ΕΛΛΗΝΙΚΗ ΠΝΕΥΜΟΝΟΛΟΓΙΚΗ ΕΤΑΙΡΕΙΑ
HELLENIC THORACIC SOCIETY

27 ΠΑΝΕΛΛΗΝΙΟ ΠΝΕΥΜΟΝΟΛΟΓΙΚΟ ΣΥΝΕΔΡΙΟ

Ξενοδοχείο
Hilton Athens

13-16 Δεκεμβρίου 2018
www.27pneumonologiko2018.gr

Προγράμματα προληπτικού ακτινολογικού ελέγχου (LDCT scan) στην πρώιμη διάγνωση του καρκίνου του πνεύμονα

Σταύρος Ελ. Ανευλαβής
Επ. καθ. Πνευμονολογίας
Δημοκρίτειο Πανεπιστήμιο Θράκης

Estimated new cases, 2018
by sex, for lung and bronchus

Male

Female

Data Sources: American Cancer Society, 2018

CancerStatisticsCenter.cancer.org

Estimated deaths, 2018
by sex, for lung and bronchus

Male

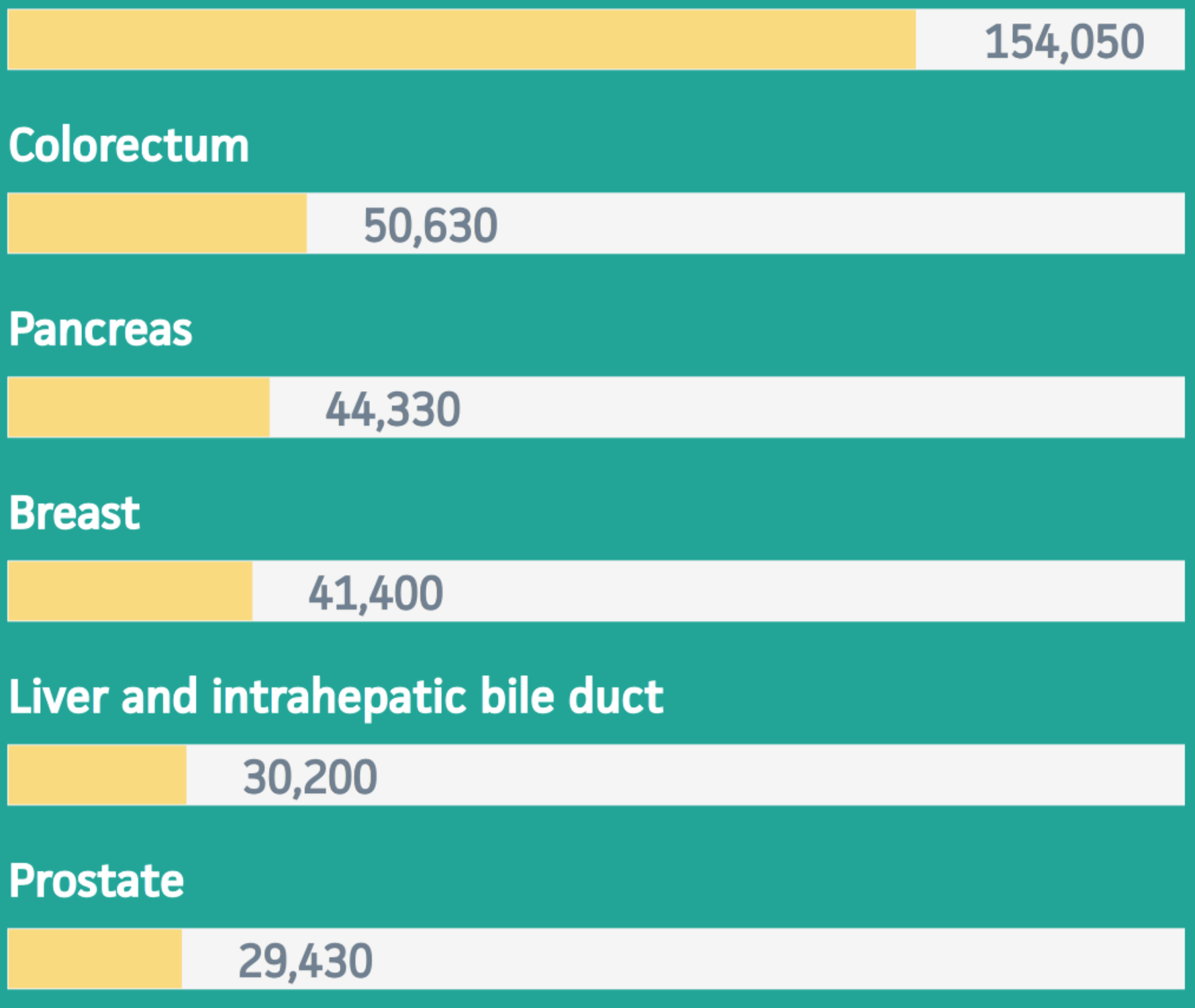
Female

Data Sources: American Cancer Society, 2018

CancerStatisticsCenter.cancer.org

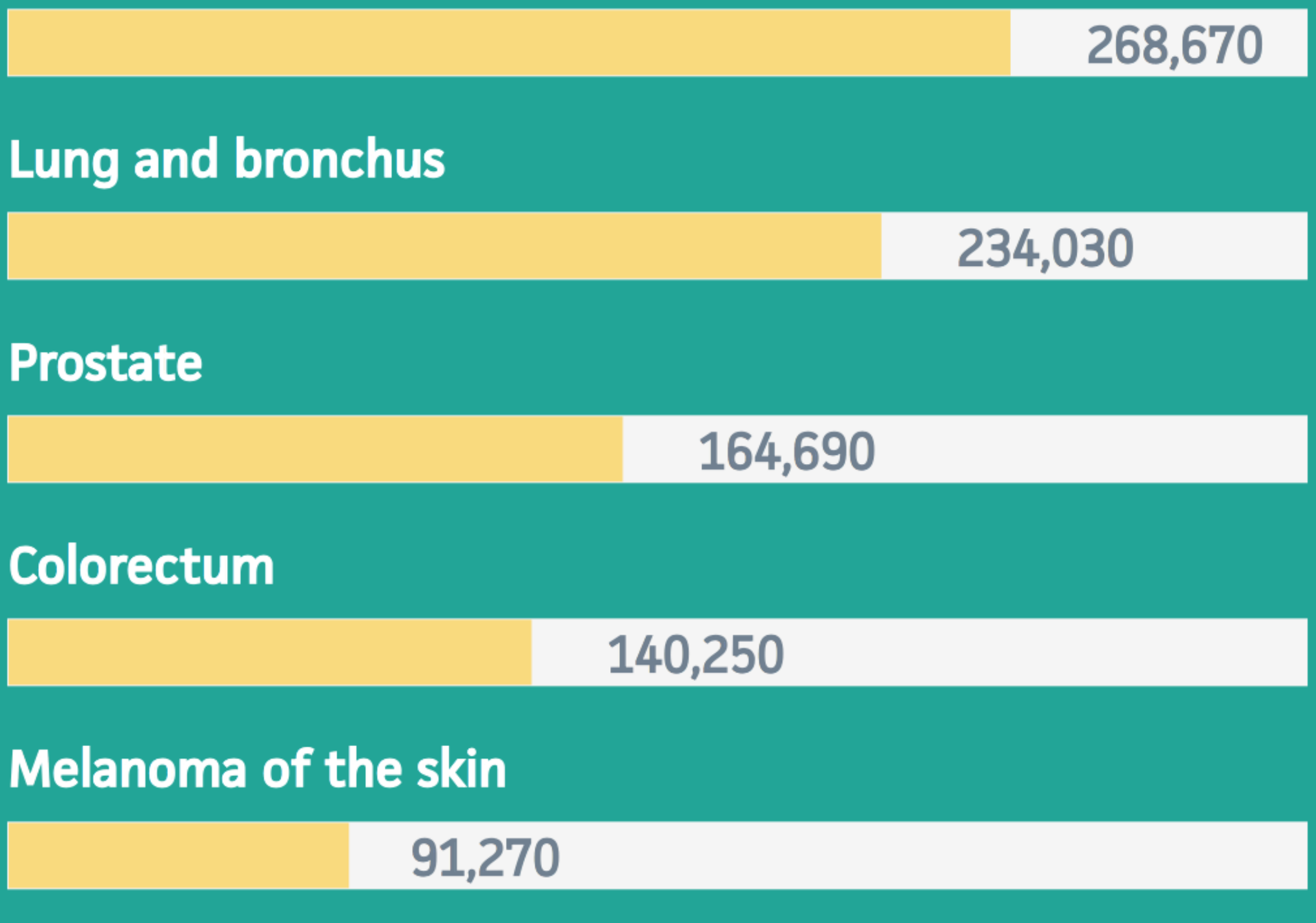
Estimated deaths, 2018

By cancer type, both sexes combined



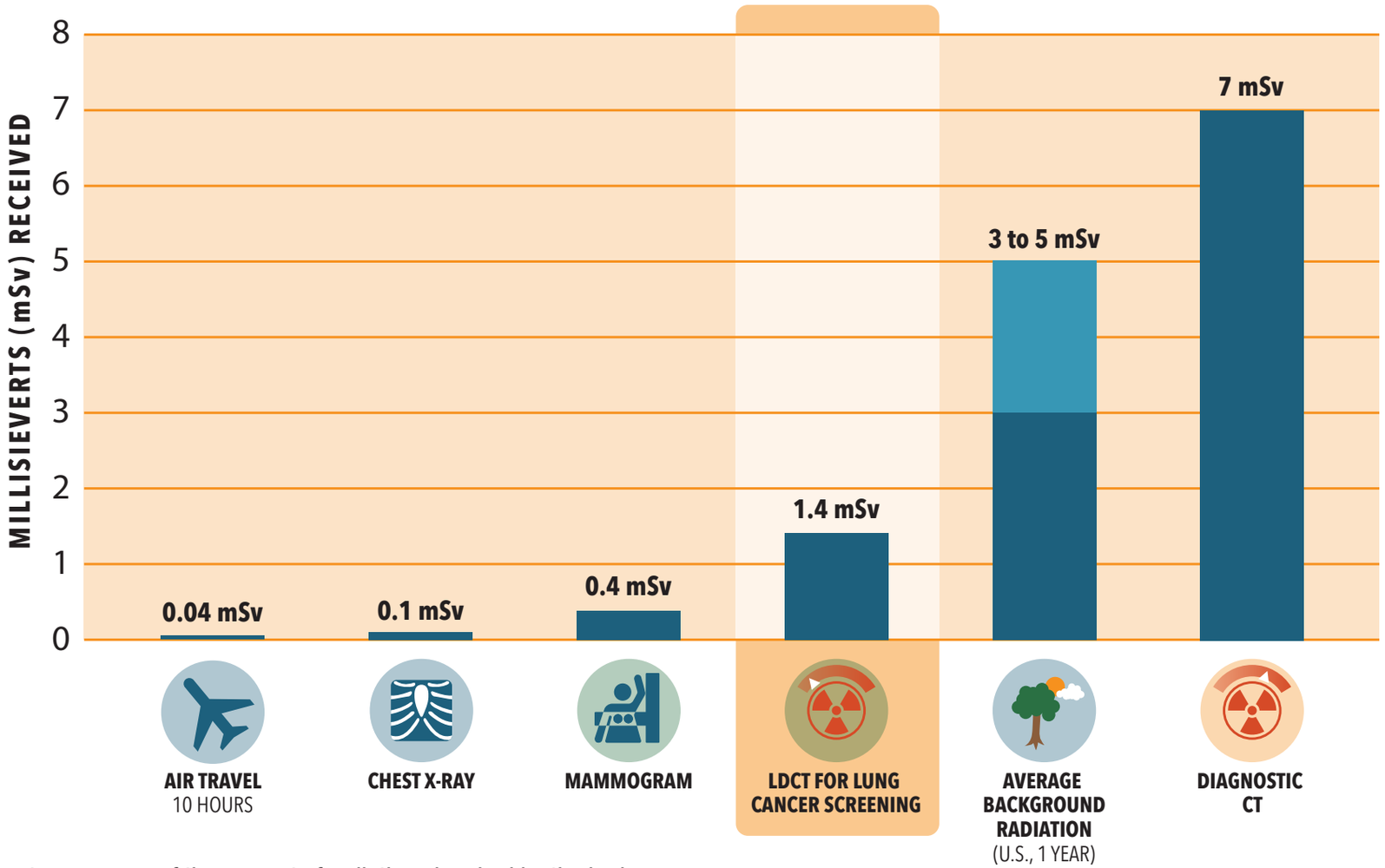
Estimated new cases, 2018

By cancer type, both sexes combined



Radiation

COMPARING SOURCES OF RADIATION



mSV=millisievert, a measure of the amount of radiation absorbed by the body.

Το ιδανικό πρόγραμμα πρόληψης

- Υψηλή ευαισθησία και ειδικότητα
- Απλές και ασφαλείς εξετάσεις
- Αποτελεσματικό κόστος
- Εύκολα πραγματοποιήσιμο

Το ιδανικό πρόγραμμα πρόληψης

- Αριθμός των συμμετεχόντων για να προληφθεί 1 καρκίνος
- Η συχνότητα των ψευδώς θετικών αποτελεσμάτων
- Η θνητότητα σχετιζόμενη με τις χειρουργικώς αντιμετωπιζόμενες περιπτώσεις
- Η υπερδιάγνωση
- Η ψυχολογική επίπτωση λόγω των ψευδώς θετικών αποτελεσμάτων
- Το κόστος και η προσβασιμότητα

Τα πρώτα προγράμματα πρόληψης

- Mayo Lung Project
  - Ακτινογραφία θώρακος και κυτταρολογική πτυέλων
- Memorial Sloan-Kettering study
  - Ακτινογραφία θώρακος και κυτταρολογική πτυέλων
- PLCO cancer screening trial
  - Ακτινογραφία θώρακος

	Recruitment period	Recruitment criteria	Screening methods
Randomised controlled trials			
NLST[1]	2002–04	Age 55–75 years, ≥30 PY smoker, quit smoking <15 years earlier	Annual low-dose CT *vs* chest x-ray for 3 years
MILD[3]	2005–11	Age >49 years, ≥20 PY smoker, quit smoking <10 years earlier, no cancers within past 5 years	Three groups: no screen, annual screen, and biennial low-dose CT for 5 years
ITALUNG[4]	2004–06	Age 55–69 years, ≥20 PY smoker	Annual low-dose CT for 4 years *vs* no screen
DANTE[5]	2001–06	Age 60–75 years, ≥20 PY smoker, quit smoking <10 years earlier, male	Annual low-dose CT for 4 years *vs* no screen
DLCST[6]	2004–06	Age 50–70 years, ≥20 PY smoker, quit smoking <10 years earlier, FEV_1 ratio >30%, able to climb two flights of stairs without pausing	Annual low-dose CT *vs* usual care for 5 years
NELSON[2]	2003–06	Age 50–75 years, smoker or quit smoking ≤10 years earlier, >15 cigarretes per day for >25 years or >ten cigarretes per day for >30 years	Low-dose CT in year 1, year 2, year 4, and year 6·5 *vs* no screen
LUSI[7]	2007–11	Age 50–69 years, heavy smoking history	Annual low-dose CT and smoking cessation for 5 years *vs* smoking cessation alone
UKLS[8]	2011–14	Age 50–75 years, ≥5% of 5-year lung cancer risk as calculated by LLP_{v2} scores	Wald single low-dose CT screen design *vs* no screen
Other studies			
I-ELCAP[14]	1993–2006	Age >60 years, ≥10 PY smoker	Annual low-dose CT and chest x-ray for 5 years
Mayo LDCT trial[18]	1999	Age >50 years, 20 PY smoker, quit smoking <10 years earlier	Annual low-dose CT for 5 years
PANCAN[19]	2008–11	Age 50–75 years, ≥2% of 3-year lung cancer risk as calculated by PLCO score	Low-dose CT in year 1, year 2, and year 4
COSMOS[20]	2000–01	Age >50 years, ≥20 PY smoker	Annual low-dose CT for 10 years

PY=pack-year. FEV=forced respiration volume. LLP_{v2}=Liverpool Lung Project risk model, version 2. PLCO=Prostate, Lung, Colorectal, and Ovarian trial risk model.

Table: **European pilot trials for lung cancer low-dose CT screening**

TABLE 2 Selection criteria, number of enrolled individuals and the rate of diagnosed lung cancer of major randomised controlled trials

Study	Selection criteria		Patients screened n (follow-up)	Lung cancer diagnosed at initial screening (total in follow-up)
	Age years	Tobacco smoking (delay since weaning)		
DLCST	50–70	⩾20 pack-years (0–9 years)	2052 (58 months)	0.8% (3.4%)
DANTE	60–74 (only men)	⩾20 pack-years (0–9 years)	1276 (34 months)	2.2% (4.7%)
ITALUNG	55–69	⩾20 pack-years (active or former)	1406 (36 months)	1.5% (2.8%)
MILD	⩾49	⩾20 pack-years (0–9 years)	1190[#] (120 months) 1186[¶] (53 months)	0.8% (2.4%)
NELSON	50–75	⩾15 pack-years[+] (0–9 years)	7907 (60 months)	0.9% (2.6%)
NLST	55–74	⩾30 pack-years (0–15 years)	26 722 (78 months)	1.1% (2.4%)

[#]: annual computed tomography; [¶]: biannual computed tomography; [+]: NELSON inclusion criteria: number of cigarettes smoked is ⩾ 15 per day for 25 years OR ⩾10 cigarettes per day for 30 years AND still smoking or have quit <10 years ago.

MILD Trial

- 4099 ασθενείς
- Τυχαιοποίηση σε 3 σκέλη
  - 1: ετήσια παρακολούθηση (1190 ασθενείς)
  - 2: 2ετής παρακολούθηση (1186 ασθενείς)
  - 3: καμία παρακολούθηση (1723 ασθενείς)

MILD Trial

- Καπνιστές ή πρώην καπνιστές ηλικίας τουλάχιστον 49 ετών
- 20 p/y
- 10 έτη διακοπή καπνίσματος

MILD Trial

- Δεν βρέθηκε διαφορά στην θνητότητα μεταξύ των σκελών της μελέτης
- Μικρός αριθμός των ασθενών ώστε να φανεί διαφορά
- Ο ρυθμός ανίχνευσης καρκίνου του πνεύμονα για την μονοετή ή δυετή παρακολούθηση δεν ήταν στατιστικά σημαντικός (3.6% vs 2.7%)

MILD Trial

- Stage I: 53,6% - 59.2%

- Stage IV: 26.8% - 22.2%

NLST

- Τυχαιοποίηση 1:1
- 3 ετήσιες LDCT
- 3 ετήσιες ακτινογραφίες θώρακα
- Αρνητική LDCT βάσης παρακολούθησης (T0): χωρίς ευρήματα ή μέγεθος όζου < 4mm

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

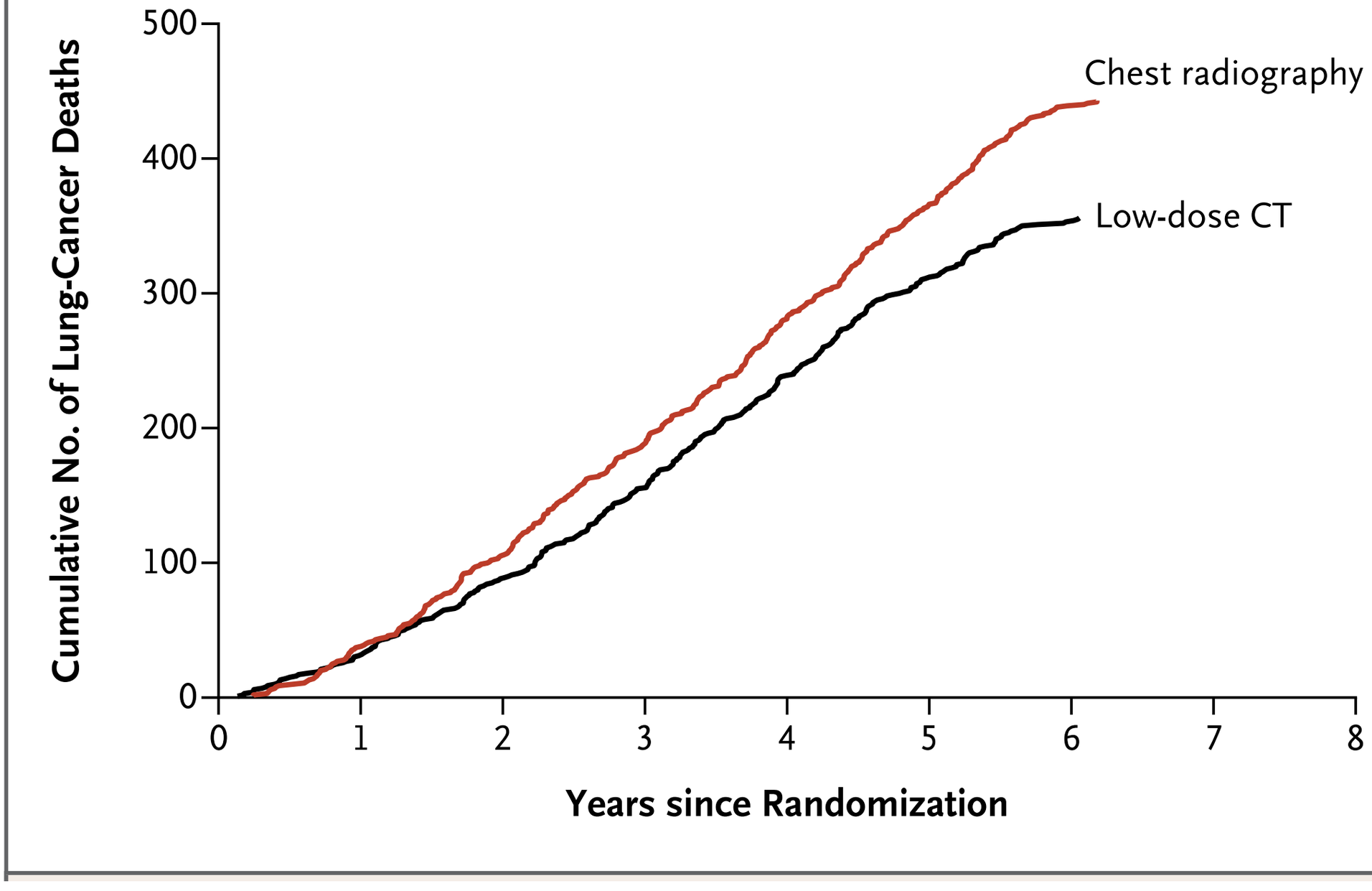
The National Lung Screening Trial Research Team*

- Πολυκεντρική τυχαιοποιημένη ελεγχόμενη μελέτη
- 53454 συμμετέχοντες
- Αύγουστος 2002 - Απρίλιος 2004
- Ηλικία 55-74 έτη
- καπνιστές ή πρώην καπνιστές
- 30 p/y
- διακοπή < 15 έτη προ της εντάξεως στη μελέτη

Αποτελέσματα

- 20% μείωση στο ποσοστό θανάτου από καρκίνο του πνεύμονα στην ομάδα LDCT (356 - 443)
- 3 φορές περισσότερα θετικά αποτελέσματα στην ομάδα LDCT
- > 50% σταδίου IA
- 320 συμμετέχοντες παρακολουθήθηκαν για να προληφθεί 1 θάνατος κατά τα 6.5 έτη περιόδου παρακολούθησης

B **Death from Lung Cancer**



Αποτελέσματα

- Θετικές τομογραφίες: 27% των τομογραφιών στους δύο πρώτους κύκλους παρακολούθησης

- 96% ψευδώς θετικά αποτελέσματα (PPV 3.8%)

NELSON

- Πολυκεντρική τυχαιοποιημένη ελεγχόμενη μελέτη
- Ολλανδία και Βέλγιο
- 15792 συμμετέχοντες
- Ηλικία 55-75 έτη
- καπνιστές ή πρώην καπνιστές
- 15 cig/d για > 25 έτη ή > 10 cig/d για > 30 έτη
- διακοπή < 10 έτη προ της εντάξεως στη μελέτη

NELSON

- Τυχαιοποίηση 1:1
- LDCT 0, 1, 3, 5.5 έτη μετά την τυχαιοποίηση
- Ομάδα ελέγχου χωρίς ακτινολογική παρακολούθηση
- Θετική LDCT: 10mm διάμετρος (50mm3 όγκος) ενδιάμεση ομάδα 5-10 mm (50-500mm3)

Non-actionable nodules were defined as such with benign morphology (e.g. calcification), small size (<50 mm3), and lack of or very slow growth of the solid component of a nodule with a volume doubling time (VDT) >600 days. **Indeterminate nodules** were defined as nodules with a volume of the solid component between 50 and 500 mm3, sub-solid nodules with a diameter of the ground glass component >10 mm, or solid nodules with a VDT between 400 and 600 days. **Actionable nodules** were defined as solid components >500 mm3, more than 20% growth in diameter of a ground glass component or VDT <400 days of a solid component. Non-actionable, reportable nodules were kept on regular (yearly) follow-up, indeterminate nodules were put on a more rapid follow-up of 3–6 months, while actionable nodules led to direct medical work-up.

Xu DM. et al. Nodule management protocol of the Nelson randomised lung cancer screening trial Lung Cancer 2006; 54: 177-184

Αποτελέσματα

- 26% μείωση των θανάτων από καρκίνο του πνεύμονα στους άνδρες συμμετέχοντες

- 61%, 53%, 39% μείωση στην συχνότητα θανάτου από καρκίνο του πνεύμονα στα 8, 9, 10 έτη παρακολούθησης στις γυναίκες συμμετέχοντες

- το 69% των καρκίνων που ανευρέθησαν ήταν σταδίου IA, IB

- Η χειρουργική αντιμετώπιση ήταν 3 φορές συχνότερη στην ομάδα μελέτης σε σύγκριση με την ομάδα ελέγχου (67.7% vs 24.5%, $P<0.001$)

Αποτελέσματα

- Θετικές τομογραφίες: 2.7%

- Ψευδώς θετικά αποτελέσματα: 59% (PPV 40.4%)

TABLE 3 Risk prediction models used in different lung cancer screening trials

Model	Risk factors included	Period of prediction of lung cancer diagnosis or death	Reference for algorithm
LLP (detection)	Age Sex Years of smoking Family history of lung cancer by age of affected relatives History of a previous cancer History of pneumonia History of exposure to asbestos	5 years	Raji *et al.* [36]
PLCO (detection)	Age Race/ethnicity Education Body mass index Chronic obstructive pulmonary disease Personal history of cancer Family history of lung cancer Smoking status (current *versus* former) Smoking intensity (average cigarettes/day) Smoking duration Smoking quit time	6 years	Tammemägi *et al.* [37]
NLST (death)	Age Sex Ethnicity Body-mass index Pack-years of smoking Years since smoking cessation Presence of emphysema First-degree relative with lung cancer	5 years	Kovalchik *et al.* [38]

Liverpool Lung Project (LLP) risk prediction model is used in the UKLS screening trial

PLCO2012 (Prostate, Lung, Colorectal, and Ovarian) randomised trial

NLST trial.

TABLE 1 Eligibility criteria for early detection of lung cancer by low dose computed tomography, according to guidelines issued in 2012–2013 by various organisations [5]

Guidelines by organisation	Date	Age years	Smoking history pack-years	Smoking cessation years	Category/ level
NCCN	Jan 2015	55–74	⩾30	<15	1
		⩾50	⩾20 (and one additional risk factor[#])		2A
ALA	Apr 2012	55–74	⩾30	<15	NA
Collaborative work of ACCP/ASCO/NCCN	May 2012	55–74	⩾30	<15	2B
AATS	June 2012	55–79	⩾30	Any active or	1
		50–79	⩾20 and added risk ⩾5% of developing lung cancer within 5 years[¶]	former smoker	2
		Any	Any and ⩾4 years remission after bronchogenic carcinoma		3
ACS	Jan 2013	55–74	⩾30	<15	NA
ACCP	May 2013	55–74	⩾30	<15	2B
USPSTF	July 2013	55–79	⩾30	<15	B

NCCN: National Comprehensive Cancer Network; ALA: American Lung Association; ACCP: American College of Chest Physicians; ASCO: American Society of Clinical Oncology; AATS: American Association for Thoracic Surgery; ACS: American Cancer Society; USPSTF: US Preventive Services Task Force; NA: not available. Levels of evidence: category 1: based upon high level evidence, there is uniform consensus

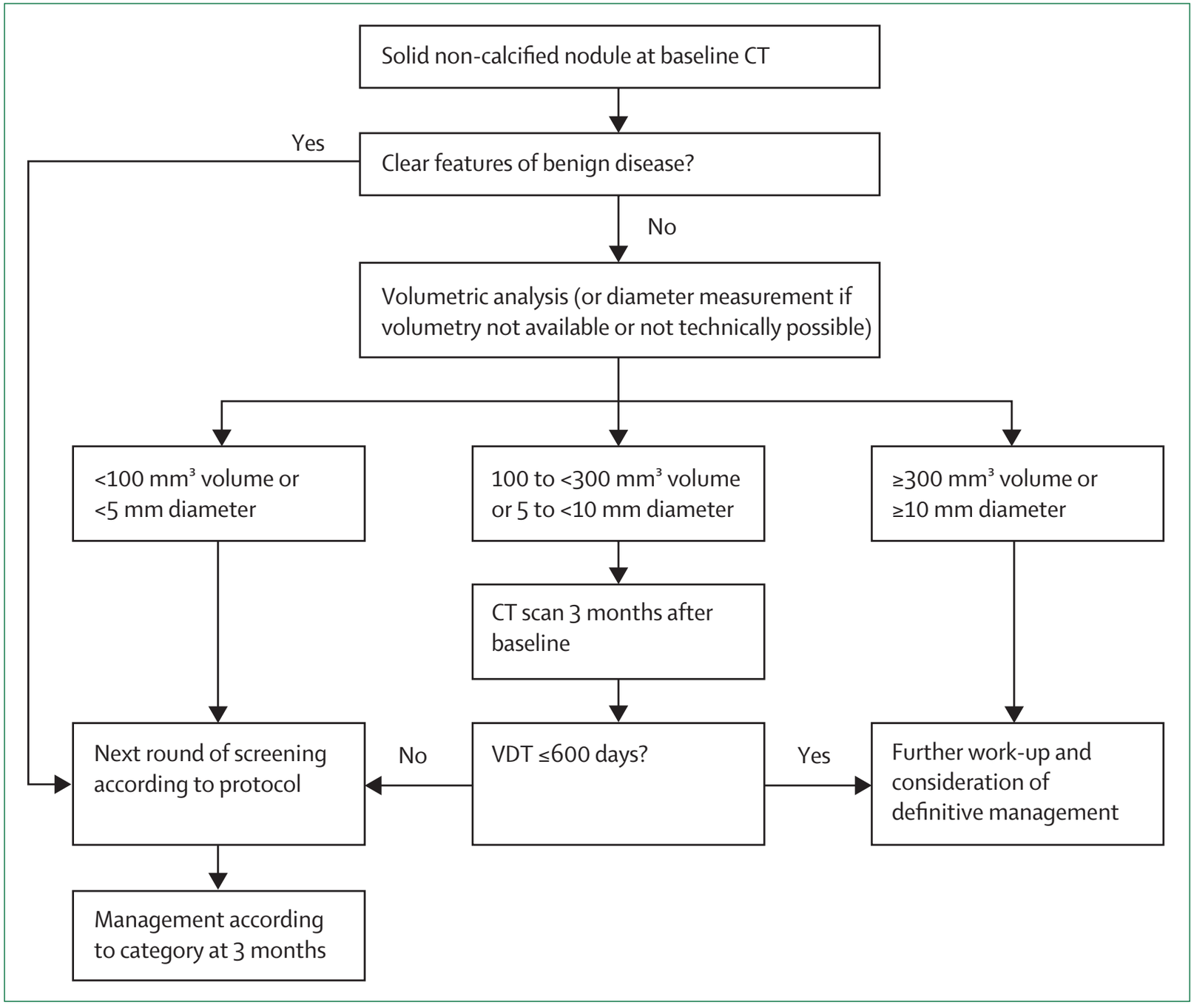


Figure 3: **Nodule management protocol for screen-detected solid nodules at baseline**
For nodules with a volume-doubling time (VDT) of 400–600 days (intermediate cancer risk of about 4%), a second repeat CT scan in 3 months should be considered as an initial work-up option.

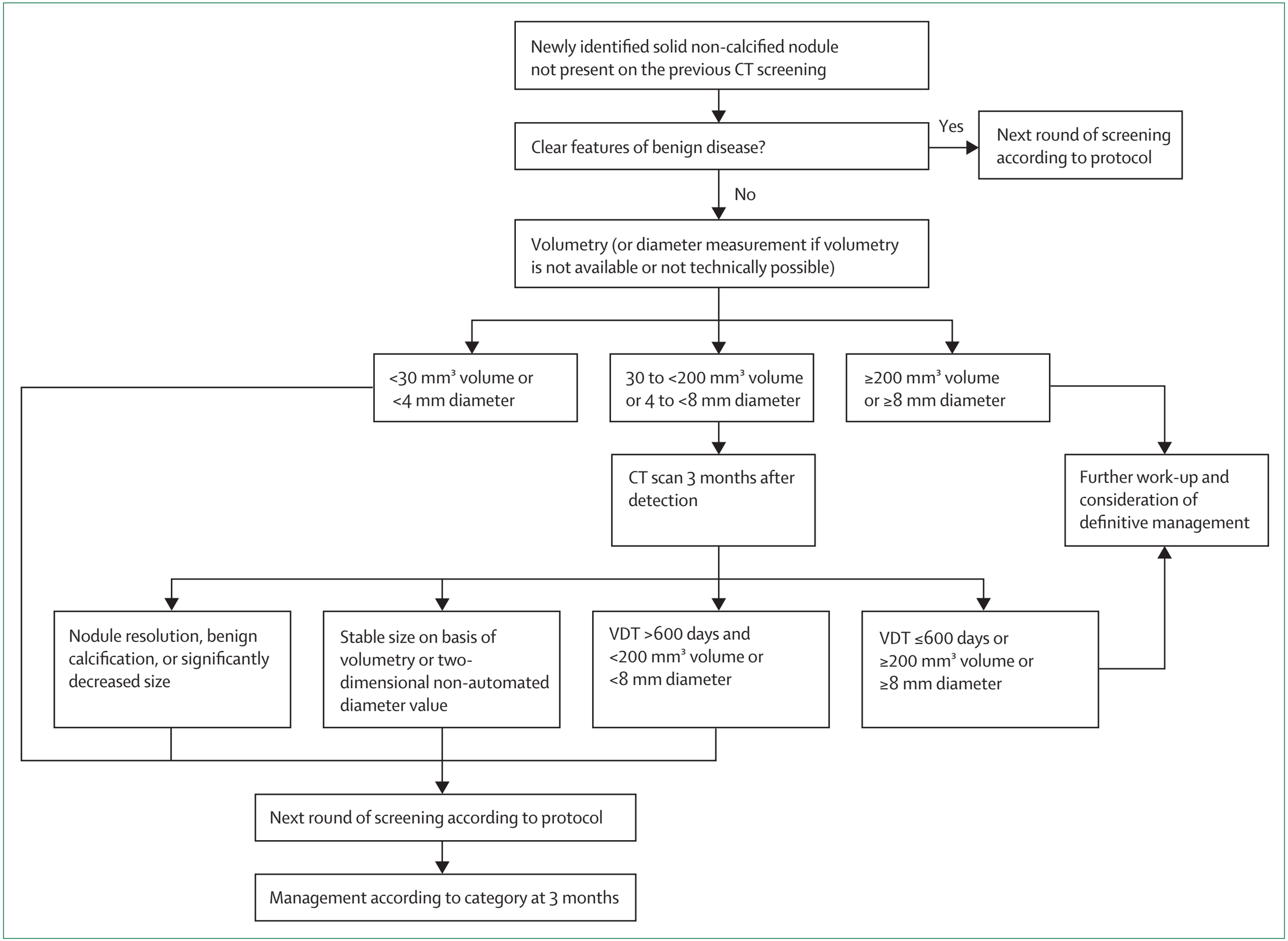


Figure 4: **Nodule management protocol for screen-detected incidental solid nodules at follow-up**
VDT=volume doubling time.

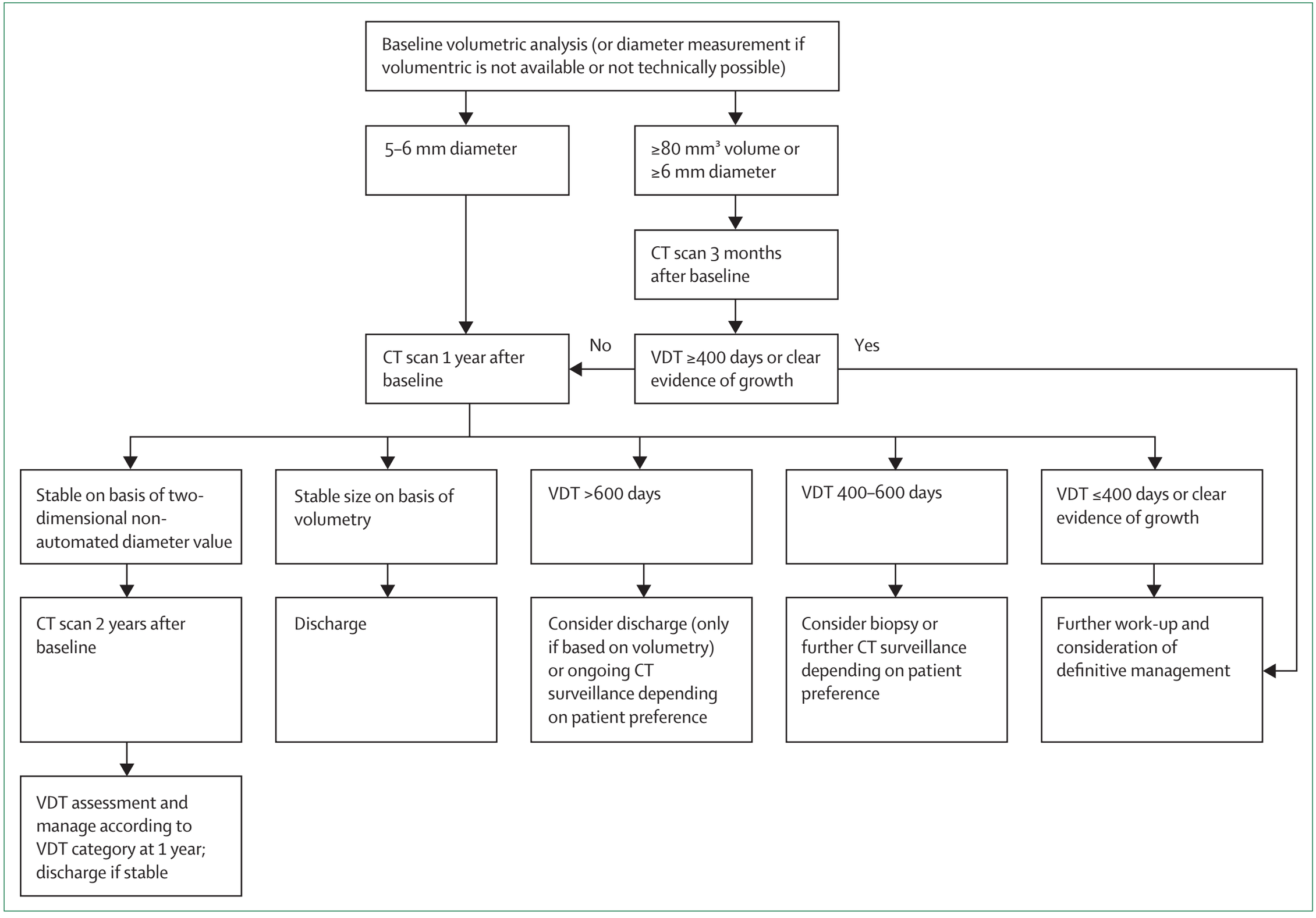


Figure 5: **Nodule management protocol for clinically detected solid nodules according to British Thoracic Society guidelines**
VDT=volume doubling time. Reproduced with permission from Callister and colleagues.[64]

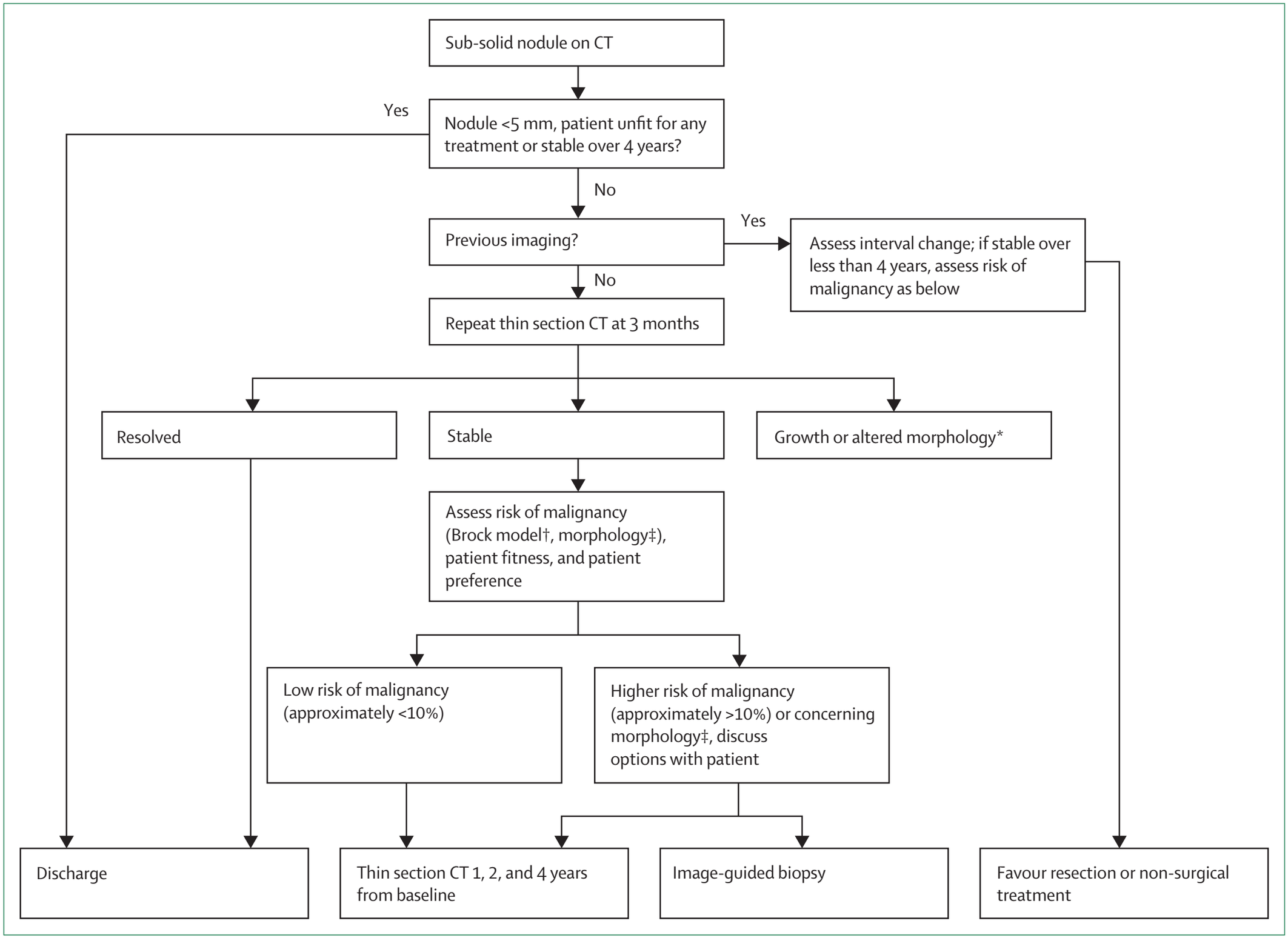


Figure 6: **Management protocol for sub-solid nodules for both screen-detected and clinically detected nodules according to British Thoracic Society guidelines**

Lancet Oncol 2017; 18: e754–66

Reproduced with permission from Callister and colleagues.[64] *Change in mass or a new solid component. †The Brock model can underestimate the risk of malignancy in sub-solid nodules that persist at 3 months. ‡The size of the solid component in part-solid nodules, pleural indentation, and bubble-like appearance.

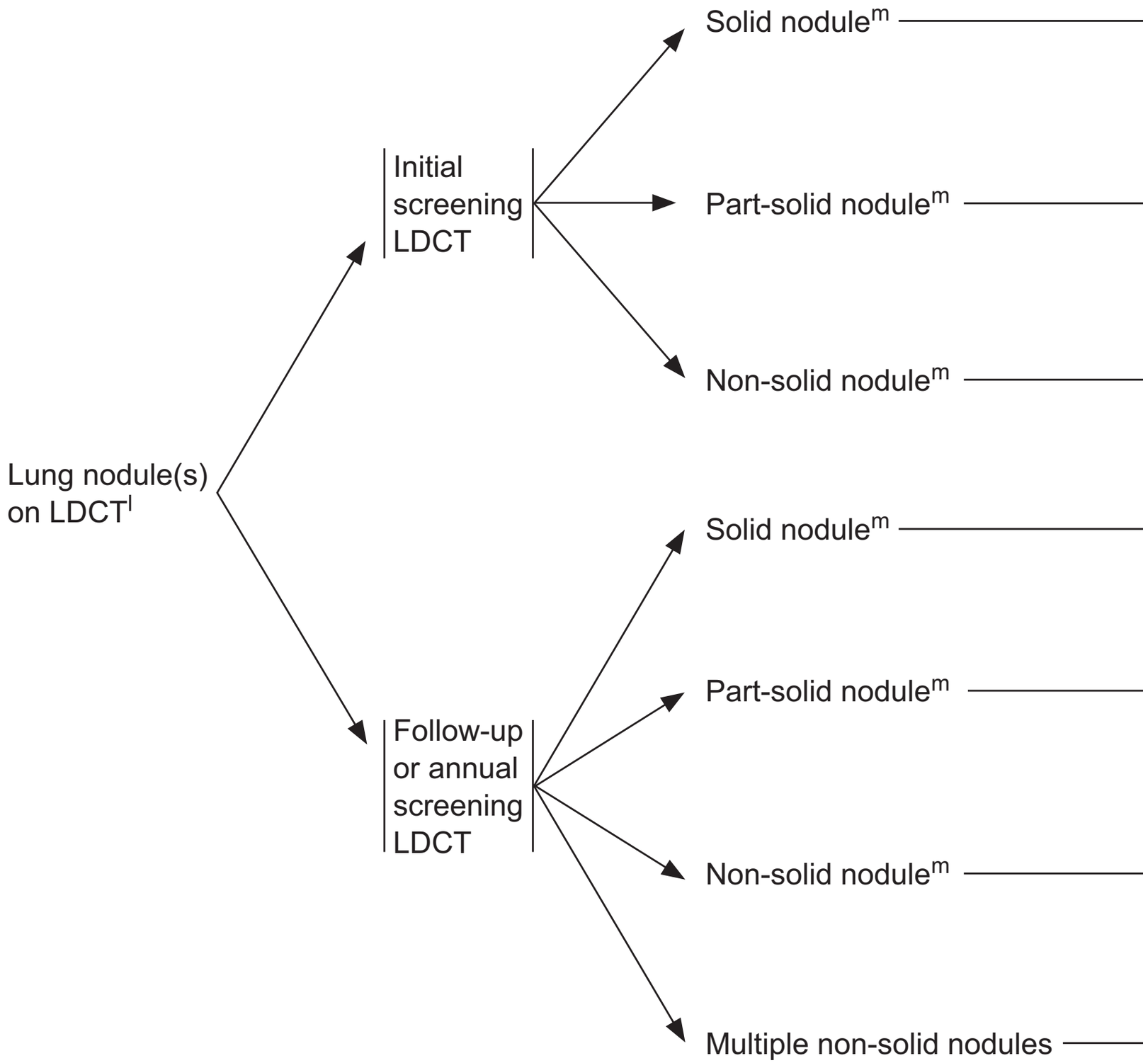
Table 1 Risk stratification based on presence of pulmonary nodules

Mid-high lung cancer risk (consider prolonged screening interval between 1 and 2 years)
No baseline nodules
Solid baseline nodule (<100 mm^3 or <5 mm)
New nodule (<30 mm^3 or <4 mm)
Stable subsolid nodule, any size
High lung cancer risk (short-term follow-up, if negative annual screening interval)
Solid baseline nodule (100–300 mm^3 or 5–10 mm)
New solid nodule (30–200 mm^3 or 4–8 mm)
Growing solid nodule (VDT 400–600 days)
Subsolid nodule, baseline or new, any size*
Very high lung cancer risk (referral for workup, if negative annual screening)
Solid baseline nodule (>300 mm^3 or >10 mm)
New solid nodule (>200 mm^3 or >8 mm
Growing solid nodule (VDT <400 days)
Subsolid nodule showing growth or altered morphology

*, in case of negative follow-up CT (no growth), consider prolonged screening interval between 1 and 2 years. VDT, volume doubling time.

National Comprehensive Cancer Network®

NCCN Guidelines Version 2.2019
Lung Cancer Screening


Lung nodule(s) on LDCT[l]
Initial screening LDCT
Solid nodule[m]
Part-solid nodule[m]
Non-solid nodule[m]
Follow-up or annual screening LDCT
Solid nodule[m]
Part-solid nodule[m]
Non-solid nodule[m]
Multiple non-solid nodules

LCS-2

EVALUATION OF SCREENING FINDINGS

FOLLOW-UP OF SCREENING FINDINGS

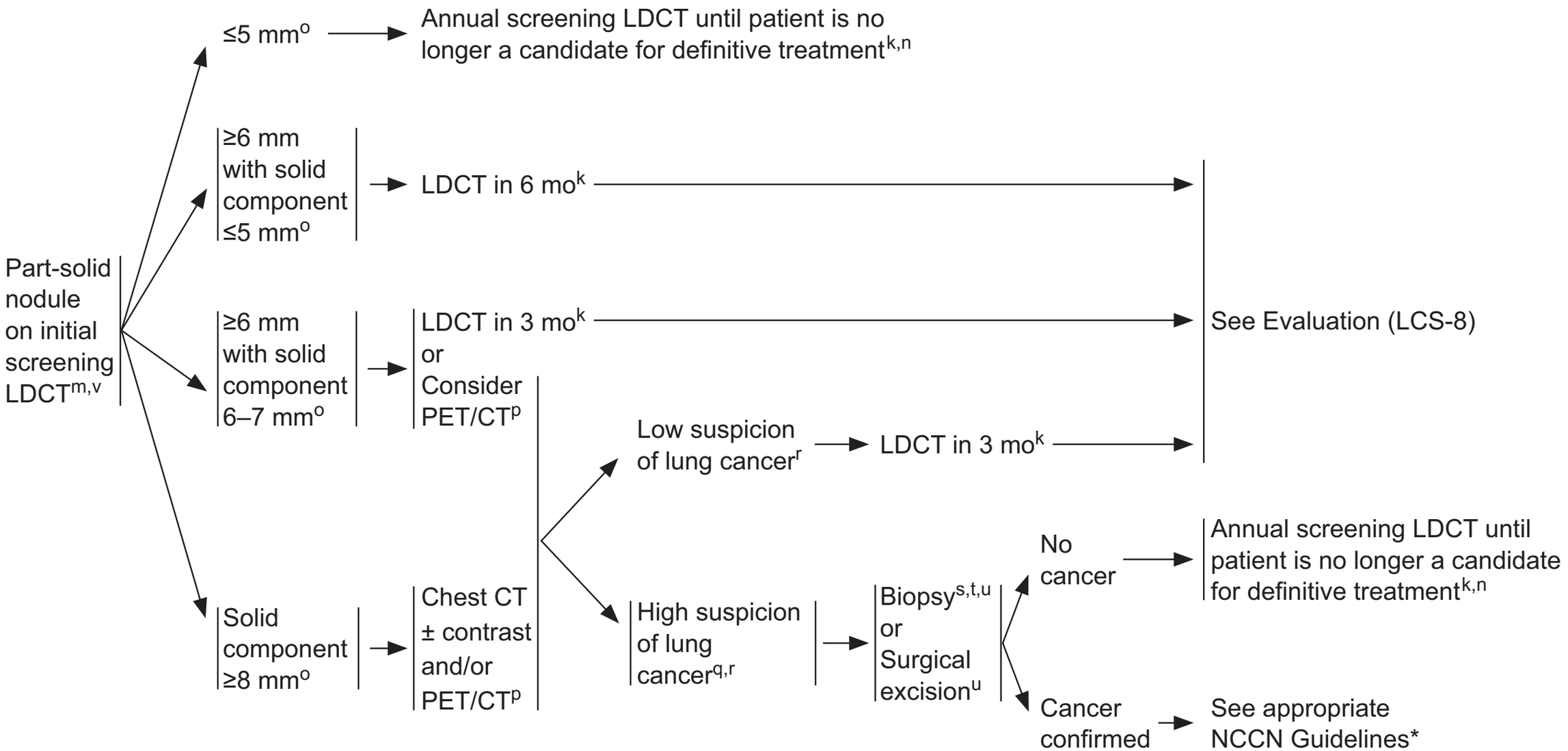
Solid nodule on initial screening LDCT[m]

- ≤5 mm[o] → Annual screening LDCT until patient is no longer a candidate for definitive treatment[k,n]
- 6–7 mm[o] → LDCT in 6 mo[k] → See Evaluation (LCS-7[†])
- 8–14 mm[o] → LDCT in 3 mo[k] → See Evaluation (LCS-7[†])
  - or
  - Consider PET/CT[p]
    - Low suspicion of lung cancer[r] → LDCT in 3 mo[k] → See Evaluation (LCS-7[†])
    - High suspicion of lung cancer[q,r] → Biopsy[s,t,u] or Surgical excision[u]
      - No cancer → Annual screening LDCT until patient is no longer a candidate for definitive treatment[k,n]
      - Cancer confirmed → See appropriate NCCN Guidelines*
- ≥15 mm[o] → Chest CT ± contrast and/or PET/CT[p] → (Low suspicion / High suspicion as above)
- Solid endobronchial nodule → LDCT[k] in 1 mo (immediately after vigorous coughing) → If no resolution → Bronchoscopy

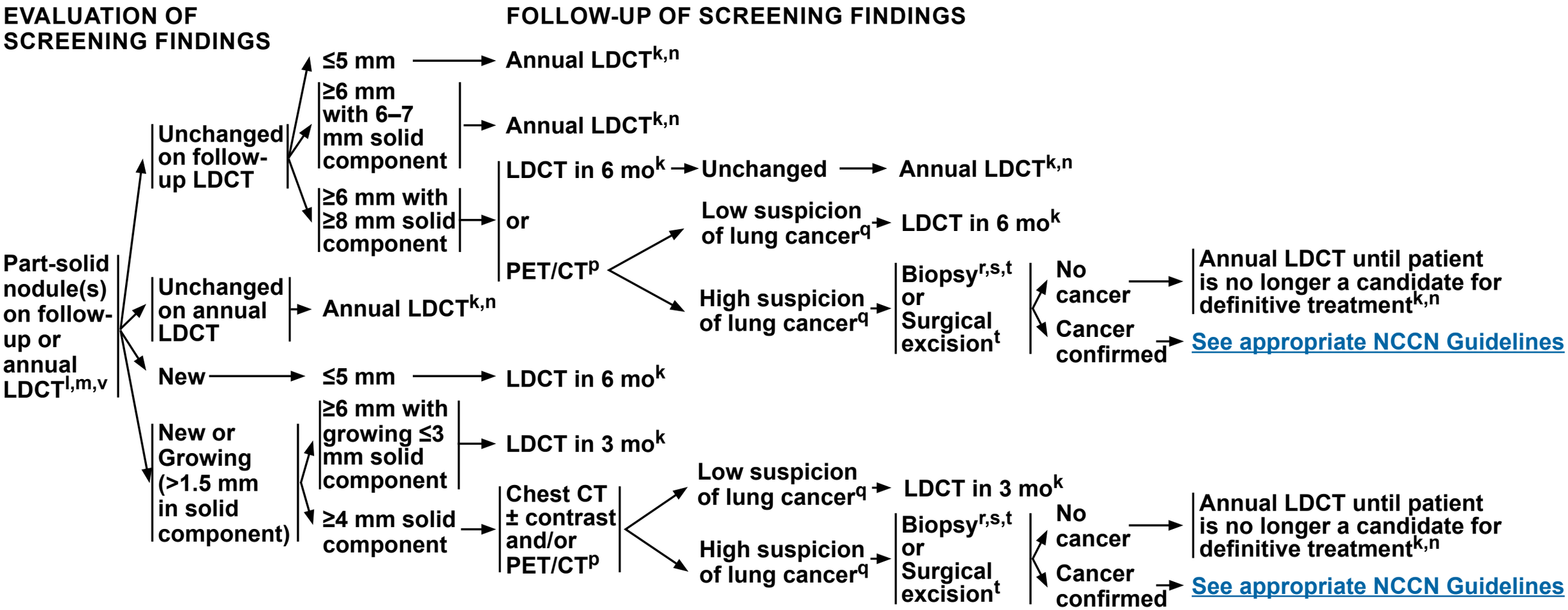
LCS-3

EVALUATION OF SCREENING FINDINGS

FOLLOW-UP OF SCREENING FINDINGS



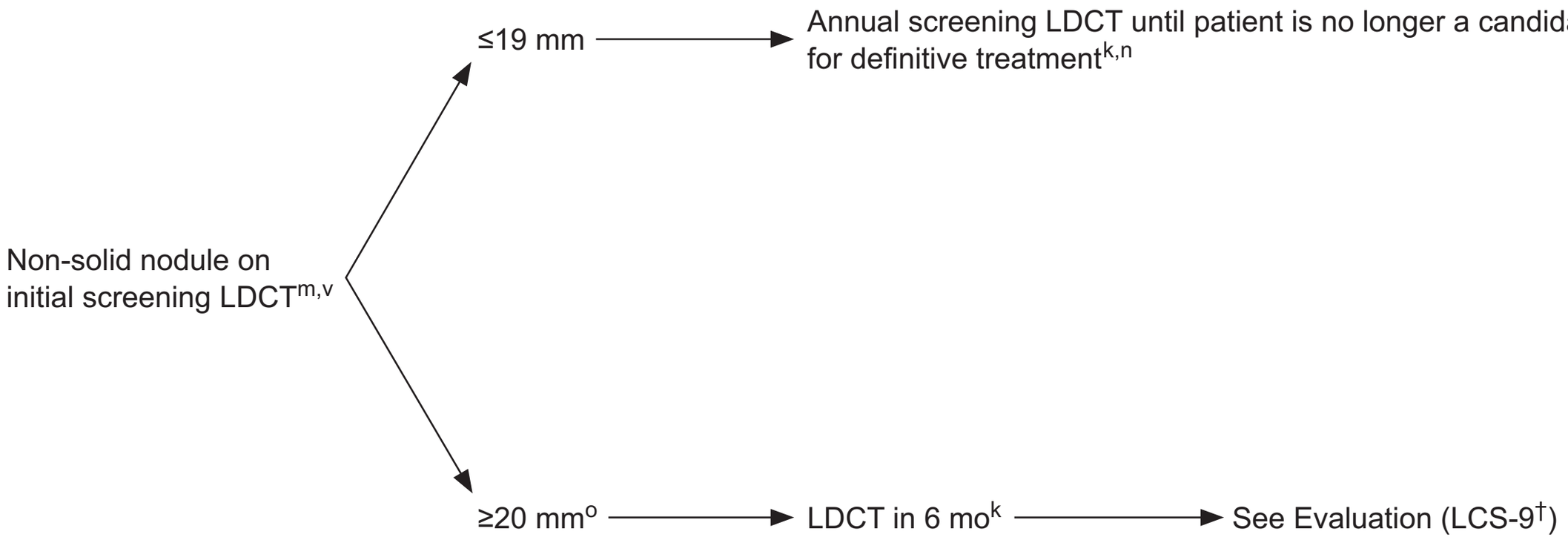
LCS-4


EVALUATION OF SCREENING FINDINGS
FOLLOW-UP OF SCREENING FINDINGS
Part-solid nodule(s) on follow-up or annual LDCT[l,m,v]
Unchanged on follow-up LDCT
≤5 mm
Annual LDCT[k,n]
≥6 mm with 6–7 mm solid component
Annual LDCT[k,n]
≥6 mm with ≥8 mm solid component
LDCT in 6 mo[k]
Unchanged
Annual LDCT[k,n]
or
PET/CT[p]
Low suspicion of lung cancer[q]
LDCT in 6 mo[k]
High suspicion of lung cancer[q]
Biopsy[r,s,t] or Surgical excision[t]
No cancer
Annual LDCT until patient is no longer a candidate for definitive treatment[k,n]
Cancer confirmed
See appropriate NCCN Guidelines
Unchanged on annual LDCT
Annual LDCT[k,n]
New
≤5 mm
LDCT in 6 mo[k]
New or Growing (>1.5 mm in solid component)
≥6 mm with growing ≤3 mm solid component
LDCT in 3 mo[k]
≥4 mm solid component
Chest CT ± contrast and/or PET/CT[p]
Low suspicion of lung cancer[q]
LDCT in 3 mo[k]
High suspicion of lung cancer[q]
Biopsy[r,s,t] or Surgical excision[t]
No cancer
Annual LDCT until patient is no longer a candidate for definitive treatment[k,n]
Cancer confirmed
See appropriate NCCN Guidelines

LCS-8

EVALUATION OF SCREENING FINDINGS

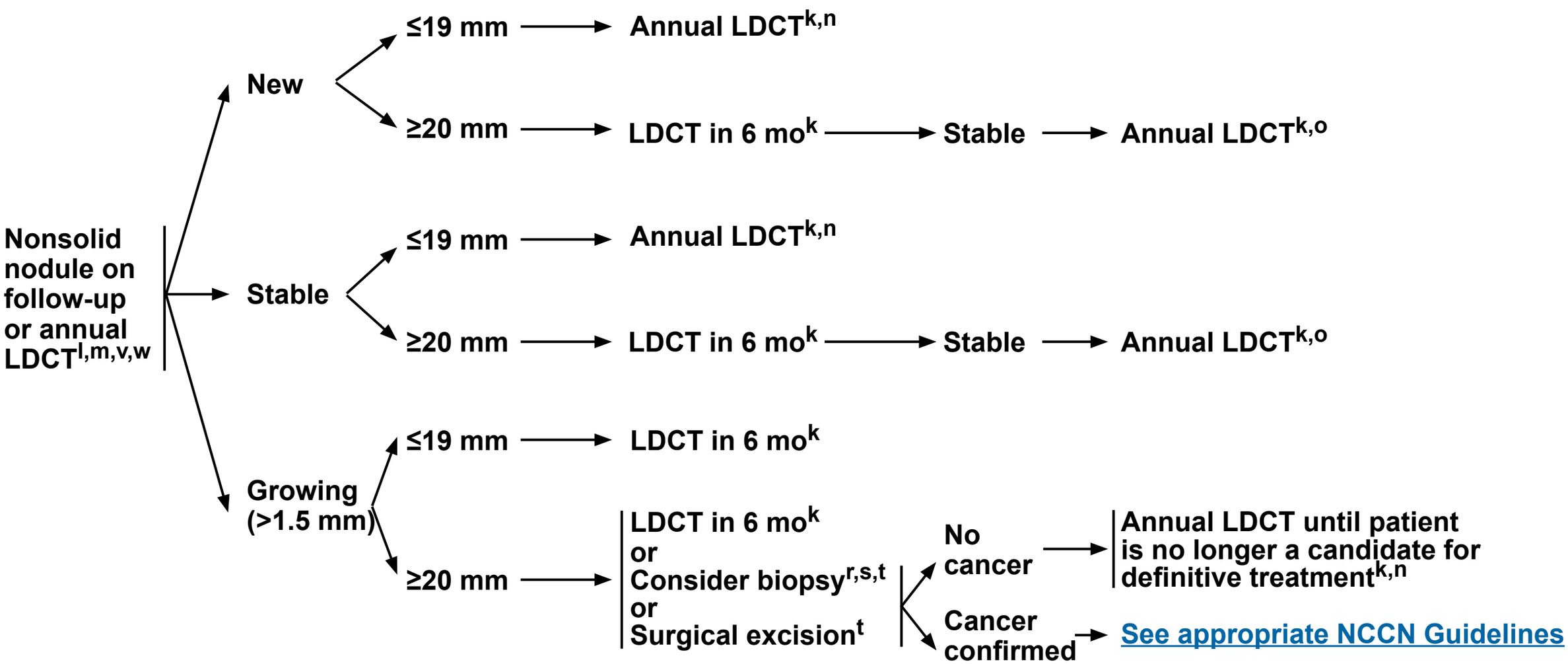
FOLLOW-UP OF SCREENING FINDINGS



LCS-5

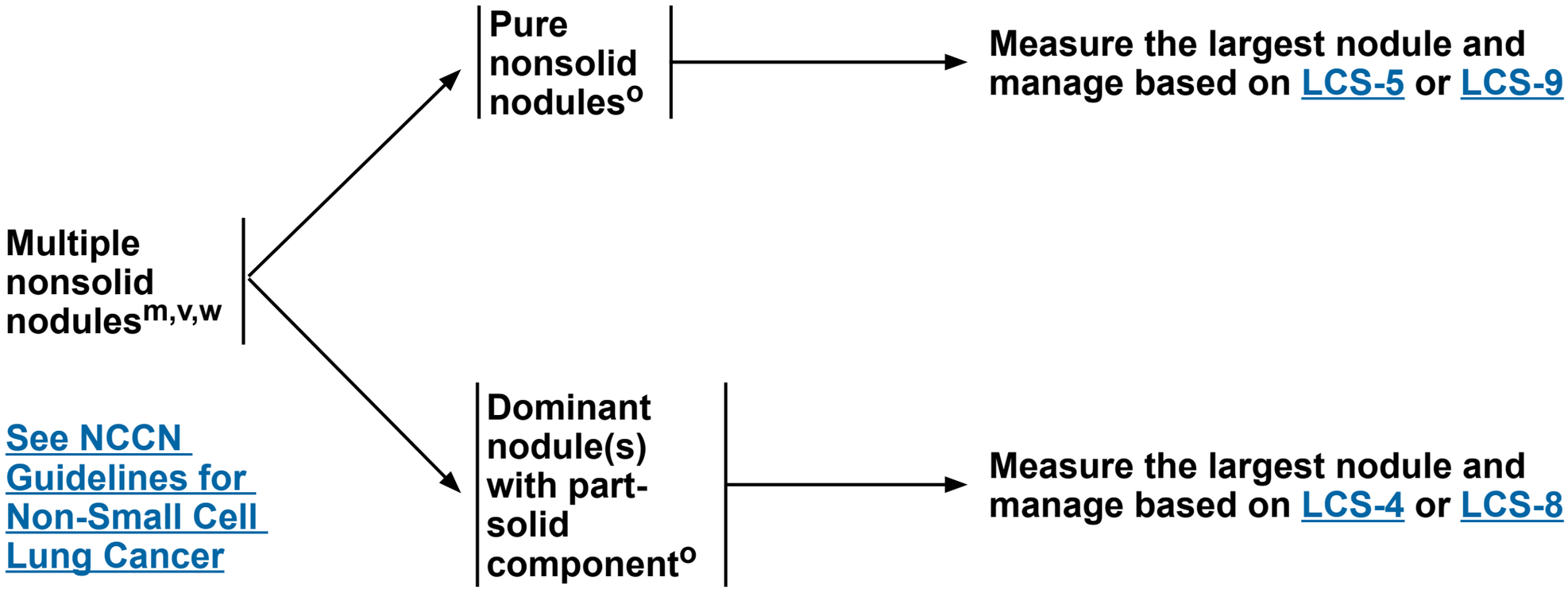
EVALUATION OF SCREENING FINDINGS

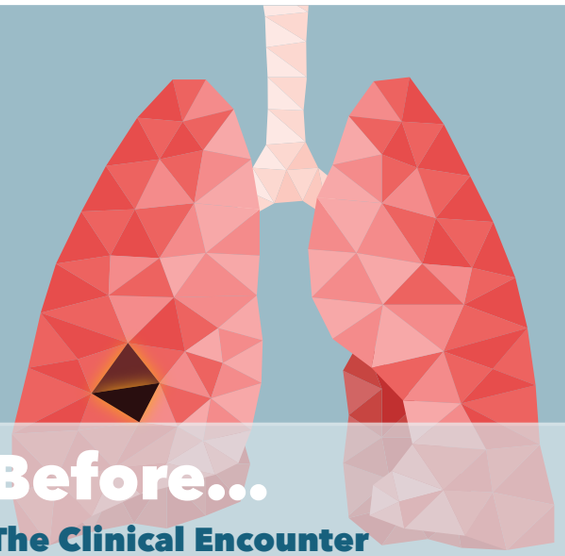
FOLLOW-UP OF SCREENING FINDINGS



EVALUATION OF SCREENING FINDINGS

FOLLOW-UP OF SCREENING FINDINGS





Lung Cancer Screening: A Clinician's Checklist

This checklist was developed to help clinicians meet the Centers for Medicare & Medicaid Services (CMS) criteria for a lung cancer screening counseling and shared decisionmaking visit. All of the criteria listed below must be met for the screening to be covered as a preventive service benefit under Medicare.

Before...

The Clinical Encounter

Determine patient's eligibility.
This checklist may be completed with the assistance of a nurse, physician assistant, or other medical assistant.

» Is the patient 55 to 77 years old? (55 to 80 years old for patients with private insurance)	☐ Yes	☐ No[a]
» Is the patient a current smoker or former smoker who has quit within the past 15 years?	☐ Yes	☐ No[a]
» Does the patient have at least a 30 pack-year smoking history? (See the calculator below.)	☐ Yes	☐ No[a]
» Is the patient asymptomatic for lung cancer with no personal history of lung cancer?	☐ Yes	☐ No[a,b]
» Is the patient healthy enough to have lung surgery?	☐ Yes	☐ No[a]
» Is the patient willing to receive potentially curative treatment?	☐ Yes	☐ No[a]

Calculate Pack-Years

(20 cigarettes = 1 pack)

Number of years smoked	×	Average number of packs smoked per day	=	Pack-years
	×		=	

During...

The Clinical Encounter

Complete all of the following activities.

☐ **Documented all elements in the patient's medical chart.**
- » Used a decision aid

☐ **Discussed potential benefits of lung cancer screening:**
- » Reduced mortality from lung cancer

☐ **Discussed potential harms of lung cancer screening, including:**
- » False-positive results
- » Followup testing if an abnormality is found (and the possible complications of invasive testing)
- » Overdiagnosis
- » Total radiation exposure (screening and diagnostic testing, cumulative)

☐ **Discussed other issues:**
- » The impact of comorbidities on screening (the benefit of screening is reduced in patients with poor health)
- » The patient's ability or willingness to undergo invasive diagnostic procedures and treatment

☐ **Counseled about:**
- » The importance of adherence to annual lung cancer screening
- » The importance of maintaining cigarette smoking abstinence or smoking cessation, as applicable
- » Tobacco cessation interventions (provided information, if appropriate)

After...

The Clinical Encounter

☐ **Establish the next steps.**
If the patient would like screening, provide a written order for the lung cancer screening visit with the following elements:
- » Patient's date of birth
- » Actual pack-year smoking history
- » Current smoking status; for former smokers, the number of years since quitting
- » Statement that the patient is asymptomatic
- » National Provider Identifier (NPI) of the ordering practitioner

» If the patient declines screening, document the discussion and the patient's decision in his or her medical record.

» If the patient is unsure about screening or wants more time, consider scheduling a followup visit to discuss the patient's screening decision.

» For all patients, reinforce the importance of smoking cessation and abstinence.

[a] Screening is not recommended. If the patient is a current smoker, encourage smoking cessation and provide resources. If the patient is a former smoker, encourage continued abstinence and provide additional support if needed.

[b] Symptomatic patients may need followup and diagnostic testing, but not screening. Patients with a history of lung cancer need surveillance, but not screening.

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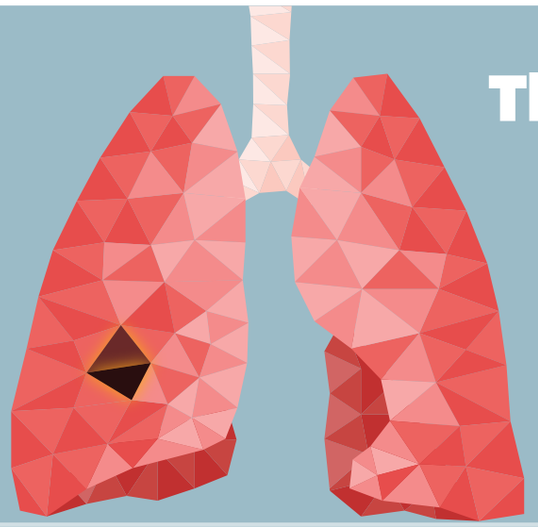

The importance of shared decisionmaking

Lung cancer screening with low-dose computed tomography (LDCT) reduces mortality from lung cancer. There are also potential harms associated with lung cancer screening, including a high-false positive rate and the associated need for diagnostic followup, known and unknown risks of additional testing associated with incidental findings, cumulative radiation exposure, and overdiagnosis. Shared decisionmaking is a collaborative patient-centered process in which patients and clinicians make decisions together, within the context of the best evidence and recommendations and based on the patient's values and preferences.

Tips To Promote a Shared Decision

Below is a five-step process for shared decisionmaking that includes exploring and comparing the possible benefits and harms of each option through meaningful dialogue about what matters most to the patient.

STEP 1: Seek your patient's participation in the decisionmaking process.

STEP 2: Help your patient explore and compare the potential benefits and harms of lung cancer screening, and assess your patient's level of understanding. (See the teach-back examples in the box to the far right.)

STEP 3: Assess your patient's values and preferences about lung cancer screening.

STEP 4: Reach a decision about lung cancer screening with your patient.

STEP 5: Evaluate your patient's feelings about the decision by having a followup discussion.

Ordering Information

Lung Cancer Screening with Low-Dose Computed Tomography (LDCT): Tools for Primary Care Clinicians, is a free multicomponent resource to support decisionmaking about lung cancer screening in the primary care setting. For electronic copies of this multicomponent resource, visit *www.effectivehealthcare.ahrq.gov/LCS/*

Talking Points

Below are specific points to address during the clinical encounter.

- Lung cancer screening can be effective if patients 1) follow the screening protocol, 2) undergo diagnostic followup procedures after a positive screening result, and 3) receive treatment, which has potential harms.
- Screening does not mean that smoking is OK. Smoking still causes lung cancer, cardiovascular disease, and other lung disease.
- Screening can lead to early treatment that can prevent some, but not all, lung cancer deaths.
- False-positive results ("false alarms") are common, and additional scans or invasive procedures may be needed. Less commonly, major complications of invasive procedures can occur, including bleeding, infection, or a collapsed lung.
- Lung cancer screening may find lung cancer that would not have ever caused symptoms or harmed the patient in his or her lifetime if the cancer had not been found. This could lead to treatment of people who do not really need treatment.
- Screening and followup testing exposes patients to radiation. The harms associated with cumulative radiation exposure are unknown.
- Screening should stop if the patient 1) exceeds the upper age criterion, 2) no longer wants screening, 3) has a worsening health condition that limits their life expectancy or increases the risk of complications from lung surgery, or 4) has not smoked for 15 years.

Teach-Back Examples

"I know I have given you a lot of information. Tell me in your own words what you have heard."

"What are your thoughts about lung cancer screening?"

"Let's stop right there for a moment. What questions or comments do you have about the information I have given you?"

Referral Information

To find a radiology imaging facility that meets the CMS eligibility criteria, please visit:

www.cms.gov/Medicare/Medicare-General-Information/MedicareApprovedFacilitie/Lung-Cancer-Screening-Registries.html

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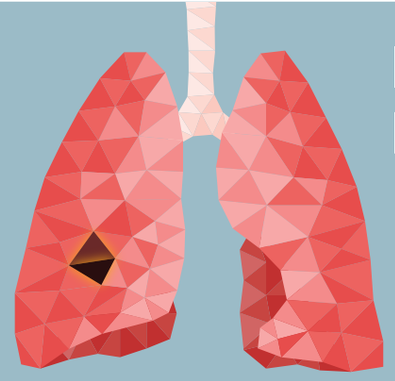
March 2016



Is Lung Cancer Screening Right for Me?

A decision aid for people considering lung cancer screening with low-dose computed tomography

If you have smoked for many years, you may want to think about screening (testing) for lung cancer with low-dose computed tomography (LDCT). Before deciding, you should think about the possible benefits and harms of lung cancer screening. This decision aid will help prepare you to talk with your health care professional about whether lung cancer screening is right for you.

What are the facts about lung cancer?

- Lung cancer is the leading cause of cancer death in the United States. Each year, about 220,000 people are diagnosed with lung cancer and 150,000 people die from lung cancer.
- About half of the people diagnosed with lung cancer are 70 years of age or older. The typical age of death from lung cancer is 72 years.

What is lung cancer?

Lung cancer happens when abnormal cells form in the lungs and grow out of control. These cells can form a tumor and can spread to other parts of the body.

Lung cancer is often diagnosed once it has spread outside the lungs. About 9 out of every 10 people with lung cancer die from the disease because it is found after it has spread.

Who should be screened for lung cancer?

The United States Preventive Services Task Force (USPSTF) is made up of experts in preventive medicine. Without pay, they review the current research to make recommendations about clinical preventive services such as screening, counseling, and preventive medications.

The USPSTF recommends lung cancer screening for individuals who:

- Are 55 to 80 years old
- Do not have any signs or symptoms of lung cancer (diagnostic testing may be recommended for people who do have signs or symptoms of lung cancer)
- Have not had lung cancer before
- Currently smoke or quit less than 15 years ago
- Are or were heavy smokers (30 pack-years history such as those who smoked 1 pack per day for 30 years or 2 packs per day for 15 years)

The USPSTF does not recommend lung cancer screening for individuals who:

- Have a condition that greatly limits how long they may live
- Are not willing to have surgery for lung cancer

Possible signs and symptoms of lung cancer

- A new cough that does not go away or gets worse
- Chest pain that is often worse when you breathe deeply, cough, or laugh
- A hoarse voice
- Unexplained weight loss and loss of appetite
- Coughing up blood or rust-colored spit or phlegm
- Shortness of breath
- Infections such as bronchitis and pneumonia that do not go away or keep coming back
- Wheezing

Many patients with lung cancer do not have any symptoms when the cancer first starts. It is best to find lung cancer early before symptoms start, when the cancer is more easily treated. This is why screening is important.

If you have any signs or symptoms of lung cancer, be sure to tell your health care professional.

Calculating pack-years*

(20 cigarettes = 1 pack)

		Number of years smoked
×		Average number of packs smoked per day
=		Pack-years

* Your health care professional can help you determine the number of pack-years you have smoked.

Remember, the best way to lower your chances of dying from lung cancer is to stop smoking.

More than 8 out of every 10 lung cancer cases in the United States are from smoking.

Lung cancer screening should not be done instead of quitting smoking. If you currently smoke, talk to your health care professional or call the nationwide quit line at

1-800-QUIT-NOW
(1-800-784-8669).

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What are the possible benefits and harms of lung cancer screening with LDCT?*

BENEFIT: Greater chance of not dying from lung cancer

- If 1,000 people are not screened with LDCT for lung cancer, **21 will die from lung cancer.**
- If 1,000 people are screened with LDCT once a year for 3 years, **18 will die from lung cancer.**
- This means that with LDCT screening, **3 fewer people will die from lung cancer.**

BENEFIT: Greater chance of not dying from any cause (not just lung cancer)

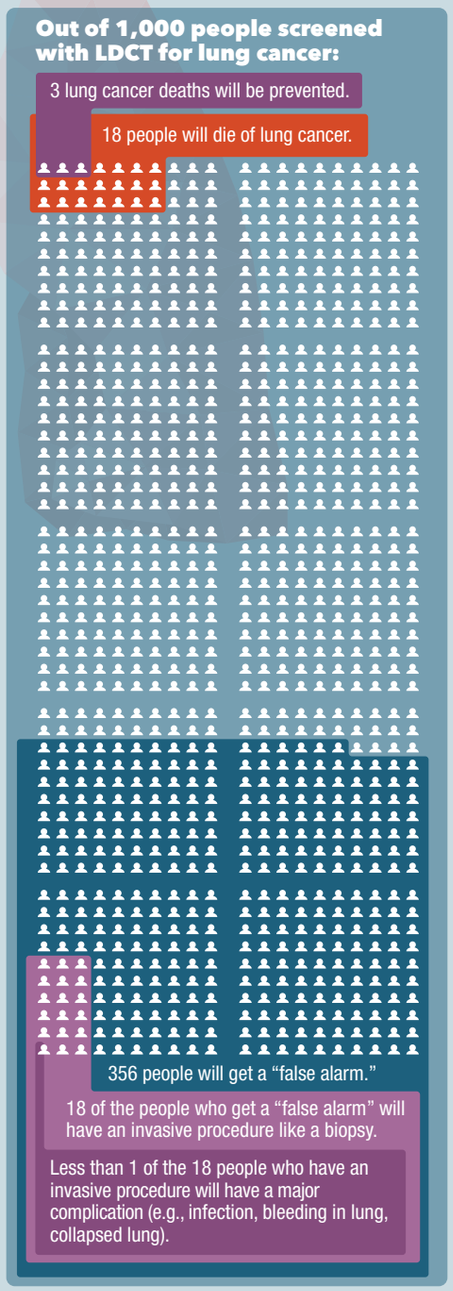
- If 1,000 people ar e not screened with LDCT for lung cancer, **75 will die from any cause.**
- If 1,000 people are screened with LDCT once a year for 3 years, **70 will die from any cause.**
- This means that with LDCT screening, **5 fewer people will die from all causes.**

HARM: False alarms and unneeded additional testing

A false alarm happens when a person has a positive screening test but does not actually have lung cancer.

- If 1,000 people are screened every year for 3 years, about **356 will have a false alarm.**
- Of these 356 people with a false alarm, **18 will have an invasive procedure** such as a biopsy (a tiny piece of lung tissue is removed to test for cancer).
- Of these 18 people, **less than 1 will have a major complication** as a result of the procedure, such as bleeding in the lung, a collapsed lung, or an infection.

If you have a positive screening test, but your followup imaging tests and biopsy do not show cancer, you could still get lung cancer in the future. So it is important for you and your health care professional to discuss lung cancer screening every year.



* For people screened once a year for 3 years and followed for an average of 6.5 years. This information applies to people who are at high risk of lung cancer because of their smoking history and age.

The benefits of lung cancer screening may be greater if your lung cancer risk is higher. For example, current smokers who smoke more than one pack a day have a higher risk for lung cancer than smokers who quit 10 years ago.

The harms of lung cancer screening may be greater if you have other health problems, such as heart disease or severe lung disease like asthma or chronic obstructive pulmonary disease (COPD). The risk of problems from biopsies may be higher in these people.

What is lung cancer screening with low-dose computed tomography?

During an LDCT scan, you lie on a table and an x-ray machine uses a low dose (amount) of radiation to make detailed images of your lungs. The scan only takes a few minutes and is not painful.

HARM: Overdiagnosis

Lung cancer screening may find a lung cancer that would not have ever caused symptoms or harmed the patient in his or her lifetime if the cancer had not been found. This could lead to treatment of people who do not really need treatment.

At the time of diagnosis, there is no way for health care professionals to know if the lung cancer will cause health problems over a lifetime. For this reason, almost all people who are diagnosed with lung cancer are treated.

Researchers found that out of every 10 people diagnosed with lung cancer after an LDCT scan, about 1 to 2 of those people are treated for cancer that likely never would have harmed them.

HARM: Radiation exposure

Exposure to radiation increases a person's chance of developing cancer. LDCT screening for lung cancer exposes a person to radiation. If the screening test is positive, additional testing may involve higher doses of radiation. Researchers do not know how being exposed to radiation from LDCT scans and additional diagnostic imaging tests may affect people. The figure below shows the amount of radiation from one LDCT scan compared with other sources of radiation.

Finding other things that are not lung cancer

Screening can find heart disease or thickened tissue in the lungs from scarring. Researchers do not know the possible benefits or harms of finding other things about your health through lung cancer screening.

What is the difference between screening and diagnostic testing?

Screening is a medical term for testing to find a disease *before it causes any symptoms or problems*. Lung cancer screening is done to find lung cancer before it has spread.

Diagnostic testing is not the same as screening. Diagnostic testing is done when someone has signs or symptoms of lung cancer or when a screening test finds something that looks like cancer. In both cases, there is a higher chance the person has lung cancer, and additional testing is done to get a final diagnosis. It is different from screening because it can involve scans with higher amounts of radiation, other tests to look at the lungs, and taking samples of lung tissue.

ΣΑΣ ΕΥΧΑΡΙΣΤΩ