Fax Referrals, Academic Detailing, and Tobacco Quitline Use
A Randomized Trial

Megan A. Sheffer, PhD, Timothy B. Baker, PhD, David L. Fraser, MS, Robert T. Adsit, MEd, Timothy A. McAfee, MD, Michael C. Fiore, MD

This activity is available for CME credit. See page A3 for information.

Background: Fax referral programs quickly and economically can link smokers’ visiting primary care clinics to state-based telephone quitlines. Yet, it is unclear how to optimize use of this strategy.

Purpose: To evaluate the potential of enhanced academic detailing in clinics (i.e., on-site training, technical assistance, and performance feedback) to boost utilization of a fax referral program called Fax to Quit.

Design: Participants were randomized to one of two intervention conditions.

Setting/participants: Participants were drawn from 49 primary care clinics in southeastern Wisconsin. The sample size was based on a power analysis in which the control intervention condition was estimated to generate 0.5 referrals/clinic/month and the experimental condition 2.0 referrals/clinic/month.

Interventions: One of two fax referral program interventions was administered: the control condition Fax to Quit–Only (F2Q-Only) or the experimental condition Fax to Quit plus Enhanced Academic Detailing (F2Q+EAD).

Main outcome measures: Clinic- and clinician-specific referral and quality referral rates (those resulting in quitline enrollment) were measured for 13 months post-intervention, starting in March 2009.

Results: Mean number of post-intervention referrals/clinician to the Wisconsin Tobacco Quitline was 5.6 times greater for F2Q+EAD (8.5, SD=7.0) compared to F2Q-Only (1.6, SD=3.6, p<0.001). The F2Q+EAD (4.8, SD=4.1) condition produced a greater mean number of quality referrals/clinician than did the F2Q-Only (0.86, SD=1.8, p<0.001) condition. Data were analyzed in 2010.

Conclusions: Enhanced academic detailing, which included on-site training, technical assistance, and performance feedback, increased the number of referrals more than fivefold over a fax referral program implemented without such enhanced academic detailing.

Trial registration: This study is registered at Clinicaltrials.gov NCT00989755.


Background

Since the first Federal Guideline on treating tobacco dependence was released in 1996,1 clinicians have recognized that the healthcare visit is an opportune time to deliver smoking-cessation interventions.2–7 Smokers identify health concerns as primary motives for quitting; they highly value their physician’s advice to quit,6,8,9 and 70% of smokers visit a primary care clinician annually.10–13 Thus, the healthcare visit constitutes a critical nexus, linking three factors: an opportunity for intervention, a highly credible change agent, and smokers motivated to make a quit attempt. Unfortunately, it has been difficult to capitalize on this confluence of propitious circumstances. Multiple strategies have been used to boost smoking intervention rates,14–18 but data suggest that relatively few smokers actually receive evidence-based treatment at healthcare visits.7,19 Therefore, although most patients who use tobacco are now identified during their healthcare visits,20,21 only a minority receive anything more than brief advice to quit during those visits.20,22,23
Telephone-based tobacco-cessation quitline services offer a promising strategy for linking smokers with evidence-based treatment. Today, all 50 states provide telephone quitline services to tobacco users who want to quit, a dramatic increase from just a decade ago. Quitlines permit the delivery of evidence-based tobacco-cessation counseling and pharmacotherapy on a population-wide basis. The availability of state-based quitline services was accelerated over the past decade by such factors as increased evidence of effectiveness, the Master Settlement Agreement of 1998 that provided states with additional tobacco control funding, and the 2004 DHHS initiative, the National Action Plan for Tobacco Cessation. This 2004 initiative included two relevant components: (1) the establishment of a national Quitline Network (a national portal for accessing state-based quitline services through a single toll-free number: 1-800-QUIT NOW) and (2) funding for initiating and enhancing state-based quitlines.

Despite the availability of quitlines, their utilization remains modest; the annual mean reach is approximately 1% of U.S. adult smokers. The disappointing and variable population penetrance of quitlines no doubt has many causes. For instance, states have struggled to meet the CDC-recommended funding level for comprehensive tobacco control programs, which include quitlines, with only six states meeting the CDC minimum recommended funding level in 2006. Funding constraints have increased over the past 3 years and limit advertising of quitline availability, which appears to be a strong driver of use. Thus, few states have achieved the CDC-recommended quitline goal of reaching 6% of smokers each year.

Borland and Segan suggested that quitline potential would be enhanced by referral mechanisms that allow clinicians to link tobacco users to cessation resources in a simple, timely, and cost-effective way. One way to achieve this is to offer quitline services to smokers as part of their routine primary healthcare visit. For patients who express interest in this offer, the clinician would then fax (or electronically transmit) a referral to their state quitline, which would then proactively contact the patient. Such fax referral programs have been implemented in many states and their use has grown substantially.

Early reports from fax referral programs have been encouraging. For example, the New York Department of Health reported a threefold increase in referrals from healthcare providers over a 2-year period following the expansion of their fax referral mechanisms. Similarly, Arizona initiated a fax referral program for clinicians after a pilot program generated an increase in quitline cessation service enrollment. In 2002, Massachusetts began a fax referral system called “Quit Works” that was coupled with provider feedback. Although only about 15% of office practices enrolled in Quit Works, the program nevertheless generated about 60% of Massachusetts quitline callers following its implementation.

Although fax referral programs have expanded rapidly, with 49 states having implemented some form of this strategy, such programs have not been evaluated systematically. In particular, researchers have not identified methods for increasing healthcare clinicians’ use of this resource. Moreover, although some fax referral programs have been offered with components that are designed to enhance utilization (e.g., physician feedback, contests, training websites), at present, such components have not been evaluated experimentally. This paper presents results of the first large experimental evaluation of enhanced academic detailing to boost quitline referrals via a fax referral program. Enhanced academic detailing was chosen as the utilization adjuvant for experimental study because of its previously demonstrated success in influencing healthcare outcomes, including the provision of smoking-cessation treatments.

Methods

Purpose

The goal of the study was to assess the effectiveness of a clinic-based quitline fax referral program supplemented with enhanced academic detailing (F2Q+EAD) compared to a standard fax referral program (F2Q-Only) as a strategy to link more smokers visiting primary care clinics to a state tobacco-cessation quitline.

Design

Forty-nine clinics were assigned randomly to one of these two conditions (described below). The sample size was based on a power analysis in which the control intervention (F2Q-Only) condition was estimated to generate 0.5 referrals/clinic/month and the experimental (F2Q+EAD) condition 2.0 referrals/clinic/month. These estimates arose from the authors’ prior work with the Wisconsin Tobacco State Quitline, and the targeted increment in referrals due to the F2Q+EAD intervention was judged to be of public health significance. The SD was conservatively set at 0.5, the mean value of the referrals/clinic/month generated by the control clinics. The power analysis was set at $\alpha=0.05$, and a two-tailed $t$-test yielded a power greater than 80%. The intervention took place over a 13-month period following clinic enrollment. The University of Wisconsin Health Sciences IRB designated the study an exempt quality-improvement study.

Setting/Participants

Using the 2007–2008 Wisconsin Medical Directory, 75 clinics in the southeast quadrant of the state were identified for potential study inclusion. These clinics had not implemented a fax referral program and appeared to meet study inclusion criteria: provide primary care clinic services (general internal medicine or family practice) and minimum of three clinicians. To ensure that the target of 50 clinics for enrollment was reached, an additional 22 clinics were identified during the clinic recruit-
ment calls (Figure 1). Identification was accomplished as a part of a screening interview with the physician leaders and clinic.

Recruitment ceased after 50 clinics agreed to be randomized to either fax referral intervention (F2Q+EAD or F2Q-Only). These 50 clinics included 28 from the original pool of 75 and all 22 clinics identified during the interviews with clinic physician leaders (from the original pool of 75 clinics, 13 declined participation, one did not meet inclusion criteria, and 33 were not contacted because enrollment was reached). Post-randomization, one of the 50 clinics was determined to be ineligible, leaving 49 to participate in the study (the one ineligible clinic was not replaced in the sample). Material incentives were not provided for study participation.

**Interventions**

In March 2009, the 49 eligible clinics were notified of their randomization to one of two intervention conditions: F2Q-Only ($n=25$) or F2Q+EAD ($n=24$).

**Fax to Quit–Only clinics.** This condition was designed to simulate the way a telephone quitline fax referral program is typically implemented in the U.S. These programs commonly are established electronically with no on-site trainings or academic detailing activities (Figure 1). For clinics in the F2Q-Only condition, the physician leader and clinic manager received a hard copy and an electronic file of a manual designed to provide comprehensive instructions for the fax referral program titled *Fax to Quit: A Step-by-Step Guide for Healthcare Organizations.*

Essentially, the manual describes the roles and responsibilities required of members of the healthcare delivery team to successfully implement a clinic-based fax referral program. The manual also includes a Fax to Quit program patient enrollment form personalized to each clinic (Appendix A, available online at www.ajpmonline.org); WTQL promotional materials (e.g., bi-fold brochures, business cards, and web cards); and a web address for ordering additional materials. The contact information for the WTQL Manager also was provided to communicate questions and/or problems.

The WTQL provided a referral outcome report for each fax referral (type of treatment service provided, patient unreachable, or declined services) in real time, to the participating clinic. Additionally, the WTQL manager provided these clinics with a monthly, electronic feedback report that includes clinic-specific information regarding cumulative fax referral outcome (number of patients accepting or declining treatment service or unreachable).

**Fax to Quit plus Enhanced Academic Detailing clinics.** In addition to the procedures and resources used in the F2Q-Only condition, the F2Q+EAD clinics received enhanced academic detailing consisting of a series of in-person on-site trainings, telephone follow-up check-ins with both the clinic manager and clinic physician leader, and performance feedback (Table 1). A trained study outreach specialist (health educator) provided an approximately 20-minute in-person on-site training to launch the Fax to Quit program at each clinic. This initial training targeted staff who “room” the patient (i.e., medical assistants and nurses) and treating clinicians (i.e., physicians, nurse practitioners, and physician assistants). It introduced the Fax to Quit program flowchart, found in

**Table 1. Intervention conditions and activities**

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fax to Quit–Only (25 clinics)</td>
<td>Fax to Quit program initiation packet sent electronically and via mail to physician leader and clinic manager</td>
</tr>
<tr>
<td></td>
<td>Electronic linkage to Quitline website for problem solving and questions</td>
</tr>
<tr>
<td></td>
<td>Real-time, patient-specific fax referral outcome sent to clinic</td>
</tr>
<tr>
<td></td>
<td>Monthly report sent electronically, listing number of referrals and referral outcome</td>
</tr>
<tr>
<td>Fax to Quit plus Enhanced Academic Detailing (24 clinics)</td>
<td>Same activities as above plus:</td>
</tr>
<tr>
<td></td>
<td>On-site training at launch and 6 months (by outreach specialist to key clinic staff)</td>
</tr>
<tr>
<td></td>
<td>Telephone check-in and performance feedback at 1 and 9 months (by outreach specialist to clinic manager)</td>
</tr>
<tr>
<td></td>
<td>Telephone check-in and performance feedback at 3, 6, and 9 months (by study physician to clinician physician leader)</td>
</tr>
</tbody>
</table>

*Key clinic staff: medical assistants, clinicians, clinic manager, and clinic physician leader*

![Figure 1. Study participation by treatment group](image-url)
the Fax to Quit manual (Appendix B, available online at www.ajpmonline.org), and included a walk-through of how the WTQL can help tobacco users quit; the time required to use the program (approximately 3 minutes); and the importance of systematic program implementation.

Additional EAD technical assistance and performance feedback included (1) two scheduled telephone check-ins (about 10 minutes each) with the clinic manager by the outreach specialist; (2) three telephone check-ins (about 10 minutes each) by the study physician with the clinic physician leader that focused on problem solving and the performance feedback reports (including the number of referrals by individual clinicians in the clinic); and (3) a 6-month follow-up training visit by the outreach specialist that targeted both the clinicians and staff who “roomed” the patients (about 20 minutes; Table 1). This follow-up in-person training served as a program “refresher” and check-in, as well as an opportunity to train new staff (medical assistants), who frequently experience high turnover in clinics. The schedule and components of EAD activities were informed by a review of the literature and personal experience delivering on-site tobacco-cessation outreach services to more than 500 clinics across Wisconsin over the past decade.43,56,57

Wisconsin Tobacco Quit Line. Identical WTQL treatment services were provided to all fax referral patients throughout the study, regardless of clinic intervention condition. Free and Clear Inc., of Seattle WA provided WTQL treatment services, including up to five WTQL-initiated one-on-one counseling calls with a Quit Coach; access to Web Coach, an interactive website that provides information, support, exercises, and cessation discussion forums monitored by a Quit Coach; a free 2-week starter kit of over-the-counter nicotine replacement therapy (patch, gum, or lozenge); printed self-help materials; and referrals to local tobacco-quitting resources (where available).

Data Collection
During the intervention phase of the study, Free & Clear Inc. provided biweekly summary data for the randomized 49 clinics with patient-specific identifiers removed. For each clinic and clinician, the summary report included (1) number of referrals to the WTQL and (2) number of “quality referrals” (where fax referral resulted in the patient enrolling in WTQL services).

Cost of delivering both interventions was determined from a state tobacco control program perspective. The data used to determine intervention costs included staff time (outreach specialist and study physician) to implement the intervention; material costs (the fax referral program manual, WTQL promotional material starter kits, and postage); and travel costs. Costs associated with clinician time (e.g., participation in trainings, program implementation) were not collected. Travel costs were tracked on staff travel reimbursement forms. Wage estimates from the Bureau of Labor Statistics48 identified health educator and internal medicine physician salary costs. Staff time spent implementing the intervention was tracked using activity logs. Materials costs were tracked based on actual costs incurred to reproduce materials. Quitline service delivery costs are not included, as the focus of the current study is to evaluate methods for driving quitline use rather than the quitline service per se.

Data Analysis
Descriptive statistics were used to characterize staff and patient demographics. Chi-square tests were used to analyze group differences in the proportion of clinics that made at least one referral. Both an independent group t-test and a Mann–Whitney U test were used to analyze mean differences in the number of fax referrals between the two intervention conditions, the latter conducted because of distributional differences between groups. To account for differences in number of clinicians per clinic, the dependent variable was defined as the mean number of referrals clinician/clinic (and “quality referrals” defined as referrals resulting in the patient enrolling in counseling services) so that clinic remained the unit of analysis. Statistical analyses were performed in 2010 using PASW Statistics 18.

Results

Clinic Staff Composition and Patient Demographics
Self-reported staff composition and patient demographics at the start of the intervention were similar across the two conditions (Table 2). Clinics in the two conditions reported similar provision of tobacco-cessation intervention with the exception that the F2Q-Only clinics reported a higher percentage of implementation of the 5A’s (Ask, Advise, Assess, Assist, and Arrange follow-up) (75%) than did the F2Q+EAD clinics (50%; p<0.03). Study clinics did not systematically track the number of patients who reported tobacco use.

| Table 2. Self-reported clinic composition, patient demographics, and standard of care for tobacco-dependence treatment at baseline |
|-----------------------------|-----------------------------|-----------------------------|-------|
|                             | F2Q-Only | F2Q+EAD | p-value |
| Number of clinicians (M [SD]; median) | 5.9 (5.4); 5.4 | 5.8 (5.2); 4.0 | 0.95 |
| Number of nurses (M [SD]; median) | 3.7 (5.3); 2.0 | 3.6 (4.9); 3.0 | 0.95 |
| Number of medical assistants (M [SD]; median) | 6.5 (6.6); 5.0 | 5.7 (5.7); 4.5 | 0.69 |
| Medicaid/BadgerCare patients (M %) | 13 | 13 | 0.84 |
| Clinics that systematically “Ask” about smoking as a vital sign (%) | 75 (19/25) | 88 (19/22) | 0.31 |
| Clinics that have implemented 5A’s (%) | 75 (19/25) | 50 (11/22) | 0.03* |
| Clinics that prescribe cessation medication (%) | 96 (24/25) | 91 (20/22) | 0.77 |

F2Q-Only, Fax to Quit–Only intervention clinics; F2Q+EAD: Fax to Quit plus Enhanced Academic Detailing intervention clinics; 5A’s, Ask, Advise, Assess, Assist, and Arrange follow-up *p<0.05

www.ajpmonline.org
**Intervention Period Referral Rates**

All 22 of the F2Q+EAD clinics fax referred one or more patients to the WTQL compared to only nine of the 25 F2Q-Only clinics during the 13-month intervention period ($\chi^2=23, p<0.001$; Figure 2, Table 3). (Two of the 24 F2Q+EAD clinics were excluded from the reported analyses because they closed before completion of the 13-month intervention period.) The number of total fax referrals from the F2Q+EAD clinics was 6.6 times greater than that from the F2Q-Only clinics (898 vs 136) over the study intervention period. At the clinic level, referrals ranged from 0 to 47 in the F2Q-Only clinics and from 1 to 156 for the F2Q+EAD clinics.

The mean number of referrals/clinician was 5.3 times greater in the F2Q+EAD clinics (8.5, SD = 4.1) compared to F2Q-Only clinics (1.6, SD = 3.6), $t(45) = -4.30$ ($p<0.001$)—also analyzed with a Mann–Whitney U test because of distributional differences ($p<0.001$). Moreover, referrals/clinician in the F2Q+EAD clinics was elevated compared to F2Q-Only clinics over all four 3-month periods of the intervention, ranging from a 5.3 to 9.9 times greater referrals per quarter in the F2Q+EAD clinics. In terms of quality referrals (those that result in quitline service enrollment), the F2Q+EAD (4.8, SD = 4.1) clinics produced 5.6 times greater number of quality referrals/clinician than the F2Q-Only (0.86, SD = 1.8, $p<0.001$).

**Program Cost**

The cost per referral was similar for the two interventions: $9.75 per referral from the F2Q-Only clinics and $8.18 per referral from the F2Q+EAD clinics. The cost of quality referrals was $15.07 and $15.52 per referral in the F2Q-Only and F2Q+EAD clinics, respectively.

**Discussion**

Enhanced academic detailing (program-specific training, telephone follow-up, and performance feedback) increased the total number of tobacco-cessation quitline referrals made through a clin-
ic-based fax referral program. Credence in the effects of the academic detailing intervention is bolstered by its consistency across diverse methods of assessing impact. For instance, although only 36% of clinics (nine of 25) without academic detailing (Fax to Quit–Only) made quitline referrals during the intervention period, 100% F2Q+EAD clinics (all 22) made such referrals (Figure 2).

When referrals per clinician are examined, in only three of 25 F2Q-Only clinics (12%) did clinicians average five or more referrals over the intervention period; in contrast, 14 of 22 F2Q+EAD clinics (58%) had clinician referrals of five or more. Moreover, referrals of the F2Q+EAD clinics exceeded those of F2Q-Only clinics by a factor of 5 or more over each of the four quarters of the study. This finding suggests that the academic detailing training effects were durable. The F2Q+EAD condition produced a significantly greater mean number of quality referrals/clinician (i.e., the enhanced academic detailing intervention increased the proportion of smokers who received WTQL treatment services). This result suggests that enhanced academic detailing helps clinicians appropriately and effectively recommend evidence-based services to smokers who are ready to make a quit attempt.

These findings are consistent with prior research showing that fax referral is an effective strategy to link a tobacco-cessation quitline with primary care clinical practices. For example, a study of four community health centers reported a 2.4-fold increase in referrals to a state-based quitline using a fax referral program compared to usual care. The benefit of an academic detailing adjuvant was suggested by another nonexperimental fax referral evaluation; the Bronx BREATHES program showed that an intensive set of academic detailing activities produced a 2.5-fold increase in the referrals of Bronx smokers to their state quitline over rates seen for other New York smokers. Evidence of effectiveness has led 50 of the 53 U.S. quitlines to implement fax referral programs, resulting in some 69,185 referrals in 2009 alone. In fact, in 2009, fax referrals generated 65% of proactive referrals to U.S. quitlines (with such alternatives as web referrals and “click to call” online ads making up the rest). The current study provides substantial evidence that fax referral programs, particularly when enhanced with academic detailing and performance feedback, can serve as a powerful strategy for increasing utilization of state-based tobacco quitlines.

The cost of a fax referral program (less than $10 per referral) is lower than alternative strategies designed to increase quitline use. TV advertising quickly and effectively reaches many people, but this strategy is costly ($70–$320/ad). Media strategies such as radio, newspapers, and direct mailings have also been used to increase quitline reach. Farrellly et al. reported that a radio advertisement campaign generated calls at a cost of $332 per call. The impact of print media on quitline call volume has been difficult to document; McDonald reported $0.96 per call in response to quitline classified ads while O’Connor and colleagues reported costs of $9.70–$60.87 per quitline caller for a New York direct mail campaign.

The current study has several limitations. First, cessation data were not collected; thus it was not possible to ascertain the clinical outcomes of the quitline referrals. Second, because all components of the enhanced academic detailing intervention were delivered to all clinics assigned to the F2Q+EAD condition, it was not possible to isolate the impact of individual components. Third, although components of the study were designed to occur at specific times, because of the busy nature of primary care clinics, enhanced academic detailing activities often occurred at a time most convenient for the clinic rather than according to protocol. Fourth, it was not possible to discern the potential impact of policy changes that took place during the study period. Specifically, two excise tax increases ($0.62 federal and $0.75 Wisconsin) were implemented during the course of the study.

Conclusion

Although tobacco-cessation quitlines have great potential to deliver evidence-based treatment for tobacco use and dependence, this potential is not realized because only about 1% of smokers use quitlines annually. This study demonstrates that pairing a fax referral program with enhanced academic detailing that includes performance feedback markedly increases the delivery of evidence-based tobacco dependence quitline treatment to smokers identified in primary care clinics. Thus, academic detailing is a promising strategy for increasing utilization of a fax referral program and the use of evidence-based treatment delivered by state quitlines.

The authors thank the staff at the Center for Tobacco Research and Intervention in the University of Wisconsin School of Medicine and Public Health for their help with this research, in particular, Jennifer Youngblood, RN, BS, MEd, Outreach Specialist, for assistance in the successful implementation of the study; Stevens Smith, PhD, for advice on statistical analysis; Linda Kurowski for graphic design; and Wendy Theobald, PhD, Kate Kobinsky, MPH, and Lezli Redmond, MPH, for technical support. In addition, the authors thank Mona Deprey, MS, and Jennifer Cinnamon at the Wisconsin Tobacco Quit Line for assistance with data collection. Those named here received compensation as salaried staff. The authors are indebted to the clinicians and staff of the participating clinics.
This work was carried out by the University of Wisconsin-Madison, Center for Tobacco Research and Intervention, Madison WI with funding from CDC grant 5R18DP001146.

The funding agency had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; or preparation, review, or approval of the manuscript.

TAM was employed by and owned stock in Free & Clear, an organization providing quitline services in Wisconsin. He was also an unpaid member of the Board of Directors of the nonprofit North American Quitline Consortium. Over the past 5 years, MCF has served as an investigator on research studies at the University of Wisconsin that were funded wholly or in part by Pfizer, Glaxo-SmithKline, and Nabi. From 1997 to 2010, MCF held a University of Wisconsin named Chair for the Study of Tobacco Dependence, made possible by a gift to the university from GlaxoWellcome. No other authors reported financial disclosures.

References

12. HSC Community Tracking Survey Household Survey. Average number of visits reported per person, per year and percent of patients with any visit during the year by type of practitioner. www.hscchange.com/CONTENT/556/hsupp=1.


52. Legge NE. Getting health professionals to care—strategic planning for fax referral systems. Paper presented at the 13th Annual World Conference on Tobacco or Health; 2006, Jul 12–15; Washington, DC.


57. Perry RJ, Keller PA, Fraser D, Fiore MC. Fax to Quit: a model for delivery of tobacco cessation services to Wisconsin residents. WMJ 2005;104(4):37–40, 44.


60. Anderson CM, Zhu SH. Tobacco quitlines: looking back and looking ahead. Tob Control 2007;16(S1):i81–i86.


68. Shelley D, Cantrell J. The effect of linking community health centers to a state-level smoker’s quitline on rates of cessation assistance. BMC Health Serv Res 2010;10:25.


71. Mosbaek CH, Austin DF, Stark MJ, Lambert LC. The association between advertising and calls to a tobacco quitline. Tob Control 2007;16(S1):i22–i29.


Appendix

Supplementary data