PROGRAM GUIDELINES

Australian Government

NATIONAL
LUNG CANCER
SCREENING
PROGRAM

Supported by the National Lung Cancer Screening Program Expert Advisory Committee on 14 February 2025.

EXECUTIVE SUMMARY

The National Lung Cancer Screening Program, referred to hereafter as “the program”, is a targeted screening program using low-dose computed tomography (low-dose CT) scans to look for lung cancer in high-risk people without any signs or symptoms suggestive of lung cancer. It is targeted to eligible people aged between 50 and 70 years of age with a history of tobacco cigarette smoking. The program provides free low-dose CT scans to participants every two years unless a screen-detected abnormality is found.

Lung cancer is the leading cause of cancer death in Australia, claiming more lives than breast and prostate cancers combined. Australia has among the best survival rates for cancer in the world, yet most people with lung cancer are diagnosed with late-stage disease (stage IV) (>42%), meaning that curative treatment is not an option. Only 26% of people with lung cancer survive five years post-diagnosis. Lung cancer also disproportionately affects priority populations such as Aboriginal and/or Torres Strait Islander peoples who experience significantly higher rates of lung cancer and significant differences in lung cancer outcomes, with an 11% five-year post diagnosis survival rate for Aboriginal and Torres Strait Islander peoples. Disparities in smoking prevalence and lung cancer incidence, mortality and survival rates are linked to health determinants like cultural, social, economic, and structural factors. Indigeneity, race, ethnicity, gender, location, socioeconomic status, and disability, along with their intersections, contribute to discrimination, increased cancer risk, and unequal access to care. These differences highlight the need for targeted, culturally safe approaches to ensure equitable lung cancer screening and health outcomes for all Australians.

Lung cancer screening saves lives. Screening helps to detect cancer at an earlier stage. Earlier diagnosis can improve health outcomes resulting in higher survival rates and improved quality of life.

The target audience of the Program Guidelines includes all healthcare providers and health support workers involved in lung cancer screening. The guidelines will assist them to navigate themselves and participants through the screening program. The guidelines may also be of interest to screening participants, policy makers and researchers.

The purpose of the Program Guidelines is to guide the delivery of a safe, effective, and high-quality National Lung Cancer Screening Program for the Australian community. The guidelines will help to address current inequities and ensure the program does not entrench further inequity. The guidelines reflect best practice and present a program that is firmly grounded in evidence and facilitates culturally safe and equitable program access and delivery for people at high risk of lung cancer in the Australian community.

The Program Guidelines include:

- Steps of the screening and assessment pathway, including screening participant recruitment and eligibility.
- Information about providing smoking cessation advice and support.
- The requirements for shared decision-making.
- Information about the low-dose computed tomography (low-dose CT) request, scan, and assessment.

- Evidence-based recommendations and practice points.
- Links to existing diagnostic and management pathways and guidelines related to suspected lung cancer and actionable additional findings.
- A focus on supporting priority populations: Aboriginal and/or Torres Strait Islander peoples, people living in rural and remote areas, people from culturally and linguistically diverse (CALD) backgrounds, people living with disability, people living with mental illness, and people from the Lesbian, Gay, Bisexual, Transgender, Intersex, Queer and Asexual (LGBTIQA+) communities.
- Links to other information materials supporting the program.

The scope of the program does not include the clinical investigation of screen-detected abnormalities or the diagnosis of lung cancer or other conditions. Therefore, those with a finding suggestive of a lung cancer or an actionable additional finding requiring management will be referred to usual care where optimal care and relevant clinical guidelines and pathways should be followed.

We would like to acknowledge the important contribution to the Program Guidelines made by numerous cancer and oncology researchers, health practitioners, consumers and carers in Australia and worldwide over many years. These Guidelines have been informed by volumes of enquiry, research and discovery, which has led to a better understanding of lung cancer and improvements in diagnosis, treatment and outcomes for patients.

In particular, the attribution table found at in the appendices acknowledges specific work and its sources which are referenced within the Guidelines.

CONTENTS

INTRODUCTION

In July 2022, the Medical Services Advisory Committee (MSAC) supported the establishment of a National Lung Cancer Screening Program to support early diagnosis, increased survivorship, and create better lung cancer outcomes. On 2 May 2023, the Australian Government announced the establishment of the National Lung Cancer Screening Program (hereafter referred to as the program). The Government considered MSAC's recommendations, and the program has been designed around these recommendations.

Lung cancer in Australia

Lung cancer is the leading cause of cancer death in Australia[1], claiming more lives than breast and prostate cancers combined[2]. In 2024, it is estimated that lung cancer will be the fifth most commonly diagnosed cancer in Australia[2]. It is estimated that about 15,122 Australians will be diagnosed with lung cancer and about 8,900 people will die of the disease in 2024[2].

Australia has among the best survival rates for cancer in the world[3,4], yet most people with lung cancer are diagnosed with late-stage disease (stage IV) (>42%)[5]. Only 26% of people with lung cancer survive five years post-diagnosis[2]. Lung cancer disproportionately affects priority populations such as Aboriginal and/or Torres Strait Islander peoples who experience significantly higher rates of lung cancer and significant differences in lung cancer outcomes. Tobacco use is the leading cause of lung cancer and of preventable death in Australia[6,7]. Seventy-three per cent of the lung cancer burden in Australia is attributable to current and former tobacco smoking[6,8].

Why lung cancer screening is important

Lung cancer screening saves lives.

Screening helps to detect cancer at an earlier stage[7]. Earlier diagnosis can improve health outcomes and is associated with higher survival rates and improved quality of life[9].

Early diagnosis of lung cancer will reduce the number of people requiring treatment for advanced stage lung cancer, when the survival rate is much lower[9].

Benefits of early diagnosis

When lung cancer is diagnosed at an early stage, treatments are more likely to be effective[9]. Early-stage lung cancer can often be treated with surgery or radiation therapy. If the cancer has spread outside the lung, which is the case in stage III and IV cancers, other treatment options may need to be considered. Treatment for advanced lung cancer (Stage IV) may only focus on slowing the growth of the cancer and improving quality of life[10].

Participation in the program is expected to increase over time as the program becomes embedded in the Australian cancer screening landscape.

Purpose of the Program Guidelines

The target audience of the Program Guidelines includes all healthcare providers and health support workers involved in lung cancer screening. The Program Guidelines will assist healthcare providers and health support workers to navigate themselves and participants through the screening program. The Program Guidelines may also be of interest to screening participants, policy makers and researchers.

The purpose of the Program Guidelines is to:

- Guide the delivery of a safe, effective, and high-quality National Lung Cancer Screening Program for the Australian community
- Standardise the delivery of the program across Australia's health systems, and across multiple service providers
- Reflect best practice and present a program that is firmly grounded in evidence
- Provide good practice statements to facilitate equitable program access and delivery for people at high risk of lung cancer in the Australian community
- Provide a foundation for monitoring and evaluation activities of the program to inform program improvements.

Scope and application

The Program Guidelines include:

- Steps of the screening and assessment pathway, including participant recruitment and eligibility
- Information about providing smoking cessation advice and support
- The requirements for shared decision-making
- Information about the low-dose computed tomography (low-dose CT) request, scan, and assessment
- Evidence-based recommendations and practice points to provide guidance on appropriate practice (refer to text box below)
- Links to other information and materials supporting the program.

Recommendations are defined as those items supported by the Medical Services Advisory Committee (MSAC) expert advice on lung cancer screening and additional items supported by strong evidence (i.e. systematic reviews, randomised controlled trials)[9].

Practice points are defined as those points that support and guide program delivery and implementation across the screening and assessment pathway. Practice points are used to address important aspects of program delivery and implementation that are not addressed by other standards or guidelines, or where limited evidence is available.

Practice points were developed based on a number of considerations and inputs including current and emerging evidence (e.g. cohort and case-control studies), current clinical best practice, expert opinion and consensus, stakeholder feedback and insights, and the program's guiding principles[9].

Practice points identify opportunities for the program to intersect with relevant standards and guidelines, and address cross-cutting issues, including:

- Access (e.g. health literacy, cost, transport, geography, other support services)
- Equity and the barriers and enablers for priority populations
- Cultural safety
- Stigma associated with lung cancer and tobacco use
- Opportunities to embed smoking cessation across the lung cancer screening and assessment pathway.

OVERVIEW OF THE PROGRAM

The National Lung Cancer Screening Program is a targeted screening program using low-dose CT scans to look for lung cancer in high-risk people without any signs or symptoms suggestive of lung cancer. Screening is recommended every two years, unless a screen-detected abnormality is found, and is targeted to people between 50 and 70 years of age with a history of tobacco cigarette smoking.

The program provides free low-dose CT scans to participants. The scope of the program does not include the clinical investigation of screen-detected abnormalities or the diagnosis of lung cancer or other conditions. Therefore, those with a finding suggestive of a lung cancer or an actionable additional finding requiring management should be referred to usual care where best practice and relevant clinical guidelines and pathways should be followed.

A person's eligibility may be opportunistically assessed for the program when visiting a healthcare provider, likely a general practitioner (GP) for another purpose. They may be proactively identified through their medical records, smoking cessation programs, or other interactions with the health system and encouraged to visit their GP, or they may self-identify and visit a GP based on information provided about the program.

Those eligible for the program will be referred by a GP or other practitioner that is able to request low-dose CT scans to a participating radiology provider for a free low-dose CT scan. There are two Medicare Benefit Schedule (MBS) item numbers specific to the program for radiology providers; one for the two-yearly low-dose CT scan, and one for the follow-up low-dose CT scans. Both MBS items require mandatory bulk billing of low-dose CT scans.

Low-dose CT scans will be undertaken at fixed radiology services. Mobile screening services will be available in some rural and remote locations to support areas with limited access to radiology infrastructure. The low-dose CT scan will be reported using the National Lung Cancer Screening Program Nodule Management Protocol which is derived from the Pan-Canadian Early Detection of Lung Cancer Study (PanCan) nodule malignancy risk calculator[11] for reporting baseline scans and the Lung Imaging Reporting and Data System (Lung-RADS®)[12] for reporting follow-up scans. This protocol determines the next steps for the participant in a consistent way:

- Continuation in the program with a low-dose CT scan in 2 years
- A shorter interval follow-up scan (in 3, 6 or 12 months) to monitor for nodule growth or changes
- Or a referral for further investigations.

The timely and consistent assessment of low-dose CT scans and reporting results is critical to delivering a safe and effective program.

The low-dose CT scan results will be sent from the radiology provider to the National Cancer Screening Register (NCSR) as well as being provided to requesting practitioners and electronic medical records as per usual practice. Following the low-dose CT scan, the participant will receive communication from the NCSR detailing next steps including if they need to make an appointment with their requesting practitioner to discuss the results.

Program outcomes

Program aim

The National Lung Cancer Screening Program aims to achieve better health outcomes for Australians by detecting lung cancer early and reducing deaths from lung cancer. Early detection can lead to more effective treatment options and improved outcomes for participants.

Program principles

The program is underpinned by the following eight principles[13]:

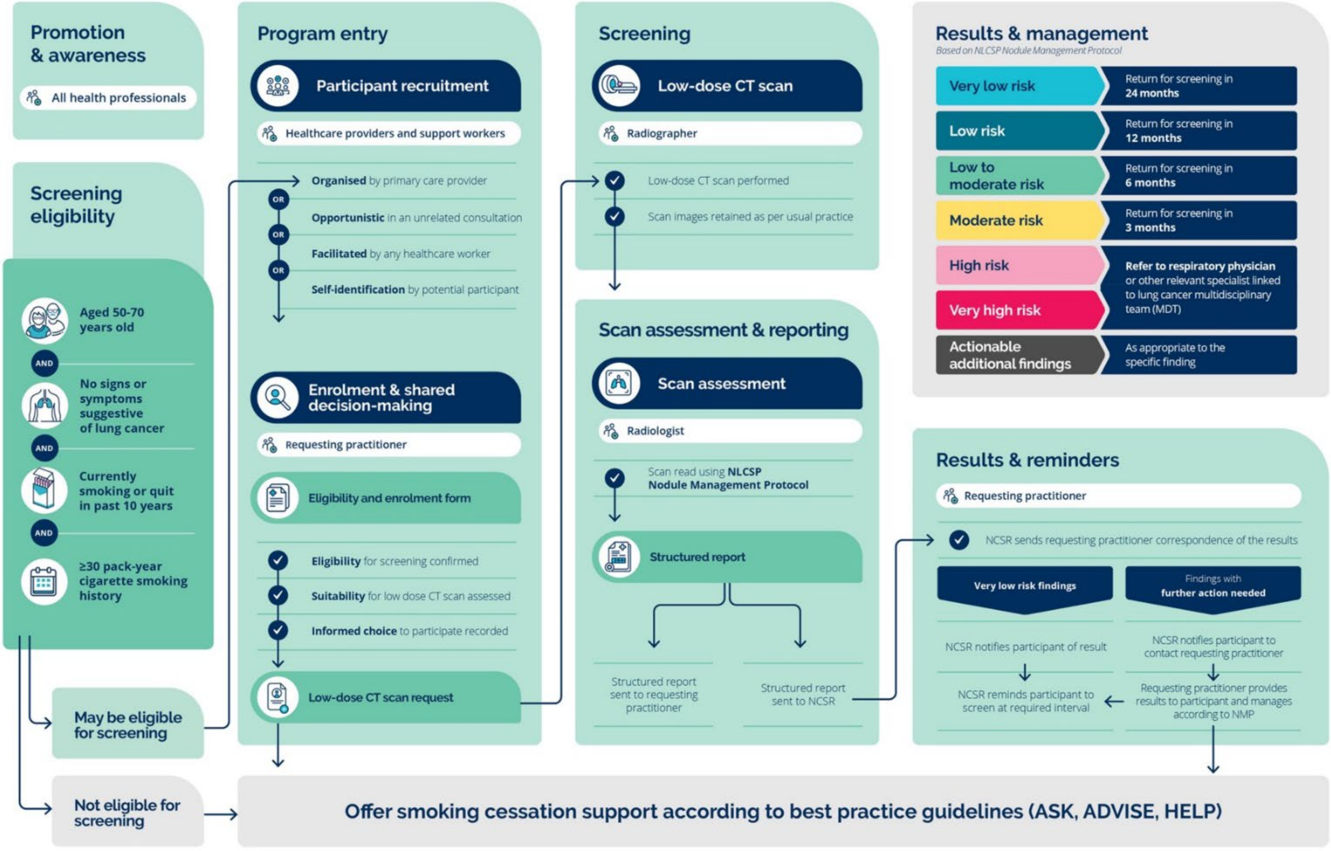
- **Accessible**
  Access to the program for all eligible participants, inclusive of demographic, geographic, socioeconomic, cultural and other factors.
- **Agile**
  Centred around ongoing application of continuous quality improvement and the implementation of new technologies to ensure the program adapts to change.
- **Value-based**
  Underpinned by efficient investment and high-quality care to create benefits for participants in the form of effective, person-centred cancer screening and improved participant engagement.
- **Person-centred**
  Centred around each individual and delivering benefit to the participant throughout their experience.
- **Culturally safe for Aboriginal and Torres Strait Islander peoples**
  Optimal and culturally safe care for Aboriginal and Torres Strait Islander peoples participating in the program.
- **Informed by Best Practice**
  Informed by evidence and guided by best practice methods, processes and techniques to ensure the program is fit for purpose.
- **Evidence-based**
  Outcomes from research, combined with clinical expertise integrated to underpin scientifically valid recommendations.
- **Research & Data Driven**
  Data used to monitor, evaluate and inform performance and shape the program.

Screening and assessment pathway

The screening and assessment pathway defines the structure of the program.

The program is structured around a screening and assessment pathway (referred to as the pathway) that is evidence-based and tailored to the unique Australian context[14]. This approach aligns with existing national cancer screening programs for breast, cervical and bowel cancer that include tailored screening and assessment pathways to define clinical and policy parameters and map the participant journey. The pathway supports the delivery of culturally safe, evidence-based and consistent care, and maximises opportunities for primary prevention, especially smoking cessation. Figure 1 presents an overview of the pathway.

Figure 1: National Lung Cancer Screening Program screening and assessment pathway



NCSR- National Cancer Screening Register
NMP- Nodule Management Protocol

Text alternative for Figure 1

Target population and eligibility criteria

The program delivers targeted screening to high-risk individuals on a two-yearly basis. Eligibility to participate in the program is assessed using risk-based eligibility criteria recommended by MSAC[9]. People are eligible to participate if they:

1. Are between 50 and 70 years of age;
   AND
2. Are asymptomatic (show no signs or symptoms suggestive of lung cancer);
   AND
3. Currently smoke or have quit smoking in the past 10 years;
   AND
4. Have a history of tobacco cigarette smoking of at least 30 pack-years.

The eligibility criteria, defined by MSAC, target people known to be at highest risk of lung cancer to ensure the program is safe and effective. MSAC examined many options for defining the proposed program. MSAC advised that its program recommendations, including eligibility criteria, would lead to acceptable value for money while also minimising risk and costs of unnecessary further diagnostic tests and treatments. MSAC also advised that the proposed eligibility criteria would be simpler to implement, as well as better aligned with lung cancer screening programs in other countries and the key lung cancer screening trials provided as evidence for the effectiveness of lung cancer screening. Learn more about **how the eligibility criteria were determined**[15].

Low-dose CT scan

There are two mandatory bulk billing MBS items for low-dose CT scans under the program. The MBS items ensure that participants will not incur any out-of-pocket costs for low-dose CT scans provided through the program.

Participants can have a free low-dose CT scan at participating public and private radiology services.

Heart of Australia will deliver mobile screening services to some rural and remote communities across Australia. Prior to mobile screening days, Heart of Australia will collaborate with communities so as many eligible people as possible can be screened while the service is in the community.

For more information on mobile screening including service delivery routes please visit the Heart of Australia website.

National Cancer Screening Register

The **National Cancer Screening Register** (NCSR) provides a single electronic record for each person in Australia participating in the Australian Government's **National Lung Cancer Screening Program**, **National Bowel Cancer Screening Program** and **National Cervical Screening Program**.

The NCSR supports the program by providing a safety net to screening participants and healthcare providers to support usual care. The NCSR will support healthcare providers to manage the participant's personal information and participation in the NCSR for lung cancer screening.

The NCSR does not replace usual care responsibilities of healthcare providers or existing arrangements that healthcare providers may have in place to ensure individuals receive appropriate and optimal care.

The NCSR has developed an interface which allows healthcare providers to integrate their clinical software, supporting seamless access and reporting of clinical data for the program from the patient management software used on a daily basis (**Clinical software integration | National Cancer Screening Register**). Primary care providers and radiologists will have a role in reporting to the NCSR.

For healthcare providers who are not integrated with the NCSR, they can also use the **NCSR Healthcare Provider Portal** which provides a self-service alternative for healthcare providers to access and submit screening data.

Register your practice

Healthcare providers should register their service or medical practice to enable NCSR functionality. If a practice is already registered with the NCSR for the National Bowel Cancer Screening Program or the National Cervical Cancer Screening Program, the practice will not be required to register again.

Practice registration can only be completed if the practice and/or healthcare provider uses one of the integrated partner's software. Once registered, practices can enable NSCR integration. Further information on clinical software integration, including guides and resources, is available from the **NCSR website**.

The NCSR will provide program information and reminders to participants. It will store structured radiology reports of the low-dose CT scans but will not store the scan images. Previous images will need to be accessed as per current practice. Relevant healthcare providers may access participant information and remind them if they need to take action in relation to lung cancer screening. Structured radiology reports will be sent to the NCSR and will also be provided to healthcare providers through usual arrangements.

The NCSR does not replace usual care or healthcare provider responsibilities; it assists with reminders and follow-up along the screening pathway.

Healthcare provider roles and responsibilities

All healthcare providers and health support workers play a role in delivering the program and ensuring that participants can navigate the screening and assessment pathway.

A summary of healthcare providers' roles and responsibilities across the pathway is detailed in Tables 1a-1e. A simplified pathway summarising the program healthcare setting and roles and responsibilities is provided in Figure 2.

Table 1a: Roles and responsibilities of requesting practitioners across the screening and assessment pathway

Requesting practitioners

	Program entry and supporting choice	Low-dose CT scan and reporting	Management of results, follow-up and reminders
General Practitioners **AND** **Medical Specialists**	• Promote the program • Identify and invite participants • Assess and confirm eligibility • Check low-dose CT suitability • Facilitate shared decision-making • Enrol participant with the NCSR • Request low-dose CT scan • Offer smoking cessation supports	• Assist participant to arrange appointment • Help to identify and arrange supports needed for low-dose CT scan	• Communicate results to participant • Refer to a respiratory physician or other specialist with relevant lung cancer expertise linked to a lung cancer multidisciplinary team for ongoing management • Manage actionable additional findings according to existing clinical guidelines • Access participant low-dose CT screening histories from NCSR as needed • Ensure reminders are enabled in participant record in practice software (in addition to NCSR reminders) • Offer smoking cessation supports

Table 1b: Roles and responsibilities of radiology providers across the screening and assessment pathway

Radiology providers

	Program entry and supporting choice	Low-dose CT scan and reporting	Management of results, follow-up and reminders
Radiologists	-	• Read and assess low-dose CT scan • Complete structured radiology report	• Access program participant low-dose CT screening histories from NCSR as needed • Send report to the NCSR • Send report to requesting practitioner
Radiographers	-	• Perform low-dose CT scan	-

Table 1c: Roles and responsibilities of healthcare providers without authorisation to request a low-dose CT scan across the screening and assessment pathway

Healthcare providers without authorisation to request a low-dose CT scan

	Program entry and supporting choice	Low-dose CT scan and reporting	Management of results, follow-up and reminders
Aboriginal and Torres Strait Islander Health Practitioners / Workers **AND** **Nurses**	• Promote the program • Identify and invite participants • Assess eligibility • Facilitate shared decision-making • Enrol participant with the NCSR • Offer smoking cessation supports • Facilitate recall and reminders	• Assist participant to make appointment (e.g. provide advice on participating radiology providers) • Help to identify and arrange supports needed for low-dose CT scan	• Support results communication • Ensure reminders are enabled in participant record in practice software • Support care coordination • Offer smoking cessation supports
Allied health professionals	• Promote the program • Recommend an eligibility assessment • Offer smoking cessation supports	• Assist participant to make appointment (e.g. provide advice on participating radiology providers) • Help to identify and arrange supports needed for low-dose CT scan	• Support results communication • Ensure reminders are enabled in participant record in practice software • Support care coordination • Offer smoking cessation supports

Table 1d: Roles and responsibilities of practice staff in primary care without authorisation to request a low-dose CT scan across the screening and assessment pathway

Practice staff in primary care

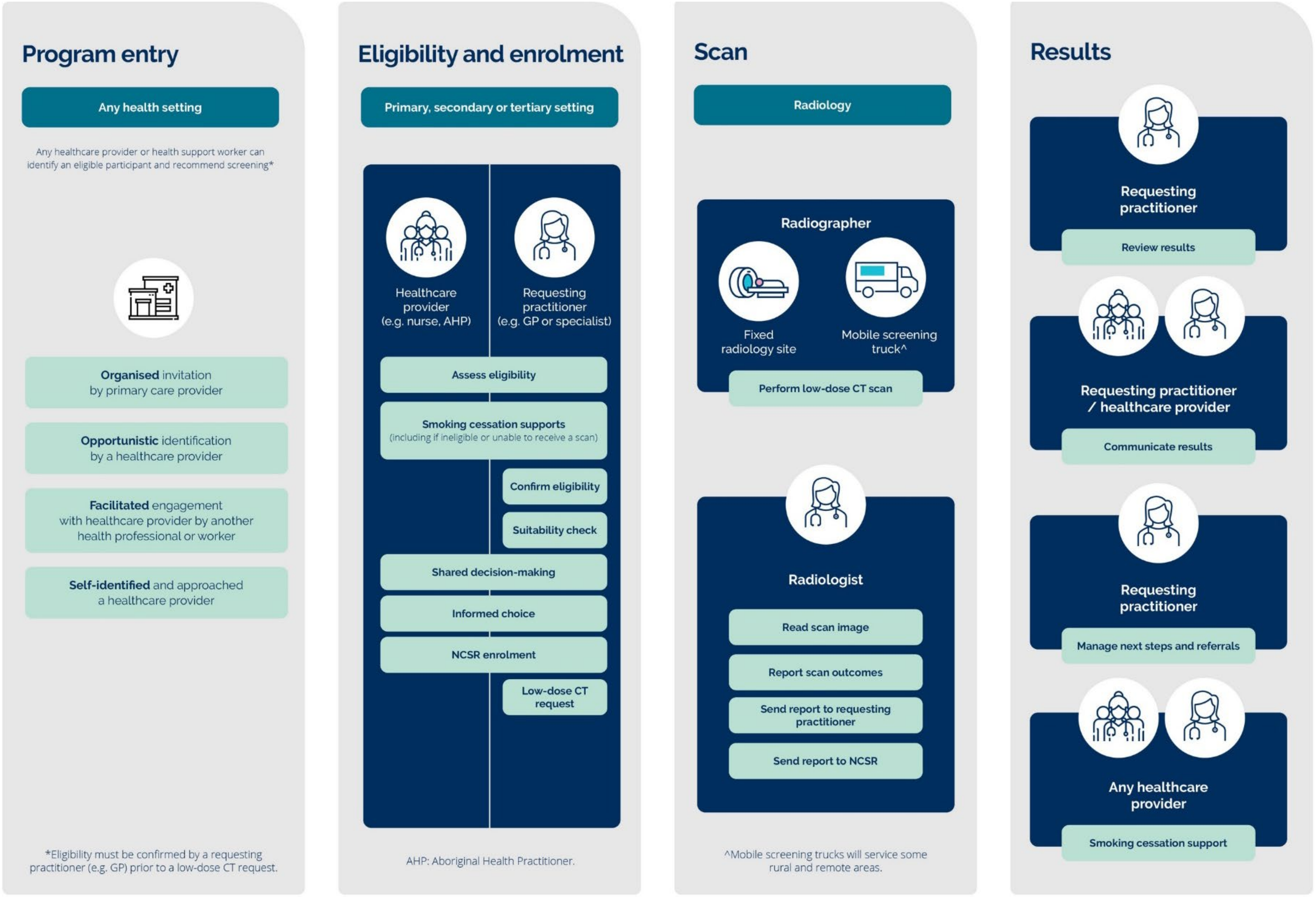
	Program entry and supporting choice	Low-dose CT scan and reporting	Management of results, follow-up and reminders
Practice managers and administrative staff	• Promote the program • Identify and invite participants • Facilitate recall and reminders	• Assist participant to make appointment (e.g. provide advice on participating radiology providers)	• Ensure reminders are enabled in participant record in practice software • Ensure NCSR is integrated with practice software

Table 1e: Roles and responsibilities of health support workers (e.g. health promotion, disability support, mental health, bicultural workers) across the screening and assessment pathway

Health support workers

	Program entry and supporting choice	Low-dose CT scan and reporting	Management of results, follow-up and reminders
Aboriginal Liaison Officers **AND** **Health support workers**	• Promote the program • Recommend an eligibility assessment • Offer smoking cessation supports (within scope of practice)	• Assist participant to make appointment • Help to identify supports needed for low-dose CT scan	• Support results communication • Support care coordination • Offer smoking cessation support within their scope of practice
Smoking cessation services	• Promote the program • Recommend an eligibility assessment • Offer smoking cessation supports (within scope of practice)	• Offer smoking cessation supports	• Offer smoking cessation supports

Figure 2: Simplified pathway summarising the program healthcare setting and roles and responsibilities



Any healthcare provider or health support worker can identify an eligible participant and recommend screening*

*Eligibility must be confirmed by a requesting practitioner (e.g. GP) prior to a low-dose CT request.

AHP: Aboriginal Health Practitioner.

^Mobile screening trucks will service some rural and remote areas.

Text alternative for Figure 2

NAVIGATING THE PROGRAM

The following sections of the Program Guidelines map out each stage of the program and provide guidance, recommendations and practice points for healthcare providers and health support workers involved in delivering the program.

Program considerations

Achieving equity in the National Lung Cancer Screening Program

In Australia, there are significant differences in lung cancer outcomes among different population groups. Disparities are strongly associated with various health determinants, such as cultural, social, commercial, environmental, economic, and structural factors. Indigeneity, race, ethnicity, sex, gender, sexuality, where people live, their socioeconomic group, whether they have a disability and the intersections of these factors can contribute to discrimination and/or exposures to cancer risk factors, differences in access to care, lung cancer diagnosis, experiences, and survival rates. These differences highlight the need for targeted, culturally safe approaches to help ensure fair and equitable lung cancer screening and health outcomes for all Australians.

Certain populations (listed below) have been identified as priority populations of the program due to an increased risk of lung cancer. This risk can be related to smoking prevalence and systemic health care access barriers[1,8,16,17]. These populations often experience limited access to appropriate and safe health services and have a distrust of health care services[17–20] resulting in poorer health outcomes overall. Therefore, ensuring the program and these supporting guidelines meets the needs of identified priority populations will achieve equity and benefit all eligible Australians.

The following groups have been identified as priority populations for the program. We acknowledge that some people may identify with one or more of the following groups:

- Aboriginal and/or Torres Strait Islander peoples
- People living in rural and remote areas
- People from culturally and linguistically diverse (CALD) backgrounds
- People living with disability
- People living with mental illness
- People from the Lesbian, Gay, Bisexual, Transgender, Intersex, Queer and Asexual (LGBTIQA+) communities.

It is important to remember that many different influences can make up a person’s identity and their experiences. This can include cultural identity, race, religion, gender identity, sexual orientation or sexuality, where a person lives, age, ability or disability, migration status as well as consideration for the circumstances they may be experiencing.

The program strives towards equitable and safe delivery for all priority populations. It is critical that healthcare providers across all settings are aware of the program and encourage potentially eligible people from these priority populations to participate in screening. People within these populations often experience intersectional and compounding barriers to screening and accessing health care[21].

It is important to recognise and care for all participants in a culturally safe way by being responsive to their values, needs and preferences.

Aboriginal and Torres Strait Islander peoples

These Program Guidelines recognise the prevailing strength and endurance of Aboriginal and Torres Strait Islander peoples, their families, and communities as the world's oldest living cultures. Aboriginal and Torres Strait Islander peoples are a priority population in the program due to inequities in smoking prevalence and access to optimal and culturally safe and appropriate healthcare, which significantly impacts lung cancer diagnosis, mortality, and survival rates[22–24]. Despite a significant downward trend, approximately 29% of Aboriginal and Torres Strait Islander peoples smoke[1,25],[,,95], meaning they are likely to make up a disproportionately large segment of the eligible screening population. In addition, the lung cancer survival rate for Aboriginal and Torres Strait Islander peoples is 11% at five years post diagnosis[22]. Such impacts and loss to communities may affect participation rates and the participation experience.

To date, Aboriginal and Torres Strait Islander peoples have low participation across the bowel, breast and cervical screening programs and high rates of positive results requiring follow up[16,26,27]. Significant efforts must be made to address the systemic barriers in the Australian health care system which contribute to underscreening and ensure that eligible Aboriginal and Torres Strait Islander peoples are given equitable opportunities to screen for lung cancer[23,28]. Getting the program right for Aboriginal and Torres Strait Islander peoples will ensure it works for all Australians and that equity is achieved.

Cultural safety in the National Lung Cancer Screening Program

The program has been co-designed with Aboriginal and Torres Strait Islander peoples and the National Aboriginal Community Controlled Health Organisation (NACCHO) to help ensure it is culturally safe. The Government is committed to working in partnership with Aboriginal and Torres Strait Islander peoples, communities and organisations, recognising that the only way to close the gap is when Aboriginal and Torres Strait Islander peoples' leadership and right to self-determination are upheld so that they may own, commit to and drive the outcomes sought, alongside all governments. The National Agreement on Closing the Gap (National Agreement), the Australian Cancer Plan, and the NACCHO Aboriginal and Torres Strait Islander Cancer Plan are key policies that demonstrate this commitment[30–32].

In realising the commitment made by all Australian Governments and Aboriginal and Torres Strait Islander representatives in the National Agreement, there is an obligation to ensure the program is delivered in a culturally safe way[30]. The four Priority Reforms outlined in the National Agreement provide a roadmap to strong and positive ways of working together to create a culturally safe program:

1. Formal partnerships and shared decision-making
2. Building the community-controlled sector
3. Transforming government organisations
4. Shared access to data and information at a regional level[30].

A holistic approach to health and wellbeing requires understanding and addressing cultural determinants. Cultural determinants of health and wellbeing such as family kinship and community, self-determination, Indigenous beliefs and knowledges, connection to Country, Indigenous languages, and cultural expression and continuity, are all strongly identified as having a positive impact on the health and wellbeing outcomes of Aboriginal and Torres Strait Islander peoples. Connection is a key component of Aboriginal and Torres Strait Islander cultures. It recognises the importance of kinship and connection to Country physically, spiritually, and through traditional knowledge sharing and storytelling.

The Australian Cancer Plan and the Aboriginal and Torres Strait Islander Cancer Plan highlight the importance of mainstream health services working collaboratively and in reciprocity with Aboriginal Community Controlled Health Organisations[31,32].

All healthcare providers have a responsibility to deliver culturally safe healthcare services. The Australian Health Practitioner Regulation Agency (Ahpra) defines cultural safety as being determined by Aboriginal and Torres Strait Islander individuals, families and communities. Culturally safe practice is the ongoing critical reflection of health practitioner knowledge, skills, attitudes, practising behaviours and power differentials in delivering safe, accessible and responsive healthcare free of racism[29]. As outlined by Ahpra, to ensure culturally safe and respectful practice, health practitioners must:

- Acknowledge colonisation and systemic racism, and social, cultural, commercial and economic factors which impact individual and community health and wellbeing
- Acknowledge and address individual racism, their own biases, assumptions, stereotypes and prejudices and provide care that is holistic, free of bias, racism and discrimination
- Recognise the importance of self-determined decision-making, partnership and collaboration in health care which is driven by the individual, family and community
- Foster a safe working environment through leadership to support the rights and dignity of Aboriginal and Torres Strait Islander peoples and colleagues[29].

To help ensure culturally safe care, program staff should undertake cultural safety training. More information is available from the **Australian Health Practitioner Regulation Agency (Ahpra) website** and the National Scheme's Aboriginal and Torres Strait Islander Health and Cultural Safety Strategy 2020–2025[29]. Training can be recommended by a local Aboriginal Community Controlled Health Organisation (ACCHO) or NACCHO affiliate.

Collaboration is critically important as **it is through Aboriginal and Torres Strait Islander leadership, including leadership from Aboriginal and Torres Strait Islander Health Workers and Health Practitioners, that equitable, culturally safe and responsive health care can be delivered for Aboriginal and Torres Strait Islander peoples and communities**[31]. This collaboration is critically important to the success of the program, as people are supported through the entire screening and assessment pathway to achieve the best possible outcomes[32].

Addressing stigma in the National Lung Cancer Screening Program

Lung cancer screening differs from other cancer screening programs as program eligibility is driven by exposure to a risk factor – tobacco use – and specifically smoking cigarettes, which is highly stigmatised[33,34]. Lung cancer, as a disease explicitly linked to tobacco use, is consequently highly stigmatised for individuals diagnosed with the disease, their families and carers. Many Australians express victim-blaming mentalities towards people diagnosed with lung cancer[35]. Experiences of stigma associated with lung cancer are also often perpetuated within health care settings[36].

Stigma attached to smoking, nicotine dependence, and lung cancer can undermine health care access through internalised perceptions that the disease is self-induced[37,38]. Stigma can manifest as guilt, shame, anxiety, and depression[39] and is strongly related to delays or avoidance in seeking supports from GPs and others when needed[40]. Stigma can also negatively impact the delivery of care and a person's psychosocial and quality of life outcomes[41].

Stigma, along with other factors, can negatively impact how people who smoke or who have a history of smoking engage with lung cancer screening[37,41,42]. Stigma represents a significant deterrent and can create unsafe care environments. This may lead to non-participation in lung cancer screening and delay people from seeking treatment and supports. Stigma can also hinder acceptance of smoking cessation supports[43] and open communication about cancer, including among families and communities[44], which may further exacerbate the potential for unsafe care, delays or non-participation in lung cancer screening.

To counter stigma in health care, healthcare providers should acknowledge the role of the tobacco industry as well as structural and historical determinants of health-related behaviours, care, and outcomes[44]. Minimising stigma and shame associated with tobacco use and cancer risk is critical, while recognising that the tobacco industry actively promotes and sells highly addictive products across Australia[45]. Stigma can be addressed in the program through collaborative efforts towards changing beliefs, attitudes and behaviours, while avoiding blame-focused discourse. Addressing participants' psychosocial needs (see below) and promoting and utilising shared decision-making are key strategies for reducing stigma. This can assist to maximise the uptake of lung cancer screening[44,46]. Everyone deserves care, support, and understanding[35].

Psychosocial care

Stigma, coupled with scan anxiety and fear of diagnosis stemming from screening for lung cancer, means that the psychosocial impact may be profound for some participants and their families[47]. Creating culturally safe spaces for individuals to discuss their lived experiences and individual needs can help to reduce anxiety and increase safety[48]. Healthcare providers should be prepared to offer or refer to psychosocial care; an approach to care which accounts for the whole person, addressing social, psychological, emotional, spiritual, and functional aspects of the participant journey[47,49]. This includes ensuring that the participant is aware of professional supports available, such as psychological counselling services, financial and travel assistance, or support groups. Support should be offered whenever it is appropriate and necessary. Information and support should be delivered in a sensitive manner and tailored to individual participant characteristics such as: age, health literacy, cultural identity, religion, mental health concerns, gender, sexuality, and language spoken.

Practice Points: Program considerations

Achieving equity:

Priority population groups of the program include:

- Aboriginal and Torres Strait Islander peoples
- People living in rural and remote areas
- People from culturally and linguistically diverse backgrounds (CALD)
- People living with disability
- People living with mental illness
- People from the Lesbian, Gay, Bisexual, Transgender, Intersex, Queer and Asexual (LGBTIQA+) communities.

Ensure priority populations have equitable access to screening and tailor approaches to provide safe and appropriate care. Some individuals may identify with one or more of the above groups.

Cultural safety:

All healthcare providers and professionals involved in delivering the program share the responsibility to ensure a culturally safe lung cancer screening program. All staff involved in the program should engage in formal cultural safety training.

Data collection:

Appropriate collection of participants' data is necessary for an inclusive and safe program. Ensure all data points are collected appropriately, accurately, and completely.

Practice Points: Program considerations

Collect and record Indigenous status:

Aboriginal and Torres Strait Islander status should be accurately and consistently collected and recorded on all relevant program forms and clinical records, in accordance with the Australian Bureau of Statistics classification and standards. This will support monitoring and evaluation of equity in the program.

Stigma:

Stigma can negatively impact participation in screening. All conversations should be free of judgement, non-stigmatising, empathetic and consider social and emotional wellbeing.

Psychosocial care:

Healthcare providers should offer psychosocial support and refer to psychosocial services where appropriate. Individuals should be provided an opportunity to discuss their lived experiences and specific needs.

Resources: Program considerations

Cancer Council – Patient Support Services

Lung Foundation Australia – services

Reducing Stigma in the National Lung Cancer Screening Program

Providing support for lung cancer screening participants

Smoking cessation

The provision of smoking cessation supports are an important component of any effective and equitable lung cancer screening program, with evidence from trials showing that participants have higher quit rates than rates expected in the general population[38]. Tobacco use is highly addictive and is the single greatest avoidable risk factor for lung cancer[50]. For people who smoke, quitting smoking is the best way to reduce lung cancer risk and improve health outcomes[51]. While the program is targeted to people with a history of tobacco cigarette smoking, it is an opportunity to discourage all forms of smoking.

Offering support for smoking cessation is the responsibility of all healthcare providers. Healthcare providers can access **clinical tools and guidelines for smoking cessation support** via Quit Centre.

People who smoke do not have to quit smoking to participate in the program.

How to implement – recommendations and practice points

Smoking cessation supports are to be offered to all potential participants by healthcare providers across the lung cancer screening and assessment pathway.

Smoking cessation support(s) should be embedded into everyday practice in the delivery of the program. Smoking cessation interventions can be offered in primary care settings according to **current Australian smoking and nicotine cessation clinical guidelines** available from the Royal Australian College of General Practitioners (RACGP)[52] and nicotine dependence support guidelines for pharmacists available from the Pharmaceutical Society of Australia. Guidelines are also available for **offering smoking cessation at the point of diagnosis** from the Clinical Oncology Society of Australia (COSA)[53].

Best practice smoking cessation interventions

It is strongly recommended that the three-step brief intervention model 'Ask, Advise, Help' be utilised across the screening and assessment pathway as it can be delivered in a short time, by any healthcare provider, and in any setting due to the low intensity and minimal resourcing required[36].

1. **ASK** and record if the person smokes.
2. **ADVISE** people who smoke on the most effective quit methods.
3. **HELP** to arrange a referral to multi-session behavioural interventions and pharmacotherapy.

The 'HELP' step can involve a referral directly to tobacco treatment specialists, such as the Quitline (**via jurisdictional web form**), as appropriate. Healthcare providers should ensure the individual has provided informed consent for the Quitline referral and agreed to be contacted by Quitline.

How should smoking cessation supports be offered?

Smoking cessation supports should be offered in a way that is understanding of, and empathetic to the person's experience of nicotine dependence. People who smoke may experience stigma due to the misconception that smoking is a 'lifestyle choice' or 'personal choice' and often face a victim-blaming mentality towards smoking-related disease. Healthcare providers should acknowledge that tobacco use is driven by harmful commercial interests and entrenched normalisation, particularly as an ongoing impact of colonisation for Aboriginal and Torres Strait Islander peoples and communities[28,45].

Healthcare providers can help address and minimise stigma by acknowledging that nicotine dependence is a clinical condition that can be treated[35,51]. Non-judgmental and person-centred terminology is encouraged rather than labels (see the **IASLC language guide**). Individuals can be supported by healthcare providers highlighting the benefits of quitting smoking and focusing on the positive impacts, including physical, psychological, financial, and social benefits[51]. Each person's interest in and responsiveness to smoking cessation supports will be different. Individuals should not be coerced or pressured and should not be made to feel guilty if they do not quit.

Initiatives to support equity and culturally safe smoking cessation supports

- Cessation medicines, including varenicline and bupropion are subsidised on the Pharmaceutical Benefits Scheme (PBS), and can be accessed with a prescription.
- Free nicotine replacement therapy (NRT) is available in some jurisdictions through Quitline.
- Pharmacotherapies may be free for Aboriginal and Torres Strait Islander peoples if they are eligible for the Closing the Gap co-payment. However, it is important to note that patches are the only form of NRT currently available on PBS for all Australians; oral NRT is currently not available on the PBS and therefore not covered under the Closing the Gap co-payment
- When contacting the Quitline, callers can ask to speak to an Aboriginal and/or Torres Strait Islander counsellor and/or advisor to provide for a culturally safe quitting service.
- Online and app-based tools can be recommended to participants to support smoking cessation progress (e.g. My QuitBuddy and the National Cessation Platform at quit.org.au).

Aboriginal and Torres Strait Islander peoples and smoking cessation

The program aligns with the **National Tobacco Strategy** and complements Australia's track record in reducing tobacco-related disease and mortality by systematically embedding smoking cessation support within the pathway[6,54]. The National Tobacco Strategy identifies greater access to cessation services as a key priority area in reducing smoking prevalence. The National Tobacco Strategy also identifies specific actions towards achieving cultural safety and best practice in providing access to, and the delivery of tobacco/nicotine cessation supports, particularly for Aboriginal and Torres Strait Islander peoples and priority populations[54].

Aboriginal and Torres Strait Islander peoples require tailored approaches and access to culturally safe and appropriate smoking cessation supports and services[23]. The majority (70%) of Aboriginal and/or Torres Strait Islander peoples who smoke want to quit[55].

When supporting Aboriginal and Torres Strait Islander individuals to quit smoking within the context of the program, it is important that healthcare providers recognise specific barriers to smoking cessation, and the ongoing colonial history that has systemically entrenched commercial tobacco use in communities[28,56–58].

Barriers to cessation include the normalisation of smoking in communities and as a social activity, and the use of tobacco as a coping mechanism for stress linked to intergenerational trauma[59]. Leveraging family and community support for smoking quit attempts has been shown to be effective to address these barriers. Barriers also exist in accessing mainstream smoking cessation services, such as online supports and Quitline, including cultural safety, language and phone accessibility, preference for face-to-face interventions, and access to affordable NRT options[60,61].

Healthcare providers need to consider individual preferences, access, cultural appropriateness, and personal circumstance when supporting smoking cessation[56]. Healthcare providers can refer individuals to culturally safe services for Aboriginal and Torres Strait Islander peoples, including Aboriginal Community Controlled Health Organisations and Quitline. Quitline services across Australia have Aboriginal and Torres Strait Islander counsellors trained to deliver culturally safe smoking cessation support. Aboriginal and/or Torres Strait Islander clients are provided with the opportunity to speak to an Aboriginal and/or Torres Strait Islander Quitline counsellor if they wish. The Tackling Indigenous Smoking (TIS) program works at a population health level to support Aboriginal and Torres Strait Islander communities to reduce the prevalence of smoking. TIS activities help to inform and support people to be nicotine free, including community education and engagement activities, mass media and social media campaigns, and promotions resources. A range of culturally appropriate resources and factsheets are available on the TIS website.

Recommendations: Smoking cessation

All people who currently smoke or have recently quit should be offered support to quit smoking or maintain cessation using the 3-step brief intervention model – Ask, Advise, Help.

Smoking cessation supports are to be offered to all potential participants by healthcare providers across the screening and assessment pathway. This includes follow-up and maintenance support.

Offer follow-up support to all people who are attempting to quit smoking.

Referral to telephone call-back counselling services can be offered to all people who smoke (where appropriate).

Practice Points: Smoking cessation

Current smoking:

Participants do not have to quit smoking to participate in the program.

Practice Points: Smoking cessation

Smoking cessation interventions:

Healthcare providers should ensure individuals have access to effective and culturally safe best practice smoking cessation interventions, including pharmacotherapy and behavioural counselling or as recommended in current Australian smoking and nicotine cessation clinical guidelines.

Smoking cessation specialists:

Healthcare providers can refer individuals to tobacco treatment specialists via Quitline and/or local smoking cessation support services and online web-based supports. Ensure the individual consents to a referral.

Documentation of smoking history:

Updated smoking history records enables identification of people eligible for the program and to offer smoking cessation support to people who currently smoke.

Data collection:

Healthcare providers should capture information on smoking cessation supports being offered during relevant consultations and the type of smoking cessation support that was offered. This will be captured in the Healthcare Provider Enrolment and Eligibility Form and Participant Management form.

Stigma:

Smoking cessation support should be delivered without judgement to avoid stigmatising the person. Individuals should not be coerced or pressured into quitting smoking.

Cultural safety:

Smoking cessation support must be culturally safe and appropriate for the individual. Ensure individual needs and preferences are considered and utilise tailored resources. Quitline services across Australia have Aboriginal and Torres Strait Islander counsellors trained to deliver culturally safe smoking cessation support.

Resources: Smoking cessation

RACGP Smoking Cessation Guidelines

Quitline

Phone: 13 78 48

- callers can ask to speak with an Aboriginal and/or Torres Strait Islander counsellor.

Quit Centre for Health Professionals

My QuitBuddy app

IASLC Language Guide

Smoking cessation resources guide

Promotion and awareness

Summary - what will happen?

Program promotion and awareness-raising are integral to maximise participation in the program. Promotion that is widespread and frequently repeated will help to reach potentially eligible people and inform the broader Australian community.

Governments, service providers and healthcare professionals have a joint responsibility to proactively promote the program to support engagement with potential participants.

Lack of awareness and understanding of the benefits of screening are the most significant barriers to participation in international lung cancer screening programs[37,62,63]. Tailored promotion of the program in both healthcare and community settings will reduce barriers to screening and increase participation of eligible people, including those from priority populations[64,65]. Positive messages from healthcare providers about the benefits of lung cancer screening can facilitate **cultural safety** and **address stigma**. Repeated provision of information improves participation in lung cancer screening programs and reduces barriers[66] such as the time constraints placed on GP consultations and competing demands for limited healthcare resources[62].

How to implement – practice points and recommendations

The program should be promoted in ways that are culturally safe, appropriate and accessible, account for various levels of literacy and health literacy, and address stigma.

Along with national campaigns, healthcare providers play an important role in recommending screening and disseminating information. Healthcare providers can engage in promotion and raising awareness of the program by:

- Familiarising themselves with specific information and education resources about the program including eligibility criteria, what a low-dose CT scan is, benefits and harms of screening, any costs involved, and referral processes for further investigations and follow-up[67].
- Clearly articulating program information to a wide range of audiences in plain language, noting:
  - Communication resources have been developed to cater to people from a broad range of backgrounds.
  - Resources are available in a range of community languages. Professional interpreters should be engaged where appropriate.
  - Community champions may facilitate the promotion of public health programs in their communities[68].
- Recommending lung cancer screening to patients in their practices[69].
- Utilising existing resources to ensure adherence to key messaging of the program[70].
- Promoting the program into existing community health education sessions and existing cancer screening programs for breast, bowel and cervical cancers.
- Repeating key messages about the program to the general public to help disseminate information widely across communities.

Practice Points: Promotion and awareness

Target audiences:

Consider the information needs of lung cancer screening priority populations, including Aboriginal and Torres Strait Islander peoples. Use resources and key messages that have been tailored for priority populations where available.

Engagement and awareness building:

When engaging priority populations, including Aboriginal and Torres Strait Islander peoples, involve trusted community members, organisations, and healthcare professionals, such as Aboriginal Health Workers and Practitioners, in promoting the lung cancer screening program and raising awareness within the community.

Accessibility:

Practice Points: Promotion and awareness

Promotion materials need to be in plain language and easy to understand. Program resources should be offered in easily accessible ways.

Offer multiple opportunities to access information:

Information about the program should be repeated and available in multiple formats and across multiple timepoints. Repetition increases information absorption and will complement general public awareness[66].

Readiness:

Strategies to get health services ready for the program are available from the **program website**. Engaging community healthcare workers is an effective means of educating the general public and reaching people at high risk of lung cancer.

Program entry and recruitment

Summary – what will happen?

Recruitment involves identifying and engaging potentially eligible individuals who are at high risk of developing lung cancer to participate in the program.

As the program is a targeted screening program with risk-based eligibility criteria, eligible individuals cannot be identified solely based on age through means such as Medicare or the electoral roll. For this reason, the NCSR does not issue invitation letters as it does for bowel and cervical cancer screening programs.

There are four routes for potential participants to enter the program:

- **Organised entry**
  A potential participant is proactively identified by a primary care practice through existing patient records (e.g. electronic medical record (EMR) or practice databases) based on their age and smoking history. Other risk factors, for example, respiratory conditions, provide an opportunity to identify people through an organised entry pathway. Individuals are proactively invited to participate in an eligibility assessment which is confirmed by a requesting practitioner.
- **Opportunistic entry**
  A potential participant is identified by a healthcare provider during an unrelated consultation. The healthcare provider offers to complete an eligibility assessment for the potential participant either during the same consultation or at another time. If the consulting healthcare provider is authorised to request a

low-dose CT scan, they may do so directly following confirmation of eligibility. EMR-based approaches could be established to flag potentially eligible participants and prompt the healthcare provider to opportunistically ask about lung cancer screening.

- **Facilitated entry**
  Facilitated entry plays an important role in reaching potential participants who may not have a regular primary care provider and provides an alternative access point that may be more appropriate for some priority populations. Facilitated entry may include supporting the potential participant to arrange a primary care appointment and/or engaging a support person such as a family member or community worker to support them. Healthcare providers or health support workers can identify individuals who are potentially eligible for the program (for example a Quitline counsellor may encourage a potential participant to see their GP for an eligibility assessment). Liaison with a requesting practitioner is then required to confirm eligibility and complete a low-dose CT request.
- **Self-identified entry**
  A potential participant proactively seeks an eligibility assessment from a requesting practitioner who can confirm eligibility and complete a low-dose CT request.

The four entry routes into the program allow for flexible ways to identify potential participants. All routes lead to an eligible participant receiving a low-dose CT scan request from a healthcare provider with an MBS provider number and authority to request CT imaging (hereby referred to as a requesting practitioner). Eligible participants will receive a welcome pack and screening reminders once enrolled in the program.

Recruitment Settings

Recruitment into the program occurs across multiple settings, including primary health care practices, Aboriginal Community Controlled Health Organisations/Medical Services, allied health settings, community primary care services and hospital-based services.

How to implement – practice points and recommendations

Practice Points: Program entry and recruitment

Organised entry:

Primary care practices can use existing clinical software-integrated mechanisms to conduct Electronic Medical Record (EMR) audits to identify potential participants who meet the eligibility criteria and proactively send an invitation to consider screening via usual practice communication methods (e.g. letter, SMS).

Practice Points: Program entry and recruitment

Opportunistic entry:

Practices can establish EMR-based prompts to flag potentially eligible participants during consultations to enable opportunistic identification of potential participants.

Eligibility self-assessment:

Individuals may have self-assessed their own eligibility prior to consulting a healthcare provider. A requesting practitioner needs to confirm and record screening eligibility before a low-dose CT scan can be requested.

Program entry:

Eligible participants will receive a welcome letter and screening reminders once enrolled in the program.

Smoking status and history:

Healthcare providers should regularly update and review the accurate recording of smoking status and history into EMRs to efficiently identify potential participants.

Data collection should include:

- Tobacco cigarette smoking history (current/former/never)
- Start smoking age (years)
- Quit smoking age (years) if applicable
- Duration smoking (years)
- Average daily cigarette consumption (number of cigarettes).

Smoking cessation:

Updated smoking history records enables smoking cessation supports to be offered to people who currently smoke. Smoking cessation supports should be offered to all individuals who currently smoke or who have recently quit.

Practice Points: Program entry and recruitment

Access:

Healthcare providers to offer tailored support options and/or services where appropriate. Consider potential participants' access to a requesting practitioner and screening site, including transportation and appointment booking.

Resources: Program entry and recruitment

For eligible individuals and general public:

- What is the National Lung Cancer Screening Program (factsheet)
- What is the National Lung Cancer Screening Program (brochure)
- About lung cancer screening
- Frequently Asked Questions from Community Members

For healthcare providers:

- Key evidence for the National Lung Cancer Screening Program
- Referring Practitioner Flowchart for Eligibility and CT Scan Referral
- GP resource guide
- Frequently Asked Questions from the Health Workforce
- Reducing Stigma in the National Lung Cancer Screening Program
- Conversation starters

Eligibility and low-dose CT scan request

Summary – what will happen?

A wide range of healthcare providers may discuss and check if people are eligible to participate in the program, such as nurses and Aboriginal and Torres Strait Islander Health Workers or Practitioners. Eligibility to participate in the program should be confirmed by a requesting practitioner. Individuals need to meet all four eligibility criteria listed below to participate in the program.

There are no program-specific MBS items for the eligibility assessment. Existing MBS items for short and long consultations in general practice can be used, such as the 715 health check for Aboriginal and Torres Strait Islander people.

National Lung Cancer Screening Program eligibility criteria:

1. Are aged 50 to 70 years;

AND 2. Are asymptomatic (no signs or symptoms suggestive of lung cancer);

AND 3. Currently smoke or have quit smoking in the past 10 years;

AND 4. Have a history of tobacco cigarette smoking of at least 30 pack-years[9].

Tobacco cigarette smoking includes packaged cigarettes and roll-your-own cigarettes (rollies). It does not include other forms of tobacco or nicotine smoking or consumption, such as vaping.

Eligible participants are not required to stop smoking to participate in the program.

Once an individual is participating in the program, their smoking history eligibility criteria does not need to be re-assessed. To remain eligible, the participant must be aged between 50-70 and be asymptomatic. The participant can continue to screen if their quit smoking duration exceeds 10 years. The participant remains eligible to continue in the program until they age out (turn 71 years), become unable to undergo a low-dose CT scan or have findings on scans that mean they exit the program. See section on **Program exit and re-entry**.

A requesting practitioner should also check the low-dose CT scan suitability of all people eligible to participate in the program prior to completing a low-dose CT scan request.

How to implement – recommendations and practice points

How to calculate smoking pack-year history

Pack-years is a way of measuring the number of cigarettes a person has smoked in their lifetime. To determine eligibility, a healthcare provider needs to calculate a person's smoking pack-year history.

Pack-years are calculated by **multiplying** the **number of years the person has smoked** by the **number of packs of cigarettes smoked per day.** For example, 1 pack-year is equal to smoking 1 pack of cigarettes per day for 1 year. For the purposes of this calculation, 1 pack is equal to 20 cigarettes.

Calculating pack-years relies on a person's recall of their smoking history. This means that calculating pack-years is an 'imperfect science' and healthcare providers will need to use clinical judgement and best estimates to determine if a person is eligible to participate in the program. Healthcare providers should encourage individuals to provide their best estimate of their smoking history/habits and acknowledge that this estimate may vary depending on a range of factors (e.g. use of tobacco pouch, sharing packets of cigarettes). Pack-year history will not be recorded in the NCSR.

Requesting practitioners are advised to use **clinical judgement and best estimates** to confirm if a person is eligible to participate in the program when calculating pack-year smoking history.

Healthcare providers should ask a person:

- How many years have you smoked tobacco cigarettes?
- On average, how many tobacco cigarettes have you smoked per day?

Sometimes people find it hard to recall their smoking history. It may be helpful to ask a person how old they were when they started smoking. Recording this data point (as a date) in practice software will help current and future health professionals determine pack-year history, and if the person is not yet eligible, review eligibility for the program over time.

Calculate pack-years

Calculate pack-years		x		=	
	NUMBER OF YEARS SMOKED		AVERAGE NUMBER OF PACKS SMOKED PER DAY (one pack equals 20 cigarettes)		PACK-YEARS

A case study example of how to calculate smoking history

- A 55-year-old person sees their GP to assess their eligibility to participate in the program.
- The person quit smoking 6 years ago. Prior to that, they would on average smoke 2 packets of 20 cigarettes per day for 15 years.
- This equates to 30 'pack-years' (2 packs per day x 15 years = 30 pack-years). This smoking history makes the person eligible for the program and they choose to commence screening.
- After being in the program for 5 years, the participant has continued to not smoke, and it has now been 11 years since they quit. **The person remains eligible to continue screening,** even though their smoking quit duration now exceeds 10 years.

Telehealth

Assessment of eligibility by a requesting practitioner can occur via a telehealth appointment, and is encouraged for participants in regional, rural and remote areas. **Telehealth MBS items** can be used if:

- The requesting practitioner and individual have an existing clinical relationship
- The individual has visited the practice for a face-to-face service in the last 12 months.

Please note, there are **some exemptions to this rule**. These exemptions are important to consider for opportunistic entry into the program. Some relevant exemptions could include for[71]:

- People experiencing homelessness
- People needing mental health support
- People receiving treatment in an Aboriginal Medical Service (AMS) or an Aboriginal Community Controlled Health Organisation (ACCHO).

Managing symptomatic participants

If an individual is found to have signs and symptoms suggestive of lung cancer at any point of the screening and assessment pathway, the requesting practitioner should investigate these according to Cancer Australia's guide for **Investigating Symptoms of Lung Cancer**: a guide for all health professionals[72] and manage the patient according to the **Optimal Care Pathway for people with lung cancer** or the **Optimal Care Pathway for Aboriginal and Torres Strait Islander People with Cancer**[73,74]. It is vital that this happens in a timely way to ensure the prompt investigation of any possible indications of lung cancer.

Recommendations: Eligibility and low-dose CT scan request

Eligibility assessment:

Assess if an individual meets the program eligibility criteria to participate in the program:

1. Are aged between 50 and 70 years of age;
   AND
2. Are asymptomatic (no signs or symptoms suggestive of lung cancer);
   AND
3. Currently smoke or have quit smoking in the past 10 years;
   AND
4. Have a history of tobacco cigarette smoking of at least 30 pack-years[9].

Practice Points: Eligibility and low-dose CT scan request

Pack-years:

Calculating pack-years is an 'imperfect science' and healthcare providers should use clinical judgement and best estimates to calculate smoking pack-years when determining program eligibility.

Confirming eligibility:

Participants must satisfy all screening eligibility criteria to enter the program. Confirm eligibility and check for low-dose CT scan suitability prior to providing a low-dose CT request.

Data collection:

Record patient information on the Healthcare Provider Eligibility and Enrolment form, including preferences for their data to be on the NCSR, suitability for a low-dose CT scan, Indigenous status, smoking cessation support and advice, and family history of lung cancer in any first-degree relative (i.e. parent, sibling or child). These data will inform program monitoring and quality.

Reassessment:

Individuals assessed as not currently eligible for the program but who may meet the criteria as they age or accumulate additional pack-years of smoking should be reassessed as soon as they meet the eligibility requirements. Consider adding a reminder in EMR for when to reassess the patient.

Psychosocial support:

Healthcare providers should offer tailored psychosocial support options and/or services where appropriate. People may experience distress or fear about being at high risk of lung cancer or feel anxious about not being screened.

Smoking cessation:

Smoking cessation support should be offered to all individuals who currently smoke or who have recently quit regardless of actual participation in screening.

Resources: Eligibility and low-dose CT scan request

For eligible individuals and general public:

- Your visit to the Radiology clinic (factsheet)
- Your visit to the Radiology clinic (brochure)
- Frequently Asked Questions from Community Members
- Eligibility Tool
- Why Am I Currently Not Eligible for Lung Cancer Screening

For healthcare providers:

- Key evidence for the National Lung Cancer Screening Program
- Referring Practitioner Flowchart for Eligibility and CT Scan Referral
- GP resource guide
- Frequently Asked Questions from the Health Workforce
- Reducing Stigma in the National Lung Cancer Screening Program
- Conversation starters
- Health Workforce Roles and Responsibilities

Suitability for low-dose CT

Summary – what will happen?

The lung cancer screening program uses low-dose CT scans of the chest to screen people for lung cancer. A requesting practitioner will assess whether eligible individuals are suitable for low-dose CT to ensure the scan is clinically appropriate.

Requesting practitioners need to check suitability for low-dose CT:

- For all people eligible to participate prior to completing a low-dose CT scan request
- Prior to each low-dose CT scan request, including the baseline scan and all follow-up scans.

This involves checking whether people are suitable to have a low-dose CT scan based on their general health alongside factors relating to a person's ability to physically access and use CT scanners. Suitability for low-dose CT scan can also be performed via **telehealth appointment.**

Most people will be able to undergo a low-dose CT scan, however some people will be eligible to participate in the program but may be unsuitable for a low-dose CT and unable to complete a scan. A person's suitability may be temporary and change over time.

How to implement – practice points and recommendations

Suitability for low-dose CT is based on specific criteria such as being able to lie flat for a minimum of 5 minutes to complete a low-dose CT scan.

People may be considered unsuitable for low-dose CT if:

- Weight exceeds restrictions of scanner (>200kg depending on the scanner)
- Unable to lie flat for a minimum of 5 minutes
- Symptomatic lung infection (e.g. COVID-19, pneumonia, bronchitis, lower respiratory tract infection with productive cough) within the previous 12 weeks
- Underwent a full CT scan of the chest within last 12 months or have one planned for clinical reasons in the next 3 months (for example, active cancer surveillance).

It is preferable for people to lift their arms above their head for a low-dose CT scan. For people unable to hold their hands above their head for a low-dose CT scan, the scan can usually still be performed with hands by their side and a very small increase in radiation dose.

Requesting practitioners should consider if participants have any other health reasons that may mean a low-dose CT scan is clinically inappropriate and these people should be managed as per usual care arrangements. Significant co-morbidities that preclude investigation and treatment of lung cancer, such as severe chronic obstructive pulmonary disease[75] or poor functioning status (such as Eastern Cooperative Oncology Group (ECOG) 3-4 on the **ECOG Performance Status Scale**)[76] should be considered during a **shared decision-making** discussion, as they may make people unsuitable for screening. However, suitability for lung cancer surgery should not be a contraindication for screening, as participants with comorbidities such as significant COPD or cardiovascular disease can safely be treated with stereotactic ablative body radiotherapy (SABR) with minimal toxicities[77].

Practice Points: Suitability for low-dose CT

Suitability for low-dose CT:

Requesting practitioners check suitability for a low-dose CT scan for all people eligible to participate in the program. Complete this check prior to completing a low-dose CT scan request at baseline and all subsequent scans.

Documentation:

Record suitability for a low-dose CT scan on the Healthcare Provider Eligibility and Enrolment form and the Participant Management form (at all subsequent appointments to provide a new low-dose

Practice Points: Suitability for low-dose CT

CT scan request) (Yes/No). Note: if not suitable due to temporary reasons, the healthcare provider should record the date for when they are suitable in the form.

For individuals assessed as suitable for low-dose CT and able to undergo a low-dose CT scan, requesting practitioners and/or healthcare providers should engage in a shared decision-making discussion to allow potential participants to make an informed choice about screening.

For those assessed as unsuitable for screening low-dose CT and unable to undergo a low-dose CT scan, practice points specific to each low-dose CT unsuitability criteria are provided in Table 2.

Table 2: Low-dose CT unsuitability criteria and associated practice points

Low-dose CT unsuitability criteria	Rationale	Practice point
Weight exceeds restrictions of scanner (>200kg depending on the scanner).	Morbid obesity is a potential issue that may result in participants being temporarily unable to be scanned due to exceeding the weight restrictions of the scanner.	• If an individual weighs >200kg, healthcare providers and/or program participants to check suitability with radiology provider. Note: Radiology service providers may ask people to confirm their weight at the time of booking a low-dose CT scan to clarify that it does not exceed the weight restrictions of the scanner. • Actively recall participants unsuitable for low-dose CT scan due to exceeding weight restrictions of the scanner at two-year intervals to reassess low-dose CT suitability. This can be done via the NCSR pause participation function. Practice-based recalls can be used for people who opt-out of the NCSR.

Low-dose CT unsuitability criteria	Rationale	Practice point
Unable to lie flat for a minimum of 5 minutes.	A low-dose CT scan requires participants to lie on their back, on a flatbed that passes into the CT scanner. Patients need to hold their breath for a few seconds and stay still while each scan is taken so that the images are clear.	-
Symptomatic lung infection (e.g. COVID-19, pneumonia, bronchitis, lower respiratory tract infection with productive cough) within the previous 12-weeks.	Lung infections may result in limited visibility of the lungs and may make CT interpretation difficult.	• Delay low-dose CT scan for 12 weeks from symptom resolution to avoid false positive results. • Those presenting with symptomatic lung infections should be booked in for a deferred scan appointment in 12 weeks' time. • Radiology service providers when considering the clinical appropriateness of low-dose CT requests must ask participants about symptomatic lung infection(s).

Low-dose CT unsuitability criteria	Rationale	Practice point
Full CT scan of the chest within last 12 months or planned for clinical reasons, in next 3 months (e.g. active cancer surveillance).	Participant has already been screened for lung cancer and the low-dose CT will result in unnecessary additional radiation exposure. The NLCSP Nodule Management Protocol can be used to assess the risk of a lesion being a lung cancer and recommend appropriate surveillance or referral for management. It cannot assess the risk of that lung lesion being a metastasis in a high risk patient, nor be used to plan surveillance for those patients.	• Ask participants about any prior or proposed cancer surveillance CT study. • Delay low-dose CT scan by 12 months since full CT scan.

Resources: Suitability for low-dose CT

Royal Australian and New Zealand College of Radiologists (RANZCR) Standards of Practice for Clinical Radiology

Shared decision-making and informed choice

Summary – what will happen?

Shared decision-making enables people to make an informed choice about lung cancer screening and is an integral component of the program. Shared decision-making discussions should prioritise the creation of a trusting environment to ensure people feel safe to ask questions and openly discuss lived experiences and diverse needs[48].

Requesting practitioners, or healthcare providers working in collaboration with the requesting practitioner, can facilitate shared decision-making. Healthcare providers should support people to make an informed choice, even if they decide not to take part in the program.

How to implement – recommendations and practice points

A shared decision-making discussion follows three steps[78,79]

- Choice talk – helping people understand that a choice to screen exists
- Options talk – informing people about their options
- Decision talk – supporting people to decide if screening is right for them.

Making an informed choice

The information provided and discussed in a shared decision-making discussion forms the basis of an individual's informed choice to participate in screening. Providing accurate and clear information is one of the best ways to help people make an informed choice.

Healthcare providers should consider providing information on the following points when engaging in shared decision-making:

Screening process

- The benefit of lung cancer screening is to find lung cancer as early as possible.
- The screening test is a low-dose CT scan which takes place in a radiology service.
- Mobile screening may be available for people living in some rural or remote areas.

Low-dose CT scan

- What is involved in lung cancer screening (e.g. what happens on the day of the scan, frequency of scans, who is involved).
- No preparation is required for a low-dose CT scan for lung cancer screening.
- Having a low-dose CT scan involves being exposed to a small amount of radiation.

Scan assessment and reporting

- Most people will not be diagnosed with lung cancer.
- Some people will have an additional health finding that is not lung cancer (e.g. interstitial lung disease).

Results communication and next steps

- How and when people will receive their screening results.
- What happens if the results require further action.
- What happens if someone is diagnosed with lung cancer.
- Treatment options for lung cancer if diagnosed (according to the **Optimal Care Pathway for people with lung cancer)**
- The possible financial costs involved in receiving treatment for lung cancer.
- Psychosocial supports available.
- Available smoking cessation supports.

Supporting shared decision-making

Shared decision-making resources have been developed to support healthcare providers to engage in shared decision-making discussions with potential screening participants. Both healthcare provider and participant-facing resources have been co-designed to support shared decision-making with Aboriginal and Torres Strait Islander peoples.

Shared decision-making resources can be accessed on the program website.

Discussions about the program, along with the information and resources provided, should be tailored to each individual’s needs. This process is integral to establishing safe and respectful environments that can further facilitate informed choice and participation.

When tailoring the discussion, healthcare providers should consider the following questions:

- What is the preferred method for receiving information (e.g. written, visual, verbal, video formats, or with the assistance of interpreters)?
- Who is the most appropriate person to provide the information?
- How much information is needed to make an informed choice?
- Who can support the person in processing the information, and should family and/or community members be included in the discussion?

Practice Points: Shared decision-making and informed choice

Shared decision-making:

Engage in shared decision-making to support people to make an informed choice about lung cancer screening, even if they decide not to take part in the program.

Facilitation:

Shared decision-making and consent processes can be facilitated by healthcare providers who either have the authority to request a low-dose CT scan, or healthcare providers (e.g., nurses, nurse practitioners, Aboriginal and Torres Strait Islander Health Workers or Practitioners) working in collaboration with requesting practitioners.

Discussion:

Engage in a genuine discussion that is responsive to peoples' values, preferences, circumstances and information needs. Provide time and space for the individual to ask questions.

Inclusive:

Ensure that shared decision-making is culturally appropriate and tailored to the individual person, with consideration of language, terminology, images, and accessibility. Use interpreters where appropriate.

Practice Points: Shared decision-making and informed choice

Flexibility:

Individuals may require flexible appointment structures to properly engage in shared decision-making. This may include having more than one consultation and/or involving the family/support network in the decision-making process.

Data privacy:

Healthcare providers must provide the National Lung Cancer Screening Program privacy information notice to all people who decide to participate in the program.

Smoking cessation:

Smoking cessation supports should be offered to all individuals who currently smoke or who have recently quit, even if the individual decides not to screen.

Resources: Shared decision-making and informed choice

For eligible individuals and general public:

- Should I screen for lung cancer? A shared decision-making resource for Aboriginal and Torres Strait Islander people
- Lung Cancer Screening Decision Tool (summary booklet)
- Lung Cancer Screening Decision Tool (booklet)

For healthcare providers:

- A privacy information notice which healthcare providers can provide to participants
- Practitioner guide to shared decision making for lung cancer screening with Aboriginal and Torres Strait Islander peoples
- Shared decision making and informed choice for lung cancer screening: A guide for healthcare providers
- Conversation starters

Enrolment in the National Cancer Screening Register

Requesting practitioners are required to complete and send the Healthcare Provider Eligibility and Enrolment Form to the NCSR to enrol a participant in the program. Healthcare providers can complete the form and enrol a participant in the NCSR either through the NCSR interface integrated with clinical software or through the NCSR Healthcare Provider Portal.

Participants will receive welcome correspondence from the NCSR which will include information on why the low-dose CT scan is important, how to complete the low-dose CT scan, and how participants can opt-out of the NCSR if they wish to do so.

Assumed Consent

In line with other national cancer screening programs in Australia, the program has adopted an assumed consent model i.e. unless there is indication from participant or healthcare provider that the participant has opted out, the NCSR will assume the individual consents to the storage of their information as part of the program within the NCSR. For this reason, healthcare providers should record if a person chooses to decline to participate through the Healthcare Provider Eligibility and Enrolment form and in accordance with the **NCSR privacy policy**.

Opting out

Individuals can choose to opt-out of the NCSR and still have a free low-dose CT scan, however they will not be considered a participant of the program or receive communication from the NCSR. The radiologist will still be able to receive the rebate from Medicare.

If the individual opts out of participating in the NCSR, it is the responsibility of the requesting practitioner to notify patients of repeat or follow-up scans. Practice staff should regularly check the patient's contact details and update their practice records.

A participant's information (for example, the participants name, address, date of birth and Medicare number) will still be stored to ensure the NCSR does not collect any new clinical information about the participant. This information will not be used or disclosed outside of this purpose.

If a participant requires more information about the NCSR or wishes to change the way they interact with the NCSR they can visit the **Information for Participants on the NCSR website**.

For more information visit the **NCSR website**.

How to implement – recommendations and practice points

Practice Points: Enrolment in the NCSR

NCSR enrolment:

Requesting practitioners are required to enrol participants in the NCSR – CIS integration guide and GP enrolment guide.

NCSR opt-out:

Participants can opt-out of enrolment in the NCSR at any time. These individuals will be considered external screeners and are not participants of the program, meaning their data will not be captured in the program reporting. Refer to the Key Definitions section for more information.

Resources: Enrolment in the NCSR

NCSR privacy policy

Low-dose CT scan request

Summary – what will happen?

Participants are screened for lung cancer by undergoing a low-dose CT scan performed by a radiographer. The low-dose CT scan is free for eligible people under Medicare. The cost of the low-dose CT scan is reimbursed to the radiology imaging provider by Medicare[81], provided there is a request from a requesting practitioner and the relevant rules are followed.

A summary of the steps leading up to the low-dose CT scan request is shown below in Table 3.

How to implement – recommendations and practice points

Requesting practitioners are required to complete a low-dose CT scan request using the program-specific request form or as per usual practice for radiology imaging requests.

It is preferred that requesting practitioners use the program-specific form. However, if using a usual practice form, then the low-dose CT scan request will need to identify that it is for lung cancer screening and include family history of lung cancer in any first-degree relative (i.e. parent, sibling or child), details of any previous chest CT (if known) and history of any cancer. This is required to ensure the patient is bulk billed for the scan and by the radiologist reading and reporting on the scans using the National Lung Cancer Screening Nodule Management Protocol.

Low-dose CT scan requests do not expire and are valid until the scan has been performed. **A participant must receive a new low-dose CT request for every scan, including for two-yearly repeat scans and any follow-up scans.**

Table 3: Summary of requirements prior to screening at baseline and two-yearly repeat / follow-up screening

Requirements	Baseline (first) screening	Two-yearly repeat / follow-up screening
Eligibility Assessment	Yes	Need to confirm they do not meet exit criteria (see Program exit and re-entry)
Suitability check for low-dose CT scan	Yes	Yes
Shared decision-making	Yes	Yes
Registration for program within the NCSR	Yes	No Confirm participant information and contact details
Low-dose CT scan request*	Yes	Yes

*Requires participant to make an appointment to see requesting practitioner to obtain the low-dose CT request.

Supporting participants

Participants should be advised to contact radiology services or medical imaging providers participating in the program to book a low-dose CT scan appointment as soon as possible after receipt of the low-dose CT scan request. This may include providing assistance to the participant to book an appointment or identifying supports needed to book and complete the low-dose CT scan.

Participants should be informed of any potential additional costs involved in getting a low-dose CT scan. Additional costs may include consultations with a medical practitioner before and after the scan, transport and travel costs for regional, rural and remote participants, or actionable additional findings.

Mobile screening may be available for some rural and remote participants. Visit the **Heart of Australia** website for scheduling and booking information.

Practice Points: Low-dose CT scan request

Request:

Complete the program-specific low-dose CT scan request form, or follow usual practice for radiology imaging requests, and provide it to the participant. Low-dose CT scan requests must specify that it is for the National Lung Cancer Screening Program and include family history of lung cancer in any first-degree relative (i.e. parent, sibling or child), details of any previous chest CT (if known) and history of any cancer.

Assistance:

Consider participant support and information needs in relation to accessing a low-dose CT scan, including mobile screening services and the participant travel support service for the program in rural and remote communities, accommodation, identifying a support person, family support, language proficiency/need for an interpreter, and eligibility for support services when booking an appointment.

Low-dose CT scan

Summary – what will happen?

Booking a low-dose CT scan appointment

Participation in the program is open to all radiology services. Low-dose CT scans are available at public and private radiology services (including mobile services).

Appointments with radiology services for low-dose CT scans need to be made in advance of the scan being performed. Participants with a low-dose CT scan request should contact a participating radiology service to book an appointment. Healthcare providers can support program participants to identify a participating radiology service and book a low-dose CT scan appointment.

As the radiology workforce is an accredited and regulated workforce, they do not require any further accreditation to deliver the program (NLCSP Quality Framework).

For more information on mobile screening including service delivery routes please visit the Heart of Australia website.

Low-dose CT scan performed

The program uses low-dose CT scans to look for lung cancer in high-risk people without any symptoms. As per the MBS item, radiographers and radiology services should refer to current Royal Australian and New Zealand College of Radiologists (RANZCR) low-dose CT image acquisition guidelines for appropriate low-dose CT acquisition.

For the low-dose CT scan, participants will lie down on a table while the equipment takes images of their chest. It is a non-contrast low-dose CT scan. The scan appointment takes between 10-15 minutes and does not involve any injections or other procedures.

How to implement – recommendations and practice points

New program-specific MBS items for low-dose CT scans

Two MBS items provide low-dose CT scans under the program. The MBS items are for:

a. The screening low-dose CT scan undertaken every 2 years
b. Follow-up low-dose CT scans for any follow-up needed during the two-yearly screening period (as required following results of the screening low-dose CT scan).

These are mandatory bulk billing items and have mandatory reporting requirements.

The MBS website provides more information on these items, including the item descriptors and explanatory notes for the scan.

Radiology providers must bulk bill low-dose CT scans for the program when using the program-specific MBS items. As a bulk-billed item, a radiology provider accepts the Medicare benefit as full payment for the service when claiming from Medicare. This means participants will not have any out-of-pocket costs for the low-dose CT scan throughout the program.

Practice Points: Low-dose CT scan

Scan quality:
Radiographers will check the quality of the scan before the participant leaves the service. A poor quality scan may need to be repeated as soon as reasonably possible. If the scan needs to be redone the same MBS item and low-dose CT scan request is used.

Resources: Low-dose CT scan

RANZCR Standards of Practice for Clinical Radiology

For eligible individuals and general public:

- Your visit to the Radiology clinic
- National Lung Cancer Screening Program explained (video)
- Frequently Asked Questions from Community Members

For healthcare providers:

- GP resource guide
- Frequently Asked Questions from the Health Workforce
- Providing Support for Lung Cancer Screening Participants
- Health Workforce Roles and Responsibilities

Low-dose CT scan assessment and reporting

Summary – what will happen?

The timely and consistent assessment of low-dose CT scans and reporting results is critical to delivering a safe and effective lung cancer screening program.

The program uses a nationally standardised approach to ensure radiologists accurately and consistently read and report program low-dose CT scan results. Reports for a participant's baseline scan (the first scan when entering the screening program) and their follow-up scans (two-yearly repeat and follow-up scans) are read and reported using the National Lung Cancer Screening Program (NLCSP) Nodule Management Protocol. The protocol has been developed by the Royal Australian and New Zealand College of Radiologists (RANZCR) and the Thoracic Society of Australia and New Zealand (TSANZ). The NLCSP Nodule Management Protocol applies the recommendations made by MSAC to the Australian setting.

Radiologists are responsible for the supervision, interpretation and reporting of the low-dose CT scan (82). As the radiology workforce is an accredited and regulated workforce, they do not require any further accreditation to deliver the program (NLCSP Quality Framework). RANZCR has developed education modules on the program and use of the NLCSP Nodule Management Protocol (RANZCR education modules).

Nodule Management Protocol

The **National Lung Cancer Screening Program Nodule Management Protocol** contains detailed guidance for the radiologist around reporting lung nodule findings and providing appropriate management recommendations. The protocol is derived from:

- Pan-Canadian Early Detection of Lung Cancer Study (PanCan) nodule malignancy risk calculator for reporting baseline scans (baseline nodule management)[11]
- Lung CT Screening Reporting & Data System (Lung-RADS®) for reporting follow-up scans, including two-yearly repeat and shorter interval follow-up scans (follow-up nodule management)[12].

The National Lung Cancer Screening Program Nodule Management Protocol contains separate baseline and follow-up nodule management guidance, with explanatory notes for radiologists to translate this guidance into the radiological interpretive environment.. The radiologist should use the most recent version of the nodule management protocol at the time of reporting. Nodule follow-up or investigation by the requesting practitioner should be undertaken according to radiological recommendation. The protocol will categorise participants into the appropriate risk category which will then determine what action is needed and the timeframe for action (see scan outcomes section).

Reporting results to the National Cancer Screening Register

Structured radiology reporting ensures a nationally standardised approach for radiologists to accurately and consistently report program low-dose CT scan results.

Low-dose CT scan reports are sent to the NCSR. Radiology providers need to register their practice with the NCSR. The NCSR interacts and operates effectively with existing radiology software, and the structured reports will integrate with the NCSR. The low-dose CT scans (images) will not be stored in the NCSR; however, the NCSR stores information about where each scan is undertaken and reported to assist radiologists with locating previous images. Comparison to previous imaging (where available) by the radiologist is a critical element in safe and accurate radiological interpretation. The information reported to the NCSR supports the delivery of the program. The NCSR provides information and helpful follow-up about screening, such as reminding participants and their healthcare provider, when they are due or overdue for lung cancer screening and when they need to take action after a scan.

Radiology providers are required to share low-dose CT scan reports to My Health Record by default and provide to the requesting practitioner through usual care arrangements for imaging reporting processes. The requesting practitioner will also be notified by the NCSR that the results report is available.

The structured report will provide the requesting practitioner all outcomes and information from the scan to communicate and manage next steps for the participant.

How to implement – recommendations and practice points

Recommendations: Low-dose CT scan assessment and reporting

Baseline scans:

Radiologists use the National Lung Cancer Screening Program Nodule Management Protocol guidance for reporting baseline scans (baseline nodule management table).

Subsequent scans:

Radiologists use the National Lung Cancer Screening Program Nodule Management Protocol guidance for reporting two-yearly repeat and all follow-up scans (follow-up nodule management table).

Reporting:

Radiologists use structured radiology reports to report all program low-dose CT scan results to the NCSR.

Practice Points: Low-dose CT scan assessment and reporting

Reporting:

Low-dose CT scan reports are provided to requesting practitioners through usual care arrangements for imaging reporting processes.

Resources: Low-dose CT scan assessment and reporting

National Lung Cancer Screening Program Nodule Management Protocol

NLCSP Structured Radiology Report

Results and next steps

Scan outcomes

Summary - what will happen?

Low-dose CT scan results will be classified into the following categories:

- Incomplete
- Very low risk
- Low risk
- Low to moderate risk findings
- Moderate risk
- High risk
- Very high risk
- Additional actionable finding.

The scan outcome category determines the participants journey through the screening and assessment pathway (see Figure 3 and Table 4).

Scan outcome management

Scan outcomes are communicated to participants by healthcare providers as per usual care, with the support of the NCSR (see **Results communication**).

Incomplete findings require further action. If part, or all, of the lung cannot be evaluated, additional screening imaging is needed. If findings are suggestive of an inflammatory or infectious process, participants return for a 1-, 2-, or 3-month low-dose CT scan; they will need to see their requesting practitioner to get a new low-dose CT scan request. If a scan is incomplete due to poor quality images (i.e. part or all of the lung cannot be evaluated), the radiology practice will notify the participant that the scan needs to be repeated, this will likely occur at the low-dose CT scan appointment.

Very low risk findings require no immediate action. Participants remain in the program and receive a reminder for a two-yearly repeat scan in two years. The practitioner should ensure participants are aware that a very low risk finding does not mean that they are not at risk of ever developing lung cancer and participants should be encouraged to re-screen every two years.

Low risk, low to moderate risk, and moderate risk findings require more frequent monitoring. Participants with low, low to moderate and moderate risk findings return for a follow-up low-dose CT scan at the interval specified in the NLCSP Nodule Management Protocol (12, 6, or 3 months respectively).

High risk and very high risk findings require further investigation. Participants with high risk and very high risk findings are referred to a respiratory physician (or other specialist) linked to a lung cancer multidisciplinary team (MDT) (see Figure 3 and Table 4). The requesting practitioner managing the participant will make the referral to a respiratory physician or relevant specialist.

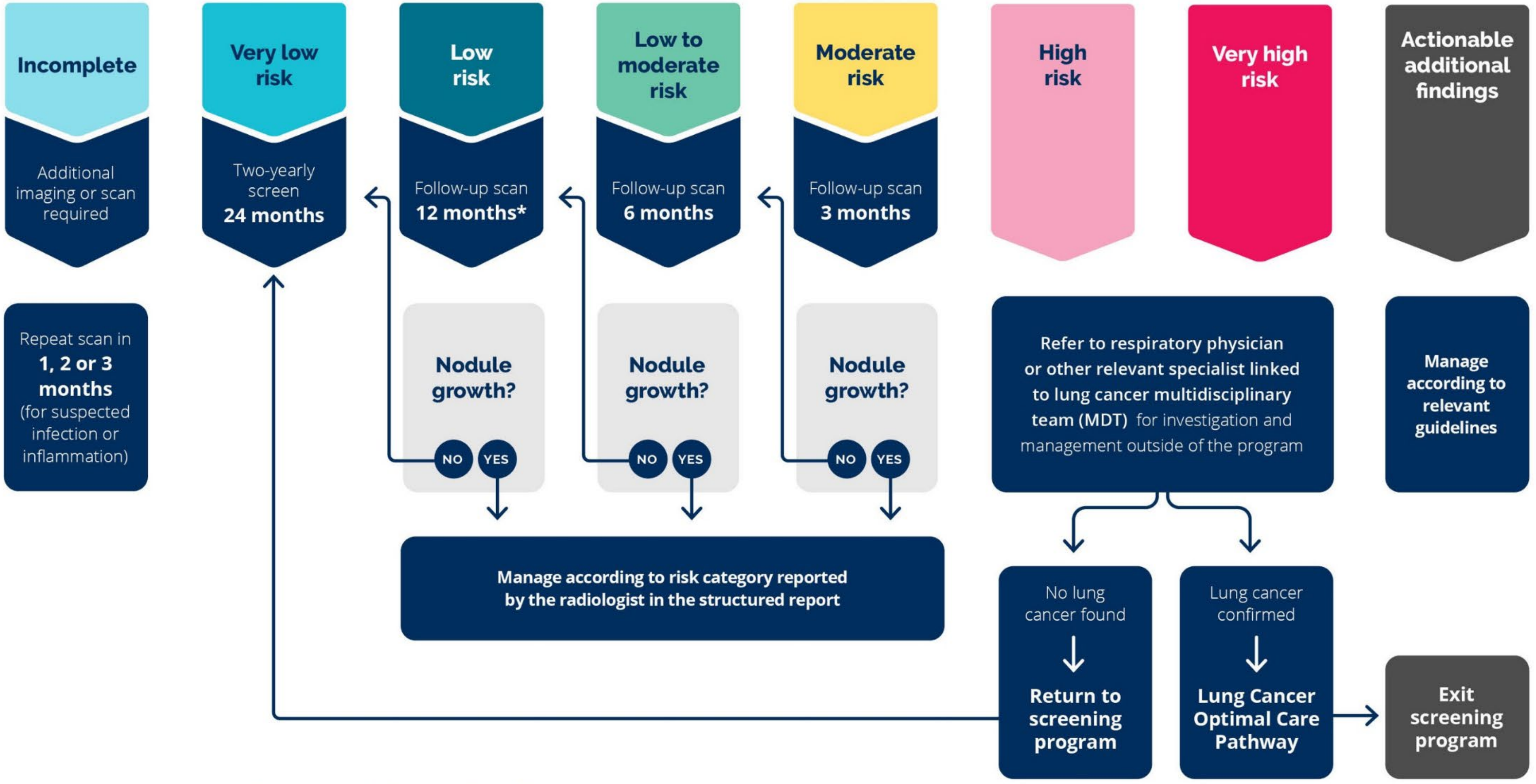
Actionable additional findings are potentially clinically significant or clinically insignificant findings unrelated to lung cancer (see **Actionable additional findings**). These should be investigated as per usual care arrangements and do not preclude a participant from continuing in the program. The practitioner managing the participant will make referrals to specialists for further investigations.

How to implement – recommendations and practice points

A two-yearly repeat screen is the standard screening interval for the program. A participant will screen every two years if they have very low risk findings.

A summary of low-dose CT scan outcome categories and further action required by the participant is provided in Table 4.

Figure 3: Simplified NLCSP Nodule Management Protocol flowchart



*Low risk participants require two 12 month scans before extending to 24 months.

Text alternative for Figure 3

Table 4: Summary of scan outcomes and further action required by the participant

Category descriptor	Communicating results with participant	Next steps for the participant
Incomplete	The radiologist could not evaluate all or part of the lung due to inflammation or infection. The participant will need to get another scan in 1, 2 or 3 months, depending on the findings.	• Continue in program • Make an appointment to see the requesting practitioner to obtain a low-dose CT scan request.
Very low risk	The radiologist did not notice anything of concern on the scan. Regular screening is important to check for changes as the participant ages.	• Continue in program • Receive a reminder for two-yearly repeat screening • Make an appointment to see the requesting practitioner to obtain a low-dose CT scan request.
Low risk	The radiologist has noticed one or more small nodules that needs monitoring over time. The participant is considered to have a low chance of lung cancer.	• Continue in program • Receive correspondence to discuss results with healthcare provider • Receive a reminder for a follow-up scan in 12-months • Make an appointment to see the requesting practitioner to obtain a low-dose CT scan request.

Category descriptor	Communicating results with participant	Next steps for the participant
Low to moderate risk	The radiologist has noticed one or more nodules on the scan that need to be monitored more frequently.	• Continue in program • Receive correspondence to discuss results with healthcare provider • Receive a reminder for a follow-up scan in 6-months • Make an appointment to see the requesting practitioner to obtain a low-dose CT scan request.
Moderate risk	The radiologist has noticed one or more nodules on the scan that need to be monitored more frequently.	• Continue in program • Receive correspondence to discuss results with healthcare provider • Receive a reminder for a follow-up scan in 3-months • Make an appointment to see the requesting practitioner to obtain a low-dose CT scan request.
High risk	The radiologist has noticed one or more nodules that need further investigation. This does not mean that the participant has cancer. There is a higher risk of lung cancer, so it is important that the participant attends all follow-ups.	• Receive correspondence to discuss results with healthcare provider • Healthcare provider organises urgent appointment • Referred to a respiratory physician* linked to a lung cancer multidisciplinary team (MDT) • Remain in program whilst investigations are underway.

Category descriptor	Communicating results with participant	Next steps for the participant
Very high risk	The radiologist has noticed one or more nodules that need further investigation. This does not mean that the participant has cancer. There is a higher risk of lung cancer, so it is important that the participant attends all follow-ups.	• Receive correspondence to discuss results with healthcare provider • Healthcare provider organises urgent appointment • Referred to a respiratory physician* linked to a lung cancer multidisciplinary team (MDT) • Remain in program whilst investigations are underway.
Actionable additional findings	Sometimes the scan can show things either in the lungs (something other than cancer, such as emphysema), or outside of the lungs (something like heart disease).	• Receive correspondence to discuss results with healthcare provider • Actionable additional findings investigated according to relevant clinical guidelines and usual care arrangements • Refer to **Actionable additional findings** and **Program exit and re-entry** sections to understand whether the participant will remain in the program or whether they will exit/pause participation.

* This may include other specialists with relevant expertise who are linked with a lung cancer MDT.

Referral pathways for high risk or very high risk findings

The investigation of screen-detected abnormalities falls outside of the program and is part of usual care and existing clinical guidance, including the Optimal Care Pathway for people with lung cancer (73). Participants with high risk or very high risk findings will be referred by their healthcare provider to a respiratory physician (or other specialist) linked to a lung cancer multidisciplinary team for clinical investigation.

The tumour, node and metastasis (TNM) system involves various tests, including but not limited to pathology and histology tests, which specialists use to stage lung cancer[83]. If lung cancer is diagnosed, specialists should update the NCSR with test findings using the Diagnosis Form. If this data has not been entered within 4 weeks since date of specialist referral, the NCSR will follow up with the specialist or the participants nominated healthcare provider. Histopathology reports will be transmitted automatically from integrated laboratories to the NCSR to support program monitoring and reporting.

Practice Points: Scan outcomes

NCSR:

Medical practitioners to enter findings from all tumour, node and metastasis (TNM) system tests to the NCSR using the Diagnosis Form within the appropriate clinical timeframe to ensure participants receive appropriate screening reminders or exit the program if lung cancer is diagnosed.

Actionable additional findings

Summary – what will happen?

As imaging of the chest is not limited to findings that may be lung cancer, other findings in the thorax, the upper abdomen and the lower neck are common.

The low-dose CT scan is an opportunity to detect and manage actionable additional findings beyond lung cancer which may be a benefit for the participant. Additional findings on low-dose CT scans occur on a continuum from benign to life threatening. Minor and clinically insignificant additional findings are common on low-dose CT scans and have the potential to cause unnecessary investigations and anxiety to participants.

Actionable additional findings for the National Lung Cancer Screening Program have been defined by guidance developed by RANZCR (RANZCR NLCSP Additional Findings Guidelines), and will be reported by radiologists in accordance with RANZCR's advice on structured reporting.

Some actionable additional findings will require specialist review while others will be managed in primary care as per usual care arrangements, clinical judgement and relevant clinical guidelines.

How to implement – recommendations and practice points

Actionable additional findings will be documented in the radiology report. The RANZCR NLCSP Additional Findings Guidelines for the National Lung Cancer Screening Program provides radiologists with follow-up recommendations. Actionable additional findings will be reported to the NCSR and will inform program monitoring and evaluation.

Requesting practitioners will be informed of actionable additional findings with further action required and will be responsible for managing the findings according to relevant clinical guidance.

Practice Points: Actionable additional findings

Documentation:

All actionable additional findings are documented in the structured radiology report and include a follow-up recommendation.

Reporting:

Actionable additional findings are reported to the NCSR to inform program monitoring and evaluation.

Management:

Requesting practitioners will be informed of actionable additional findings with further action required and will be responsible for managing the findings according to relevant clinical guidelines.

Resources: Actionable additional findings

For eligible individuals and general public:

- Understanding your results
- Understanding lung nodules and other findings (factsheet)
- Understanding lung nodules and other findings (brochure)
- About lung cancer screening
- Frequently Asked Questions from Community Members

For healthcare providers:

- GP resource guide
- Frequently Asked Questions from the Health Workforce
- Providing Support for Lung Cancer Screening Participants
- Reducing Stigma in the National Lung Cancer Screening Program
- Health Workforce Roles and Responsibilities

Results communication

Role of requesting practitioners

The requesting practitioner is responsible for communicating screening results to the participant. Both the requesting practitioner and the participant will be notified by the NCSR when the results report is available.

The structured report will provide the requesting practitioner with the scan outcome and information required to communicate results and manage the next steps for the participant. Results should be communicated to the participant in a timely manner.

If the requesting practitioner is a medical specialist or consultant, they should consider engaging the participants' primary healthcare provider to support communication of scan results, by facilitating a timely and appropriate clinical handover, including being a nominated healthcare provider for the participant in the NCSR.

Participants may nominate an alternate recipient of their communication in situations where they may not have a regular GP, e.g. where locum GPs are relied upon.

Requesting practitioners are advised to manage results communication according to usual care, including for actionable additional findings. Cancer screening participants are known to prefer verbal communication when receiving screening results, particularly for findings with further action required[66].

Effective, high-quality and culturally safe communication of screening results is critical to:

- Participants' understanding of what their results mean for their health

- Minimising participant distress or anxiety
- Supporting participants through the follow-up pathway and minimise loss to follow-up
- Fostering culturally safe and respectful health care environments, especially for priority populations.

Role of the NCSR

For participants registered in the NCSR, the process of communicating results and next steps is supported by direct correspondence from the NCSR to both the participant and the requesting practitioner (Figure 4 and Table 5).

For participants who cease correspondence from the NCSR, all communication of scan results will be the responsibility of the requesting practitioner.

Table 5: Summary of NCSR results communication responsibility and recipient

Program correspondence from NCSR

Risk category	Recipient: Participant	Recipient: Requesting practitioner
Incomplete (findings suggestive of an inflammatory or infectious process)	Notified to contact requesting practitioner	Notified to contact participant
Very low risk	Notified of very low risk findings and to rescreen every two years	Notified of very low risk findings and to rescreen every two years
Low risk	Notified to contact requesting practitioner	Notified to contact participant
Low to moderate risk	Notified to contact requesting practitioner	Notified to contact participant
Moderate risk	Notified to contact requesting practitioner	Notified to contact participant
High risk	Notified to contact requesting practitioner	Notified (via phone call and correspondence) to contact participant

Risk category	Recipient: Participant	Recipient: Requesting practitioner
Very high risk	Notified to contact requesting practitioner	Notified (via phone call and correspondence) to contact participant
Actionable additional findings	Notified to contact requesting practitioner	Notified to contact participant

The NCSR will notify the participant and the requesting practitioner when results are available and facilitate screening reminders (Figure 4).

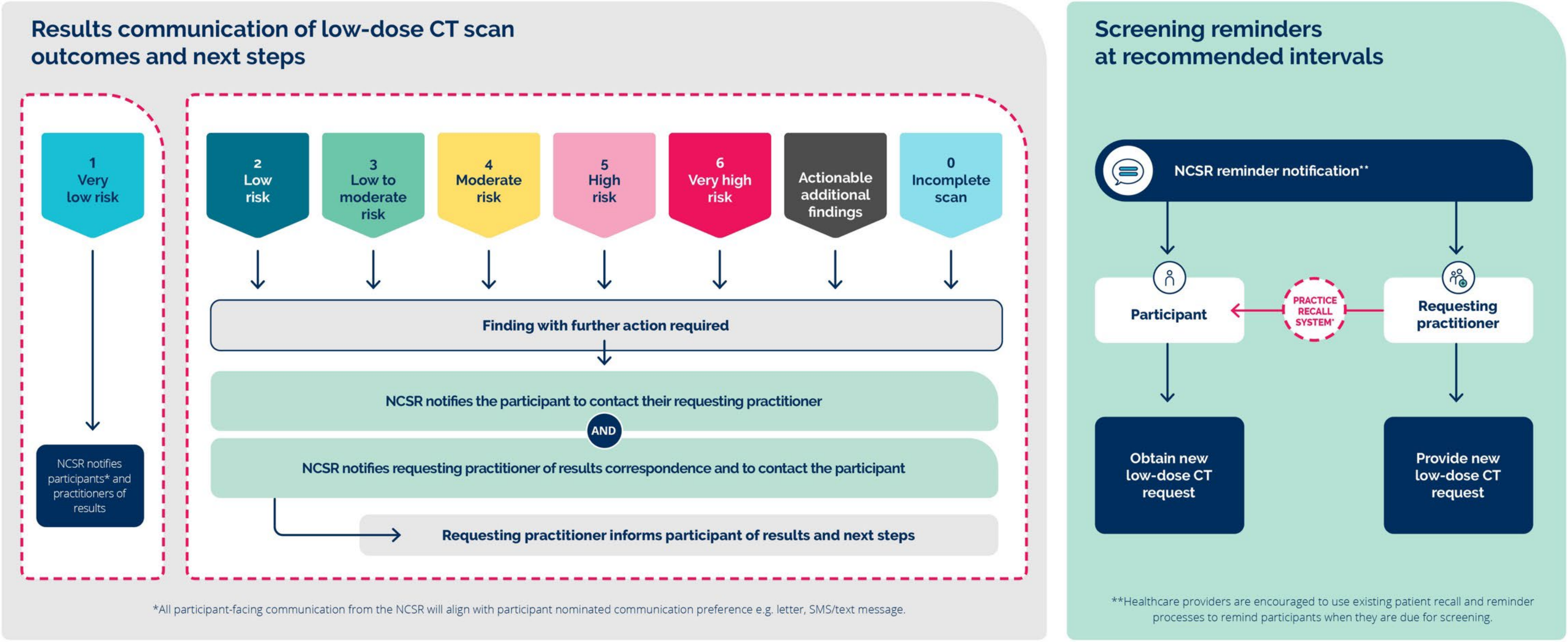
The NCSR supports the program by acting as a communication safety net by prompting participants and their healthcare providers to undertake any required follow-up action. NCSR communication does not replace the duty of care responsibilities that healthcare providers have for communicating with and managing participants.

Participants can select their communication mode preference in the NCSR participant portal i.e. posted mail or SMS text message.

Healthcare providers can ask participants about their preferred method of communication from the NCSR upon enrolment to the program and encourage participants to access the NCSR portal via MyGov to update their information as appropriate.

Results communication responsibilities

Figure 4: Simplified results communication process and responsibilities



*All participant-facing communication from the NCSR will align with participant nominated communication preference e.g. letter, SMS/text message.

**Healthcare providers are encouraged to use existing patient recall and reminder processes to remind participants when they are due for screening.

Text alternative for Figure 4

Results communication and lung cancer risk

All communication with participants should be sensitive to the likelihood of "scan anxiety"[84]. Healthcare providers should ensure psychosocial support is available and should be aware of services which are tailored to specific priority populations.

Healthcare providers are to accommodate participants' communication preferences regarding how and when is appropriate to discuss their results, including if multiple consultations or support persons are needed. Participants should be provided with accurate and clear information about what their results mean and what follow-up is required.

The approach taken to communicate results will vary depending on the scan result and corresponding risk category. Healthcare providers should discuss the next steps involved and consider any support that may be needed to facilitate participant continuation in screening.

The **International Association for the Study of Lung Cancer (IASLC) Language Guide** is an important resource for conversing with participants throughout the pathway, including when communicating results[85].

Communicating results to Aboriginal and Torres Strait Islander peoples

It is the responsibility of all healthcare providers to provide culturally safe care to program participants.

It is critical that Aboriginal and Torres Strait Islander participants and their families and/or communities can make self-determined decisions about their participation in the program.

Healthcare providers can support this by fostering culturally safe environments and tailoring their usual care practice to be person-centred (incorporating family and cultural roles)[86,87], strengths-based and responsive to the needs of the participant. This may include:

- Offering multiple appointments to discuss scan results and what they mean for the participant. This includes making space and time for family and/or support people to attend and support the participant.
- Enabling multiple family members and/or support people to attend appointments to discuss results in person or remotely.
- Taking time to build rapport with the participant to establish a safe space for clarifications and questions. Healthcare providers should ensure that the participants understand what is being communicated.
- Using Aboriginal and Torres Strait Islander co-designed and/or tailored resources to aid in the communication of results and any follow-up discussions. Cancer Council provides a repository of relevant **cancer factsheets and resources for Aboriginal and Torres Strait Islander people**[88].
- Communicating results via a telehealth appointment (if eligible). This may be particularly important to consider for rural and remote participants.

Healthcare providers can consult **appropriate resources**[89] for effective communication with Aboriginal and Torres Strait Islander peoples in health settings.

Practice Points: Results communication

Communication:

Participants are notified by the NCSR that their results are available. Screening results to be communicated by the healthcare provider to the participant as per usual care.

Clarity:

Healthcare providers should ensure that information is clear, and that the participant understands what their results mean. This may mean having more than one consultation and involving family and support networks as appropriate.

Sensitivity:

All communication should be strengths-based, person-centred and delivered under the principle of 'treat the person not the illness'. Providers can consult the IASLC Language Guide for guidance.

Smoking cessation follow-up:

Smoking cessation follow-up support should be offered to all individuals who currently smoke or who have recently quit.

Psychosocial support:

Participants should be provided with clear and appropriate information about existing psychosocial services and supports. Healthcare providers should be attentive to the presence or development of psychological distress. This includes the distress of participants in the program, their supports, and/or their family members.

Information processing:

Healthcare providers should be mindful that the emotional distress associated with receiving information about a positive result may temporarily impair a participant's capacity to process and understand the result. Reiterate the information and check that the participant has clearly understood.

Practice Points: Results communication

Stigma:

All results should be communicated without judgement, blame, or stigma.

Cultural safety:

Ensure a culturally safe environment is provided for participants. When communicating scan results to Aboriginal and Torres Strait Islander participants, healthcare providers should communicate effectively and respectfully and ensure Aboriginal and Torres Strait Islander participants and their families and/or communities can make self-determined decisions.

Sensitivity:

Efforts to establish rapport with the participant (and any support persons present) are critical to creating a safe space for individuals to ask for clarifications and to ask questions.

Additional support:

Healthcare providers can refer to the Cancer Council information and support line (13 11 20) which delivers a comprehensive range of support services for all people, affected by all cancers, across every state and territory.

Resources: Results communication

For eligible individuals and general public:

- Understanding your results
- Understanding lung nodules and other findings (factsheet)
- Understanding lung nodules and other findings (brochure)
- About lung cancer screening

For healthcare providers:

- GP resource guide
- Frequently Asked Questions from the Health Workforce
- Providing Support for Lung Cancer Screening Participants
- Reducing Stigma in the National Lung Cancer Screening Program
- Health Workforce Roles and Responsibilities

Screening reminders

Summary - what will happen?

Two-yearly repeat and follow-up scan reminders will be issued by the NCSR in line with the participant's chosen communication method.

The NCSR will send screening reminders directly to participants via their preferred method (posted mail or SMS) and to the requesting practitioner (or recorded primary healthcare provider), who can help support and facilitate continued participation in the program.

How to implement – recommendations and practice points

Healthcare providers are encouraged to send practice-branded and/or tailored screening reminders to participants whose participation is recorded in their EMR system.

Personalised reminders can minimise loss to follow up by encouraging participants to stay engaged in the program and return for screening at the recommended follow-up time interval. Healthcare providers are advised to adapt their existing recall and reminder systems to align with the program screening schedule, including two-yearly repeat scans at two-years, and follow-up scans (at 3-, 6- or 12-months).

The participants' requesting practitioner is responsible for:

- Facilitating an appointment to re-complete a low-dose CT scan suitability check.
- Providing a low-dose CT scan request for two-yearly repeat screening and follow-up scans.

The NCSR will manage screening reminders following participant enrolment. A participant receives a notification from the NCSR as per the information provided in Table 5.

For participants who have elected not to receive communication from the NCSR, they should receive reminders and follow-up notifications from their requesting practitioner when:

- They are due for their two-yearly repeat screening or follow-up scan and need to return to their requesting practitioner for a new low-dose CT request.
- They have not yet actioned a low-dose CT scan request and/or have not actioned the required follow-up tests following the results of a low-dose CT scan.

Practice Points: Screening reminders

Practice reminders:

Healthcare providers are encouraged to send screening reminders directly to participants. The mode through which healthcare providers remind their clients will be specific to their practice or clinic and their own procedures (e.g. SMS or email).

Next steps:

Requesting practitioners are required to re-check suitability for all low-dose CT scans and provide a new low-dose CT scan request when a participant is due for two-yearly repeat screening or follow-up scans.

NCSR:

The NCSR will send participants screening reminders. For participants who have opted out of NCSR communication, requesting practitioners are responsible for sending screening reminders.

Program exit and re-entry

Summary - what will happen?

Participants may exit the program at any time. There are many reasons participants may exit the program, including for medical reasons, such as a cancer diagnosis, or being no longer able to undergo a low-dose CT scan. Participants may also actively opt-out of the program, or may exit as they reach the upper age limit of the program. It is important that, upon program exit, individuals continue to be managed according to usual care from their healthcare provider as they may still be at risk of developing lung cancer.

Eligible participants who have exited the program (unless they have aged out, e.g. 71 years of age) can re-enter and receive a low-dose CT scan request following confirmation of low-dose CT scan suitability.

Eligible participants who have been successfully treated for lung cancer can re-enter the screening program. Clinical judgement can be used to assess if this is appropriate for the individual.

Participants may not respond to reminders, which is known as lapsed screening. Reminders will continue to be sent, in particular for the two-yearly scans. Additionally, participants can choose to defer their next screen or pause screening reminders for a period.

Upon exit from the program (if aged out, opts-out or has a diagnosis of lung cancer), participants will be advised through the NCSR and/or their healthcare provider that their existing information in the NCSR will remain, but they will not receive further communications. If deceased, the NCSR will be contacted by Services Australia in this scenario and all correspondence will cease.

NCSR communication is provided via the participant's communication preference.

Deferring or pausing participation

A participant can request to change or defer the date of their next screening. They can also request to pause or change their preference for participating in the program for a defined period.

These requests can be updated or cancelled at any time via the **Participant Portal**, submission of a webform, or via calling the NCSR on 1800 627 701.

How to implement – recommendations and practice points

Age

The NCSR will notify participants if they exit the program due to their age (notification will occur at the end of the screening round after they have turned 71 years).

Healthcare providers are advised to discuss options for ongoing monitoring and investigation outside of the program if the person becomes symptomatic. Healthcare providers are also advised to continue to offer smoking cessation support, if applicable, following a participant's exit from the program.

Diagnosis

Participants who exit the program due to being diagnosed with lung cancer should be managed according to usual care practices including the **Optimal Care Pathway for people with lung cancer**.

Program re-entry

There are some points that enable re-entry into the program. These include if a participant:

- Has previously opted out of the program, remains eligible and decides to re-enter the program
- Became unwell while participating in the program and had to exit. Now recovered and eligible to continue.

To re-enter the program participants should have their age eligibility re-confirmed, have no signs or symptoms suggestive of lung cancer, and suitability for low-dose CT scan checked. They will also need to re-engage in shared decision-making and make an informed choice to participate.

Practice Points: Program exit and re-entry

Screening duration:

Participants should be given every opportunity to screen in accordance with the Program Guidelines until the participant is no longer eligible to participate, or until they choose to exit the program.

Program exit:

A participant with a high risk or very high risk nodule will exit the program and be referred to and managed according to the Optimal Care Pathway for people with lung cancer. Participants who exit the program due to symptomatic ineligibility will be monitored according to usual care.

Referral for investigation:

If a participant has a high risk or very high risk nodule finding, the requesting practitioner should refer them to a respiratory physician or other specialist with relevant expertise linked to a lung cancer MDT.

Ageing out:

Healthcare providers and/or the NCSR should inform participants at the end of the screening round in which they have turned 71 years of age that they are no longer eligible for the program. Upon exit, the participant's healthcare provider should discuss broader options.

Re-entry:

Participants seeking to re-enter the program need to only meet the age eligibility criterion and have no signs or symptoms suggestive of lung cancer. Check for low-dose CT scan suitability and re-engage in a shared decision-making discussion.

Psychosocial support:

Healthcare providers to offer tailored psychosocial support options and/or services to participants where appropriate. Program exit may cause people distress.

Smoking cessation:

Smoking cessation support should be offered to all individuals who currently smoke or who have recently quit, even if they choose to exit the program.

KEY DEFINITIONS

Actionable additional findings: Actionable additional findings on lung cancer screening are defined as low-dose CT scan findings unrelated to the primary purpose of identifying lung cancer for which follow-up action is required[90].

Asymptomatic: For the purposes of the program, asymptomatic is defined as having no signs or symptoms suggestive of lung cancer (for example unexplained persistent cough, coughing up blood, shortness of breath).

Baseline scan: The first scan a participant has as part of the National Lung Cancer Screening Program.

Ceasing correspondence: Ceasing correspondence from the National Cancer Screening Register does not opt the participant out of the program. A participant may choose not to receive correspondence or defer correspondence from the National Cancer Screening Register. However, they still consent to their screening information being provided to the register. The participant and requesting practitioner become responsible for screening reminders and follow-up.

Cultural safety: Culturally safe practice requires the ongoing critical reflection of health practitioner's knowledge, skills, attitudes, practising behaviours and power differentials in delivering safe, accessible, and responsive healthcare free of racism. Defined by Ahpra, cultural safety is determined by Aboriginal and Torres Strait Islander individuals, families and communities[91].

Eligibility assessment: An assessment of whether individuals meet the National Lung Cancer Screening Program eligibility criteria and qualify for participation in the program.

Follow-up scan: A low-dose CT scan that a participant has following the baseline scan. Follow-up scan intervals are based on the risk category of the scan outcome.

Healthcare providers: Any healthcare provider working across primary, secondary, and tertiary healthcare settings. They are integral for the recruitment and delivery of the National Lung Cancer Screening Program but are not all able to request a National Lung Cancer Screening Program low-dose CT scan. *A summary of healthcare provider roles and responsibilities can be found in Tables 1a-1e.*

Health support workers: Those who play a vital role in health care teams and provide support to people across the screening and assessment pathway.

High risk individuals: The potential participants in the National Lung Cancer Screening Program who meet the eligibility criteria for the program.

Low-dose computed tomography scan: A low-dose computed tomography scan, referred to as **low-dose CT scan**, is the diagnostic imaging scan used to look for nodules in the lung that may indicate lung cancer.

Low-dose CT scan request: The form (hard copy or electronic) issued by a requesting practitioner who is authorised to request the National Lung Cancer Screening Program low-dose CT scan.

Low-dose CT scan reporting: The reading and interpretation of low-dose CT scan results. This is also referred to as the assessment or evaluation of results, which may include computer-aided detection and other approaches to analysis.

Low-dose CT scan suitability: Low-dose CT scan suitability for the National Lung Cancer Screening Program involves assessing whether individuals are suitable for screening low-dose CT based on their general health alongside factors relating to a person's ability to physically use CT scanners. The requesting practitioner assesses low-dose CT suitability to ensure the scan is clinically appropriate.

Multidisciplinary teams: Multidisciplinary teams comprise the core disciplines that are integral to providing good care. The team is flexible in approach, reflects the patient's clinical and psychosocial needs and has processes to facilitate good communication.

National Cancer Screening Register (NCSR): The NCSR provides a single electronic record for each person participating in cancer screening programs, and provides a national electronic infrastructure for the collection, storage, analysis and reporting of screening program data. The NCSR will provide program information and reminders to participants. It will not hold the scan images. Relevant healthcare providers may access participant information and remind them if they need to take action in relation to lung cancer screening.

National Lung Cancer Screening Program: The formal title for the National Lung Cancer Screening Program in Australia, referred to as the **program**.

Opt-out of the NCSR: Opt-out of the NCSR means to opt-out of the program. An eligible person will become an external screener (see definition of a **Participant**) if their low-dose CT scan is claimed using the National Lung Cancer Screening Program MBS items, or they may cease screening all together. There are two ways to opt-out of the NCSR:

- **Opt-out of the NCSR from the start:** The external screener does not consent to their screening information being held in the NCSR and therefore they are never enrolled.
- **Opt-out from the NCSR after being a participant:** The individual who previously consented to their screening information being provided to the NCSR withdraws this consent and is no longer a program participant. Their existing data remains in the NCSR but is not viewable. A former participant can view the data by calling the NCSR Call Centre. However no new data will be provided to the NCSR if the individual becomes an external screener.
- In both situations, the participant and requesting practitioner are responsible for screening reminders and follow-ups if the individual becomes an external screener.
- Opting-out of the NCSR is not the same as **ceasing correspondence** (refer to definition). Individuals who opt-out of the NCSR are not considered participants in the program, while those who cease correspondence remain participants, allowing their screening information to be shared with the register.
- An individual can opt-in to the NCSR any time.

Pack-years: A way of measuring the number of cigarettes a person has smoked in their lifetime. Pack-years are calculated by multiplying the total number of years a person has smoked by the number of packs of cigarettes (approximately 20 individual cigarettes) smoked per day.

Participant: An eligible person registered as part of the National Lung Cancer Screening Program through the National Cancer Screening Register.

- **External screeners:** Eligible people who choose not to register for the National Lung Cancer Screening Program through the National Cancer Screening Register. They are not considered a participant of the program as there is no other mechanism to monitor their participation.
- These individuals are able to have lung cancer screening low-dose CT scans claimed under the program MBS items but will not be captured in program reporting. The requesting practitioner is responsible for screening and results communications.
- The Program Guidelines do not refer to external screeners as they are not participants of the program, but nodule management protocols should be used to guide their screening pathway.
- This approach aligns with the National Bowel Cancer Screening Program and the National Cervical Screening Program within the National Cancer Screening Register.

Program exit: When a participant exits the screening program by having a lung cancer diagnosis, opting out or reaching the National Lung Cancer Screening Program upper age limit of 71 years (age ineligibility).

Program re-entry: When an eligible participant re-enters the National Lung Cancer Screening Program after previously exiting the program for any reason (excluding the upper age limit of 71 years).

Recruitment: The way in which potentially eligible participants are identified and recruited to participate in the National Lung Cancer Screening Program.

Requesting practitioners: Healthcare providers authorised to request low-dose CT scans as part of the National Lung Cancer Screening Program, including general practitioners, medical specialists, and consultant physicians.

Results communication: The process of sharing the low-dose CT scan results with program participants and their requesting practitioner(s).

Screening reminders: Notifications sent by the National Cancer Screening Register to the program participant and the requesting practitioner to remind participants they are due for lung cancer screening.

Shared decision-making: Shared decision-making for the National Lung Cancer Screening Program involves discussion to foster collaboration and trust between a participant and their health care provider, with a goal to empower participants to be actively involved in their health care. It is about aligning the participant's values, preferences and circumstances with the best available evidence about the available options, their benefits and harms, and uncertainties of treatment to make the most appropriate and informed health care decision for that person[92–94]. Shared decision-making is a person-centred process that enables people to feel safe and trusted to make informed decisions based on their values, beliefs, and understanding.

Smoking: Smoking, in the context of the National Lung Cancer Screening Program, refers to tobacco cigarette smoking only and does not include the use of other combustible tobacco products, including vapes or e-cigarettes.

Smoking cessation: The stopping or quitting of smoking cigarettes or other combustible tobacco products (e.g. cigars, cigarillos, pipes, and shisha). Smoking cessation support refers to assistance given to someone to help them quit smoking. Cessation support should also be offered to people who use vapes or e-cigarettes, noting that tobacco products in the context of the National Lung Cancer Screening Program does not includes vapes or e-cigarettes.

Two-yearly repeat screening: Two-yearly repeat screening is the standard screening interval of the National Lung Cancer Screening Program. A participant screens every two years if their low-dose CT scan outcome has no significant or very low risk findings.

GLOSSARY

Term	Definition
ACCHO	Aboriginal Community Controlled Health Organisation
AMS	Aboriginal Medical Service
Ahpra	Australian Health Practitioner Regulation Agency
CALD	Culturally and linguistically diverse
COSA	Clinical Oncology Society of Australia
ECOG	Eastern Cooperative Oncology Group
EMR	Electronic Medical Record
GP	General Practitioner
IASLC	International Association for the Study of Lung Cancer
LGBTIQA+	Lesbian, Gay, Bisexual, Transgender, Intersex, Queer and Asexual people
Low-dose CT	Low-dose computed tomography
Lung-RADS	Lung Imaging Reporting and Data System
MBS	Medical Benefit Schedule
MDT	Multidisciplinary team
MSAC	Medical Services Advisory Committee
NACCHO	National Aboriginal Community Controlled Health Organisation
NCSR	National Cancer Screening Register
NLCSP	National Lung Cancer Screening Program
PanCan	Pan-Canadian Early Detection of Lung Cancer
PBS	Pharmaceutical Benefits Scheme
RACGP	Royal Australian College of General Practitioners
RANZCR	Royal Australian and New Zealand College of Radiologists
SMS	Short message service
TIS	Tackling Indigenous Smoking
TNM	Tumour, node and metastasis system
TSANZ	Thoracic Society of Australia and New Zealand

APPENDICES

More information

Organisation	Resource	Location
National Lung Cancer Screening Program	For information on the National Lung Cancer Screening Program.	www.health.gov.au/nlcsp
National Cancer Screening Register	If you need to check if a participant has had a lung cancer screening scan and when they last had a scan.	www.ncsr.gov.au Phone: 1800 627 701
Royal Australian and New Zealand College of Radiologists (RANZCR)	For more information on low-dose CT scan dosage, assessment and reporting as part of the National Lung Cancer Screening Program.	www.ranzcr.com/our-work/national-lung-cancer-screening-program-nlcsp Phone: 02 9268 9777
Optimal Care Pathway for people with lung cancer	For more information on how to manage individuals with signs and symptoms suggestive of lung cancer.	www.cancer.org.au/health-professionals/optimal-cancer-care-pathways
Optimal Care Pathway for Aboriginal and Torres Strait Islander people with cancer	For more information on how to manage Aboriginal and Torres Strait Islander individuals with signs and symptoms suggestive of lung cancer.	www.canceraustralia.gov.au/optimal-cancer-care-pathways
Heart of Australia	For more information on mobile lung cancer screening services, including service delivery routes.	www.heartofaustralia.com.au/lung-cancer-screening/ Phone: 1800 432 786

Organisation	Resource	Location
Cancer Council Australia	Lung Cancer Clinical Guidelines. For more information on lung cancer prevention, treatment and support.	www.cancer.org.au/clinical-guidelines/lung-cancer www.cancer.org.au Phone: 13 11 20
Lung Foundation Australia	For more information about lung cancer and lung health.	www.lungfoundation.com.au/ Phone: 1800 654 301
QUIT	For more information on smoking cessation supports and services.	www.quit.org.au Quitline: 13 78 48
Tackling Indigenous Smoking	For information on reducing the prevalence of smoking in Aboriginal and Torres Strait Islander communities.	www.tacklingsmoking.org.au Phone: 1800 662 447
Primary Health Networks	For more information on your region's primary health care system, including local health pathways.	www.health.gov.au/our-work/phn

Practice points for the National Lung Cancer Screening Program

Pathway step:
Program considerations

Practice points
Priority populations: Priority population groups of the program include: • Aboriginal and Torres Strait Islander peoples • People living in rural and remote areas • People from culturally and linguistically diverse backgrounds (CALD) • People living with disability • People living with mental illness • People from the Lesbian, Gay, Bisexual, Transgender, Intersex, Queer and Asexual (LGBTIQA+) communities. Ensure priority populations have equitable access to screening and tailor approaches to provide safe and appropriate care. Some individuals may identify with one or more of the above groups.
Cultural safety: All healthcare providers and professionals involved in delivering the program share the responsibility to ensure a culturally safe lung cancer screening program. All staff involved in the program should engage in formal cultural safety training.
Data collection: Appropriate collection of participants' data is necessary for an inclusive and safe program. Ensure all data points are collected appropriately, accurately, and completely.
Collect and record Indigenous status: Aboriginal and Torres Strait Islander status should be accurately and consistently collected and recorded on all relevant program forms and clinical records, in accordance with the Australian Bureau of Statistics classification and standards. This will support monitoring and evaluation of equity in the program.
Stigma: Stigma can negatively impact participation in screening. All conversations should be free of judgement, non-stigmatising, empathetic and consider social and emotional wellbeing.
Psychosocial support: Healthcare providers should offer psychosocial support and refer to psychosocial services where appropriate. Individuals should be provided an opportunity to discuss their lived experiences and specific needs.

Pathway step:
Smoking cessation

Practice points
Current smoking: Participants do not have to quit smoking to participate in the program.
Smoking cessation interventions: Healthcare providers should ensure individuals have access to effective and culturally safe best practice smoking cessation interventions, including pharmacotherapy and behavioural counselling or as recommended in **current Australian smoking and nicotine cessation clinical guidelines.**
Smoking cessation specialists: Healthcare providers can refer individuals to tobacco treatment specialists via Quitline and/or local smoking cessation support services and online web-based supports. Ensure the individual consents to a referral.
Documentation of smoking history: Updated smoking history records enables identification of people eligible for the program and to offer smoking cessation support to people who currently smoke.
Data collection: Healthcare providers should capture information on smoking cessation supports being offered during relevant consultations and the type of smoking cessation support that was offered. This will be captured in the Healthcare Provider Enrolment and Eligibility form and Participant Management form.
Stigma: Smoking cessation support should be delivered without judgement to avoid stigmatising the person. Individuals should not be coerced or pressured into quitting smoking.
Cultural safety: Smoking cessation support must be culturally safe and appropriate for the individual. Ensure individual needs and preferences are considered and utilise tailored resources. Quitline services across Australia have Aboriginal and Torres Strait Islander counsellors trained to deliver culturally safe smoking cessation support.

Pathway step: Promotion and awareness

Practice points
Target audiences: Consider the information needs of lung cancer screening priority populations, including Aboriginal and Torres Strait Islander peoples. Use **resources** and key messages that have been tailored for priority populations where available.
Engagement and awareness building: When engaging priority populations, including Aboriginal and Torres Strait Islander peoples, involve trusted community members, organisations, and healthcare professionals, such as Aboriginal Health Workers and Practitioners, in promoting the lung cancer screening program and raising awareness within the community.
Accessibility: Promotion materials to be in plain language and easy to understand. Program resources to be offered in easily accessible ways.
Offer multiple opportunities to access information: Information about the program should be repeated and available in multiple formats and across multiple timepoints. Repetition increases information absorption and will complement general public awareness[66].
Readiness: Strategies to get health services ready for the program are available from the **program website**. Engaging community healthcare workers is an effective means of educating the general public and reaching people at high risk of lung cancer.

Pathway step: Program entry and recruitment

Practice points
Organised entry: Primary care practices can use existing clinical software-integrated mechanisms to conduct Electronic Medical Record (EMR) audits to identify potential participants who meet the eligibility criteria and proactively send an invitation to consider screening via usual practice communication methods (e.g. letter, SMS).
Opportunistic entry: Practices can establish EMR-based prompts to flag potentially eligible participants during consultations to enable opportunistic identification of potential participants.
Eligibility self-assessment: Individuals may have self-assessed their own eligibility prior to consulting a healthcare provider. A requesting practitioner needs to confirm and record screening eligibility before a low-dose CT scan can be requested.
Program entry: Eligible participants will receive a welcome letter and screening reminders once enrolled in the program.
Smoking status and history: Healthcare providers should regularly update and review the accurate recording of smoking status and history into EMRs to efficiently identify potential participants. Data collection should include: • Tobacco cigarette smoking history (current/former/never) • Start smoking age (years) • Quit smoking age (years) if applicable • Duration smoking (years) • Average daily cigarette consumption (number of cigarettes).
Smoking cessation: Updated smoking history records enables smoking cessation supports to be offered to people who currently smoke. Smoking cessation supports should be offered to all individuals who currently smoke or who have recently quit.
Access: Healthcare providers to offer tailored support options and/or services where appropriate. Consider potential participants' access to a requesting practitioner and screening site, including transportation and appointment booking.

Pathway step:
Eligibility and low-dose CT scan request

Practice points
Pack-years: Calculating pack-years is an 'imperfect science' and healthcare providers should use clinical judgement and best estimates to calculate smoking pack-years when determining program eligibility.
Confirming eligibility: Participants must satisfy all screening eligibility criteria to enter the program. Confirm eligibility and check for low-dose CT scan suitability prior to providing a low-dose CT request.
Data collection: Record patient information on the Healthcare Provider Eligibility and Enrolment form, including preferences for their data to be on the NCSR, suitability for a low-dose CT scan, Indigenous status, smoking cessation support and advice, and family history of lung cancer in any first-degree relative (i.e. parent, sibling or child). These data will inform program monitoring and quality.
Reassessment: Individuals assessed as not currently eligible for the program but who may meet the criteria as they age or accumulate additional pack years of smoking should be reassessed as soon as they meet the eligibility requirements.
Psychosocial support: Healthcare providers should offer tailored psychosocial support options and/or services where appropriate. People may experience distress or fear about being at high risk of lung cancer or feel anxious about not being screened.
Smoking cessation: Smoking cessation support should be offered to all individuals who currently smoke or who have recently quit regardless of actual participation in screening.

Pathway step:
Suitability for low-dose CT

Practice points
Suitability for low-dose CT: Requesting practitioners check suitability for a low-dose CT scan for all people eligible to participate in the program. Complete this check prior to completing a low-dose CT scan request at baseline and all subsequent scans.
Documentation: Record suitability for a low-dose CT scan on the Healthcare Provider Eligibility and Enrolment form and the Participant Management form (at all subsequent appointments to provide a new low-dose CT scan request) (Yes/No). Note: if not suitable due to temporary reasons, the healthcare provider should record the date for when they are suitable in the form.

Pathway step:
Shared decision-making and informed choice

Practice points
Shared decision-making: Engage in shared decision-making to support people to make an informed choice about lung cancer screening, even if they decide not to take part in the program.
Facilitation: Shared decision-making and consent processes can be facilitated by healthcare providers who either have the authority to request a low-dose CT scan, or healthcare providers (e.g., nurses, nurse practitioners, Aboriginal and Torres Strait Islander Health Workers or Practitioners) working in collaboration with requesting practitioners.
Discussion: Engage in a genuine discussion that is responsive to peoples' values, preferences, circumstances and information needs. Provide time and space for the individual to ask questions.
Inclusive: Ensure that shared decision-making is culturally appropriate and tailored to the individual person, with consideration of language, terminology, images, and accessibility. Use interpreters where appropriate.
Flexibility: Individuals may require flexible appointment structures to properly engage in shared decision-making. This may include having more than one consultation and/or involving the family/support network in the decision-making process.

Practice points
Data privacy: Healthcare providers must provide the National Lung Cancer Screening Program privacy information notice to all people who decide to participate in the program.
Smoking cessation: Smoking cessation supports should be offered to all individuals who currently smoke or who have recently quit, even if the individual decides not to screen.

Pathway step:
Enrolment in the NSCR

Practice points
NCSR enrolment: Requesting practitioners are required to enrol participants in the NCSR – **CIS integration guide and GP enrolment guide**.
NCSR opt-out: Participants can opt-out of enrolment in the NCSR at any time. These individuals will be considered external screeners and are not participants of the program, meaning their data will not be captured in the program reporting. Refer to the Key Definitions section for more information.

Pathway step:
Low-dose CT scan request

Practice points
Request: Complete the program-specific low-dose CT scan request form, or follow usual practice for radiology imaging requests, and provide it to the participant. Low-dose CT scan requests must specify that it is for the National Lung Cancer Screening Program and include family history of lung cancer in any first-degree relative (i.e. parent, sibling or child), details of any previous chest CT (if known) and history of any cancer.
Assistance: Consider participant support and information needs in relation to accessing a low-dose CT scan, including mobile screening services and the participant travel support service for the program in rural and remote communities, accommodation, identifying a support person, family support, language proficiency/need for an interpreter, and eligibility for support services when booking an appointment.

Pathway step:
Low-dose CT scan

Practice points
Scan quality: Radiographers will check the quality of the scan before the participant leaves the service. A poor quality scan may need to be repeated as soon as reasonably possible. If the scan needs to be redone the same MBS item and low-dose CT scan request is used.

Pathway step:
Low-dose CT scan assessment and reporting

Practice points
Reporting: Low-dose CT scan reports are provided to requesting medical practitioners through usual care arrangements for imaging reporting processes.

Pathway step:
Scan outcomes

Practice points
NCSR: Medical practitioners to enter findings from all tumour, node and metastasis (TNM) system tests to the NCSR using the Diagnosis Form within the appropriate clinical timeframe to ensure participants receive appropriate screening reminders or exit the program if lung cancer is diagnosed.

Pathway step:
Actionable additional findings

Practice points
Documentation: All actionable additional findings are documented in the structured radiology report and include a follow-up recommendation.
Reporting: Actionable additional findings are reported to the NCSR to inform program monitoring and evaluation.

Practice points
Management: Requesting practitioners will be informed of actionable additional findings with further action required and will be responsible for managing the findings according to relevant clinical guidelines.

Pathway step: Results communication

Practice points
Communication: Participants are notified by the NCSR that their results are available. Screening results to be communicated by the healthcare provider to the participant as per usual care.
Clarity: Healthcare providers should ensure that information is clear, and that the participant understands what their results mean. This may mean having more than one consultation and involving family and support networks as appropriate.
Sensitivity: All communication should be strengths-based, person-centred and delivered under the principle of 'treat the person not the illness'. Providers can consult the IASLC Language Guide for guidance.
Smoking cessation follow-up: Smoking cessation follow-up support should be offered to all individuals who currently smoke or who have recently quit.
Psychosocial support: Participants should be provided with clear and appropriate information about existing psychosocial services and supports. Healthcare providers should be attentive to the presence or development of psychological distress. This includes the distress of participants in the program, their supports, and/or their family members.
Information processing: Healthcare providers should be mindful that the emotional distress associated with receiving information about a positive result may temporarily impair a participant's capacity to process and understand the result. Reiterate the information and check that the participant has clearly understood.
Stigma: All results should be communicated without judgement, blame, or stigma.

Practice points
Cultural safety: Ensure a culturally safe environment is provided for participants. When communicating scan results to Aboriginal and Torres Strait Islander participants, healthcare providers should communicate effectively and respectfully and ensure Aboriginal and Torres Strait Islander participants and their families and/or communities can make self-determined decisions.
Sensitivity: Efforts to establish rapport with the participant (and any support persons present) are critical to creating a safe space for individuals to ask for clarifications and to ask questions.
Additional support: Healthcare providers can refer to the Cancer Council information and support line (13 11 20) which delivers a comprehensive range of support services for all people, affected by all cancers, across every state and territory.

Pathway step: Screening reminders

Practice points
Practice reminders: Healthcare providers are encouraged to send screening reminders directly to participants. The mode through which healthcare providers remind their clients will be specific to their practice or clinic and their own procedures (e.g. SMS or email).
Next steps: Requesting practitioners are required to re-check suitability for all low-dose CT scans and provide a new low-dose CT scan request when a participant is due for two-yearly repeat screening or follow-up scans.
NCSR: The NCSR will send participants screening reminders. For participants who have opted out of NCSR communication, requesting practitioners are responsible for sending screening reminders.

Pathway step:
Program exit and re-entry

Practice points
Screening duration: Participants should be given every opportunity to screen in accordance with the Program Guidelines until the participant is no longer eligible to participate, or until they choose to exit the program.
Program exit: A participant with a high risk or very high risk nodule will exit the program and be referred to and managed according to the Optimal Care Pathway for people with lung cancer. Participants who exit the program due to symptomatic ineligibility will be monitored according to usual care.
Referral for investigation: If a participant has a high risk nodule finding or suspected lung cancer, the requesting practitioner should refer them to a respiratory physician linked to a lung cancer MDT.
Ageing out: Healthcare providers and/or the NCSR should inform participants at the end of the screening round in which they have turned 71 years of age that they are no longer eligible for the program. Upon exit, the participant's healthcare provider should discuss broader options.
Re-entry: Participants seeking to re-enter the program need to only meet the age eligibility criterion and have no signs or symptoms suggestive of lung cancer. Check for low-dose CT suitability and re-engage in a shared decision-making discussion.
Psychosocial support: Healthcare providers to offer tailored psychosocial support options and/or services to participants where appropriate. Program exit may cause people distress.
Smoking cessation: Smoking cessation support should be offered to all individuals who currently smoke or who have recently quit, even if they choose to exit the program.

Guidelines development approach

In January 2024, Cancer Australia commissioned the University of Melbourne, in partnership with the Australian National University and Lung Foundation Australia, to develop Program Guidelines to support the delivery of the National Lung Cancer Screening Program.

The guidelines were developed in consultation with experts, clinicians, researchers, Aboriginal and Torres Strait Islander peoples, and consumers.

The guidelines development process included:

- Consultation with over 150 key stakeholders, including Aboriginal and Torres Strait Islander communities, priority populations, clinical and research disciplines, consumers and policymakers. Participation extended across all states and territories, geographic areas and healthcare systems.
- Advice from the National Lung Cancer Screening Program Clinical Materials Multidisciplinary Working Group comprising general practitioners, radiologists, radiographers, pathologists, clinicians, Aboriginal and/or Torres Strait Islander and consumer representatives.
- An iterative and collaborative process of development with the program's implementation partners: Cancer Australia, the Department of Health and Aged Care, and the National Aboriginal Community Controlled Health Organisation (NACCHO).
- Advice from key advisory groups, including:
    - National Lung Cancer Screening Program Advisory Group (PAG), an intergovernmental body with membership from all jurisdictions providing advice on program implementation, policy and governance
    - National Lung Cancer Screening Program Expert Advisory Committee (EAC), a key multidisciplinary advisory group providing clinical advice on the quality and safety of the program.
- Public consultation on the draft National Lung Cancer Screening Program Guidelines. A total of 91 submissions were received from a range of organisations and individuals, including Aboriginal and Torres Strait Islander health and medical services, State and Territory Health Departments, government agencies, peak bodies, professional membership groups, cancer policy, research and advocacy stakeholders, Primary Health Networks, hospitals and cancer services, radiology and pathology service providers, research and academic groups, pharmaceutical companies and individual health professionals and consumers.

The final Program Guidelines were accepted by Cancer Australia on behalf of the Commonwealth, in consultation with the Department of Health and Aged Care and NACCHO, with support from the National Lung Cancer Screening Program Expert Advisory Committee.

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Attributions

The following tools, sources and systems are referenced within the Program Guidelines. This attribution table is included in support of all such references.

Source	Attribution
Screening Protocol	This Screening Protocol is a screening tool, intended for use by health professionals to assist with reporting and screening of lung cancer risk under the National Lung Cancer Screening Program. The Protocol does not provide a diagnosis. It must not be used in place of the clinical and professional judgement of medical professionals. This Screening Protocol is a compilation of derivative and original work, provided subject to the terms of the respective licenses set out below. The Screening Protocol is provided for use as part of the National Lung Cancer Screening Program only. Any commercial use is strictly prohibited. Copyright in original material vests in the owners identified below or, in respect of new material, in the Department of Health on behalf of the Commonwealth of Australia.
Pan-Can Risk Calculator	Lung Nodule Malignancy Risk Calculator (as found here) © 2013, A McWilliams, MC Tammemagi, JR Mayo and S Lam (the "Software"). The Software remains the property of Brock University, The British Columbia Cancer Agency Branch, and The University of British Columbia ("the Institutions"). The Software is distributed "AS IS" under its Licence solely for non-commercial use in accordance with its license which can be found here (Nodule Malignancy Prediction Calculator - Lung Cancer Screening and Risk Prediction)
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Lung-RADs®	Lung-RADs® is a registered trademark of the American College of Radiology
Lung-RADs® Protocol	The Lung-CT Screening Reporting & Data System (Lung-RADs®) is licensed under a Creative Commons Attribution-No Derivatives 4.0 International License by the American College of Radiology. Lung-RADs® is based on a work at this link by the American College of Radiology Lung-RADs® Committee: E Kazerooni, DR Aberle, WC Black, MK. Gould, A Leung, BJ McKee, RF Munden, D Yankelevitz. License to this material is subject to the disclaimer of warranties and the limitation of liability by the Licensor set out at section 5 of the License.

Text alternatives

Figure 1: National Lung Cancer Screening Program screening and assessment pathway (text alternative)

The figure is a flowchart summarising the seven key stages in the pathway:

- Promotion and awareness
- Screening eligibility
- Program entry
- Screening
- Scan assessment and reporting
- Results and management
- Results and reminders.

Each stage has additional steps along the pathway.

Promotion and awareness

The pathway starts at promotion and awareness. All health professionals can play a role in promoting and raising awareness of the National Lung Cancer Screening Program.

Screening eligibility

To be eligible for the National Lung Cancer Screening Program, a person must:

- Be aged 50-70 years old and
- Have no signs or symptoms suggestive of lung cancer and
- Be currently smoking or quit in the past 10 years and
- Have an equal to or greater than 30 pack-year cigarette smoking history.

A person may be eligible for screening if they fulfil all these criteria. If a person is not eligible for screening, they should still be offered smoking cessation support according to best practice guidelines using the Ask, Advise, Help model.

Program entry

The first step in program entry is participant recruitment. This means that a person is identified as being potentially eligible for screening by a healthcare provider or health support worker, and may occur through four different entry points. Entry may be:

1. Organised by a primary care provider
2. Opportunistic identification in an unrelated consultation
3. Facilitated by any healthcare worker to see a requesting practitioner

4. Self-identification by a participant.

Enrolment and shared decision-making

A requesting practitioner is required to complete the NCSR enrolment form, which records that:

- Eligibility for screening is confirmed
- Suitability for a low-dose CT scan has been assessed
- Informed choice to participate has been recorded.

A requesting practitioner then provides the participant with a low-dose CT scan request and offers them smoking cessation support according to best practice guidelines using the Ask, Advise, Help model.

Screening

The low-dose CT scan is performed by a radiographer. Scan images are retained as per usual practice in the radiology facility.

Scan assessment and reporting

Scan assessment is the responsibility of a radiologist. The scan is read using the NLCSP Nodule Management Protocol.

The scan results are then reported using a structured reporting template. The completed structured report is sent to the requesting practitioner and to the National Cancer Screening Register.

Results and management

The NLCSP Nodule Management Protocol categorises results based on risk and dictates how each category is managed:

- Very low risk means that the participant returns for screening in 24 months.
- Low risk means that the participant returns for screening in 12 months.
- Low to moderate risk means that the participant returns for screening in 6 months.
- Moderate risk means that the participant returns for screening in 3 months.
- High risk means that the participant is referred to a respiratory physician or other relevant specialist linked to a lung cancer multidisciplinary team.
- Very high risk means that the participant is referred to a respiratory physician or other relevant specialist linked to a lung cancer multidisciplinary team.
- Actionable additional findings are managed as appropriate to the specific finding.

Results and reminders

The requesting practitioner is responsible for communicating results to the participant. However, the National Cancer Screening Register also communicates with the requesting practitioner by sending correspondence of the results to the requesting practitioner.

For very low risk findings, the National Cancer Screening Register notifies the participant of the result. The National Cancer Screening Register also reminds the participant to screen at the required interval (in two years).

For any findings with further action needed, the National Cancer Screening Register notifies the participant to contact their requesting practitioner. The requesting practitioner then provides the results to the participant and manages the results according to the NLCSP Nodule Management Protocol. The requesting practitioner should also offer smoking cessation support according to best practice guidelines (using the Ask, Advise, Help model).

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Figure 2: Simplified pathway summarising the program healthcare setting and roles and responsibilities (text alternative)

Figure 2 is a diagram showing the healthcare settings in which the National Lung Cancer Screening Program will be delivered, and the roles of healthcare providers within these settings.

Program entry

Program entry can occur in any health setting.

The diagram lists the four program entry pathways:

1. Organised invitation by a primary care provider
2. Opportunistic identification by a healthcare provider
3. Facilitated engagement with a healthcare provider by another health professional or worker
4. Self-identified eand approached a healthcare provider.

Any healthcare provider or health support worker can identify potentially eligible participants and recommend screening. However, eligibility must be confirmed by a requesting practitioner before a low-dose CT request can be provided.

Eligibility and enrolment

Eligibility and enrolment into the program can occur in primary, secondary, or tertiary healthcare settings.

The diagram shows a side-by-side comparison of the responsibilities of healthcare providers, such as nurses or Aboriginal Health Practitioners, and requesting practitioners, such as general practitioners or specialists.

Healthcare providers can:

- Assess eligibility
- Provide smoking cessation supports to both eligible participants and people who are ineligible or unable to receive a scan
- Conduct shared decision-making
- Support and record informed choice, and
- Enrol participants in the National Cancer Screening Register.

Requesting practitioners perform ALL the same responsibilities as healthcare providers, but are required to:

- Confirm eligibility
- Conduct a suitability check, and
- Provide a low-dose CT scan request.

Scan

Low-dose CT scans are performed at radiology services, which includes fixed sites or in mobile screening trucks for some rural and remote areas. A radiographer performs the low-dose CT scan.

A radiologist reads scan images, reports scan outcomes and communicates the report to the requesting practitioner and to the National Cancer Screening Register.

Results

A requesting practitioner reviews results, communicates the results to the participant, and manages next steps or referrals. Healthcare providers can also communicate results. Any healthcare provider can offer smoking cessation support.

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Figure 3: Simplified NLCSP Nodule Management Protocol flowchart (text alternative)

The simplified NLCSP Nodule Management Protocol flowchart illustrates the risk categories defined by the NLCSP Nodule Management Protocol, along with the corresponding actions required for managing low-dose CT scan results.

Low-dose CT scan results are categorised based on nodule risk and other findings. The categories are:

- Incomplete
- Very low risk
- Low risk
- Low to moderate risk
- Moderate risk
- High risk
- Very high risk.

"Actionable additional findings" can be added to categories for any clinically significant findings unrelated to lung cancer.

Incomplete

If a scan is incomplete, an additional imaging or scan is required.

The participant will need a repeat scan in 1, 2 or 3 months due to suspected infection or inflammation.

Very low risk

If a scan is reported as very low risk, a participant will return for a two-yearly screen in 24 months.

Low risk

If a scan is reported as low risk, a participant will return for a follow-up scan in 12 months.

The follow-up scan in 12 months is then assessed for nodule growth.

Nodule growth?

If yes, there is nodule growth, the participant will be managed according to the risk category reported by the radiologist in the structured report.

If no, there is no nodule growth, the participant will return for a follow-up scan in 24 months. Go to two-yearly screen 24 months.

See footnote.

Footnote

It should be noted that low risk participants require two 12 month scans before extending to 24 months. Further details are in the NLCSP Nodule Management Protocol.

Low to moderate risk

If a scan is reported as low to moderate risk, the participant will return for a follow-up scan in 6 months.

The follow-up scan in 6 months is then assessed for nodule growth.

Nodule growth?

If yes, there is nodule growth, the participant will be managed according to the risk category reported by the radiologist in the structured report.

If no, there is no nodule growth, the participant will return for a follow-up screen in 12 months. Go to follow-up scan in 12 months.

Moderate risk

If a scan is moderate risk, the participant will return for a follow-up scan in 3 months.

The follow-up scan in 3 months is then assessed for nodule growth.

Nodule growth?

If yes, there is nodule growth, the participant will be managed according to the risk category reported by the radiologist in the structured report.

If no, there is no nodule growth, the participant will return for a follow-up screen in 6 months. Go to follow-up scan in 6 months.

High risk

If a scan is high risk, the participant is referred to a respiratory physician or other relevant specialist linked to a lung cancer multidisciplinary team for investigation and management outside of the program.

If no lung cancer is found at investigation, the participant will remain in the screening program. The participant's next scan will be the two-yearly screen 24 months.

If lung cancer is confirmed, the participant will be managed according to the relevant Lung Cancer Optimal Care Pathway. The participant will exit the program.

Very high risk

If a scan is very high risk, the participant is referred to a respiratory physician or other relevant specialist linked to a lung cancer multidisciplinary team for investigation and management outside of the program.

If no lung cancer is found at investigation, the participant will remain in the screening program. The participant's next scan will be the two-yearly screen 24 months.

If lung cancer is confirmed, the participant will be managed according to the relevant Lung Cancer Optimal Care Pathway. The participant will exit the program.

Actionable additional findings

If actionable additional findings are reported as part of the scan results, the participant will be managed according to relevant guidelines.

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Figure 4: Simplified results communication process and responsibilities (text alternative)

Figure 4 is a simplified flowchart of the results communication process for low-dose CT scans.

For very low risk scans, known as category 1, the NCSR directly notifies participants and practitioners of results.

For all other categories, including low risk, low to moderate risk, moderate risk, high risk, and very high risk, known as categories 2 through 6 respectively, as well as scans with actionable additional findings and incomplete scans, known as category 0, further action is required. For findings with further action required, the NCSR notifies the participant to contact their requesting provider and the requesting practitioner to contact the participant.

The NCSR also supports the screening reminder process, which is depicted as an additional flowchart. The NCSR sends reminder notifications to the participant when the participant is due for screening at the recommended interval, prompting the participant to obtain a new low-dose CT request. The NCSR sends reminder notifications to the requesting practitioner to provide the participant with a new low-dose CT scan. Requesting practitioners are encouraged to use existing patient recall and reminder processes to remind participants when they are due for screening.

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