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Clinical Management of Tobacco Dependence in Inpatient Psychiatry: Provider Practices and Patient Utilization

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Abstract

Objective—This investigation examined predictors of utilization of nicotine replacement therapy (NRT) during a smoke-free psychiatric hospitalization.

Methods—Smokers (N=324) were recruited from smoke-free adult inpatient psychiatric units. Exploratory analyses examined correlates of NRT provision and utilization.

Results—The prevalence of NRT use was 51% overall and was greater among patients offered NRT on admission (58%) versus later (34%), among patients with more severe depression and nicotine withdrawal, and among those who reported perceptions that NRT decreases nicotine withdrawal, provides a nicotine substitute, and helps with quitting smoking ($p<.05$, all comparisons). Although the ratio of nicotine patch dose to usual cigarettes per day was 1.2±.7, the ratio was negatively correlated with time to first cigarette (Spearman's $\rho=-.30$, $p<.01$), suggesting potential underdosing of more dependent smokers.

Disclosures
The other authors report no competing interests.

Conclusions—During smoke-free psychiatric hospitalizations, clinical management of nicotine withdrawal may be enhanced by offering patients NRT directly on admission, educating patients on the benefits of NRT, and increasing the dosage for more dependent smokers.

Tobacco use among psychiatric inpatients has been reported as prevalent as 42%–60% (1), is related to greater psychiatric symptom severity (2,3), and affects the metabolism of some psychotropic medications (4). In 1992, the Joint Commission banned tobacco use in hospitals yet exempted psychiatric units (5). Despite slow integration of smoking bans in these settings, a 2011 survey of state psychiatric facilities indicated that 79% of facilities were nonsmoking, a nearly fourfold improvement from 2005 (6).

With increased adoption of smoking bans in inpatient psychiatry, clinical management of hospitalized smokers is critical. Symptoms of nicotine withdrawal (such as anger, anxiety, and depression) emerge within the first 12–24 hours of nicotine deprivation and typically peak within the first week of abstinence (7). Given nicotine withdrawal and psychiatric symptom overlap, failure to manage nicotine withdrawal may confound assessment, clinical management, and pharmacological treatment of inpatient smokers with serious mental illness (1–4). In nonpsychiatric samples, nicotine replacement therapy (NRT) decreases withdrawal and craving and increases the likelihood of quitting smoking by 50%–70% (8). The American Psychiatric Association specifically recommends provision of NRT during hospitalization to manage symptoms of nicotine withdrawal (9). Little, however, is known regarding actual use of NRT in psychiatric hospitals with complete smoking bans.

Scharf and colleagues (10) found that adoption of a smoking ban in a psychiatric hospital in Pittsburgh resulted in a more than 17-fold ($p<.001$) increase in NRT dosing over a three-year period. Clinicians favored the provision of oral versus transdermal patch forms of NRT, and patients hospitalized on dual-diagnosis units were prescribed more NRT and higher doses compared with patients hospitalized on other units (10). Evidence from nonpsychiatric hospital settings indicates that staff training (11) and inclusion of NRT on computerized template orders (12) are associated with greater offering of NRT by providers, whereas consistent and persistent offering of NRT (13) and behavioral and motivational counseling (11,14) are associated with greater utilization of NRT among patients. [References citing additional evidence are listed online in a data supplement to this report.]

With the unique focus on mental health providers' offering of NRT and patients' willingness to use NRT during an acute psychiatric hospitalization, we aimed in this study to characterize the clinical management of tobacco dependence and withdrawal among smokers hospitalized with serious mental illness and to examine demographic, psychiatric, substance use, and smoking-relevant predictors of NRT provider practices and patient utilization.

Methods

We recruited 324 adult smokers (61% of the sample were men, patients' mean±SD age was 39.8±13.0 years, and 58% were Caucasian) for participation in two randomized clinical trials for smoking cessation (14). Recruitment sites included San Francisco General Hospital (SFGH) (April 2009–April 2010), a large urban, public hospital primarily serving patients

without insurance (N=100), and the Langley Porter Psychiatric Institute (LPPI) (July 2006–December 2008) at the University of California, San Francisco (UCSF), primarily serving self-paying and privately insured patients (N=224). The units were locked, acute-stay units for adults wtih complete smoking bans: LPPI went smoke-free in 1988, SFGH in 2008. The formularies at both hospitals included NRT patches and gum. Research protocols were standardized between the sites and approved by the UCSF Institutional Review Board and SFGH administration.

Intention to quit smoking was not required for participation. Inclusion criteria were smoking five or more cigarettes per day, being 18 or older, and English fluency. Exclusion criteria were contraindication for NRT use, current use of varenicline, intention to leave the area during the study period, and lack of capacity to provide consent. Among eligible patients approached to participate, recruitment rates were 71% at SFGH and 79% at LPPI.

Research staff reviewed medical records of newly admitted patients to identify potentially eligible smokers and then requested a clinical introduction from unit staff. After eligibility screening, interested patients provided informed consent and completed the assessments on site. For participants who reported at the baseline interview that they had not yet been offered NRT but would like it, study staff spoke with clinical staff to facilitate NRT provision.

Demographic characteristics included age, sex, gender, race-ethnicity, marital status, highest level of education completed, employment status, and annual household income. Tobacco-related characteristics included age at which participants had their first cigarette, age of onset of regular smoking, years smoked, number of cigarettes smoked per day, past NRT use, and stage of change for quitting smoking. The seven-item Minnesota Nicotine Withdrawal Scale (MNWS) assessed nicotine withdrawal. Time of smoking the first cigarette of the day and the number of cigarettes per day were assessed to calculate the Heaviness of Smoking Index (HSI). A six-item NRT questionnaire was created to assess whether participants were offered NRT on admission, and if so, its formulation and dose, as well as the perceived advantages of NRT and potential side effects.

Measures of mental health status and substance use included the ten-item Center for Epidemiologic Studies Depression Scale (CES-D-10); the ten-item Alcohol Use Disorders Identification Test (AUDIT); and the ten-item Drug Abuse Screening Test (DAST). Additional mental health characteristics were obtained from participants' medical records, including reason for hospitalization (suicidality, homicidality, or grave disability) and the Global Assessment of Functioning (GAF) score at hospital admission and discharge. Finally, LPPI participants were assessed for mood and psychotic disorders, as specified in *DSM-IV* and with the use of the Computerized Diagnostic Interview Schedule. For SFGH participants, medical records were reviewed to ascertain axis I *DSM-IV* diagnoses.

Analyses, conducted in SPSS version 20, were primarily exploratory. Pearson's chi square and one-way analyses of variance examined theoretically relevant demographic, psychiatric, substance use, and smoking-specific variables in relation to whether participants were

offered NRT by unit staff on admission and whether the participant opted to use NRT during hospitalization.

Results

Most participants were recruited into the study within 24 hours of admission (median=24, interquartile range=24, 72). The sample was diverse in terms of demographic, psychiatric, and substance use characteristics (Table 1). Participants had smoked for 21 years, averaged 19 cigarettes per day, and on average showed a moderate level of nicotine dependence (HSI=3.2±1.7, with higher scores indicating smoking earlier in the day and smoking more cigarettes per day). Few participants were prescribed bupropion for the treatment of depression (7%, N=21), and use was unrelated to MNWS score.

A majority of participants (73%, N=236) were offered NRT by a clinician directly on hospital admission. Study staff facilitated offering NRT to the other 27% of the sample at the baseline interview.

Of the total sample, 51% (N=164) opted to use NRT: 78% (N=128) transdermal patch, 52% (N=86) gum, and 31% (N=50) both. A significant difference in NRT utilization was observed in regard to timing of NRT offer. Participants offered NRT on admission were more likely to use NRT than those offered it later: 58% (N=135) versus 34% (N=29), respectively (χ^2=14.8, df=1, p<.01). Timing of NRT offer did not differ by patients' demographic, psychiatric, or non-nicotine substance use characteristics; length of hospitalization; hospital site; or treatment condition (14).

Participant use of NRT, however, differed by patient characteristics. Specifically, participants who used NRT during the hospitalization compared with those who did not use NRT had greater average depressive symptoms (CES-D-10 score 19.2±6.9, with higher scores indicating more severe depression) than those who did not use NRT (CES-D score 17.4±8.5) (F=4.3, df=1 and 297, p<.05), greater HSI scores (3.6±1.7 versus 2.8±1.7; F=17.9, df=1 and 320, p<.01), and greater nicotine withdrawal (MNWS score 16.9±6.2 versus 15.0±6.8, with higher scores indicating more severe nicotine withdrawal) (F=6.9, df=1 and 318, p<.01). Prior use of the nicotine patch was related to NRT patch use during hospitalization (61% versus 32%) (χ^2=23.6, df=1, p<.01); the same was not true for prior use of nicotine gum.

Use of NRT during the hospitalization was more likely among participants who believed that NRT decreases nicotine withdrawal (72% versus 40%; χ^2=28.0, df=1, p<.01), provides a substitution when one cannot smoke (67% versus 44%; χ^2=14.8, df=1, p<.01), and is helpful for quitting smoking (62% versus 47%; χ^2=4.8, df=1, p<.05). Use of NRT among participants did not differ by study site, treatment condition, or other demographic, tobacco-related, mental health, or substance use characteristics.

The average ratio of NRT patch dose to number of cigarettes per day in the sample was 1.2±.73, which is consistent with standard dosing guidelines of 1 mg per cigarette smoked. However, according to cotinine-replacement studies, this ratio likely reflects an underdosing of approximately 35% (15). Also, the ratio was inversely correlated with time to smoking the first cigarette of the day, a measure of nicotine dependence (coded as smoking within 30

minutes of waking=1; smoking after 30 minutes of waking=0; Spearman's ρ=−.30, p<.01). This result suggests that more dependent smokers may have received inadequate levels of nicotine replacement. Use of combination NRT (patch plus gum) was not significantly more likely among participants who reported smoking their first cigarette within 30 minutes of waking or among those with elevated MNWS scores. Instead, supplemental NRT gum in combination with the NRT patch was more likely among participants with a primary psychotic disorder diagnosis (61%) compared with those with bipolar disorder (40%), unipolar depression (31%), and other diagnoses (27%) (χ^2=8.03, df=3, p<.05).

Discussion

The use of NRT to manage nicotine withdrawal is recommended in psychiatric facilities (9), which are increasingly adopting smoke-free policies. Failing to manage nicotine withdrawal may confound or impede clinical management of smokers hospitalized with serious mental illness (1–4). This investigation examined predictors of utilization of NRT during a smoke-free psychiatric hospitalization. Approximately three-fourths of smokers were offered NRT upon admission, prior to study recruitment. Just over half of the sample opted to use NRT. Participants offered NRT upon admission were significantly more likely to use NRT than participants offered it later. Patients offered NRT at admission may have viewed NRT as a standard or prioritized part of their treatment plan, or patients may have been more willing to accept NRT when offered it by an identified treating provider rather than facilitated by study staff. Research indicates that consistent and persistent offerings and ongoing negotiations for the use of NRT may increase medication adherence and utilization (13). Future research should examine these factors with regard to NRT use in inpatient psychiatry.

NRT users were more likely to be heavy smokers experiencing greater symptoms of nicotine withdrawal and depression. NRT use may be particularly beneficial for these smokers for managing nicotine withdrawal, symptoms of which overlap with global negative affect (7). NRT use was more likely among those who reported prior nicotine patch use and those who believed NRT would help decrease withdrawal, provide a substitute for nicotine, and help with quitting smoking. To increase utilization on inpatient units, the findings support the strategies of increased use of NRT among smokers with milder depressive symptoms and education and motivational enhancement for NRT use (11). Further, NRT use during an inpatient hospitalization may increase future use. Notably, NRT use was unrelated to stage of change for quitting smoking. Among hospitalized smokers with serious mental illness, it seems that most viewed NRT as a strategy to manage transient nicotine withdrawal during hospitalization, rather than as a cessation aid.

Participants on average were provided with a patch dose replacing about 1.2 mg of nicotine per cigarette smoked, which cotinine-replacement studies indicate likely reflects an underdosing by just over one-third (15). In this study, more dependent smokers, as indexed by those who smoked within the first 30 minutes of waking, were not routinely provided an NRT patch dose that exceeded 21 mg of nicotine nor were they more likely to receive nicotine gum in addition to the patch—a better approach to manage acute cravings and urges among heavier smokers. These findings suggest two needs: first, for improved assessment of tobacco dependence via provider training in line with best clinical practices and second, for

consideration of combination NRT. Participants with a primary psychotic disorder were more likely to use combination NRT than participants with other psychiatric disorders. This may reflect awareness or sensitivity clinicians have toward tobacco use among those with schizophrenia, including concerns about the potential for nicotine withdrawal to precipitate agitation (2). No significant relation was observed between timing of clinicians' offer of NRT and participant demographic, psychiatric, or substance use characteristics, suggesting the need to further explore provider or unit characteristics or beliefs that may encourage or preclude provision of NRT to patients on admission.

The study was not explicitly designed to examine psychiatric inpatient NRT utilization, was cross-sectional, and assessed practices in a narrow geographical location, all of which limit generalizability of findings. Participants self-selected their use of NRT; therefore, it is possible that heavier smokers chose not to use NRT gum in addition to the patch, regardless of its potential benefits. Despite these limitations, study enrollment rates were high (>70%), with a diverse sample recruited. Also, although SFGH had adopted its smoke-free policy fairly recently, no differences in provider practices were observed between sites concerning patient utilization.

Conclusions

Overall, the study identified several findings relevant to the clinical management of nicotine withdrawal during a smoke-free inpatient psychiatric hospitalization. Despite low motivation to quit smoking, half the sample used NRT during hospitalization. This proportion could be higher, and future research is needed to specifically examine motivational approaches to increase use of NRT and motivation to quit among hospitalized smokers with serious mental illness. The parent study is investigating whether such an approach leads to more patients using NRT during and after hospitalization (14). Prior use of the nicotine patch predicted on-unit use, supporting the utility of encouraging patient adoption. NRT is an important tool for managing the care of hospitalized smokers during a tobacco-free psychiatric hospitalization. Study findings provide direction for optimizing NRT use in inpatient psychiatry, including consistently offering NRT on admission, providing combination NRT for more dependent smokers, and educating and motivating patients to use NRT to manage withdrawal and ultimately to quit smoking.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Table 1

Baseline characteristics of smokers in smoke-free adult inpatient psychiatric units of two hospitals

Characteristic	Total N	N	%
Demographic			
Age (M±SD years)	324	39.8±13.0	
Sex	324		
Male		198	61
Female		126	39
Gender	324		
Male		199	61
Female		116	36
Transgender		9	3
Race-ethnicity	324		
Caucasian		188	58
African American		47	15
Asian American		28	9
Hispanic		19	6
Other (Native American, multiethnic, or multiracial)		42	13
Marital status	322		
Never married		196	61
Divorced, separated, or widowed		75	23
Married or live-in partner		51	16
Education (M±SD years)	321	14.0±3.1	
Employment status	317		
Unemployed		198	63
Employed		74	23
Retired, student, homemaker		45	14
Annual income	317		
<$10,000		143	45
$10,000–$20,999		70	22
$21,000–$40,999		50	16
≥$41,000		54	17
Psychiatric	324		
GAF score on admission (M±SD)[a]	304	31.7±8.8	
Days of hospitalization (median)[b]		6.0	
DSM-IV axis I disorder	324		
Primary unipolar depression		142	44
Primary bipolar depression		68	21
Primary psychotic disorder		81	25
Other		33	10
Substance use			
Hazardous alcohol consumption (AUDIT)[c]	321	132	41

Characteristic	Total N	N	%
Current illicit drug–related problems (DAST)[d]	320	179	56
Smoking			
Age first smoked (M±SD years)	323	15.1±6.3	
Age became regular smoker (M±SD years)	323	18.6±7.6	
Duration of regular smoking (M±SD years)	321	20.9±13.4	
Cigarettes smoked per day (M±SD)	324	19.0±12.1	
Smoked within first 30 minutes of waking (yes)	324	249	77
Heaviness of Smoking Index score (M±SD)[e]	324	3.2±1.7	
Nicotine withdrawal (M±SD)[f]	322	15.9±6.6	
Lifetime quit attempts (median)[g]	320	3	
24-hour quit attempt in past year (yes)	323	140	43
Smoke-free hospitalization > longest lifetime quit attempt (yes)	272	33	12
Smoke-free hospitalization > most recent quit attempt (yes)	277	79	29
Stage of change	324		
Precontemplation		119	37
Contemplation		145	45
Preparation		60	19
Past nicotine replacement patch use	324	88	27
Past nicotine replacement gum use	324	64	20

[a] Global Assessment of Functioning. Possible scores range from 0 to 100, with higher scores indicating better functioning.

[b] Interquartile range 4 and 11

[c] Alcohol Use Disorders Identification Test

[d] Drug Abuse Screening Test

[e] Possible scores range from 0 to 6, with higher scores indicating heavier smoking as indexed by time to first cigarette of the day and daily cigarette consumption.

[f] As measured on the Minnesota Nicotine Withdrawal Scale. Possible scores range from 0 to 28, with higher scores indicating greater nicotine withdrawal severity.

[g] Interquartile range 1 and 10