Lung Cancer Screening in Alberta in 2023

UNIVERSITY OF ALBERTA

Lung Cancer Screening in Alberta in 2023

- Dr Gavin Armstrong MB BCh MRCP FRCR(UK)
  - Partner Radiologist – MIC Medical Imaging
  - Thoracic and Body Radiologist – Royal Alexandra Hospital, Edmonton
  - Member of ALCSP DI Working Group

Faculty / Presenter Disclosure

Faculty/Presenter Disclosure Faculty: [Gavin Armstrong]

Relationships with financial sponsors:

Grants/research support: [None]
Speakers bureau/honoraria: [None]
Consulting fees: [None]
Patents: [None]
Other: [Employee of MIC Medical Imaging]

Objectives

- Evidence for Lung Cancer Screening
- Improving the efficiency of Lung Cancer Screening
- Limitations and potential harms
- Lung Cancer Screening in Alberta in 2023
- MDT and patient pathways

Lung Cancer Screening - Why?

- Most common cause of cancer deaths in Canada
- 5-year relative survival rate 17%
- 70% advanced disease at diagnosis (Stage III-IV)
- >1500 deaths/yr in Alberta

Lung Cancer Screening - Why?

- NLST Trial (US) 2011
  - 20% reduction in lung cancer deaths
  - 6.7% reduction in all-cause mortality
  - 57% of cancers detected at early stage
- NELSON study (Netherlands) 2020
  - CT screening vs no screening
  - 24% reduction lung cancer deaths (M)
  - Effect greater in smaller sample of females
- Similar results in other European studies – MILD (2019); LUSI (2020)

1. NEJM 2011;365:395-409
2. NEJM 2020;382:503-513


THE NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Targeting of Low-Dose CT Screening According to the Risk of Lung-Cancer Death

Stephanie A. Kovalchik, Ph.D., Martin Tammemagi, Ph.D., Christine D. Berg, M.D., Neil E. Caporaso, M.D., Tom L. Riley, B.Sc., Mary Korch, M.Sc., Gerard A. Silvestri, M.D., Anil K. Chaturvedi, Ph.D., and Hormuzd A. Katki, Ph.D.

ABSTRACT

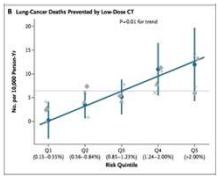
BACKGROUND

In the National Lung Screening Trial (NLST), screening with low-dose computed tomography (CT) resulted in a 20% reduction in lung-cancer mortality among participants between the ages of 55 and 74 years with a minimum of 30 pack-years of smoking and no more than 15 years since quitting. It is not known whether the benefits and potential harms of such screening vary according to lung-cancer risk.

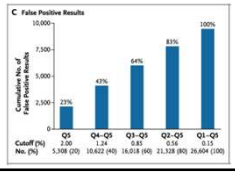
From the Di ngs and Gen N.A.R.I.) and National Ca tutes of Hea agement Ser Rockville, M

PLCOm2012 lung cancer risk prediction model

N ENGL J MED 369;3: July 18, 2013



NNS 5276 531 415 171 161



PanCan Study - 2017

- Canadian Research
- Risk prediction model
  - Age, smoking duration, pack-years, FHx, education level, BMI, CXR <3yrs, COPD
- Enrolled participants had 6-year lung cancer risk of at least 2%
- Effective at identifying individuals with early-stage cancers; at higher proportion than NLST
  - 70% vs 57%

Lancet Oncol. 2017 Nov;18(11):1523-1531

LDCT Lung Cancer Screening Endorsement

- US Preventative Services Task Force (USPSTF)
  - 2013
- Canadian Task Force on Preventative Health Care (CTFPHC)
  - 2016


CMAJ GUIDELINES

Recommendations on screening for lung cancer

Canadian Task Force on Preventive Health Care*

- CTFPHC published in CMAJ in 2016
- But.....
  - No formal screening program existed in Alberta
- Estimated that 140000 Albertans are eligible for lung cancer screening

Lung Cancer Screening

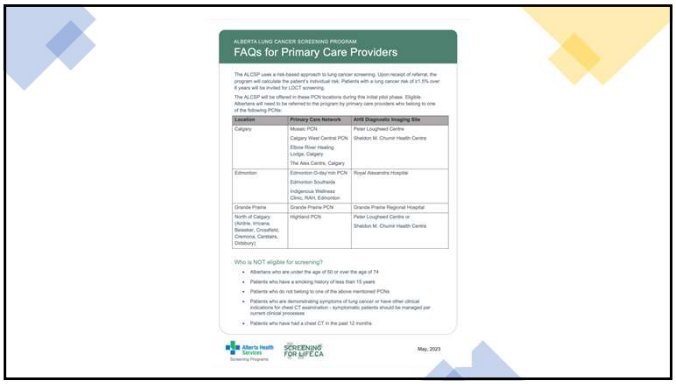
- Priority Action in 2019-2029 Canadian Strategy for Cancer Control
  - Grant funding to AHS for pilot
- AB Cancer Plan to 2030 Vision
  - "By 2030, Alberta will be a place where most cancers are prevented, more cases of cancer are cured, and the suffering of people affected by cancer is dramatically reduced"
- ALCSP funded through AHS and Canadian Partnership Against Cancer (CPAC)

Who is at Risk of Lung Cancer?

- 1/13 Albertans will develop lung cancer
- Smoking; asbestos exposure; radon gas; air pollution
- ?? effects of vaping and marijuana

Who is Eligible for Lung Cancer Screening in Alberta?

- ALCSP
  - 2 year pilot project
- 3000 eligible Albertans
- Patients from selected PCNs
- LDCT scans in Edmonton, Grande Prairie and Calgary


ALBERTA LUNG CANCER SCREENING PROGRAM

FAQs for Primary Care Providers

The ALCSP uses a risk-based approach to lung cancer screening. Upon receipt of referral, the program will calculate the patient's individual risk. Patients with a lung cancer risk of ≥1.5% over 6 years will be invited for LDCT screening.

The ALCSP will be offered in these PCN locations during this initial pilot phase. Eligible Albertans will need to be referred to the program by primary care providers who belong to one of the following PCNs:

Location	Primary Care Network	AHS Diagnostic Imaging Site
Calgary	Mosaic PCN Calgary West Central PCN Elbow River Healing Lodge, Calgary The Axia Centre, Calgary	Peter Lougheed Centre Sheldon M. Chumir Health Centre
Edmonton	Edmonton O-day'min PCN Edmonton Southside Indigenous Wellness Clinic, RAH, Edmonton	Royal Alexandra Hospital
Grande Prairie	Grande Prairie PCN	Grande Prairie Regional Hospital
North of Calgary (Airdrie, Irricana, Bowater, Crossfield, Crowsnest, Carstairs, Didsbury)	Highland PCN	Peter Lougheed Centre or Sheldon M. Chumir Health Centre

Who is NOT eligible for screening?

- Albertans who are under the age of 50 or over the age of 74
- Patients who have a smoking history of less than 15 years
- Patients who do not belong to one of the above-mentioned PCNs
- Patients who are demonstrating symptoms of lung cancer or have other clinical indications for chest CT examination – symptomatic patients should be managed per current clinical processes
- Patients who have had a chest CT in the past 12 months

Alberta Health Services Screening Programs | SCREENING FOR LIFE CA | May, 2023

Who is Eligible for Lung Cancer Screening in Alberta?

- 50-74 yrs old
- Current or former smokers
- > 15 pack years of smoking
- Risk will be calculated by the program
- PLCOm2012 – 6 year risk of > 1.5%

Who is NOT Eligible for Lung Cancer Screening in Alberta?

- Patients without a family physician
- <50 or >74 yrs old
- < 15 pack years of smoking
- Symptomatic patients
- CT chest within past 12 months
- Life expectancy < 10 years OR significant comorbidities

Alberta Lung Cancer Screening Program (ACLSP)

- Started 1st Sept 2022
- 7-month report card
- 975 referrals
- 584 accepted into program
  - 59.9%
- Edmonton – 238
- Calgary – 590
- Grande Prairie - 125

ALCSP Annual Report 2022-23 – V.1 March 31,2013

Alberta Lung Cancer Screening Program Pilot

- Annual low dose CT scan
- ACR Lung-Rads reporting framework
- NP led management and communication
- ATOP assessment for high-risk lesions
- Monthly ALCSP tumor board rounds
- Tobacco cessation resources

Economic Impact of Lung Cancer Screening

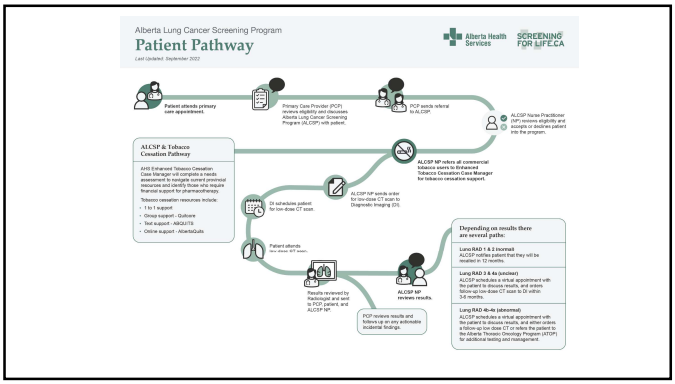
- Decision analytical modeling technique
- 3-year time horizon
- Benefits of decreased HSU from earlier diagnosis vs costs of screening
  - e.g. Inpatient, outpatient, physician services, costs for Rx drugs and cancer treatments
- Assuming 101000 eligible Albertans
- Estimated 88476 scans over 3 years
- Stage shift to earlier diagnosis
- Screening cost $35.6M vs $42M in saved HSU costs
  - Net cost avoidance $6.65M; probability 72%

- JTO Clin Res Rep. 2022 Jul;3(7):100350

Harms of Lung Cancer Screening?

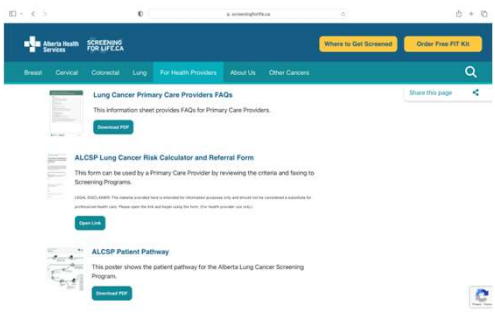
- Radiation dose
  - Equivalent to 6-12 mths of environmental radiation or 5-10 CXRs
- False positive scans
  - 2-3%
- Incidental findings
- Early recall for CT and other investigations
  - 5-8% have abnormalities, unlikely to be cancer, but additional LDCT recommended
- Overdiagnosis
- Cost and resource utilization

www.screeningforlife.ca



ALCSP – Patient Referral

- https://screeningforlife.ca/for-health-providers/lung-screening-information/risk-calculator-and-referral-form/

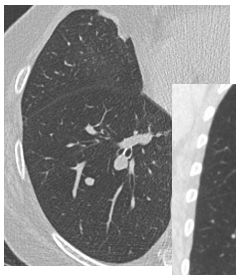


ACR Lung-Rads

Possible outcomes of a screening CT

- Normal result – 90%
- Unclear result – 7%
- Abnormal result – 3%
- Incidental findings – 10%

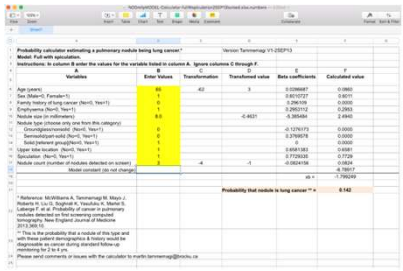
Lung-Rads 2



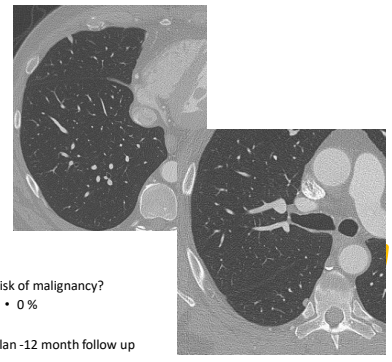
65 yr old female; smoker; no emphysema; no FHx
5 mm RLL nodule

- Risk of malignancy?
  - < 1%
- Plan -12 month follow up

Nodule Risk Calculator

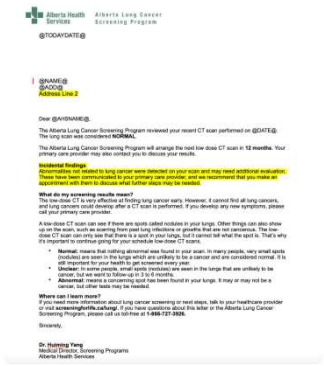


Lung-Rads 2



- Risk of malignancy?
  - 0 %
- Plan -12 month follow up

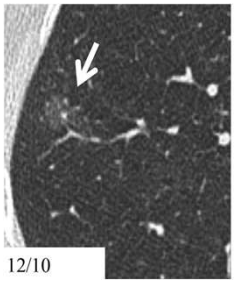
Results communication – Lung-Rads 1 or 2



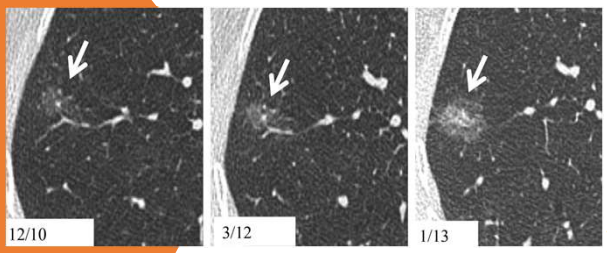
Lung-Rads 3

50 yr old Male

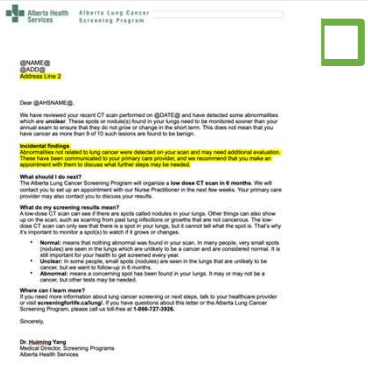
12 mm GGO



- Risk of malignancy?
  - 3.2 %
- Plan – 6 month follow up



Results communication – Lung-Rads 3



Alberta Health Services — Alberta Lung Cancer Screening Program

@NAME@
@ADD@
Address Line 2

Dear @AHSNAME@,

We have reviewed your recent CT scan performed on @DATE@ and have detected some abnormalities which are **unclear**. These spots or nodule(s) found in your lungs need to be monitored sooner than your annual exam to ensure that they do not grow or change in the short term. This does not mean that you have cancer as more than 9 of 10 such lesions are found to be benign.

Incidental findings
Abnormalities not related to lung cancer were detected on your scan and may need additional evaluation. These have been communicated to your primary care provider, and we recommend that you make an appointment with them to discuss what further steps may be needed.

What should I do next?
The Alberta Lung Cancer Screening Program will organize a **low dose CT scan in 6 months**. We will contact you to set up an appointment with our Nurse Practitioner in the next few weeks. Your primary care provider may also contact you to discuss your results.

What do my screening results mean?
A low-dose CT scan can see if there are spots called nodules in your lungs. Other things can also show up on the scan, such as scarring from past lung infections or growths that are not cancerous. The low-dose CT scan can only see that there is a spot in your lungs, but it cannot tell what the spot is. That's why it's important to monitor a spot(s) to watch if it grows or changes.

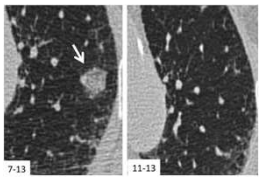
- **Normal:** means that nothing abnormal was found in your scan. In many people, very small spots (nodules) are seen in the lungs which are unlikely to be a cancer and are considered normal. It is still important for your health to get screened every year.
- **Unclear:** In some people, small spots (nodules) are seen in the lungs that are unlikely to be cancer, but we want to follow-up in 6 months.
- **Abnormal:** means a concerning spot has been found in your lungs. It may or may not be a cancer, but other tests may be needed.

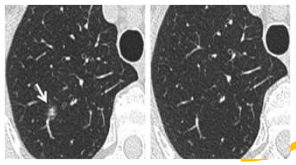
Where can I learn more?
If you need more information about lung cancer screening or next steps, talk to your healthcare provider or visit **screeningforlife.ca/lung/**. If you have questions about this letter or the Alberta Lung Cancer Screening Program, please call us toll-free at **1-866-727-3926**.

Sincerely,

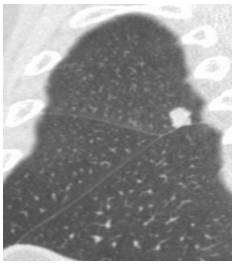
Dr. Huiming Yang
Medical Director, Screening Programs
Alberta Health Services

Not all nodules are cancer…..





Lung-Rads 4



70 yr old male

13 mm nodule

- Risk of malignancy?
  - 15-20 %
- Plan – MDT team discussion; consider PET-CT/biopsy

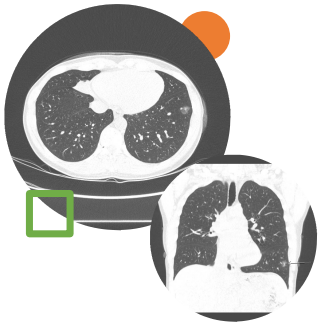
Next steps for ALCSP

- Increased recruitment
  - Patient self-referral coming soon……
  - 1-866-727-3926
- Demonstration to AHS of key metrics
- Prove lack of impact on other services

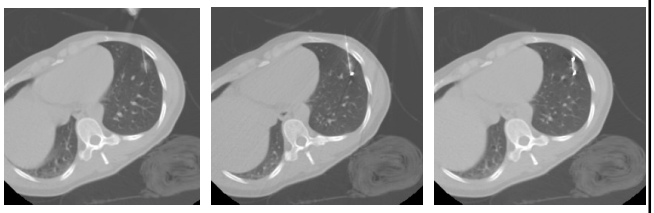
Improving Efficiency of Lung Cancer Screening

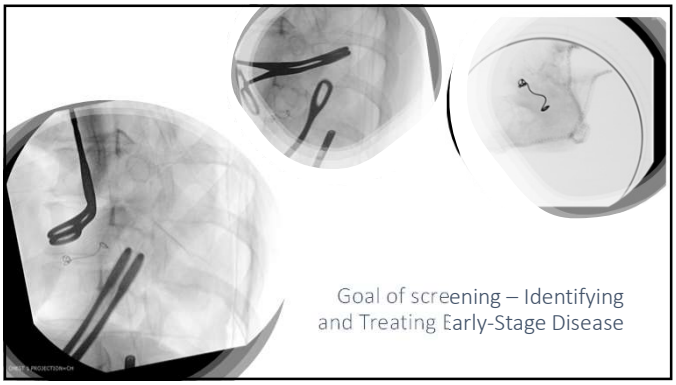
- Risk calculators
  - Patient risk for developing lung cancer
  - Nodule risk
- Training
- Synoptic reporting
- MDT

Goal of screening – Identifying and Treating Early-Stage Disease



Goal of screening – Identifying and Treating Early-Stage Disease





Summary

- Low Dose CT for Lung Cancer Screening is evidence based
- Making Lung Cancer Screening more efficient
- ALCSP is up and running
- Patient pathways and referral process

UNIVERSITY OF ALBERTA

Acknowledgements

Dr Alain Tremblay, Clinical Lead for ALCSP

Nadine Strilchuk, NP for ALCSP
Nadine.strilchuk@ahs.ca

Radiologist, clinical and non-clinical colleagues on ALCSP Diagnostic Imaging QI Working Group

References

- 1. Tammemagi MC, Schmidt H, Martel S, et al. **Participant selection for lung cancer screening by risk modelling (the Pan-Canadian Early Detection of Lung Cancer PanCan study): a single-arm, prospective study.** *Lancet Oncology 2017; 18: 1523-1531.*
- 2. Aberle DR, Adams AM, Berg CD, et al. **Reduced lung-cancer mortality with low-dose computed tomographic screening.** *The New England Journal of Medicine 2011; 365: 395-409.*
- 3. de Koning HJ, van der Aalst CM, de Jong PA, et al. **Reduced Lung-Cancer Mortality with Volume CT Screening in a Randomized Trial.** *N Engl J Med 2020; 382: 503-513.*
- 4. ACR **Lung CT screening reporting & data system Lung-RADS Version 2022.** *https://www.acr.org/Clinical-Resources/Reporting-and-Data-Systems/Lung-Rads*
- 5. Kovalchik SA, Tammemagi MC, Berg CD, et al. **Targeting of Low Dose CT Screening According to the Risk of Lung Cancer Death.** *N Engl J Med 2013; 369:245-254.*
- 6. **Alberta Lung Cancer Screening Program 2022-23 Annual Report; V.1 March 31,2013**
- 7. ***www.screeningforlife.ca***
- 8. Thanh NX, Pham T-M, Waye A, Tremblay A et al. **Expected Cost Savings From Low-Dose CT Scan Screening for Lung Cancer in Alberta, Canada.** *JTO Clin Res Rep 2022;3(7):100350.*