

Enhancing hospitalists smoking cessation counseling and billing compliance by education intervention: a quality improvement project

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ABSTRACT

Smoking causes an estimated 480,000 deaths every year. At our institute, tobacco treatment services (TTS) provide inpatient counseling and hospitalists have an essential role in providing education and replacement medications at discharge. Our project focused on increasing knowledge among hospitalists to improve the frequency of smoking cessation consultation and utilization of pharmacotherapy, accompanied by appropriate documentation and billing. We used baseline data from March 2018 to February 2019. Educational intervention was implemented from March 2019 to June 2019. Post-intervention results are reported from July 2019 to February 2020. Pre- and post-intervention periods' results were compared. A significantly higher number of patients received TTS counseling during the post-intervention phase compared to pre-intervention (54 vs. 41%, $p < 0.0001$). A significantly higher number of patients were prescribed inpatient medications (42% to 48%, $p = 0.004$) and at the time of discharge (22% to 31%, $p < 0.0001$). However, there was a significant decrease in physician billing from pre-intervention to post-intervention, dropping from 19.5% to 16.2% ($p = 0.012$). Physicians' gender, experience level, and loss of incentives impacted their consultation and billing behaviors. Future studies should continue to address the importance of TTS and physician behavior on increasing inpatient smoking cessation counseling and treatment.

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1. Introduction



Most of the disease burden in the USA due to tobacco use is caused by cigarette smoking [1]. More than 40 million US adults Americans still smoke, and smoking remains the single most significant preventable cause of death in the world. Smoking and secondhand smoke exposure cause an estimated 480,000 deaths every year. More than 16 million Americans live with a smoking-related disease, and the total economic cost of smoking in the US is more than \$170 billion per year on medical care to treat smoking-related diseases in adults [2]. While the rate of cigarette smoking has dropped significantly, from 42% in 1965 to 13.7% in 2018, the gains have been inconsistent; fewer than one in ten cigarette smokers are successful in quitting each year [2].

At any age, quitting smoking improves health immediately and over the long term [3]. Smoking cessation substantially reduces the risk of cardiovascular diseases, multiple types of cancer, arteriosclerosis, chronic obstructive pulmonary disease, poor reproductive health outcomes, etc. compared to continued smoking [4]. However, tobacco use often requires repeated and long-term intervention in order for patients to quit [2]. When

used separately and in conjunction, both smoking cessation pharmacotherapies and behavioral counseling are cost-effective strategies that increase the likelihood of quitting [5].

It is extremely important that healthcare providers understand their critical role in encouraging smokers to quit [6]. Providers can help their patients quit by advising them to do so, offering counseling, prescribing medications, connecting them to external resources, and following up to provide continued support [2]. According to the CDC, even brief advice to quit from a physician improves cessation rates and is cost-effective. However, almost 50% of adult smokers that saw a health professional in 2015 were not given advice to quit [2]. Additionally, less than one-third of smokers used cessation counseling or cessation-approved medications.

In fact, the US Preventative Services Task Force recommends that all physicians screen adults for tobacco use and provide cessation interventions to their patients [7]. The US Public Health Service published a clinical practice guideline outlines the implementation of a series of steps, including asking about tobacco use, advising users to quit, assessing readiness to quit, assist users with a cessation plan, and

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arrange followup visits. However, many physicians are not in compliance with these recommended steps; in a study assessing provider counseling of Medicaid-enrolled smokers, fewer than 25% were referred to counseling, prescribed pharmacotherapy, or had follow-up visits arranged by their physician [8].

These statistics emphasize a window of opportunity, particularly during patient hospitalization; physicians must address this issue during inpatient hospital stays. Over 6.5 million smokers are hospitalized each year, and physicians may fail to counsel their patients on smoking cessation and prescribe smoking cessation medications [6]. Smokers receiving tobacco treatment over the course of hospitalization, as well as outpatient follow-up treatment, are more likely to quit than those who do not [6]. Further, data from the 2014–2015 Nationwide Adult Medicaid Consumer Assessment of Health Plans survey revealed that patients value prevention-oriented advice and give better ratings to physicians and health plans that offer more support and advice about cessation [4].

Despite the potential benefits of enhanced patient outcomes, not many hospitals have implemented system-wide smoking cessation programs. Even when cessation services are implemented within healthcare settings, they may be delivered in a disproportionate and inconsistent manner [5]. Our study proposed an educational intervention approach for our hospitalist group, intending to increase smoking cessation counseling and initiate pharmacotherapy with appropriate documentation of billing.

2. Methods

The institutional quality council approved the project as a quality improvement project. It aimed to improve tobacco cessation counseling for hospitalized patients who were identified as current smokers at an academic tertiary care center. Smokers were identified by self-report at the time of admission; data was captured from template screening questions for current/previous smokers and the amount of cigarettes smoked. The center has dedicated tobacco treatment counseling services (TTS) that are complementary to assist with tobacco addiction. The TTS comprised of a team of medical assistants, social workers as well as nursing staff that is trained to do the patient education.

In order for the TTS team to engage with inpatients identified as smokers, the medical doctor requested a consult for the medicine patient identified as a smoker; the consult was automatic for surgical patients. Medical doctors must select patients for the consults to contain the volume of requests since TTS resources were limited so we picked the most difficult

patients or the ones that will benefit the most. TTS consults were initiated by the nurse or hospitalist after the initial history and physical. Patients were carefully selected based on the criteria of active tobacco use and willingness to quit. Patients deemed to be undergoing active withdrawal from nicotine were also selected to be seen by the TTS team.

Hospitalist's role was to obtain the history of smoking, determine and label smoking status based on the history provided by the patient/family. Hospitalists also initiated the conversation for tobacco hazards, importance of quitting, treatment modalities available, outpatient resources, informed of TTS and ordered the consult. They also evaluated treatment that the patient was prescribed. TTS worked in collaboration with the hospitalists to order medications and provide in depth counselling. TTS consult note was incorporated in the electronic medical records (EMR), however hospitalist was required to co-sign and bill for the services provided.

The project targeted hospitalists to increase tobacco cessation consults and therapy, appropriately involve TTS, and bill for the consults.

2.1. Intervention and implementation

Orientation and education plan was developed and implemented by the study team over four months from March to June of 2019.

A multi-pronged set of interventions were implemented:

- (1) Education modules in ULearn: 30 minutes Motivational interview session by one of our expert addiction medicine trained MD and psychiatrist and/or another 30 minutes, Nicotine addiction/nicotine replacement treatment module.
- (2) Laminated pamphlets were distributed to educate on how to appropriately counsel, document, and bill for these services.
- (3) A dedicated hospitalist faculty development session with education from the experts in addiction medicine and tobacco cessation.
- (4) Periodic feedback to individual providers on tobacco counseling and documentation. The communication via a series of emails; at six weeks and four months.

Following intensive education, the hospitalist cohort was followed for their performance for a duration of 9 months (June 2019 to Feb 2020).

2.2. Tobacco cessation counseling by hospitalists':performance and outcomes

The performance and outcomes data during post-intervention phases were compared to the pre-intervention data from the prior year, March 2018

to Feb 2019. The hospitalist performance was evaluated by compliance with billing for cessation consults during the pre-intervention and post-intervention phases. The medicine financial team queried the Hospital Medicine billing database for CPT codes 99406 and 99407 for the frequency of billing by the participating hospitalists. A friendly reminder email, as well as personal contact, was made in three months if there was no improvement in billing. APPs were not included since they were not doing their own billing at the time. We also utilized the hospital clinical analytics hospitalization database (QlikView) for tracking consult frequency and physician attribution. Our TTS team provided data for current tobacco users, inpatient treatment, and patients discharged on medications.

The primary outcomes studied were the frequency of inpatient consulting to quit smoking and the physicians' billing compliance, these measures were chosen as the data was retrievable electronically. We also evaluated improvement in 1. Utilization of TTS frequency 2. The number of patients prescribed medications for tobacco replacement therapy during hospitalization, and 3. Patients discharged on replacement medications.

3. Data analysis

The results are reported descriptively as frequency and percentages of smoking cessation consults billed, TTS involvement, patients on medication replacement therapy in the hospital and at discharge. All of these variables were compared between the post-intervention phase and pre-intervention phase using the chi-squared test (incident rate ratio analysis) using STATA, statistical software (version 10, Stata Inc.).

4. Results

The total number of attending physicians that participated in the study was 52 (26 females and 26 males). Twenty physicians (38.4%) had clinical experience more than 5 years. The baseline characteristics of the physician cohort are outlined in Table 1. Years of experience was determined by years since completion of residency. Only two physicians completed the modules and 12 physicians attended the lectures, since these were not mandatory. However, every single physician received a one on one educational session on how to educate patients appropriately.

There were 2,636 current tobacco smokers during the pre-intervention phase and 1,200 in the post-intervention phase. Among these smokers 1,074 (41%), and 649 (54%, $p < 0.0001$) had received TTS counseling respectively. Hospitalists' billing consults significantly decreased from pre-intervention to post-

Table 1. Study cohort's characteristics.

Characteristics	Number N (%)
N	52
Mean age (years)	28 years
Females	26 (50%)
Years of experience	
<5 years	32 (61.6%)
≥5 years	20 (38.4%)
Nocturnist	8 (15.3%)
Mixed day and night hospitalists	44 (84.6%)

intervention, dropping from 19.5% to 16.2% ($p = 0.012$). A significantly higher number of patients were prescribed medications in the hospital (improved from 42% to 48%, $p = 0.004$) and at discharge (improved from 22% to 31%, $p < 0.0001$) compared to pre-intervention. (Table 2 and Figure 1)

The female physicians had higher billing consult rates compared to their male peers during all phases (Figure 2). The male physicians' billing frequency did not change significantly from pre-intervention to post-intervention phases. However, female physicians' billing frequency decreased significantly during the post-intervention phase from 13.8% to 10.8% ($p = 0.02$). Figure 3 shows tobacco cessation consults by providers' experience. Physicians with less experience improved significantly to 18.6% ($p = 0.007$) during the post-intervention phase. On the other hand, physicians with longer experience decreased significantly in the post-intervention phase (18.6%, $p < 0.0001$ (Figure 3) .

5. Discussion

Patients when hospitalized may be more amiable to smoking cessation counseling. Rigotti et al 2012. found that intensive counseling interventions, beginning with hospital stay and continuing with contacts for at least once month after discharge increased smoking cessation rates after discharge; these interventions were effective regardless of the patient's reason for admission [9]. A study by Feterik et al.

Table 2. Study outcomes for pre-intervention and post-intervention phases.

Outcomes	Pre-intervention March 2018- February 2019	Post-intervention July 2019- February 2020	P value
Tobacco Users	2636	1200	
TTS Counselling	1074 (41%)	649 (54%)	<0.0001
Physicians Billing	515 (19.5%)	194 (16.2%)	$P = 0.012$
(decrease)			
Inpatient Medications Treatment	1102 (42%)	575 (48%)	$P = 0.04$
Patients discharged on Medications	587 (22%)	375 (31%)	$P < 0.0001$
Consults provided by Female Physicians	364 (13.8%)	130 (10.8%)	0.02
Consults provided by Male Physicians	151 (5.7%)	64 (5.3%)	0.32

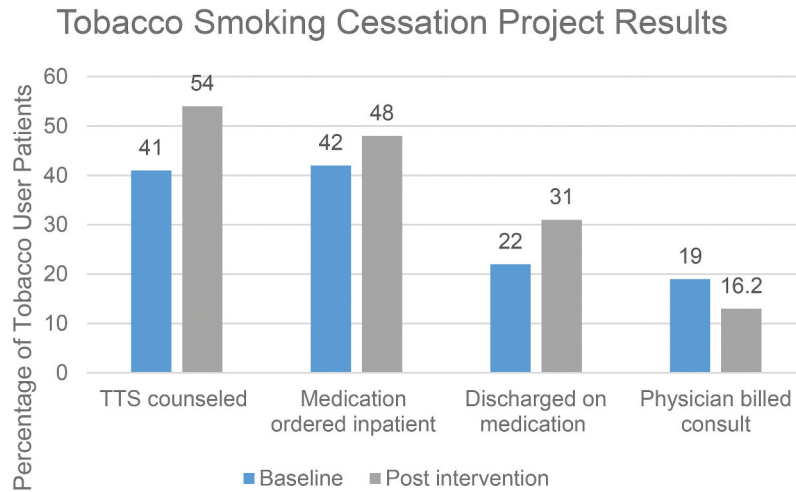


Figure 1. TTS consults, medications prescriptions, and consults during pre-intervention,, and post-intervention phases. While TTS, medication ordered during inpatient hospitalization, and medication during discharge increased, physician billing decreased from baseline to post-intervention.If

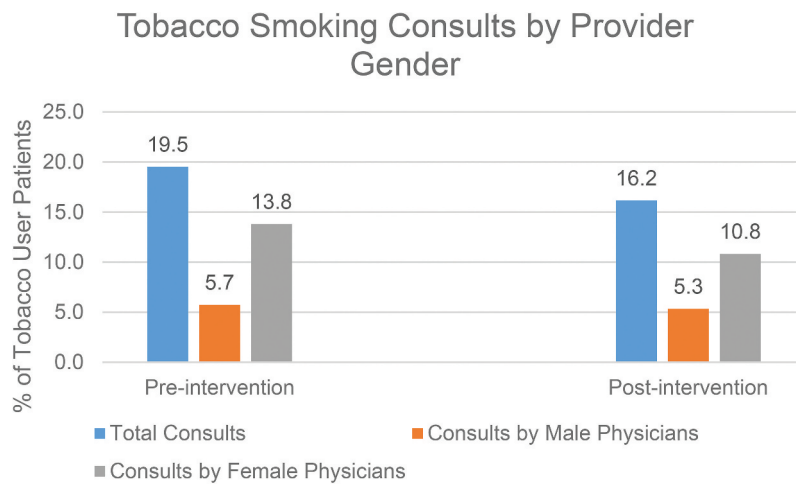


Figure 2. Gender-based differences in consults provided. While female billing compliance was generally greater than than of male physicians, billing by female physicians significantly decreased from pre-intervention to post-intervention phases.

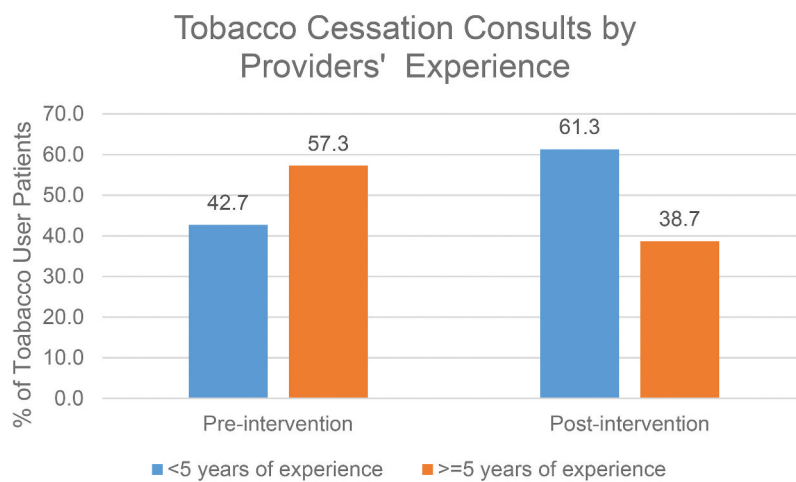


Figure 3. Consults variation based on provider experience. While billing by physicians with less than 5 years of experience increased, billing by physicans with 5 or more years of experience decreased.

proposed that if hospitalists counsel daily tobacco users on cessation, they are more likely to receive an order form and use nicotine replacement treatments during hospitalization [10]. The highest rate of 81% order for nicotine replacement treatments and administration was in the group of patients counseled by both hospitalist and the Tobacco Treatment Service [10]. These results emphasize the importance of both TTS and behavior of healthcare providers in efforts to increase smoking cessation rates among patients.

Our hospitalist group is committed to providing smoking cessation services through specialized programs in collaboration with the Tobacco Treatment Services team and individual physician counseling efforts. Despite this commitment, we have noted that the documentation of these discussions is inconsistent and often of poor quality; prescribing nicotine replacement therapy prior and upon discharge is infrequent, and billing for the counseling we do provide is likely under-captured. A review of billing data from Calendar Year (CY) 2018 showed that our providers accurately bill only about 10% of these services. We seek to understand if providing appropriate education and resources to our hospitalist group will help improve the inpatient counseling, prescription of treatment medications during hospital admission and at the time of discharge. We also studied if these interventions lead to an increase in billing compliance by the physicians.

Data from the 2014–2015 Nationwide Adult Medicaid Consumer Assessment of Health Plans survey revealed that patients value prevention-oriented advice and give better ratings to the physicians and health plans that offer more support and advice about smoking cessation [11]. Like other quality improvement projects aim to enhance clinical outcomes, implementation of this project had of the potential for health care staff to collaborate to increase smoking cessation; however, there were numerous challenges that must be overcome. Efforts around smoking cessation can sometimes be challenging and frustrating for clinicians. Lack of familiarity with best practices and pessimistic views toward cessation methods lead to underuse by physicians, and addressing patients' smoking behavior is often not considered as a part of routine care due to various factors. These include lack of time, practice habits, and specialized skills that can be tackled with appropriate physician education [12]. Smoking cessation counseling may become a lower priority compared to other patient management tasks or higher acuity patients with more comorbidities [10]. Additionally, while a tobacco treatment service is promising, it may suffer from inconsistent adoption due to clinician barriers. A study by Seth et al showed that physicians valued TTS, but fatigue, time constraints, competing

priorities, and poor communication among TTS staff were barriers to using the service [13]; this suggests the need for system-level changes to increase uptake of TTS to promote smoking cessation [13].

Our study was a comprehensive method to utilize the hospitalist workforce to contribute to the smoking cessation efforts. Evidence-supported measures that increase the chances of cessation include direct physician advice, approved pharmacotherapy, structured counseling, and a follow-up plan [14]. If appropriate education and resource are provided to the physicians, it leads to an improvement in addressing inpatient issues attributed to nicotine withdrawals. Ramsey et al. mention the need for standardized point-of-care treatment for cigarette smoking; interestingly 94% of these patients exhibited an interest in smoking cessation [15]. However, Ravara et al. reported a lack of awareness among the inpatient physicians in regards to their essential role in tobacco control [16]. This urges a strong need for physician education and motivation to help better serve our patients. In a study by Champassak et al, physicians were least likely to complete the final steps of the series recommended by the US Public Health Service, which was to offer their patients assistance to quit and arranging follow-up. The study suggests that medical doctors lack the knowledge and/or motivation to use advanced counseling skills to help their patients quit, which reemphasizes the ongoing need for physicians to address smoking cessation [7].

Smoking cessation became a covered benefit in 2014 under the Affordable Care Act (Obamacare). Medicare and commercial insurance carriers provide reimbursements for smoking cessation counseling and interventions if appropriately done. In hospitals that operate on RVU based models, teaching billing compliance and educating physicians on how to bill effectively for these services can also help generate RVU for the organizations. Our hospitalist group was educated via learning modules and templates (Figures 4 and 5). This also included incentivizing them for an RVU based model in the first half of the study. Physicians were also educated on how to bill quickly and effectively for these services.

Interestingly, while we saw an increase in inpatient counseling efforts and prescription of medications at discharge, billing compliance decreased. During the second half of the study, due to administrative changes, our institution moved away from an RUV to a fixed salary model. This caused a reduction in billing compliance, but interestingly physicians were still providing adequate counseling and treatments. This makes a point that education and training are independent of the RVU incentive provided to the physicians and can be a useful tool to implement tobacco cessation efforts by the inpatient providers.



Figure 4. Educational learning template for use by hospitalist. Template pertaining to smoking cessation counseling for use by healthcare providers.



Figure 5. Educational learning template for use by hospitalist counseling codes, documentation requirements, and reimbursement reminders for use by physicians.

However, in the absence of any incentive, more efforts need to be made to find an initial incentive to encourage physicians in providing these services as part of routine clinical care. Our results indicate that physicians are not motivated to spend time billing if it is not benefiting them, but patient care did improve. Decreased billing was due to the loss of monetary incentives during the intervention phase. Additionally, female medical doctors were more compliant with counseling and billing, but showed a significant decrease in billing when the incentive was removed. We also see that physician experience

length might impact behavior and compliance. Seasoned medical doctors with more years of experience could potentially be more fatigued and dealing with a busier workload; therefore, they might be more influenced by incentive. On the other hand, physicians with less experience may feel more obligated to comply. Future studies should continue to explore the effects of incentives, physician experience, and physician gender on compliance with TTS. Another noteworthy limitation of our study is that sometimes, when counseling was done but the patient was less receptive, there was no documentation. We

could not include that in our data, so there may be some underestimation of the effect of hospitalist counseling.

In summary, a significantly higher number of patients had received TTS counseling during the post-intervention phase. A higher number of patients were prescribed inpatient medications and at discharge. Our study demonstrates that an educational intervention for the hospitalists can effectively increase the frequency of smoking cessation counseling and prescription of pharmacotherapy during and after discharge to our inpatient setting. However, since billing consults decreased, we see that an incentive in some form may be a governing factor in improving provider performance. Gender and experience influence noted in physician performance and response to educational intervention, emphasizing the need for focused education by gender and experience of the providers. Exploring these topics could have a great impact on smoking cessation and enhanced clinical outcomes.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

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