

BC Cancer Lung Screening

Primary Care Provider Resource Guide



Communicating Lung Screening
Information to Patients

www.screeningbc.ca/lung

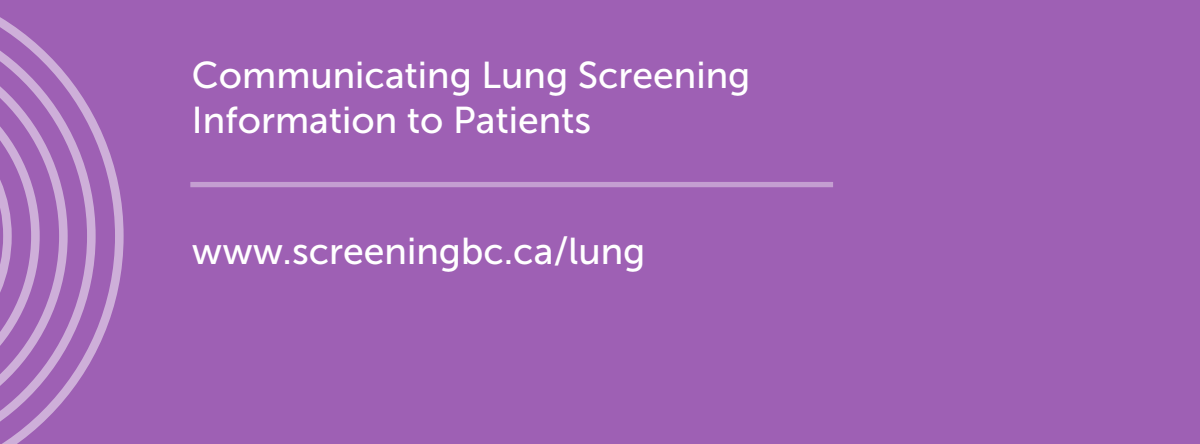






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Lung Screening Program Overview

Lung cancer is the leading cause of cancer death in Canada and worldwide. In B.C., seven people die of lung cancer every day.¹ With 70 per cent of all cases diagnosed at an advanced stage, the Lung Screening Program aims to detect lung cancer at an earlier stage, when treatment is more effective. A network of lung screening clinics has been established across B.C. within each health authority, using the existing computed tomography (CT) capacity in hospitals for patients to access.

Lung screening will involve a low-dose computed tomography (LDCT) scan of the lungs. During the scan, the patient lies on a table, and a CT scanner takes detailed images of their lungs. The scan takes less than 15 seconds and is not painful. Patients do not need to take any medications, or receive any needles for this test. After a patient's LDCT scan, a radiologist with expertise in early diagnosis will review the images taken at a designated reading site located within the patient's health authority. Results of the patient's lung scan will be sent to the patient and their primary care provider.

It's expected that once the Lung Screening Program is fully implemented across B.C., approximately 20,000 patients per year will receive screening. Of these patients, the program aims to diagnose approximately 350 cases annually, with more than 75 per cent diagnosed at an earlier stage than would have previously.

Who is eligible for lung screening?

Lung screening is best for those who are at high-risk for lung cancer and who are not experiencing any symptoms. This usually includes people who are:

- Between 55 and 74 years of age;
- Currently smoking, or have previously smoked; and,
- Have a smoking history of 20 years or more.

If patients meet the above criteria, they are encouraged to call the Lung Screening Program (1-877-717-5864) to complete a consultation over the phone. The consultation involves a risk assessment to determine the patient's screening eligibility. Please refer to the Program Flowchart (pages 4 and 5) for an illustration of the lung screening pathway.

Role of primary care providers

Primary care providers play an important role in the Lung Screening Program, including:

- Supporting patients with their decision making, and recommending lung screening when appropriate;
- Providing smoking cessation support; and,
- Providing follow-up for incidental findings and support for abnormal results.

Importance of organized lung screening

An organized lung screening program is essential for the following reasons:

- To ensure eligible British Columbians have an equitable opportunity to participate in high quality lung screening.
- To ease the burden on primary care providers by acting as a centralized resource and assuming responsibility for eligibility determination, shared decision making, smoking cessation counselling, results communication, early recall notification and future surveillance reminders until upper age limit is reached, or the individual is no longer eligible for screening due to co-morbidities.
- To provide standardized communication, screening and care to individuals at high-risk for lung cancer.
- If screening results are abnormal, to provide individuals with the appropriate recommendation for further testing and follow-up.



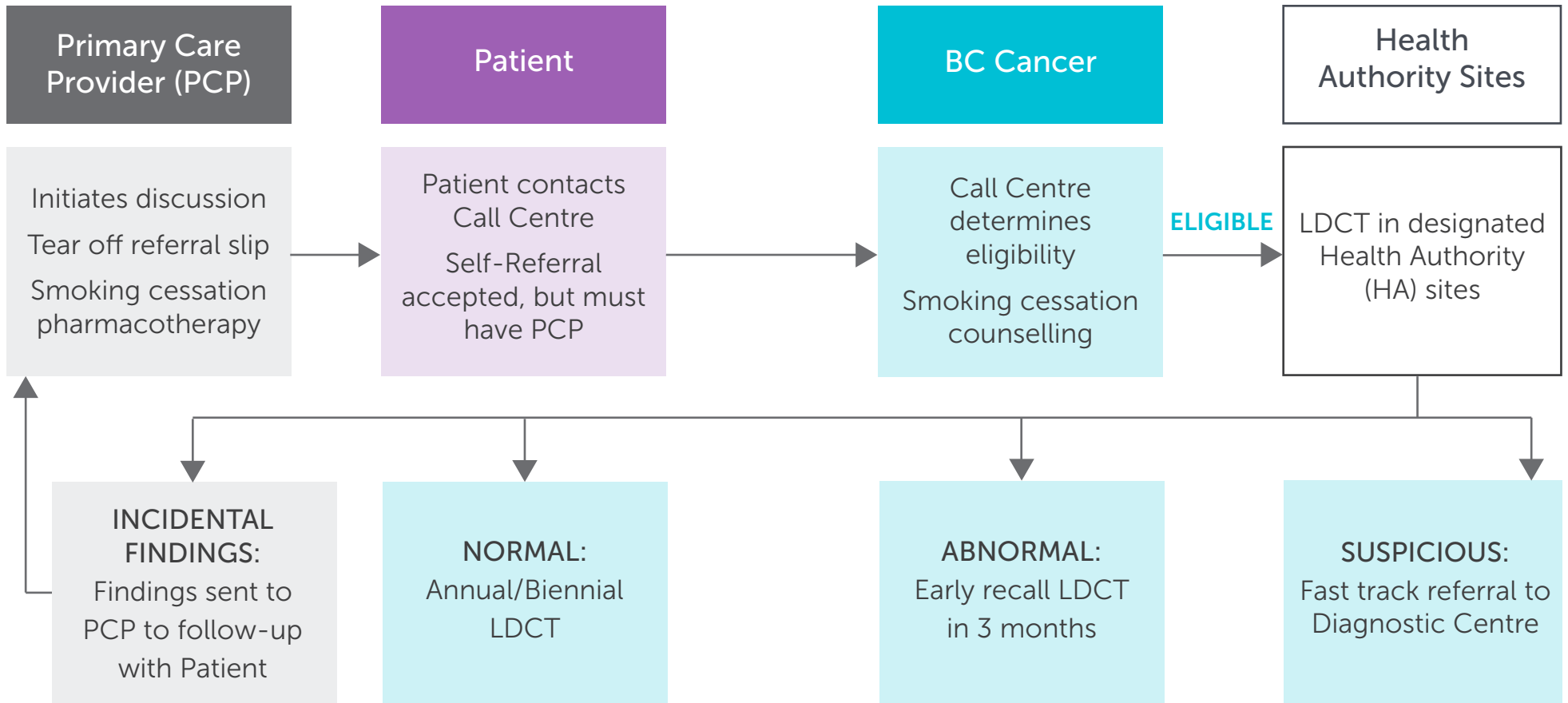
Additional Questions?

For more information about the Lung Screening Program, please visit our website at: www.screeningbc.ca/health-professionals or email us at: screening@bccancer.bc.ca.

References

¹ Canadian Cancer Statistics Advisory Committee in collaboration with the Canadian Cancer Society, Statistics Canada and the Public Health Agency of Canada. Canadian Cancer Statistics 2021. Toronto, ON: Canadian Cancer Society; 2021. Available at: cancer.ca/Canadian-Cancer-Statistics-2021-EN.

Lung Screening Program Flowchart



Lung Screening Eligibility

- Between 55 and 74 years of age;
- Currently smoking or have smoked in the past; and
- Have a smoking history of 20 years or more.

Role of Primary Care Providers:

- Support decision making and recommend lung screening if appropriate;
- Support smoking cessation; and,
- Support with follow-up of incidental findings and abnormal results.

* Please do not request LDCT scans for lung screening directly from the hospital/clinic. Instead, have eligible patients call the Lung Screening Program: 1-877-717-5864.

Importance of Lung Screening

Why is lung cancer screening important?

Lung cancer is currently the most commonly diagnosed cancer, and is the leading cause of cancer death in Canada.¹ In fact, lung cancer kills more people than colon, breast, and prostate cancers combined. The goal of lung cancer screening is to detect lung cancer at its earliest stages, when treatment is more effective. According to the National Lung Screening Trial, it is estimated that for every 300 people who will die of lung cancer over a 10-year period, 60 fewer people will die of the disease with lung screening.²

What the Evidence Says

- Lung cancer is the most common cause of cancer death in Canada.¹
 - In 2021, an estimated 3,600 British Columbians will be diagnosed with lung cancer, and an estimated 2,700 will die of the disease.
 - Seven British Columbians die of lung cancer each day.
 - Lung cancer is the second most common cancer in both males and females.
- Early detection means more treatment options, less invasive procedures, shorter hospital stays and faster recovery.
 - 70 per cent of all lung cancers are currently diagnosed at an advanced stage, and when symptoms are already present. The five-year survival for lung cancer is approximately 19 per cent.³⁻⁵
 - The majority of lung cancers are diagnosed at stage III or IV, which means that the cancer cells have already spread from the lungs.
 - Lung screening in high-risk populations using LDCT can identify cancer at the earliest stages, when the five-year survival is 80 per cent or more.³
- With screening, it is expected that in B.C., approximately 350 lung cancers would be diagnosed each year, and more than 75 per cent would be diagnosed in early stages, when more treatment options are available.

What Your Patient Should Know

- Lung cancer is one of the most diagnosed cancers and the leading cause of cancer death in B.C.
- Normally, lung cancer symptoms don't appear until the disease is already at an advanced stage and has spread. Therefore, it's important to screen when you are not experiencing any symptoms.
- Screening works by finding cancer early, when there are more treatment options and a better chance of success. The best way to reduce your risk of lung cancer is to not smoke and to get screened.
- Screening works best when you receive regular scans to monitor for any changes. Even if you don't have any spots now, you may get them in the future. Therefore, it's important to return for lung screening when you're due, as the risk of lung cancer increases with age.



References

¹ Canadian Cancer Statistics Advisory Committee in collaboration with the Canadian Cancer Society, Statistics Canada and the Public Health Agency of Canada. Canadian Cancer Statistics 2021. Toronto, ON: Canadian Cancer Society; 2021. Available at: www.cancer.ca/Canadian-Cancer-Statistics-2021-EN.

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³ Organized screening for lung cancer will save lives and resources in the cancer system [Internet]. Canadian Partnership Against Cancer. 2020 [cited 2022Jan6]. Available from: <https://www.partnershipagainstcancer.ca/topics/lung-screening-resources/>.

⁴ Canadian Cancer Statistics Advisory Committee. Canadian cancer statistics. A 2020 special report on lung cancer. Toronto, ON: Canadian Cancer Society; 2020.

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Lung Screening Eligibility

Who is eligible for lung screening?

Lung screening is unique because it targets a specific high-risk population that is largely determined by smoking history. This is because smoking remains the most significant cause of lung cancer, resulting in over 70 per cent of lung cancer deaths in men, and 55 per cent of lung cancer deaths in women.¹

Patients who have a primary care provider can self-refer to the program if they meet the following criteria:

- Between 55 and 74 years of age;
- Currently smoking or have previously smoked; and,
- Have a smoking history of 20 years or more.

Participants who call the Lung Screening Program (1-877-717-5864) will speak to a **Patient Navigator** who will conduct a risk assessment to further assess their screening eligibility.

Participants will be asked a series of questions about their smoking history, age, ethnicity, family history of cancer, and other details related to their health profile. A risk score will be calculated based on the answers provided. The risk score is a percentage estimate of someone's risk of developing lung cancer in the next six years. Participants with a >1.5 per cent risk of developing lung cancer over the next six years are considered eligible to participate in the Lung Screening Program.

Patient Navigators help determine screening eligibility by conducting a risk assessment and supporting participants throughout the screening process. They provide lung screening information and ensure all follow-up appointments are appropriately booked.

Why is lung screening not recommended to everyone?

People who are not at high-risk of getting lung cancer should not get screened because screening has not been shown to prevent lower-risk individuals from dying from lung cancer, and may introduce more harm than good.²⁻³

You should NOT refer your patient for lung screening if they:

- Have been diagnosed with lung cancer;
- Are under surveillance for lung nodules;
- Have had hemoptysis of unknown cause or unexplained weight loss of more than five kilograms in the past year*; or,
- Are currently undergoing diagnostic assessment, treatment or surveillance for life-threatening conditions (e.g. a cancer with a poor prognosis or on home oxygen therapy for severe lung disease as assessed by the referring physician).

* People with these symptoms should receive appropriate diagnostic investigation and consultation.

What Your Patient Should Know

- Lung screening is recommended to those at high-risk for lung cancer, and who are not experiencing any symptoms. This usually includes people who are:
 - Between 55 and 74 years of age;
 - Currently smoking or have previously smoked; and
 - Have a smoking history of 20 years or more.
- If you think you qualify, please contact the Lung Screening Program for a phone consultation at: 1-877-717-5864. A Patient Navigator will complete a risk assessment with you over the phone to determine your screening eligibility.
- Not everyone will be eligible for lung screening since screening has not been shown to prevent lower-risk individuals from dying from lung cancer.



References

¹ O'Keeffe LM, Taylor G, Huxley RR, Mitchell P, Woodward M, Peters SAE. Smoking as a risk factor for lung cancer in women and men: a systematic review and meta-analysis. *BMJ Open*. 2018 Oct;8(10):e021611.

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³ Wilkinson AN, Lam S. Lung cancer screening primer: Key information for primary care providers. *Can Fam Physician*. 2021 Nov;67(11):817-822.

Lung Cancer Risk Calculation

How is the lung cancer risk score calculated?

The risk assessment involves using the PLCOm2012 risk calculator, which has been validated in Canada and internationally as an advanced method for assessing lung screening eligibility.¹ The PLCOm2012 model incorporates lung cancer risks based on demographic, environmental and clinical risk factors, including:¹

- Age;
- Education (proxy for socioeconomic status);
- Family history of lung cancer;
- Body mass index;
- Chronic obstructive pulmonary disease (COPD);
- Smoking duration;
- Smoking intensity;
- Smoking quit time (if any);
- Personal history of cancer; and,
- Race or ethnic origin.

Data obtained from Tammemägi et al. (2013).

Individuals with a six-year lung cancer percentage risk greater than 1.5 per cent will be eligible for lung screening.

What the Evidence Says

- Risk model-based screening that utilizes comprehensive lung cancer risk factors can minimize disparities to screening access due to race, sex and socioeconomic status.²⁻⁴
- Studies have shown a risk model-based approach has higher sensitivity, higher positive predictive value, more life years gained, fewer screened to prevent one lung cancer death, and higher cost-effectiveness than a risk factor approach based only on age and smoking history.^{1,3,5,6}
- Studies show that when the above factors are not incorporated, higher instances of cancer are missed in individuals that would qualify for lung screening utilizing the PLCOm2012 method.²⁻⁷
 - For instance, one study reported a statistically significant smaller proportion of black individuals (32 per cent) who were diagnosed with lung cancer met the 30 pack-year screening criteria compared to white individuals (55 per cent).⁸
 - Disparities are also observed across different education levels and by sex.^{2,4}
 - Compared to non-First Nations, First Nations peoples have a higher risk of lung cancer despite smoking less tobacco.⁹

What Your Patient Should Know

- During your risk assessment, you will be asked questions on your smoking and health history.
- Your answers to these questions will help determine your lung cancer risk, and therefore your eligibility for screening.
- Some people may smoke less or for a shorter period of time, but are considered to be at high-risk of lung cancer because of other reasons.
- These questions are asked to provide an equal opportunity for everyone who would benefit from lung screening to participate.
- You do not need to answer any question(s) you are uncomfortable with. This will not affect your participation in the program. Screening works best for those who are considered high-risk for lung cancer, and who are not experiencing any symptoms. When lung cancer is found early, there are more treatment options, and a better chance of success.

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Low Dose Computed Tomography (LDCT) Scan

Why is a LDCT scan used for lung screening?

Individuals eligible for lung screening will receive a low-dose computed tomography (LDCT) scan. Screening with LDCT is an effective way to find lung cancer at an early stage, when there are more treatment options and a better chance of success. A LDCT scan is quick and painless. Individuals will not need to take any medications or receive any needles for this test.

What the Evidence Says

- The LDCT scan is a safe and effective way to screen for lung cancer.
 - The National Lung Screening Trial (NLST), a randomized controlled trial with over 50,000 participants found that people at high-risk of getting lung cancer who screened with LDCT annually for two years had a 20 per cent relative reduction in lung cancer mortality over six years, compared with people who got screened the same number of times at the same interval with a chest x-ray.¹
 - The EU-NELSON randomized controlled trial with over 54,000 participants who got screened with four LDCT scans over 6.5 years had a 24 per cent reduction in lung cancer mortality compared to no screening.²
- The Canadian Task Force on Preventative Health Care does not recommend chest x-ray, with or without sputum cytology for lung cancer screening.³
- The amount of radiation exposure from a LDCT scan is considered acceptable relative to the number of lung cancer deaths prevented. The amount of radiation exposure is:
 - Approximately the same as what you would receive from the natural background over six months.⁴
 - Five times less than that of a diagnostic chest CT scan.^{5,6}



What Your Patient Should Know

- A low-dose CT (LDCT) scan is a safe and effective way to screen for lung cancer, and can pick up much more than a chest x-ray can.
- During your lung scan, you will lie on a table that passes through a doughnut shaped machine called a scanner. The scanner uses a small amount of radiation to take detailed images of your lungs.
- The scan takes less than 15 seconds and is not painful. You do not need to take any medications or receive any needles for this test.
- Once you've completed your scan, your images will be sent to a radiologist – someone who specializes at reading scans for review.
- Both you and your primary care provider will receive results in 2 to 3 weeks following your screening appointment.

References

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Benefits and Harms of Lung Screening

What are the benefits and harms of screening?

Like any other screening test, lung screening is not perfect, and can have its own risks. However, for individuals at high-risk of lung cancer, the benefits of screening often outweigh its risks. For individuals at low-risk of lung cancer, screening has not been shown to prevent these individuals from dying from lung cancer, and may pose more harm than good.¹

Potential Benefits of Screening

- For individuals at high-risk of getting lung cancer, screening with a LDCT scan is the best way of detecting lung cancer early, when treatment is more effective.¹⁻⁴
 - In randomized clinical trials, lung screening with LDCT resulted in a significant mortality reduction benefit of 20 to 39 per cent, compared to no screening, or screening with chest x-ray.^{1,2,4}
- For individuals who have stopped smoking, screening is one of the best options to reduce their risk of dying from lung cancer.⁵
- Lung screening can also result in incidental findings in other body parts that would not otherwise be known, including the thyroid, heart, lung, kidneys, adrenal glands and liver that may require follow-up.³
- A common finding is the identification of coronary calcification, which can lead to risk management discussions between the patient and their primary care provider, and result in lifestyle interventions.³

Potential Harms of Screening

- **Overdiagnosis:** no screening test is perfect, and LDCT scans may show nodules that require further follow-up but are later discovered to be very slow growing and not expected to cause any problems during the patient's lifetime. During the follow-up process, patients may experience additional stress and anxiety.
 - According to results from the National Lung Screening Trial (NLST) and the NELSON trial (Nederlands-Leuvens Longkanker Screenings Onderzoek), the overdiagnosis rate of lung screening is low and comparable to that observed with screening mammography.^{4,6,7}
 - The overdiagnosis rate with LDCT screening is between 3.1 to 9 per cent.^{4,7} This is comparable to other screening procedures such as mammography, which is between 9.7 to 12.4 per cent.⁷
- **False-positive:** Screening using LDCT has a false-positive rate similar to other widely used cancer screening procedures such as mammography, which has a false-positive rate of 7 to 12 per cent.⁸
 - The false-positive rate of LDCT is approximately 13 per cent at baseline, and 5 per cent for subsequent annual screening examinations.^{4,7,9}
- LDCT may not always catch cancer at an early stage, and may find cancer when it has already spread to other parts of the body, and when treatment is less effective.

Potential Harms Continued...

- LDCT can miss finding a nodule that is cancerous or fast-growing lung cancer, such as small cell carcinoma that can develop between screenings.
 - Therefore, it's important to encourage your patients to screen regularly since screening works best when patients receive regular scans to detect any new nodules or changes to existing ones.
- Depending on the patient's results, they may require a lung biopsy or surgery, which carries additional risks, including bleeding, infection or a pneumothorax.¹⁰ These side effects are rare, but some risks exist.
 - In a large study, of the people who had a follow-up procedure, less than 2 per cent had at least one complication or problem, from the follow-up procedure.¹⁰
- Individuals receiving a LDCT scan will be exposed to a very small amount of radiation at 1.5 mSv or less.
 - LDCT uses five times less radiation than regular CT (8 mSv) and is equivalent to the natural background radiation over six months, so the chances of getting cancer through repeated exposure is fairly low.¹¹

What Your Patient Should Know

- Lung screening is recommended to those at high-risk for lung cancer, since the benefits of screening typically outweigh its risks for these individuals.
- No screening test is perfect. Your lung scan may suggest you have lung cancer when no cancer is present. This is known as a **false-positive** result.
- On the contrary, your lung scan may show cancers that require follow-up, but are later discovered to be very slow growing, and not expected to cause any problems during your lifetime. This is known as an **overdiagnosis**. Both scenarios can lead to increased stress and anxiety.
- Your lung scan will expose you to a small amount of radiation, similar to what you would receive from the natural background (radiation from the sky and ground) over a six-month period.¹¹
- Your lung scan looks for signs of lung cancer and other lung diseases. Screening has been shown to increase the chance of survival of those diagnosed with lung cancer by 20 to 39 per cent.^{1,2,4}

References

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Smoking Cessation

Is smoking cessation offered as part of lung screening?

Yes, when patients call the Lung Screening Program to complete their risk assessment, they will be provided with information on smoking cessation. Quitting smoking doubles the benefits of lung screening and significantly improves a patient's lung and general health.

What the Evidence Says

- In Canada, more than 85 per cent of lung cancer cases are related to smoking tobacco.¹
 - Those with a history of heavy smoking are at the greatest risk of lung cancer.
- Fortunately, smoking abstinence doubles the benefits of screening.^{2,3}
- Research has shown that lung screening participants who currently smoke are highly motivated to quit.⁴
- It's therefore essential that smoking cessation services are made available to patients along the lung screening pathway.
 - According to the Alberta Lung Cancer Screening Study, an embedded smoking cessation program more than doubled the quit rate (13 per cent) compared to the general population (5 per cent).⁴
- Pharmacotherapy increases smoking quit rate from 17 to 20 per cent compared to 10 per cent with counselling alone.⁵
- Patients who quit or reduce their smoking also decrease their risk of heart attacks, chronic obstructive pulmonary disease (COPD) and stroke.
- Over 50 per cent of lung cancer patients have stopped smoking. For people who have stopped smoking, screening is one of the best options to reduce their risk of dying from lung cancer.⁶

What Your Patient Should Know

- Quitting smoking can be hard. However, there are many resources to help support your decision to quit or reduce smoking.
- Quitting smoking doubles the benefits of lung screening and significantly improves your lung health.
- Quitting smoking also improves health outcomes for other tobacco-related diseases including heart attack, stroke and chronic obstructive pulmonary disease (COPD).
- You may talk to your primary care provider about resources to help you quit smoking. The Lung Screening Program will also discuss available resources with you during your phone consultation.

The following are some smoking cessation resources you may share with your patients:

BC Smoking Cessation Program

The BC Smoking Cessation Program helps eligible B.C. residents to quit smoking, or use other tobacco products by covering the price of:

Nicotine Replacement Therapy (NRT) Products: Each calendar year (from January to December), eligible B.C. residents can receive a single continuous course of treatment with NRTs. This can be up to 12 weeks (84 days in a row). NRT products include specific nicotine gums, lozenges, and patches.

Patients do not need to see their primary care provider or be registered for PharmaCare in order to get NRT products. Patients can visit their local pharmacy to access NRT products. They and the pharmacist must both sign a declaration form.

Smoking Cessation Prescription Drugs: Each calendar year (from January to December), PharmaCare will cover a portion of one prescription smoking cessation drug for a single continuous course of treatment. This can be up to 12 weeks (84 days in a row).

Patients should talk to their primary care provider about whether prescription smoking cessation drugs are appropriate for them.

For more information on the BC Smoking Cessation Program, please visit: www.healthlinkbc.ca.

More Smoking Cessation Resources

QuitNow: This is a free program offering telephone based behavioural counselling to British Columbians looking to quit or reduce tobacco and e-cigarette use. QuitNow is delivered by the BC Lung Foundation on behalf of the Government of British Columbia. For more information on the program, please visit: www.quitnow.ca.

Respecting Tobacco: The First Nations Health Authority has developed helpful and supportive resources for the traditional and non-traditional use of tobacco, and help with quitting commercial tobacco use. For more information on these resources, please visit: www.fnha.ca/respectingtobacco.

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Screening Results

What types of results are there and what do they mean?

The type of management an individual needs depends on the size and appearance of any nodules found during their lung screening, and other details the radiologist notices on their LDCT scan. Please refer to the following table for the different types of screening results, example scan results, what they mean and their next steps:

Table 1: Lung Nodule Management Protocol

No Concerning Findings	<p>The radiologist did not notice anything of concern from the patient's LDCT scan, but regular screening is important to monitor for any changes as the risk of developing cancer increases as people age.</p> <p>Next Steps: Both you and the patient will receive a reminder letter when it is time for them to screen again in two years.</p>
Low Chance of Cancer	<p>The radiologist considers the patient to have a low chance of lung cancer, but recommends continued monitoring of their lungs.</p> <p>Next Steps: Both you and the patient will receive a reminder letter when it is time for them to screen again in one year.</p>
Additional Screening Required	<p>The radiologist has noticed some findings in the patient's LDCT scan that may be related to inflammation, infection, or a need to monitor an area more closely. We would like to check again in three months to look for any changes.</p> <p>Next Steps: Your patient will be contacted to arrange a follow-up LDCT scan in three months, and you will also be notified of this decision.</p>
Follow-Up Required	<p>The radiologist has noticed some spots that require further investigation. This does not mean the patient has cancer, but it is important that they attend all follow-up.</p> <p>Next Steps: A fast track diagnostic work-up referral has been sent to a designated thoracic centre in your health region. Your patient will be contacted shortly by a chest specialist to arrange for follow-up, which may include more scans or a biopsy, and you will also be notified.</p>
Findings Not Related to Lung Cancer	<p>The radiologist has noticed findings that are not related to cancer but do require follow-up.</p> <p>Next Steps: Your patient's results will be sent to you to decide if any follow-up is needed.</p>

Figure 1: LDCT Scan Results Displaying Lung Cancer Progression Over Time

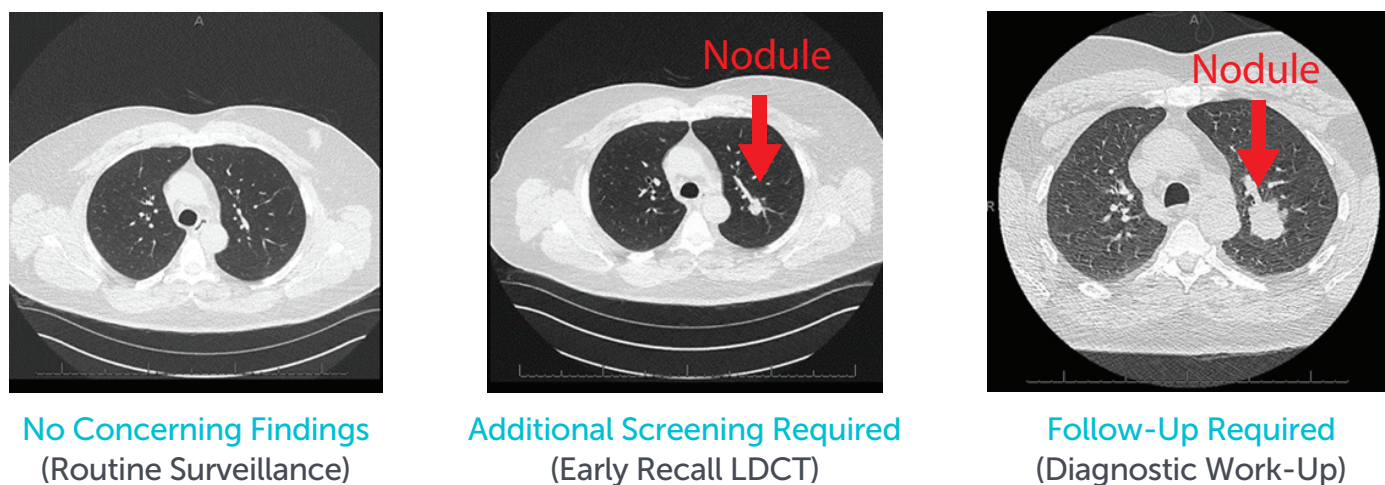


Figure 1 clearly shows the importance of encouraging patients to return for lung screening when they're due. Lung screening works best when patients receive regular LDCT scans to see if there are any nodules or changes to existing nodules since their last scan. Even if there are no nodules now, patients may get them in the future since the risk of lung cancer increases with age.

Approximately 4 per cent of participants will need to proceed to diagnostic work-up. There will be an automatic Fast Track referral generated by the Lung Screening Program on behalf of the patient's primary care provider to the regional designated Diagnostic Lung Referral team that has the expertise and infrastructure to diagnose and treat small early lung cancers. The Diagnostic Team will contact the patient and arrange for follow-up testing of any suspicious lung nodules found on the LDCT scan. The primary care provider will be notified of the referral and asked to send relevant patient medical history to the Diagnostic Team. The primary care provider will also be notified if a patient has actionable incidental finding(s) that require further intervention or diagnostic work-up.

What Your Patient Should Know

- After your lung screening, a radiologist looks for spots, also known as nodules on your lung scan. These spots indicate small lumps of tissue that many people have, and does not mean you have cancer.
- If spots are found, the radiologist cannot determine from your scan alone if these spots are scars, areas of inflammation, or possible signs of lung cancer. Therefore, it's important that you attend all recommended follow-up.
- Your follow-up is determined by the size and appearance of any spots found during your screen, and other details the radiologist notices on your scan.
- It's very important that you return for screening when you're due, since screening works best when you receive regular lung scans to monitor for any changes.



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