NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

Health and social care directorate

Quality standards and indicators

Briefing paper

Quality standard topic: Lung cancer in adults

Output: Prioritised quality improvement areas for development.

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Contents

1 Introduction

This briefing paper presents a structured overview of potential quality improvement areas for lung cancer in adults. It provides the committee with a basis for discussing and prioritising quality improvement areas for development into draft quality statements and measures for public consultation.

1.1 Structure

This briefing paper includes a brief description of the topic, a summary of each of the suggested quality improvement areas and supporting information.

If relevant, recommendations selected from the key development source below are included to help the committee in considering potential statements and measures.

1.2 Development sources

The key development sources referenced in this briefing paper are:

- Lung cancer: diagnosis and management (2019) NICE guideline NG122
- Brain tumours (primary) and brain metastases in adults (2018) NICE guideline NG99
- Suspected cancer: recognition and referral (2015) NICE guideline NG12
- Improving supportive and palliative care for adults with cancer (2004) NICE cancer service guideline CSG4

2 Overview

2.1 Focus of quality standard

This quality standard will cover diagnosis and management of lung cancer in adults. It will update and replace the existing NICE quality standard for lung cancer in adults (QS17).

2.2 Definition

Cancer that begins in the lungs is called primary lung cancer. Lung cancer has two main types:

- non-small-cell lung cancer (NSCLC), which is more common and spreads more slowly. It can be either squamous cell carcinoma, adenocarcinoma or large-cell carcinoma.
- small-cell lung cancer (SCLC), which is rarer and spreads more quickly.

There are a variety of other cancers that can affect the lungs but most of them are rare. Mesothelioma, pancoast and carcinoid tumours are three of the more common types[1].

2.3 Incidence and prevalence

Over 46,000 people were diagnosed with lung cancer in the UK in 2015. An estimated 79% of lung cancers are preventable, with 72% linked to smoking, 13% to occupational exposure, 8% to air pollution and 5% to ionising radiation. Lung cancer can be linked to more than one cause.[2]

Lung cancer is the third most common diagnosed cancer in England, but accounts for the most deaths. In 2016, only 25.7% of all lung cancers were diagnosed at an early stage. This varied by cancer alliance with a range of 21.4 to 32.9%.[3]

In 2016 in the UK, over 35,000 people died from lung cancer. The overall mortality rate from lung cancer has decreased by 9% over the last decade. However, while there has been a decrease of 19% in mortality rates in men, there has been an increase of 2% in women. This is linked to lifestyle factors such as smoking and is driven by an increased incidence of lung cancer in older women.

For lung cancer patients in England diagnosed 2011 to 2015, one-year age-standardised net survival was 38.5%. This varied by cancer alliance with a range of 34.5-42.7%. This is one of the widest ranges in survival across cancer alliances of all cancers. For lung cancer patients in England followed up to 2016, five-year survival was 15.2%. This varied by cancer alliance with a range of 12.4-17.6%.[4]

In the UK, lung cancer is more common in people of European family origin than in people of African or Asian family origin. It is strongly linked to socioeconomic deprivation. There are many risk factors for lung cancer, including age, genetics, lifestyle (especially smoking) and occupation. Lung cancer is estimated to cost the UK economy £2.4 billion per year.

2.4 Management

Lung cancer is diagnosed and staged using a variety of tests, including chest X-rays, CT or positron-emission tomography CT (PET-CT). Lung cancer samples are commonly acquired for diagnosis using bronchoscopy, endobronchial ultrasound (EBUS) or a percutaneous procedure (guided by CT or ultrasound).

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[1] Roy Castle Lung Cancer Foundation website (accessed 23/4/19)
[2] All statistics in this section are from Cancer Research UK website (accessed 24/4/19), unless otherwise stated
[3] NHS England (2018) Implementing a timed lung cancer diagnostic pathway
[4] NHS England (2018) Implementing a timed lung cancer diagnostic pathway

Treatment depends on the type, size, position and stage of the cancer, and the person's health. Possible treatments include radiotherapy, systemic anti-cancer therapies, surgery, supportive care cryotherapy, photodynamic therapy and ablation.

Since 2011 there have been changes in the way that lung cancer is diagnosed and treated. The 2016 national lung cancer audit identified that only 72% of people have pathological confirmation of their lung cancer. There is also inconsistency in the availability of molecular testing in lung cancer diagnosis.

NHS England has taken steps to shorten the time to treatment, as well as improve access to and uptake of radiotherapy, and stereotactic ablative radiotherapy (SABR) is routinely used for certain subgroups of people with early-stage NSCLC. There are now a variety of licensed immunotherapies and biological targeted therapies for treating advanced NSCLC.

See appendices 1–3 for the algorithms for intrathoracic staging before radical treatment and systemic treatment options for advanced non-squamous NSLC and advanced squamous NSLC from NICE guideline NG122.

3 Summary of suggestions

3.1 Responses

In total 14 stakeholders responded to the 2-week engagement exercise 11/03/19 to 25/3/19. In addition, 3 other stakeholders responded to confirm that they had no specific comments at this stage.

Stakeholders were asked to suggest up to 5 areas for quality improvement. Specialist committee members were also invited to provide suggestions. The responses have been merged and summarised in table 1 for further consideration by the committee.

Full details of all the suggestions provided are given in appendix 5 for information.

Table 1 Summary of suggested quality improvement areas

Suggested area for improvement	Stakeholders
Public awareness	• BTOG, MCS, ROCHE, SCM, SCR
Diagnosis and staging • Diagnostic pathway • Investigations • Communication	 • BTOG, BTS, NCD, NHSE, ROCHE, SCMs • BTS, MED, ROCHE, RCPath, SCMs • SCR
Improving health outcomes • Smoking cessation • Prehabilitation	 • ASH, MCS, NCD, SCMs, SCS • BDA, MCS, SCS
Treatment • Treatment with curative intent for NSCLC • Systemic anti-cancer therapy (SACT) • Chemotherapy for SCLC	 • BTOG, NCD, NHSE, MED, ROCHE, RCGP, SCMs, SCS • SCM • BTOG, SCM
Care and support • Clinical Nurse Specialist • Holistic needs assessments • Follow-up after treatment	 • MCS, SCMs • BDA, MCS, NCD • SCS, SCM
Palliative care • Enhanced supportive care • Management of brain metastases	 • BDA, BTS, NHSE, MCS • SCM
Additional areas • Lung cancer screening • Resources for MDT's • Funding to develop diagnostic tests and treatments	 • NHSE, SH, SCS • SCM • ROCHE

ASH, Action on Smoking and Health
BDA, British Dietetic Association
BTOG, British Thoracic Oncology Group
BTS, British Thoracic Society
MCS, Macmillan Cancer Support
MED, Medtronic Ltd
NHSE, Clinical Expert Group for Lung Cancer NHSE
NCD, National Clinical Director NHSE
RCGP, Royal College of General Practitioners
RCPath, Royal College of Pathologists
ROCHE, Roche Products and Roche Diagnostics UK
SCM, Specialist Committee Member
SCR, The Society and College of Radiographers
SCS, Society for Cardiothoracic Surgery in Great Britain and Ireland
SH, Siemens Healthineers

3.2 Identification of current practice evidence

Bibliographic databases were searched to identify examples of current practice in UK health and social care settings; 1914 papers were identified for lung cancer. In addition, 112 papers were suggested by stakeholders at topic engagement and 26 papers internally at project scoping.

Of these papers, 23 have been included in this report and are included in the current practice sections where relevant. Appendix 4 outlines the search process.

3.3 Resource impact

The areas identified for quality improvement are not expected to have a significant impact on resources. Most of the recommendations in the updated NICE lung cancer guideline reflect current practice. It is therefore expected that the resource impact of implementing any single guideline recommendation will be less than £1 million per year in England (or £1,800 per 100,000 population).

For those recommendations where clinical practice is likely to change as a result of this quality standard, there will not be a significant change in resource use. This is because the populations the recommendations apply to are small and the unit costs for the interventions are small.

For example, the recommendation for brain imaging for people with stage II non-small-cell lung cancer (NSCLC) may be a change to current practice in some areas. However, because the number of people diagnosed with stage II NSCLC is relatively small, this is not expected to result in a significant resource impact.

The recommendations from NICE NG12, NICE CSG4 and NG99 are also not expected to have a significant resource impact, as they relate to previous NICE guidelines and are likely to reflect current practice.

4 Suggested improvement areas

4.1 Public awareness

4.1.1 Summary of suggestions

Stakeholders highlighted the importance of improving public awareness of the symptoms of lung cancer to encourage earlier presentation and diagnosis and to reduce the proportion of people who are diagnosed via an emergency presentation. As there is a link between lung cancer mortality and socioeconomic deprivation it was suggested that locally coordinated public awareness campaigns are needed in socioeconomically deprived areas. Other stakeholders suggested that more general awareness raising is needed to target people who may not consider themselves to be at risk. It was suggested that it is important to involve a wide range of organisations in the awareness campaign including public health, health, social care and voluntary organisations in order to get the message out within the local population. Stakeholders indicated that awareness raising activities could include lung health-checks.

4.1.2 Selected recommendations from development source

Table 2 below highlights recommendations that have been provisionally selected from the development sources that may support potential statement development. These are presented in full after table 2 to help inform the committee's discussion.

Table 2 Specific areas for quality improvement

Suggested quality improvement area	Suggested source guidance recommendations
Public awareness	**Access to services and referral** NICE NG122 Recommendation 1.1.1

Access to services and referral

NICE NG122 – Recommendation 1.1.1

The public needs to be better informed of the symptoms and signs that are characteristic of lung cancer, through coordinated campaigning to raise awareness.

4.1.3 Current UK practice

Public Health England's[5] regional pilot of the Be Clear on Cancer campaign to raise public awareness of persistent cough as a symptom of lung cancer ran in the East

[5] Public Health England Be Clear on Cancer: Regional and national lung cancer awareness campaigns 2011 to 2014: Final evaluation results – Executive headlines

and West Midlands in 2011. Based on the early findings from the pilot, the first national campaign in 2012 was commissioned, and then two further national campaigns in 2013 and 2014. Campaigns were targeted at people over the age of 50 and people in lower social class groups. As a result of the initial evaluation of the four 'cough' campaigns, a broader respiratory symptoms campaign was carried out nationally in 2016 and a reminder campaign launched in May 2017.

There have also been a variety of local awareness campaigns including:

- a local pharmacy group ran a lung cancer campaign for 4 weeks in summer 2013 which targeted specific groups, such as people buying cough remedies, the elderly, patients involved in medicines use reviews or smoking cessation, and patients who were waiting for medicines to be dispensed [6].
- In November 2018 NHS Liverpool Clinical Commissioning Group (CCG) and Public Health Liverpool worked with Macmillan and Cancer Research UK to help raise awareness of lung health problems at supermarket events linked to Lung Cancer Awareness month[7].

A study of people diagnosed with advanced lung cancer following emergency presentation in Wolverhampton[8] concluded that the most recent local awareness campaign did not target the most common major symptoms presented by this group which were non respiratory, including pain.

[6] Phillips, Alexander How a pharmacy-led lung cancer awareness campaign met NHS aims the Pharmaceutical Journal 17 April 2014
[7] NHS Liverpool CCG Lung cancer awareness month supermarket events 1 November 2018
[8] Hancock et al Where and why do patients with advanced lung cancer present in Wolverhampton? Lung Cancer Vol91 (Supplement 1) (pp S10), 2016.

4.2 Diagnosis and staging

4.2.1 Summary of suggestions

Diagnostic pathway

Stakeholders indicated that rapid diagnosis and assessment is important to improve outcomes for people with lung cancer and patient experience. It was suggested that implementation of the National Optimal Lung Cancer Pathway[9] will reduce local variation and ensure faster treatment. It was highlighted that there is currently local variation in the proportion of people with lung cancer who have a pathological diagnosis. Although it isn't needed for all people with lung cancer, a pathological diagnosis that meets pathology standards is important to determine the most appropriate treatment. Specific areas of the diagnostic pathway that require improvement were identified as:

- Radiology reporting – target of chest X-ray to CT scan and clinic within 24 hours
- All steps completed to ensure diagnosis confirmed within 28 days
- Time from the initial chest X-ray to referral for treatment
- Recording of stage of disease.

Investigations

Stakeholders highlighted the importance of a range of specific investigations in the diagnosis of lung cancer to ensure the most appropriate treatment is provided as soon as possible, as follows:

- PET-CT scan
- Mediastinal lymph node sampling – quality of EBUS-TBNA and CT-guided biopsy
- Bronchoscopy
- Brain imaging
- Molecular testing based on adequate tissue sampling
- Immunohistochemistry tests
- Transfer factor (TLCO).

Communication

A stakeholder suggested that people having investigations for lung cancer should be informed of the results as soon as possible including the impact on their diagnosis and treatment. Ideally this should be facilitated via a one-stop clinic using a 'hot-reporting' system. It was suggested that there are currently inconsistencies in the processes and time taken for results to be available and discussed with the person.

[9] Lung Cancer Expert Group (2017) National optimal lung cancer pathway

4.2.2 Selected recommendations from development source

Table 3 below highlights recommendations that have been provisionally selected from the development sources that may support potential statement development. These are presented in full after table 3 to help inform the committee's discussion.

Table 3 Specific areas for quality improvement

Suggested quality improvement area	Selected source guidance recommendations
Diagnostic pathway	**Lung and pleural cancers** NICE NG12 Recommendation 1.1.1 **Diagnosis and staging** NICE NG122 Recommendation 1.3.32
Investigations	**Diagnosis and staging** NICE NG122 Recommendations 1.3.4, 1.3.8, 1.3.11, 1.3.15, 1.3.17 to 1.3.19, 1.3.24 to 1.3.26, 1.4.13
Communication	**Communication** NICE NG122 Recommendation 1.2.3

Diagnostic pathway

Lung and pleural cancers

NICE NG12 Recommendation 1.1.1

Refer people using a suspected cancer pathway referral (for an appointment within 2 weeks) for lung cancer if they:

- have chest X-ray findings that suggest lung cancer

Diagnosis and staging

NICE NG122 Recommendation 1.3.32

Provide fast-track lung cancer clinics for investigating suspected lung cancer, because they are associated with faster diagnosis and less anxiety.

Investigations

Diagnosis and staging

NICE NG122 Recommendation 1.3.4

Ensure that all people with lung cancer who could potentially have treatment with curative intent are offered positron-emission tomography CT (PET-CT) before treatment.

NICE NG122 Recommendation 1.3.8

Offer endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) for biopsy of paratracheal and peri-bronchial intra-parenchymal lung lesions.

NICE NG122 Recommendation 1.3.11

When taking samples, ensure they are adequate (without unacceptable risk to the person) to permit pathological diagnosis, including tumour subtyping and assessment of predictive markers.

NICE NG122 Recommendation 1.3.15

Offer image-guided biopsy to people with peripheral lung lesions when treatment can be planned on the basis of this test.

NICE NG122 Recommendation 1.3.17

Offer flexible bronchoscopy to people with central lesions on CT if nodal staging does not influence treatment.

NICE NG122 Recommendation 1.3.18

Offer PET-CT as the preferred first test after CT with a low probability of nodal malignancy (lymph nodes below 10 mm maximum short axis on CT), for people with lung cancer who could potentially have treatment with curative intent.

NICE NG122 Recommendation 1.3.19

Offer PET-CT (if not already done), followed by EBUS-TBNA and/or EUS-FNA, to people with suspected lung cancer who have enlarged intrathoracic lymph nodes (lymph nodes greater than or equal to 10 mm short axis on CT) and who could potentially have treatment with curative intent.

NICE NG122 Recommendation 1.3.24

Offer contrast-enhanced brain CT to people with clinical stage II NSCLC who are having treatment with curative intent. If CT shows suspected brain metastases, offer contrast-enhanced brain MRI.

NICE NG122 Recommendation 1.3.25

Offer contrast-enhanced brain MRI for people with stage III NSCLC who are having treatment with curative intent.

NICE NG122 Recommendation 1.3.26

Offer people with clinical features suggestive of intracranial pathology CT of the head followed by MRI if normal, or MRI as an initial test.

NICE NG122 Recommendation 1.4.13

Perform spirometry and transfer factor (TLCO) in all people being considered for treatment with curative intent.

Communication

NICE NG122 Recommendation 1.2.3

Offer accurate and easy-to-understand information to people and their family members or carers (as appropriate). Explain the tests and treatment options, including potential survival benefits, side effects and effect on symptoms.

4.2.3 Current UK practice

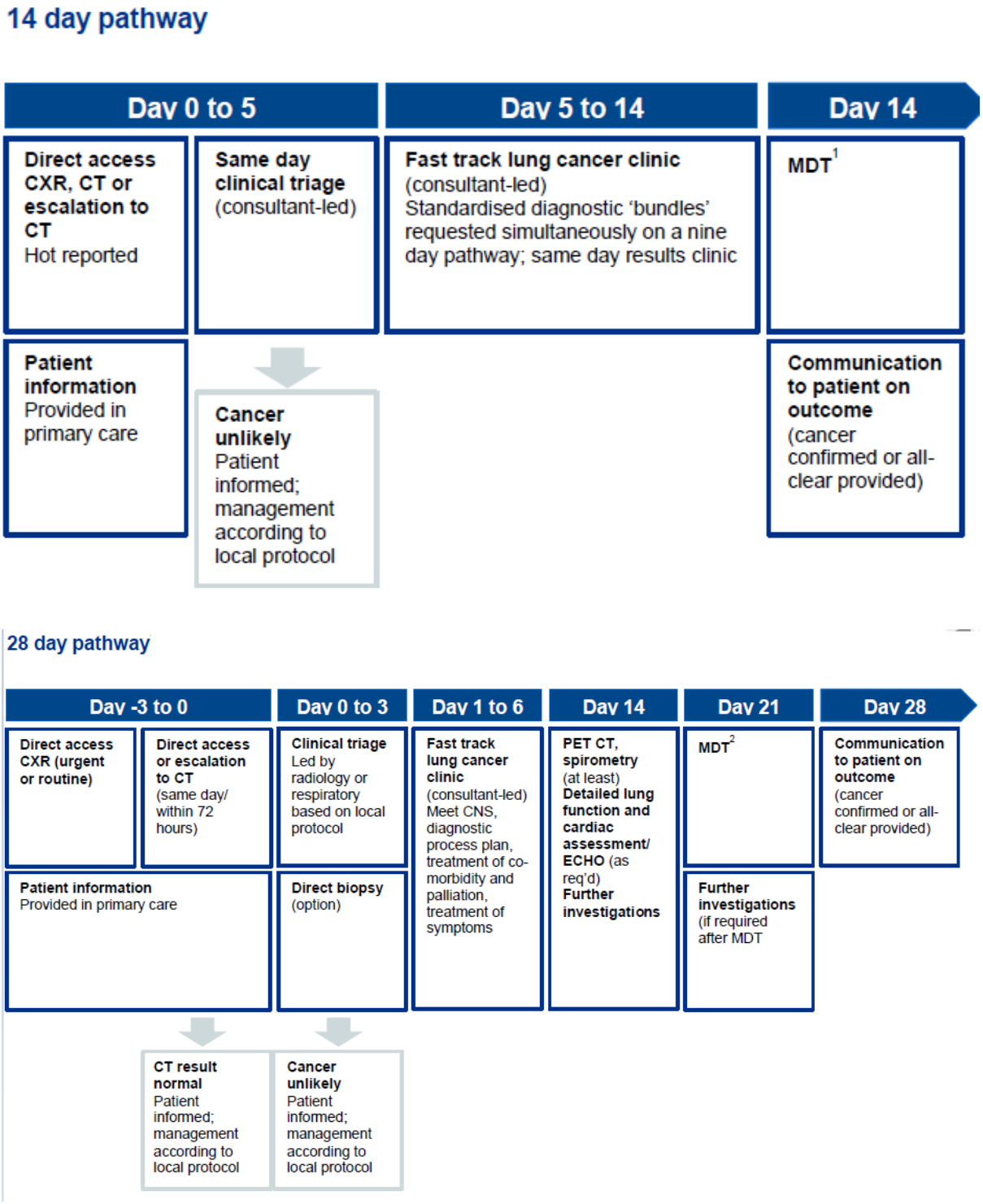
Diagnostic pathway

NHS England's 2017-18 annual report on waiting times for suspected and diagnosed cancer patients[10] indicates that:

- 96% of 63,772 people with suspected lung cancer were seen by a specialist within 14 days of an urgent GP referral.
- 98% of 32,271 people with lung cancer started a first definitive treatment within 31 days of the decision to treat date.
- 72% of 12,003 people with lung cancer started a first definitive anti-cancer treatment within 62 days of an urgent GP referral.

NHS England's handbook on implementing a timed lung cancer diagnostic pathway[11] sets out how diagnosis can be achieved in 14 days and 28 days for the lung cancer pathway based on the National Optimal Lung Cancer Pathway. A new diagnostic standard for cancer that emphasises the importance of receiving a diagnosis or ruling out cancer within 28 days will be introduced from April 2020.

[10] NHS England Waiting Times for Suspected and Diagnosed Cancer Patients: 2017-18 Annual Report
[11] NHS England (2018) Implementing a timed lung cancer diagnostic pathway



The Care Quality Commission undertook a review of radiology reporting[12] within the NHS in England in 2017, and found that:

- The timescales for reporting on radiology examinations, and arrangements for monitoring and managing backlogs, vary widely between trusts.
- There are few national standards that trusts can benchmark themselves against.

[12] Care Quality Commission Radiology review 2018

- Even trusts that were monitoring their performance did not always report on time.

The 2017 report of the National Lung Cancer Audit[13] indicated that 72% of patients had their lung cancer confirmed pathologically compared with a target of >80%. Across individual organisations, results varied from around 56% to 100%. For patients with pathological confirmation, 9% of NSCLC cases were classified as not otherwise specified, achieving the target of <15%. Across individual organisations, however, this varied widely from 0 to 36% with 16 organisations not achieving the target.

The 2017 report of the National Lung Cancer Audit reported that disease stage was recorded in 96% of cases in England, the highest achieved since the audit began in 2005.

Investigations

A survey of radiologists in 2017[14] concluded that there were variations among UK radiologists performing lung biopsy in decision-making, pre-biopsy work-up, post-biopsy monitoring, management of pneumothorax, and discharge. The study highlighted:

- different techniques used (CT (98%), core needle biopsy (89%) and co-axial technique (87%))
- around 30% did not require pre-biopsy lung tests and around 45% stopped aspirin before the procedure
- varying numbers of samples were taken
- around 65% used chest drain prevention techniques
- post-biopsy chest radiography was performed by around 95% but the timing varied.

A retrospective analysis of notes for people diagnosed with lung cancer from 2011 to 2015 at St Georges hospital in London[15] found that 53% of 257 people were tested for EGFR mutations and 24% for ALK testing. The frequency of EGFR testing over the 5-year period was constant but ALK testing increased in frequency. The most common reasons for exclusion from testing were early tumour staging with surgical resection (35.8%) and palliative care (28.3%). In 20% of people, however, there was no clear reason documented for not testing.

[13] Royal College of Physicians. National Lung Cancer Audit annual report 2017 (for the audit period 2016). London: Royal College of Physicians, 2018
[14] Tavare et al A survey of UK percutaneous lung biopsy practice: current practices in the era of early detection, oncogenetic profiling, and targeted treatments Clinical Radiology Sept 2018 vol 73, issue 9, p 800-809
[15] Jones J and Benepal T, (2017) Mutational testing in lung adenocarcinoma patients – are we testing everyone we should be? Lung cancer Jan 2017 103 (Suppl. 1): S38-39

A survey of lung cancer lead clinicians in 2014[16] (59/154 centres responded) found that 51% of centres did not image the brain in people newly diagnosed with lung cancer who do not have symptoms or signs to suggest brain metastases. Of those centres that did image the brain 21 (72%) used CT as the first-line imaging technique and six (20%) used MRI.

Communication

The national cancer patient experience survey 2017[17] results for people with lung cancer who received cancer related treatment showed that:

- 78% completely agreed that the results of their test were explained in a way that they could understand. A further 20% agreed to some extent
- 83% said that the way they were told they had cancer was done sensitively, while 17% said it needed to be done more sensitively
- 75% completely understood the explanation of what was wrong with them and 23% understood some of it
- 56% were given written information about the type of cancer they had which was easy to understand. 10% were given written information but it was difficult to understand. 19% were not given written information and 9% did not need written information.

[16] Hudson BJ, Crawford MB, Curtin JJ (2015) Brain imaging in lung cancer patients without symptoms of brain metastases: a national survey of current practice in England Clinical Radiology 70(6): 610-13
[17] Quality Health National Cancer Patient Experience Survey 2017: national results

4.3 Improving health outcomes

4.3.1 Summary of suggestions

Smoking cessation

Stakeholders indicated that smoking cessation support (including pharmacological support) should be provided to people who smoke and are diagnosed with lung cancer. It was suggested that stopping smoking can increase life expectancy, improve quality of life and support management of the condition. Continuing to smoke is associated with complications after radical therapy. It was suggested that there is currently considerable variation in the availability of support in local areas.

Prehabilitation

Stakeholders suggested that prehabilitation can improve outcomes for people having surgery who are assessed as having borderline fitness. Prehabilitation, including pulmonary rehabilitation, is a strategy to begin the rehabilitation process before surgery, chemotherapy and radiotherapy, and an opportunity to tackle the management of a number of risk factors such as anaemia and malnutrition which may have an adverse effect on functional capacity and ultimately on postoperative outcomes, including recovery. Stakeholders suggested that prehabilitation may increase the number of people who can be offered surgery.

4.3.2 Selected recommendations from development source

Table 4 below highlights recommendations that have been provisionally selected from the development sources that may support potential statement development. These are presented in full after table 4 to help inform the committee's discussion.

Table 4 Specific areas for quality improvement

Suggested quality improvement area	Selected source guidance recommendations
Smoking cessation	**Treatment** NICE NG122 Recommendations 1.4.1 to 1.4.3
Prehabilitation	**Not directly covered in NICE NG122 and no recommendations are presented**

Smoking cessation

Treatment

NICE NG122 Recommendation 1.4.1

Inform people that smoking increases the risk of pulmonary complications after lung cancer surgery.

NICE NG122 Recommendation 1.4.2

Advise people to stop smoking as soon as the diagnosis of lung cancer is suspected and tell them why this is important.

NICE NG122 Recommendation 1.4.3

Offer nicotine replacement therapy and other therapies to help people to stop smoking in line with the NICE guideline on stop smoking interventions and services and the NICE technology appraisal guidance on varenicline for smoking cessation.

4.3.3 Current UK practice

Smoking cessation

The 2nd national lung cancer organisational audit[18] indicated that access to on-site smoking cessation services decreased from 86% in 2014 to 67% in 2017.

A survey of healthcare professionals at all 38 centres that perform thoracic surgery in Great Britain[19] indicated that more than 20% of patients proceeding to surgery were current smokers according to 86% of respondents (99). The majority (61%) stated that less than 50% of smokers give up before surgery; a further 22% were uncertain how many successfully stop smoking. Over 70% of the respondents currently provide a GP referral, community-based cessation service or both. Better access to support would improve cessation rates according to 64% of respondents.

Analysis of primary care records for people diagnosed between 1999 and 2013[20] found that general practitioners were less likely to support smoking cessation in people with lung, bladder, and upper aerodigestive tract cancer than those with coronary heart disease, and people with cancer were less likely to stop smoking. 24% of people with cancer were offered advice to quit, and 13% were prescribed

[18] Royal College of Physicians. National Lung Cancer Audit annual report 2017 (for the audit period 2016). London: Royal College of Physicians, 2018
[19] Oswald et al A national survey of thoracic surgery units: Pre-operative smoking cessation practice shows need for better provision of service Lung Cancer Vol 91. Supp 1. Page S62
[20] Farley et al Physician Support of Smoking Cessation After Diagnosis of Lung, Bladder, or Upper Aerodigestive Tract Cancer Ann Fam Med. 2017 Sep;15(5):443-450

treatment. One year on from diagnosis, 61.7% of people with cancer still smoked, compared to 55.4% of people with coronary heart disease.

Prehabilitation

The 2017 national lung cancer organisational audit[21] indicated that access to on-site pulmonary rehabilitation decreased from 81% in 2014 to 67% in 2017.

[21] Royal College of Physicians. National Lung Cancer Audit annual report 2017 (for the audit period 2016). London: Royal College of Physicians, 2018

4.4 Treatment

4.4.1 Summary of suggestions

Treatment with curative intent for NSCLC

Stakeholders indicated that there is currently variation in the types of treatment given and outcomes for people with NSCLC in different hospitals. It is important to improve the proportion of people with early stage cancer who are treated with curative intent. Commissioners should ensure consistency in level of expertise and equipment available to improve access to treatments and reduce perioperative mortality. Stakeholders highlighted the importance of improving access to specific treatments, as follows:

- Surgery including lobectomy via minimally invasive surgery
- Stereotactic ablative radiotherapy (SABR) for people not having surgery
- Radical chemoradiotherapy with adjuvant immunotherapy for stage 3 non-operable lung cancer
- Multimodality therapy (combination of chemotherapy, radiotherapy and/or surgery) for people having radical treatment

Systemic anti-cancer therapy (SACT)

The management of advanced stage NSCLC in line with the SACT algorithms in the NICE guideline was highlighted as a priority.

Chemotherapy for SCLC

It was suggested that people diagnosed with SCLC should receive chemotherapy when appropriate as it can improve quality of life and survival. Chemotherapy should be started within 14 days of diagnosis as it can significantly alter the clinical course.

4.4.2 Selected recommendations from development source

Table 5 below highlights recommendations that have been provisionally selected from the development sources that may support potential statement development. These are presented in full after table 5 to help inform the committee's discussion.

Table 5 Specific areas for quality improvement

Suggested quality improvement area	Selected source guidance recommendations
Treatment with curative intent	**Treatment** NICE NG122 Recommendations 1.4.20, 1.4.24, 1.4.27, 1.4.32, 1.4.34, 1.4.40
SACT	**Treatment** NICE NG122 SACT algorithm (see appendix 2 and 3)
Chemotherapy for SCLC	**Treatment** NICE NG122 Recommendations 1.4.53, 1.4.59

Treatment with curative intent

Treatment

NICE NG122 Recommendation 1.4.20

For people with NSCLC who are well enough and for whom treatment with curative intent is suitable, offer lobectomy (either open or thoracoscopic).

NICE NG122 Recommendation 1.4.24

For people with stage I–IIA (T1a–T2b, N0, M0) NSCLC who decline lobectomy or in whom it is contraindicated, offer radical radiotherapy with stereotactic ablative radiotherapy (SABR) or sublobar resection.

NICE NG122 Recommendation 1.4.27

For people with stage I–IIA (T1a–T2b, N0, M0) NSCLC who decline surgery or in whom any surgery is contraindicated, offer SABR. If SABR is contraindicated, offer either conventional or hyperfractionated radiotherapy.

NICE NG122 Recommendation 1.4.32

Consider chemoradiotherapy for people with stage II or III NSCLC that are not suitable for or decline surgery. Balance potential benefit in survival with the risk of additional toxicities.

NICE NG122 Recommendation 1.4.34

Offer postoperative chemotherapy to people with good performance status (WHO 0 or 1) and T1a–4, N1–2, M0 NSCLC.

NICE NG122 Recommendation 1.4.40

For people with operable stage IIIA–N2 NSCLC who can have surgery and are well enough for multimodality therapy, consider chemoradiotherapy with surgery.

Chemotherapy for SCLC

Treatment

NICE NG122 Recommendation 1.4.53

Offer people with limited-stage disease SCLC (broadly corresponding to T1–4, N0–3, M0) 4 to 6 cycles of cisplatin-based combination chemotherapy. Consider substituting carboplatin in people with impaired renal function, poor performance status (WHO 2 or more) or significant comorbidity.

NICE NG122 Recommendation 1.4.59

Offer platinum-based combination chemotherapy to people with extensive stage disease SCLC (broadly corresponding to T1–4, N0–3, M1a/b – including cerebral metastases) if they are fit enough.

4.4.3 Current UK practice

Treatment with curative intent for NSCLC

The national lung cancer audit[22] reported that in 2016, 17.5% of people with NSCLC had surgery, against a target of 17%, an increase from 16.7% in 2015. 18 organisations were identified as having a significantly better surgical resection rate than the national average. However, adjusted surgical resection rates varied from 4.8 to 40.1%, and 60 organisations failed to meet the audit standard. Low surgical rates in some organisations may be due to their surgical cases being allocated to a tertiary surgical trust.

The 2018 lung cancer clinical outcomes report[23] indicated that the number of lung cancer resections in England rose by 30% from 4,892 in 2013 to 6,343 in 2016. 81% of resections were for stage one or two lung cancer, while 12.9% were for stage IIIA disease. The majority (93%) of surgery for lung cancer is performed for NSCLC. Most operations are done in relatively fit people with only 9.5% with a performance status of two or more. For the first time, most lung cancer operations in 2016 were performed using minimal access (VATS and robotic) surgery. More than 77% of all resections for lung cancer were lobectomy or bilobectomy procedures.

[22] Royal College of Physicians. National Lung Cancer Audit annual report 2017 (for the audit period 2016). London: Royal College of Physicians, 2018
[23] Royal College of Physicians Lung cancer clinical outcomes publication 2018 (for surgical operations performed in 2016)

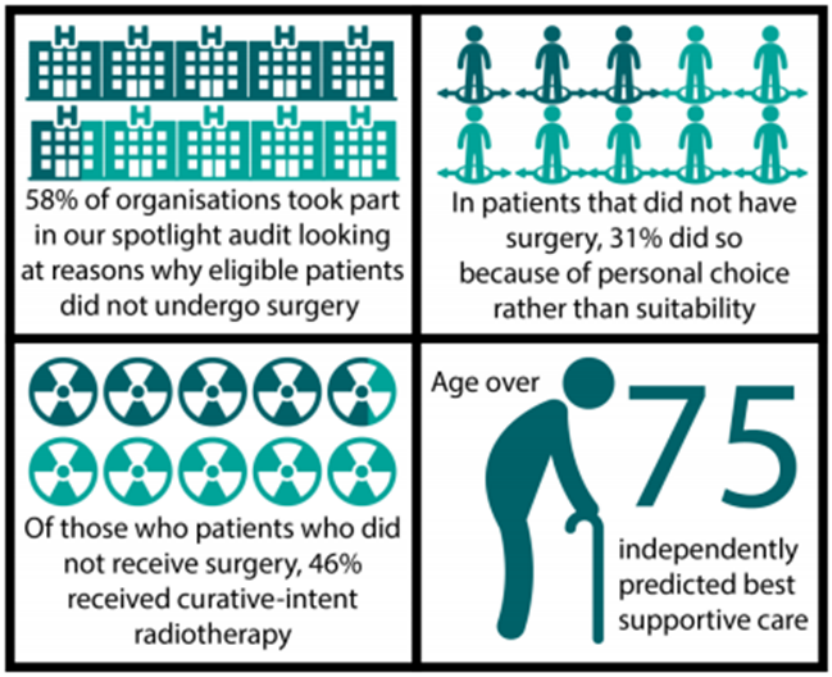
A 2018 GIRFT (Getting it right first time) programme national speciality report on cardiothoracic surgery[24] found variation between providers in the rate of video-assisted thoracoscopic surgery (VATS) procedures for lung resection – from 84% down to 10.3%.

A study of people with NSCLC treated with curative-intent radiotherapy in UK radiotherapy centres[25] found that 49% received the guideline-recommended therapy for their tumour type (either continuous hyperfractionated, accelerated radiotherapy (CHART), concurrent chemoradiation (cCRT) or stereotactic ablative radiotherapy (SABR)). People aged 70 years or over were less likely to access the guideline recommended therapy than those under 70 years (40% compared with 60%), both as a result of clinicians offering therapy less frequently and a higher refusal of therapy. A reluctance to travel to a different centre was a key component of these decisions. SABR was delivered to only 52% of suitable patients, mainly because it was not available in the local centre.

The national lung cancer audit[26] included a new measure for curative-intent treatment rate for people with stage 1 or 2 NSCLC and performance status 0-2. Overall, 80.4% received curative-intent treatment in 2016 (surgery 60.6%, stereotactic ablative radiotherapy (SABR) 11.5% and other radical radiotherapy 9.8%; percentages include some patients who received radical radiotherapy after surgery). Across individual organisations (excluding tertiary trusts), the rate of curative treatment varied from 54.5% to 100%. There were 13 trusts where one in three patients with good performance status and early-stage NSCLC did not receive curative-intent treatment.

The national lung cancer audit ran its first quality improvement spotlight audit in August 2017 to understand why the radical treatment rate was low in people with early-stage lung cancer. 31% of people did not have surgery owing to patient choice and, of these, 66% preferred SABR or other radical radiotherapy, while the remainder elected for no treatment.The audit concluded that there is a need to highlight to MDT's that when radical radiotherapy or SABR is not an option, more patients could be undergoing further detailed assessment before excluding surgery.

[24] NHS GIRFT Cardiothoracic Surgery: GIRFT Programme National Specialty Report 2018
[25] McAleese, Baluch, Drinkwater, Bassett, Hanna The Elderly are Less Likely to Receive Recommended Radical Radiotherapy for Non-small Cell Lung Cancer Clinical Oncology Vol 29, Issue 9, September 2017
[26] Royal College of Physicians. National Lung Cancer Audit annual report 2017 (for the audit period 2016). London: Royal College of Physicians, 2018



Data analysis[27] for people diagnosed with stage 3 NSCLC in England in 2016 investigated the use of curative intent multi-modality treatment in this group. A variety of national data sources were linked, and 6,288 cases analysed. Analysis indicated that 18% received multi-modality treatment with either surgery or radical radiotherapy combined with chemotherapy, 34% received anti-cancer treatment of palliative intent and 36% received supportive care only.

SACT

The national lung cancer audit[28] reported that 62.5% of people with good performance status and advanced NSCLC received SACT in England in 2016, compared with an audit standard of 65%. This dropped slightly from 2015 (64%). For England, across individual organisations (excluding tertiary trusts), the casemix-adjusted results varied from 25.7% to 100%, with 85 organisations failing to achieve the standard. Nine organisations were identified as outliers.

Chemotherapy for SCLC

The national lung cancer audit showed that 68% of SCLC patients in England received chemotherapy in 2016 (audit standard 70%), just slightly lower than 2015 (69%). Across individual organisations (excluding tertiary trusts) the results, adjusted for casemix, varied from 27.9% to 100%, with six organisations identified as outliers.

[27] Harden, Khakwani, Beckett, Adizie Curative Intent Treatment for Stage III NSCLC in England Journal of Thoracic Oncology Vol 13, Issue 10, supplement, October 2018
[28] Royal College of Physicians. National Lung Cancer Audit annual report 2017 (for the audit period 2016). London: Royal College of Physicians, 2018

33% of people with SCLC in England in 2016 received their chemotherapy within 14 days of pathological diagnosis with wide variation across organisations.

4.5 Care and support

4.5.1 Summary of suggestions

Clinical Nurse Specialist

Stakeholders suggested that it is important for people with known or suspected lung cancer to have ongoing access to a clinical nurse specialist from initial referral. The clinical nurse specialist provides continuity, can assess individual needs and is an important link with the multidisciplinary team. A stakeholder suggested that as there are limited numbers of clinical nurse specialists it is particularly important for people living in socioeconomically deprived areas to be able to access a clinical nurse specialist in order to improve outcomes and avoid unnecessary hospital admissions.

Holistic needs assessments

It was suggested that people with lung cancer should have holistic needs assessments at each key stage of care to inform their care plan. Stakeholders suggested that assessments should include nutrition as well as practical, social and financial issues. The assessment may be carried out by a clinical nurse specialist and will identify the need for referral to specialist services such as such as an oncology dietitian. Stakeholders highlighted the importance of interventions to improve patient experience and quality of life.

Follow-up after treatment

Stakeholders suggested that there is currently variation in the follow-up of people with lung cancer who receive treatment including surgery. There is increasing use of CT scans rather than chest X-ray and virtual appointments rather than attending an outpatient appointment, however there is no standard pathway. It was suggested that clinical nurse-led models should be used for follow-up.

4.5.2 Selected recommendations from development source

Table 6 below highlights recommendations that have been provisionally selected from the development sources that may support potential statement development. These are presented in full after table 6 to help inform the committee's discussion.

Table 6 Specific areas for quality improvement

Suggested quality improvement area	Selected source guidance recommendations
Clinical Nurse Specialist	**Communication** NICE NG122 Recommendation 1.2.2 **Cancer clinical nurse specialists** NICE NG122 Recommendation 1.3.33 **Follow-up and patient perspectives** NICE NG122 Recommendation 1.6.3
Holistic needs assessments	**Co-ordination of care** NICE CSG4 Key Recommendation 2
Follow-up after treatment	**Follow-up and patient perspectives** NICE NG122 Recommendations 1.6.1, 1.6.2

Clinical nurse specialist

Communication

NICE NG122 Recommendation 1.2.2

Ensure that a lung cancer clinical nurse specialist is available at all stages of care to support people and (as appropriate) their family members or carers.

Cancer clinical nurse specialists

NICE NG122 Recommendation 1.3.33

All cancer units/centres should have one or more trained lung cancer clinical nurse specialists to:

- see people before, at the time of and after diagnosis
- provide continuing support
- facilitate communication between the secondary care team (including the multidisciplinary team), the person's GP, the community team and the person with lung cancer
- help people access advice and support whenever they need it.

Follow-up and patient perspectives

NICE NG122 Recommendation 1.6.3

Ensure that people know how to contact the lung cancer clinical nurse specialist involved in their care between their scheduled hospital visits.

Holistic needs assessment

Co-ordination of care

NICE CSG4 Key Recommendation 2

Assessment and discussion of patients' needs for physical, psychological, social, spiritual and financial support should be undertaken at key points (such as at diagnosis; at commencement, during, and at the end of treatment; at relapse; and when death is approaching). Cancer Networks should ensure that a unified approach to assessing and recording patients' needs is adopted, and that professionals carry out assessments in partnership with patients and carers.

Follow-up after treatment

Follow-up and patient perspectives

NICE NG122 Recommendation 1.6.1

Offer all people with lung cancer an initial specialist follow-up appointment within 6 weeks of completing treatment to discuss ongoing care. Offer regular appointments after this, rather than relying on the person requesting appointments when they experience symptoms.

NICE NG122 Recommendation 1.6.2

Offer protocol-driven follow-up led by a lung cancer clinical nurse specialist as an option for people with a life expectancy of more than 3 months.

4.5.3 Current UK practice

Clinical Nurse Specialist

The national lung cancer audit[29] indicated that 70% of people with lung cancer in England in 2016 were seen by a lung cancer nurse specialist (CNS) and 58% had a lung CNS present at diagnosis. This was an improvement compared with 2015 when

[29] Royal College of Physicians. National Lung Cancer Audit annual report 2017 (for the audit period 2016). London: Royal College of Physicians, 2018

57% of patients were recorded as being seen by a lung CNS; however, it was still lower than in 2014 (84% seen and 65% at diagnosis).

The national cancer patient experience survey 2017[30] indicated that 91% of people with lung cancer who received cancer related treatment were given the name of a CNS who would support them through their treatment. 78% of those people found it very or fairly easy to contact their CNS, and 5% indicated that this was quite or very difficult. 10% had not tried to contact their CNS.

A census of cancer, palliative and chemotherapy speciality nurses and support workers in England in 2017[31] indicated that there were 372 specialist lung cancer nurses (4.3% vacancy rate) and 19 lung chemotherapy nurses in England on 9 October 2017. The report noted considerable variation between areas in the number of new patients per lung cancer specialist nurse (between 62 and 203).

A workload analysis for lung cancer nurse specialists[32] indicated that unpaid overtime was substantial for over 60% of nurses and was not associated with specific service factors; lack of administrative support was associated with large caseloads and chemotherapy facilities. The most frequent specialist nursing intervention to not be routinely offered was proactive case management.

Holistic needs assessment

The national cancer patient experience survey 2017 showed that:

- 54% of people with lung cancer agreed that hospital staff discussed or gave information about the impact that cancer could have on their day to day activities. 14% indicated that hospital staff did not do this, but they would have liked them to. 28% indicated that it was not necessary.
- 48% of people with lung cancer indicated that hospital staff gave them information about how to get financial help or any benefits they may be entitled to. 22% indicated they did not get this information but would have liked it and 29% said it was not necessary.

Follow-up after treatment

A survey of specialists involved in lung cancer treatment in north west England[33] found that surveillance patterns varied between the treatment modality delivered and

[30] Quality Health National Cancer Patient Experience Survey 2017: national results
[31] Macmillan Cancer workforce in England 2017
[32] Stewart et al Barriers to delivering advanced cancer nursing: A workload analysis of specialist nurse practice linked to the English National Lung Cancer Audit European Journal of Oncology Nursing vol 36, October 2018
[33] Griffiths P, Fullerton D, Lees D P265 Survey of north west england ct follow-up of patients post radical treatment for lung cancer Thorax 2017;72:A227

specialty and concluded that here is no standardised follow up protocol for people with NSCLC after radical treatment in north west England.

- Following curative surgery (n=19 respondents): Short-term CT surveillance intervals varied between no routine CT (n=5), 3–6 monthly (n=4), 1–2 yearly (n=10).
- Following radical radiotherapy (n=16): Frequency of CT varied between no routine CT (n=4), 3–6 monthly (n=5) and 1–2 yearly (n=7).
- Following Stereotactic Ablative Radiotherapy (SABR) (n=7): Frequency of CT surveillance varied from 3–6 monthly (n=5) to 1–2 yearly (n=2).
- The total duration of routine follow-up also varied from ‘Indefinitely’ (n=2) to 5 years (n=16), and 10 years (n=3).

4.6 Palliative care

4.6.1 Summary of suggestions

Enhanced supportive care

Stakeholders highlighted that people with advanced lung cancer should be referred for enhanced supportive care as early as possible. Enhanced supportive care can improve survival and quality of life as well as reducing hospital admissions. It was suggested that it is important to ensure that enhanced supportive care includes nutrition interventions.

Management of brain metastases

It was suggested that there needs to be more standardisation of the management of brain metastases in people with NSCLC as brain radiotherapy may not increase survival.

4.6.2 Selected recommendations from development source

Table 7 below highlights recommendations that have been provisionally selected from the development sources that may support potential statement development. These are presented in full after table 7 to help inform the committee's discussion.

Table 7 Specific areas for quality improvement

Suggested quality improvement area	Selected source guidance recommendations
Enhanced supportive care	**Communication** NICE NG122 Recommendation 1.2.8 **Palliative interventions and supportive and palliative care** NICE NG122 Recommendations 1.5.1, 1.5.2 and 1.5.19
Management of brain metastases	**Management of confirmed brain metastases** NICE NG99 Recommendation 1.7.8

Enhanced supportive care

Communication

NICE NG122 Recommendation 1.2.8

Offer to discuss end-of-life care with the person sensitively and when appropriate. Wherever possible, avoid leaving this discussion until the terminal stages of the illness.

Palliative interventions and supportive and palliative care

NICE NG122 Recommendation 1.5.1

Supportive and palliative care of the person should be provided by general and specialist palliative care providers in line with the NICE guidance on improving supportive and palliative care for adults with cancer.

NICE NG122 Recommendation 1.5.2

Identify and refer people who may benefit from specialist palliative care services without delay.

NICE NG122 Recommendation 1.5.19

Other symptoms, including weight loss, loss of appetite, depression and difficulty swallowing, should be managed by multidisciplinary groups that include supportive and palliative care professionals.

Management of brain metastases

Management of confirmed brain metastases

NICE NG99 Recommendation 1.7.8

Do not offer whole-brain radiotherapy to people with:

- non-small-cell lung cancer and
- brain metastases that are not suitable for surgery or stereotactic radiosurgery/radiotherapy and
- a Karnofsky performance status of under 70.

4.6.3 Current UK practice

Enhanced supportive care

A study of the place and cause of death in people with lung cancer in the UK[34] (based on data from the National Lung Cancer Audit, Hospital Episode Statistics and the Office for National Statistics) indicated that of 143,627 people, 40% died in an acute hospital, 29% died at home and 17% died in a hospice. Individual factors strongly associated with death in an acute hospital bed compared to home were male sex, increasing age, poor performance status, social deprivation and diagnosis via an emergency route. There was marked variation between cancer networks in place of death. The proportion of patients dying in an acute hospital ranged from

[34] O'Dowd et al Place and cause of death in patients with lung cancer in the United Kingdom Journal of Thoracic Oncology. Conference: 16th World Conference on Lung Cancer. Conference Publication: 10 (9 SUPPL. 2) (pp S518), 2015.

28% to 48%, with variation most notable in provision of hospice care (9% versus 33%). The study concluded that the level of variation suggested a need to improve end-of-life planning in those at greatest risk and to review the allocation of resources to provide more hospice beds, enhanced community support and ensure equal access.

Management of brain metastases

No published studies on current practice were highlighted for this suggested area for quality improvement; this area is based on stakeholder's knowledge and experience.

4.7 Additional areas

Summary of suggestions

The improvement areas below were suggested as part of the stakeholder engagement exercise. However, they were felt to be either unsuitable for development as quality statements, outside the remit of this particular quality standard referral or require further discussion by the committee to establish potential for statement development.

There will be an opportunity for the committee to discuss these areas at the end of the session on 15th May.

Lung cancer screening

Stakeholders suggested that screening programmes using CT imaging to detect lung cancer at an earlier stage should be introduced for higher risk groups. The NHS Long Term Plan indicates that lung health checks using mobile CT scanners will be available more widely for people identified as being at high risk of lung cancer. NICE quality standards do not address screening.

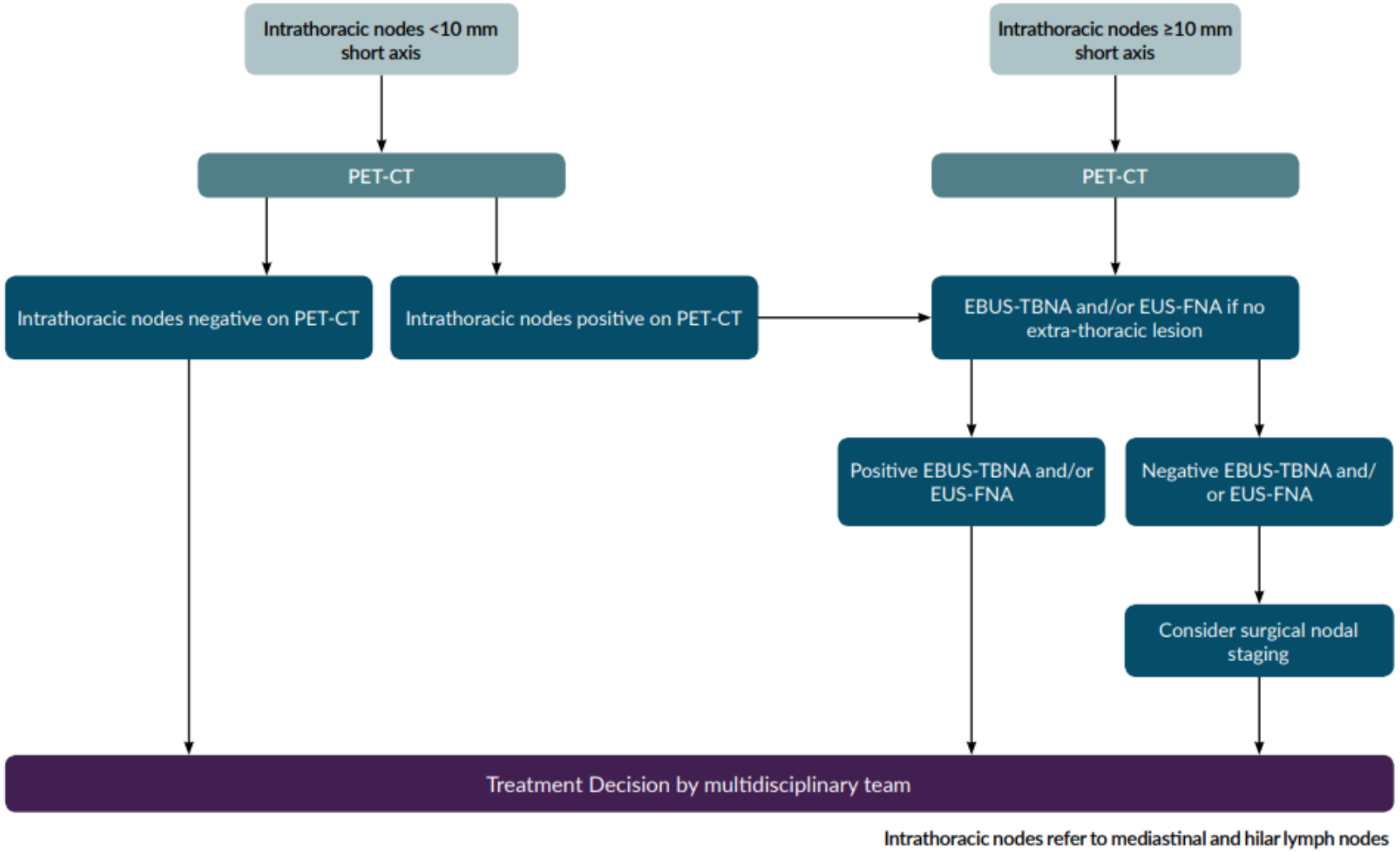
Resources for MDT's

It was suggested that multi-disciplinary teams should be adequately resourced in order to deliver NHS England's service specification, reduce variation and improve quality of care. Quality statements focus on specific actions that demonstrate high quality care or support, rather than the resources required to deliver the service.

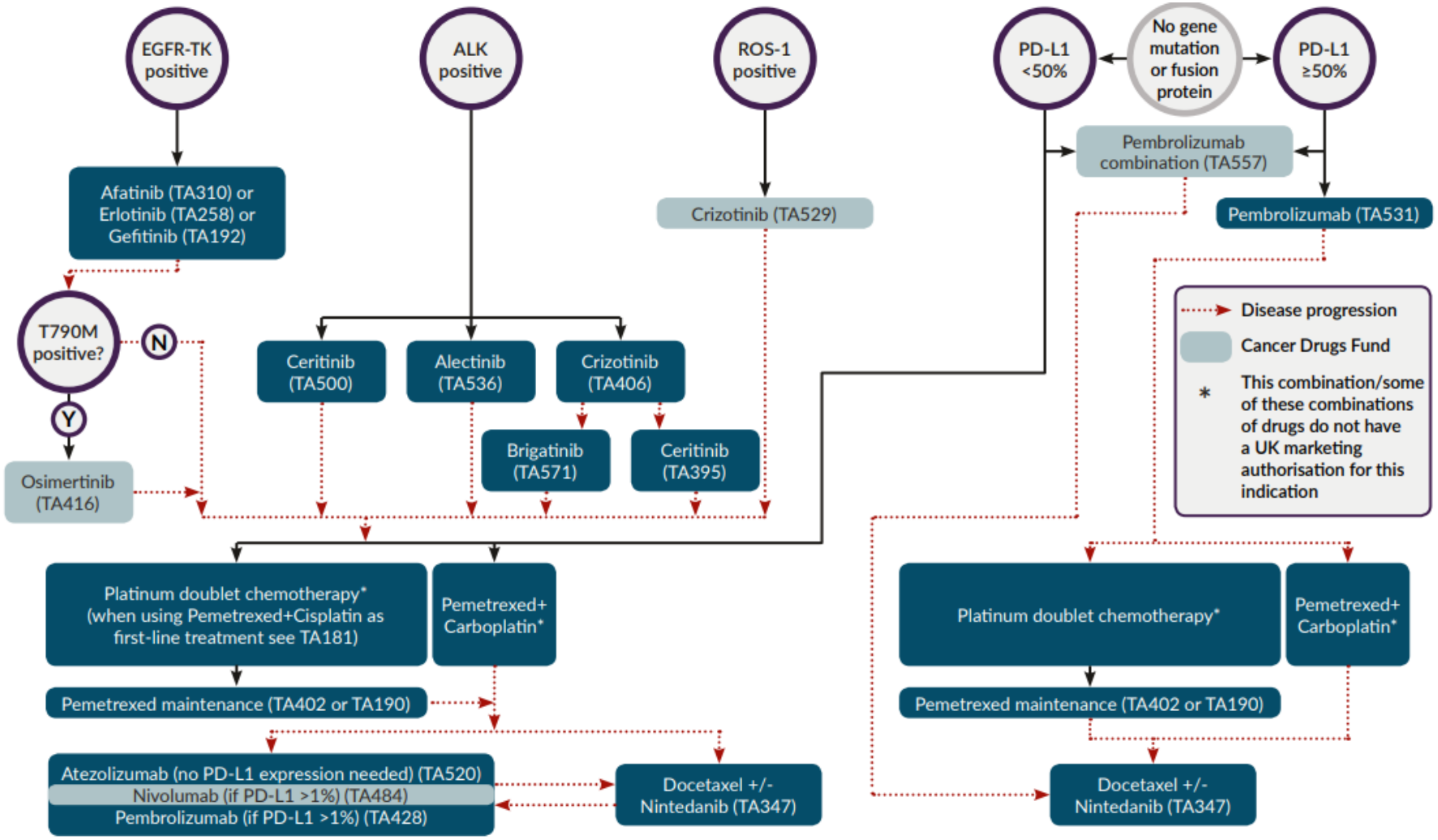
Funding to develop diagnostic tests and treatments

A stakeholder suggested that funding is required for next-generation sequencing tests and treatments for lung cancers with rare mutations and those with poor prognosis. Funding for the development of tests and treatment is beyond the scope of NICE quality standards.

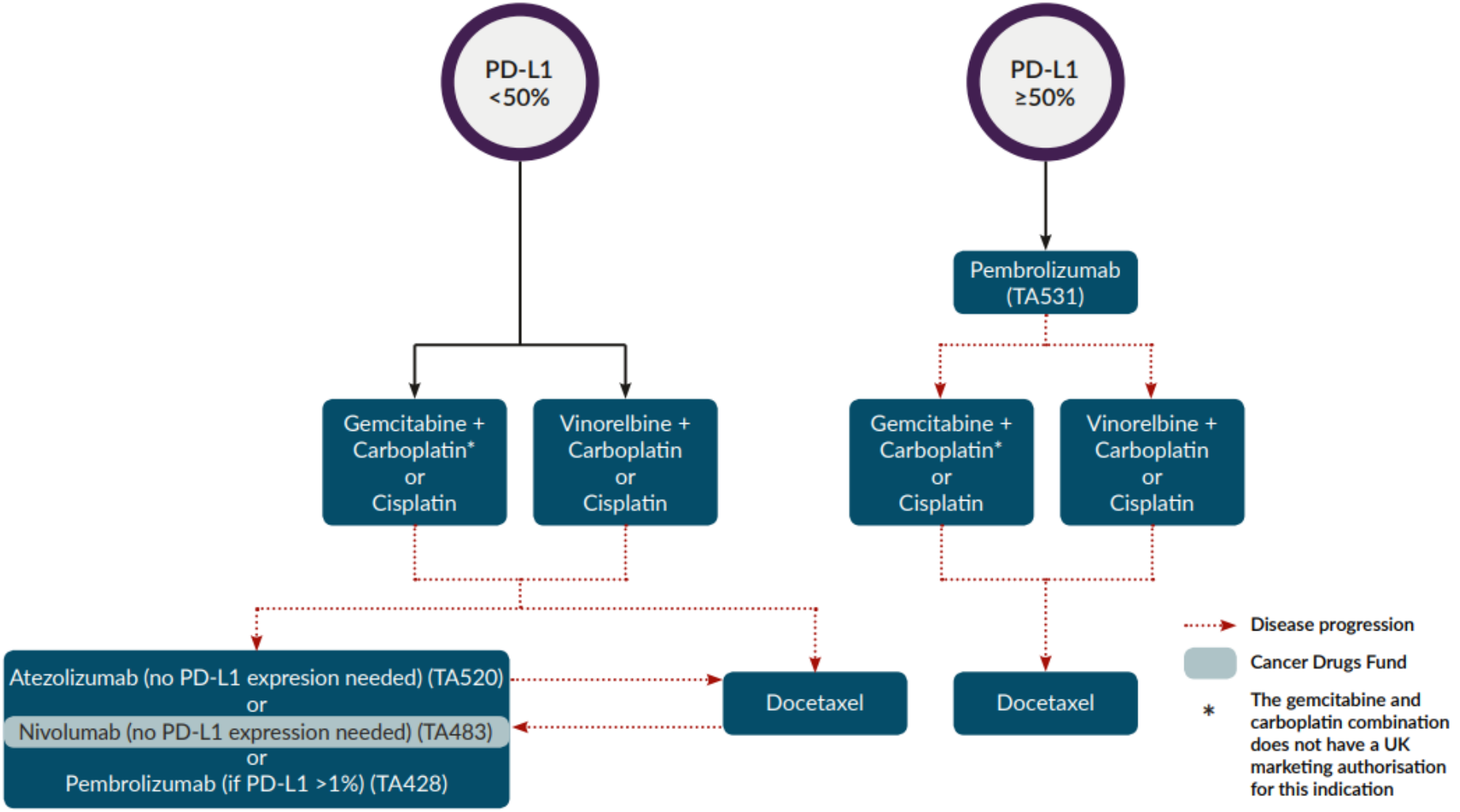
Appendix 1: Algorithm for intrathoracic nodal staging of non-small-cell lung cancer in patients being considered for radical treatment



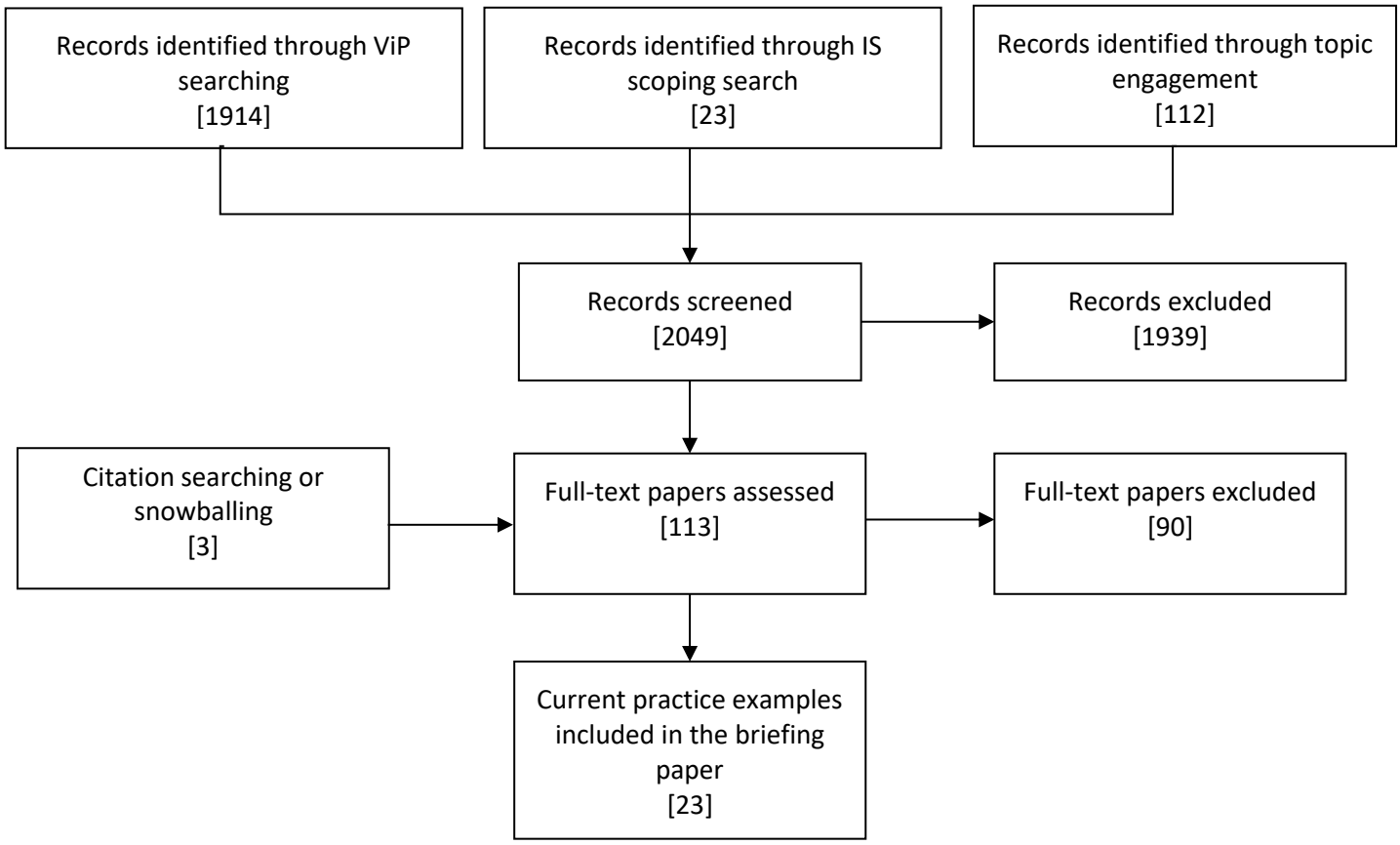
Appendix 2: Algorithm for systemic anti-cancer therapy: management options for people with non-squamous (adenocarcinoma, large cell undifferentiated) carcinoma and non-small-cell carcinoma (non-otherwise specified)



Appendix 3: Algorithm for Systemic anti-cancer therapy: management options for people with squamous non-small-cell carcinoma



Appendix 4: Review flowchart



Appendix 5: Suggestions from stakeholder engagement exercise – registered stakeholders

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
Public awareness					
1	British Thoracic Oncology Group	Public awareness of early diagnosis and lung cancer screening (where services exist). Including % of patients being offered a lung health check.	Early diagnosis is the key to improving outcomes in lung cancer. Public health is central to this. Screening for lung cancer has been shown to improve outcomes in lung cancer, and to cause 'stage shift', with more patients diagnosed at an early stage. Lung health-checks, weather in isolation or as part of a lung cancer screening program, are a central part of	Lung cancer screening has been shown to be beneficial and is a national lung cancer screening program is currently under consideration. Lung cancer screening is an ideal opportunity to undertake a lung health check, Funding for public health measures about early diagnosis is consistently under pressure.	
2	Macmillan Cancer Support	Quality Statement 1: People are made aware of the symptoms and signs of lung cancer through local coordinated public awareness campaigns that result in early presentation	This is important because there is a strong link between lung cancer mortality and socioeconomic deprivation.	Key area for quality improvement here is ensuring the targeting of local coordinated public awareness campaigns in socioeconomically deprived areas	Please see study in Thorax medical journal that notes risk of dying within 90 days of diagnosis increases for those who are socioeconomically deprived: https://thorax.bmj.com/content/thoraxjnl/70/2/161.full.pdf Initiatives such as mobile scanning trucks in supermarket car parks should continue to be targeted in deprived areas: https://www.theguardian.com/society/2019/feb/08/nhs-to-screen-for-lung-cancer-in-trucks-in-supermarket-car-parks
3	Roche Products and Roche Diagnostics UK	Key area for quality improvement 1: Public awareness	Raising patient awareness on the symptoms of lung cancer is important to encourage earlier	Lung cancer treatment outcomes depends on disease progression at diagnosis. Some patients present too	1. https://www.roycastle.org/ 2. https://www.cancerresearchuk.org/

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
			referral and diagnosis. Patient organisations such as the Roy Castle Lung Cancer Foundation[1] and Cancer Research UK (CRUK)[2] have any increasing role in supporting patients and reaching suspected and non-suspected patients (including non-smokers, women, and people younger in age). They are powerful stakeholders to support public awareness campaigns.	late to benefit from the latest treatment and diagnostic tools available. This includes smokers considered at risk, but also people not considered at risk. It is important to raise general awareness among all potential patients to benefit from the full benefits of the latest technologies. Raising public awareness can lead to earlier diagnosis, which is in line with the NHS long-term plan[3] and can generate significant cost benefits. Furthermore, raising awareness among family and community members would also drive earlier referral for patients who do not consider themselves at risk and might otherwise receive a delayed diagnosis.	3. NHS long term plan (2019). Available at: https://www.longtermplan.nhs.uk/publication/nhs-long-term-plan/
4	SCM4	Key area for quality improvement 9 Proportion of patients who are diagnosed via emergency presentation			
5	SCM7	Key area for quality improvement 1	PUBLIC AWARENESS OF EARLY DIAGNOSIS AND SCREENING	THE MESSAGES ARE NOT CLEAR ENOUGH	PUBLIC FEEDBACK
6	The Society and College of Radiographers	Key area for quality improvement 2 The Society & College of Radiographers	Despite the development of diagnosis and treatment, a large proportion of lung cancer patients are diagnosed at later stages than is preferable (beyond stage one).	Quality statement 1 in Quality Standard (QS) 17 states: 'People are made aware of the symptoms and signs of lung cancer through local coordinated public awareness campaigns that result in early presentation.'	NHS England, *Targeted screening for lung cancer with radiation dose computed tomography* https://www.england.nhs.uk/publication/targeted-screening-for-lung-cancer/

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
		advocate that locally coordinated campaigns must remain a priority in quality standards for lung cancer. Additionally, it is important to note that campaigns must use the system-wide potential of public health, health and social care staff as resources and sources of information to patients, service users and local populations: to assist in the prevention or early diagnosis of lung disease.		The Society & College of Radiographers advocate that locally coordinated campaigns must remain a priority in quality standards for lung cancer. Additionally, it is important to note that campaigns must use the system-wide potential of public health, health and social care staff as resources and sources of information to patients, service users and local populations: to assist in the prevention or early diagnosis of lung disease. We anticipate that with the development of targeted screening, artificial intelligence systems to aid diagnosis and genomic medicine driving treatment, the role of radiographers, nursing, allied health professional, scientific, psychological, imaging and therapeutic support workers will change in the future; to provide increased preventive functions, targeted screening or earlier diagnosis in a coordinated healthcare system. This offers opportunities for further development of local campaigns.	NHS England, *NHS to rollout lung cancer scanning across the UK*: https://www.england.nhs.uk/2019/02/lung-trucks/ Allied Health Solutions, *The current and potential contribution of allied health support workers to public health. End of study report* http://www.alliedhealthsolutions.co.uk/PDFs/SupportWorkforce/PHE-AlliedHealthSupportWorkerStudyReport.pdf Health Education England, *Making Every Contact Count* https://www.makingeverycontactcount.co.uk/implementing/other-examples/ Royal Society for Public Health, *Healthy conversations and the Allied Health Professionals* https://www.rsph.org.uk/uploads/assets/uploaded/58510d9a-c653-4e7a-a90133fc4c7b192e.pdf NHS Health Education England, *The Topol review* https://topol.hee.nhs.uk/
Diagnosis and staging – Diagnostic pathway					
7	British Thoracic Oncology Group	% patients receiving tissue (as opposed to clinical/radiological) diagnosis of lung cancer, and % of patients with tissue	Although not all patients should undergo biopsy to diagnose their lung cancer (for example, it is not appropriate in patients with poor performance status with no treatment options), ensuring that	Ensuring prompt reporting of molecular results is a challenge to all hospitals. There is great variation in the speed of service, and the specialist nature of the molecular tests means that in a large	National optimal Lung Cancer Pathway standards

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
		diagnosis in whom PD-L1 is reported within 1 week, and other (ALK, EGFR, ROS1) are reported within 2 weeks of pathology report publication.	all appropriate patients are fully investigated for their disease is essential. Delays in reporting of 'molecular' results which are required in order to make treatment decision can result in optimal treatment being missed, or indeed treatment being given at all if the patient becomes too unwell.	number of cancer units, these tests are sent to other institutions for processing. Pathways are complex, and often very inefficient. Delays in obtaining molecular results is one of the greatest frustrations for lung oncologists.	
8	British Thoracic Society	Key area for quality improvement 1 Implementation of the National Optimal Lung Cancer Pathway with a maximum pathway length of 49 days.	There is evidence that faster patient pathways lead to improved outcomes in outcomes for lung cancer patients.	Moving forward there is an expectation that Trusts need to achieve the targets set out in the NOLCP rather than the 62-day pathway. There is still variability in practice and speed of pathway/ diagnosis which needs to be addressed. Lung cancer outcomes remain poor in the UK compared to other compared to other comparable countries.	https://www.cancerresearchuk.org/sites/default/files/national_optimal_lung_pathway_aug_2017.pdf
9	British Thoracic Society	Key area for quality improvement 4 Improvements in radiology reporting turnaround times and direct to CT access- to speed up pathway length?	Early diagnosis is key to improving outcomes for lung cancer patients. There is a target of CXR to CT and Clinic in less than 24 hours in the NOLCP.	The NOLCP stipulates targets for radiology and reporting targets that need to be adhered to including direct access to CT-guided biopsy.	https://www.cancerresearchuk.org/sites/default/files/national_optimal_lung_pathway_aug_2017.pdf
10	Clinical Expert Group for Lung Cancer NHSE	Faster Diagnosis	There is existing and emerging evidence that outcomes for lung cancer patients are improved with faster diagnosis well beyond that expected from the lead time. This also holds true if restricted to	This means that better and more efficient organisation of care will improve survival. The National Optimal Lung cancer pathway is a national priority for implementation, supported by a number of organisations including GIRFT. It is the mechanism through which faster	The NOLCP can be found here: http://content.smallerearthtech.co.uk/system/file_uploads/16086/original/National_Optimal_LUNG_Pathway_Aug_2017.pdf

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
			people with early stage disease treated with surgery	diagnosis can be achieved and should be specifically recommended within the quality standard	
11	National Clinical Director, NHSE	2.Improvements in the implementation of the steps in the Rapid Diagnosis and Assessment Pathway for suspected lung cancer, and from April 2020, the timing of the steps to ensure patients have a diagnosis within 28 days			
12	Roche Products and Roche Diagnostics UK	Key area for quality improvement 2: Early diagnosis	Earlier diagnosis in lung cancer is crucial to improve patient experience and treatment outcomes because there are limited treatment options when presenting with advanced lung cancer (at Accident and Emergency for example). We are aligned with this priority highlighted in the NHS long-term plan1 and we support the Accelerate, Coordinate, Evaluate (ACE)2 Programme by CRUK. An important point to bear in mind is the time-to-diagnosis within the care pathway. Indeed, immunohistochemistry tests take around 48 hours and molecular	Earlier diagnosis is a key area for improvement because there is a wide variation in the referrals of lung cancer across the UK. Patients are diagnosed at different stages of the disease progression, which highlights that some areas require targeted care and specialist nurses. We suggest that a publication quantifying these differences would be highly beneficial to focus resources on areas which need it the most. This data could be pooled at Clinical Commissioning Groups level and compare the percentage of patients receiving diagnosis in A&E - when indeed, the disease has progressed significantly enough that the patient presents at secondary care.	1. NHS long term plan (2019). Available at: https://www.longtermplan.nhs.uk/publication/nhs-long-term-plan/ 2. Barbara Gill (2017) ACE Lung Cancer Pathway Cluster. Improving diagnostic pathways for patients with suspected lung cancer. Available at: https://www.cancerresearchuk.org/sites/default/files/ace_lung_pathways_final_report_v1.5.pdf

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
			tests 5 - 10 days to deliver a result. This may extend the 28-day timeframe from referral to diagnosis. Therefore, it is important to factor in the time for diagnostic test to be undertaken into the care pathway to allow for an early diagnosis as possible.		
13	Royal College of Pathologists	Pathology standards	There is a dearth of recommendations about pathology standards – even a point to the RCPath Minimum dataset would have been of value as pathology is key to diagnosis.	RCPath would like to ensure that there is some mention of pathology standards in the upcoming review as we note there is no pathologist in the group	
14	SCM1	Key area for quality improvement 3 % Pathological diagnosis	Indicator of a services performance. A pathological diagnosis is needed to give patients access/choice of treatments, particularly as new treatment modalities and combinations are dependent on pathological sub typing and predictive markers.	NLCA audit reports significant variations across the UK from 56-100%.	NCLA 2017 Audit
15	SCM1	Key area for quality improvement 5 Implementation of NLCOP or pick out certain aspects?	Implementation of the NLCOP aims to reduce the inequalities in service provision across the UK & to improve the timeliness of events. Reducing timeframes between events i.e. achieving a 'faster diagnosis', uncertainity is often cited by patients as the main cause of anxiety.	The implementation of the NLCOP has potential to revolutionise lung cancer services and as such patient experience/outcomes.	United Kingdom Lung Cancer Coalition (2016) 25 by 25: A ten year strategy to improve lung cancer survival rates Cancer Research https://www.cancerresearchuk.org/sites/default/files/national_optimal_lung_pathway_aug_2017.pdf

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
16	SCM4	Key area for quality improvement 3 Time from initial chest x-ray or referral to treatment		Variability and adds to inequalities	Cancer waiting times
17	SCM5	The proportion of cancers diagnosed at stages 1&2	The recording of stage of disease gives an indication of the success of early diagnosis interventions. With the introduction of lung health checks in the long term plan this will measure the effectiveness in driving earlier diagnosis.	Currently the recording of stage is done by the lung MDT. Information on the distribution of stage is not readily available outside of providers. When reported there is variation and data quality issues which do not enable the real baseline within the population to be understood and therefore acted upon. Lung health checks are a new intervention where it is expected to deliver a stage shift at diagnosis. By collecting this data accurately and timely success of the intervention can be measured to support further roll out.	The NHS Long term plan 2019 sets the ambition for achieving earlier diagnosis of all cancers with an expectation of a high proportion being diagnosed at stages 1&2 by 2028
18	SCM5	Reducing times to treatment by delivering a timed lung cancer pathway	The National Optimal Lung Cancer Pathway is potentially the most important initiative to improve times to treatment, increase the proportion of patients treated through better performance status, and in reducing variation in clinical practice.	Performance status worsens rapidly in some patients with lung cancer and is one of the strongest independent predictors of both receipt of treatment and outcome with potential treatment options changing whilst on a diagnostic pathway that is delayed.	Implementing a timed lung cancer diagnostic pathway (2018).
19	SCM7	Key area for quality improvement 4	STANDARDISED PRACTICES AND PATHWAYS	DIFFERENCES THROUGHOUT THE COUNTRY	NLCA
Diagnosis and staging - Investigations					
20	British Thoracic Society	Key area for quality improvement 3	Adequate tissue sampling is required to ensure testing for	There are increasing numbers of NICE-approved targeted drug therapies which	https://www.nice.org.uk/guidance/indevelopment/gid-ng10061

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
		Molecular testing should be available in all patients/ there should be equitable access to appropriate targeted treatments. Adequate tissue sampling method selected to allow sufficient tissue to be obtained for all required tests to be undertaken.	potential molecular targets can take place. Where a drug target exists patients should be offered this in line with NICE recommendations.	makes assessment of targetable mutations and molecular targets essential to ensure the most appropriate treatment is provided for each patient.	https://www.nice.org.uk/guidance/ta557 https://www.nice.org.uk/guidance/ta536 https://www.nice.org.uk/guidance/ta531 https://www.nice.org.uk/guidance/ta529 https://www.nice.org.uk/guidance/ta520 https://www.nice.org.uk/guidance/ta571 https://www.nice.org.uk/guidance/ta500 https://www.nice.org.uk/guidance/ta484 https://www.nice.org.uk/guidance/ta416 https://www.nice.org.uk/guidance/ta422
21	Medtronic Ltd	Bronchoscopy for the diagnosis of Lung Cancer	Early diagnosis of lung cancer is critical for the effective treatment of the disease. To diagnose or rule out cancer within the timeframe set out in the NHS Long Term Plan, a rapid and effective modality is required. We feel that it is important to explicitly include bronchoscopy within the quality standard.	The sequence of investigations within the 'Lung Cancer diagnosis and Management Draft Guidance (October 2018)', requires CT to be performed before an intended bronchoscopy. CT is proven to detect more nodules and early-stage cancer when compared to chest radiography, however over 96% of patients who have a low dose CT are false positives (N Engl J Med 2011; 365:395-409 DOI: 10.1056/NEJMoa1102873).	The NHS Long Term Plan gives a target of either diagnosing or ruling out cancer within 28 days of referral from a GP or from screening.

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22	Roche Products and Roche Diagnostics UK	Key area for quality improvement 3: Awareness of testing and treatments available	It is important to consider all diagnosis and treatment options to deliver an early diagnosis and the best treatment outcomes. We suggest raising awareness on all testing and treatment options available is an important aspect considering the fast pace of change in the landscape of technologies available. In regards to treatments, guidelines updated on a regular basis based on approved technology appraisals would be of great assistance to the clinical community. We also suggest publishing NICE guidelines in a peer reviewed medical journals which would allow for these to be more accessible to the global clinical community. This will be particularly pertinent in the rapidly changing landscape of immunotherapies.	The range of assays available in the area of lung cancer is rapidly evolving and it is important to keep up with the awareness and adoption pace to give patient access to the best care available. In the marketplace, there are assays that are on label for the stratification of patients for lung cancer therapies. For example, the VENTANA PD-L1 (SP263) Assay can be used for Durvalumab, Nivolumab as well as Pembrolizumab. The package insert for this assay contains all the verification and validation data for the multiple therapies. No further tests are required as this is fully validated and verified and CE-IVD approved for these indications. There are other assays available but these would require single testing for each therapy as they are not on-label for multiple drugs. The Ventana PD-L1 SP142 Assays is the only assay that is CE/IVD approved for patient selection for Atezolizumab. It is essential that laboratories are aware of the differences in assays to make an informed choice of which to use for each therapy option. We suggest it is important to educate laboratories, pharmacists and consultants on these new advancements.	1. Roche (2013): https://www.roche.de/res/content/7854/progrp_factsheet.pdf 2. Stieber & al (2006). National Academy of Clinical Biochemistry Guidelines for the Use of Tumor Markers in Lung Cancer. Tumor Biology. 27. Available at: https://www.researchgate.net/publication/242354126_National_Academy_of_Clinical_Biochemistry_Guidelines_for_the_Use_of_Tumor_Markers_in_Lung_Cancer

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				Furthermore, to maximise the use of technologies available, we suggest a test recommended by European guidelines should not be excluded if it is not recommended by NICE. As an example, the Elecsys® ProGRP is an electrochemiluminescence immunoassay (ECLIA) used for the quantitative determination of Pro-gastrin-releasing peptide (ProGRP) in human plasma and serum[1]. This assay is used to aid in the differential diagnosis in lung cancer and in the management of patients with small cell lung cancer (SCLC) in conjunction with other clinical methods. The results must be interpreted in conjunction with other methods in accordance with standard clinical management guidelines. ProGRP is elevated in early stage SCLC. However, as the incidence of SCLC in the general population is low, Elecsys® ProGRP assay testing is not recommended as a screening procedure in the general population (reference: package insert of Elecsys® ProGRP, 2018). ProGRP is a recommended marker by the National Academy of Clinical Biochemistry Guidelines for the Use of Tumor Markers in Lung Cancer[1] but not by NICE.	

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				Finally, we would like to highlight the importance of raising awareness of clinical trials, pathways and studies available. In a rapidly changing treatment landscape, the importance of having readily available and updated treatment guidelines, aligned with currently NICE approved therapies, will ensure clinicians have the appropriate knowledge of approved therapies to treat these patients appropriately.	
23	SCM2	Before radical treatment with curative intent, patients with stage II lung cancer should undergo a head CT scan, and patients with stage IIIA lung cancer should undergo a head MRI scan.	Undiagnosed metastatic disease can expose patients to the risks of radical therapy (in terms of morbidity and mortality) without the chance of benefit. It is therefore important to ensure that patients are completely staged before radical therapy.	The 2019 lung cancer guideline has made a new recommendation that stage II patients should undergo a head CT, and stage III patients should undergo a head MRI before radical therapy. The current prevalence of these practices is unknown, but will likely involve changes in the practices of many providers.	Draft lung cancer guideline update https://www.nice.org.uk/guidance/GID-NG10061/documents/short-version-of-draft-guideline
24	SCM3	Key area for quality improvement 1: Brain Imaging prior to radical treatment for NSCLC	Good evidence to suggest both clinically and economically that this is of benefit for patients with Stage II and IIIA NSCLC planned for radical therapy. Primarily patients found to have incidental brain mets can avoid surgery/ inappropriate treatment	There is evidence for brain imaging. The last NICE guideline in 2011 suggested CT brain imaging, but the 2019 update takes this further by clarifying CT brain for stage II and MRI for Stage IIIA. Implementation will require additional resource and clinicians will be keen that this does not add additional delays for	NICE LCGUT 2019 Offer contrast-enhanced brain CT to people with clinical stage II NSCLC who are having treatment with curative intent. If CT shows suspected brain metastases, offer contrast-enhanced brain MRI. [2019] 1.3.25 Offer contrast-enhanced brain MRI for people with stage IIIA NSCLC

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			and management of expectations of survival outcomes.	the definitive management of the patient.	who are having treatment with curative intent. [2019]
25	SCM4	Key area for quality improvement 4 Proportion of patients for whom nodal status affects treatment who have had a mediastinal lymph node sampling procedure performed prior to the initiation of curative-intent therapy		Refers to quality of EBUS being performed where there is large variability. New recommendation in 2019 guideline	https://www.ncbi.nlm.nih.gov/pubmed/27552438
26	SCM4	Key area for quality improvement 5 Proportion of patients with stage II or higher who have had a PET scan, brain imaging and transfer factor prior to treatment with curative intent		Incorporates new guideline recommendations and an important metric to prevent futile curative treatment	
27	SCM4	Key area for quality improvement 6 Proportion of non-surgical tissue acquisition procedures in patients with		Variability and poorly performed. Crucial to implementation of 2019 guidance	

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		advanced lung cancer who obtained an adequate amount of tissue for molecular testing			
28	SCM6	KEY AREA FOR QUALITY IMPROVEMENT 1: PET-CT scanning following initial assessment and CT and before invasive tests (including CT-guided or EBUS-TBNA or EUS-FNA) biopsy)	Following initial assessment and diagnostic CT, PET-CT scanning (in patients with or without enlarged mediastinal lymph nodes) will inform decisions regarding further invasive tests and i) minimise number of diagnostic/staging tests and ii) minimise harm	As in previous column but NB also this was one of the key amendments in the Lung cancer: diagnosis and management update 2019 (see items 1.3.18 – 1.3.21) This quality standard will have a bearing on reducing benign resection rates which, naturally, should be kept as low as reasonably achievable.	NICE Lung cancer: diagnosis and management update (2019)
29	SCM6	KEY AREA FOR QUALITY IMPROVEMENT 2: Access to at least one centre where there is experience of performing image-guided thoracic biopsy with suitably low complication rates	The NICE 2019 Lung cancer: diagnosis and management guideline update has stressed the importance for EBUS and EUS (see 1.3.9). The same principle must apply to image-guided biopsy where not only should there be radiologists skilled in performing image-guided biopsy but also have acceptably low rates of complication	As with EBUS-TBNA and EUS-FNA, image-guided biopsy of lung lesions is part and parcel of the investigation protocol in management of lung cancer and the same standards should necessarily apply to image-guided biopsy A 2018 UK survey has revealed wide variations not only in the decision-to-proceed to biopsy but also the pre-biopsy work-up and complication management. Larger studies on complications rates (specifically, pneumothoraces requiring chest drain insertion should be <10%)	Tavare AN et al Clin Radiol 2018;73:800 Moreland A et al Eur Radiol 2016:26:3483

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30	SCM6	KEY AREA FOR QUALITY IMPROVEMENT 3: The local performance of image-guided biopsy procedures	(Essentially as in Key Area No: 2 above)		
31	SCM7	Key area for quality improvement 2	TISSUE DIAGNOSIS	ENSURING MOST APPROPRIATE TREATMENT	MOLECULAR PROFILING
32	SCM8	EBUS		assessing that it is being done in a uniform and standard way as per recommendations	
33	SCM8	using MRI for brain imaging			
Diagnosis and staging - Communication					
34	The Society and College of Radiographers	Key area for quality improvement 1. The Society and College of Radiographers believe that in addition to multidisciplinary team notification, patients/service users must be sensitively and appropriately informed of examination results as soon as they are available. Preferably this will be facilitated via a one-stop clinic	To ensure that people have a positive experience of care, are kept informed of any examination results and the impact on their diagnosis and treatment at each stage of their care pathway. With reference to Quality statement 3 in Quality Standard (QS)17 there is a standard that "People with a chest X-ray result suggesting lung cancer have a copy of the radiologist's report sent to and followed up by the lung cancer multidisciplinary team." The Society and College of Radiographers believe that in addition to the multidisciplinary team, patients/service users must	Quality statement 4 says "People with known or suspected lung cancer know how to contact a named lung cancer specialist nurse between hospital visits." Is there evidence that patients understand when and how to do this in relation to receiving results - or do they wait to be contacted, assuming no news is good news? Quality statement 6 states "People with lung cancer, following initial assessment and computed tomography (CT) scan, are offered investigations that give the most information about diagnosis and staging with the least risk of harm." There is a gap between the initial assessment the CT and the patient being offered more information about diagnosis, staging and treatment. Gaps are anxiety provoking for patients,	Patients commonly ask radiographers when they will receive their results. The Society and College of Radiographers is aware that there are inconsistencies around the processes and the time taken for results to be available and discussed with the patient. https://www.cqc.org.uk/news/releases/cqc-calls-action-address-variation-radiology-reporting-timescales The Society and College of Radiographers is also aware that some centres have even gone as far as to ask radiographers not to tell the patient when to expect their result. This is not a practice we support and we do not feel it is in the best interests of the patient to avoid delivering serious

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		operating an immediate 'hot-reporting' system.	also be sensitively and appropriately informed of examination results as soon as they are available. There is currently a focus on processes and little regard to communicating with the patient at each step.	families and carers; how will the patient be informed/updated during these stages? NHS England refer to the development of one-stop clinics, operating an immediate 'hot-reporting' system. It is important to note that implementation of such systems requires the development of the whole multidisciplinary team. For example, to enable one stop clinics reporting radiographers must be available to provide immediate reports for chest X-ray in collaboration with radiologist mentors and teams.	news. We also hear from our patient group that lack of information is of great concern to them. The current quality standard does well to ensure the process runs effectively and that clinicians communicate with each other but it does less well in keeping the patient informed at every stage. There are potentially long delays during which the patient is not aware of the outcome of their results. We would prefer to see a quality statement that explicitly addresses this anxiety extending wait/delay. Please see the College of Radiographers *Patient Public and Practitioner Partnerships within Imaging and Radiotherapy: Guiding Principles* available here: https://www.sor.org/learning/document-library NHS England, *Implementing a timed lung cancer diagnostic pathway* https://www.england.nhs.uk/wp-content/uploads/2018/04/implementing-timed-lung-cancer-diagnostic-pathway.pdf Culpan, g., A-M. Culpan, Docherty, P. and Denton, E. (2019) Radiographer reporting: A literature review to support cancer workforce planning

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					https://www.radiographyonline.com/article/S1078-8174(18)30220-7/pdf
Improving health outcomes – Smoking cessation					
35	Action on Smoking and Health	Smoking cessation for patients diagnosed with lung cancer who smoke	Smoking cessation is recommended within the treatment section of NICE guidance on 'Lung cancer: diagnosis and management'.[i] Smoking cessation following diagnosis of lung cancer can substantially increase life expectancy, quality of life and enable better management of the condition, with recent research showing that those who stopped smoking and survived treatment lived 1.97 years on average compared to only 1.08 years for those who continued to smoke after lung cancer diagnosis. [ii] Furthermore, in a systematic review of the influence of smoking cessation on prognosis after diagnosis of early stage lung cancer, researchers found continued smoking to be significantly associated with increased risk of all cause mortality (hazard ratio 2.94, 95% confidence interval 1.15 to 7.54) and recurrence (HR 1.86, CI 1.01 to 3.41) in early stage non-small cell lung cancer and of all cause	The delivery of smoking cessation interventions for lung cancer patients who smoke is poor. 87% of male and 84% of female lung cancer cases in the UK are attributable to smoking. Nearly a third of lung cancer patients still smoke at diagnosis and estimates of between 13% to 60% of smokers with lung cancer continue to smoke after diagnosis.[iv] It is essential that all smokers with lung cancer are given advice to quit and are referred to specialist support, in line with NICE guidance NG92.[v] Yet, findings from an analysis of over 12,000 electronic patient records show that cancer patients receive less support from their GP to quit smoking than patients with coronary heart disease, despite the former having higher rates of smoking prevalence at diagnosis (32.0% vs 18.2%, respectively. Just 24% of cancer patients were offered advice to quit, and only 13% were prescribed treatment.[vi] One year on from diagnosis, 61.7% of cancer patients still smoked, compared to 55.4% of coronary heart disease patients, demonstrating the consequence of failure to deliver smoking cessation treatment.vi	

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			mortality (HR 1.86, CI 1.33 to 2.59), development of a second primary tumour (HR 4.31, CI 1.09 to 16.98) and recurrence (HR 1.26, CI 1.06 to 1.50) in limited stage small cell lung cancer.[iii] On the basis of data from this systematic review, five-year survival rates amongst 65 year-old patients with early stage non-small cell lung cancer who continued to smoke were estimated to be 33%, compared with 70% in those who quit smoking. Similarly, in limited stage small cell lung cancer, an estimated 29% of continuing smokers would survive for five years compared with 63% of quitters.iii	Smoking cessation treatment can increase a smoker's chances of quitting up to fourfold.[vii] Treatment for smoking cessation also only costs between £300-£6,000 per QALY,[viii,ix] thus proving to be highly cost-effective. Indeed, smoking cessation interventions compare favourably with new, high-cost lung cancer treatment drugs like pembrolizumab, which costs around £86,913 per QALY for an increased life expectancy of 1.32 years over chemotherapy according to recent research.[x] The recent Royal College of Physicians report, *Hiding in Plain Sight: Treating Tobacco Dependency in the NHS* (2018) interrogates the issue of NHS treatment of tobacco addiction in detail. The report examined NHS practices in addressing harms and costs arising from smoking among patients and argues for a comprehensive approach to treating their addiction: "*smoking cessation should be incorporated… as a systematic and opt-out component of all NHS services, and delivered in smoke-free settings. It is unethical to do otherwise*".[xi] The recent NHS Long Term Plan vindicated this conclusion, committing to offer all people admitted to hospital who	

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				smoke NHS-funded tobacco treatment services by 2023/24.[xii] It is therefore an opportune moment to improve the provision of smoking cessation support for those diagnosed with lung cancer who smoke and this should be seized upon in the quality standard.	
36	Macmillan Cancer Support	Quality Statement 1 and 5: Holistic Needs assessment to include smoking cessation support - Offer Smoking cessation for all people referred for lung cancer investigation. 1.4.3	The majority of patients who smoke on an urgent suspected lung cancer pathway will not have lung cancer but will have ongoing significant risk of poor health outcomes due to smoking	All people investigated for suspected lung cancer should have access to face to face stop smoking intervention and a prescription for appropriate NRT within 2 weeks to capitalise on the 'teachable moment.'	https://academic.oup.com/jnci/article/106/6/dju084/947357 This offer is a higher level of smoking cessation support than is recommended in NICE smoking cessation guideline
37	National Clinical Director, NHSE	1.Improvements in the uptake of smoking cessation interventions (Ottawa Model, CURE programme)			
38	SCM2	Ensure that all current smokers diagnosed with lung cancer have access to smoking cessation support including pharmacological support	Smoking is responsible for the great majority of cases of lung cancer. Continued smoking is associated with complications after radical therapy and reduced long term survival after treatment.	Smoking cessation is a highly cost effective intervention backed by NICE guidance (PH48 and NG92).	NICE guidance PH48 (secondary care) and NG92 (primary care).
39	SCM4	Key area for quality improvement 8			

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		Proportion of active smokers with lung cancer who have had smoking cessation advice delivered			
40	SCM8	smoking cessation advice		I'm not sure how this is measurable apart from ensuring that all patients are given specific advice and maybe even encouraged to attend a smoking cessation workshop(which is probably outside remit of NICE guidelines).	
41	Society for Cardiothoracic Surgery In Great Britain and Ireland	Smoking cessation	There is a definite link between smoking and development of lung cancer. There is also evidence that continuing to smoke at the time of undergoing surgery for lung cancer can lead to increased complications and/or mortality. Currently smoking cessation services vary between areas and funding has been lost for services in some regions.	Good quality smoking cessation services that can see all patients rapidly and have successful outcomes would result in lower numbers of lung cancer patients and also mean that patients with lung cancer undergoing invasive treatments would be less likely to have complications with procedures.	Agostini P, Cieslik H, Bishay E, Kalkat MS, Rajesh PB, Steyn RS, Naidu B. The impact and risk factors for Post operative Pulmonary Complications following Lung Resection in current UK practice – Are there any modifiable factors?" Thorax. 2010 Sep;65(9):815-8 Webb J, Kerr A , Thickett D , Naidu B Smoking habits of pre-surgery patients European Respiratory Journal 2015 46: PA2511 McBride CM, Ostroff JS. Teachable moments for promoting smoking cessation: the context of cancer care and survivorship. Cancer Control. 2003 Jul-Aug;10(4):325-33 Farley A, Aveyard P, Kerr A, Naidu B, Dowswell G. Surgical lung cancer patients' views about smoking and support to quit after diagnosis: a

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					qualitative study. J Cancer Surviv. 2015 Aug 23.
Improving health outcomes - Prehabilitation					
42	British Dietetic Association	Implementing prehabiliation including the nutrition components – Eat Well , nutritional Counselling and Nutrition Interventions	Ensuring nutrition is part of the rehabilitative process from decision to treat with surgery and pre chemotherapy and radiotherapy	This is not being offered comprehensively currently with different centre using different models of delivery . There are some examples of pilots and out comes in the Evidence Insight review	Macmillan published Evidence Insight review August 2017 highlighting the benefits of prehabilitation in cancer – and the nutrition components. Evidence review being launched in Jul 2019 at Prehabilitation World Congress 2019
43	Macmillan Cancer Support	Quality Statement 8, 9 and 10 Borderline fitness/multimodal assessment and performance status can be improved with access to prehabilitation for people undergoing surgical resection	There is good evidence, that prehabilitation programs have positive effects on improving health outcomes for cancer patients before and after surgery *:* Rehabilitation maximises outcomes for patients having all treatment modalities for cancer by anticipating the problems they might face during their treatment and helping people to make changes to manage these before they happen therefore about providing personalised and proactive support. Prehabilitation is a strategy to begin the rehabilitation process before surgery, and an opportunity to tackle the management of a number of risk factors such as anemia and malnutrition which may have an adverse effect on functional	Although there is insufficient evidence to support the routine functional assessment before surgery, the assessment of exercise capacity before surgery is considered pivotal in the management of patients with lung cancer, both for prognostic and therapeutic reasons. Prehabilitation could improve exercise capacity, and might increase the number of inoperable-to-operable patients and reduce postoperative morbidity and mortality Prehabilitation exercise should be undertaken prior to surgery or treatment for two primary reasons. The first is to optimize the physical status and overall medical stability before surgery and reduce postoperative morbidity in operable patients. Rehabilitation before surgery has demonstrated reduced mortality and morbidity in colorectal, heart and spinal	Prehabilitation and rehabilitation for surgically treated lung cancer patients https://www.sciencedirect.com/science/article/pii/S231130061730040X Cancer Prehabilitation An Opportunity to Decrease Treatment-Related Morbidity, Increase Cancer Treatment Options, and Improve Physical and Psychological Health Outcome http://www.integrativeoncology-essentials.com/wp-content/uploads/2013/08/Cancer-Prehabilitation-paper.pdf Cancer Prehabilitation and its Role in Improving Health Outcomes and Reducing Health Care Costs https://www.researchgate.net/publication/270516941_Cancer_Prehabilitation_and_its_Role_in_Improving_Health_Outcomes_and_Reducing_Health_Care_Costs Prehabilitation in thoracic surgery http://jtd.amegroups.com/article/view/23296/html

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			capacity and ultimately on postoperative outcomes, including recovery	surgery, and this has promoted study of the role of prehabilitation in lung resection.	Greater Manchester lung cancer prehabilitation pathway https://gmcancerorguk.files.wordpress.com/2018/03/final-version-gm-lung-cancer-prehabilitation-pathway.pdf Cancer Prehabilitation: Important Lessons From a Best Practices Model http://theoncologynurse.com/ton-issue-archive/2015-issues/march-vol-8-no-2/16357-cancer-prehabilitation-important-lessons-from-a-best-practices-model Implementing High Quality Lung Cancer Prehabilitation at Mary Washington Healthcare, Fredericksburg, VA http://cancerbulletin.facs.org/forums/Docs/Eligibility%20Requirements/ER%2011%20Rehabilitation%20Services/(ER11)%20STAR%20Rehab%20Summary%20Mary%20Washington%20(6340290).pdf Prehabilitation in lung cancer work in wales https://www.healthandcareresearch.gov.wales/uploads/2017%20annual%20conference/ANNUAL%20CONFERENCE%20PRESENTATIONS/showcase-Prehabilitation_the_step_beyond_enhanced_recovery_after_surgery.pdf The European Respiratory Society and the European Society of Thoracic Surgeons have published evidence-based guidelines on the use of

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					physical therapy programs in lung cancer patients. The suggestions were that exercise training may improve surgical risk and/or recovery, symptom control, and possibly, risk of dying following a lung cancer diagnosis A. Brunelli, A. Charloux, C.T. Bolliger, *et al.*ERS/ESTS clinical guidelines on fitness for radical therapy in lung cancer patients (surgery and chemo-radiotherapy) Eur Respir J, 34 (2009), pp. 17-41 Editorial in BMJ highlighting impact of surgery and shift from post treatment optimisation only to pretreatment intervention: Enhanced recovery protocols have contributed to early recovery, but their focus is largely on in-hospital care in the immediate postoperative period. Current approaches fail to acknowledge the role of the patient in optimising their eligibility for surgery and improving surgical outcomes https://www.bmj.com/content/358/bmj.j3702
44	Society for Cardiothoracic Surgery In Great Britain and Ireland	Pulmonary Rehabilitation	Availability of pulmonary rehabilitation both pre and post surgery for lung cancer.	There is evidence suggesting that pulmonary rehabilitation both pre and post surgical resection can result in improved outcomes for patients. In cases of patients with borderline fitness for surgery it may also result in some patients being offered surgery who may not without such a programme.	The key questions in rehabilitation in thoracic surgery. Mahendran K, Naidu B. J Thorac Dis. 2018 Apr;10(Suppl 8):S924-S930. doi: 10.21037/jtd.2018.03.147. Review

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				There is a wide variability in the availability of pulmonary rehabilitation services and often they cannot accommodate lung cancer patients in a timely fashion. Improved access to such services would benefit patients.	Effectiveness of perioperative pulmonary rehabilitation in thoracic surgery. Vagvolgyi A, Rozgonyi Z, Kerti M, Vadasz P, Varga J. J Thorac Dis. 2017 Jun;9(6):1584-1591 Prehabilitation in thoracic surgery. Sanchez-Lorente D, Navarro-Ripoll R, Guzman R, Moises J, Gimeno E, Boada M, Molins L. J Thorac Dis. 2018 Aug;10(Suppl 22):S2593-S2600. doi: 10.21037/jtd.2018.08.18. Review.
Treatment – Treatment with curative intent for NSCLC					
45	British Thoracic Oncology Group	Resection rate for patients with early stage (I and II) non-small cell lung cancer	Surgery is the preferred treatment for early stage lung cancer and is undertaken with curative intent. Higher resection rates correlate with survival and better outcomes, but the UK has historically had lower resection rates than other European countries.	Resection rates in the UK have been improving. However there remains geographical variation which is not explained my patient demographics / casemix alone.	National Lung Cancer Audit 2017 (published January 2018)
46	British Thoracic Oncology Group	% of patients with locally advanced (stage III) non-operable lung cancer who receive radical chemoradiotherapy	Radical chemotherapy, which is undertaken with curative intent, is the more recognised treatment paradigm for patients with locally advanced disease. New treatments after chemoradiotherapy, in particular adjuvant immunotherapy, have further improved the outcome of this patient group, and these treatments are NICE approved. Consequently, ensuring appropriate patients undergo	Practice is very variable in the UK, and unfortunately the commonest management of locally advanced lung cancer is best supportive care. There is a significant proportion of patients who are not being given the opportunity to have this treatment, no adjuvant immunotherapy, which are now regarded as standard of care. Ensuring that appropriate patients with locally advanced disease are properly assessed for radical chemoradiotherapy,	National Lung Cancer Audit 2017 (published January 2018) SACT database (current)

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			radical chemoradiotherapy is essential.	by a multi-disciplinary team experienced in this treatment paradigm, is required. In addition to knowing the % of patients who have radical chemoradiotherapy, it is also important to understand how many were treated concurrently and how many sequentially.	
47	British Thoracic Oncology Group	Waiting times for lung cancer treatments, in particular radiotherapy.	Delays in treatment not only cause patient distress but are also associated with worse survival.	Data on cancer waiting times are collected already. The introduction of the National Optimal Lung Cancer Pathway standards sets new targets for all hospitals. Understanding which treatment modality struggle with waiting times will allow targeting of resources to the most needed areas.	National Cancer Wait Times data National Lung Cancer Audit 2017 (published January 2018)
48	Clinical Expert Group for Lung Cancer NHSE	Reducing variation	There is ongoing evidence for unacceptable variation in treatment given and outcomes and QS should try to mitigate this. It is unacceptable that this means that people can expect different outcomes according to where they are treated. New commissioning models are required to balance the level of expertise and services	The lung cancer CEG has produced new commissioning guidance that sets out how service should be commissioned to reduce variation by, as far as possible, promoting the commissioning of equivalent expertise and equipment. It should be referenced in the QS	The service guidance is available here: http://content.smallerearthtech.co.uk/system/file_uploads/16090/original/Clinical_Advice_for_the_Provision_of_Lung_Cancer_Services_Aug_2017.pdf The National Lung cancer audit report can be can here: https://www.hqip.org.uk/resource/national-lung-cancer-audit-clinical-outcome-publication-report-2018/#.XJZYdfZ2tZQ
49	Medtronic Ltd	Minimally invasive surgery for the treatment of lung cancer.	Minimally invasive surgery is associated with improved patient outcomes and reduced rates of complications when compared to	The current standard of care within the *'Lung Cancer diagnosis and Management Draft Guidance (October 2018)'* offers people with non-small-cell	Current best practice is highlighted in the '*Lung Cancer Clinical Outcome publication in 2018'*. University Hospitals Southampton have a very

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			open surgery. We feel that it is therefore important to explicitly include minimally invasive techniques within the Quality Standard.	lung cancer (NSLC) a lobectomy by either open or thoracoscopic means. Lobectomy via minimally invasive surgery is associated with a shorter length of stay and non-inferior long-term survival when compared to an open lobectomy. (*Annals of Surgery. 269(1):163–171, JAN 2019 DOI: 10.1097/SLA.0000000000002342)*	low median length of stay of 4 days. Over 85% of lung cancer resections are being undertaken at this hospital using minimally invasive techniques, for example Video Assisted Thoracoscopic Surgery.
50	National Clinical Director, NHSE	3.Reduction in unwarranted variation – increase in commissioning and availability of NG12 direct access diagnostic tests, and reduction in inequity of access to curative surgery			
51	National Clinical Director, NHSE	4.Reduction in perioperative deaths (action from the Lung cancer clinical outcomes report, Feb 2019)			
52	Royal College of General Practitioners	Reduce variation in diagnosis and treatment across geographical areas	There is evidence of variation in diagnosis and treatment across England. Time to diagnosis and differences in treatment regimens are associated with patient survival. Ensuring the early diagnosis and best treatment for all persons with	Patients living in most deprived CCGs are less likely to be diagnosed at early stages. Different regions use different initial treatments. Variations in the use of surgical resection, radical radiotherapy and chemotherapy.	NHS England health inequalities board paper: https://www.england.nhs.uk/wp-content/uploads/2018/03/09-pb-29-03-2018-scene-setter-on-current-trends-health-inequalities.pdf Variation in treatment related to survival:

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			lung cancer in England could increase the length of people's lives.		https://thorax.bmj.com/content/73/6/530 Survival by geographical region: https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/indexoffcancersurvivalforclinicalcommissioninggroupsinengland/adultsdiagnosed2000to2015andfollowedupto2016#breast-colorectal-and-lung-cancer-one-year-survival LSHTM Cancer Survival Group:https://csg.lshtm.ac.uk/research/themes/trends-and-inequalities/
53	SCM1	Key area for quality improvement 2 1yr Survival, encompass rx standards for Surgery, SACT etc	Overall indicator of a service's overall performance	NLCA audit reports significant variations across the UK, for 1 yr survival ranges and treatment modalities.	NCLA 2017 Audit
54	SCM2	Patients undergoing radical therapy for stage IIIA lung cancer should undergo multimodality therapy with a combination of chemotherapy, radiotherapy and/or surgery, after a full	Stage IIIA lung cancer can be treated radically. Several combination regimes are possible, but single modality therapy is associated with poor results.	The 2019 lung cancer guideline update has made new recommendations on stage IIIA radical treatment (1.4.40), but treatment patterns for stage IIIA disease across the country are not fully understood. There is a risk that patients are being offered suboptimal management.	NICE lung cancer guideline update Evidence review C.

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		discussion of the treatment options.			
55	SCM3	Key area for quality improvement 3: Role of SABR for management of early stage NSCLC.	New radiotherapy technique. Increasing availability. A reasonable alternative to surgery in selected candidates.	So that this is a treatment option available to people with early stage NSCLC unsuitable for, or who decline surgery.	NICE LCGUT 2019 1.4.24 For people with stage I-IIa (T1a-T2b, N0, M0) NSCLC who decline lobectomy or in whom it is contraindicated, offer radical radiotherapy with SABR or sublobar resection. [2019] See the NICE guideline to find out why we made this recommendation and how it might affect practice. 1.4.27 For people with stage I-IIa (T1a-T2b N0, M0) NSCLC who decline surgery or in whom any surgery is contraindicated, offer SABR. If SABR is contraindicated, offer either conventional or hyperfractionated radiotherapy. [2019] SABR Consortium
56	SCM4	Key area for quality improvement 1 Proportion of patients with PS0-1, stage 1-3a treated with curative intent		Poor outcomes and variability	NLCA
57	SCM7	Key area for quality improvement 5	WATING TIMES FOR TREATMENTS, E.G. RADIOTHERAPY	ADDITIONAL STRESS AND ANXIETY FOR PATIENTS	PERSONAL EXPERIENCE

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58	SCM8	use of SABR within UK			
59	SCM8	use of concurrent chemo radiation on all suitable people and offering adjuvant durvalumab			
60	Society for Cardiothoracic Surgery In Great Britain and Ireland	Minimally Invasive Surgery	Ensuring that minimally invasive surgery is offered for all patients with early stage lung cancer.	There is now a large amount of evidence suggesting that's minimally invasive surgery for lung cancer has improved patient outcomes over open surgery in terms of length of hospital stay, pain and complications. There is also evidence showing at least equivalent or improved long term survival in patients undergoing minimally invasive surgery. There is variable use of minimally invasive techniques between surgical centres. It is suggested that all patients suitable for such techniques should be offered the option of a minimally invasive operation.	Cardiothoracic Surgery, GIRFT Programme National Specialty Report by David Richens. Postoperative pain and quality of life after lobectomy via video-assisted thoracoscopic surgery or anterolateral thoracotomy for early stage lung cancer. a randomised controlled trial. Bendixen M, Jørgensen OD, Kronborg C, Andersen C, Licht PB. Lancet Oncol. 2016 Jun;17(6):836-844. Video-assisted thoracoscopic surgery versus open lobectomy for primary non-small-cell lung cancer: a propensity-matched analysis of outcome from the European Society of Thoracic Surgeon database. Falcoz PE, Puyraveau M, Thomas PA, Decaluwe H, Hürtgen M, Petersen RH, Hansen H, Brunelli A; ESTS Database Committee and ESTS Minimally Invasive Interest Group.

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					Eur J Cardiothorac Surg. 2016 Feb;49(2):602-9. A meta-analysis of unmatched and matched patients comparing video-assisted thoracoscopic lobectomy and conventional open lobectomy. Cao C, Manganas C, Ang SC, Yan TD. Ann Cardiothorac Surg. 2012 May;1(1):16-23
Treatment – Systemic anti-cancer therapy (SACT)					
61	SCM3	Key area for quality improvement 4: SACT algorithm for advanced NSCLC	Encompasses all NICE TAs for global overview of management of advanced stage NSCLC.	Patients receive the right therapy within the correct indications of NICE TAs. Will be updated as further approvals go through.	Algorithm LCGUT 2019 NICE TAs
Treatment – Chemotherapy for SCLC					
62	British Thoracic Oncology Group	% of patients diagnosed with small cell lung cancer (SCLC) who receive chemotherapy	Small cell lung cancer is very aggressive, but is usually higher chemotherapy sensitive. Chemotherapy has been clearly shown to result in improved quality of life and survival. Even very symptomatic patients can benefit significantly from chemotherapy.	Chemotherapy treatment rates for SCLC have stalled, and remain below National Standard targets, and below clinically acceptable levels. Chemotherapy remains an absolutely vital part of the management of SCLC. Ensuring that all appropriate SCLC patients are treated with chemotherapy is a quality indicator of service.	National Lung Cancer Audit 2017 (published January 2018)
63	SCM1	Key area for quality improvement 4 All small cell lung cancer patients are	Small cell lung cancer often progresses over a period of days – weeks, early access to chemotherapy can significantly alter the clinical course.	NLCA audit reports significant variations across the UK from 28 -100% accessing chemotherapy	NCLA 2017 Audit

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		considered for chemotherapy & commenced within 14 days of diagnosis.			
Care and support – Clinical Nurse Specialist					
64	Macmillan Cancer Support	Quality Statement 4: People with known or suspected lung cancer have access to a named lung cancer clinical nurse specialist who they can contact between scheduled hospital visits	People from socioeconomically deprived backgrounds are more likely to have lower levels of self-efficacy and health literacy. The provision of a clinical nurse specialist who can keep the patient informed is therefore vital. Outcomes are significantly improved with access to a Lung Cancer CNS and holistic assessment People unlikely to be able to access treatment will have their needs better met if have access to a holistic needs assessment	The availability of clinical nurse specialists must be targeted towards deprived areas, as the provision can be patchy – 1 in 8 people will not be assigned a clinical nurse specialist in hospital. There is variability in access to a lung cancer CNS and workforce issues suggest lack of people to fulfil roles to ensure equity of access, suggesting CNS teams involving other roles like support workers to support holistic assessment and support The study by The University of Nottingham and London South Bank University (LSBU) and funded by the charity, Dimbleby Cancer Care also highlighted if people with lung cancer were over 75 or not able to have treatment they were less likely to have access to a lung cancer CNS and a holistic needs assessment	In this study of 2413 participants, the participants identified average 5.5 (4.7) concerns, financial concerns being most frequent. However, patients are less likely to be screened for other concerns, such as practical, social, and financial concerns: https://onlinelibrary.wiley.com/doi/full/10.1002/cam4.1709 A study looking at the picture of lung cancer care in England, found that patients with lung cancer experience significantly better outcomes in terms of life expectancy, avoiding unnecessary hospital admissions and managing the effects of treatment when cared for by specialist lung cancer nurses. The research team used anonymised patient healthcare records available from Public Health England and a nationwide survey of lung cancer nurse specialists (LCNS), analysing more than 100,000 people with lung cancer and more than 200 nurses across England. https://www.nottingham.ac.uk/news/pressreleases/2018/july/care-provided-by-specialist-cancer-nurses-helps-

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					improve-life-expectancy-of-patients-with-lung-cancer-says-new-study.aspx http://www.dimblebycancercare.org/care-provided-by-specialist-cancer-nurses-helps-improve-life-expectancy-of-patients-with-lung-cancer-says-new-study/ Study evaluating impact on access to treatment id people with lung cancer have access to a CNS https://bmjopen.bmj.com/content/5/12/e008587 Macmillan workforce census https://www.macmillan.org.uk/_images/cancer-workforce-in-england-census-of-cancer-palliative-and-chemotheraphy-speciality-nurses-and-support-workers-2017_tcm9-325727.pdf Thinking differently report https://www.macmillan.org.uk/documents/policy/thinking-differently.pdf
65	SCM1	Key area for quality improvement 1 Clinical Nurse Specialist available to every pt from initial referral throughout pathway (inclu HNA &	Access to a CNS is recommended within NICE guidance. CNS availability should be available throughout a patient's pathway, facilitating HNA* at key stages e.g. diagnosis, start/end of treatment, disease progression. As survival improves, treatment modalities become more complex and ongoing, patients & their	Research ie MCS: CNS positively impacts the patient experience/outcomes. Evidence of significant variation in access to CNS & downward trend in NLCA report 2017. Only 71 % of patients seen by a CNS & only 58% seen by a CNS at time of diagnosis.	NLCA Organisational Audit NLCA 2017 Audit https://www.rcplondon.ac.uk/projects/national-lung-cancer-audit NICE Lung cancer guideline

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		associated interventions)	families face new challenges as they 'live with & beyond' their cancer thus requiring specialist support/advice. The CNS is the 'key worker' that can provide continuity and facilitate multidisciplinary interventions. 'CNS' provision may include CNS/ANP's specialising in the clinical setting i.e. diagnostic, oncology, surgery, SPC, of importance is the patient being aware of who their 'key worker' is & how to contact them. *To elicit concerns/care needs, facilitate access to information & services to meet those needs	NLCA Organisational audit demonstrated significant variation in CNS resource, with only 19% reaching the suggested standard. NCPES report demonstrates needs of patients are not being met e.g. financial help, someone to discuss their worries.	
66	SCM4	Key area for quality improvement 2 Proportion of patients seen by lung cancer CNS at diagnosis and during their pathway		Poor compliance and variability. Been shown to linked to outcomes and patient experience	NLCA
Care and support – Holistic needs assessment					
67	British Dietetic Association	Undertake nutritional assessment from diagnosis and at key stages in the pathway	Unintentional weight loss is common in patients with cancer and is often the first sign of disease in patients with lung cancer. NICE new suspected cancer guideline 2015 cites both	There is currently variable levels of screening in this group and access to oncology dietitians. This could be an extension of the holistic needs assessment and carried out for all patients form diagnosis	Mariani et al 2012- Weight loss in cancer patients ;a plea for a better awareness of the issue .Support Cancer Care.20;2.

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			weight loss and loss of appetite in their list of key symptoms for recognition and referral		Nutritional screening is recommended by the Quality Care Commission , Department for Health (2010) NICE CG Nutrition support for adults ;oral nutritional support , enteral tube feeding and parenteral. 2017.
68	British Dietetic Association	Including nutrition and dietary support from a specialist oncology dietitian in Optimal radiotherapy quality statement 11	Optimal radiotherapy quality statement 11 should include nutritional assessment and support. Oesophagitis affects up to 30 % of lung cancer patients receiving radiotherapy- which is likely to affect nutritional status and may affect ability to complete treatment	The current assessment and support is variable , inadequate support can result in treatment stoppages and preventable hospital admissions	Kiss N, Isenring E, Gough K, et al (2014) The prevalence of weight loss during (chemo)radiotherapy treatment for lung cancer and associated patient- and treatment-related factors. Clin Nutr. 33(6):1074-80.
69	Macmillan Cancer Support	Quality Statement 5: People with lung cancer are offered a holistic needs assessment (HNA) at each key stage of care that informs their care plan and the need for referral to specialist services	People from socioeconomically deprived backgrounds have higher levels of unmet needs in terms of practical, financial and emotional support, and have worse outcomes in terms of communication and information from healthcare professionals.	Ensuring that people from the most deprived backgrounds have consistent access to high quality Holistic Needs Assessments that are more than a tick-box exercise, taking into account their needs. HNAs should screen for things beyond clinical needs such as financial problems.	1 in 8 people not assigned a clinical nurse specialist in hospital: https://www.quality-health.co.uk/resources/surveys/national-cancer-experience-survey/2013-national-cancer-patient-experience-survey-reports/301-2013-national-cancer-patient-experience-survey-programme-national-report/file People who are assigned a clinical nurse specialist in hospital are 49% more likely to be given easy-to understand written information about the type of cancer they have: https://www.macmillan.org.uk/documents/aboutus/whatwedo/cancerintheuk2014.pdf

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70	National Clinical Director, NHSE	5.Improvements in patient experience and Quality of Life metrics			
Care and support – Follow-up after treatment					
71	Society for Cardiothoracic Surgery In Great Britain and Ireland	Standardisation of lung cancer follow up with low dose CT.	Currently there is a wide variety of follow up plans used for patients who have had surgery for lung cancer. These normally include either CT or chest x-ray. There has been a move towards increased use of CT in follow up and less frequent outpatient appointments. It would be beneficial for patients and staff to have a standard follow up protocol with CT and virtual or face to face follow up.	There is no clear follow up pathway for patients following lung cancer surgery. There is evidence that CT follow up picks up recurrent disease earlier and when combined with virtual follow up may be more cost effective than other models which often use more frequent outpatient review and chest x-rays. CT and virtual follow up also means patients need to attend hospital less frequently when well and is often preferred by patients.	Lou F, Huang J, Sima CS, et al. Patterns of recurrence and second primary lung cancer in early-stage lung cancer survivors followed with routine computed tomography surveillance. J Thorac Cardiovasc Surg. 2013;145(1):75-81; discussion -2. Hanna WC, Paul NS, Darling GE, et al. Minimal-dose computed tomography is superior to chest x-ray for the follow-up and treatment of patients with resected lung cancer. J Thorac Cardiovasc Surg. 2014;147(1):30-3. Crabtree TD, Puri V, Chen SB, et al. Does the method of radiologic surveillance affect survival after resection of stage I non-small cell lung cancer? J Thorac Cardiovasc Surg. 2015;149(1):45-52, 3.e1-3.
72	SCM2	Offer nurse-led follow up after radical treatment for lung cancer.	The organisation of follow up can significantly affect people's experience of care, and might improve outcome. There is evidence and NICE guidance for nurse-led models of follow up.	The NICE lung cancer guideline states "offer protocol-driven follow up by a lung cancer clinical nurse". This is based on randomised trial evidence, but current quality standards state only "can include…nurse led follow up". These two are not aligned.	Current NICE quality standard 14 and draft lung cancer guideline 1.6.2.
73	SCM7	Key area for quality improvement 3	OPTIMAL FOLLOW UP	RELAPSES	PHYSICIAN COMMENTS

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Palliative care – Enhanced supportive care					
74	British Dietetic Association	Include dietitians in the palliative care team in quality statement 15 – Palliative interventions	Up to 60% of advanced lung cancer patients will develop anorexia cachexia- they will suffer from a range of nutrition impact symptoms which could be addressed with nutritional interventions to support Quality of Life	ESPEN guidelines on nutrition and cancer patients 2016 recognise that this group need nutritional advice support for quality of life. There are Clinical practice guidelines on cancer cachexia in advanced cancer patients support nutrition interventions EPCRC2010 and on artificial nutrition and cancer where dietitian can support with appropriate and timely nutrition support .This is vital as more palliative treatments become available in the lung cancer population and patients are impacted by nutrition impact symptoms which could be identified and addressed when the dietitians role is recognised as part of the palliative multidisciplinary team	MENAC ;The multimodal exercise, nutrition and anti-inflammatory treatment for cachexia trial is ongoing and is likely to provide more supporting evidence ESPEN guidelines on ethical aspects of artificial nutrition and hydration 2016
75	British Thoracic Society	Key area for quality improvement 2 All patients with metastatic disease should be given access to palliative/ enhanced supportive care.	It is important to ensure that all patients who are deemed not fit for SACT/Radiotherapy or surgery have full access to palliative care services, including the provision of palliative interventions. Any patients with advanced disease should be referred for enhanced supportive care input early in their pathway.	Not all areas have access to enhanced supportive care and this has been shown to improve survival and quality of life in patients with lung cancer.	Can early palliative care with anticancer treatment improve overall survival and patient-related outcomes in advanced lung cancer patients? A review of the literature. Ambroggi M, Biasini C, Toscani I, Orlandi E, Berte R, Mazzari M, Cavanna L. Support Care Cancer. 2018 Sep;26(9):2945-2953. doi: 10.1007/s00520-018-4184-3. Epub 2018 Apr 27.
76	Clinical Expert Group for Lung Cancer NHSE	Patient experience and supportive care	There remain limited evidence for lung cancer experience from the National survey, this is related to the short life expectancy for many patients. Other research is characterising the most important reported symptoms that cause	A recommendation for the inclusion of enhanced supportive care for all advanced stage patients within the QS would be in keeping with current UK practice	The latest meta-analysis is available here: https://www.ncbi.nlm.nih.gov/pubmed/28034065

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			distress. The role of supportive care in this important. There is also evidence that early enhanced supportive care may improve survival		
77	Macmillan Cancer Support	Quality Statement 15: Earlier referral into specialist palliative care services – based on paragraph from draft lung cancer diagnosis and management (update) - People with lung cancer have access to all appropriate palliative interventions delivered by expert clinicians and teams. 1.5.2 Identify and refer people who may benefit from specialist palliative care 7 services without delay. [2005]	There is good evidence that early palliative care in cancer patients can improve outcomes by reducing symptom burden, and improving quality and sometimes length of life.	Whilst there is some good evidence for early palliative care in the lung cancer group, more could be done to encourage referral at point of diagnosis or understand who would benefit from referral at diagnosis, and to understand the specific areas where this impacts quality of life.	https://bmcpalliatcare.biomedcentral.com/articles/10.1186/s12904-018-0285-5 Age and sex moderate the effects of early palliative care for patients with advanced lung cancer. Early palliative care may need to be tailored to individuals' unique sociodemographic and clinical characteristics. https://journals.sagepub.com/doi/abs/10.1177/0269216317751893 https://www.ncbi.nlm.nih.gov/pubmed/29704108 https://www.ncbi.nlm.nih.gov/pubmed/29739231 This study showed that early palliative care may optimize patient selection for chemotherapy receipt leading to reduced use of high-intensity therapy by focusing on quality of life in accordance with patients' performance, preferences and goals of care. https://www.sciencedirect.com/science/article/abs/pii/S1556086418331848
78	Macmillan Cancer Support	Quality Statement 15:	Patients with lung cancer who are admitted to hospital (either	Early palliative care involvement is associated with an increased chance of people dying in their preferred place of	https://ascopubs.org/doi/full/10.1200/EDBK_201369

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		All patients admitted to hospital with lung cancer should be offered a palliative/supportive care referral section 1.2.8 and 1.5.2	diagnosis as emergency or as a complication of treatment/ disease progression) have worse outcomes than others	death and a reduction in health care costs	
Palliative care – Management of brain metastases					
79	SCM3	Key area for quality improvement 2: Management of Brain metastases in NSCLC	The Quartz study brings new evidence that whole brain radiotherapy may not add survival benefit for patients with NSCLC with brain mets, especially if of poor performance status.	Aids clinical decision making to determine equal provision of WBXRT to patients as individual interpretation of the data offered by the Quartz has been different around the regions – standardisation of care provided.	Quartz Study, Mulvenna et al, 2016 The Lancet NICE LCGUT 1.5.16 See NICE's recommendations on brain metastases. Consider palliative whole-brain radiotherapy for patients with symptomatic brain metastases with good performance status (WHO 0 or 1).
Additional areas – Lung cancer screening					
80	Clinical Expert Group for Lung Cancer NHSE	Screening for lung cancer	There are now two larger RCTs that have demonstrated efficacy of CT screening and a national screening programme of higher risk people is being piloted. This is supported by a protocol to ensure that the activity is performed at the appropriate standard to maximise benefit and minimised harm	Although this has only just started, it has the potential to make major changes to outcome in lung cancer, but services must be prepared and assess the impact on the rest of the lung cancer service. The QS should refer to this in the planning of services as many cancer alliances are already planning for this	The protocol can be found here: https://www.england.nhs.uk/wp-content/uploads/2019/02/targeted-lung-health-checks-standard-protocol-v1.pdf
81	Siemens Healthineers	How can we capture the early detection of lung	There is good evidence to support the increased access and use of	Evidence from UK trials in Liverpool & Manchester show an improvement :	Published data from Manchester (Wythenshawe) and Liverpool trials would support this improvement

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		cancer using CT imaging rather than chest Xray. Recent announcement by NHS England (Feb 2019) to appoint 10 regions to carry out early detection of lung cancer in adults using low dose CT scanners	CT scanners to better identify lung cancers. Technology has enabled scanners to provide diagnostics at lower dose than previous.	1.early detection of lung cancers, 2.survival rates and 3.uptake by patients at risk. A shift in the detection of lung cancers from stage 4 to stage 1/ 2 as a result of this intervention.	
82	Society for Cardiothoracic Surgery In Great Britain and Ireland	Screening programmes for lung cancer	There has been evidence from the national lung screening trail and more recently from the Nelson trial that screening high risk groups for lung cancer results in decreased mortality from the disease	From the recent studies it appears a formalised screening programme would pick up lung cancers at an earlier stage and results in decreased lung cancer mortality.	Reduced lung-cancer mortality with low-dose computed tomographic screening. National Lung Screening Trial Research Team, Aberle DR, Adams AM, Berg CD, Black WC, Clapp JD, Fagerstrom RM, Gareen IF, Gatsonis C, Marcus PM, Sicks JD. N Engl J Med. 2011 Aug 4;365(5):395-409 WCLC 2018: NELSON Study: CT Screening for Early Lung Cancer Reduces Lung Cancer Mortality The International Association for the Study of Lung Cancer 19th World Conference on Lung Cancer (Abstract PL02.05).
Additional areas – Resources for MDT's					
83	SCM4	Key area for quality improvement 7		Would allow appropriate resourcing, improving quality of care and reducing variation	https://www.ncbi.nlm.nih.gov/pubmed/30661021

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		Whether the multi-disciplinary team is adequately resourced to deliver the service according to the NHS England specification			
Additional areas – Funding to develop diagnostic tests and treatments					
84	Roche Products and Roche Diagnostics UK	Key area for quality improvement 4: Broad availability of next-generation sequencing tests and treatments for lung cancers with rare mutations	There is a need for broad funding of next-generation sequencing (NGS) tests and a defined pathway to ensure the successful roll-out of trials and the funding of treatments for patients with rare types of mutated lung cancer. In the last ten years, it has become evident that subsets of non-small-cell lung carcinoma (NSCLC) can be further defined at the molecular level by recurrent 'driver' mutations that occur in multiple oncogenes, including AKT1, ALK, BRAF, EGFR, HER2, KRAS, MEK1, MET, NRAS, PIK3CA, RET, and ROS1. Mutations can be found in all NSCLC histologies and in current, former, and never smokers. Indeed, never smokers with adenocarcinoma have the highest incidence of EGFR, HER2, ALK, RET, and ROS1 mutations[1].	Presently, NGS tests are predominantly paid for privately, which creates an inequality in the system. Unfortunately, even if a mutation is found, most of the treatments are neither licensed nor reimbursed due to poor clinical trial data (predominantly due to the small population, hence the viability of clinical trials). Personalised lung cancer treatment via NGS and appropriate treatment in the future, will ensure that all lung cancer patients receive the most optimised treatment available for their sub-set of lung cancer.	1. Lovly, C., L. Horn, W. Pao. 2018. Molecular Profiling of Lung Cancer. My Cancer Genome. Available at: https://www.mycancergenome.org/content/disease/lung-cancer/ (Last updated: March 2016).

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85	Roche Products and Roche Diagnostics UK	Key area for quality improvement 5: Funding of treatments for lung cancers with poor prognosis (e.g. small cell lung cancer)	SCLC is an aggressive neuroendocrine tumour characterised by early metastasis and accounts for 13–15% of all lung cancers. SCLC is a more aggressive cancer than NSCLC and can lead to early widespread metastases. Two-thirds of SCLC diagnoses are extensive-stage small cell lung cancer (ES-SCLC) due to the tendency to metastasise early. The current standard of care for ES-SCLC is Carboplatin-Etoposide and advances in treatment have not occurred in this disease for twenty years. The survival rate is poor and new treatments, such as immunotherapies are needed to improve outcomes for patients diagnosed with SCLC. Thus, there is a medical need to fund these new treatments for lung cancers with poor prognosis.	Survival from SCLC in England is worse than in some European countries with a 5-year survival rate of only 5%. The 5-year survival rate is lower for ES-SCLC patients than for all SCLC patients at less than 1% with current standard of care carboplatin and etoposide. The National Lung Cancer Audit (NLCA) data from 2004–2011 comprising information from lung cancer patients in England showed that median survival was four months for ES-SCLC (performance status 0–4) patients, of which 69% of all SCLC patients in the audit received chemotherapy[4]. In addition, there has been little improvement in the survival rates of SCLC patients in recent years as demonstrated by analysis of data from a US cancer centre, where the 5-year overall survival rates have increased from 8.3%	1. Woolhouse I. Variation in lung cancer outcomes in the UK and Europe. Clin Med (Lond). 2011;11(2):110-1. 2. Coleman MP, Forman D, Bryant H, Butler J, Rachet B, Maringe C, et al. Cancer survival in Australia, Canada, Denmark, Norway, Sweden, and the UK, 1995-2007 (the International Cancer Benchmarking Partnership): an analysis of population-based cancer registry data. Lancet. 2011;377(9760):127-38. 3. Walters S, Maringe C, Coleman MP, Peake MD, Butler J, Young N, et al. Lung cancer survival and stage at diagnosis in Australia, Canada, Denmark, Norway, Sweden and the UK: a population-based study, 2004-2007. Thorax. 2013;68(6):551-64. 4. Khakwani A, Rich AL, Tata LJ, Powell HA, Stanley RA, Baldwin DR, et al. Small-Cell Lung Cancer in England: Trends in Survival and Chemotherapy Using the National Lung Cancer Audit. PLoS ONE. 2014;9(2):e89426.

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					5. Schabath MB, Nguyen A, Wilson P, Sommerer KR, Thompson ZJ, Chiappori AA. Temporal trends from 1986 to 2008 in overall survival of small cell lung cancer patients. Lung Cancer. 2014;86(1):14-21.
General comments					
86	DHSC	Thank you for the opportunity to comment on the topic engagement for the above quality standard. I wish to confirm that the Department of Health and Social Care has no substantive comments to make, regarding this consultation.			
87	National Clinical Director, NHSE	Is there anything else happening in the topic area which you think may be of interest to the committee? • Targeted Lung Health Checks programme https://www.england.nhs.uk/publication/targeted-screening-for-lung-cancer/ • GIRFT team will be completing a review of all lung cancer services in 2019/20 and 2020/21			
88	Roy Castle Lung Foundation	As the secretariat for the NHSE Lung Cancer Clinical Expert Group, we are happy to support the CEG's submission.			
89	Royal College of Radiologists	We asked our members for feedback on this exercise, but unfortunately received no responses.			
90	SCM4	Additional evidence sources for consideration National lung cancer audit quality indicators, NHS England lung cancer service specification quality standards http://documents.roycastle.org/Lung_Service_SpecificationV8DRAFT.pdf , American College of Chest physicians			

[i] NICE. [CG121] Lung cancer: diagnosis and management. April 2011.
[ii] Koshiaris C, Aveyard P, Oke J, Ryan R, Szatkowski L, Stevens R, Farley A. Smoking cessation and survival in lung, upper aero-digestive tract and bladder cancer: cohort study. *British Journal of Cancer* October 2017; 117, 1224-1232
[iii] Parsons A, Daley A, Begh R, Aveyard P. Influence of smoking cessation after diagnosis of early stage lung cancer on prognosis: systematic review of observational studies with meta-analysis. BMJ. 2010;340:b5569.
[iv] Walker M, et al. Smoking relapse during the first year after treatment for early-stage non-small-cell lung cancer. Cancer, Epidemiology, Biomarkers & Prevention 2006; 15(12): 2370-2377
[v] NICE. [NG92] Stop smoking interventions and services. March 2018.

[vi] Farley A, Koshiaris C, Oke J, Ryan R, Szatkowski L, Stevens R, Aveyard P. Physician support of smoking cessation after diagnosis of lung, bladder, or upper aerodigestive tract cancer. Ann Fam Med. September 2017; 15(5) 443-450
[vii] West R. Stop smoking services: increased chances of quitting. NCSCT Briefing #8. 2012:
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