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Cost-effectiveness of smoking cessation treatment initiated during psychiatric hospitalization: analysis from a randomized, controlled trial

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Abstract

Objective—We examined the cost-effectiveness of smoking cessation treatment for psychiatric inpatients.

Method—Smokers, regardless of intention to quit, were recruited during psychiatric hospitalization and randomized to receive stage-based smoking cessation services or usual aftercare. Smoking cessation services, quality of life, and biochemically-verified abstinence from cigarettes were assessed during 18-months of follow-up. Trial findings were combined with literature on changes in smoking status and the age and gender adjusted effect of smoking on health care cost, mortality, and quality of life in a Markov model of cost-effectiveness during a lifetime horizon.

Results—Among 223 smokers randomized between 2006 and 2008, the mean cost of smoking cessation services was $189 in the experimental treatment group and $37 in the usual care condition ($p < 0.001$). At the end of follow-up, 18.75% of the experimental group was abstinent from cigarettes, compared to 6.80% abstinence in the usual care group ($p <0.05$). The model projected that the intervention added $43 in lifetime cost and generated 0.101 additional Quality Adjusted Life Years (QALYs), an incremental cost-effectiveness ratio of $428 per QALY. Probabilistic sensitivity analysis found the experimental intervention was cost-effective against the acceptance criteria of $50,000/QALY in 99.0% of the replicates.

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Conclusions—A cessation intervention for smokers identified in psychiatric hospitalization did not result in higher mental health care costs in the short-run and was highly cost-effective over the long-term. The stage-based intervention was a feasible and cost-effective way of addressing the high smoking prevalence in persons with serious mental illness.

Keywords

Cost; cost-effectiveness; smoking-cessation; serious mental illness; tobacco use; nicotine replacement therapy; Markov model

Introduction

Individuals with mental health disorders are at least twice as likely to smoke as persons without mental illness[1] and consume more cigarettes than other smokers.[2–4] Persons with serious mental illness (SMI), including schizophrenia, bipolar disorder, and severe and chronic depression, have much higher age-adjusted mortality rates than the rest of the population.[5–7] High smoking prevalence, and high rates of smoking related illness, contribute to this elevated risk.[5]

Pharmacologic and behavioral cessation treatments for smokers with SMI have been found effective in clinical trials, with quit rates between 4 and 22%.[8] Bupropion and varenicline have been shown to be effective cessation pharmacotherapies in smokers with schizophrenia.[9–11] Initiation of tobacco cessation in during medical hospitalization is effective,[12] but trials have not been conducted in psychiatric hospitals. The inpatient psychiatric setting is a promising venue to identify smokers with SMI who may be ready to quit. Most psychiatric hospitals are now smoke-free environments and many provide hospitalized smokers with nicotine replacement therapy (NRT), giving patients a trial period of abstinence supported by pharmacotherapy, but hospitals are not yet availing themselves of this opportunity to treat nicotine dependence.[13]

Smoking cessation in other populations provides sufficient value to justify the cost of treatment, with a cost-effectiveness ratio well below the $50,000 per Quality Adjusted Life Year (QALY) threshold often used in the United States.[14–19] It does not follow that cessation services will be cost-effective for smokers with SMI, who tend to have lower quit rates than other smokers[2, 20] and may require more intensive cessation services. The incremental value of quitting is attenuated by the lower quality of life[21] and higher mortality rates from causes other than smoking in patients with SMI.[5] The cost-effectiveness of smoking cessation for patients with SMI has not been determined,[8] a gap addressed by this paper.

A previously reported randomized clinical trial among patients recruited from a locked acute inpatient psychiatry unit with a complete smoking ban supported by NRT found a sustained tobacco treatment program resulted in significantly greater abstinence from tobacco during 18 months of follow-up.[22] We now report the cost of the treatment, its effect on utilization and cost of mental health services in the short-run, and its cost-effectiveness over the long-term.

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Methods

Adult inpatients in a smoke-free psychiatric care unit, the Langley Porter Psychiatric Institute at the University of California San Francisco, were recruited and randomized to standard care or a stage-tailored smoking cessation intervention. All participants received NRT to manage withdrawal during hospitalization. Standard care consisted of a smoking cessation pamphlet provided during hospitalization and brief advice to quit. The experimental interventions included a computer-assisted assessment of stage of change and other major constructs of the transtheoretical model (i.e., decisional balance, temptations, and processes of change) with tailored feedback administered during the hospital stay, and 3 and 6 months later. Feedback at the later sessions highlighted changes from the earlier assessments. Printed feedback reports were provided to the participant and mailed to their outpatient provider. Participants also received a stage-tailored workbook, met with a study counselor on the unit for 15–30 minutes, and were offered up to 10 weeks of (NRT) in the form of transdermal patch for use post-hospitalization.

Informed consent was obtained under an Institutional Review Board approved protocol. Smoking status was assessed at 3, 6, 12, and 18-month follow-up regardless of treatment status using participant reported 7-day abstinence verified by carbon monoxide (CO) testing and collateral report.

Cost of smoking cessation services

The cost of NRT was estimated as the retail price. The cost of other cessation pharmacotherapies was the acquisition cost of the U.S. Medicaid program,[23] 65% of the average wholesale price.[24] Each computer assessment was assigned a pro-rata share of the computer, software, and technical assistance. Labor costs were $22/hour, including wages and benefits. Self-reported cessation services obtained outside of the study were assigned the unit costs of study provided services or unit costs obtained from literature review.

Health services utilization and cost

We obtained the quantity and cost of mental health care obtained by trial participants in the 18 months of study follow-up and used a long-term model to estimate the cost of medical services.

We obtained utilization and charge data from the recruitment site. Participants reported medications used and mental health services received from other providers, and provided releases to obtain bills for psychiatric hospitalization. Inpatient charges were adjusted by the hospital’s cost-to-charge ratio. Outpatient visits were assigned the mean cost of that service at the study site. Medication costs were estimated as Medicaid acquisition cost. We included all costs from discharge from the hospital stay where participants were randomized until the end of follow-up.

Group differences in health care utilization were compared using a negative binomial regression. Differences in cost were compared using a gamma regression with log link function.

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Quality of Life

Quality of life was assessed with the medical outcomes short form (SF-12),[25] scored with preference-based utility weights.[26] We estimated the effect of mental illness and other non-smoking factors on quality of life by dividing the utility of the final assessment of each participant by the utility of a population of primary care patients matched by age and smoking status.[27]

Model

We used a lifetime model to project the effect of smoking cessation on health care cost and morbidity adjusted survival. The Quality Adjusted Life Years (QALY) is the standard measure defined so that improvements in survival and quality life can be represented on a single scale. Years of life are adjusted for their quality, measured in units of preference-based utility, a measure that spans a range from zero (representing death) to one (representing perfect health). The difference in cost between experimental and control conditions was divided by the difference in QALYs to determine the Incremental Cost Effectiveness Ratio (ICER), or the cost incurred per QALY realized, a widely used measure of efficiency.

We constructed a Markov model to project the effect of smoking cessation on future smoking status and the associated quality of life, health care costs, and mortality. During each model cycle, current smokers may quit, former smokers may relapse, and members of either group may die. The model tallies the costs and QALYs that are realized by each randomization group, given their initial smoking status, over a life-time horizon (until all smokers and former smokers have died).

The model used trial data on participant age, the effect of mental health on quality of life, the initial cost of smoking cessation services, and smoking status at the end of follow-up. Other parameters used in the model are presented in Table 1.

We found the spontaneous cessation rate of smokers to be 4.3% per year,[28] the relapse rate among quitters to be 15.0% in the first year after a sustained one-year quit[31] and diminishing in subsequent years.[30–33] We assumed a relapse rate that was 150% higher, as former smokers with psychiatric illness are more likely to relapse than other smokers.

We estimated mortality rates by applying published hazard ratios for smokers and former smokers to age-specific U.S. mortality rates of never smokers.[34–37] The extra non-smoking mortality risk associated with mental illness was based on review of literature on all-cause and smoking-related mortality in different illnesses[5–7] weighted by the mix of illnesses among trial participants.

The model used a 3 month cycle, the minimum interval between study follow-up assessments. It was calibrated by comparing its projection of expected years of life at the time of a permanent quit in smokers in the general population to published reports.[40, 41]

We used published age and gender specific estimates of quality of life.[27] We estimated the effect of smoking on annual health care costs. We used age and gender specific health care

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costs from a national survey,[39] and adjusted these for the relative effect of smoking status on health care charges in a study of a large employer's health plan.[38] These estimates reflect an initial increase in relative cost associated with quitting, and a reduction in relative cost 5 years after cessation. We excluded mental health care costs incurred during the trial because our estimates lacked precision due to the extreme variance and skewness of these cost data. We considered the effect of including these estimates in sensitivity analysis. We made the simplifying assumption that survival and quality of life in former smokers is unaffected by the length of time since quitting.

All future life years, costs, and QALYs were discounted at 3% per annum. Costs were expressed in 2010 U. S. dollars. The statistical significance of the cost-effectiveness finding was determined via a Monte Carlo probabilistic sensitivity analysis, a random sampling of 1,000 sets of parameters from their estimated probability distributions. To ensure that samples were within the range appropriate to the parameter, we characterized cost using the gamma distribution and quality of life using the beta distribution, and constructed a probability density function from the age distribution of trial participants. The analysis accounts for uncertainty of both trial findings and the model parameters. An Incremental Cost-Effectiveness Ratio (ICER) was determined from each random draw. The percentage of ICERs that failed to meet the criterion for cost-effectiveness represents the p-value of the test of the statistical hypothesis that the intervention was cost-effective at a particular cost-effectiveness threshhold.[42] The model was constructed using commercially available software (TreeAge 2012). An appendix with a more complete description of the model, input parameters, and sensitivity analyses is available on online (web citation to be determined).

Results

A total of 224 participants enrolled between July 2006 and December 2008, with a 79% recruitment rate. We excluded one participant who declined consent for medical record review. There were 112 participants in the experimental condition and 111 participants in the control condition.

Baseline characteristics

Participants average 39.9 years (SD = 13.8) of age at randomization. They had smoked an average of 20 years (SD = 13.6) and used an average of 19 cigarettes (SD = 13) per day. The most severe psychiatric diagnosis of study participants was schizophrenia spectrum disorders (18.9%), bipolar depression (24.3%), unipolar depression (46.8%), or another diagnosis (9.9%). An alcohol or drug problem was present in 69.4%. Most participants were male (60.4%), never married (60.2%), Caucasian (63.8%), and unemployed (54.6%); 35% had a household income < $10,000 a year. There were no significant differences in measured characteristics by treatment group assignment.

Utilization and cost findings

Table 2 reports smoking cessation services provided by the study and received from other sources. Experimental intervention subjects received an average of 1 counseling session (on-unit), 2.2 computer sessions, and 3.1 weeks of NRT. Out-of-study smoking cessation

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services, chiefly NRT, were obtained by 25.9% of intervention participants and 25.2% of standard care participants.

The lower half of Table 2 reports utilization of mental health services during the 18 months of study follow-up. Participants randomized to the experimental intervention had significantly fewer psychiatric hospital stays, an average of 0.8 stays compared to 1.3 stays in the standard care group ($p < 0.05$), but the mean number of days of psychiatric hospitalization (6.0 days in the experimental group vs. 8.8 days in standard care) was not significantly different. The groups had no significant differences in use of psychiatric outpatient care or medications.

Smoking cessation treatment provided by the study cost $172 for the experimental group and $22 for the control group (Table 3). When the small cost of smoking cessation services obtained outside the study is included, the total cost of smoking cessation services was $189 in the experimental group and $37 in the standard care group ($p < 0.001$). Randomization to the experimental condition thus added $152 in smoking cessation services cost. The bottom half of Table 3 reports the cost of mental health services received by participants following discharge from the hospitalization in which they were randomized until the end of follow-up 18 months later. There was no evidence that randomization to the experimental group increased mental health utilization. The mean cost of mental health services was $15,728 in the experimental group and $22,185 in the standard care group. Despite the large magnitude of this difference, it was not statistically significant because of great variance and the skewed distribution in costs (skewness = 3.1).

Table 4 presents trial findings used in the model. Four participants died during the study, with 2 deaths in each treatment group. Since the numbers were small, we did not use these trial events for mortality estimates in the model. Of the remaining 219 participants, follow-up data were available on 199 (90.9%), including 180 followed to 18 months, and 19 followed only to 12 months. We estimated abstinence among survivors at the last available follow-up at 12 or 18 months. In the experimental group, 18/96 (18.75%) were abstinent from tobacco at follow-up, compared to 7/103 (6.80%) in the control group ($p<.05$). (These figures differ slightly from the previous report, which was based on individuals who completed 18 months of follow-up, who were 20% abstinent in the experimental group and 7.7% abstinent in the control group).[22]

The incremental increase in abstinence was thus 11.95%. The short-term incremental cost-effectiveness of the experimental condition was $1,272 per quit (the incremental cost of $152 divided by the incremental effectiveness of .1195).

Table 4 also reports the mean cost incurred by trial participants in each treatment group contingent on abstinence status at the end of follow-up, allowing sensitivity analyses to reflect the positive correlation between cessation services cost and treatment success. Participant responses to the SF-12 resulted in a preference based utility weight that was 0.786 of the expected value given their smoking status and age. We applied this value to represent the additional effect of psychiatric status on quality of life.

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Cost-effectiveness findings

The base-case model estimated that quitting at 41 years of age results in a discounted gain of 0.83 QALYs or 1.14 life-years. The incremental cost-effectiveness of the experimental intervention determined by the model is presented in Table 5. Discounted life time cost with the experimental intervention was $184,057 per person, or $43 greater (95% confidence interval of −$1558 to +$1992) than the $184,014 lifetime cost of standard care. Persons receiving the experimental intervention were expected to live 23.766 life years, or 0.139 life years more (95% confidence interval of 0.026–0.250) than the 23.627 life years realized with standard care. The experimental intervention yielded 15.233 quality adjusted life years (QALYs), or 0.101 QALYs more (95% confidence interval of 0.016–0.191) than the 15.122 QALYs realized with standard care. The additional $43 cost of experimental intervention yielded a gain of 0.101 QALYs, an incremental cost-effectiveness ratio (ICER) of $428/QALY or $312/LY.

One-way sensitivity analyses were used to test the effect of model parameters. Under the assumption that smoking cessation does not affect life-time health care costs, (that is, if we only considered the direct cost of cessation services provided during the trial), the incremental cost-effectiveness ratio increases to $1,499/QALY. The incremental cost-effectiveness ratio remained below $5,000/QALY over a range of parameter values for relapse rate in quitters, the future quit rates of smokers, the smoking and non-smoking related mortality hazard, and quality of life. Higher ratios (but still less than $10,000/QALY) were obtained if the intervention was delivered to persons 75 years of age, or if smokers with psychiatric illness quality of life that was 50% of what was observed in the trial.

A probabilistic sensitivity analysis was used to test the significance of the cost-effectiveness finding. Using a threshold of $50,000/QALY as the criteria for cost-effectiveness, the hypothesis that the intervention was cost-effective was significant with $p = 0.01$ (that is, 99.0% of the replicates were cost-effective at this threshold).

Had the model included the short-term mental health care costs observed during the trial, the experimental intervention would have saved $6,414 relative to the control condition, that is, the intervention would have strongly dominated standard care, as it was cost-saving and more effective. A probabilistic sensitivity analysis with these costs included found that the intervention was not significantly cost-effective at any threshold criteria. This result is attributable to the great variance and skewness in the mental health costs observed during trial follow-up.

Discussion

This randomized clinical trial determined that an intervention for smokers initiated during a smoke-free psychiatric hospital stay and continued 6-months post-hospitalization was cost-effective relative to standard care.

The short-term incremental cost-effectiveness of the intervention was $1,272 per quit. This was better than the average incremental cost effectiveness of $2,777 per quit found in a systematic review of 14 smoking cessation studies (expressed in 2010 dollars).[18]

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We estimated that an individual with the psychiatric illness of trial participants who quits smoking at 41 years of age will realize a discounted gain of 0.83 QALYs or 1.14 life-years. This benefit is lower than the typical value of 2 QALYs per quit benefit estimated for other smokers.[15, 43–46] reflecting the higher non-smoking mortality hazard and lower health related quality of life associated with psychiatric illnesses. Although we estimated the benefit per quit to be to be lower in this population than in smokers generally, the intervention was still highly cost-effective.

The ICER of $428/QALY was lower (more cost-effective) than smoking interventions in other populations. Brief physician advice has an incremental cost-effectiveness ratio of $1,240–$3,620/QALY (in $2010).[43] Addition of pharmacotherapies to counseling has an incremental cost effectiveness of $1,133–$1,774/QALY.[16] Varenicline for prevention of relapse in recent quitters has an incremental cost-effectiveness of $3,413/QALY.[47] Like other smoking cessation interventions, this intervention was highly efficient, yielding additional QALYs for a cost that was well below the commonly used threshold for judging cost-effectiveness (the range of $50,000–$100,000/QALY in the United States).

There was no evidence that the intervention increased the utilization or cost of mental health services. The experimental group incurred a mean of $15,728 mental health service cost, compared to $22,185 in the standard care group, a difference that was not statistically significant. Our previous trial of smoking cessation for psychiatric outpatients with depression had this same result, with a non-significant trend towards lower mental health services costs in the group assigned to receive more intensive cessation services.[48] Concern has been expressed that smoking cessation treatments may worsen outcomes in psychiatric patients.[49] This study added to the evidence that treating smokers identified in psychiatric settings does not increase mental health care cost.

We acknowledge several limitations. In the absence of adequate information, we assumed that relapse rates in former smokers are 150% higher in persons with mental illness than in the general population. We used quit rates for continuing smokers as are observed in the general population. Our findings were robust across a wide range of relapse and spontaneous quit rates, however. In the absence of better information, we assumed that the effect of smoking cessation on health care cost is unaffected by the presence of a psychiatric illness. The trial lacked the statistical power needed to estimate the effect on smoking cessation mental health costs.

The burdens of smoking on persons with mental illness and substance use disorders have been cited as reasons why these groups should be given priority in tobacco control efforts.[50] We found that cessation treatment for smokers identified during a psychiatric hospitalization was as cost-effective as cessation services provided to tobacco users without mental illness, as determined by other studies. This suggests that there will not necessarily be any loss of efficiency if tobacco control efforts prioritize services for persons with mental illness.

Supplementary Material

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Clinical points

A smoking cessation intervention for smokers identified during psychiatric hospitalization was highly cost-effective according to criteria used to evaluate the adoption of health care interventions in the United States. There was no evidence that the intervention increased the utilization or cost of mental health services. Although persons with psychiatric illness have lower quality of life and increased mortality from non-smoking causes, directing smoking cessation programs to persons with mental illness does not mean that tobacco control efforts will become less efficient.

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Table 1

Model parameters for changes in smoking status, mortality, quality of life and cost obtained from literature review

Parameter	Parameter value	Source
Quit rate among current smokers (% per year)	4.3%	28[29]
Relapse rate among former smokers after one year of abstinence (% per year)		30–33
Year 2 after initial quit	15%	
Year 3–5 after initial quit	5%	
Year 6–9 after initial quit	2%	
Year 10+ after initial quit	1%	
Excess mortality relative to never smokers (hazard ratio)		34–37
Female current smokers age 24–54	1.369	
Female current smokers age 55–74	2.533	
Female current smokers age 75+	1.411	
Female former smokers age 24–54	1.214	
Female former smokers age 55–74	1.666	
Female former smokers age 75+	1.111	
Male current smokers age 24–54	2.486	
Male current smokers age 55–74	2.550	
Male current smokers age 75+	1.326	
Male former smokers age 24–54	1.074	
Male former smokers age 55–74	1.992	
Male former smokers age 75+	1.074	
Excess mortality from non-smoking causes (hazard ratio)		
Smoking mortality hazard in schizophrenia	1.65	5
All-cause mortality hazard in schizophrenia	2.5	6
Non-smoking mortality hazard in depression	1.3	7
Quality of life (preference-based utilities)		27
Female moderate smokers age 55–64	0.7648	
Female moderate smokers age 65–74	0.7520	
Female moderate smokers age 75+	0.6778	
Female former smokers age 55–64	0.7827	
Female former smokers age 65–74	0.7709	
Female former smokers age 75+	0.6987	
Male moderate smokers age 55–64	0.7815	
Male moderate smokers age 65–74	0.7575	
Male moderate smokers age 75+	0.7112	
Male former smokers age 55–64	0.8020	
Male former smokers age 65–74	0.7802	

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Parameter	Parameter value	Source
Male former smokers age 75+	0.7358	
Health care charges incurred by smokers and former smokers relative to the general population (relative charges)		38
Smokers	1.1881	
Recent quitters (< 5 years)	1.2476	
Long-term quitters (5+ years)	0.9595	
Annual health care cost (2010 $U.S.)		39
Female age 18–24	2,235	
Female age 25–44	3,347	
Female age 45–64	6,229	
Female age 65–90	9,623	
Male age 18–24	1,072	
Male age 25–44	2,158	
Male age 45–64	5,217	
Male age 65–90	10,249	

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Table 2

Mean smoking cessation and mental health services utilization by treatment group during 18 months of follow-up

	Experimental Group (n=112)		Control Group (n=111)	
	Mean	**(SD)**	**Mean**	**(SD)**
Study provided cessation services				
Individual counseling (sessions)	0.97	(0.2)	–	
NRT patch (weeks)	3.06	(3.9)	–	
Computer aided assessments (sessions)	2.20	(0.9)	–	
Computer session reminders	12.43	(5.3)	–	
Self-help materials	–		1.00	(0)
Out-of-study cessation services (reported)				
Individual counseling (sessions)	0.02	(0.1)	0.01	(0.1)
Group counseling (sessions)	0.01	(0.2)	0.03	(0.2)
NRT	0.30	(0.6)	0.34	(0.7)
Bupropion	0.04	(0.2)	0.02	(0.1)
Varenicline	0.04	(0.2)	0.03	(0.2)
Mental health services				
Inpatient mental health care (excluding index stay)				
Psychiatry (total days)	6.0	(14.6)	8.8	(15.7)
Psychiatry (# of stays)	0.8 *	(1.3)	1.3	(1.8)
Residential addiction treatment (days)	9.6	(27.5)	6.6	(21.8)
Residential addiction treatment (stays)	0.3	(0.7)	0.2	(0.5)
Outpatient mental health care (visits)				
Emergency department visits	0.4	(0.8)	0.3	(1.3)
Day treatment/partial hospitalization	4.9	(16.4)	9.0	(32.5)
Individual visits	2.4	(6.1)	3.7	(10.9)
Subtotal outpatient mental health care	7.7	(17.3)	13.0	(34.5)
Psychiatric medication (days × # of medications used)	414.2	(488)	467.9	(539)

* $p < 0.05$

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Table 3

Mean smoking cessation and mental health cost per participant by treatment group during 18 months of follow-up (2010 $ U.S.)

	Experimental Group (n=112)		Control Group (n=111)	
	Mean	**(SD)**	**Mean**	**(SD)**
Smoking cessation services				
Study-provided smoking cessation services				
Individual counseling	16	(2.7)	–	
NRT patch	44	(56.3)	–	
NRT mailing	1	(3.0)	–	
Expert system	42	(15.0)	–	
Expert system reminder	68	(29.0)	–	
Provider packet mailing	1	(2.2)	–	
Self-help material distribution	–		22	(0)
Subtotal, study-provided cessation services	172	(72.8)	22	(0)
Subtotal, out-of-study cessation services	16	(33.7)	15	(31.7)
Total, smoking cessation services	189 *	(83.2)	37	(31.7)
Mental health services				
Inpatient mental health care				
Psychiatry (minus index stay)	8,085	(19,473)	12,202	(21,662)
Residential addiction treatment	1,418	(4,037)	963	(3,198)
Subtotal, inpatient mental health care	9,502	(20,432)	13,164	(22,501)
Outpatient mental health care				
Emergency care	107	(234)	103	(383)
Day treatment/partial hospitalization	2,838	(9,453)	5,181	(18,768)
Individual visits	1,161	(2,902)	1,398	(3,677)
Subtotal, outpatient mental health care	4,106	(9,687)	6,682	(19,089)
Psychiatric medication	2,119	(3,085)	2,338	(3,149)
Total, mental health care cost	15,728	(22,864)	22,185	(32,206)
Total, all cost	15,917	(22,871)	22,222	(32,215)

* $p < 0.001$

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Table 4

Cost, outcomes, and participant characteristics from trial used in smoking cessation model

Variable	Mean	(SD)
Effectiveness of treatment (% abstinent at end of follow-up)		
Experimental Intervention	18.75	–
Standard care	6.80	–
Cost of Intervention during 18 months (2010 $ U.S.)		
Abstinent at Last Follow-Up		
Experimental Intervention	240	(82)
Standard care	31	(15)
Not Abstinent at Last Follow-Up		
Experimental Intervention	180	(81)
Standard care	38	(33)
Population characteristics		
Male (percent)	59.9	–
Age (years) at follow-up	40.9	(13.64)
Utility Adjustment	0.786	(0.189)

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Table 5

Cost, outcomes, and cost-effectiveness from lifetime Markov model

Strategy	Experimental Intervention	Standard Care	Difference
Cost (2010 U.S. $)			
Cost of cessation treatment in trial	189	37	152
Discounted cost of follow-up health services	183,868	183,977	−109
Total discounted cost	184,057	184,014	43
Outcomes			
Discounted Life Years	23.766	23.627	0.139
Discounted Quality Adjusted Life Years	15.233	15.122	0.101
Incremental Cost-Effectiveness Ratio (ICER)			
$/LY	312		
$/QALY	428		