Treating Tobacco Use in Patients with Posttraumatic Stress Disorder

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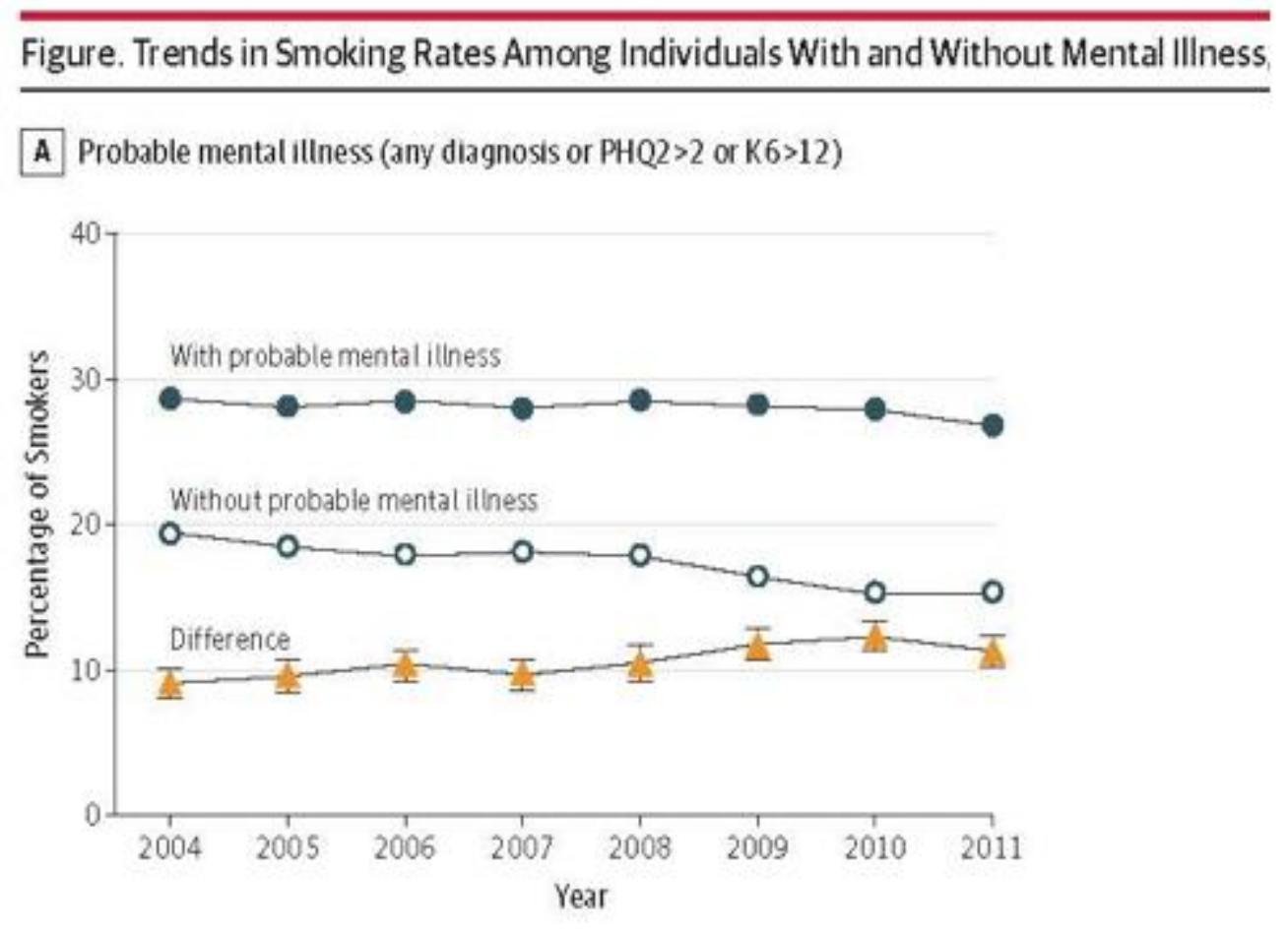
Tobacco Use and PTSD

- High rates of use
- Harms caused by tobacco
- Myths about tobacco use and mental illness
- How to treat co-occurring tobacco use and PTSD
- Technology can help

Tobacco Use by Smokers with Mental Health Disorders: Changes in Prevalence



LeCook et al. 2014

Smoking Rate by Psychiatric History in VA

- Smoking rates among VA patients with mental illness
- Current overall smoking rate in VA **17.9%**
- Odds ratio of being a current smoker compared to not having a mental disorder:

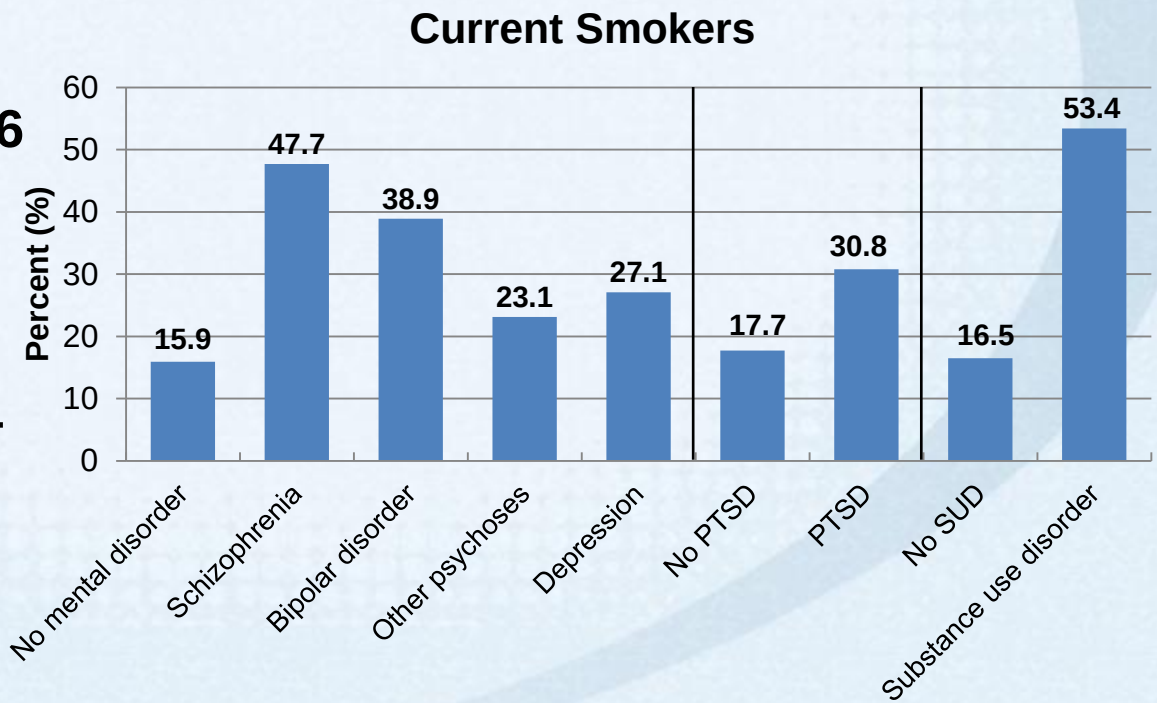
Schizophrenia **1.78**

Bipolar disorder **1.46**

Depression **1.18**

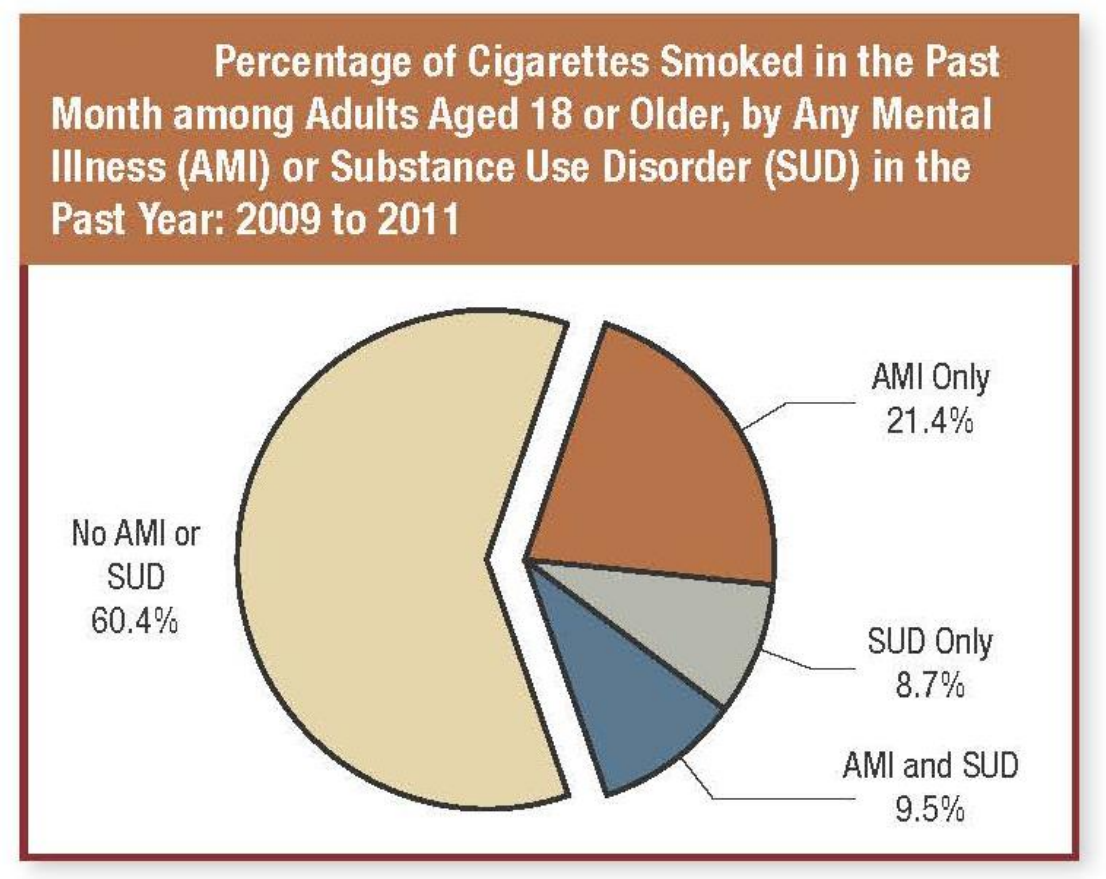
PTSD **0.95**

Substance use **2.74**



Duffy et al., 2012

Tobacco Use by Smokers with Mental Health Disorders: Percent of Cigarettes Smoked Past Month

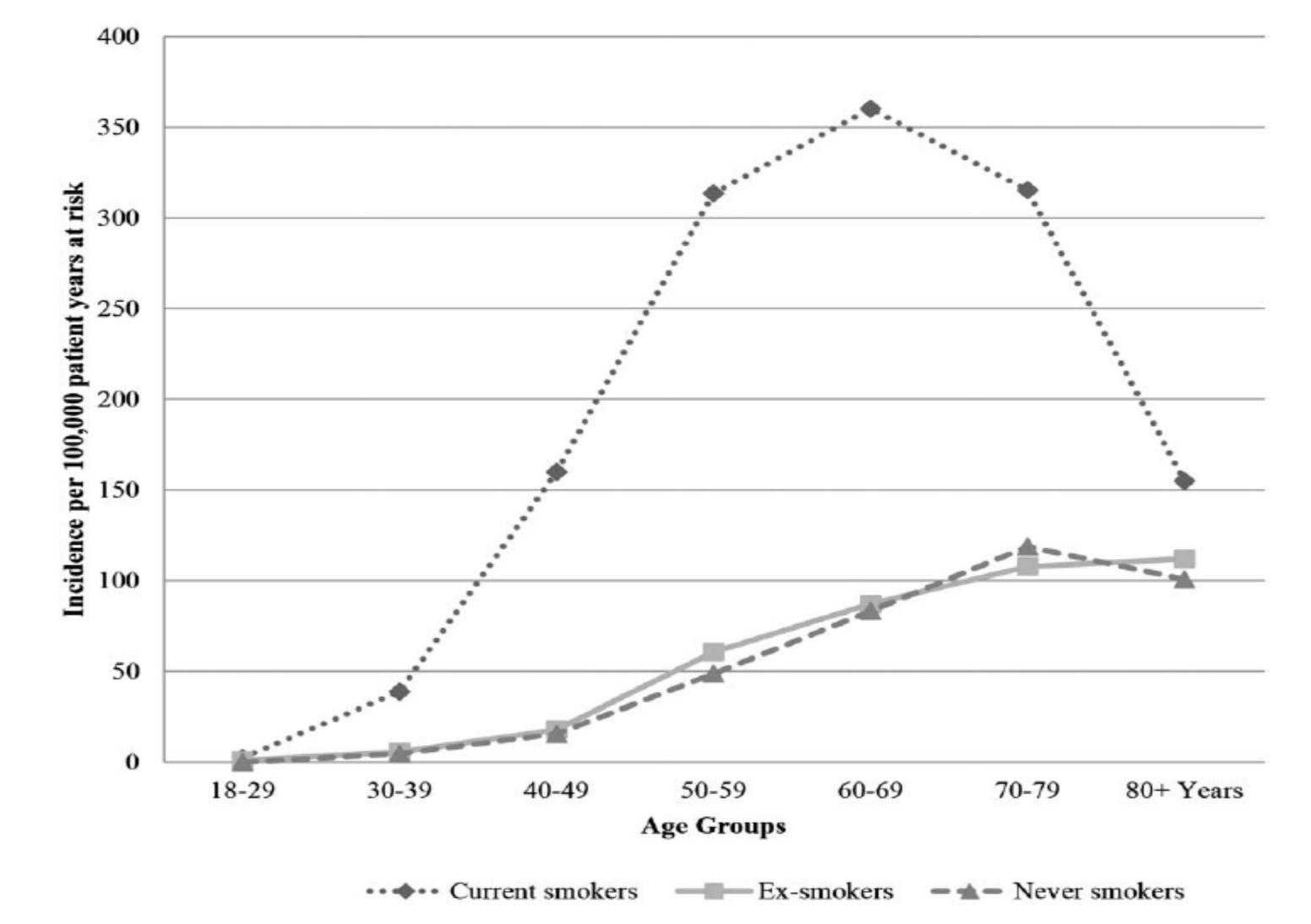


Source: National Survey on Drug Use & Health 2009-2011
MMWR 2013

Tobacco Kills People with Mental Illness

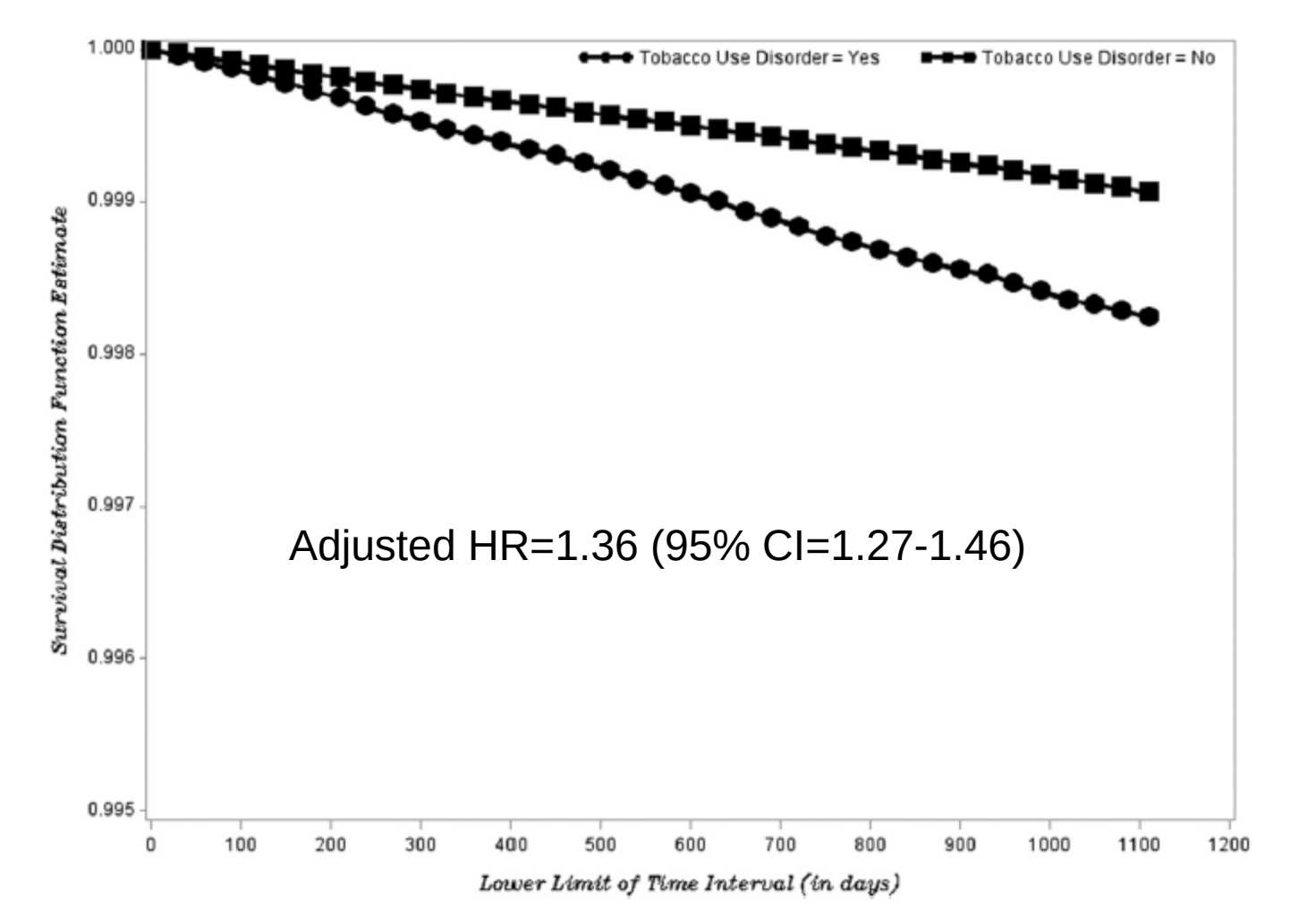
- Tobacco users with mental illness die 25 years earlier than non-users (Colton & Manderscheid, 2006)
- Tobacco users with mental illness have a greater risk of dying from CVD, respiratory illnesses, and cancer, than people without mental illness (e.g., Dalton et al., 2002; Himelhoch et al., 2004; Lichtermann et al., 2001, Olfsen et al., 2015)
- Tobacco use predicts future suicidal behavior in Veterans
  - Independent of age, gender, psychiatric disorder, service connection and severity of medical comorbidity (Bohnert et al., 2014)

Incidence of Myocardial Infarction (N=1728)



Lloyd et al., 2016

Tobacco Use and Suicide Among Veterans



Adjusted HR=1.36 (95% CI=1.27-1.46)

Bohnert et al., 2014

BJPsych The British Journal of Psychiatry (2010)
196, 440–446. doi: 10.1192/bjp.bp.109.065912

Cigarette smoking and depression: tests of causal linkages using a longitudinal birth cohort†

Joseph M. Boden, David M. Fergusson and L. John Horwood

Background
Research on the comorbidity between cigarette smoking and major depression has not elucidated the pathways by which smoking is associated with depression.

Aims
To examine the causal relationships between smoking and depression via fixed-effects regression and structural equation modelling.

Method
Data were gathered on nicotine-dependence symptoms and depressive symptoms in early adulthood using a birth cohort of over 1000 individuals.

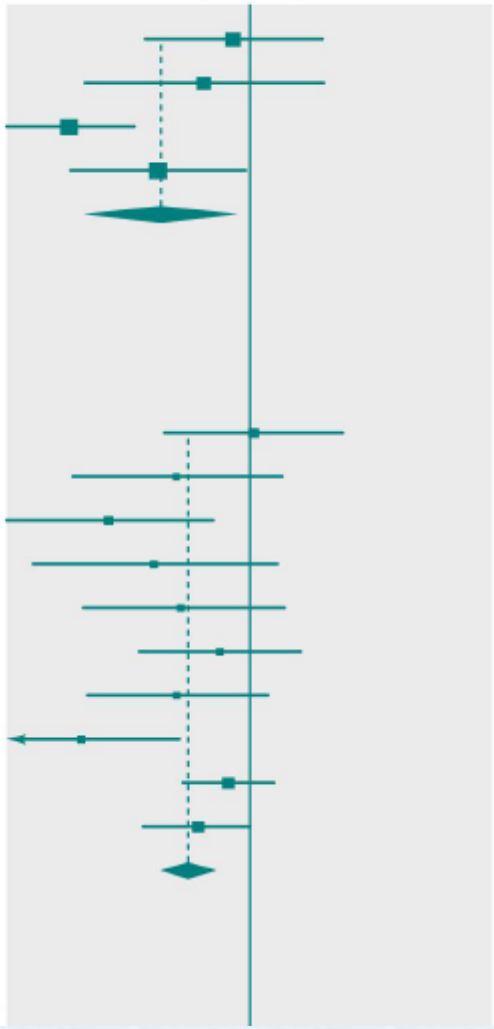
Results
Adjustment for confounding factors revealed persistent significant ($P < 0.05$) associations between nicotine-dependence symptoms and depressive symptoms. Structural equation modelling suggested that the best-fitting causal model was one in which nicotine dependence led to increased risk of depression. The findings suggest that the comorbidity between smoking and depression arises from two routes; the first involving common or correlated risk factors and the second a direct path in which smoking increases the risk of depression.

Conclusions
This evidence is consistent with the conclusion that there is a cause and effect relationship between smoking and depression in which cigarette smoking increases the risk of symptoms of depression.

Declaration of interest
None.

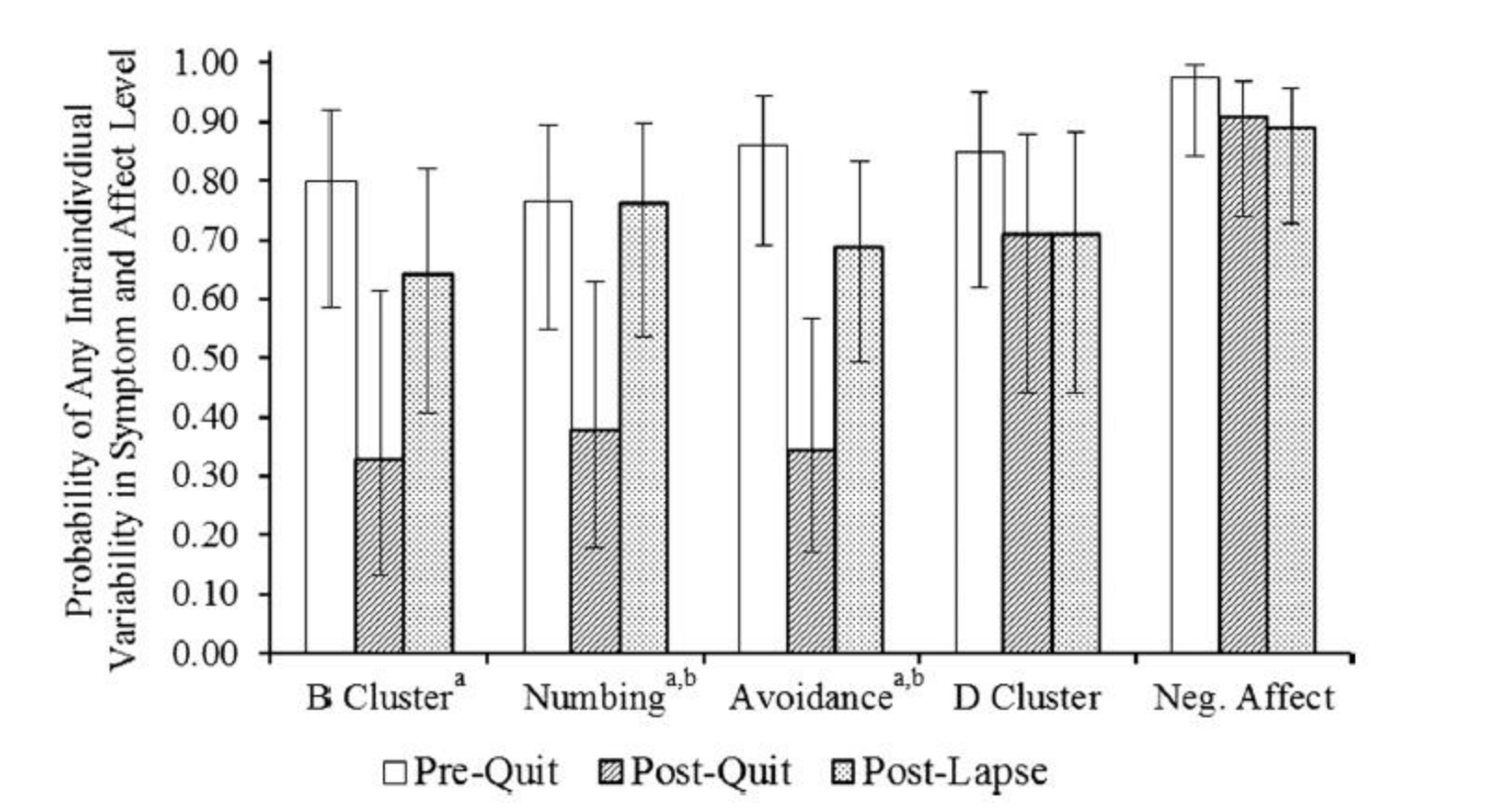
Meta-analysis of Observational Studies: Quitters vs. Non-Quitters

Study	SE	Standard mean difference (95% CI)	Weight (%)	Standard mean difference (95% CI)
Anxiety				
Solomon 2006	0.19		25	-0.06 (-0.42 to 0.30)
Dawkins 2009	0.25		20	-0.19 (-0.68 to 0.30)
McDermott 2013	0.13		29	-0.74 (-1.00 to -0.48)
Becona 2002	0.18		26	-0.37 (-0.72 to -0.02)
Total			100	-0.37 (-0.70 to -0.03)
Test for heterogeneity: τ^2=0.08, χ^2=10.43, df=3, P=0.02, I^2=71%				
Test for overall effect: z=2.16, P=0.03				
Depression				
Solomon 2006	0.19		9	0.01 (-0.35 to 0.37)
Berlin 2010	0.22		7	-0.30 (-0.72 to 0.12)
Blalock 2008	0.22		7	-0.58 (-1.00 to -0.16)
Dawkins 2009	0.25		5	-0.39 (-0.88 to 0.10)
Kahler 2011	0.21		7	-0.28 (-0.69 to 0.13)
Vazquez 1999	0.17		11	-0.12 (-0.44 to 0.20)
Busch 2011	0.19		9	-0.30 (-0.67 to 0.07)
Kahler 2002	0.20		8	-0.69 (-1.09 to-0.29)
Munafo 2008	0.09		21	-0.09 (-0.27 to 0.09)
Kinnunen 2006	0.11		17	-0.21 (-0.42 to 0.00)
Total			100	-0.25 (-0.37 to -0.12)
Test for heterogeneity: τ^2=0.01, χ^2=12.83, df=9, P=0.17, I^2=30%				
Test for overall effect: z=3.89, P<0.001				



Taylor et al., 2014

PTSD Sx during Quit Attempt



Dedert et al., 2014

Integrating Tobacco Cessation Into Mental Health Care for Posttraumatic Stress Disorder

A Randomized Controlled Trial

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Context Most smokers with mental illness do not receive tobacco cessation treatment.

Objective To determine whether integrating smoking cessation treatment into mental health care for veterans with posttraumatic stress disorder (PTSD) improves long-term smoking abstinence rates.

Design, Setting, and Patients A randomized controlled trial of 943 smokers with military-related PTSD who were recruited from outpatient PTSD clinics at 10 Veterans Affairs medical centers and followed up for 18 to 48 months between November 2004 and July 2009.

Intervention Smoking cessation treatment integrated within mental health care for PTSD delivered by mental health clinicians (integrated care [IC]) vs referral to Veterans Affairs smoking cessation clinics (SCC). Patients received smoking cessation treatment within 3 months of study enrollment.

Main Outcome Measures Smoking outcomes included 12-month bioverified prolonged abstinence (primary outcome) and 7- and 30-day point prevalence abstinence assessed at 3-month intervals. Amount of smoking cessation medications and counseling sessions delivered were tested as mediators of outcome. Posttraumatic stress disorder and depression were repeatedly assessed using the PTSD Checklist and Patient Health Questionnaire 9, respectively, to determine if IC participation or quitting smoking worsened psychiatric status.

Results Integrated care was better than SCC on prolonged abstinence (8.9% vs 4.5%; adjusted odds ratio, 2.26; 95% confidence interval [CI], 1.30-3.91; $P=.004$). Differences between IC vs SCC were largest at 6 months for 7-day point prevalence abstinence (78/472 [16.5%] vs 34/471 [7.2%], $P<.001$) and remained significant at 18 months (86/472 [18.2%] vs 51/471 [10.8%], $P<.001$). Number of counseling sessions received and days of cessation medication used explained 39.1% of the treatment effect. Between baseline and 18 months, psychiatric status did not differ between treatment conditions. Posttraumatic stress disorder symptoms for quitters and nonquitters improved. Nonquitters worsened slightly on the Patient Health Questionnaire 9 relative to quitters (differences ranged between 0.4 and 2.1, $P=.03$), whose scores did not change over time.

Conclusion Among smokers with military-related PTSD, integrating smoking cessation treatment into mental health care compared with referral to specialized cessation treatment resulted in greater prolonged abstinence.

Trial Registration clinicaltrials.gov Identifier: NCT00118534

JAMA. 2010;304(22):2485-2493 www.jama.com

NICOTINE DEPENDENCE INflicts a disproportionate toll on individuals with mental illness, adversely affecting quality and length of life.[1] Posttraumatic stress disorder (PTSD), a prevalent mental disorder,[2] is highly associated with smoking (45%) and unsuccessful quit attempts.[3] Individuals with PTSD smoke more heavily than smokers without PTSD and use tobacco to regulate mood and psychiatric symptoms.[4,5] Tobacco dependence likely contributes to the high mortality,[6] morbid-

Integrated Care for Smoking Cessation

Treatment for Veterans with PTSD

TREATMENT MANUAL

Behavioral Counseling

Overview of Study Design

- Randomized, controlled clinical trial with a parallel comparison of:
  - **Integrated Care (IC)**
  - **Smoking Cessation Clinic (SCC)**
- 943 patients randomized to IC vs. SCC
- 10 participating sites (VA PTSD clinics)

Integrated Care
Treatment Components

- **Skills Acquisition (5 weekly core treatment sessions)**
  - Behavioral Counseling (5 sessions totaling ~150 minutes)
  - Pharmacotherapy
  - Self-help readings
- **Relapse Prevention and Management**
  - Three weekly follow-up sessions
  - Monthly “check in” booster sessions as needed

Integrated Care
Who Provides Treatment?

- Case manager who coordinates overall mental health care provides tobacco cessation counseling
- Team psychiatrist or nurse provides medications
- Ongoing, continuous contact and familiar relationship
- Ability to monitor, detect, and respond to relapses over time

Specialized Smoking Cessation Clinic (SCC)
Comparison Condition

Referral to Specialized Smoking Cessation Clinic

- No attempt to control treatment delivered in SCC
- SCCs adhere to recognized clinical practice guidelines for smoking cessation treatment
- Practice patterns of SCC's were assessed annually to confirm adherence with evidence-based practice guidelines

Participant Characteristics

Characteristic	Integrated Care (n=472)	Smoking Cessation Clinic (n=471)
Age, mean (95% CI)	54.4 (53.6—55.2)	54.7 (54.0—55.5)
Male, No. (%)	444 (94.1)	439 (93.2)
Race, No. (%)		
White	272 (57.6)	275 (58.4)
African American/Black	171 (36.2)	174 (36.9)
American Indian/Alaskan Native	7 (1.5)	4 (0.9)
Asian/Pacific Islander/Native Hawaiian	3 (0.6)	3 (0.6)
Other	19 (4.0)	15 (3.2)
Hispanic, No. (%)	22 (4.7)	17 (3.6)
Marital status, No. (%)		
Married or remarried	212 (44.9)	217 (46.1)
Divorced or separated	194 (41.1)	187 (39.7)
Never married	48 (10.2)	47 (10.0)
Widowed	18 (3.8)	20 (4.3)

Participant Characteristics Cont.

Characteristic	Integrated Care (n=472)	Smoking Cessation Clinic (n=471)
Employment status, No. (%)		
Unemployed/retired	363 (76.9)	366 (77.7)
Stable full or part time	94 (19.9)	88 (18.7)
Temporary full or part time	15 (3.2)	17 (3.6)
Education > 12th grade, No. (%)	327 69.6	307 (65.2)
Period of service, No. (%)		
Prior to Vietnam	10 (2.1)	14 (3.0)
Vietnam	362 (76.7)	369 (78.3)
Between Vietnam and Persian Gulf	68 (14.4)	63 (13.4)
Persian Gulf	57 (12.1)	41 (8.7)
Between Persian Gulf and Iraq/Afghanistan	30 (6.4)	28 (5.9)
Iraq/Afghanistan	66 (14.0)	62 (13.2)

Baseline Smoking Characteristics

Characteristic	Integrated Care (n=472)	Smoking Cessation Clinic (n=471)
Age when started smoking, mean (95% CI)	17.6 (17.1—18.2)	17 (16.6—17.5)
Years smoking cigarettes regularly, mean (95% CI)	34.5 (33.5—35.5)	35.1 (34.1—36.1)
Average cigarettes/day last 30 days, mean (95% CI)	21.9 (21.0—22.9)	21.4 (20.4—22.3)
≥25 cigarettes per day last 30 days, No. (%)	149 (31.6)	134 (28.5)
Daily smoker last 90 days, No. (%)	431 (91.3)	427 (90.7)
Prior quit lasting ≥1 year, No. (%)	143 (30.3)	160 (34.0)
Quit attempt in the past year, No. (%)	202 (42.9)	192 (40.8)
Past treatment in a VA Smoking Cessation Clinic, No. (%)	156 (33.1)	147 (31.2)
Living with smokers past 90 days, No. (%)	176 (37.3)	203 (43.1)
Fagerström Test for Nicotine Dependence, No. (%)		
Minimally dependent (<4 points)	74 (15.7)	80 (17.0)
Moderately dependent (4-6 points)	213 (45.1)	238 (50.5)
Highly dependent (7-10 points)	185 (39.2)	153 (32.5)

Baseline Psychiatric Characteristics

Characteristic	Integrated Care (n=472)	Smoking Cessation Clinic (n=471)
DSM-IV diagnoses, No. (%)*		
Major depression current	205 (47.2)	193 (45.0)
Major depression past only	121 (27.9)	134 (31.2)
Bipolar disorder past only	27 (6.3)	26 (6.2)
Psychotic disorder past only	11 (2.7)	15 (3.6)
Anxiety disorder current (excludes PTSD)	102 (24.8)	91 (22.2)
Anxiety disorder past only (excludes PTSD)	49 (11.9)	53 (12.9)
Current alcohol abuse/dependence in partial remission	21 (4.8)	24 (5.5)
Alcohol disorder past only	325 (74.7)	331 (76.4)
Stimulant disorder past only	132 (30.1)	135 (31.1)
Cannabis disorder past only	125 (28.5)	126 (29.1)
Opioid disorder past only	63 (14.4)	60 (13.8)
CAPS total score, mean (95% CI), range 0-136	75.5 (73.8—77.2)	74.9 (73.3—76.6)
PCL total score, mean (95% CI), range 17-85	59.6 (58.6—60.7)	58.9 (57.7—60.0)
PHQ-9 total score, mean (95% CI), range 0-27	13.6 (13.1—14.2)	13.4 (12.8—14.0)
Psychotropic Medication Use, No. (%)		
Anti-depressants	347 (73.5)	356 (75.6)
Mood stabilizers	70 (14.8)	72 (15.3)
Sedative/hypnotics and anxiolytics	159 (33.7)	169 (35.9)
Anti-psychotics	111 (23.5)	113 (24.0)

*Excludes SCID data from one site due to administration error

Primary Outcome
Prolonged Abstinence

	Number Quit	Percent	Adj. Odds Ratio (95% CI)	P-value
PA (Self-Reported)	IC = 73 SCC = 42	IC = 15.5% SCC = 7.0%	2.59 (1.67 – 4.02)	< .001
PA (Bioverified)	IC = 42 SCC = 21	IC = 8.9% SCC = 4.5%	2.26 (1.30 – 3.91)	< .004

Behavioral Treatment Received from Randomization to Month 18

	Smoking Cessation Clinic (n=471)	Integrated Care (n=472)	p-value
Total smoking cessation treatment sessions received in assigned condition, mean (SD)	2.4 ± 3.2	8.8 ± 6.4	<0.001
Smoking cessation treatment sessions received in assigned condition, No. (%)			
0	152 (32.6)	47 (10.1)	
1-2	150 (32.2)	33 (7.1)	
3-5	113 (24.2)	69 (14.8)	<0.001
6-8	27 (5.8)	97 (20.9)	
>8	24 (5.2)	219 (47.1)	

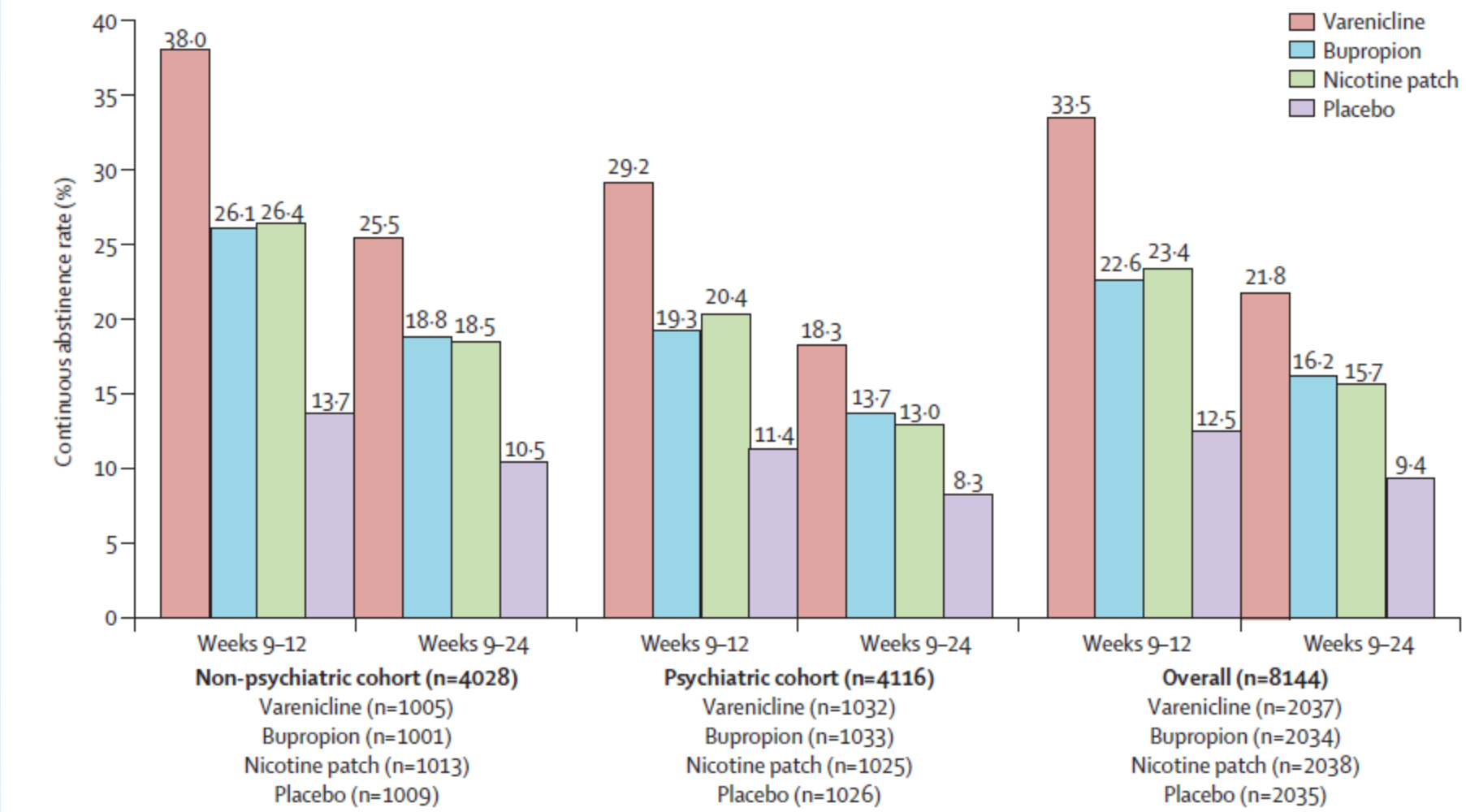
Data not available for 7 Integrated Care and 5 Smoking Cessation Clinic patients.

Pharmacotherapy Received from Randomization to Month 18

Medication		Smoking Cessation Clinic (n=471)	Integrated Care (n=472)	p-value
Any cessation medication	Patients reporting use, No. (%)	364 (79.3)	383 (84.0)	0.07
	Total days of use, mean (SD)	130.9 ± 156.2	164.8 ± 173.4	0.005
Bupropion for smoking cessation	Patients reporting use, No. (%)	134 (29.2)	188 (41.2)	<0.001
	Total days of use, mean (SD)	185.1 ± 166.4	181.3 ± 159.3	0.84
Any NRT	Patients reporting use, No. (%)	301 (65.6)	317 (69.5)	0.2
	Total days of use, mean (SD)	69.3 ± 92.3	87.8 ± 109.5	0.02
Nicotine Patch	Patients reporting use, No. (%)	224 (48.8)	234 (51.3)	0.45
	Total days of use, mean (SD)	50.8 ± 73.8	52.5 ± 65.3	0.79
Nicotine Polacrilex (Gum and/or Lozenge)	Patients reporting use, No. (%)	140 (30.5)	171 (37.5)	0.03
	Total days of use, mean (SD)	61.6 ± 85.0	87.1 ± 111.7	0.02
Bupropion plus any NRT	Patients reporting use, No. (%)	60 (13.1)	100 (21.9)	<0.001
	Total days of use, mean (SD)	44.2 ± 49.8	56.8 ± 81.4	0.23
Varenicline	Patients reporting use, No. (%)	54 (11.8)	56 (12.3)	0.81
	Total days of use, mean (SD)	67.0 ± 70.2	82.3 ± 68.9	0.25

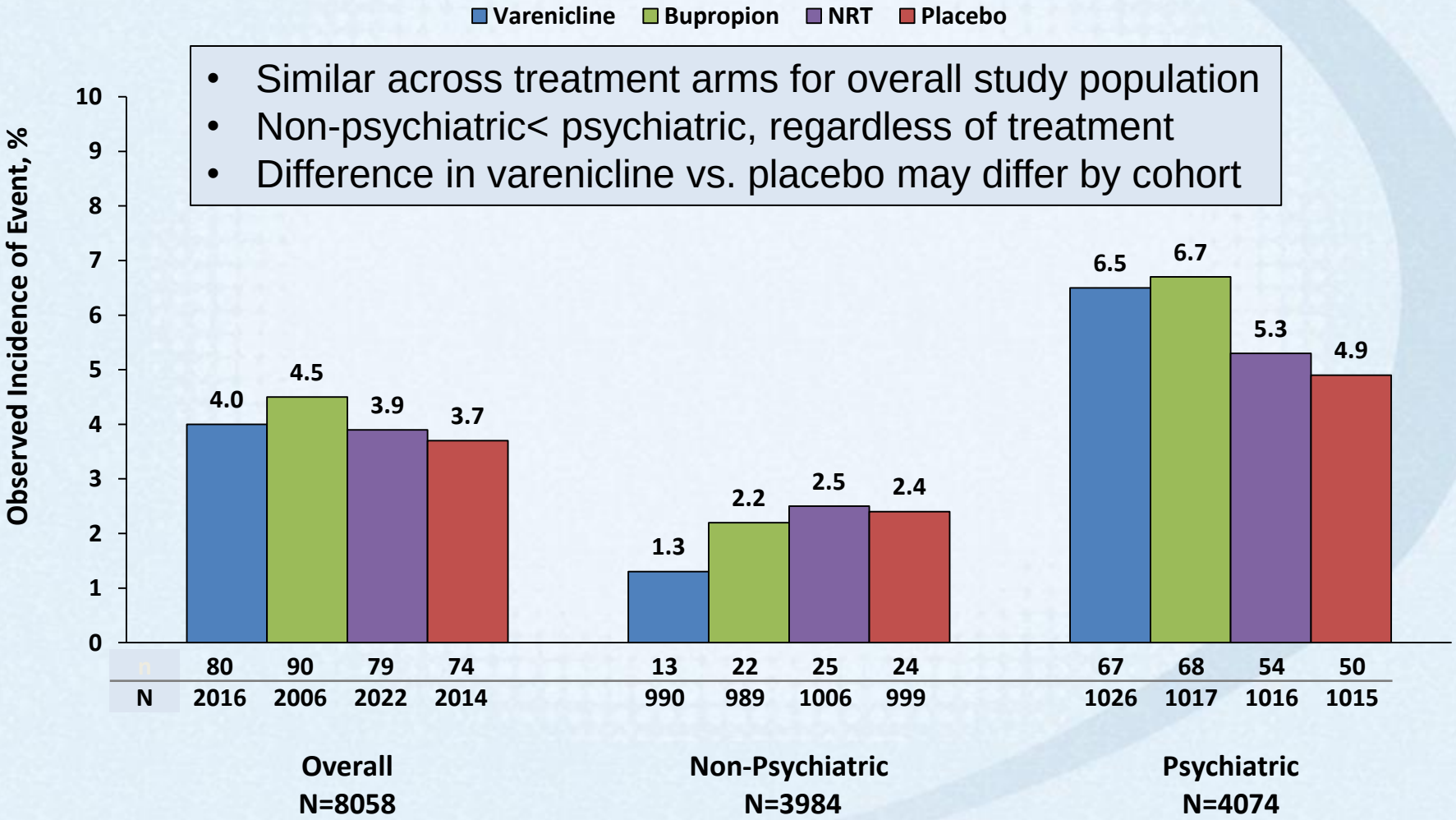
Data not available for 16 Integrated Care and 12 Smoking Cessation Clinic patients.
Days of use calculated for patients self-reporting any use only.
Varenicline did not become available within the Veterans Health Administration until year 3 of the study and was used as a second line agent; thus it was not available to all patients.

Neuropsychiatric Safety and Efficacy of Varenicline



Anthenelli et al., 2016

Primary Neuropsychiatric AE Composite Endpoint
Observed incidence

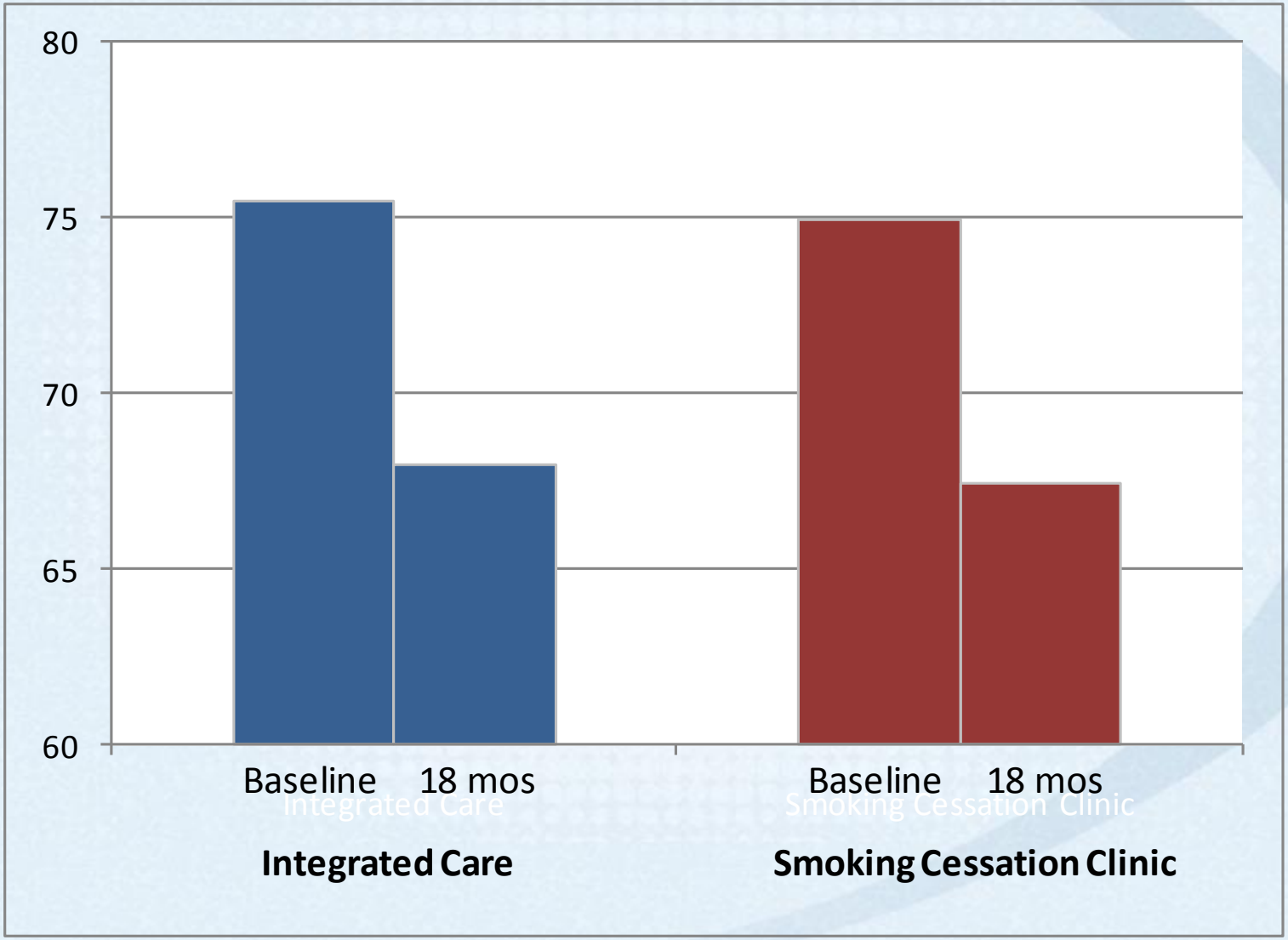


- Similar across treatment arms for overall study population
- Non-psychiatric< psychiatric, regardless of treatment
- Difference in varenicline vs. placebo may differ by cohort

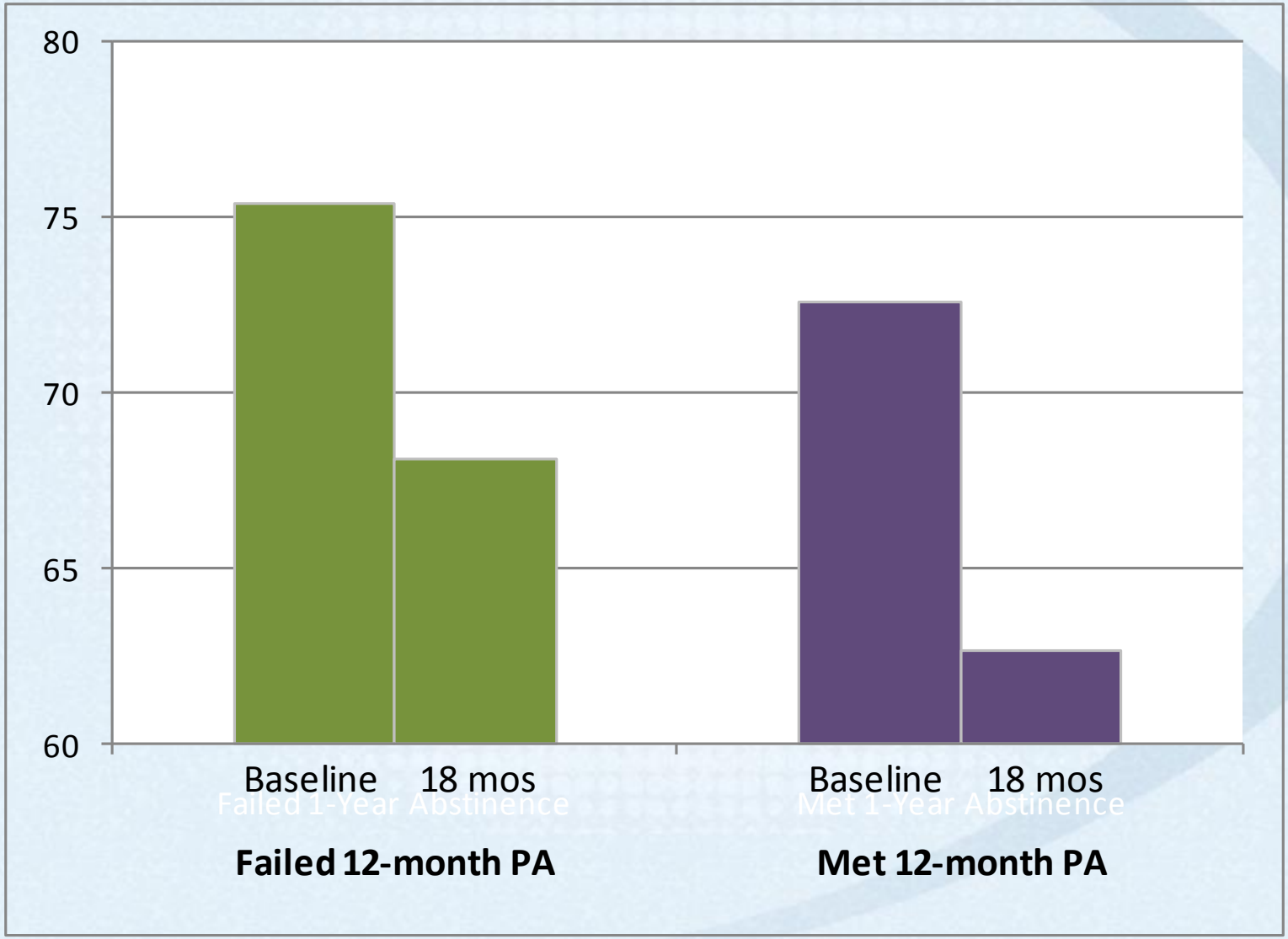
Anthenelli et al., 2016

Treatment + 30 days

Change in PTSD Severity:
CAPS Scores by Treatment Condition



Change in PTSD Severity:
CAPS Scores by 12-Month Prolonged Abstinence



Session 1

- Assess Tobacco Use, Abstinence Attempts, and Reasons for Quitting Smoking
- Advise Quitting
- Motivational Interventions (Only for Patients Unwilling to Quit)
- Empathic Support and Encouragement in Quitting Smoking
- Orient to Plan for Behavioral Counseling
- Recommend Smoking Cessation Medications
- Guidelines for Setting a Quit Date
- Goal Assignments for Session 2
- Schedule Session 2
- Coordinate Care with Prescriber

Session 2

- Identify Quit Date
- Identify Smoking Triggers
- Strategies for Reduced Smoking
- Rudimentary Skills for Coping with Smoking Triggers
- Controlled breathing
- Identify Existing Patient-Generated Coping Skills
- Goal Assignments for Session 3
- Schedule Session 3

Session 3

- Review Assignment to Practice Coping with Smoking Triggers
- Review Status of Reduced Smoking
- Teach Principles of Coping with Smoking Triggers
- Develop an Action Plan for Coping with Smoking triggers
- Assess Follow-Through With Smoking Cessation Medications
- Goal Assignments for Session 4
- Schedule Session 4

Session 4

- Review Assignment to Practice Coping with Smoking Triggers
- Review Status of Reduced Smoking
- Behavior Changes to Prepare for Quit Date
- Review Use of Controlled Breathing
- Identify Sources of Social Support and How Others Will Help The Patient Stop Smoking
- Assess Availability and Use of Smoking Cessation Medications
- Goal Assignments for Session 5
- Schedule Session 5

Session 5

- Review Assignment to Practice Coping with Smoking Triggers
- Review Status of Reduced Smoking
- Review Preparation for Quit Date Assignment
- Review Assignment to Use Social Supports
- Actions to Take on Quit Date
- Introduction to Relapse Prevention
- Review Plan for Smoking Cessation Medications
- Goal Assignments for Follow-up Session
- Schedule Follow-up Appointment

Follow-up Visits

- Assess Smoking Status & Quit Date Experiences

PROCEDURES FOR ABSTINENT PATIENTS

- Congratulate Patient/Support Continued Abstinence
- Discuss Positive Experiences Associated with Quitting
- Assess & Resolve Problems Encountered in Quitting

PROCEDURES FOR PATIENTS WHO CONTINUE TO SMOKE

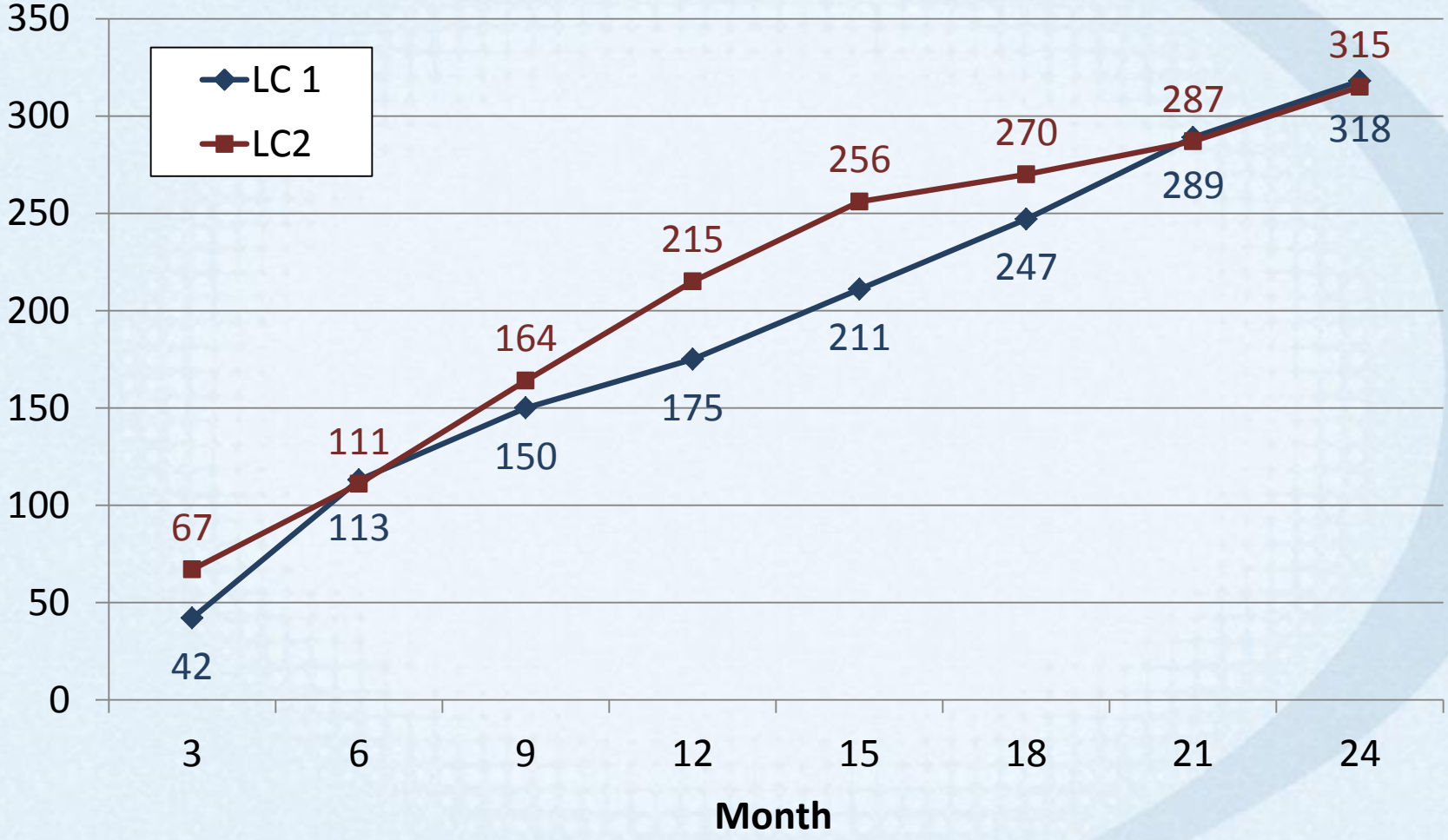
- Renew Commitment to Abstinence & Reinstate Appropriate Treatment
- Goal Assignments for Following Session
- Schedule Next Follow-Up Visit

Integrated Smoking Cessation Care Learning Collaboratives

- **Integrated Care I—October 2010 to September 2011**
  - Six outpatient PTSD clinical teams (PCTs); 38 participants.
  - Three in-person meetings over 8 months.
- **Integrated Care II—March 2012 to September 2012**
  - Six PCTs; 32 participants.
  - Two in-person meeting over 4 months.

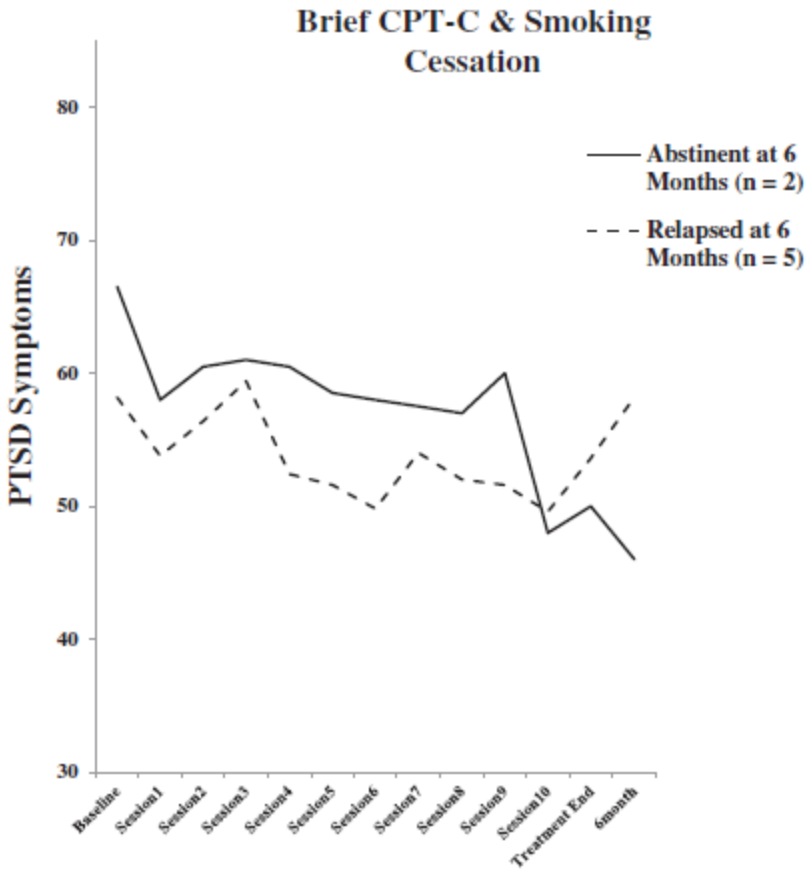
> **"Initially, I had doubts. 'This is just one more thing. How am I going to fit this in?' But the first meeting was great and the second even better because you heard what others were doing and how great it could be."** ~*Integrated Care I participant*

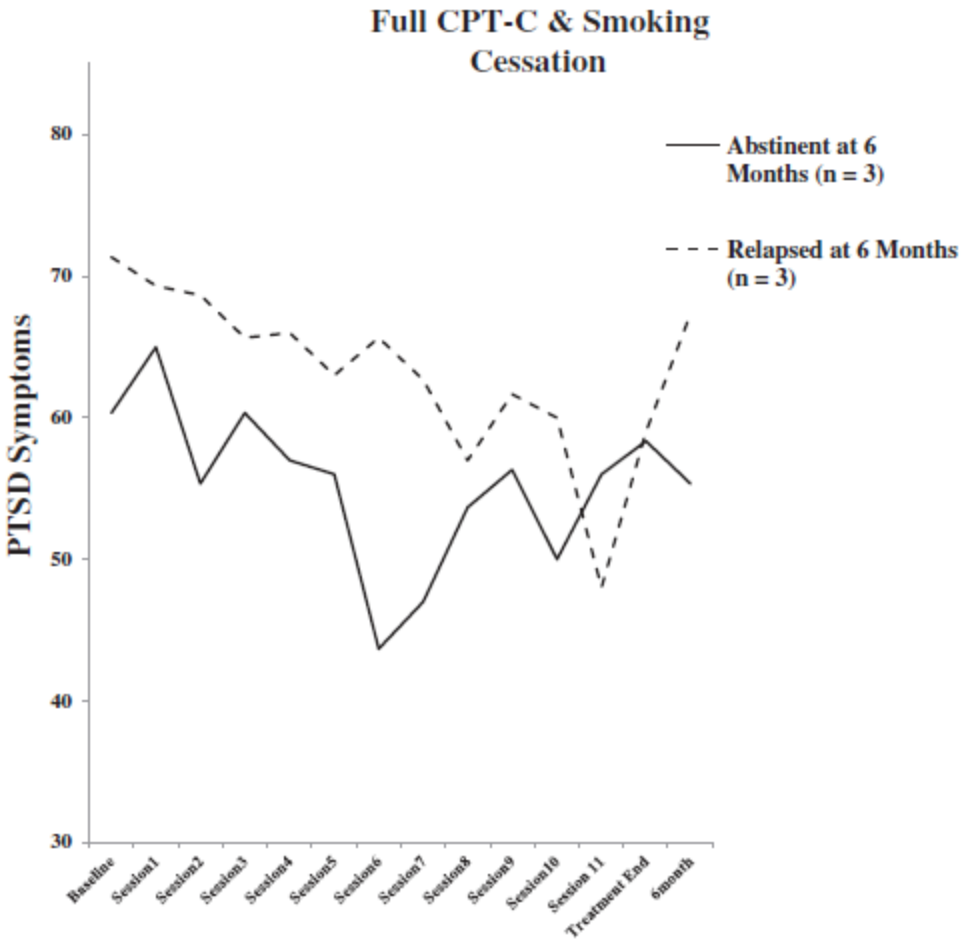
Number Veterans Enrolled in Integrated Care



Ebert et al., *Am. J. of Public Health*, 2014

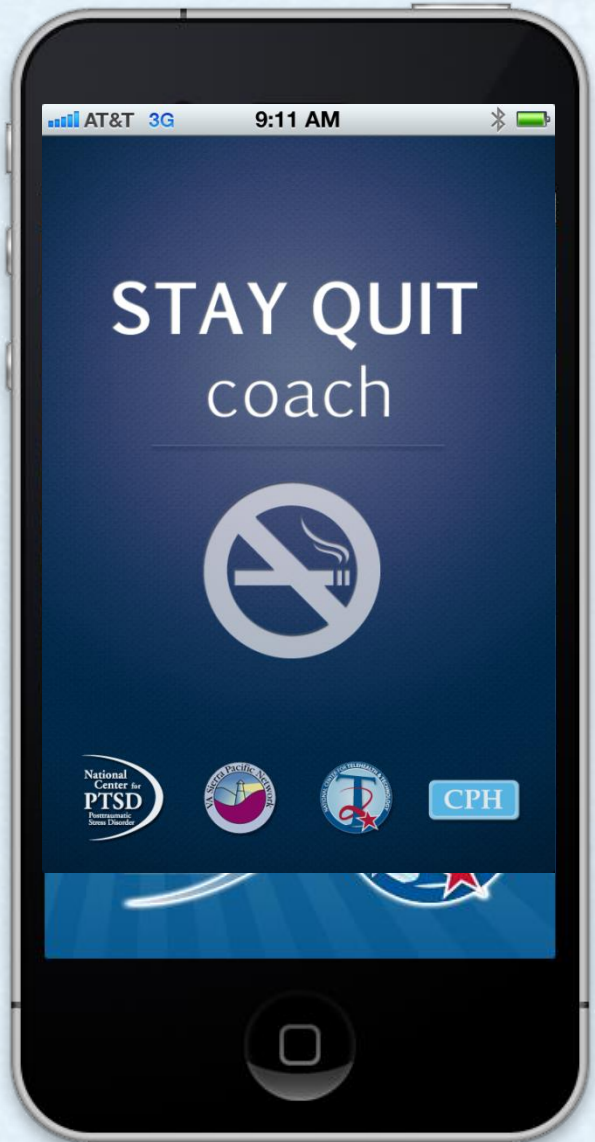
Combined CPT and Tobacco Cessation





Dedert et al., 2016

•Stay Quit Coach Overview



Stay Quit Coach is a mobile phone application designed to prevent relapse to smoking after quitting.

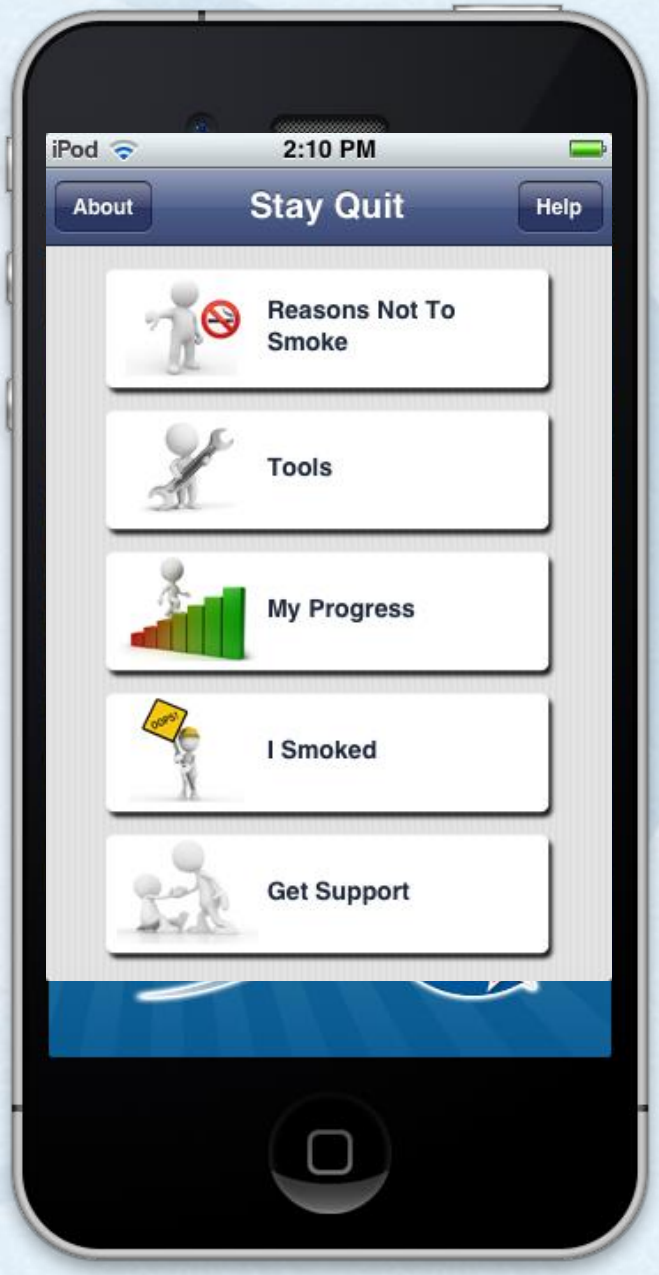
This application provides:

- Education on the risks of smoking, the benefits of quitting , and medication and nicotine replacement therapies
- Perspectives and coping tools for those who smoke after quitting
- Tools for coping with urges to smoke
- Reminders to take medications or nicotine replacement therapies
- Motivation by reminding users of reasons for quitting
- Help tracking the benefits of having quit smoking

It is meant to be used in conjunction with Integrated Care for Smoking Cessation but can also be used as a standalone self-help tool.

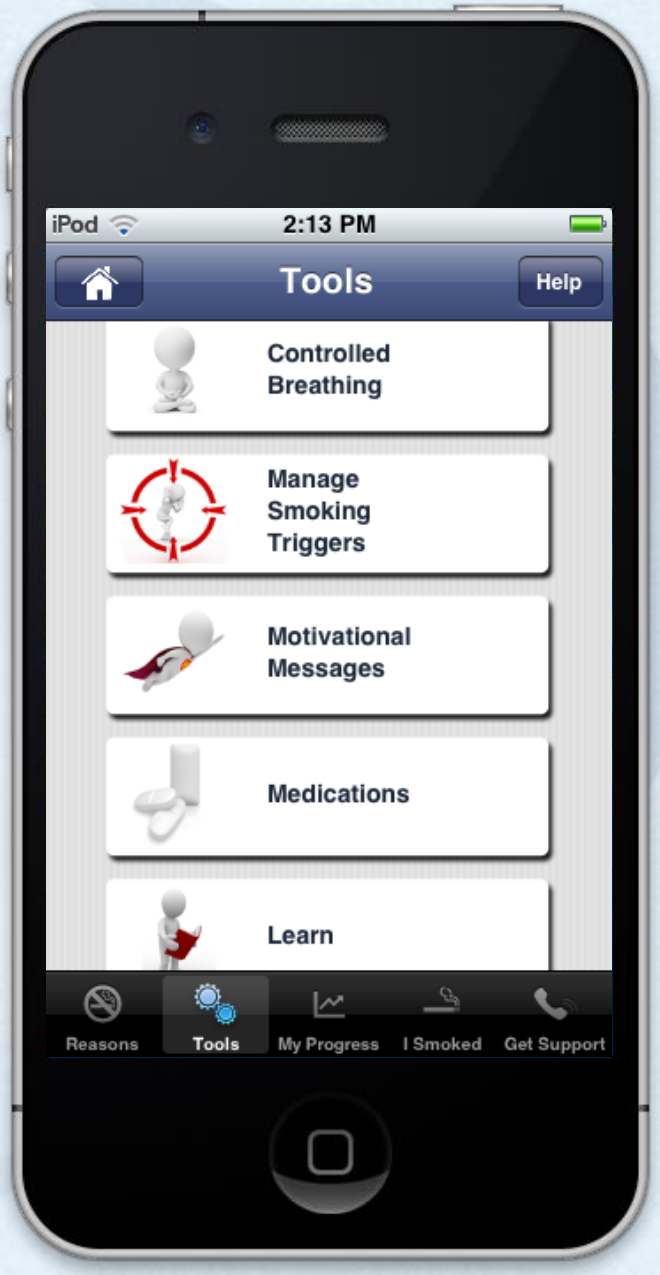
Home Screen

- From the Home screen users can choose from the five main actions of the application.
- The **About** button provides users with information about the app and the development team
- The **Help** button provides a brief description of the main sections of the app.



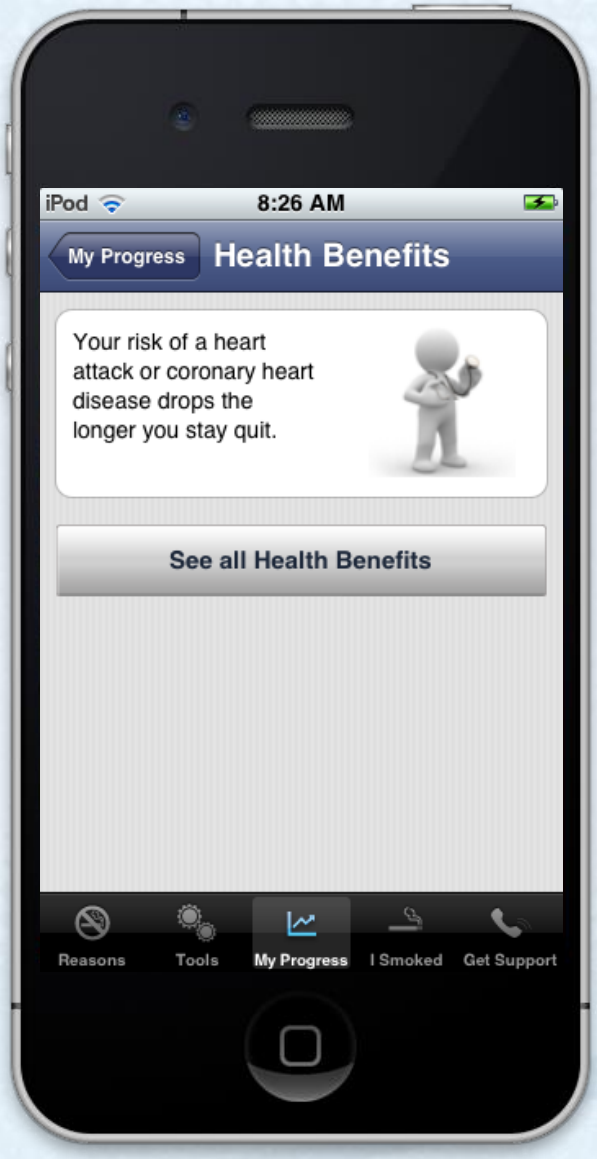
Tools

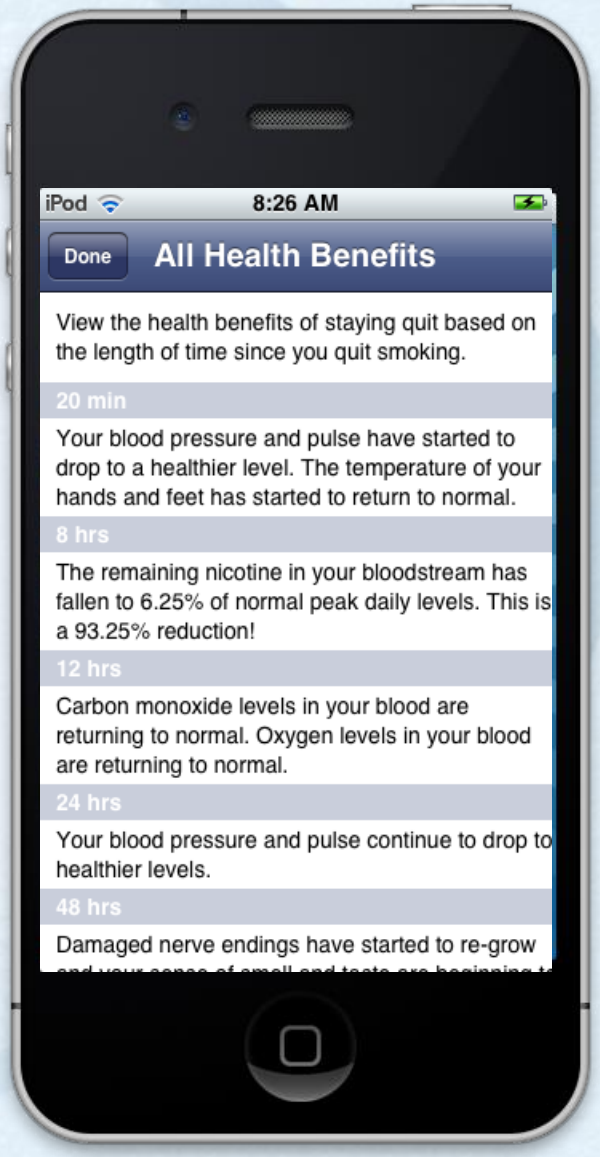
- Allows users to employ three different coping skills in the face of urges to smoke, and/or as preventive measures against relapse to smoking.
- Also allows users to manage medications and learn about smoking cessation.
- The five sections are:
  - Controlled Breathing
  - Manage Smoking Triggers
  - Motivational Messages
  - Medications
  - Learn



My Progress

iPod
8:26 AM
My Progress
Help
You have stayed quit for 123 days! You have saved....
$490.77
Health Benefits
View your Health Benefits since you quit smoking & see how staying quit improves your health over time.
Quit Date
Oct 2, 2012
Reasons
Tools
My Progress
I Smoked
Get Support


iPod
8:26 AM
My Progress
Health Benefits
Your risk of a heart attack or coronary heart disease drops the longer you stay quit.
See all Health Benefits
Reasons
Tools
My Progress
I Smoked
Get Support


iPod
8:26 AM
Done
All Health Benefits
View the health benefits of staying quit based on the length of time since you quit smoking.
20 min
Your blood pressure and pulse have started to drop to a healthier level. The temperature of your hands and feet has started to return to normal.
8 hrs
The remaining nicotine in your bloodstream has fallen to 6.25% of normal peak daily levels. This is a 93.25% reduction!
12 hrs
Carbon monoxide levels in your blood are returning to normal. Oxygen levels in your blood are returning to normal.
24 hrs
Your blood pressure and pulse continue to drop to healthier levels.
48 hrs
Damaged nerve endings have started to re-grow

Resources for Patients: Text Messaging Program

I've been trying to quit for years, this program has helped me accomplish my goal. Thank you for the support.

Automated text message smoking cessation program

- Sends 2-5 texts per day beginning 2 weeks before quit date and continuing for 6 weeks afterward
- Provides tips, support, and encouragement for quitting smoking
- Keywords (Urge, Stress, Smoked, Crisis) can be used anytime to receive an immediate tip in response
- Connects users with other VA resources: quitline, Veterans Crisis Line, Stay Quit Coach, refers back to VA provider for smoking cessation medications
- smokefree.gov/VET

smokefreeVET

smokefreeVET en Español

In collaboration with the National Cancer Institute

PTSD Consultation Program

FOR PROVIDERS WHO TREAT VETERANS

PTSDconsult@va.gov

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