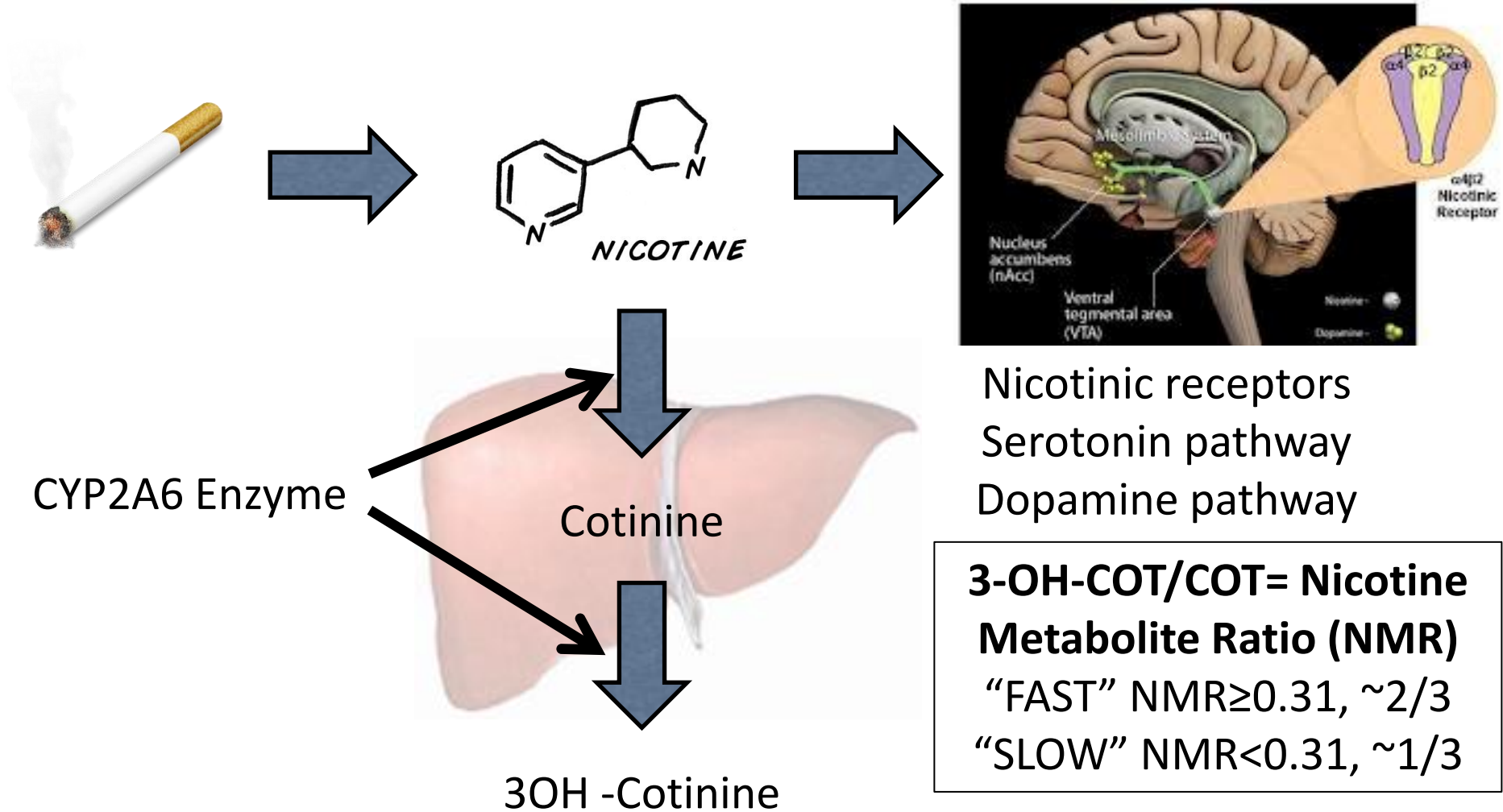


- Many additional genome-wide significant variants exhibiting polygenic risk for smoking
- Translating this information into precision approaches requires synthesis of data and replication in prospective studies → not yet standard of care.

Pharmacogenomics of smoking cessation

- Genes in multiple pathways associated w/ treatment response and side effects
 - *dopamine (ANKK1, DRD2, DRD4, SLC6A3),*
 - *nAChRs (CHRNA3, CHRNA4, CHRNA5, CHRNA7, CHRNB2, CHRNB4)*
 - ***nicotine metabolism (cytochrome 2A6 (CYP2A6) and nicotine metabolite ratio (NMR)) associated w/treatment response, side effects.***
- Goals of precision medicine: who is more/less likely to respond to cessation medications.
- Precision approaches *becoming* actionable, but **currently not standard of care**

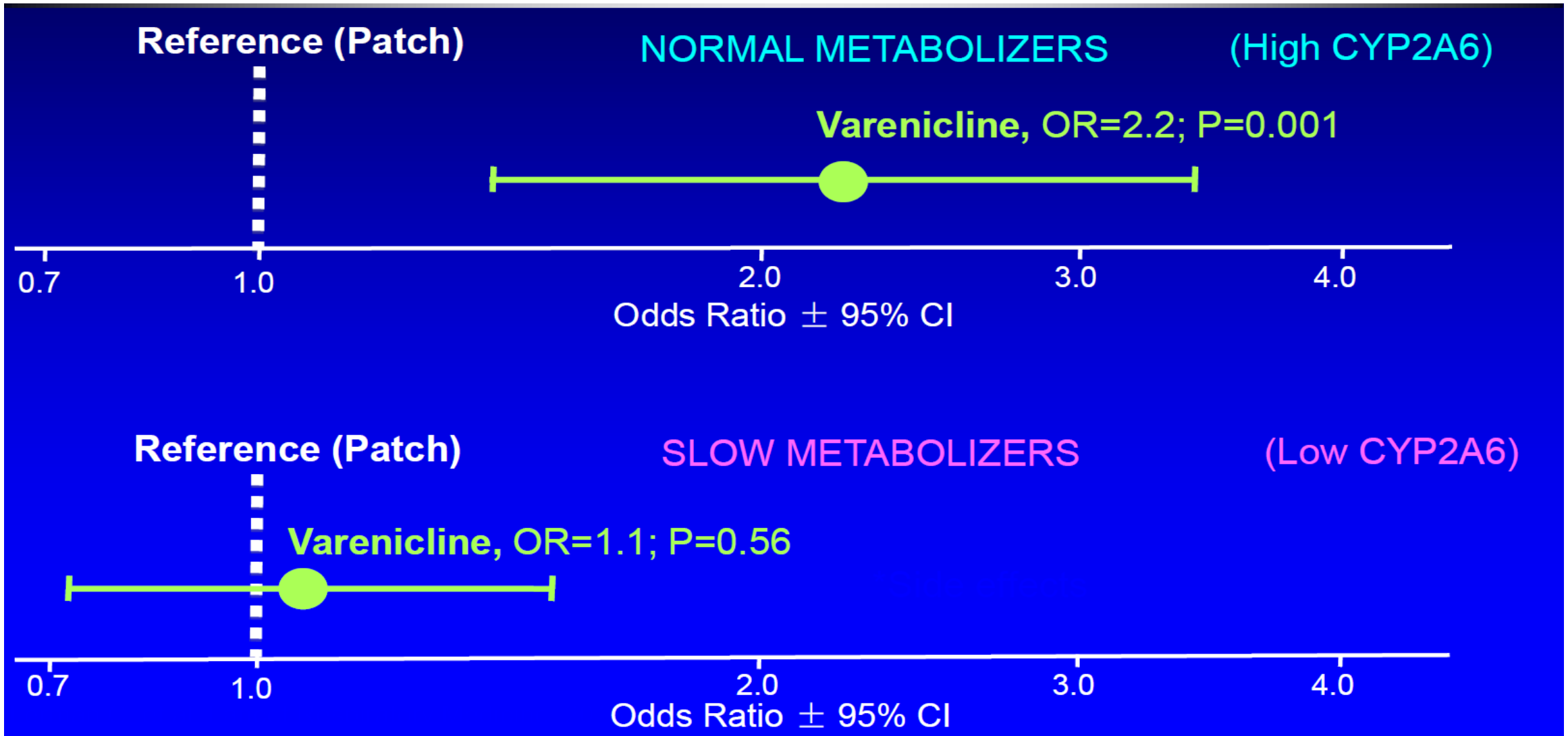
Nicotine Metabolism Ratio: NMR



Faster Metabolizers exhibit some important features

- Characteristics of higher NMR (higher CYP2A6 activity)
 - *Smoke more cigarettes per day; more intensely*
 - *Exhibit pronounced responses to smoking cues*
 - *Have greater availability of nicotinic receptors*
 - *Have difficulty quitting smoking*
 - *Lower quit rates with nicotine replacement*

CYP2A6 Activity (NMR) Interacts with Treatment Outcomes



Optimize
pharmacotherapy
based on nicotine
metabolism ?
or
Polygenic risk scores?

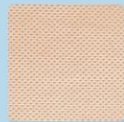

Nicotine Metabolite Ratio (NMR)

The **NMR** blood test shows how fast your body breaks down nicotine. The number ranges from 0-2 showing if you are **SLOW** or **FAST**.

The NMR can be measured by a routine blood test.

Knowing if you are **SLOW** or **FAST** can help match you with the best medicine to quit smoking.

Recommended Medicine:

SLOW	FAST
Nicotine Replacement	Varenicline (Chantix®)
	

SLOW: Similar quit rates w/V, NRT; more side effects w/V
FAST: 2X quit rate with V vs. NRT; NNT 5 vs. 26

Summary - Smoking is a chronic disease that can be successfully addressed in the healthcare system

- Successful 50+ year public health campaign, but 34 million still smoke
- Most want to quit and try to quit each year, but only 5% receive standard of care.
- FDA approved meds are safe and effective
- Behavioral therapy networks are available
- Residual smoking-related disease risk can persist long after smoking cessation – think screening
- New treatments are coming – stay tuned!

Resources Available

To read the full report and access related materials, visit:

www.SurgeonGeneral.gov

To learn more about tobacco control and prevention and quitting smoking, visit:

www.CDC.gov/tobacco

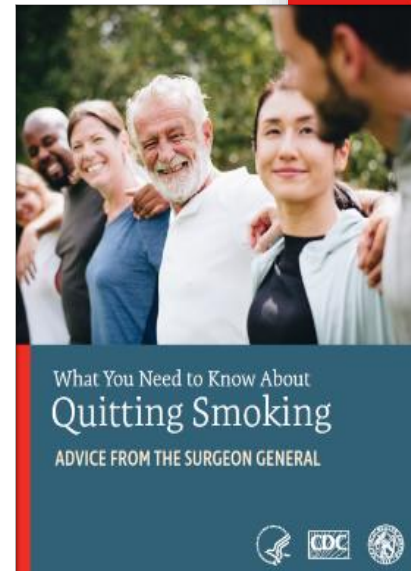
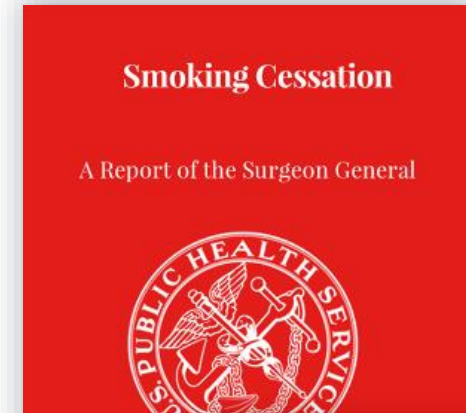
www.CDC.gov/quit

www.smokefree.gov

Contact Info:



SGReports@cdc.gov





Smoking Cessation

A Report of the Surgeon General

Thank you!
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U.S. Department of Health and Human Services