# Evidence relevant to the guide for the investigation of symptoms of lung cancer

November 2012



Endorsed by



*Evidence relevant to the guide for the investigation of symptoms of lung cancer* was prepared and produced by the Department of General Practice, Monash University, for:

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## Foreword

Lung cancer is the leading cause of cancer death in both males and females in Australia. Its high mortality rate is a result of both a high incidence rate and low survival. While survival from lung cancer has increased for both sexes, the 5-year relative survival from this disease remains low at only 14%.

Poor survival is due, at least in part, to the relatively high proportion of people diagnosed at an advanced stage. Evidence also suggests that many people with lung cancer have not been appropriately referred for treatment.

*Investigating symptoms of lung cancer: a guide for GPs* has been developed to provide guidance on the appropriate investigation and referral of people with symptoms that may be lung cancer. The guide provides a systematic approach to the assessment of symptoms, to enable earlier diagnosis and appropriate and timely referral into the lung cancer care pathway, based on evidence contained in this document.

This document and the guide emphasise the importance of referring patients to multidisciplinary team care, providing a coordinated approach to treatment planning and delivery which is evidence-based and individualised.

We anticipate that the information and guidance contained in the guide will impact positively on clinical practice, furthering our goal of reducing the mortality from lung cancer and improving the wellbeing of people affected by this disease.



Dr Helen Zorbas  
CEO  
Cancer Australia

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### Contributors

Cancer Australia gratefully acknowledges the support of the many individuals and groups who contributed to the development of this report. See Appendix C for more information.

## Part 1 Investigating symptoms of lung cancer: a guide for general practitioners

### Investigating symptoms of lung cancer: a guide for GPs

This guide was developed to assist GPs to manage people who have or may have lung cancer and support the early and rapid referral into the cancer care pathway. This is a general guide to appropriate practice to be followed subject to the clinician's judgement in each individual case. The guide is based on the best available evidence and expert consensus. August 2012.

**Lung cancer is the most common cause of cancer death in Australia. Symptoms of lung cancer can often be non-specific thereby hindering early diagnosis and treatment.**

#### Lung cancer in Australia1

* Lung cancer is the fourth most commonly diagnosed invasive cancer in Australia. Around 6000 men and 3800 women were diagnosed with lung cancer in Australia in 2007.
* Lung cancer is the leading cause of cancer death, for both non-Indigenous and Indigenous men and women.
* Only 14% of those diagnosed with lung cancer survive five years after diagnosis.
* The incidence of lung cancer is strongly related to age, with over 80% of new lung cancers diagnosed in people aged 60 years and older.
* While tobacco smoking is the largest single cause of lung cancer, people who have never smoked may also be diagnosed with lung cancer.3 About 90% of lung cancer in males and 65% in females is estimated to be a result of tobacco smoking.
* Indigenous people are about 1.7 times as likely to be diagnosed with lung cancer as non-Indigenous people. This difference may be partly explained by higher rates of smoking by Indigenous adults.

#### Risk factors for lung cancer1

##### Lifestyle factors:

* Tobacco smoking\*

##### Environmental factors:

* Passive smoking
* Radon exposure
* Occupational exposure e.g. asbestos, diesel exhaust4
* Air pollution

##### Personal factors:

* Age
* Family history of lung cancer
* Previous lung diseases

##### \*Differences in smoking rates may occur by:

* Geographical area
* Socio-economic status
* Aboriginal and Torres Strait Islander status
* Country of birth

#### Recommendations to facilitate referral and patient support

* Ensure referrals are timely and provide relevant and sufficiently detailed information to the specialist
* Provide the patient with information that clearly describes:
* where the patient is being referred
* who the patient will see (for example, which specialist)
* what the patient can expect from the specialty service
* the expected timeframes.
* Advise the patient to carry their previous imaging results when they attend a new chest X-ray or chest CT scan.
* Advise the patient to stop smoking, and offer nicotine replacement therapy and/or other therapies to assist the patient to stop smoking.
* Ensure the patient's need for continuing support is addressed whilst they are waiting for their referral appointment. Where possible, provide culturally-appropriate information and support.
* Share information between healthcare professionals about:
* the management plan
* what the patient has been told
* what the patient has understood (where possible)
* the involvement of other healthcare professionals
* any advance decision made by the patient with regard to end-of-life care
* other relevant patient information.

#### The role of multidisciplinary teams in early diagnosis and patient care

**Multidisciplinary care is the best practice approach to providing evidence-based cancer care.**

The GP's role is vital in the early and rapid referral of patients with suspected lung cancer to lung cancer multidisciplinary teams (MDTs).

Aboriginal Health Workers provide a critical link for Aboriginal and Torres Strait Islander people with cancer in providing information, support and co-ordination to improve health outcomes.

Multidisciplinary care (MDC) is an integrated team-based approach to cancer care where medical and allied health care professionals consider all relevant treatment options and collaboratively develop an individual treatment and care plan for each patient.5

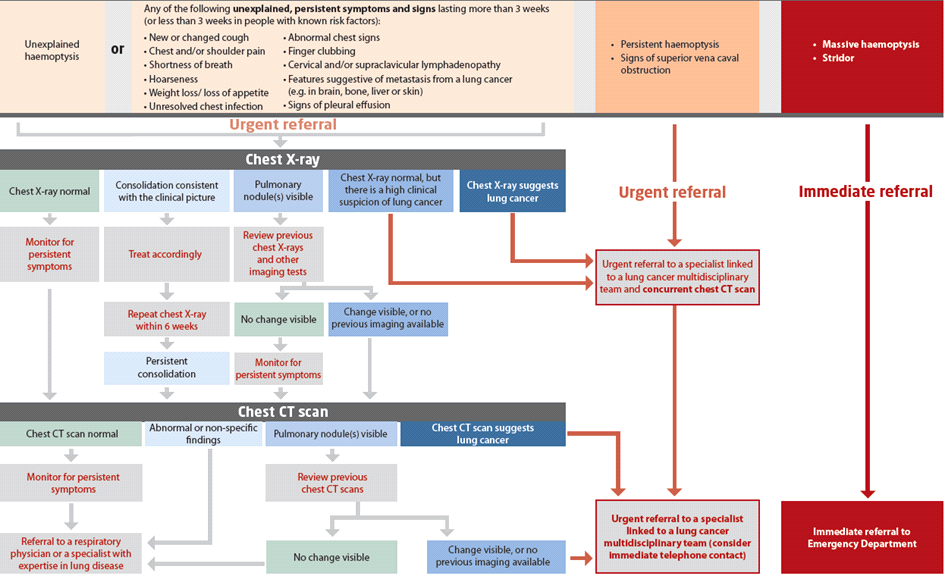
Evidence indicates that a team approach to cancer care can improve patient survival and quality of life, improve delivery of best practice care in accord with evidence-based guidelines, improve coordination of care, and facilitate the provision of information and support for patients.6,7

In lung cancer, a small number of available studies have found improved survival of patients8,9 who had been diagnosed via an MDT.10,11,12 MDC has also been associated with improved patient satisfaction, increased rates of surgical resection, radical radiotherapy, chemotherapy and timeliness of care.13

The existence of lung cancer MDTs across Australia provide the mechanism to improve patient care, outcomes and address variations in care.

**References** 1. AIHW & Cancer Australia 2011. Lung cancer in Australia: an overview. Cat. No. CAN 58. Canberra: AIHW. 2. AIHW 2012. Cancer survival and prevalence in Australia: period estimates from 1982 to 2010. Cat. No. CAN 65. Canberra: AIHW. 3. Hippisley-Cox J, Coupland C. Br J Gen Pract. 2011 November; 61(592): e715-e723. 4. Benbrahim-Tallaa L, Baan R et al Lancet Oncol 2012 July; 13(7):663-644 5. NBOCC. Multidisciplinary Care in Australia: A National Demonstration Project in Breast Cancer. NBOCC. Camperdown, NSW 2003. 6. Wilcoxon H, Luxford K, Saunders C, Peterson J & Zorbas H. Asia Pac J Clin Oncol 2011;7:34-40. 7. Saini KS, Taylor C, Ramirez AJ, Palmieri C, et al. Ann Oncol 2012;23(4):853-9. 8. Price A, Kerr G, Gregor G, Ironside J, Little F. Radiother Oncol 2002;64 (Suppl. 1):80. 9. Forrest LM, McMillan DC, McArdle CS, Dunlop DJ. Br J Cancer 2005;93:977-78. 10. Murray PV, O'Brien ME, Sayer R, et al. Lung Cancer 2003;42(3):283-90. 11. Martin-Ucar AE, Waller DA, Atkins JL, et al. Lung Cancer 2004;46:227-32. 12. Dillman RO, Chico SD. J Oncol Pract 2005;1:84-92. 13. Coory M, Gkolia P, Yang IA, Bowman RV, Fong KM. Lung Cancer 2008;60(1):14-21.

### Symptoms and signs



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## Part 2 Investigating symptoms of lung cancer: a guide for general practitioners - recommendations

### 2.1 Background

Lung cancer poses an enormous burden on the Australian health system and economy, causing more deaths per annum than breast, prostate and ovarian cancers combined.1 The symptoms of lung cancer can often be non-specific thereby hindering early diagnosis and contributing to the high mortality rate associated with late diagnosis.2

Patients with symptoms of lung cancer are likely to present to general practitioners (GPs) as part of routine primary care or during the management of other diseases such as chronic obstructive pulmonary disease, chronic heart failure and coronary heart disease.3 As the symptoms for chronic obstructive pulmonary disease, chronic heart failure and coronary heart disease can present in a similar manner to early symptoms for lung cancer, an early diagnosis of lung cancer can be missed.3 It is important, therefore, to enhance awareness of the risks and symptoms of lung cancer and provide GPs with the most recent evidence to assist them to pursue appropriate referral pathways in order to facilitate the early detection and management of lung cancer. Strategies to increase awareness of lung cancer, including an awareness of risk factors, benefits of treatment, effective investigation of symptoms and the importance of referral to a multidisciplinary team (MDT), which may facilitate diagnosis at an earlier stage.4,5 This guide is intended for use by GPs.

### 2.2 Scope and purpose

This guide is intended to be a concise, easy to refer to, easily accessible, evidence based tool for GPs on the effective investigation, and timely referral to a MDT, of patients who have or may have lung cancer.

The guide provides advice about:

* incidence of lung cancer
* broad overview of risk factors and preventive activities
* initial investigations
* diagnosis and staging
* referral pathways
* patient support/information for patients and carers
* service organisation and MDT function.

Screening and an appropriate assessment of risk are not part of this guide. Ongoing projects regarding risk assessment are being undertaken as part of the Cancer Australia Lung Cancer Initiative.

This guide provides information to assist in the management of adult patients (18 years and older) who present to a GP or an Aboriginal Community Controlled Health Service, who shows symptoms of lung cancer (these might be demonstrated as a symptom of a co-existing morbidity). The guide provides information about adults with a risk of non-small-cell lung cancer and adults with a risk of small cell lung cancer. The guide does not provide advice on the following:

* adults with mesothelioma
* adults with lung metastases arising from primary cancers originating outside the lung
* children (younger than 18) with lung cancer
* adults with rare lung tumours (for example, pulmonary blastoma), and
* adults with benign lung tumours (for example, bronchial adenoma).

### 2.3 Health questions

The health questions addressed in this guide are:

**Symptoms of lung cancer:** What are the symptoms or combinations of symptoms that are likely to indicate lung cancer?

**Investigations:** How effective are diagnostic and staging investigations in patients with suspected lung cancer?

**Referral:** Effective follow up of suspected lung cancer - red flags, referral pathways.

### 2.4 Recommendations

Many of the recommendations in this guide were adapted or endorsed from the New Zealand Guidelines Group (NZGG) guidelines, *"Suspected cancer in primary care: guidelines for investigation, referral and reducing ethnic disparities"* (NZGG 2009)6, National Institute of Clinical and Health Excellence guidelines, "The *diagnosis and treatment of lung cancer"* (NICE 2011)7, or American College of Chest Physicians guidelines, *"Diagnosis and Management of Lung Cancer"* (ACCP 2007)8-14. More detail about the process used to derive these recommendations can be found in Part 3.

Where there are differences in the wording of endorsed recommendations, please note these have been updated by the Expert Advisory Panel (EAP; Appendix C) to ensure consistency of wording for this guide.

Table 1 Summary of recommendations

| Symptoms and signs | Evidence base and Source | Adaptation |
| --- | --- | --- |
| 1 Investigate symptoms of lung cancer in patients with the following risks:   * lifestyle factors: * tobacco smoking, former tobacco smoking. * environmental factors: * passive smoking * radon exposure * occupational exposure, e.g. previous exposure to asbestos, diesel exhaust * air pollution. * personal factors: * age * family history of lung cancer * smoking-related chronic obstructive pulmonary disease * previous lung diseases * history of cancer especially head and neck cancer. | International expert opinion, NZGG 2009 | Adapted to include risks identified in AIHW 2011 and IARC 2012 |
| 2 Urgently refer a patient for a chest X-ray if they have:   * unexplained haemoptysis   OR   * any of the following unexplained, persistent symptoms and signs (lasting more than 3 weeks or less than 3 weeks in patients with known risk factors): * new or changed cough * chest and/or shoulder pain * shortness of breath * hoarseness * weight loss/loss of appetite * unresolved chest infection * abnormal chest signs * finger clubbing * cervical and/or supraclavicular lymphadenopathy * features suggestive of metastasis from a lung cancer (for example, in brain, bone, liver or skin) * signs of pleural effusion. | International expert opinion, NZGG 2009 | Reworded to include "new or changed" cough, "unresolved chest infection" and signs of pleural effusion" |

| Investigation | Evidence base and Source | Adaptation |
| --- | --- | --- |
| 3 Review previous chest X-rays and other relevant imaging tests in every patient with a pulmonary nodule(s) that is visible on chest X-ray. | Level III-3, ACCP 2007 | Accepted with no changes |
| 4 Refer any patient with risk factors for lung cancer, who has clinical and chest X-ray features of pneumonia for a repeat chest X-ray within 6 weeks to confirm resolution. | International expert opinion, NZGG 2009 | Reworded to include "has clinical and chest X-ray features of pneumonia" |
| 5 After urgent referral for chest X-ray, ensure the chest X-ray is completed, reported and reviewed as soon as possible. | International expert opinion, NZGG 2009 | Reworded to replace "the chest X-ray should be completed and reported within one week" with "ensure the chest X-ray is completed, reported and reviewed as soon as possible" |
| 7 Review previous imaging tests in every patient with a pulmonary nodule(s) that is/are visible on chest CT scan. | Level III-3, ACCP 2007 | Reworded from "indeterminate single pulmonary nodule" to "pulmonary nodule(s)" |
| 8 In the general practice setting sputum cytology is not recommended for the investigation of lung cancer due to its low sensitivity and increased risk of delay. | International expert opinion, NZGG 2009 | Reworded to qualify this statement to relate to the general practice setting and include limitations of the  test |
| 9 If a chest X-ray is normal and symptoms persist, refer the patient for a chest CT scan. | New Recommendation  Australian local expert advisory panel consensus statement | — |
| 10 If a chest CT scan is normal and symptoms persist, refer the patient to a respiratory physician (or a designated specialist with expertise in lung disease). | New Recommendation  Australian local expert advisory panel consensus statement | — |

| Referral | Evidence base and Source | Adaptation |
| --- | --- | --- |
| 11 Immediately refer a patient to an emergency department if any of the following are present:   * massive haemoptysis * stridor. | International expert opinion NICE 2011, with adaptations by the Australian local expert advisory panel consensus | Reworded to recommend immediate referral to emergency department for symptoms of massive haemoptysis and stridor, regardless of smoking status |
| 12 Urgently refer a patient to a specialist linked to a lung cancer multidisciplinary team, while awaiting results of a chest CT, if the patient has:   * persistent haemoptysis and are smokers or former smokers aged 40 years or older or who have other risk factors, * signs of superior vena caval obstruction (swelling of the face/neck with fixed elevation of jugular venous pressure), or * a chest X-ray suggestive of lung cancer (including pleural effusion and slowly resolving consolidation). | International expert opinion, NZGG 2009  International expert opinion, NICE 2011 | Reworded to include "specialist linked to a lung cancer multidisciplinary team" |
| 13 Urgently refer a patient to a specialist linked to a lung cancer multidisciplinary team if a chest X-ray or CT scan suggests lung cancer (including pleural effusion and slowly resolving consolidation). | International expert opinion, NICE 2011 | Reworded to include "specialist linked to a lung cancer multidisciplinary team" |
| 14 Urgently refer a patient to a specialist linked to a lung cancer multidisciplinary team, while awaiting results of a chest CT scan, if the patient has a normal chest X-ray, but there is a high suspicion of lung cancer. | International expert opinion, NZGG 2009 | Reworded to replace "referral to specialist" with "referral to a specialist linked to a lung cancer multidisciplinary team, while awaiting the results of a chest CT scan" |
| 15 Consider immediate telephone contact with an appropriate specialty service when the patient has a high index of suspicion of lung cancer. | International expert opinion, NZGG 2009 | Reworded to include reference to lung cancer |
| 16 Ensure referrals:   * are made in a timely manner, and * provide relevant and sufficiently detailed information to the specialist, including the most appropriate way to contact the patient. | International expert opinion, NZGG 2009 | Accepted with no changes |
| 17 Ensure that the patient is aware of the timeframes, where available, for:   * receiving an acknowledgment of the referral, or * being seen by a specialist or an investigation service. | International expert opinion, NZGG 2009 | Accepted with no changes |
| 18 When a patient presents with signs or symptoms suggestive of lung cancer, provide information that clearly describes:   * where the patient is being referred * by whom the patient will be seen * what a patient can expect from the speciality service. | International expert opinion, NZGG 2009 | Reworded to include reference to lung cancer |
| 19 Advise patients to carry their previous imaging results when they attend for a new chest X-ray or chest CT scan. | New recommendation  Australian local expert advisory panel consensus statement | — |
| 20 Advise patients to stop smoking, and advise the patient why this is important. | Level III-3, NICE 2011 | Reworded to remove "as soon as the diagnosis of lung cancer is suspected" |
| 21 Offer nicotine replacement therapy and other therapies to assist patients to stop smoking. | Level III-3, NICE 2011 | Accepted with no changes |
| 22 Address the patient's need for continuing support while the patient is waiting for a referral appointment(s). Include inviting the patient to contact the GP again if the patient has concerns or further questions before their specialist appointment. | International expert opinion, NZGG 2009 | Accepted with no changes |
| 23 Where possible, provide culturally-appropriate information and support. | International expert opinion, NZGG 2009 | Reworded to replace "enquire about a person's ethnicity to ensure that the person's health care preferences can be met" with "provide culturally-appropriate information and support" |
| 24 Share information between healthcare professionals about:   * the management plan * what the patient has been told * what the patient has understood (where possible) * the involvement of other agencies and healthcare professionals * any advance decision made by the patient with regard to end-of-life care * other relevant patient information. | Level IV, NICE 2011 | Reworded to include "other relevant patient information" and exclude "any problems the patient has" |

## Part 3 Investigating symptoms of lung cancer: a guide for general practitioners - evidence base and development process

### 3.1 Adaptation methodology

This guide was developed using the ADAPTE framework for guideline adaptation.15 The ADAPTE framework is an internationally-accepted rigorous and evidence-based process which is used to assess the appropriateness and quality of guidelines and to adapt selected high quality guidelines to a local context. The guideline development process is described in: The ADAPTE Collaboration 2009. *The ADAPTE Process: Resource toolkit for Guide Adaptation. Version 2.0.* Available from <http://www.g-i-n.net>.15

#### 3.1.1 Set-up phase

A multidisciplinary expert advisory panel (EAP; Appendix C) was convened to oversee the development of this guide. Membership to the panel included a consumer, GPs, medical oncologist, a radiologist, respiratory physician, thoracic surgeon, and a representative from the Cancer Service Networks National Program (CanNET). The EAP oversaw the project and was responsible for determining the health questions as identified in sections 3.2. The EAP was supported by the Monash University project team and Cancer Australia staff who provided project management and technical support for the development of the guide.

#### 3.1.2 Adaptation phase

##### 3.1.2.1 Guideline selection for adaptation

A search to identify relevant guidelines was conducted in May 2011 using the following websites and the search term "lung cancer":

* The Cochrane Library
* Clinical Guidelines Portal
* National Guidelines Clearinghouse
* International Guidelines Database
* Institute for Clinical Systems Improvement
* New Zealand Guidelines Group (NZGG)
* Scottish Intercollegiate Guidelines Network
* Centre for Reviews and Dissemination
* National Comprehensive Cancer Network (NCCN).

This search yielded a total of 71 guidelines for lung cancer. At the EAP meeting held on 24 May 2011, the list was reviewed. A shortlist of 13 guidelines were considered relevant for consideration of rigour of development and levels of evidence through the AGREE process (Appendix A).16

Quality appraisal of evidence-based guidelines was undertaken. The following 13 guidelines were assessed using the AGREE process:

* The diagnosis and treatment of lung cancer - update (UK, NICE 2011)7
* Guidelines for treatment of cancer: small cell lung cancer (USA, NCCN 2011a)17
* Guidelines for treatment of cancer: non-small cell lung cancer (USA NCCN 2011 b)18
* Early stage and locally advanced (non-metastatic) non-small-cell lung cancer: ESMO clinical practice guidelines for diagnosis, treatment and follow-up (Eur ESMO 2010a)19
* Metastatic non-small-cell lung cancer: ESMO clinical practice guidelines for diagnosis, treatment and follow-up (Eur ESMO 2010b)20
* Small-cell lung cancer: ESMO clinical practice guidelines for diagnosis, treatment and follow-up (Eur ESMO 2010c)21
* General principles of care. In: Suspected cancer in primary care: guidelines for investigation, referral and reducing ethnic disparities. (NZ NZGG 2009)6
* Evaluation of patients with pulmonary nodules: when is it lung cancer?: ACCP evidence-based clinical practice guidelines (2nd Ed)(USA ACCP 2007a)10
* Initial diagnosis of lung cancer: ACCP evidence-based clinical practice guidelines (2nd Ed) (USA ACCP 2007b)12
* Initial evaluation of the patient with lung cancer: symptoms, signs, laboratory tests, and paraneoplastic syndromes: ACCP evidenced-based clinical practice guidelines (USA ACCP 2007c)13
* Chronic cough due to lung tumors: ACCP evidence-based clinical practice guidelines (2nd Ed) (USA ACCP 2006)8
* Guidelines for management of small pulmonary nodules detected on CT scans (USA Fleischner Society 2005)22
* Clinical practice guidelines for the prevention, diagnosis and management of lung cancer (AUS NHMRC 2004)23

Each guideline was appraised independently by two members of the project team. The two members then met face to face to establish consensus about AGREE scores. The scores were tabled at the EAP meeting held on 1 August 2011 for review. The EAP selected three guidelines for further consideration as these guidelines produced the highest overall AGREE scores (NICE 20117, NZGG 20096 and ACCP 20078-14 guidelines). The ACCP 20078-14 guidelines were considered as a single guideline given that the same methodological processes were used for each chapter of these guidelines.

##### 3.1.2.2 Guideline recommendation inclusion criteria

After the EAP selected guidelines for further consideration, the currency and consistency of recommendations in the three guidelines were reviewed for inclusion in this guide.

The project team contacted the guideline developers and the lead author of the three selected guidelines by email, for the purpose of requesting information about the currency of those guidelines. The guideline developers advised the project team that those guidelines were the most recent version.

In order to assess whether the recommendations included in the three guidelines were a comprehensive account of the available literature, the project team assessed the search strategies used by the guideline developers.

The search strategies for the NICE and NZGG guidelines were comprehensive. The search strategy for the ACCP guidelines were comprehensive in some aspects while other aspects appeared to be less comprehensive. The project team reviewed the evidence summaries accompanying each guideline to assess whether the recommendations were consistent with the research evidence, and the extent to which the recommendations reflected this evidence.

The developers of the NICE7, NZGG6 and ACCP8-14 guidelines, in formulating recommendations for each guideline, utilised different methodologies to represent the level of evidence supporting recommendations:

* the NICE 20117 guideline did not include levels of evidence assigned to recommendations, but accompanied recommendations with a qualifying statement and a separate evidence summary document that included detailed evidence tables. Not all summaries were explicitly linked to the recommendations, however the detail of individual studies could be ascertained from the accompanying evidence tables
* the NZGG 20096 guideline represented the evidence supporting recommendations with grades of evidence. All recommendations endorsed from this guideline were represented with a Grade C level. A Grade C was defined as "the recommendation is supported by international expert opinion"
* the ACCP 20078-14 guidelines utilised a grading system consisting of two types of recommendations (strong and weak) and two dimensions (the ratio of benefit to harm and the quality of evidence).11

As each guideline developer used different criterion for describing the strength of evidence, the project team relabelled these levels of evidence according to the National Health and Medical Research Council (NHMRC) Evidence Hierarchy: designations of 'levels of evidence' (Appendix B). The NICE 2011 guideline development group, advised by stakeholders, decided not to update the evidence on symptoms and referrals. The NZGG 2009 development group undertook a systematic evidence review of the literature regarding all components of symptom and referral. The ACCP guidelines development group commissioned separate agencies to undertake full systematic reviews on small cell lung cancer and non-small cell lung cancer. The outcomes of the systematic literature reviews were then crafted into separate guidelines by several multidisciplinary groups of clinicians and researchers. The project team assessed the ACCP reviews as part of the AGREE process for this project during the AGREE process. The ACCP guideline group conducted a separate review process for the ACCP Chronic Cough guideline, however a review was not available for this project. The accompanying evidence summaries included in the NICE7, NZGG6 and ACCP8-14 guidelines are closely reflected in the recommendations in these guidelines.

##### 3.1.2.3 Synthesising recommendations

Recommendations for inclusion in this guide were selected by the EAP using a staged consensus process, which was developed by the EAP and endorsed by the Project Steering Group prior to commencement of the process. The process was:

* the EAP agreed to indicate levels of evidence where they exist
* if no consensus existed then this would be stated in the guide
* the project team would keep a record of any gaps in evidence or areas where there was no consensus
* where recommendations were to be made by consensus this would equate to at least 75% of the EAP membership agreeing on a decision.

The comprehensiveness, applicability and acceptability of recommendations were considered, with the following questions used to guide the discussion:

* is the necessary expertise (knowledge and skills) available in the context of use?
* are there any constraints, organisational barriers, legislation, policies, and/or resources in the healthcare setting of use that would impede the implementation of the recommendation?
* is the recommendation compatible with the culture and values in the Australian setting?
* does the benefit to be gained from implementing this recommendation make it worth implementing?24

### 3.2 Supporting evidence and information for recommendations

#### 3.2.1 Symptoms of lung cancer: What are the symptoms or combinations of symptoms that are likely to indicate lung cancer?

Table 2 Signs and Symptoms: recommendations, source, evidence and adaptation

| Symptoms and signs | Evidence base and Source | Adaptation |
| --- | --- | --- |
| 1 Investigate symptoms of lung cancer in patients with the following risks:   * lifestyle factors: * tobacco smoking, former tobacco smoking. * environmental factors: * passive smoking * radon exposure * occupational exposure, e.g. previous exposure to asbestos, diesel exhaust * air pollution. * personal factors: * age * family history of lung cancer * smoking-related chronic obstructive pulmonary disease * previous lung diseases * history of cancer especially head and neck cancer | International expert opinion, NZGG 2009 | Adapted to include risks identified in AIHW 2011 and IARC 2012 |
| 2 Urgently refer a patient for a chest X-ray if they have:   * unexplained haemoptysis   OR   * any of the following unexplained, persistent symptoms and signs (lasting more than 3 weeks or less than 3 weeks in patients with known risk factors): * new or changed cough * chest and/or shoulder pain * shortness of breath * hoarseness * weight loss/loss of appetite * unresolved chest infection * abnormal chest signs * finger clubbing * cervical and/or supraclavicular lymphadenopathy * features suggestive of metastasis from a lung cancer (for example, in brain, bone, liver or skin) * signs of pleural effusion. | International expert opinion, NZGG 2009 | Reworded to include "new or changed" cough, "unresolved chest infection" and"signs of pleural effusion" |

The risk groups identified in the NZGG 2009 guidelines were endorsed by the EAP. Additional risks that were identified in a recent review by the Australian Institute of Health and Welfare25 and the identification of diesel engine exhaust as a carcinogenic to humans by International Agency for Research on Cancer in June 201226 were also included in this guide. This guide provides GPs with a brief summary of risks and red flags, to prompt follow up and investigation for lung cancer.

The evidence to support the recommendations about signs and symptoms were endorsed from the NZGG 2009 guidelines.6 In developing these recommendations the EAP also considered the symptoms and signs as outlined in the NICE 2011 guidelines and ACCP 2007 guidelines. The NZGG 2009 guidelines were selected for endorsement as they utilised an updated review of the literature, which was undertaken as a supplement to the consideration of the NICE 2005 guidelines.27 The NICE 2011 guidelines endorsed the NICE 2005 guidelines without the undertaking of a further systematic review. The NICE 2005 guidelines were based on a systematic review by Beckles et al.2S The ACCP 2007 guidelines were based on this same review.28 No guidelines or literature were available to recommend any combination of symptoms that were more indicative of lung cancer than others.

#### 3.2.2 Investigations: How effective are diagnostic and staging investigations in patients with suspected lung cancer?

Table 3 Investigations: recommendations, source, evidence and adaptation

| Investigation | Evidence base and Source | Adaptation |
| --- | --- | --- |
| 3 Review previous chest X-rays and other relevant imaging tests in every patient with a pulmonary nodule(s) that is visible on chest X-ray. | Level III-3, ACCP  2007 | Accepted with no changes |
| 4 Refer any patient with risk factors for lung cancer, who has clinical and chest X-ray features of pneumonia for a repeat chest X-ray within 6 weeks to confirm resolution. | International expert opinion, NZGG 2009 | Reworded to include "has clinical and chest X-ray features of pneumonia" |
| 5 After urgent referral for chest X-ray, ensure the chest X-ray is completed, reported and reviewed as soon as possible. | International expert opinion, NZGG 2009 | Reworded to replace "the chest X-ray should be completed and reported within one week", with "ensure the chest X-ray is completed, reported and reviewed as soon as possible" |
| 6 Perform chest computed tomography (CT) in every patient with a pulmonary nodule(s) that shows change on chest X-ray or if no previous imaging is available. | Level III-3, ACCP 2007 | Reworded from "indeterminate single pulmonary nodule" to "a pulmonary nodule(s) that shows change on chest X-ray or if no previous imaging is available" |
| 7 Review previous imaging tests in every patient with a pulmonary nodule(s) that is/are visible on chest CT scan. | Level III-3, ACCP 2007 | Reworded from "indeterminate single pulmonary nodule" to "pulmonary nodule(s)" |
| 8 In the general practice setting sputum cytology is not recommended for the investigation of lung cancer due to its low sensitivity and increased risk of delay. | International expert opinion, NZGG 2009 | Reworded to qualify this statement to relate to the general practice setting and include limitations of the test |
| 9 If a chest X-ray is normal and symptoms persist, refer the patient for a chest CT scan. | New recommendation  Australian local expert advisory panel consensus statement |  |
| 10 If a chest CT scan is normal and symptoms persist, refer the patient to a respiratory physician (or a designated specialist with expertise in lung disease). | New recommendation  Australian local expert advisory panel consensus statement |  |

Chest X-ray, chest CT scan, sputum cytology, spirometry and a complete blood count were considered as first-line investigations for lung cancer in the NZGG 2009, NICE 2011 and ACCP 2007 guidelines.

The recommendation for chest X-ray in this guide was endorsed from the recommendation in the NZGG 2009 guidelines and the NICE 2011 guidelines. The NICE 2011 guidelines endorsed a review that was undertaken for the development of the 2005 NICE guidelines.27 The evidence reviewed by the NICE 2005 guidelines group included one systematic literature review.29 The NICE 2005 group concluded that chest X-ray was the mandatory first-line investigation for lung cancer. The NZGG 2009 guideline group reviewed the evidence in the NICE 2005 guidelines and highlighted further evidence, including a literature review30, population-based case-control study31 and a retrospective case-series study32, to conclude that although there is a risk of false negatives with a chest X-ray, this is still the most appropriate first-line investigation for lung cancer.

The recommendations for chest CT in this guide were endorsed in the NICE 2011 guidelines, which in turn had endorsed the recommendations of the NICE 2005 guidelines. The NICE 2005 review of literature regarding the use of chest CT as a diagnostic method for lung cancer included two studies.33, 34 These studies indicated high sensitivity of chest CT (ranging from 88-100%) with lower specificity (ranging from 3677%). The positive predictive value and negative predictive values were 62.3-90.2% and 71.4-100%, respectively. The NICE 2005 guidelines concluded that chest CT provides useful information about the positioning of lesions which can be used by specialists to inform further diagnostic tests.

Chest CT should include both the chest and upper abdomen, preferably with thin sections through the nodule. It is also important that the chest CT performed is a contrast CT. In Australia, it is routine practice to use a contrast chest CT and to include the upper abdomen when performing a chest CT. The EAP, therefore, did not develop a specific recommendation to support this guidance.

To improve the identification of changes over a period of time, the EAP endorsed the recommendation by the ACCP 2007 for reviewing previous imaging tests when viewing the results of a chest X-ray or chest CT scan. The EAP further clarified that changes on a chest CT scan can become visible over time. The EAP aimed to support implementation of this recommendation by including an additional consensus-based recommendation to advise patients to carry all previous imaging test results with them and present these to the radiologist when they attend an appointment for a chest X-ray or chest CT scan. The EAP supported two new consensus based recommendations. The first was 'if a chest X-ray is normal and symptoms persist, the GP should refer the patient for a chest CT scan' and the second, 'if a chest CT scan is normal and symptoms persist, the GP should refer the patient to a respiratory physician, or a designated specialist with expertise in lung disease'.

Sputum cytology was also considered in the NZGG 2009 and NICE 2011 guidelines. Both guidelines used the evidence in the NICE 2005 guidelines to reach consensus agreements that sputum cytology should be either recommended with reservations (NICE 2011) or not recommended (NZGG 2009) due to its indiscriminant nature. The NICE 2005 guidelines referred to one systematic literature review35 and one diagnostic study36 which showed sensitivity of 22-33% and specificity of 94-99% for sputum cytology. Positive predictive value and negative predictive values were 91-93% and 38-94%, respectively. This literature review, which included an assessment of 17 studies, found that sensitivity for sputum cytology was increased in the detection of centrally located masses (71%) compared with peripherally located masses (49%).35 In light of this finding the EAP considered that sputum cytology is not advisable for the investigation of lung cancer within the GP setting, where undertaking this test would risk delaying referral. Sputum cytology is, however, a valid option for the investigation of central masses if access to other diagnostic investigations is limited. The EAP endorsed the recommendation in the NZGG 2009 guidelines, whilst noting the limitations of the test based on its low sensitivity.

Access to spirometry tests by practising GPs is not uniform throughout Australia. As such, the EAP excluded this method of investigation for GPs.

#### 3.2.3 Referral: Effective follow up of suspected lung cancer - red flags, referral pathways

Table 4 Referral: recommendations, source, evidence and adaptation

| Referral | Evidence base and Source | Adaptation |
| --- | --- | --- |
| 11 Immediately refer a patient to an emergency department if any of the following are present:   * massive haemoptysis * stridor. | International expert opinion NICE 2011, with adaptations by the Australian local expert advisory panel consensus | Reworded to recommend immediate referral to emergency department for symptoms of massive haemoptysis and stridor, regardless of smoking status |
| 12 Urgently refer a patient to a specialist linked to a lung cancer multidisciplinary team, while awaiting results of a chest CT, if the patient has:   * persistent haemoptysis and are smokers or former smokers aged 40 years or older or who have other risk factors, * signs of superior vena caval obstruction (swelling of the face/neck with fixed elevation of jugular venous pressure), or * a chest X-ray suggestive of lung cancer (including pleural effusion and slowly resolving consolidation). | International expert opinion, NZGG 2009  International expert opinion, NICE 2011 | Reworded to include "specialist linked to a lung cancer multidisciplinary team" |
| 13 Urgently refer a patient to a specialist linked to a lung cancer multidisciplinary team if a chest X-ray or CT scan suggests lung cancer (including pleural effusion and slowly resolving consolidation). | International expert opinion, NICE 2011 | Reworded to include "specialist linked to a lung cancer multidisciplinary team" |
| 14 Urgently refer a patient to a specialist linked to a lung cancer multidisciplinary team, while awaiting results of a chest CT scan, if the patient has a normal chest X-ray, but there is a high suspicion of lung cancer. | International expert opinion, NZGG 2009 | Reworded to replace "referral to specialist" with "referral to a specialist linked to a lung cancer multidisciplinary team, while awaiting the results of a chest CT scan" |
| 15 Consider immediate telephone contact with an appropriate specialty service when the patient has a high index of suspicion of lung cancer. | International expert opinion, NZGG 2009 | Reworded to include reference to lung cancer |
| 16 Ensure referrals:   * are made in a timely manner, and * provide relevant and sufficiently detailed information to the specialist, including the most appropriate way to contact the patient. | International expert opinion, NZGG 2009 | Accepted with no changes |
| 17 Ensure that the patient is aware of the timeframes, where available, for:   * receiving an acknowledgment of the referral, or * being seen by a specialist or an investigation service. | International expert opinion, NZGG 2009 | Accepted with no changes |
| 18 When a patient presents with signs or symptoms suggestive of lung cancer, provide information that clearly describes:   * where the patient is being referred * by whom the patient will be seen * what a patient can expect from the speciality service. | International expert opinion, NZGG 2009 | Reworded to include reference to lung cancer |
| 19 Advise patients to carry their previous imaging results when they attend for a new chest X-ray or chest CT scan. | New recommendation  Australian local expert advisory panel consensus statement |  |
| 20 Advise patients to stop smoking, and advise the patient why this is important. | Level III-3, NICE 2011 | Reworded to remove "as soon as the diagnosis of lung cancer is suspected" |
| 21 Offer nicotine replacement therapy and other therapies to assist patients to stop smoking. | Level III-3, NICE 2011 | Accepted with no changes |
| 22 Address the patient's need for continuing support while the patient is waiting for a referral appointment(s). Include inviting the patient to contact the GP again if the patient has concerns or further questions before their specialist appointment. | International expert opinion, NZGG 2009 | Accepted with no changes |
| 23 Where possible, provide culturally-appropriate information and support. | International expert opinion, NZGG 2009 | Reworded to replace "enquire about a person's ethnicity to ensure that the person's health care preferences can be met" with "provide culturally-appropriate information and support" |
| 24 Share information between healthcare professionals about:   * the management plan * what the patient has been told * what the patient has understood (where possible) * the involvement of other agencies and healthcare professionals * any advance decision made by the patient with regard to end-of-life care * other relevant patient information. | Level IV, NICE 2011 | Reworded to include "other relevant patient information" and exclude "any problems the patient has" |

The high mortality rates for lung cancer are related, in part, to the late stage of diagnosis of the disease.25 The NICE 2011 guidelines highlight that factors contributing to this late-stage diagnosis are practitioner- and patient-related delays in diagnosis or the lack of symptoms present at early stages of lung cancer. The EAP agreed that the prompt and effective referral for suspected lung cancer is likely to improve outcomes for patients with lung cancer.

The EAP also considered it valuable to recommend an appropriate GP response that reflected severity of symptoms; that is, referral to an emergency department, directly to an MDT or further investigation by the GP. While NICE 2011 recommended referral to an MDT for patients with stridor, the EAP agreed that patients with these clinical signs should be investigated at an emergency department. This comment is in agreement with the recommendation from NICE 2005 which suggests that referral to an emergency department is considered for patients with stridor.

The recommendations in this guide for referral were developed through local expert consensus by adapting the relevant sections in the NZGG 2009 guidelines and the NICE 2011 guidelines. The NZGG 2009 guidelines focused on efficiency and transparency in referral pathways to specialists, whereas the NICE 2011 guidelines endorse NICE 2005 recommendations to refer patients through the MDTs. Multidisciplinary care potentially provides a more coordinated approach in which all relevant treatment options are considered from the outset, resulting in improved patient satisfaction, increased rates of surgical resection, radical radiotherapy, chemotherapy, and timeliness of care.37 While there is less evidence to demonstrate the impact of a multidisciplinary diagnostic pathway on patient outcomes, this is due to limited available evidence, rather than evidence refuting improved patient outcomes.37 A small number of available studies found either extension in survival of patients 38,39 who had been diagnosed via a multidisciplinary team or no change.40,41,42 The EAP agreed that the existence and referral to MDTs around Australia, along with an increasing health system focus towards coordinated care, were likely to expedite patient review and management through the care pathway.

### 3.3 Future research

While an assessment of risks is included in this guide, this list is not comprehensive. Cancer Australia is undertaking a review of the evidence about risk factors for lung cancer which will provide further guidance for GPs for assessing the risk of lung cancer in their patients.

Regarding first line investigations, while chest X-ray is the internationally-accepted first line investigation for symptoms of lung cancer, this method has been shown to produce false-negative results.30 More evidence is, therefore, required to ascertain the validity and reliability of chest X-ray, or alternative methods such as micro-RNA detection28 as optimal first line investigations for lung cancer.

Further research is also necessary to build on current evidence regarding the effectiveness and feasibility of referral to an MDT compared with referral to a specialist only, and the benefits of prompt diagnosis on patient outcomes.

### 3.4 Implementation and sustainability

In Australia, cancer care is provided by a range of health professionals along a complex clinical care pathway. This guide addresses the first step in this continuum by providing GPs with guidance about assessment and referral for symptoms and signs of lung cancer. This guide also endeavours to standardise care and thereby remove variations in patient care.

In developing recommendations regarding chest X-ray and chest CT scan, the EAP considered the availability of these tests throughout Australia to enable referral in a timely fashion.

This guide was created in the context of the ongoing development of MDTs in each state and territory in Australia. This project is complemented by the creation of and link to a national directory of MDTs. It is anticipated that this guide will facilitate appropriate referrals from GPs to MDTs. Although MDTs focussing on lung cancer operate in many parts of the country, an MDTs may not be available at the local cancer service. GPs are advised to refer patients to a health professional who is a lung cancer specialist linked to an MDT.

In the near future, this guide and the national directory of MDTs will be able to be used alongside the other projects that are currently being undertaken by Cancer Australia for the purpose of providing better links for GPs to tertiary care.

This project is part of the Cancer Australia Lung Cancer Initiative, established to provide national leadership in lung cancer treatment by building an accessible evidence base to support the development and implementation of co-ordinated cancer care. Cancer Australia's program includes research to build the evidence around lung cancer care, increasing support and guidance for health professionals and improving data and reporting for lung cancer.

According to Cancer Australia specifications, the guide will be reviewed in 5 years or in circumstances where major changes in evidence become available. The project team welcomes feedback about the usability of this guide for investigating symptoms of lung cancer in the Australian general practice setting by contacting ph: (02) 9357 9400.

### 3.5 External review and consultation process

A public consultation of the guide was undertaken from 6 January 2012 until 18 February 2012. An email announcement was distributed via Cancer Australia to the project newsletter distribution list, which comprised 218 individuals. Comments were requested from GPs, Divisions of General Practice/ Medicare Locals in Australia, cancer and lung-related organisations, professional organisations and patient-representing organisations. A second announcement was sent via the Cancer Australia e-alert distribution list which reached 246 recipients. These groups were notified of the draft guide and invited to comment on the document. The draft document was available via the Cancer Australia website. A total of 42 responses were received as part of the consultation, from health professionals (15), consumers or carers (6), organisations and health system professionals (8), researchers (3) and others (10). Specific feedback was also received from The Royal Australian College of General Practitioners (RACGP), during the process of obtaining endorsement of the guide from the RACGP. This resulted in a total of 91 specific comments about content, structure, format, method of delivery and suitability to the audience.

All responses were collated and reviewed by the Expert Advisory Panel at a face to face meeting. Members who were unable to attend the meeting provided their considerations of the feedback immediately following the the stakeholder consultation period prior to this meeting. The outcomes of the meeting and revised guide were then circulated to Panel members for support or further comment followed by all members being individually contacted to confirm their support for the guide. A consultation process with members of Cancer Australia's National Lung Cancer Advisory Group (NLCAG) was also undertaken, resulting in out of session feedback from EAP members and NLCAG members to finalise the guide. The guide was submitted to the RACGP for endorsement, which was achieved on 1 November 2012.

### 3.6 Conflicts of interest

All members of the EAP completed statements on their conflicts of interest (Appendix D). Where conflicts of interest were identified, the Chair noted these in the minutes. The Chair determined that no conflicts of interest required further mitigation and as such members continued their appointments on the EAP.

## Abbreviations

| Abbreviation | Description |
| --- | --- |
| ACCP | American College of Chest Physicians |
| EAP | Expert Advisory Panel |
| CT | Computed tomography |
| GP | General practitioner |
| MDT | Multidisciplinary team |
| NHMRC | National Health and Medical Research Council |
| NICE | National Institute of Health and Clinical Excellence |
| NZGG | New Zealand Guidelines Group |
| RACGP | The Royal Australian College of General Practitioners |

## Glossary

| Term | Definition |
| --- | --- |
| Haemoptysis | Coughing up of blood or blood-stained sputum from the bronchi, larynx, trachea, or lungs43 |
| Massive haemoptysis | >600 mL of blood in 24 hours or one cup full of blood (250 mL) at one sitting44 |
| Multidisciplinary team | Multidisciplinary care is an integrated team-based approach to cancer care where medical and allied health professionals consider all relevant treatment options and collaboratively develop an individual treatment and care plan for each patient45 |
| Negative predictive value | A measure of the usefulness of a screening/diagnostic test. It is the proportion of those with a negative test result who do not have the disease, and can be interpreted as the probability that a negative test result is correct46 |
| Positive predictive value | A measure of the usefulness of a screening/diagnostic test. It is the proportion of those with a positive test result who have the disease, and can be interpreted as the probability that a positive test result is correct46 |
| Pulmonary nodule | A round or oval opacity of less than 3cm in diameter, completely surrounded by lung parenchyma and not associated with lymphadenopathy, atelectasis or pneumonia47 |
| Sensitivity | A measure of a screening/diagnostic test's ability to correctly detect people with the disease. It is the proportion of diseased cases that are correctly identified by the test46 |
| Signs of superior vena cava obstruction | Swelling of the face and or neck with fixed elevation of jugular venous pressure48 |
| Specificity | A measure of a screening/diagnostic test's ability to correctly identify people who do not have the disease. It is the proportion of people without the target disease who are correctly identified by the test46 |
| Stridor | A high pitched sound resulting from turbulent air flow in the upper airway (usually trachea or main bronchi)7 |

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## Appendix A AGREE Rating of Shortlisted Guidelines

Table 5 AGREE Rating of Shortlisted Guidelines

| Shortlisted Guidelines | UK, NICE 20117 (%) | USA, NCCN 2011a17 (%) | USA NCCN 2011b18 (%) | Eur ESMO 2010a1' (%) | Eur ESMO 2010b20 (%) | Eur ESMO 2010c21 (%) | NZ NZGG 20094 (%) | USA ACCP 2007a10 (%) | USA ACCP 2007b12 (%) | USA ACCP 2007c13 (%) | USA ACCP 20068 (%) | USA Fleischner Society 200522 (%) | AUS NHMRC 200423 (%) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Scope and Objective | 94 | 47 | 47 | 58 | 53 | 53 | 92 | 89 | 81 | 64 | 64 | 83 | 83 |
| Stakeholder involvement | 89 | 56 | 56 | 39 | 50 | 22 | 100 | 83 | 81 | 86 | 78 | 28 | 86 |
| Rigour of development | 86 | 38 | 35 | 1 | 5 | 20 | 58 | 59 | 66 | 60 | 59 | 23 | 75 |
| Clarity of presentation | 97 | 83 | 83 | 89 | 86 | 83 | 89 | 89 | 61 | 86 | 86 | 89 | 83 |
| Applicability | 67 | 29 | 38 | 6 | 10 | 4 | 54 | 25 | 33 | 19 | 38 | 50 | 56 |
| Editorial Independence | 96 | 92 | 83 | 50 | 50 | 50 | 100 | 100 | 100 | 92 | 96 | 0 | 29 |
| Overall Guideline Assessment | 83 | 50 | 46 | 58 | 58 | 58 | 92 | 58 | 75 | 75 | 83 | 58 | 67 |

## Appendix B NHMRC Evidence Hierarchy

Table 6 NHMRC Evidence Hierarchy: designations of 'levels of evidence' according to type of research question

| Level | Intervention | Diagnostic accuracy | Prognosis | Aetiology | Screening Intervention |
| --- | --- | --- | --- | --- | --- |
| I | A systematic review of level II studies | A systematic review of level II studies | A systematic review of level II studies | A systematic review of level II studies | A systematic review of level II studies |
| II | A randomised controlled trial | A study of test accuracy with: an independent, blinded comparison with a valid reference standard, among consecutive persons with a defined clinical presentation | A prospective cohort study | A prospective cohort study | A randomised controlled trial |
| lll-1 | A pseudo randomised controlled trial (i.e. alternate allocation or some other method) | A study of test accuracy with: an independent, blinded comparison with a valid reference standard, among non-consecutive persons with a defined clinical presentation | All or none | All or none | A pseudo randomised controlled trial (i.e. alternate allocation or some other method) |
| III-2 | A comparative study with concurrent controls:   * non-randomised, experimental trial * cohort study * case-control study * interrupted time series with a control group | A comparison with reference standard that does not meet the criteria required for Level II and lll-l evidence | Analysis of prognostic factors amongst persons in a single arm of a randomised controlled trial | A retrospective cohort study | A comparative study with concurrent controls:   * non-randomised, experimental trial * cohort study * case-control study |
| III-3 | A comparative study without concurrent controls:   * historical control study * two or more single arm study * interrupted time series without a parallel control group | Diagnostic case-control study | A retrospective cohort study | A case-control study | A comparative study without concurrent controls:   * historical control study * two or more single arm Study |
| IV | Case series with either post-test or pre-test/post-test outcomes | Study of diagnostic yield (no reference standard) | Case series, or cohort study of persons at different stages of disease | A cross-sectional study or case series | Case series |

## Appendix C Contributors

### Expert Advisory Panel members

The following were members of the expert advisory panel:

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Mr David Copley, RN, Aboriginal and Torres Strait Islander Representative, South Australia

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### Cancer Australia team

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### Monash University project team

The following staff crafted this guide:

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## Appendix D Declarations of interest from the Expert Advisory Panel

| Member | Interested declared | Decision taking |
| --- | --- | --- |
| Professor Danielle Mazza | None | — |
| Professor David Barnes | Involved in the management of an update for the 2004 Australian Lung Cancer Guidelines | Declare and can participate in discussions on all topics |
| Mr David Copley | None | — |
| Dr Vinod Ganju | Involved in the development of guidelines for the management of upper gastrointestinal cancers | Declare and can participate in discussions on all topics |
| Dr Rona Hiam | Employee of Cancer Australia and is involved in the management of an update for the 2004 Australian Lung Cancer Guidelines | Declare and can participate in discussions on all topics |
| Associate Professor Ken Lau | None | — |
| Ms Margaret McKenzie | None | — |
| Dr Vivienne Milch | Employee of Cancer Australia | Declare and can participate in discussions on all topics |
| Mr Ashleigh Moore OAM | None | — |
| Mrs Teresa Leonardi Dall’Acqua OAM | Participation on an Cancer Australia committee for assessment of clinical trials | Declare and can participate in discussions on all topics |
| Dr Siven Seevanayagam | None | — |
| Dr Julie Thompson | None | — |
| Dr Helen Zorbas | Employee of Cancer Australia | Declare and can participate in discussions on all topics |