Supplementary Materials

Supplementary Methods

Recruitment Procedures

The Lung Cancer Screening (LCS) site coordinators were trained by Georgetown project coordinators and the Principal Investigator (PI) using the Zoom teleconference platform. The training focused on the methods used to recruit patients, including data entry in REDCap, roleplays to conduct baseline interviews, and data tracking in Microsoft Excel to manage information about eligible participants. A detailed site protocol manual, which includes telephone scripts, a comprehensive study description, the verbal consent process, and the baseline interview protocol, was developed and shared with all sites to provide consistent information and training for site coordinators. The information was available on a secure website that was accessible to all of the LCS sites and was updated as needed. Additionally, the use of these online resources facilitated consistent training in the case of staff turnover.

The Georgetown staff and PI had monthly phone meetings with each LCS site to ensure adherence to the study recruitment protocol, discuss participant accrual progress, and brainstorm methods to maximize enrollment and minimize dropout. We also e-mailed weekly accrual reports to communicate recruitment rates. Georgetown project coordinators and the LCS sites used e-mail to clarify data entered into the REDCap system. Finally, approximately every 4-6 months, the Georgetown team hosted a teleconference that included all 8 of the LCS sites to communicate information that applied to the entire study. This also allowed the sites to share information with each other and provided updates on participant accrual.

Intervention Procedures

Discussion of the screening result was framed as a primary motivator to quit, including 1) emphasis on the importance of quitting following any abnormal finding, and 2) encouragement to use the lung screening event as an opportunity to quit, to reduce future health risks, including lung cancer and other tobacco-related diseases, and 3) to maximize quality of life. For those with a normal result or whose abnormal result was ultimately considered normal after a work-up, the TTS assessed thoughts that reflected minimization of the need to quit (e.g., ‘this result means I can continue smoking’ or ‘this result is a license to smoke’),[1] discusses converting the original motivation for undergoing screening into motivation to quit, and discusses the importance of using the screening as an opportunity to quit for disease prevention. Providing education that a normal result is not a permanent 'clean bill of health,' that quitting can increase the possibility of having a normal result again next year, that older adults who quit can add years to their life,[2] each served to challenge the potential for minimization of the consequences of continued smoking.

NRT Procedures

The tobacco treatment specialist (TTS) recommended using the patches beginning on the participant’s quit date or for 24-hour ‘practice’ quit dates. If slips occurred during patch use, participants were encouraged to remove the patch if more than five cigarettes were smoked.

As is standard in research studies, participants who wanted to continue using patches after using all of the patches supplied by the study had to obtain them from other sources, which may or may not have been covered by insurance or a quitline, for example.

Timing of the Follow-Up Assessments

In a smoking cessation trial that includes individuals who are not ready to quit, the follow-up assessments are tied to the randomization date as opposed to the end of treatment.[3] The timing of the first follow-up assessment, which was designed to occur at 3 months post-randomization, was a median of 100 days between randomization and the 3-month assessment, with no difference between study arms. Further, as the calls were scheduled based on participant preference, the amount of time between the last counseling session and the 3-month assessment was impacted by how participants chose to schedule the calls (e.g., to group the sessions toward the beginning or end of the 3-month intervention period). Some participants completed all of their calls on a weekly basis and were therefore finished with the calls in a shorter period, while others started later and therefore completed their calls in a more compressed timeframe, or were unable to complete all available calls during the 3 month window. Given that the calls were scheduled at participants' convenience and that participants had various extenuating circumstances that resulted in scheduling changes, it is unlikely that there was a systematic group difference in the distribution of calls, other than the planned number of calls (3 vs. 8). Further, the scheduling of the counseling sessions did not take into account the amount and timing of the use of NRT. Teasing apart the distribution of calls (e.g., occurring close in time vs spread apart) from the number of calls (3 vs. 8) and from the amount of NRT used was beyond the scope of this analysis, which was to determine whether the combined use of counseling and NRT predicted cessation outcomes.

Training and Supervision of Tobacco Treatment Specialists

All TTSs received training at one of the Association for the Treatment of Tobacco Use and Dependence (ATTUD) accredited week-long programs for TTS. Prior to counseling trial participants, each counselor performed roleplays with experienced staff members, our patient advocate (a former smoker who quit while participating in our pilot study[4]), and doctoral-level investigators (clinical psychologists). The TTSs also counseled two pilot participants, completing the full Intensive and Minimal arm protocols. These calls with pilot participants were recorded and feedback was provided on protocol adherence and motivational interviewing skills.

Twice per year, our study consultant, a member of the Motivational Interviewing Network of Trainers (MINT), provided a full-day training for the TTSs and supervisors. Both didactics and roleplaying are used to demonstrate central constructs of MI, including the use of open-ended questions and reflections, cultivating change talk, softening sustain talk, providing a collaborative atmosphere, and expressing a deep understanding of the participant's perspective. TTSs received monthly individual supervision from our MINT consultants (both English- and Spanish-speaking), which included detailed feedback using the Motivational Interviewing Treatment Integrity (MITI) protocol on a recorded counseling call to ensure compliance with MI techniques.[5] Finally, the team held a monthly meeting with the MINT trainer to cover general MI techniques that were applicable to recent sessions conducted by the TTSs, using roleplays and discussion to improve the TTS's MI skills.

All of the counseling sessions were recorded for quality assurance. Each TTS received weekly supervision using audio recorded calls (individual and group) provided by two clinical psychologists. Supervision of the Spanish-language TTS was conducted in Spanish by both the project director and a MINT trainer. Each weekly supervision meeting involved listening to an audio recording of one session per counselor. Supervisors (and other counselors during the group meetings) provided feedback on protocol adherence and MI techniques. We used fidelity coding

forms to assess protocol adherence and to discuss areas needing improvement. The counseling protocol is available upon request.

Intervention Fidelity Coding

We assessed intervention fidelity by recording and coding a random selection of 10% of the counseling calls, selected from each six month period of data collection to ensure inclusion of calls conducted during all phases of the trial. Further, we selected the calls from each of the following three groups: sessions 1-3 in the Minimal arm, sessions 1-3 in the Intensive arm, and sessions 4-8 in the Intensive arm. All sessions were audio-recorded using Zoom.

Using a coding manual developed for this trial, two investigators trained 6 coders to conduct the fidelity ratings. Inter-rater reliability was calculated for 20% of the coded calls. We held regular meetings and came to a consensus on disagreements. Coders were blinded to study arm and session number.

Fidelity coding assessed for the presence of the 22 core topics, including current smoking status and readiness to quit (3 items); a discussion of behavioral strategies for reducing or quitting smoking (5 items), assessment of NRT use or NRT adherence (1 item), use of MI techniques (5 items), discussion of the print materials (1 item), and limiting the session to 20 minutes (1 item). In the Intensive arm, a discussion of the LCS result and its impact on motivation to reduce or quit was required in the first three sessions (2 items). Relapse prevention items were coded for sessions in which the participant had stopped smoking (4 items).

Supplementary Table 1. Pre/Post COVID-19 Enrollment (Reach) and Retention Rates

	Pre-March 11, 2020		Post- March 11, 2020	
Participation rate at Enrollment (T0)	1030/3029= 34%		83/1078=7.7%	
Participation rate Post-LCS[a] (T1)	774/985= 78.6%		70/73=95.9%	
Predictor Variables	ITC (n = 378)	MTC (n = 371)	ITC (n = 31)	MTC (n = 38)
Age, Mean (SD), Median	63.6 (5.8), 63	63.8 (5.96), 63	63.5 (6.3), 64	62.9 (4.6), 63
Sex, No. (%)				
Female	191 (50.5)	197 (53.1)	21 (67.7)	21 (55.3)
Male	187 (49.5)	174 (46.9)	10 (32.3)	17 (44.7)
Race, No. (%)				
African American	31 (8.2)	23 (6.2)	4 (12.9)	10 (26.3)
Other	5 (1.3)	4 (1.1)	0 (0)	1 (2.6)
White	340 (89.9)	343 (92.5)	27 (87.1)	27 (71.1)
Missing/refused	2	1	0	0
Ethnicity, No. (%)				
Hispanic	18 (4.8)	20 (5.4)	0	3 (7.9)
Not Hispanic	360 (95.2)	350 (94.6)	31 (100)	35 (92.1)
Education, No. (%)				
High School/GED or Less	134 (35.5)	133 (36.1)	9 (30.0)	10 (26.3)
Associate's Degree/Vocational School	153 (40.6)	146 (39.7)	12 (40.0)	16 (42.1)
Bachelor's Degree or More	90 (23.9)	89 (24.2)	9 (30.0)	12 (31.6)
Pack Years, M (SD), median	48.2 (17.5), 44	48.2 (17.4), 43.5	48.5 (15.3), 45	44.5 (13.5), 44
Readiness to Quit at T1, No. (%)				
Not considering quitting	123 (32.5)	115 (31.0)	8 (25.8)	16 (42.1)
Next 6 months	71 (18.8)	77 (20.8)	7 (22.6)	5 (13.2)
Next 30 days	184 (48.7)	179 (48.2)	16 (51.6)	17 (44.7)

[a] LCS = Lung Cancer Screening; T1 = Post-Lung Screening Assessment and Randomization.

Supplementary Table 2. Demographic Characteristics by Enrollment (Reach) and Retention (Chi Square Analyses)

	Comparing Enrolled vs. Declined at T0[a]			Comparing Retained vs. Dropped Out[b] at T1[a]			Comparing Retained vs. Dropped Out[b] at T2[a]			Comparing Retained vs. Dropped Out[b] at T3[a]			Comparing Retained vs. Dropped Out[b] at T4[a]		
Characteristics	Enrolled No. (%)	Declined/ Never Reached No. (%)	*P*	Retained (randomized No. (%)	Declined/ Never Reached No. (%)	*P*	Retained at T2 No. (%)	Declined/ Never Reached at T2 No. (%)	*P*	Retained at T3 No. (%)	Declined / Never Reached at T3 No. (%)	*P*	Retained at T4 No. (%)	Declined/ Never Reached at T4 No. (%)	*P*
Total No.	113	2994		818	277		572	241		498	311		473	332	
Age (% older 64-80)	505 (45.4)	1346 (45)	0.82	391(47.8)	101 (36.5)	0.001	280 (49.0)	108 (44.8)	0.28	239 (48.0)	146 (46.9)	0.77	241 (51.0)	143 (43.1)	0.03
Race (% African American)	88 (7.9)	152 (5.1)	0.001	86 (8.3)	19 (6.9)	0.002	58 (10.1)	10 (4.1)	0.03	47 (9.4)	21 (6.8)	0.53	46 (9.7)	22 (6.6)	0.18
Ethnicity (% Hispanic)	89 (8.1)	222 (7.7)	0.71	41 (5.0)	47 (17.5)	0.001	25 (4.4)	15 (6.2)	0.27	20 (4.0)	20 (6.4)	0.13	18 (3.8)	21 (6.3)	0.10
Sex (% female)	608 (54.6)	1397 (46.7)	0.001	430 (52.6)	170 (61.4)	0.011	296 (51.7)	130 (53.9)	0.57	254 (51.0)	170 (54.7)	0.31	247 (52.2)	175 (52.7)	0.89
LDCT Screening (% Annual)	588 (53.1)	19 (50.0)	0.71	473 (57.8)	108 (39.7)	0.001	328 (57.3)	142 (58.9)	0.68	292 (58.6)	176 (56.6)	0.57	278 (58.8)	190 (57.2)	0.66

[a] T0 = Initial assessment at Trial Enrollment; T1 = Post-Lung Screening Assessment and Randomization; T2 = 3-month post-randomization assessment; T3 = 6-month post-randomization assessment; T4 = 12-month post-randomization assessment; LDCT = low-dose computed tomography.

[b] Dropped out includes both passive (never reached) and active (declined) dropouts.

Supplementary Table 3. Quit rates among those who completed ≥1 counseling session

Smoking abstinence among participants who completed at least one counseling session[a]	Intensive Arm, No. (%) (n = 361)	Minimal Arm, No. (%) (n = 328)
Biochemically verified[b]		
3-month (T2)	37 (10.2)	15 (4.3)
6-month (T3)	29 (8.0)	23 (7.0)
12-month (T4)	33 (9.1)	25 (7.6)
Self-reported		
3-month (T2)	58 (16.1)	30 (9.1)
6-month (T3)	41 (11.4)	36 (11.0)
12-month (T4)	46 (12.7)	38 (11.6)

[a] One participant in the Intensive arm and two in the Minimal arm who quit did not attend any counseling sessions and are excluded from this analysis.

[b] Methods of verification: NicAlert, NicoTest, expired CO conducted in person, expired CO using iCO remote device

Supplementary Table 4. Quit rates among those who completed the 3-, 6-, or 12-month follow-up assessments (not intent-to-treat analyses)

Smoking abstinence among participants who completed the 3- (T2) or 6- (T3) or 12-month (T4) follow-up assessments	Intensive Arm, No. (%) (n = 291, T2; n= 255, T3; n=240, T4)	Minimal Arm, No. (%) (n = 281, T2; n= 243, T3; n=233, T4)
Biochemically verified[a]		
3-month (T2)	37 (12.7)	16 (5.7)
6-month (T3)	29 (11.4)	24 (9.9)
12-month (T4)	34 (14.2)	25 (10.8)
Self-reported		
3-month (T2)	58 (19.9)	32 (11.4)
6-month (T3)	42 (16.5)	38 (15.6)
12-month (T4)	49 (20.4)	40 (17.2)

[a] Methods of verification: NicAlert, NicoTest, expired CO conducted in person, expired CO using iCO remote device

Supplementary Table 5. Other Tobacco, Nicotine, and Marijuana Use at Baseline (T0)

Other Tobacco, Nicotine, and Marijuana Use at Baseline[a]	Intensive Telephone Counseling (n = 409) No. (%)	Minimal Telephone Counseling (n = 409) No. (%)	Total (N = 818) No. (%)
Cigars			
Never	273 (66.7)	273 (66.7)	546 (66.7)
Yes but not since pre-screening (T0) interview	130 (31.8)	122 (29.8)	252 (30.8)
Some days	4 (1.0)	13 (3.2)	17 (2.1)
Every day	2 (0.5)	1 (0.2)	3 (0.4)
Smokeless tobacco			
Never	376 (91.9)	374 (91.4)	750 (91.7)
Yes but not since pre-screening (T0) interview	30 (7.3)	34 (8.3)	64 (7.8)
Some days	1 (0.2)	1 (0.2)	2 (0.2)
Every day	2 (0.5)	0 (0.0)	2 (0.2)
E-cigarette use			
Never	206 (50.4)	204 (49.9)	410 (50.1)
Yes but not since pre-screening (T0) interview	164 (40.1)	183 (44.7)	347 (42.4)
Some days	32 (7.8)	16 (3.9)	48 (5.9)
Every day	7 (1.7)	6 (1.5)	13 (1.6)
Marijuana use			
Never	307 (75.6)	321 (78.7)	628 (77.1)
Monthly or less	44 (10.8)	48 (11.8)	92 (11.3)
2-4 times a month	21 (5.2)	11 (2.7)	32 (3.9)
2-3 times a week	16 (3.9)	12 (2.9)	28 (3.4)
4+ times a week	18 (4.4)	16 (3.9)	34 (4.2)
Refused	3	2	5

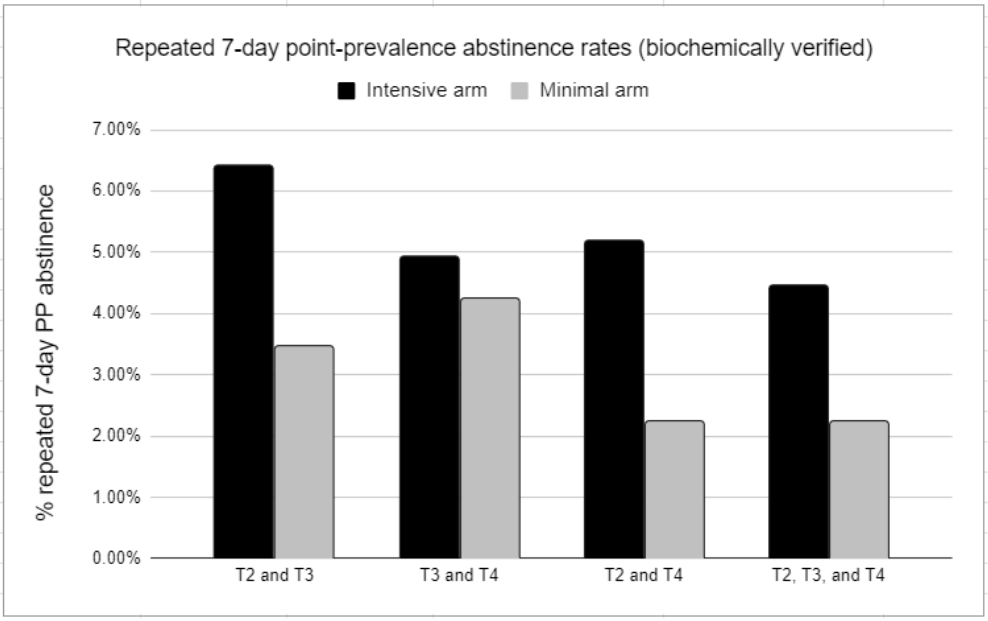
[a] T0 = Initial assessment at Trial Enrollment

Supplementary Table 6. Psychological Characteristics at Randomization (T1)

Psychological characteristics	Intensive Arm, No. (%) (n = 409)	Minimal Arm, No. (%) (n = 409)	Total, No. (%) (N = 818)
Comparative Risk for Lung Cancer (T1)			
Lower risk	63 (16.1)	62 (16.1)	125 (16.1)
Same risk	166 (42.3)	159 (41.4)	325 (41.9)
Higher risk	163 (41.6	163 (42.4)	326 (42.0)
Refused/Missing	17	15	42
Worry about Lung Cancer (T1)			
Not at all/ A little	94 (23.2)	90 (22.5)	184 (22.9)
Somewhat	163 (40.2)	161 (40.3)	324 (40.2)
Extremely	148 (36.5)	149 (37.3)	297 (36.9)
Refused/Missing	4	9	13
Pain or Discomfort			
No pain or discomfort	167 (41.0)	171 (42.1)	338 (41.6)
Moderate pain or discomfort	194 (47.7)	194 (47.8)	388 (47.7)
Extreme pain or discomfort	46 (11.3)	41 (10.1)	87 (10.7)
Refused/Missing	2	3	5
Anxiety or Depression			
Not anxious or depressed	197 (48.4)	222 (54.8)	419 (51.6)
Moderately anxious or depressed	163 (40.0)	153 (37.8)	316 (38.9)
Extremely anxious or depressed	47 (11.5)	30 (7.4)	77 (9.5)
Refused/Missing	2	4	6

[a] T1 = Post-Lung Screening Assessment and Randomization

Supplementary Figure 1. Repeated point-prevalence abstinence rates



Notes. The figure shows the percentage of participants with repeated point-prevalence abstinence (not called prolonged abstinence due to uncertainty regarding lapses or relapses between the assessments),[6] stratified by arm, comparing the follow-up assessments. The data suggest that repeated point-prevalence abstinence was higher in the Intensive vs. the Minimal arm at each comparison, although the differences are very small and need replication.

T2: 3-month post-randomization assessment;
T3: 6-month post-randomization assessment;
T4: 12-month post-randomization assessment.

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