

Table S1 Impact of CT lung cancer screening on smoking behaviour

Author Year Country trial	Study type	Sample size	Study population	Smoking cessation advice	Comparison	Primary outcome; follow-up	Main Results
Balata et al. (38) 2020 UK Lung Health Check	Observational	462 current smokers 457 former smokers	Age 64.6 years (mean), eligible: 55–74 years 50.7% females Current & former smokers Smoking history: 51 pack-years (mean) Lung cancer risk [Prostate Lung Colorectal Ovarian (PLCO) model]: ≥ 1.51	Participants received brief smoking cessation advice and information about smoking stop services	Impact CT screening on smoking behaviour and attitudes + Negative vs. positive screening result(s)	Self-reported 1-month prevalence abstinence and smoking attitudes at 12 months	<ul style="list-style-type: none"> ● 10.2% one-year quit rate ● of which 79% quit for over 6 months (long-term abstinence) ● 5.3% relapse rate ● 55% of current smokers attributed quitting to screening ● 44% baseline smokers reported that screening made them consider stopping, 29% that it made them attempt to stop and 25% that it made them smoke less ● Baseline screening result did not impact smoking behavior of smokers (P=0.78) ● Only 1% of current smokers reported feeling that it is acceptable to smoke
Pistelli et al. (24) 2019 Italy ITALUNG	RCT	1,239 screen arm 1,383 control arm	Eligible: 55–69 years 34.6% females Current & former smokers 65.3% current smokers Smoking history: ≥ 20 pack-years in the last 10 years, quit <10 years	All participants received written information about smoking cessation service, a more structured cessation intervention was	CT screening vs. no screening Negative and positive screening result(s) vs. controls	Self-reported point prevalence abstinence at year 4	<ul style="list-style-type: none"> ● Cessation rate higher in intervention arm (20.8%) than control arm (16.7%), P=0.029 ● Trend: Relapse rate lower in intervention (6.4%) than control arm (7.6%), P=0.50 ● In ITT-analysis: ● Trend: Cessation rate higher in intervention arm (16.0%) than control arm (14.6%), P=0.059

				offered at one site (n=119), at the other two sites no or only a few smokers used the service			<ul style="list-style-type: none"> ● No statistical difference in relapse rate between intervention (4.9%) and control arm (6.4%), P=0.26 ● Cessation rates of participants with positive baseline scan result higher than rates of controls at year 4; OR=1.59 (95% CI: 1.12–2.26, P=0.009), no significant difference between participants with negative scan and controls, OR=1.24 (95% CI: 0.94–1.63, P=0.124)
Clark et al. (23) 2019 Scotland ECLS	Observational	95 participants with positive screening results 174 with negative results	Positive results group: Age 61 years (median), negative group: 60 years (median), eligible: 50–75 years 55.8% females Current & former smokers 51.3% current smokers Smoking history: ≥20 pack-years (or fewer if had 1 st degree relative with lung cancer)	Participants were told that the best way to reduce lung cancer risk is to stop smoking (60)	Negative vs. positive screening result(s)	Self-reported smoking behaviour at 3 and 6 months	<ul style="list-style-type: none"> ● No difference in 2–3 months (excluding last week) smoking prevalence; OR: 0.81 (95% CI: 0.33–2.00) ● No difference in 7 day-point smoking prevalence; OR: 1.02 (95% CI: 0.46–2.30) ● No difference in proportion of participants who start smoking 30 minutes or less after waking; OR: 1.02 (95% CI: 0.40–2.58) ● No difference in intent to quit in next month; OR: 1.48 (95% CI: 0.66–3.32)
Brain et al. (31) 2017 UK UKLS	RCT	2,028 screen arm 2,027 control arm	Mean age ≈ 67.7 years (61), eligible 50–75 years ≈25.1% females (62) 38.1% current smokers High risk of lung cancer (≥5% over 5 years) using Liverpool Lung Project (LLPv2) risk prediction	Participants in both trial arms received smoking cessation leaflets and list of available smoking	CT screening vs no screening + Negative vs. positive screening result(s)	Self-reported smoking cessation at T1 (2 weeks after baseline scan results or control assignment) and T2 (up to 2 years after recruitment)	<p>At T1 (ITT-analysis)</p> <ul style="list-style-type: none"> * Cessation rate higher in screen arm (14%) than control arm (8%) at T1 (P<0.001) <p>At T2 (ITT-analysis)</p> <ul style="list-style-type: none"> * Cessation rate also higher in screen arm (24%) than control arm (21%) at T2 (P=0.003) * Cessation rate of participants with positive result higher (30%) than cessation rate of control group

			model	cessation resources			(21%); aOR: 2.29 (95% CI: 1.62–3.22), P=0.007 and cessation rate of those with negative result (15%); OR: 2.43, (95% CI: 1.54–3.84), P<0.001 <ul style="list-style-type: none"> No significant effect of negative result compared to control group at T1; OR: 1.78 (95% CI: 1.04–3.05), P=0.09, or at T2; OR: 0.90 (95% CI: 0.58–1.40), P=0.07
Clark et al. 2016 (29) United States NLST	Observational	16,964 participants (8,358 smokers, 786 recent quitters, 7,820 long-term formers)	Age 61.5 years (mean), eligible: 55–74 years 45% females Current & former smokers Smoking history: ≥30 pack-years, quit <15 years 41.9% of current smokers: heavy smokers (>1 pack/day)	Current smokers received information about available smoking cessation resources (4)	Negative vs. positive screening result(s) + Impact CT screening on smoking behaviour	Self-reported point prevalence abstinence and 6-months prolonged abstinence, measured annually for 5 years	<ul style="list-style-type: none"> Abstinence rates among current smokers during 5 years: <ul style="list-style-type: none"> * Annual 7-day point prevalence quit rates: 11.6–13.4% * prolonged abstinence: 4.1–10.1% Relapse rate: <ul style="list-style-type: none"> * recent quitters: 65.5% (95% CI = 62.1–68.9) *long-term former smokers: 7.3% (95% CI = 6.7, 7.9) After false positive screening result: increased likelihood of <ul style="list-style-type: none"> *point abstinence; HR =1.23, (95% CI: 1.13–1.35) and *prolonged 6-month abstinence; HR=1.28 (95% CI: 1.15–1.43) Recent quitters less likely to relapse with any false positive result than with a negative result (HR =0.72, 95% CI: 0.54–0.96) Screening result was not associated with relapse in long-term former smokers; HR =1.11 (95% CI: 0.87–1.43) or baseline smokers who quit during study follow-up; HR =1.00 (95% CI: 0.82–1.21)

Bade et al. (26) 2016 Germany LUSI	RCT	2,029 screen arm 2,023 control arm	Age 50–69 years 35.3% females (63) 61.3% current smokers ≥25-year smoking of ≥15 cigs/day, OR ≥ 30-year smoking of ≥10 cigs/day	All participants were offered to participate in personalized clinician-delivered smoking cessation counselling	CT screening vs. no screening	Self-reported change in smoking status at 24 months follow-up	<ul style="list-style-type: none"> ● Smoking prevalence decreased among the screen arm by 3.4% (P<0.0001) and among the control arm by 4.5% (P<0.0001) ● No statistically significant difference between study arms (P=0.511) ● Similar results with multiple imputation: 3.4% (screen) and 4.5% (control) ● Results with propensity score analysis: 3.0% (screen) and 4.9% (control), still no significant difference, P=0.236
Borondy et al. (39) 2016 United States Lahey Hospital & Medical Center	Observational, retrospectively reviewed	678 current smokers 783 former smokers	Age 62.5 years (mean) Current (46%) & former smokers Smoking history: 49 pack-years (mean), years quit: 10.1 (mean) Eligible: 55–74 years & ≥30 pack-years & <15 years quit OR 50–74 & ≥20 pack-years & any quit duration & family history risk lung cancer or personal history lung disease, exposure carcinogens or smoking-related cancer	Participants received information about smoking cessation and available resources	Impact CT screening on smoking behaviour + Negative vs. abnormal result(s)	Self-reported point prevalence abstinence at most recent follow-up exam	<ul style="list-style-type: none"> ● Point prevalence of smoking abstinence of current smokers: 20.8% ● Smoking relapse of former smokers: 9.3% ● Baseline screening results were not associated with smoking cessation; OR: 1.09 (95% CI: 0.72–1.70) ● A positive result was associated with reduced relapse rates among smokers recently quit smoking (i.e., 2 years or less ago); OR: 0.33 (95% CI: 0.14–0.71)
Tammemäggi et al. (30) 2014	Observational	15,489 current smokers	Age: 60.6 years (mean); Eligible 55–74 years	Current smokers received	Negative vs abnormal	Self-reported smoking behaviour:	Likelihood of smoking was negatively associated with severity of screening results (P<0.0001).

United States NLST			41.3% females Current smokers Smoked 25.9 cigs/day (mean) Smoking history: 54.9 pack-years (mean; range: 29–412), quit <15 years	information about available smoking cessation resources (4)	(lung cancer or other abnormalities) screening result (CT scan or X-thorax)	smoke a pack in the last 30 days or 7-day point prevalence Follow-up period: 7 years	<ul style="list-style-type: none"> Continued smoking was less likely if a major abnormality was found in the last screen that *was not suspicious for lung cancer; OR= 0.81 (95% CI: 0.72–0.91), P<0.001 *was suspicious for lung cancer but stable; OR =0.79 (95% CI: 0.71–0.87), P<0.001) *was suspicious for lung cancer and new/ changed (OR =0.66; 95% CI: 0.61–0.72), P<0.001) Individuals with negative results: also declining smoking prevalence over time
Ashraf et al. (21) 2014 Denmark DLCST	RCT	2,052 screen arm 2,052 control arm	Age 57.9 years (mean; range: 49–71) 44.8% females Current (76.1%) & former smokers, Smoking history: ≥ 20 pack-years, 36.2 pack-years (mean) Quit: <10 years 19 cigs/day (mean)	All participants received minimal smoking cessation counselling of <5 minutes and lung function tests	CT screening vs no screening	Annual self-reported point prevalence of smoking (≥4 weeks) for 5 study years At baseline and second screening, self-reported smoking was biochemically verified	<ul style="list-style-type: none"> ITT-analysis: No differences in annual smoking status between screen vs. control group over 5 years (P=0.213–0.909) Overall (screen + control), the cessation rate increased from 24% at baseline to 37% at year 5 (P<0.001) Annual point prevalence quit rate increased from 11% (year 2) to 24% (year 5) (P<0.001) Annual point prevalence relapse rate (9–12%) remained stable across the 5 years (P=0.287)
van der Aalst et al. (28) 2011 The Netherlands & Belgium NELSON	Observational, random samples	550 with negative result 440 with at least 1 indeterminate result	Age 58 years (mean), eligible: 50–75 years Only males Current smokers 44.3% smoked >20 cigarettes per day (heavy smoker)	Participants received short smoking cessation leaflet at randomization and a sub-cohort	Negative vs. indeterminate screening result(s)	Self-reported smoking behavior (prolonged smoking abstinence) at 24 months after randomization	<ul style="list-style-type: none"> Indeterminate group reported more quit attempts (P=0.02) No significant differences in smoking abstinence between negative and indeterminate group: Prolonged abstinence: 8.9% vs. 11.5%, OR: 1.26 (95% CI: 0.48–3.30), P=0.19

			Smoking history: >15 cigs/day for >25 years OR >10 cigs/day for >30 years, quit ≤10 years 68.7% had smoking history of >30 pack-years	was randomized to standard information brochure or computer- tailored advice			<ul style="list-style-type: none"> ● Slight increase in prolonged abstinence after one (10.9%) or more (15.0%) indeterminate results compared to only negative test results (8.9%), but not statistically significant, P=0.26
van der Aalst et al. (27) 2010 The Netherlands & Belgium NELSON	RCT	641 screen arm 643 control arm	58 years (mean), eligible: 50–75 years Only males Current smokers >15 cigs/day for > 25 years OR >10 cigs/day for >30 years, quit ≤10 years 51.8% had smoking history of >30 pack-years	Participants received short smoking cessation leaflet at randomization and a sub-cohort was randomized to standard information brochure or computer- tailored advice	CT screening vs. no screening	Self-reported smoking behavior (prolonged abstinence) at 24 months after randomization	<ul style="list-style-type: none"> ● Overall: 16.6% cessation rate ● Lower prolonged abstinence in screen arm (14.5%) than control arm (19.1%), OR: 1.40 (95%-CI: 1.01-1.92), P<0.05 ● In ITT-analysis: no difference between screen (13.1%) and control (14.9%) arm in prolonged abstinence rates (P=0.35)
Styn et al. (37) 2009 United States PluSS	Observational	2,094 current smokers	57 years (median), eligible: 50–79 years, 50.7% females Current smokers 65.2% heavy smokers (≥20 cigs/day) Smoking history: ≥1/2	At study entry, current smokers were encouraged to quit and recommended a hospital-based	Negative vs. abnormal screening result	Self-reported >30 day point prevalence of smoking and quit attempts at 12 months after initial screening	<ul style="list-style-type: none"> ● Overall smoking abstinence: 15.5% ● Any quit attempt: 58.5% ● An abnormal finding with medium-high suspicion of lung cancer was associated with an increase in quitting attempts by 18.8%, increase in an any >30 day quit interval by 17.7% and

			pack/day for ≥ 25 years, quit <10 years	smoking cessation program + nurse practitioners informally encouraged quitting at subsequent telephone contacts		Self-reported abstinence was biochemically verified in 95 of 108 (88.0%) cases	increase in >30-day abstinence at year 1 without relapse by 12.2% compared to a negative result
Ashraf et al. (22) 2009 Denmark DLCST	RCT	2,052 screens 2,052 controls	57.9 years (mean; range: 49-71 years) 44.8% females Current & former smokers: 76.1% current smokers Smoking history: ≥ 20 pack-years, 36.2 pack-years (mean) Quit: <10 years 19 cigs/day (mean)	All participants received minimal smoking cessation counselling of >5 minutes and lung function tests	CT screening vs no screening + Negative vs. abnormal screening result(s)	Self-reported point prevalence (≥ 4 weeks) and biochemically verified smoking status at 12 months	<ul style="list-style-type: none"> ● ITT-analysis: smoking cessation screen: 11.9% versus control: 11.8%; P=0.95 ● Relapse 10.0% screen versus 10.5% control, P=0.81) ● Higher quit rates amongst participants with positive CT result (17.7%) compared to those with negative CT findings (11.4%), P=0.04 ● Lower relapse rate among former smokers with positive CT findings (4.7%) than with negative findings (10.6%), P<0.01
Anderson et al. (32) 2009 United States ELCAP	Observational	730 current smokers 1,227 long-term former smokers 121 recent quitters	61.4 years (mean) 51 % females Current (35.1%) & former smokers Smoking history: ≥ 10 pack-years 36.3% of current smokers smoke more than 1	Current smokers were advised to quit smoking and were provided contact details for a telephone quit-line	Negative vs abnormal screening result(s)	Self-reported 30-day point or prolonged (>1 year) abstinence, or 30-day point relapse Follow-up period: 12 years, but 6-year follow-up used for	<ul style="list-style-type: none"> ● Smokers with negative results have 28% lower likelihood of point abstinence at 1 or more follow-ups compared with those with positive result; HR: 0.72, P<0.004 ● Consistently negative scans not associated with a lower likelihood of prolonged abstinence at 6-year follow-up; HR: 1.34 (0.90–1.99); P=0.15

			pack/day, 50.7% of long-term former smokers smoked 1 pack/day, 41.3% of recent quitters smoked 1 pack/day			data analysis	<ul style="list-style-type: none"> ● Consistently negative scan not associated with relapse in long-term quitters; HR: 0.51 (95% CI: 0.20–1.29), recent quitters; HR 0.88 (95% CI: 0.42–1.82) or baseline smokers who quit during study; HR 1.61 (95% CI: 0.39–6.70) ● Relapse rate long-term former smokers (at T0): 4.4% at 6-year of follow-up
Taylor et al. (25) 2007 United States LSS & NLST	Observational	144 LSS participants 169 NLST participants	63.2 years (mean; range: 55-74 years) 46.3% females Current & former smoker 51.8% current smokers Smoking history: ≥30 pack-years, Quit <15 (NLST) or <10 (LSS) years	Current smokers received information about available smoking cessation resources (4)	Impact CT screening on smoking behaviour + Negative vs. abnormal screening result(s)	Self-reported changes in smoking status and readiness to quit 1 month after screening result	<ul style="list-style-type: none"> ● Current smokers quit rate: 7% ● Former smokers relapse rate: 4% ● Among younger LSS participants, a positive result was associated with higher readiness to quit, and a negative result was associated with less readiness to quit, χ^2 (2, N=32)=7.7, P=0.02 ● No association of screening result with readiness to quit in NLST or older LSS participants
MacRedmond et al. (36) 2006 Ireland PALCAD	Observational	307 current smokers 142 former smokers	56.4 years (median; range 50–74 years) Current (68.4%) & former smokers Smoking history: ≥10 pack-years, still smoking at age 45	Smoking cessation advice was given to current smokers, only 1.3% accepted referral to smoking cessation group	Impact CT screening on smoking behaviour	Self-reported changes in smoking status (not further specified)	<ul style="list-style-type: none"> ● 19.2% quit smoking during study period, 1.6% relapsed ● 60.8% continued smoking
Townsend et al. (35) 2005 United States	Observational	926 current smokers 594 former	59.7 years (mean; range: 50–85 years) 48.2% females	Sub-cohort randomized to smoking	Impact CT screening and abnormal	Self-reported annual 7-day point prevalence of	Having more abnormal results is related to higher abstinence rate: *0 abnormal results: 19.8%

Mayo clinic		smokers	Current & former smokers Smoking history: >20 pack-years; quit: <10 years	cessation self-help materials or resource list	findings on smoking behaviour	abstinence Follow up period: 3 years	*1 abnormal result: 24.2%, *2 abnormal results: 28.0% *3 abnormal results: 41.9% (P=0.003, OR =1.34 per previous recommendation)
Cox et al. (34) 2003 United States Mayo clinic	Observational	901 current smokers 574 former smokers	59 years (mean; range: 50–85 years) 48.4% females Current (61.1%) & former smokers Smoking history: ≥20 pack-years, 45 pack-years (median; range: 20–230), quit: <10 years	Sub-cohort randomized to smoking cessation self-help materials or resource list	Impact CT screening on smoking behaviour + Negative vs. abnormal screening result(s)	Self-reported 7-day point prevalence abstinence at 1 year follow-up Self-reported abstinence was biochemically verified in 98% of 314 participants	<ul style="list-style-type: none"> ● Current smokers: 14% abstinence ● Former smokers: 90% abstinence ● Screening result was not associated with smoking cessation (P=0.653)
Ostroff et al. (33) 2001 United States ELCAP	Observational	134 current smokers	67 years (mean), eligible: >60 59.7% females Current smokers Mean number of cigs/day: 25 Smoking history: ≥10 pack-years, 53 pack-years (median; range: 10–147)	Current smokers were advised to quit smoking and were provided contact details for a telephone quit-line (26)	Impact CT screening on smoking behaviour + Negative vs. abnormal screening result(s)	Self-reported changes in smoking status (not further specified)	<ul style="list-style-type: none"> ● Change in smoking status: *23.1% quit smoking, *26.1% reduced smoking *2.9% increased smoking, *47.8% no change ● 73.9% stated that study made them think about quitting ● 87% of those who quit or reduced smoking, stated that CT screening had a major role in changing smoking behaviour ● Trend: Quitting or reducing smoking was slightly more likely with an abnormal scan (62%) than when with a negative scan (46%), P=0.09

Table S2 Effectiveness of smoking cessation help in lung cancer screening setting

Author Year Country	Type trial and recruitment method	Sample size	Study population	Intervention; level of personalization	Primary outcome; follow-up	Main results
Lucchiari et al. (44) 2020 Italy COSMOS-II	RCT Volunteers	70 intervention (nicotine e-cig) 70 placebo (nicotine free e-cig) 70 control	62.8 years (mean), eligible: >55 years 37.1% females Current smokers Daily cigarettes smoked: 19.38 (mean) Smoking history: ≥10 cigs/day for ≥10 past years	Lung cancer screening, CT scan; treatment group received nicotine e-cigarette, placebo received nicotine-free cigarettes, all participants received 3 months personalized clinician-delivered telephone-based cognitive- behavioral therapy	Primary: Improvement in lung health (respiratory symptoms, cough- related QoL) Secondary: Self- reported and biochemically- confirmed 30-day and abstinence at 6 months	<ul style="list-style-type: none"> ● No differences in pulmonary health ● 20% overall abstinence rate at 6 months (when drop-outs excluded) ● No significant differences in abstinence between groups (P=0.691) ● Nicotine e-cigarette group smoked fewer cigarettes per day (11.0±6.51) than placebo (14.0±7.92) or control (13.5±6.49), F (2, 118) =4.005, P<0.020
Pistelli et al. (24) 2019 Italy ITALUNG	Observational Recruited via written information signed by GP and local screening site (64)	119 intervention, of whom 76 successfully completed all visits 306 screening participants who did not enter smoking cessation program 66 matched-controls from routine practice who underwent smoking cessation intervention but not CT screening	Intervention group: 59 years (mean), non- participants: 61 years (mean) Current smokers Eligible: 55–69 years; ≥20 pack-years in the last 10 years, quit <10 years	Lung cancer screening, CT scan; those who entered smoking cessation intervention received personal clinician-delivered counseling and pharmacotherapy (varenicline, bupropion, nicotine replacement therapy; either separately or in various combinations)	Self-reported point prevalence abstinence at year 4	<ul style="list-style-type: none"> ● Those who entered intervention had threefold higher odds of smoking cessation than those who did not participate in intervention; OR=3.16 (95% CI: 1.63–6.12), P=0.001 ● ITALUNG participants who completed all intervention visits had higher cessation rates over a 12-months follow-up than matched controls: e.g., cessation rates at 12 months after quit day: 28.9% (ITALUNG participants) vs. 13.6% (matched controls)
Tremblay et al. (43)	RCT	171 intervention 174	62 years (mean)	Lung cancer screening;	Self-reported 30-day	No differences found between control vs.

<p>2019 Canada Alberta Lung Cancer Screening</p>	<p>Volunteers, recruited through media reports, social media advertising, posters and pamphlets in community centers and primary care offices</p>	<p>control</p>	<p>53.9% females Current smokers Eligible: 55–74 years; ≥ 30 pack-year smoking history; quit ≤ 15 years OR 55-80 years old and 6-year lung cancer risk $\geq 1.5\%$ (PLCO) Smoking history: 43.2 pack-years (mean)</p>	<p>CT scan; usual care for control (information brochure) or personalized clinician-delivered telephone-based counseling intervention using screening results</p>	<p>abstinence at 12 months, also measured at 6 and 24 months</p>	<p>intervention arm</p> <ul style="list-style-type: none"> ● 30-day abstinence at 6 months: 10.3% vs. 14.6% (difference 4.3%, 95% CI: -2.74 to 11.40) ● 30-day abstinence at 12 months: 12.6% vs. 14% (difference 1.4%, 95% CI: -5.9 to 8.7, P=0.7) ● 30-day abstinence at 24 months: 22.2% vs. 21.7% [difference -0.5%, 95% CI: -0.5 (-12.11 to 13.76) P=0.934] ● More than one contact (goal was 7 contacts) was established in only 42% of participants in intervention arm and 4% in controls (P<0.001) ● Use of NRT: 27.6% vs. 24.9% (P=0.6) ● At least 1 quit attempt: 66.5% vs. 67.6% (P=0.8)
<p>Park et al. (42) 2015 United States NLST</p>	<p>Observational, matched case-control study Most of the NLST screening sites used direct mass mailing to contact potential participants. Communication and educational resources,</p>	<p>1,668 cases (quitters), 1,668 controls (smokers)</p>	<p>61 years (range: 52-74 years) 47.8% females Current and former smokers ≥ 30 pack-year smoking history; quit ≤ 15</p>	<p>Lung cancer screening; half had CT-scan, other half had chest X-Ray; Clinician-delivered 5A (ask, advise, assess, assist, arrange)</p>	<p>Prevalence of 5A and associated self-reported smoking cessation</p>	<ul style="list-style-type: none"> ● ‘Assist’ intervention associated with a 40% increase in odds of post-screen cessation; OR: 1.4 (95% CI: 1.21–1.63), ‘arrange’ associated with a 46% increase in odds of cessation; OR: 1.46 (95% CI: 1.19–1.79) ● Less intensive interventions (ask, advise, assess) did not increase the odds of cessation; OR: 1.10 (95% CI:

	local media announcements, presentations to community groups at clinics, churches, and meetings of special interest groups were also utilized (65)					0.93–1.30); 0.99 (95% CI: 0.84–1.17); 1.14 (95% CI: 0.98–1.32) respectively
Taylor et al. (46) 2017 United States Lombardi Comprehensive Cancer Center	Pilot RCT Volunteers who participate in clinical screening programs	46 intervention 46 control	60.2 years (mean; range: 50-73 years) 56.5 % females Current smokers 47.1% smoke ≥ 20 cigs/day Smoking history: 47.1 pack-years (mean)	Lung cancer screening; CT-can; usual care for control (including information/contact details for resources) or personalized telephone-based counselling using screening results	7-day self-reported + biochemically-confirmed point prevalence of abstinence at 3 months, no follow-up	Intervention versus control arm: <ul style="list-style-type: none"> ● Biochemically-verified cessation rates: 17.4% versus 4.3%, P=0.04 ● No difference in self-reported abstinence: 21.7% vs. 19.6%, P=0.80 ● 60.9% attended all six sessions
Marshall et al. (48) 2016 Australia Queensland Lung Cancer Screening	Pilot RCT Volunteers, recruited through newspaper advertisements and press releases (66)	28 intervention, 27 control	63 years (median in both groups), eligible: 60–74 36.4% female Current smokers Smoke 25 cigs/day (median) Smoking history: 57.5 pack-years (median) in both groups	Lung cancer screening; CT-scan; usual care for control (including information/contact details for resources) or single face-to-face session of tailored counselling using lung function results and lung cancer risk, usual care materials + MP3 take-home audio	Self-reported point-prevalence at 12 months, no follow-up	No difference between intervention versus control arm: <ul style="list-style-type: none"> ● Point prevalence of cessation: 14.3% vs. 18.5% (Fisher's Exact Test P=0.74) ● 45.5% of potential participants enrolled in smoking-sub study
Bade et al. (26) 2016	Observational Random sample from	1,268 participants (623 screen, 645 control)	50-69 years $\approx 43\%$ females	Lung cancer screening; CT-scan (screen arm);	Self-reported point-prevalence of smoking	<ul style="list-style-type: none"> ● Decrease in smoking prevalence by 9.6% (screen arm) and 10.4%

Germany LUSI	population registries	attended smoking cessation counselling (4,052 study participants in whole trial)	95.1% current smokers 46.8% smoke 20 ≥ cigs/day Eligible: ≥ 25-year smoking of ≥15 cigs/day, OR ≥30-year smoking of ≥10 cigs/day	all participants received personalized clinician-delivered smoking cessation counselling, adjusted to participant's current disposition to change smoking behavior	at 24 months after counselling	(controls) for participants who received SC counselling (both P<0.0001) ● Much less decrease in non-attenders of SC counselling, screen arm: 0.8 %, P=0.297; controls: 1.6%, P=0.034.
Pozzi et al. (40) 2015 Italy MILD	Observational Volunteers recruited through lay press and television advertisements (67)	187 participants	55 years (median; range: 47-72 years) 37.4% females Current smokers 63.1% smoke ≥20 cigs/day Smoking history: 20 pack-years (median, range: 0-120)	All participants received pharmacological aid (varenicline) combined with personalized clinician-delivered behavioral counselling	Sustained abstinence from smoking at 3, 6 and 12 months after enrollment	● Continuous smoking abstinence * at 3 months 48.7% * at 6 months: 33.7% * at 12 months: 19.8% ● 43% increase of odds of cessation in comparison to MILD trial participants who did not receive cessation assistance, OR: 1.43 (95% CI: 1.11-1.84) ● Treatment retention: 61.1%
Fillipo et al. (45) 2015 COSMOS-II	Observational, retrospectively reviewed Volunteers	71 participants	64.9 years (mean) 25.4% female Current smokers Eligible: >55 years, ≥30 pack-years	Lung cancer screening; CT-scan; 20 received miRNA test; all participants received personalized clinician-delivered behavioral counselling combined with pharmacological treatment (NRT, varenicline or bupropion)	Prolonged (>6-month) smoking abstinence	● Prolonged smoking abstinence in 57.1% of participants, 1.6% relapse rate ● 42.9% interrupted cessation program
van der Aalst (41) 2012 The Netherlands	RCT Population-registry based selection	642 intervention 642 control	57 years (median in both groups) Only males	Lung cancer screening; CT-scan for half of participants, standard brochure for control, or	Self-reported smoking behavior (prolonged smoking abstinence at	● 23% filled in questionnaire and received tailored advice

NELSON			<p>Current smokers</p> <p>Eligible: smoked >15 cigs/day for >25 years or >10 cigs/day for >30 years</p> <p>Smoking history: 38 pack-years (median in both groups)</p> <p>Smoke cigs/day: 18 (median in both groups)</p>	questionnaire to receive computer-tailored smoking cessation information	24 months after randomization	<ul style="list-style-type: none"> ● Prolonged abstinence lower in tailored information group (12.5%) than standard brochure group (15.6%), not statistically significant, OR =0.77 (95% CI: 0.56–1.06) ● Less than half (42.7% of brochure and 47.4% of tailored information group) recalled having received cessation advice
Clark et al. (47) 2004 United States Mayo clinic	RCT Volunteers, recruited through local and regional television and newspaper coverage	85 intervention 86 control	<p>57.4 years (range: 51– 74)</p> <p>49.1% females</p> <p>Current smokers 60% smoke \geq20 cigs/day</p>	<p>Lung cancer screening; CT-scan;</p> <p>Written self-help materials (control)</p> <p>Or list of internet sources for smoking cessation</p>	Self-reported 7-day point prevalence of smoking abstinence or readiness to smoke at 12 months follow-up	<p>Intervention versus control arm:</p> <ul style="list-style-type: none"> ● Quit attempts: 68% versus 48% (P=0.011) ● 7-days point prevalence of smoking cessation: 5% versus 10% (P=0.166) ● Readiness to quit smoking: 27% versus 30% (P=0.704) ● Review material: standard group is more likely to review all material (P=0.001) ● 27.6% of potential participants declined participation

Appendix: search strategy

Smoking cessation lung cancer screening

Database searched	via	Years of coverage	Records	Records after duplicates removed
Embase	Embase.com	1971 – present	177	175
Medline ALL	Ovid	1946 – present	121	22
Web of Science Core Collection	Web of Knowledge	1975 – present	130	14
Cochrane Central Register of Controlled Trials	Wiley	1992 – present	40	6
Other sources: Google Scholar			100	19
Total			568	236

Embase.com 177

('smoking cessation'/mj/de OR 'smoking cessation program'/mj/de OR (((smok* OR tobacco* OR cigar*) NEAR/6 (cessat* OR stop* OR abstinence* OR discontin* OR dependen* OR behav* OR quit* OR giv*-up))):ti) AND ('lung tumor'/exp OR (((lung* OR pulmonar*) NEAR/6 (tumor* OR tumour* OR cancer* OR carcinoma* OR neoplas*)):ab,ti,kw) AND ('cancer screening'/mj/de OR 'screening'/mj/de OR 'mass screening'/mj/de OR 'early cancer diagnosis'/mj/de OR 'computer assisted tomography'/mj/exp OR 'early diagnosis'/mj/de OR (screening* OR CT-scan* OR LDCT OR tomogra* OR ((early) NEAR/3 (diagnos* OR detect*)):ti)

Medline (Ovid) 121

(* Smoking Cessation/ OR (((smok* OR tobacco* OR cigar*) ADJ6 (cessat* OR stop* OR abstinence* OR discontin* OR dependen* OR behav* OR quit* OR giv*-up))).ti.) AND (exp Lung Neoplasms/ OR (((lung* OR pulmonar*) ADJ6 (tumor* OR tumour* OR cancer* OR carcinoma* OR neoplas*))).ab,ti,kf.) AND (exp * Early Diagnosis/ OR * Mass Screening/ OR exp * "Tomography, X-Ray Computed"/ OR (screening* OR CT-scan* OR LDCT OR tomogra* OR ((early) ADJ3 (diagnos* OR detect*))).ti.)

Web of science 130

TI=((smok* OR tobacco* OR cigar*) NEAR/5 (cessat* OR stop* OR abstinence* OR discontin* OR dependen* OR behav* OR quit* OR giv*-up)) AND TS=((lung* OR pulmonar*) NEAR/5 (tumor* OR tumour* OR cancer* OR carcinoma* OR neoplas*)) AND TI=(screening* OR CT-scan* OR LDCT OR tomogra* OR ((early) NEAR/3 (diagnos* OR detect*)))

Cochrane central 40

((((smok* OR tobacco* OR cigar*) NEAR/6 (cessat* OR stop* OR abstinence* OR discontin* OR dependen* OR behav* OR quit* OR giv* NEXT up))):ti) AND (((((lung* OR pulmonar*) NEAR/6 (tumor* OR tumour* OR cancer* OR carcinoma* OR neoplas*)))ab,ti,kw) AND ((screening* OR CT-scan* OR LDCT OR tomogra* OR ((early) NEAR/3 (diagnos* OR detect*)))ti)

Google Scholar *Top 100 relevant records*

intitle:"smoke|smoking|tobacco cessation|stop|quit" "lung|pulmonary tumor|tumour|cancer|carcinoma|neoplasm"
intitle:screening|CT|LDCT|tomography|"early diagnosis|detection"

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