Lung Cancer Screening

Dr Catherine Bettington 19<sup>th</sup> July 2025





Commenced 1<sup>st</sup> July 2025!

WHY?

HOW?

WHO?

# WHY?

# Lung cancer is the leading cause of cancer deaths

## Table 1 - Australia's most commonly diagnosed cancers in 2024, persons, all ages,

Age-standardised incidence rates (cases per 100,000 persons )-projections data

Age-standardised rates are standardised to the 2024 Australian population.

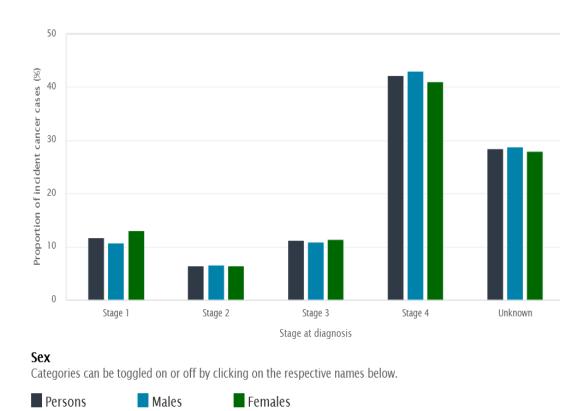
#### Table 2 - Australia's most common causes of cancerrelated death in 2024, persons, all ages

Age-standardised mortality rates (deaths per 100,000 persons ) - projections data

Age-standardised rates are standardised to the 2024 Australian population.

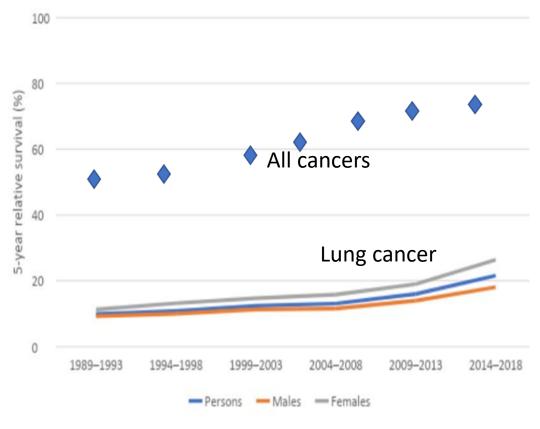
Rank	Cancer type	Age-standardised rate	Rank	Cancer type	Age-standardised rate
1	Prostate cancer	97.1	1	Lung cancer	32.8
2	Breast cancer	78.1	2	Colorectal cancer	19.3
3	Melanoma of the skin	69.8	3	Pancreatic cancer	14.4
4	Colorectal cancer	57.2	4	Prostate cancer	14.4
5	Lung cancer	55.7	5	Breast cancer	12.2

#### **DIAGNOSED AT LATE STAGE**



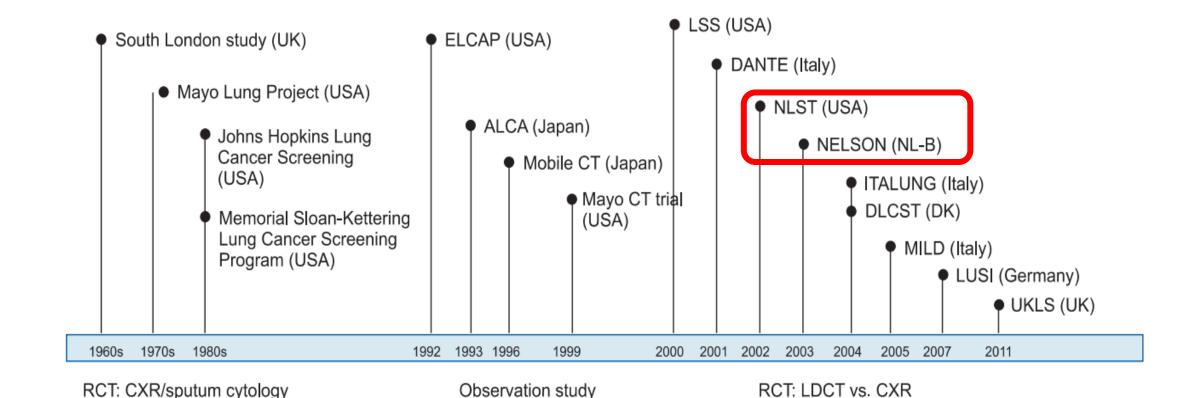
https://ncci.canceraustralia.gov.au/diagnosis/distribution-cancer-stage/distribution-cancer-stage

#### **OUTCOMES NOT AS GOOD**



https://www.canceraustralia.gov.au/cancer-types/lung-cancer/statistics

## Evidence for Lung Cancer Screening



# The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812

AUGUST 4, 2011

VOL. 365 NO. 5

#### Reduced Lung-Cancer Mortality with Low-Dose Computed Tomographic Screening

The National Lung Screening Trial Research Team\*

NLST	
Population	Age 55-74 30 Pack Year Hx Former smoker < 15 years
Intervention	Low dose CT (diameter) Annually for 3 years
Outcome	20% reduction in lung cancer mortality

## The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812

FEBRUARY 6, 2020

VOL. 382 NO. 6

### Reduced Lung-Cancer Mortality with Volume CT Screening in a Randomized Trial

H.J. de Koning, C.M. van der Aalst, P.A. de Jong, E.T. Scholten, K. Nackaerts, M.A. Heuvelmans, J.-W.J. Lammers, C. Weenink, U. Yousaf-Khan, N. Horeweg, S. van 't Westeinde, M. Prokop, W.P. Mali, F.A.A. Mohamed Hoesein, P.M.A. van Ooijen, J.G.J.V. Aerts, M.A. den Bakker, E. Thunnissen, J. Verschakelen, R. Vliegenthart, J.E. Walter, K. ten Haaf, H.J.M. Groen, and M. Oudkerk

Nelson Trial	
Population	Age 50-74 >15 cigarette/day 25+ years >10 cigarettes/day, 30+ years Former smoker <10 years
Intervention	Low Dose CT (volumetric assessment) Year 1,2 and 5.5
Outcome	24% reduction in lung cancer mortality



## Analysis 1.1. Comparison 1: Primary outcome: lung cancer-related mortality, Outcome 1: Lung cancer-related mortality - planned time points

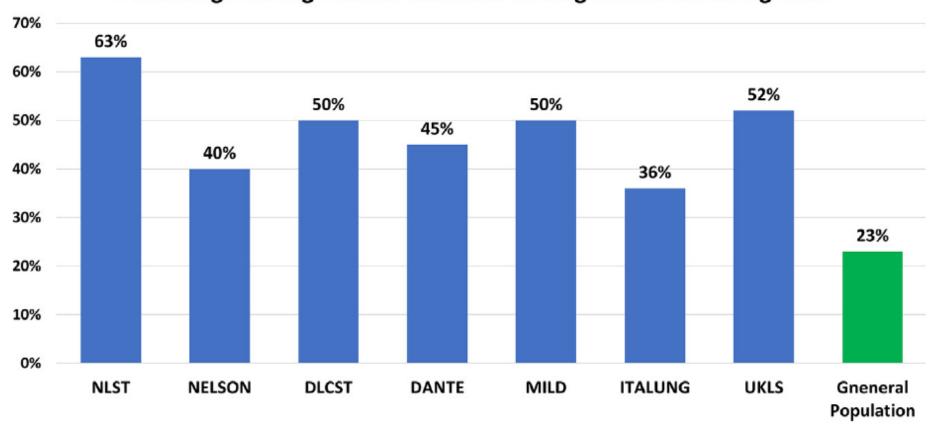
	LDC	CT	Cont	rol		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
Field 2021	30	1987	46	1981	4.2%	0.65 [0.41 , 1.03]	
Paci 2017	43	1613	60	1593	5.9%	0.71 [0.48, 1.04]	<del></del>
Becker 2020	29	2029	40	2023	3.9%	0.72 [0.45 , 1.16]	
Pastorino 2012	40	2376	40	1723	4.7%	0.73 [0.47, 1.12]	
De Koning 2020	181	7900	242	7889	24.3%	0.75 [0.62 , 0.90]	<b></b> -
Aberle 2011	356	26722	443	26732	45.7%	0.80 [0.70, 0.92]	-
Infante 2015	59	1264	55	1186	6.8%	1.01 [0.70 , 1.44]	<u> </u>
Wille 2016	39	2052	38	2052	4.5%	1.03 [0.66, 1.60]	<del></del>
Total (95% CI)		45943		45179	100.0%	0.79 [0.72 , 0.87]	•
Total events:	777		964				<u> </u>
Heterogeneity: Tau <sup>2</sup> = 0.00; Chi <sup>2</sup> = 4.79, df = 7 (P = 0.69); I <sup>2</sup> = 0%						0.5 0.7 1 1.5 2	
Test for overall effect: 2	Z = 4.92 (P <	0.00001)					Favours LDCT Favours control
Test for subgroup differ	rences: Not ap	pplicable					

Bonney A,. Impact of low-dose computed tomography (LDCT) screening on lung cancer-related mortality. Cochrane Database of Systematic Reviews 2022, Issue 8. Art. No.: CD013829. DOI:10.1002/14651858.CD013829.pub2

Outcomes	№ of participants (trials) follow-up	Certainty of the evidence (GRADE)	Relative	Anticipated absolute effects*(95% CI)	
			effect (95% CI)	Risk with no screening	Risk difference
Lung cancer-related mortality - planned	91,122	$\oplus \oplus \oplus \ominus$	RR 0.79	Trial population	
time points	(8 RCTs)	<b>Moderate</b> <sup>a</sup>	40.000		
Follow-up: 6 years to 10 years from			(0.72 to	21 per 1000	4 fewer per 1000 people
randomisation			0.87)		screened
					(3 fewer to 6 fewer)
All-cause mortality - planned time points	91,107	⊕⊕⊕⊝	RR 0.95	Trial population	
Follow-up: 6 years to 10 years from	(8 RCTs)	<b>Moderate</b> <sup>a</sup>	(0.91 to	90 may 1000	4 forwar nor 1000 noonlo
	(ORCIS)			89 per 1000	4 fewer per 1000 people
randomisation			0.99)		screened
					(1 fewer to 8 fewer)

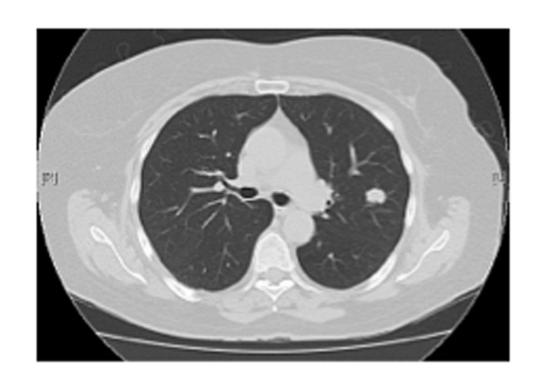
## STAGE MIGRATION

#### Percentage of stage I cases detected in Lung cancer screening RCTs



# Treatment and Outcome is Highly Dependent on Stage of Disease

#### STAGE 1

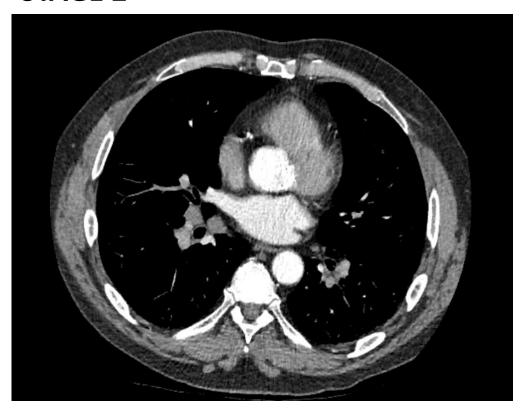


#### **TREATMENT**

- Intent: Cure
- Options
  - Surgery alone
  - Radiotherapy alone
- Outcome 5 year OS 70-80%

# Treatment and Outcome is Highly Dependent on Stage of Disease

#### **STAGE 2**



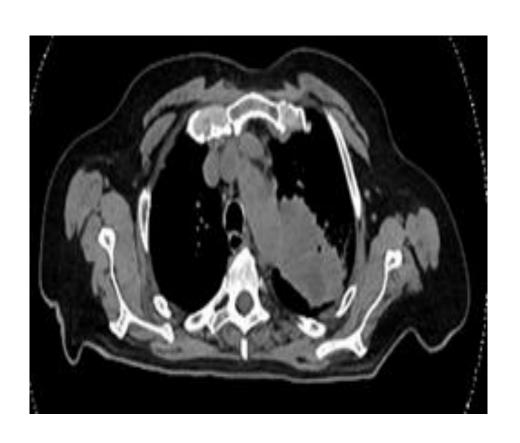
#### **TREATMENT**

- Intent: Cure
- Options
  - Surgery plus adjuvant chemotherapy
  - Concurrent Chemoradiotherapy

• Outcome: 5 year OS 50-60%

# Treatment and Outcome is Highly Dependent on Stage of Disease

#### **STAGE 3**



#### **TREATMENT**

- Intent: Cure
- Options
  - Neo-adjuvant chemoimmunotherapy then surgery
  - Chemoradiotherapy then consolidation immunotherapy
- Outcome: 5 year OS 40%

# Treatment and Outcome is Highly Dependent on Stage

#### **STAGE 4**



#### **TREATMENT**

- Intent: Palliative
- Options
  - Systemic therapy
  - Palliative radiotherapy
  - Best supportive care
- Outcome
  - Median survival 18months
  - 5 year OS 10%

# HOW? WHO?

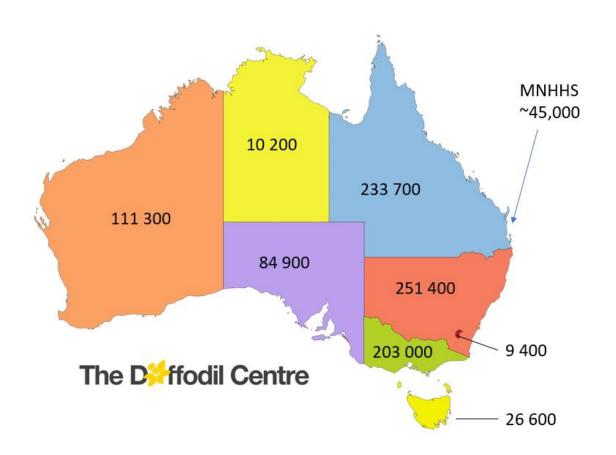
## **NLCSP Overview**

- Commenced 1<sup>st</sup> July 2025 (~1400 registrations in first 2 weeks)
  - Age 50-70 years
  - 30 pack year smoking history
  - Current or quit in last 10 years
  - No symptoms to suggest lung cancer
- 2 yearly (biennial) scanning cycle
- Nodule Management algorithm
- Recommendations for additional findings



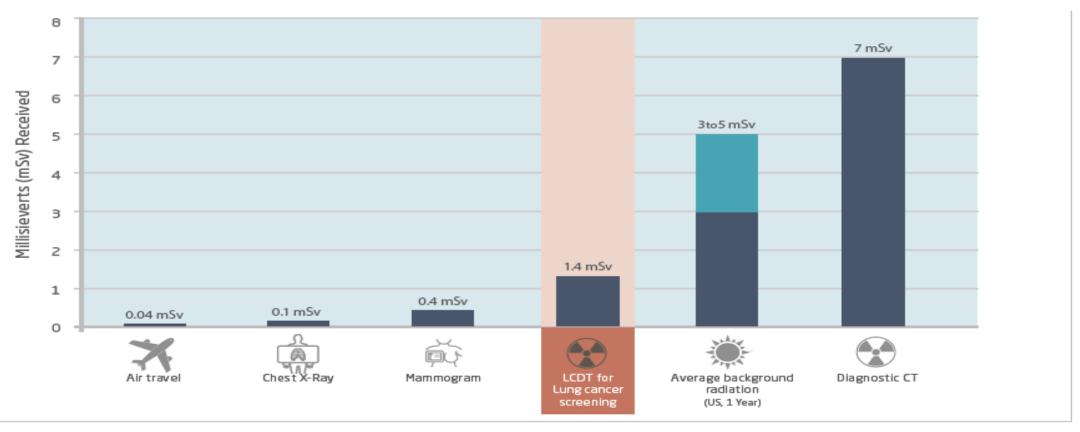


## How many eligible?



- 12.8 14.1% of population
- 930,500 individuals
- 75% currently smoke

## LOW DOSE CT SCAN



Source: Agency for Healthcare Research and Quality. Is Lung Cancer Screening Right for Me? A decision aid for people considering lung cancer screening with low-dose computed tomography. Available from <a href="https://effectivehealthcare.ahrq.gov/decision-aids/lung-cancer-screening/patient.html">https://effectivehealthcare.ahrq.gov/decision-aids/lung-cancer-screening/patient.html</a>

### **HEALTH WORKFORCE ROLES** AND RESPONSIBILITIES



Promote and recruit



Conduct eligibility and suitability check and request low-dose CT scan



Provide smoking cessation support



Enrol in the program



Conduct the low-dose CT scan



Read and report the low-dose CT scan



Communicate results



Support results communication



Manage

findings

low-risk, low to moderate Manage risk and referrals for moderate-risk epeat scans and nodules and investigations actionable additional



Manage high-risk or very high-risk nodules

Requesting practitioners

Healthcare providers\* (see key)

Health support workers

Requesting practitioners

Healthcare providers\* can support assessment of eligibility

(see key)

Requesting practitioners

Healthcare providers\* (see key)

Health support workers

Requesting practitioners

Administrative staff (see kev)

Radiographers

Radiologists

Requesting practitioners Healthcare providers\* (see key)

Health support workers

Requesting practitioners

Respiratory Requesting physicians practitioners. linked to a lung cancer MDT\*\*

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

Requesting practitioners:

Healthcare providers authorised to request a low-dose CT scan, including general practitioners, nurse practitioners and other medical practitioners

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

\*Registered nurse, registered nurses, practice nurses and enrolled nurses, Aboriginal and Torres Strait Islander health workers and practitioners, allied health professionals

Health support workers:

Aboriginal liaison officers, health support workers and smoking cessation specialists

Administrative staff (based in primary care): Practice managers and administrative staff



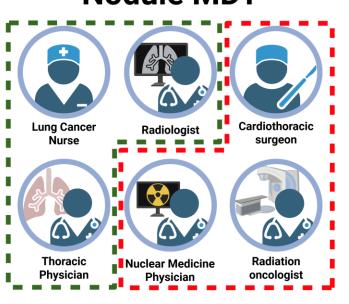
**NATIONAL LUNG CANCER SCREENING** PROGRAM

## Predicted screening outcome

75%	Very low risk	LDCT 24 months	
14%	Low risk	LDCT 12 months	
00/	Low to moderate risk	LDCT 6 months	
8%	Moderate risk	LDCT 3 months	
201	High risk	Refer to respiratory	
3%	Very high risk	physician linked to a lung cancer MDT	
		As appropriate to the specific	

## Respiratory Physician Linked to an MDT

#### **Nodule MDT**



### **Lung Cancer MDT**







Cardiothoracic surgeon





**Pathologist** 



Radiation oncologist



**Nuclear Medicine** 

**Physician** 

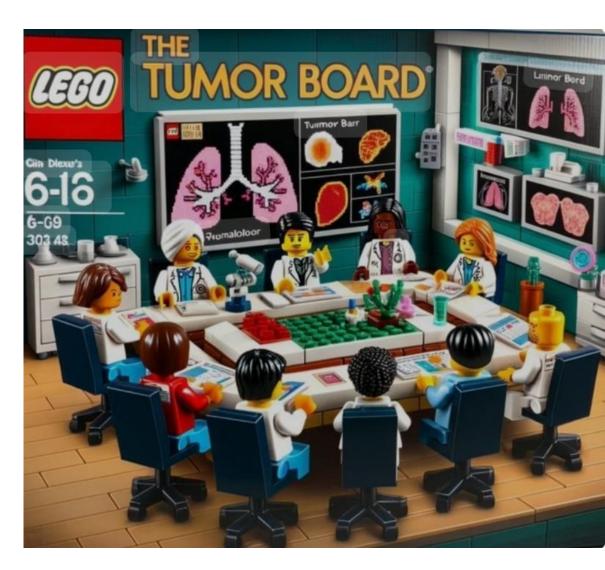
**Oncologist** 



Care



**Thoracic Physician** 







### **Incidental Mx**

https://www.ranzcr.com/college/document-library/nlcspadditional-findings-guidelines

#### **NATIONAL LUNG CANCER SCREENING PROGRAM**

**Additional Findings Guidelines** 

Interstitial	lung
abnormali	ty

*Interstitial lung abnormality* with high-risk features (honeycombing, reticulation, traction bronchiectasis or *progression*) – report

Interstitial lung abnormality, stable or <u>without</u> high-risk *features* – report

Interstitial lung abnormality with *high-risk features*: Clinical review (symptoms, family history, crackles). Perform high resolution CT chest (including prone acquisition). Refer to respiratory physician.

Interstitial lung abnormality without *high-risk features*: Clinical review (symptoms, family history, crackles). Imaging findings will be assessed at next screening CT.

ERS/ESTS/ESTRO/ESR/ESTI/EFOMP statement on management of incidental findings from low dose CT screening for lung cancer.(2)

Interstitial lung abnormalities detected incidentally on CT: a Position Paper from the Fleischner Society (3).

Expert opinion (ANZSTR and TSANZ).

### **SUMMARY**

#### • WHY?

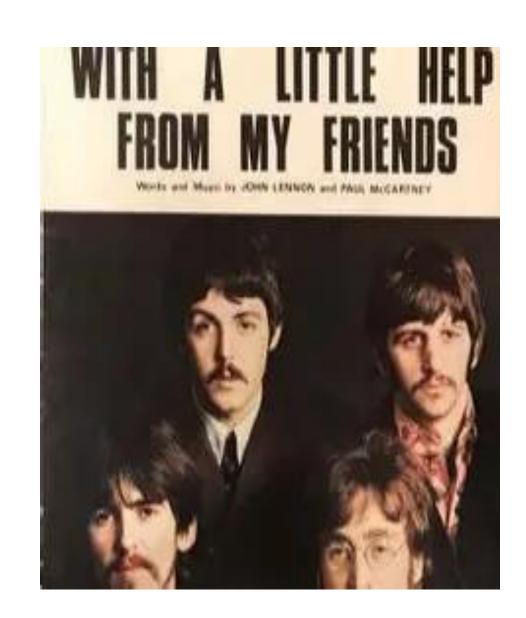
- Reduction in Lung Cancer Mortality
- Reduction in All Cause Mortality
- Stage Shift

#### • WHO?

- 50-70yo
- 30 Pack Year Smoking
- Quit <10 years ago

#### • HOW?

- LDCT scan, every 2 years
- With a lot of help from you all!



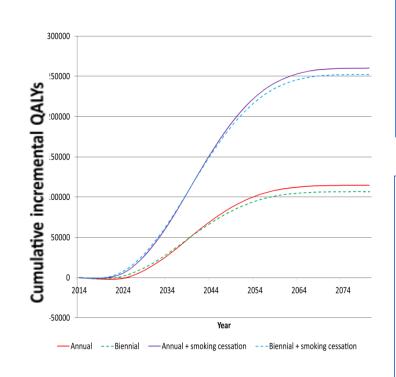
## Acknowledgements

Many slides prepared by Queensland Lung Cancer Screening giants:
 Prof Kwun Fong, A/Prof Henry Marshall, Dr Gerry Olive



# Doubling the benefit: Smoking cessation plus screening

- Long-term smoking abstinence plus LCS
   ~doubles mortality benefit from 21%
   reduction to 38% reduction
- 2. People who quit at /around time of lung cancer diagnosis have ~30% overall survival benefit
- All-cause mortality benefit: Quitting by age 60 could reduce premature mortality by 40% (~4-5 years)



biennial LDCT with smoking cessation

biennial
LDCT
without
smoking
cessation

- 1. Tanner Am J Respir Crit Care Med 2016; 2. Banks, E, BMC Medicine 2015;
- 3. Caini S, M. Journal of Thoracic Oncology 2022; Goffin JR,. Lung Cancer 2016;101:98-103

## Radiation Oncology Implications

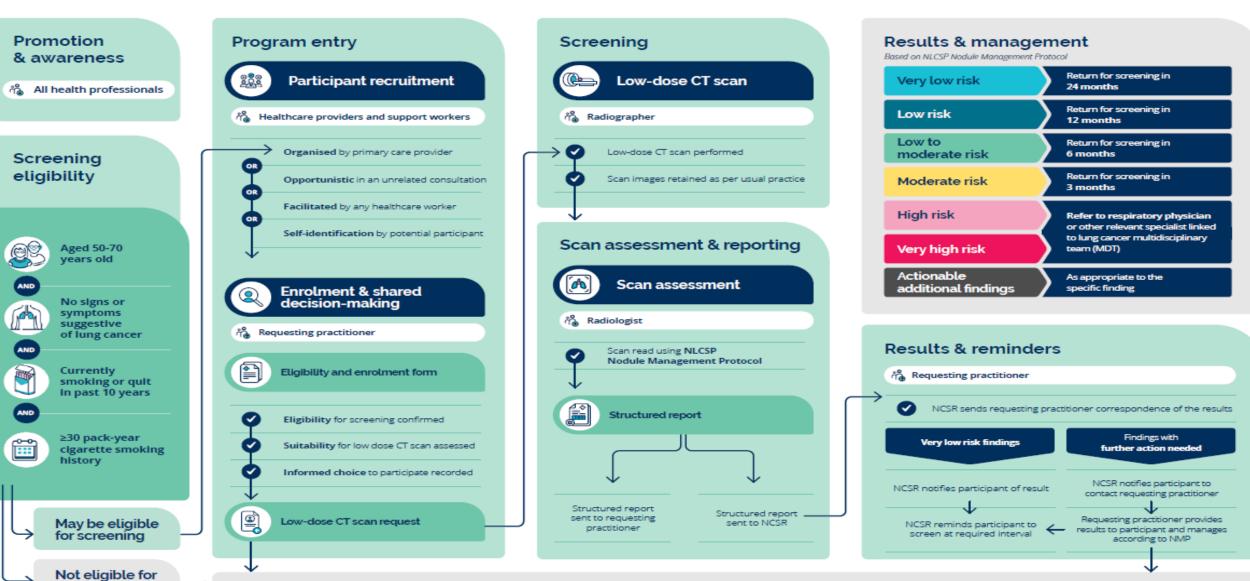
- 1. RONC Demand??
- 2. Pulmonary Nodule MDTs
- 3. Empiric Radiotherapy
- 4. Knowledge of Natural History GGO's
- 4. SBRT for GGO



## SCREENING AND ASSESSMENT PATHWAY







Offer smoking cessation support according to best practice guidelines (ASK, ADVISE, HELP)

screening

## **Empiric Radiotherapy**

- Historic manta of cancer care
  - No pathologic proof of malignancy = No therapy
- Increasing challenge of considering SBRT without biopsy

- Considerations
  - Risk of CT guided biopsy
  - Diagnostic yield of attempted biopsy
  - Risk of SBRT (peripheral vs central zone)