



Ontario Health
Cancer Care Ontario

Lung Cancer Screening Pilot for People at High Risk

Evaluation Indicator List

May 2020

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Recruitment

Indicator	Methodology
<p>Number of self-presenting participants</p>	<p>Definition: Number of participants who self-presented to the pilot.</p> <p>Numerator: number of participants who self-presented to the pilot in the reporting period.</p> <p>Cohort: all participants who presented to the pilot (self-presented and physician-referred)</p>
<p>Proportion of self-presenting participants who met triage criteria</p>	<p>Definition: the proportion of participants who self-presented to the pilot and met triage criteria.</p> <p>Denominator: Total number of participants who entered the pilot by self-presentation in the reporting period.</p> <p>Numerator: total number of participants who entered the pilot by self-presentation and met triage criteria, during the reporting period.</p>
<p>Proportion of provider-referred participants</p>	<p>Definition: the proportion of participants who were referred to the pilot by a physician.</p> <p>Denominator: Total number of participants who entered the pilot in the reporting period.</p> <p>Numerator: total number of participants who entered the pilot by physician referral during the reporting period</p>
<p>Proportion of participants meeting triage criteria who had a risk assessment booked</p>	<p>Definition: the proportion of participants recruited to the pilot who met triage criteria (applies only to self-presenters; all physician-referred participants are assumed to meet triage criteria and had a risk assessment appointment booked.</p> <p>Denominator: total number of participants recruited during reporting period (physician-referred and self-presented) who met triage criteria.</p>

	Numerator: total number of participants recruited during reporting period who met triage criteria and had a risk assessment appointment booked.
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Risk Assessment

Indicator	Methodology
Wait time from pilot entry to risk assessment completion	<p>Definition: the wait time from pilot entry (physician referral or self-presentation) to completion of risk assessment, in days.</p> <p>Cohort: total number of participants who completed a risk assessment during the reporting period.</p>
Proportion of participants eligible for screening	<p>Definition: the proportion of participants who completed a risk assessment and were eligible for screening.</p> <p>Denominator: total number of participants who completed a risk assessment in the reporting period.</p> <p>Numerator: total number of participants who completed a risk assessment during the reporting period and were eligible for screening.</p>
Incomplete risk assessments	<p>Definition: the proportion of participants who booked a risk assessment appointment but did not complete a risk assessment.</p> <p>Denominator: total number of participants recruited during reporting period who met triage criteria and had a risk assessment appointment booked.</p> <p>Numerator: total number of recruited participants during reporting period who had a risk assessment booked but did not complete a risk assessment.</p>
Wait time from completion of risk assessment to date of initial LDCT appointment	<p>Definition: time (in days) from the date of risk assessment to date of baseline LDCT scan appointment.</p> <p>Cohort: risk-assessed participants who were eligible</p>

	for screening, and had a baseline LDCT scan appointment scheduled.
Wait time from risk assessment completion to baseline LDCT scan completion	<p>Definition: time (in days) from the date of risk assessment to date of baseline LDCT scan completion.</p> <p>Cohort: risk assessed participants who were eligible for screening, and completed a baseline LDCT scan.</p>

Smoking Cessation

Indicator	Methodology
Proportion of smokers who quit smoking during the pilot	<p>Definition: the proportion of screen-eligible current smokers (at Risk Assessment) who quit smoking during the pilot.</p> <p>Denominator: total number of risk-assessed participants who were current smokers at risk assessment and had baseline and 12-month follow-up scans.</p> <p>Numerator: total number of risk-assessed participants who were former smokers at 12-month follow-up scan.</p>
Proportion of current smokers who were eligible for screening	<p>Definition: the proportion of risk-assessed participants who were current smokers (at risk assessment) who met screening eligibility criteria.</p> <p>Denominator: total number of risk-assessed participants who were current smokers at risk assessment and had baseline and 12-month follow-up scans.</p> <p>Numerator: total number of risk-assessed participants who were current smokers at risk assessment and eligible for screening.</p>
Change in self-reported quit attempts during the pilot	<p>Definition: mean difference between number of quit attempts reported at risk assessment and number of quit attempts reported at 12-month follow-up scan.</p>

	<p>Cohort: total screen-eligible current smokers who had a baseline LDCT scan with Lung-RADS™ score 1 or 2 and attended one year recall LDCT.</p>
Change in self-reported heaviness of smoking index	<p>Definition: mean difference between self-reported heaviness of smoking index (HSI) at baseline risk assessment and reported HSI at 12-month follow-up scan.</p> <p>Cohort: total screen-eligible current smokers who had a baseline LDCT scan with Lung-RADS™ score 1 or 2 and attended one-year recall LDCT.</p>
Proportion relapse among former smokers	<p>Definition: the proportion of screen-eligible participants who were former smokers at baseline LDCT and current smokers at 12-month follow-up scan.</p> <p>Denominator: total number of risk-assessed participants who were former smokers at risk assessment and had baseline and 12-month follow-up scans.</p> <p>Numerator: total number of current smokers at follow-up who had been former smokers at risk assessment.</p>
Proportion of current smokers who accepted referral to smoking cessation services	<p>Definition: the proportion of risk-assessed participants (regardless of screening eligibility) who were current smokers who accepted referral to smoking cessation services, either in-hospital or Smokers’ Helpline.</p> <p>Denominator: total number of risk-assessed participants who were current smokers.</p> <p>Numerator: total number of risk-assessed participants who were current smokers at risk assessment and accepted referral to smoking cessation services (in-hospital or Smokers’ Helpline).</p>

<p>Proportion of current smokers who had a baseline LDCT scan who attended first in-person smoking cessation counselling session</p>	<p>Definition: the proportion of screen-eligible participants who had a baseline LDCT scan, were current smokers, and attended first in-person smoking cessation counselling session.</p> <p>Denominator: Proportion of risk-assessed participants who were eligible for screening, had a baseline LDCT scan, were current smokers and accepted referral to in-person smoking cessation counselling.</p> <p>Numerator: Proportion of risk-assessed participants who were eligible for screening, had a baseline LDCT scan, and were current smokers, who accepted referral to in-person smoking cessation counselling and attended first in-person session.</p>
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Low-Dose CT Scan

Indicator	Methodology
<p>Proportion of eligible participants who had a baseline LDCT scan</p>	<p>Definition: the proportion of screen-eligible participants who completed a baseline LDCT scan.</p> <p>Denominator: total number of eligible participants in reporting period.</p> <p>Numerator: total number of eligible participants in reporting period who completed a baseline LDCT scan.</p>
<p>Proportion of eligible participants who did not have a baseline LDCT scan</p>	<p>Definition: the proportion of screen-eligible participants who did not complete a baseline LDCT scan.</p> <p>Denominator: total number of eligible participants in reporting period.</p> <p>Numerator: total number of eligible participants in reporting period who did not complete a baseline LDCT scan.</p>

<p>Wait time for LDCT scan completion to result communication</p>	<p>Definition: mean time in days from the date LDCT scan was completed to date result was relayed to participant.</p> <p>Cohort: all screen-eligible participants who completed an LDCT scan during the reporting period.</p>
<p>Proportion of LDCT scans with each Lung-RADS™ score, by screening round</p>	<p>Definition: the proportion of LDCT scans with Lung-RADS™ scores of 1, 2, 3, 4A, 4B and 4X for each screening round.</p> <p>Denominator: total number of LDCT scans in each screening round completed during the reporting period.</p> <p>Numerator: Total number of LDCT scans completed in each screening round with each Lung-RADS™ score.</p>

Follow-up

Indicator	Methodology
<p>Lung-RADS™ 4 referred for follow-up</p>	<p>Definition: Proportion of participants with a Lung-RADS™ 4 result who were referred to diagnostic assessment.</p> <p>Denominator: Number of participants who had a LDCT scan with a Lung-RADS™ 4 result (4B, 4X).</p> <p>Numerator: Number of participants who had a Lung-RADS™ 4 result (4B, 4X) and were referred to diagnostic assessment.</p>
<p>Lung-RADS™ 4 referral follow-up</p>	<p>Definition: Proportion of participants with a Lung-RADS™ 4 result who were referred to and participated in diagnostic assessment.</p> <p>Denominator: Number of participants with a Lung-RADS™ 4 result (4B, 4X) who were referred to diagnostic assessment.</p>

	<p>Numerator: Number of participants with a Lung-RADS™ 4 result (4B, 4X) who were referred to and participated in diagnostic assessment.</p> <p>Participation in diagnostic assessment is defined as the participant attended in person for the diagnostic work-up, regardless of whether they completed all test assessments required for definitive results.</p>
<p>Distribution of Lung-RADS™ scores at 3-month follow-up of a previous Lung-RADS™ 4A</p>	<p>Definition: Distribution of Lung-RADS™ score at 3-month follow-up, among those who had a 4A score.</p> <p>Cohort: Participants who had a Lung-RADS™ 4A result and subsequently returned for a 3-month follow-up LDCT scan.</p> <p><i>3-month follow-up Lung-RADS™ score: 1 or 2, 3, 4A, 4B, 4X.</i></p>

Retention

Indicator	Methodology
<p>12-month recall of Lung-RADS™ 1-2 result</p>	<p>Definition: Proportion of participants with a Lung-RADS™ 1 or 2 result who had a 12-month recall, stratified by return interval.</p> <p>Denominator: Participants who completed a LDCT scan with a Lung-RADS™ score of 1 or 2.</p> <p>Numerator: Participants who completed a LDCT scan with a Lung-RADS™ scores of 1 or 2, and returned for their 12-month recall LDCT scan.</p>
<p>6-month follow-up of Lung-RADS™ 3 result</p>	<p>Definition: Proportion of participants with a Lung-RADS™ 3 result who had a 6-month follow-up LDCT, stratified by return interval.</p> <p>Denominator: Participants who completed a LDCT scan with a Lung-RADS™ score result of 3.</p>

	<p>Numerator: Participants who completed a LDCT scan with a Lung-RADS™ score result of 3, and returned for their 6-month follow-up LDCT scan.</p>
3-month follow-up of Lung-RADS™ 4A result	<p>Definition: Proportion of participants with a Lung-RADS™ 4A result who completed a 3-month follow-up LDCT, stratified by return interval.</p> <p>Denominator: Participants who completed a LDCT scan with a Lung-RADS™ score result of 4A.</p> <p>Numerator: Participants who completed a LDCT scan with a Lung-RADS™ score result of 4A, and returned for their 3-month follow-up LDCT scan.</p>

Diagnosis

Indicator	Methodology
Cancer stage of Lung-RADS™ 4A at baseline	<p>Definition: Distribution of cancer stage at diagnosis for participants with Lung-RADS™ 4A score at baseline and diagnosed with lung cancer.</p> <p>Cohort: Participants who had a baseline LDCT scan with Lung-RADS™ score of 4A and scheduled to have a 3-month follow-up LDCT scan; and subsequently confirmed with lung cancer by the Ontario Cancer Registry.</p>
Positive predictive value	<p>Definition: Proportion of participants with abnormal LDCT scan result who were diagnosed with lung cancer after completing diagnostic work-up.</p> <p>Denominator: Number of participants with an abnormal LDCT scan result with a definitive diagnosis (positive or negative for lung cancer) after completing diagnostic work-up.</p> <p>Numerator: Number of participants with an abnormal LDCT scan result with a positive lung cancer diagnosis after completing diagnostic work-up.</p>

<p>Screen-detected lung cancer by stage</p>	<p>Definition: Proportion of screen-detected lung cancers by stage at diagnosis.</p> <p>Denominator: Number of participants with screen-detected lung cancer.</p> <p>Numerator: Number of participants with screen-detected lung cancer by stage at diagnosis (I, II, III, or IV).</p>
<p>Lung cancer within one year of a normal LDCT scan</p>	<p>Definition: Proportion of participants who were diagnosed with lung cancer within one year of a normal screening LDCT scan.</p> <p>Denominator: Number of participants who had a normal (Lung-RADS™ 1 or 2) screening LDCT scan.</p> <p>Numerator: Number of participants who were diagnosed with lung cancer within one year of a normal (Lung-RADS™ 1 or 2) screening LDCT scan.</p>
<p>Proportion of interval lung cancers</p>	<p>Definition: Proportion of lung cancers that were interval cancers.</p> <p>Denominator: Number of participants who were diagnosed with lung cancer.</p> <p>Numerator: Number of participants who were diagnosed with lung cancer within one year following a normal (Lung-RADS™ 1 or 2) screening LDCT scan.</p>
<p>Wait time from diagnostic assessment referral received to first thoracic consult</p>	<p>Definition: Wait time from diagnostic assessment referral received date to first consult date with thoracic surgeon or respirologist.</p> <p>Cohort: Participants with a Lung-RADS™ score of 4B or 4X for whom diagnostic assessment referral was received and who had a consultation with thoracic surgeon or respirologist.</p> <p>Calculation: Median and 90th percentile wait time in days = date of first thoracic surgeon/respirologist</p>

	consult – date of diagnostic assessment referral received.
Wait time from diagnostic assessment referral received to diagnosis	<p>Definition: Wait time from diagnostic assessment referral received date to lung cancer diagnosis date.</p> <p>Cohort: Participants with a Lung-RADS™ score of 4B or 4X for whom diagnostic assessment referral was received and had a diagnostic outcome for lung cancer (positive, negative, suspicious follow-up).</p> <p>Calculation: Median and 90th percentile wait time in days = date of diagnosis – date of diagnostic assessment referral received.</p>
Cancer detection rate	<p>Definition: Proportion of participants with a screen-detected lung cancer, stratified by screening round (baseline, 12-month recall).</p> <p>Denominator: Number of participants who completed a baseline or 12-month recall LDCT scan.</p> <p>Numerator: Number of participants with a screen-detected lung cancer diagnosed following an abnormal baseline or 12-month recall LDCT scan result.</p>
Cancer diagnosis	<p>Definition: Proportion of participants who underwent diagnostic assessment, stratified by diagnostic result and screening round.</p> <p>Denominator: Number of participants who underwent diagnostic assessment after a baseline or 12-month recall LDCT scan.</p> <p>Numerator: Number of participants who underwent diagnostic assessment, stratified by diagnostic outcome for lung cancer (positive, negative, suspicious follow-up).</p>

Harms (Diagnosis)

Indicator	Methodology
<p>Follow-up with image-guided biopsy</p>	<p>Definition: Proportion of participants with a Lung-RADS™ 4 result who underwent image-guided biopsy, stratified by diagnostic outcome.</p> <p>Denominator: Number of participants with a Lung-RADS™ 4 result (4B or 4X) who participated in diagnostic assessment.</p> <p>Numerator: Number of participants with a Lung-RADS™ 4 result (4B or 4X) who participated in diagnostic assessment and had an image-guided biopsy. Results were stratified by diagnostic outcome for lung cancer (positive, negative, suspicious follow-up).</p>
<p>Follow-up with surgical lung biopsy</p>	<p>Definition: Proportion of participants with a Lung-RADS™ 4 result who underwent surgical lung biopsy or resection, stratified by diagnostic outcome.</p> <p>Denominator: Number of participants with a Lung-RADS™ 4 result (4B or 4X) who participated in diagnostic assessment and had a surgical lung biopsy or resection.</p> <p>Numerator: Number of participants with a Lung-RADS™ 4 result (4B or 4X) who participated in diagnostic assessment and had a surgical lung biopsy or resection. Results were stratified by diagnostic outcome for lung cancer (positive, negative, suspicious follow-up).</p>
<p>Complications within 90 days of lung cancer diagnostic tests</p>	<p>Definition: Proportion of participants who had complications within 90 days of invasive lung cancer diagnostic tests, stratified by complication and diagnostic test type.</p> <p>Denominator: Number of participants with a Lung-RADS™ 4 result (4B or 4X) who participated in</p>

	<p>diagnostic assessment and had at least one invasive lung cancer diagnostic test.</p> <p>Numerator: Number of participants who had complications within 90 days of an invasive lung cancer diagnostic test.</p> <p>Participant’s complications were identified based on the primary diagnosis for their emergency department visit, or hospital admission. Results were stratified by diagnostic outcome for lung cancer (positive, negative, suspicious follow-up).</p>
<p>Unplanned hospital visits within 90 days of invasive lung cancer diagnostic tests</p>	<p>Definition: Proportion of participants who had an unplanned hospital visit within 90 days of invasive lung cancer diagnostic tests, stratified by lung cancer diagnosis.</p> <p>Denominator: Number of participants with a Lung-RADS™ 4 result (4B or 4X) who participated in diagnostic assessment and had at least one invasive lung cancer diagnostic test.</p> <p>Numerator: Number of participants who had at least one unplanned hospital visit (emergency department visit or hospital admission) within 90 days of an invasive lung cancer diagnostic test. Results were stratified by diagnostic outcome for lung cancer (positive, negative, suspicious follow-up).</p>
<p>Death within 30 days of invasive lung cancer diagnostic tests</p>	<p>Definition: Proportion of participants who died within 30 days of an invasive lung cancer diagnostic test.</p> <p>Denominator: Number of participants with a Lung-RADS™ 4 result (4B or 4X) who participated in diagnostic assessment and had at least one invasive lung cancer diagnostic test.</p> <p>Numerator: Number of participants who died within 30 days of an invasive lung cancer diagnostic test.</p>

Treatment

Indicator	Methodology
Lung cancer treatment for screen detected cancers	<p>Definition: Proportion of participants with screen-detected lung cancer who received lung cancer treatment, stratified by treatment type.</p> <p>Denominator: Number of participants with screen-detected lung cancer.</p> <p>Numerator: Number of participants with screen-detected lung cancer who received lung cancer treatment.</p>