Clinical practice guidelines for the prevention and diagnosis of lung cancer

1 Clinical practice guidelines for the prevention and diagnosis of lung cancer

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1 Foreword

Foreword

To be added

2 Summary of recommendations

2.1 Summary of recommendations

This page provides a summary of the recommendations in the draft guidelines. If you would like to make a comment about a specific recommendation, please click on the link and navigate to the content page, where you can make a comment using the blue button under the relevant section.

For explanation of the different types of recommendations, see below.

You may also like to refer to the Guideline Development Handbook for details on the levels of evidence and recommendation grades.

2.2 Prevention and diagnosis of lung cancer

2.2.1 Screening and early detection

2.2.2 In people at risk of lung cancer, does population based screening with chest radiography reduce mortality?

Recommendation	Grade
Chest radiography is not recommended for lung cancer screening in asymptomatic individuals.	**A**

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2.2.3 In people at risk of lung cancer, does population based CT screening reduce mortality?

Recommendation	Grade
There is insufficient evidence to recommend population-based CT Screening.* * Despite the existing evidence from North America that computed tomography (CT) screening can reduce lung cancer specific and all-cause mortality in some people at high risk for lung cancer, current uncertainties including the generalisability of this international trial result to the Australian setting, the lack of local cost effectiveness evidence, and concerns as how best to implement a safe and effective screening program in Australia, mean that the available evidence is insufficient to recommend population based CT screening in Australia at the current time.	**B**

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2.2.4 Which population group would potentially most benefit from CT screening for lung cancer?

Recommendation	Grade
CT scans for the early detection of lung cancer in asymptomatic individuals should only be considered in those at high risk of lung cancer and who meet the following minimum criteria: aged 55-74 with heavy smoking histories (at least 30 pack years, current or former smokers who have quit within the prior 15 years).* *See the section on population-based CT screening for more information.Available evidence is insufficient to recommend populated based CT screening.	**C**

Point(s)
Current evidence does not support population-based screening with CT scanning. For the asymptomatic individual at high risk for lung cancer who is considering a CT scan to detect early lung cancer, it is recommended that they discuss any potential benefits against the potential harms of a low dose CT scan with their GP.

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This guideline includes evidence-based recommendations (EBR), consensus-based recommendations (CBR) and practice points (PP) as defined in the table below. Recommendations and practice points were developed by working party members and sub-committee members.

Each EBR was assigned a grade by the expert working group, taking into account the volume, consistency, generalisability, applicability and clinical impact of the body of evidence according to NHMRC Level and Grades for Recommendations for Guidelines Developers.[1]

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2.2.5 NHMRC approved recommendation types and definitions

Type of recommendation	Definition
Evidence-based recommendation	A recommendation formulated after a systematic review of the evidence, indicating supporting references
Consensus-based recommendation	A recommendation formulated in the absence of quality evidence, after a systematic review of the evidence was conducted and failed to identify admissible evidence on the clinical question
Practice point	A recommendation on a subject that is outside the scope of the search strategy for the systematic review, based on expert opinion and formulated by a consensus process

Source: National Health and Medical Research Council. Procedures and requirements for meeting the NHMRC standard for clinical practice guidelines. Melbourne: National Health and Medical Research Council, 2011

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2.3 References

1. ↑ National Health and Medical Research Council. *NHMRC levels of evidence and grades for recommendations for guideline developers.* Canberra: National Health and Medical Research Council; 2009 Available from: https://www.nhmrc.gov.au/_files_nhmrc/file/guidelines/developers/nhmrc_levels_grades_evidence_120423.pdf.

2.1 Chest radiography screening

Contents

2.1.1 Background

In the previous Australian lung cancer guidelines, it was noted that no forms of population screening for lung cancer, including regular chest radiography, with or without sputum cytology even in high-risk groups, have been shown to improve outcomes and screening is not recommended.

Since then a number of articles have been published (as linked) with two notable papers, the results of the PLCO (prostate, lung, colon and ovarian) cancer screening study of chest radiography in male and female subjects aged 55–74 years[1] and a high quality Cochrane Systematic Review by Manser et al.[2]

PLCO started in 1992, recruiting 154,901 participants, with 50% women and 45% never smokers; randomly assigned to screening or usual care.[1] The research question was whether annual single-view (posterior-anterior) chest radiograph reduced lung cancer mortality compared to usual care. Initially all participants randomised to screening were invited to receive a baseline and three annual chest x-ray screens; the protocol later changed to screen never-smokers only three times. Screening adherence was 86.6% at baseline and 79% to 84% at years 1 through 3; the rate of screening use in the usual care group was 11%.

Cumulative lung cancer incidence rates through 13 years of follow-up were 20.1 per 10 000 person-years in the intervention group and 19.2 per 10 000 person-years in the usual care group (rate ratio [RR]; 1.05, 95% CI, 0.98-1.12). At 13 years of follow-up, 1,213 lung cancer deaths were observed in the intervention group, compared with 1,230 lung cancer deaths in the usual-care group (mortality relative risk, 0.99; 95% CI, 0.87–1.22). Sub-analyses suggested no differential effect by sex or smoking status.

Some Investigators have suggested that a possible small benefit from chest radiography may be possible as the reporting time of PLCO may have been too late.[3] Also, a benefit, smaller than the 20% reduction in lung cancer mortality resulting from the 90% study power is not excluded. For instance, in higher risk PLCO participants matching the National Lung Screening Trial (NLST) criteria[1], an absolute reduction in the number of deaths was observed 316 versus 334 (rate ratio 0.94; with95% CI 0.81 - 1.10).

The 2013 Cochrane Review is an updated version of the original review published in The Cochrane Library in 1999 and updated in 2004 and 2010.[2] The Authors reported that the meta-analysis of studies comparing different frequencies of chest x-ray screening, frequent screening with chest x-rays was associated with an 11% relative increase in mortality from lung cancer compared with less frequent screening (RR 1.11, 95% CI 1.00 to 1.23); noting though that several included had potential methodological weaknesses. Manser et al also observed a non-statistically significant trend to reduced lung cancer mortality with chest x-ray and sputum cytology was compared with chest x-ray alone (RR 0.88, 95% CI 0.74 to 1.03).

Overall, the bulk and consistency of evidence, as well as the lack of significant benefit observed in the PLCO trial supports the conclusion that lung cancer screening with chest radiology does not reduce lung cancer mortality.

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2.1.2 Evidence summary and recommendations

Evidence summary	Level	References
There is no evidence to support reduced lung cancer mortality through screening for lung cancer with chest x-rays.	I	[2]

Evidence-based recommendation	Grade
Chest radiography is not recommended for lung cancer screening in asymptomatic individuals.	**A**

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2.1.3 References

1. ↑ [1.0] [1.1] [1.2] Oken MM, Hocking WG, Kvale PA, Andriole GL, Buys SS, Church TR, et al. *Screening by chest radiograph and lung cancer mortality: the Prostate, Lung, Colorectal, and Ovarian (PLCO) randomized trial.* JAMA 2011 Nov 2;306(17):1865-73 Available from: http://www.ncbi.nlm.nih.gov/pubmed/22031728.
2. ↑ [2.0] [2.1] [2.2] Manser R, Lethaby A, Irving LB, Stone C, Byrnes G, Abramson MJ, et al. *Screening for lung cancer.* Cochrane Database Syst Rev 2013 Jun 21;6:CD001991 Available from: http://www.ncbi.nlm.nih.gov/pubmed/23794187.
3. ↑ Sagawa M, Nakayama T, Sobue T, JECS Study Group. *A different interpretation of the efficacy of lung cancer screening in the PLCO trial.* Eur J Epidemiol 2015 Jul 22 Available from: http://www.ncbi.nlm.nih.gov/pubmed/26197850.

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2.1.1 Introduction

2.1.1.1 =Introduction

Include text

2.1.1.2 Systematic review questions

Two clinical questions in regards to CT Screening were addressed via systematic review:

In people at risk of lung cancer, does population based CT screening reduce mortality?

Which population group would most benefit from CT screening for lung cancer?

2.1.1.2.1 Issues requiring more clinical research study

Relevant further research questions include:

1. What is the optimal screening interval for low dose CT?

2. What is the optimal target group for low dose CT screening?

3. Is low dose CT screening cost-effective?

4. What is the optimal nodule management strategy in the setting of low dose CT screening?

2.1.2 Population-based CT screening

Contents

2.1.2.1 Introduction

Lung cancer is the leading cause of cancer death in Australia. The World Health Organisation reported in 2012 that 1.59 million deaths were due to lung cancer, by far the greatest single cause of cancer death.[1] An Australian report into healthcare reform titled 'Healthcare in Australia 2012–13: Five years of performance' highlighted lung cancer as one of six emerging areas of concern.[2] Despite overall incidence falling between 2007 and 2013, lung cancer rate among women has increased substantially, reinforcing the need for ongoing emphasis on early identification and treatment of this disease.

The advent of low dose computed tomography (LDCT) has provided an opportunity to detect lung cancers in its early stage, and the potential to reduce the overall mortality of lung cancer affected patients. There has generated much clinical and public interest in lung cancer screening program by LDCT in high risk patients. There is however ongoing debate and question on its benefits and feasibility of such screening program.

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2.1.2.2 Screening with low dose CT

There is evidence that low dose computed tomography (LDCT) screening reduces lung cancer specific mortality and all-cause mortality in high risk patients. Evidence of lung cancer specific mortality reduction came from the National Lung Screening Trial (NLST) in US which showed a 20% reduction, p=0.004[3] and also from a meta-analysis with a odds ratio of 0.84, 95% CI 0.74-0.96[4] using pooled data from four randomised trials, including NLST, Danish Lung Cancer Screening Trial (DLCST)[5][6], Detection and Screening of Early Lung Cancer by Novel Imaging Technology and Molecular Essays (DANTE trial)[7][8] and Multicentric Italian Lung Detection study (MILD study)[9]. Evidence of all-cause mortality reduction came from the largest and high quality NLST study alone, which has a study population of 53,434, with their results showing a reduction of 6.7%, p=0.02.[3] Other smaller randomised trials (DLCST, DANTE and MILD) all had study populations of fewer than 5000 and do not have sufficient statistical power to demonstrate significant all-cause mortality reduction.

There however remain uncertainties and ongoing questions on the generalisability of these limited trial results, the cost effectiveness of LDCT screening, optimal screening target group, optimal nodule management strategy and potential harms of screening, such as false positive results, over-diagnosis and radiation risk.[10][4][11] The feasibility of lung cancer screening outside a research environment is also uncertain.

The current available evidence is therefore insufficient to recommend population based LDCT screening outside a research program, and we await further results from the existing screening trials with longer follow up time and completion of other European studies such as UK Lung Screen and NELSON study which are expected in 2015 and 2016, as well as the pooled analysis of European screening trials to provide the power required to identify potential effect on mortality reduction.

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2.1.2.3 Evidence summary and recommendations

Evidence summary	Level	References
Computed tomography (CT) screening reduces lung cancer specific mortality in high risk patients.	I, II	[3], [4]
Computed tomography (CT) screening reduces all-cause mortality in high risk patients.	II	[3]

Evidence-based recommendation	Grade
Perform low dose computed tomography (CT) screening in high risk patients under a research program.	**A**

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2.1.2.4 Issues requiring more clinical research study

Relevant further research questions include:

1. What is the optimal screening interval for low dose CT?
2. What is the optimal target group for low dose CT screening?
3. Is low dose CT screening cost-effective?
4. What is the optimal nodule management strategy in the setting of low dose CT screening?

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2.1.2.5 References

1. ↑ World Health Organisation. *Cancer fact sheet.* [homepage on the internet] World Health Organisation; [cited 2015 Feb 4; updated 2015 Feb]. Available from: http://www.who.int/mediacentre/factsheets/fs297/en/#.
2. ↑ COAG Reform Council. *Healthcare in Australia 2012-13: Five years of performance.* Sydney: COAG Reform Council; 2014 Available from: http://apo.org.au/files/Resource/coag_healthcare-in-australia-2012-13_2014.pdf.
3. ↑ 3.0 3.1 3.2 3.3 Aberle DR, Adams AM, Berg CD, Black WC, Clapp JD, Fagerstrom RM, et al. *Reduced lung-cancer mortality with low-dose computed tomographic screening.* N Engl J Med 2011 Aug 4;365(5):395-409 Available from: http://www.ncbi.nlm.nih.gov/pubmed/21714641.

4. ↑ 4.0 4.1 4.2 Fu C, Liu Z, Zhu F, Li S, Jiang L. *A meta-analysis: Is low-dose computed tomography a superior method for risky lung cancers screening population?* Clin Respir J 2014 Oct 13 Available from: http://www.ncbi.nlm.nih.gov/pubmed/25307063.
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8. ↑ Infante M, Cavuto S, Lutman FR, Passera E, Chiarenza M, Chiesa G, et al. *Long-term Follow-up Results of the DANTE Trial, a Randomized Study of Lung Cancer Screening with Spiral Computed Tomography.* Am J Respir Crit Care Med 2015 Mar 11 Available from: http://www.ncbi.nlm.nih.gov/pubmed/25760561.
9. ↑ Pastorino U, Rossi M, Rosato V, Marchianò A, Sverzellati N, Morosi C, et al. *Annual or biennial CT screening versus observation in heavy smokers: 5-year results of the MILD trial.* Eur J Cancer Prev 2012 May;21(3):308-15 Available from: http://www.ncbi.nlm.nih.gov/pubmed/22465911.
10. ↑ Bach PB, Mirkin JN, Oliver TK, Azzoli CG, Berry DA, Brawley OW, et al. *Benefits and harms of CT screening for lung cancer: a systematic review.* JAMA 2012 Jun 13;307(22):2418-29 Available from: http://www.ncbi.nlm.nih.gov/pubmed/22610500.
11. ↑ Humphrey LL, Deffebach M, Pappas M, Baumann C, Artis K, Mitchell JP, et al. *Screening for lung cancer with low-dose computed tomography: a systematic review to update the US Preventive services task force recommendation.* Ann Intern Med 2013 Sep 17;159(6):411-20 Available from: http://www.ncbi.nlm.nih.gov/pubmed/23897166.

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2.1.2.6 Appendices

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2.1.3 Population benefiting from CT screening

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2.1.3.1 Introduction

The National Lung Screening Trial[1] demonstrated a 20% reduction in lung cancer mortality in individuals undergoing screening by computed tomography compared to screening by chest radiograph. This is the only adequately statistically powered trial to report its primary end-point to date and demonstrate mortality benefit. The eligibility criteria were age 55-74 years, current or former smokers who had smoked ≥30 pack years (20 cigarettes per day for 1 year = 1 pack year). Former smokers had to have quit less than 15 years before study entry. Most other screening RCTs determined eligibility based on age and smoking history and although none have reported mortality benefit to date, they mostly found prevalence lung cancer rates similar or slightly lower than NLST (Table 2). DLCST[2], MILD[3] and DANTE[4] reported no mortality benefit. These trials were not statistically powered to demonstrate differences in mortality. All three trials[2][3][4] accepted lower smoking pack year history than NLST (≥20 years) and MILD and DLCST recruited younger participants (from age 49 and 50 respectively). This lower risk profile is reflected in lower baseline lung cancer prevalence rates (Table 2). Bach estimated 10 year lung cancer risk for former smoker participants meeting minimum inclusion criteria as 2% for NLST, 1% for DLSCT, and less than 1% for NELSON.[5]

2.1.3.2 Assessing lung cancer risk - factors other than age and smoking

Individuals at low risk of cancer will gain little benefit from screening but will risk exposure to screening harms such as false-positive scans (non-cancerous nodule/s detected), anxiety, medical radiation, invasive procedures.[5][6] This variable risk benefit ratio was illustrated in post hoc analysis of NLST participants.[7] When stratified into quintiles of lung cancer risk, the ratio of false positive screening results (risk) to CT-prevented lung-cancer death (benefit) improved from 1648:1 in the lowest risk quintile to 65:1 in the highest risk quintile.

Evaluation of other risk factors apart from age and smoking history might also be useful in determining which individuals have the highest risk of lung cancer and therefore stand to gain most benefit from screening. Lung cancer risk factors other than older age and smoking history are well recognised in the literature. Post hoc analysis of data from several screening trials has shed light on risk in selected subgroups and examined multivariable risk assessment:

Analysis of NLST data found weak evidence of slightly improved mortality benefit in women[8] and increased mortality benefit in African Americans[9]. When stratified by age ≥65years, the older cohort had a higher cancer prevalence but also a higher rate of false-positive screening results.[10] Surgical rates and surgical complication rates were similar between the two age groups however a healthy volunteer effect was seen in comparison to the general population (e.g. less emphysema and heart disease) which may have accounted for these good surgical outcomes. Analysis of DLCST data found risk of death due to lung cancer was associated with older age, COPD diagnosis and heavier smoking history.[11] Post-hoc analysis of NLST data stratified according to multivariable risk estimation showed improved cost-effectiveness and increased mortality benefit in higher risk individuals.[7][12] In addition, screening eligibility based on multivariable risk estimation has been shown to be more efficient than NLST and USPSTF criteria, improving sensitivity and decreasing false-positive rates.[13][14] Baseline data from the UKLS[15], where eligibility was based on multivariable risk assessment, showed slightly higher rates of prevalent lung cancer detection compared to trials with eligibility based on age and smoking (Table 2).

Despite this suggestive evidence, there are currently no prospective primary data from mature, well powered trials to support mortality benefit when using risk factors other than NLST-based age and smoking criteria to select individuals for screening.

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2.1.3.2.1 What do other guidelines say?

Some guidelines have extended their recommendations beyond NLST eligibility criteria to individuals who are slightly older,[16][17] or who have other recognised risk factors[18], based on expert opinion and/or modelling but most adhere to NLST inclusion criteria[5][19][20][21] (Table 1).

Table 1. Summary of selected North American lung cancer screening guidelines

Study	USPSTF[16]	Centers for Medicare & Medicaid Services (CMS)[17]	NCCN[18]	ACCP /ASCO[5]	Canadian [21]
Age	55-80	55-77	55-74	55-74	55-74
Smoking history	≥30 Smoking cessation <15yr	≥30 Smoking cessation <15yr	≥30 Smoking cessation <15yr	≥30 Smoking cessation <15yr	≥30 Smoking cessation <15yr
Other risk factors considered	no	no	Age ≥50 and ≥20PY and one additional risk factor: Radon exposure; Occupational exposure; Cancer history; Family history of lung cancer in first-degree relatives; Disease history (COPD or pulmonary fibrosis); Smoking exposure (second-hand smoke)	no	no
Screen interval	annual	annual	annual	annual	3 annual screens then once every 2 years after each negative scan.
Screening cessation	Smoking cessation <15yr; illness that substantially limits life expectancy or the ability or willingness to have curative surgery		patient no longer a candidate for definitive treatment		
Evidence base	SR, modelling	SR	Literature review; statement of consensus of the authors	SR	SR

Table 2. Lung cancer CT screening randomised controlled trials

Study	NLST[1]	DANTE [4]	DLCST[2]	NELSON[22]	ITALUNG [23]	MILD [3]	LUSI[24]	UKLS[15]
Age range	55-74	60–74	50–70	50–74	55–69	49–75	50–69	50-75
Quit time (former smokers), years	<15	<10	<10 and quit after the age of 50 years	≤10	≤10	<10	≤10	5% risk of developing lung cancer in 5 years
Smoking pack years	≥30	≥20	≥20	≥15 (>15 CPD for >25 years, or >10 CPD for >30 years)	≥20	≥20	≥15 (>15 CPD for >25 years, or >10 CPD for >30 years)	
Prevalence round cancer (screen detected), n (%)	292 /26309 (1.11)	8/1196 (0.67)	17/2047 (0.83)	62/7135 (0.87)	21/1406 (1.49)	nr	23/2028 (1.13)	42/1994 (2.11)
Mortality benefit	20% relative risk reduction	No benefit	No benefit	nr	nr	No benefit	nr	nr

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2.1.3.3 Screening benefits

2.1.3.3.1 Smoking cessation

Participation in lung cancer screening may prompt smokers to try and quit. Alternatively a negative scan result may give false reassurance and reduce motivation to quit. The evidence is not compelling either way. No primary data were found in the search however two systematic reviews of screening have noted limited data showing no difference or mixed results either way.[5][6]

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2.1.3.4 Screening harms

2.1.3.4.1 Medical radiation

No studies were identified. Systematic reviews reported dose ranges from RCTs and cohort trials of between 0.61 to 1.50mSv and cumulative dose across 4 annual screens of 6 to 7mSv.[6] Bach estimated NLST cumulative dose was ~8mSv per participant over 3 years, including both screening and diagnostic examinations.[5] The immediate potential benefit of diagnosing early lung cancer in some participants has to be weighed against the postponed potential risk of radiation-induced cancer many years later.

2.1.3.4.2 Over-diagnosis

The rate of over-diagnosis is uncertain.[6][5] NLST estimated the rate as 18.5% (95% CI, 5.4%–30.6%).[25]

2.1.3.4.3 False-positive rate

Varying definitions of what constitutes a positive scan result and difference in reporting make comparisons between RCTs difficult. FPR tends to be higher in baseline rounds. Cumulative positive scan rates were highest in NLST with an average of 24% across all three rounds and a cumulative rate of 39%. Of the positive scans, 96.4% were false positive. Most positive scans were followed with further imaging tests.[1]

2.1.3.4.4 Risks of major complications and death

In NLST, the risk of death following diagnostic events (including imaging) for benign nodules was 4.1 per 10,000 screened.[5] The risks of major complications following diagnostic events (including imaging) for benign nodules was 4.5 per 10,000 screened.[5] In comparison, the number needed to screen to prevent one lung cancer death in NLST was 320 (~31 deaths avoided per 10,000 screened).[1]

2.1.3.4.5 Anxiety, quality of life

When screening large numbers of individuals, participant reported health related quality of life (HRQoL) is an important consideration; even small decrements in HRQoL may have important implications when applied across large populations. Three RCTs reported HRQoL using generic and specific measures (Table 3). Generic questionnaires allows comparison across a range of health problems, treatments and screening programs, whereas screening-specific questionnaires may be more sensitive to the impact of screening which might not be captured by generic tools.

NLST found participants with True Positive scans had worse generic HRQoL outcomes at 1 and 6 months after the first screening scan, but those with False Positive Scans or Significant Incidental Findings were similar to participants with Negative Scans at both time points.[26] NELSON assessed generic HRQoL. There were some statistically, but not clinically significant changes in HRQoL up to 6 months after baseline CT. Participants with higher levels of anxiety reported more discomfort in connection with having to wait for the results of the CT scan.[27] After 2 years follow-up, there was no significant difference between the screen and control groups. Participants with an indeterminate baseline result reported a temporary increase in lung cancer-specific distress

compared to participants with a negative baseline scan, but this was no longer apparent at 2 years follow-up and an indeterminate result at the second screening round had no impact on HRQoL.[28][29] DLCST used a validated screening-specific instrument. There were statistically significant adverse HRQoL effects across all screening rounds for screen and control groups which were differentially worse in the control group. These negative effects tended to persist. Although statistically significant, a minimal clinically important difference was not defined a priori.[30][31] Evidence suggests individuals undergoing screening are at risk of negative HRQoL effects. Those most at risk are individuals diagnosed with lung cancer and individuals with pre-existing higher levels of anxiety. Positive scans may cause temporary adverse effects on HRQoL.

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Table 3. Health related quality of life (HRQoL)

	Comparison	Tools	Time-points	Findings	Comments
Aggestrup [30] DLCST	1) Control group and screen group (all participants) at baseline; 2) Control group and screen group participants with negative baseline screening results prior to first incidence scan.	1) COS 2) COS-LC MICD – not defined. Part 1 of questionaire only	1) COS Prior to randomisation 2) COS-LC prior to first incidence round	1) Non-statistically significant higher scores seen in control group subjects prior to randomization 2) control group reported higher negative psychosocial consequences prior to incidence round (equivalent to 20-50% of participants moving from ‘not at all’ to ‘a bit’ in one item on each scale of COS-LC). 3) Both groups showed statistically significant within-group mean increase in negative psychosocial consequences	4) Screened participants with true positive and false positive scans were excluded.

	Comparison	Tools	Time-points	Findings	Comments
				between prevalence round and first incidence round (equivalent to 50-100% of participants moving from 'not at all' to 'a bit' in one item in each scale)	
Rasmussen [31] DLCST	3) Control group and screen group (all participants) at baseline prior to randomization 4) Within and between group comparisons prior to each of 5 screening rounds	3) COS 4) COS-LC MICD – not defined	Before each of 5 annual screening rounds	1) significant increase in negative psychosocial consequences from baseline through rounds 2-5 for both the CT group and the control group (mean increase >0, p<.0001 for 3 of 4 possible scales). 2) During rounds 2-5 the control group experienced significantly more negative psychosocial consequences in	3) High differential drop out in control group (Over five screening rounds the mean COS-LC completion rate for the CT group was 94.1% and 75.5% for the control group) 4) the control group also attended annual clinic which could increase awareness of lung cancer risk when completing the COS-LC leading to more negative psychosocial

	Comparison	Tools	Time-points	Findings	Comments
				seven of nine scales compared with the CT group (mean Delta score >0 and p<.033).	consequences compared with a control group not attending clinic
Gareen[26] NLST ACRIN	2812 participants at 16 of 23 ACRIN sites who had baseline HRQoL assessments were invited to enrol at the time of their first positive CT result or first SIF result (at T0, T1 or T2 scan). Participants were matched to a negative screen control (based on date of screen, trial arm, site of accrual, sex, and 5-year age caliper). Generic HRQoL	1) SF-36v2 2) STAI (form Y-1)	1) 1 month after scan 2) 6 months scan	1) 1 month and 6 month HRQoL and state anxiety did not differ across participants with FP, SIF, or negative screens. 2) 1 month and 6 month HRQoL were lower and anxiety was higher for TP participants compared to participants with FP, SIF, and negative screens. MCID 1) SF-36v2: A change of 3 to 5 points in either of the component scores across groups or over time 2) STAI: difference between 2 groups 1 standard error	HRQoL study participants had similar age distribution and smoking status to the remainder of the NLST population but were more likely to be female, white, non-Hispanic, more educated, and unmarried.

	Comparison	Tools	Time-points	Findings	Comments
				=small effect; 1.5 SE = moderate effect 2SE = large effect. 91.8% of participants were aware of screening results within 4 weeks of scan.	
Vanden Berg NELSON [27] Cancer 2008	N=351 participants randomized to the screening arm. Generic HRQoL. Significant differences between means at 2 assessments or sub-groups were considered clinically relevant if the minimally important difference (MID), was met (0.5 SD).	1) SF-12v1 2) EQ-5D 3) STAI-6 4) IES	1) Before baseline CT 2) 1 day after baseline CT (before scan result known) 3) 6 months after baseline CT (scan result known)	1) median SF-12 did not significantly change over time 2) EQ-5D, STAI-6, and IES scores showed statistically significant changes but which were all below threshold of MID 3) Approximately 46.0% and 51.3%, respectively, of the participants reported discomfort in connection with having to wait for the results of the CT scan and dreading those results. These patients had	270 completed all 3 questionnaires (76.9%). Baseline HRQoL was comparable to age- and sex-adjusted reference population. Many subjects may have held the belief that they took action to deal with their lung cancer risk.

	Comparison	Tools	Time-points	Findings	Comments
				relevantly higher STAI-6 and IES scores (P < .01) (unfavorable) at all 3 assessments.	
Van den Bergh[29] NELSON Br J Cancer 2010	LDCT group with indeterminate or a negative result after screening generic HRQoL	1) SF-12 2) EQ-5D 3) STAI-6 4) IES	1) T0, before randomisation 2) T1, 1 week before the baseline screening; 3) T2, 1 day after the screening; 4) T3, 2 months after the screening results but before the 3-month follow-up CT	1) Scores on SF-12, EQ-5D, and STAI-6 showed no clinically relevant changes over time. 2) At T3, IES scores increased after an indeterminate result, and decreased after a negative result (statistically and clinically relevant)	
				1) no significant differences in HRQoL scores over time between the screen and control groups, 2) no significant differences in HRQoL scores over time between the indeterminate or negative second-round screening result group.	

Van den Bergh[28] NELSON Eur Respir J 2011	1. screen and control groups, 2. screenees with indeterminate result (requiring a follow-up CT) and negative screening result generic HRQoL, 1,466 participants	1) SF-12 2) EQ-5D 3) STAI-6 4) IES	1) before randomisation (T0), 2) 2 months after baseline screening (screen group only; T1) 3) 2-yr follow-up (T2)	3) a temporary increase in lung cancer-specific distress (IES scores) after an indeterminate baseline result (mean scores T0: 4; T1: 7.8; T2: 4.5). 4) simillar HRQoL scores between the screen and control groups at 2-yr follow-up, 5) at 2 years, the unfavourable short-term effects of an indeterminate baseline screening result had resolved and an indeterminate result at the second screening round had no impact on HRQoL	

Key: SF-12, 12-item Short Form, developed from SF-36;

EQ-5D EuroQol questionnaire,

STAI-6 6-item short form State-Trait Anxiety Inventory,

IES Impact of Event Scale (lung cancer-specific distress)

SF-36 Short Form-36 (generic HRQoL)

State Trait Anxiety Inventory (form Y-1) original 40-item scale

COS - Consequences Of Screening (screening specifi HRQoL measure);

COS-LC Consequences Of Screening in Lung Cancer (condition-specific instrument)

COS and COS-LC are divided into 2 parts: Part I is relevant for potential screening participants and can be used before the potential participants are invited to lung screening, at invitation to screening, at screening and after screening; Part II is only applicable for screenees after a final screening result is known.

COS is the common core questionnaire of the COS-LC and the Consequences Of Screening in Breast Cancer (COS-BC).

COS part 1 consists of four core scales [“Anxiety” (7 items), “Behaviour” (7 items), “Dejection” (6 items), and “Sleep” (4 items)] and two single items (‘busy to take mind of things’ and ‘less interest in sex’). COS-LC part 1 uses the same 4 scales plus 2 single items and, in addition, five lung cancer screening-specific scales (‘focus on airway symptoms’, ‘introvert’, ‘stigmatisation’, ‘harm of smoking’ and ‘self-blame’). The two single items and all the items in the nine psychosocial scales have four response categories: ‘not at all’, ‘a bit’, ‘quite a bit’ and ‘a lot’ scored 0, 1, 2 or 3, respectively. The higher the score of the outcome, the more negative psychosocial consequences the person has experienced.

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2.1.3.5 Evidence summary and recommendations

Evidence summary	Level	References
Men and women aged 55-74 with heavy smoking histories (at least 30 pack years, current or former smokers who have quit within the prior 15 years) benefit from CT screening for lung cancer.	II	[1], [5], [6]

Evidence-based recommendation	Grade
CT screening should only be considered in individuals aged 55-74 with heavy smoking histories (at least 30 pack years, current or former smokers who have quit within the prior 15 years). Individuals should be counselled on the risks and benefits of screening.	**B**

Consensus-based recommendation

Recommended screening interval

The recommended screening interval for the high risk population group is annual screening until the individuals no longer meets the criteria.

Practice point

It is advisable to have a tailored discussion of the risks and benefits of screening with individuals who meet NLST inclusion criteria and who wish to consider lung cancer screening.

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2.1.3.6 References

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2.9 Guideline development process

to be adapted to suit lung project. Below copied from melanoma.

2.9.1 Background

In 2010 Cancer Council Australia embarked on the revision of the treatment and follow-up section of the 2004 Clinical Practice Guidelines for the Prevention, Diagnosis and Management of Lung Cancer with funding received from Cancer Australia. This revision of the Management and Follow-up section was finalised in 2012. The Management Committee of the Lung Cancer Guidelines Revision project was contacted to propose suitable lead authors and working party members for the prevention and diagnosis guidelines (see Guidelines:Lung_cancer /Prevention_and_diagnosis/Working_party_members_and_contributors|Working party members and contributors]].

In November 2012, Cancer Council Australia convened the first working party meeting to determine the included clinical questions to be part of the prevention and diagnosis section of the lung cancer.

This project is a continuation of the revision of the with the revised published in 2012.

Cancer Council Australia contributed in kind resources consisting of project staff, facilities, systems and travel budget to revise the prevention and diagnosis section of the lung cancer guidelines.

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2.9.2 Project governance, guidelines scope and guidelines development group

Cancer Council Australia appointed a small Management Committee to oversee the guidelines revision project. The Management Committee is responsible for the overall management and strategic leadership of the guidelines review process. This includes the establishment of the wider multidisciplinary guidelines working party and question-specific sub-committee members in consultation with the lead authors and the evaluation of declarations of interest and, if necessary, implementing management strategies for conflict/s of interest.

During a face-to-face meeting in November 2014, the Management Committee assessed the clinical questions addressed the 2008 guidelines and determined the priority clinical questions to be included in this revision. Twenty-three questions were identified to be of greatest importance, covering issues related to diagnosis, staging and management of cutaneous melanoma (see list of clinical questions).

The Management Committee proposed lead authors for each included clinical question. The nominated individuals were invited to join the (see multidisciplinary working party). In addition, the Management Committee identified and nominated two consumer representatives and two GP representatives to join the multidisciplinary working party.

In consultation with the question lead author, sub-committees consisting of members with relevant expertise and experience were established for each question (see multidisciplinary working party).

Declarations of interest were collected from all nominated members and evaluated (see COI register). All members were advised to update their declarations of interest over the course of the project and received reminders to review their declarations prior to every formal working party meeting.

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2.9.3 Guidelines development approach

The Management Committee agreed to use Cancer Council Australia's Cancer Guidelines Wiki Platform and approach to develop the guidelines. The Wiki Platform is web-based and supports all processes of guidelines development, such as the literature search, critical appraisal, data extraction, evidence assessment and summary processes, as well as content and recommendation development, online consultation, review and web publication. It is in line with the NHMRC guidelines requirements, designated standards of quality, process and grading system for recommendations.[1][2] An infrastructure is set in place to process literature updates and continuously update content as new evidence emerges and is reviewed.

The Development of Clinical Practice Guidelines using Cancer Council Australia's Cancer Guidelines Wiki Handbook[3] illustrates the steps in the development of Cancer Council Australia's web-based clinical practice guidelines. It provides information to assist working party members and staff members to develop concise clinical questions in PICO format, construct sound search strategies, systematically search the literature, critically appraise, summarise the evidence and formulate guidelines recommendations.

The Management Committee was approached by the German guidelines development group, which developed the guidelines "Malignant Melanoma S3-Guideline Diagnosis, Therapy and Follow-up of Melanoma"[4] in 2012 and adapted some sections from the 2008 Australian guidelines. The systematic review team assessed the German guidelines using the AGREE II assessment tool[5] and found the guidelines to be high quality. As many exhaustive systematic reviews were undertaken to answer critical clinical questions in the melanoma diagnosis and management guidelines, it was decided to adapt the German systematic reviews and update the literature searches, where possible, rather than undertaking new systematic reviews for the same clinical questions (see also 3b. If a relevant clinical practice guidelines was found and assessed as suitable for adaption). The data extractions and quality appraisals of any new studies will be shared with the German group.

Rather than waiting until systematic reviews and content for all included clinical questions have been finalised, the Management Committee agreed to publish finalised question content and the associated recommendations in stages. The group decided that it is important to publish content and results as soon as it is finalised by the working party to ensure that the medical community receives up-to-date information without any publication delay. Prior to publication, feedback would be sought from guidelines stakeholders about the clinical questions content (See also Public consultation).

The first set of completed draft contents is now being released for public consultation (refer to set of questions).

- What are the clinical features of melanoma and how do atypical melanomas present?
- What type of biopsy should be performed for a suspicious pigmented skin lesion?
- When is a sentinel node biopsy indicated?
- What are the recommended safety margins for radical excision of primary melanoma?

Subsequent clinical questions and associated recommendations will be published in 2016 and 2017.

The detailed steps in preparing the question content, conducting the literature searches, appraising the literature and formulating and grading recommendations, are outlined below.

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2.9.4 Steps in preparing clinical practice guidelines

For every clinical question the following steps were completed:

1. Develop a structured clinical question in PICO format

2. Search for existing relevant guidelines and systematic reviews answering the clinical question

3. Perform systematic review process, depending on if a relevant clinical practice guideline is identified or not

3a If no relevant clinical practice guideline was found	**3b If a relevant clinical practice guideline was found and assessed as suitable for adaption**
Developing the systematic review protocol and systematic literature search strategy for each PICO question Conducting the systematic literature search according to protocol Screening of literature results against pre-defined inclusion and exclusion criteria Critical appraisal and data extraction of each included article Create body evidence table of all included literature	Undertake systematic literature search update for the question of the existing clinical practice guideline Screening of literature update results against pre-defined inclusion and exclusion criteria Critical appraisal and data extraction of each new included article Update body evidence table of evidence review of existing guideline with new literature update results

4. Summarise the relevant data

5. Assess the body of evidence and formulate recommendations

6. Write the content narrative

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2.9.4.1 Step 1. Develop a structured clinical question

All included questions were reviewed on the basis of their purpose, scope and clinical importance to the target audience and were structured according to the PICO (populations, interventions, comparisons, outcomes) framework. The lead authors provided the systematic review team with feedback to refine the PICO questions and inclusion and exclusion criteria for the systematic review.

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2.9.4.2 Step 2. Search for existing relevant guidelines and systematic reviews

For each PICO question, the National Guideline Clearinghouse, the Guidelines Resource Centre and the scoping search for the PICO question were scanned for relevant clinical practice guidelines that could potentially be suitable for adaption.

Full systematic reviews were then performed as outlined in the sections below (*Developing a systematic search strategy*; *Conducting the systematic literature search according to protocol*; *Screening of literature results against pre-defined inclusion and exclusion criteria*; *Critical appraisal and data extraction of each included article*).

If an existing relevant guideline was identified, the guideline was assessed with the AGREEII assessment tool[5] to ensure the guideline is of high quality. The ADAPTE process was then followed.[6]

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2.9.4.3 Step 3. Perform systematic review process

2.9.4.3.1 Step 3a. If no relevant clinical practice guideline was found

2.9.4.3.1.1 Developing a systematic search strategy

For each PICO question, systematic literature search strategies were developed by the technical team. Searches were limited or widened as necessary according to the PICO structure using keywords or MESH and subject terms. Systematic search strategies were derived from these terms for each included electronic databases. The included standard databases searched were Pubmed, Embase, Trip database, Cochrane Database of Systematic Reviews and Database of Abstracts of Reviews of Effects and Health Technology Assessment for all questions. The psychosocial questions also included CINAHL and PsycINFO databases to retrieve relevant literature.

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2.9.4.3.1.2 Conducting the systematic literature search according to protocol

Clinical practice guidelines should be based on systematic identification and synthesis of the best available scientific evidence.[1] For each clinical question that required a systematic literature review, literature searches were conducted systematically from 2007 onwards. The following electronic databases were part of the systematic literature search strategy:

- **PubMed –** bibliographic references and abstracts to articles in a range of languages on topics such as clinical medical information and biomedicine, and including the allied health fields, biological and physical sciences.
- **EMBASE –** major pharmacological and biomedical database indexing drug information from 4550 journals published in 70 countries.
- **Trip Database –** A medical database with focus on Evidence based medicine and clinical practice guidelines with content available from Cochrane and Bandolier.
- **Database of Abstracts of Reviews of Effects and Health Technology Assessment –** Contains details of systematic reviews that evaluate the effects of healthcare interventions and the delivery and organisation of health services.
- **The Cochrane Database of Systematic Reviews**.
- **Cinahl –** Bibliographic references and abstracts to journal articles, book chapters, pamphlets, audiovisual materials, software, dissertations, critical paths, and research instruments on topics including nursing and allied health, biomedicine, consumer health, health sciences librarianship, behavioral sciences, management, and education
- **Psychinfo –** Bibliographic references and abstracts to journal articles, book chapters, dissertations and technical reports on psychology; social, clinical, cognitive and neuropsychology; psychiatry, sociology, anthropology and education, with source material from a wide range of languages.

Additional relevant papers from reference lists and, where appropriate, clinical trial registries, were also identified for retrieval as part of the snowballing process.

The full detailed systematic literature search strategy for every clinical question is fully documented in the appendix of the clinical question.

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2.9.4.3.1.3 Screening of literature results against pre-defined inclusion and exclusion criteria

Part of the systematic review process is to screen all retrieved literature results against the pre-defined inclusion and exclusion criteria in two stages.

a) First screen – During the first screening round, the titles and abstracts of all retrieved literature were screened by one reviewer. All irrelevant, incorrect and duplicates were removed.

b) Second screen – A second screen was undertaken based on the full article. Two reviewers assessed each article for inclusion against the pre-defined inclusion and exclusion criteria for each question. In the case of a disagreement between the reviewers, a third independent reviewer assessed the article against the inclusion and exclusion criteria. Articles that met the inclusion criteria were forwarded for quality assessment and data extraction.

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2.9.4.3.1.4 Critical appraisal and data extraction of each included article

Two assessors independently assessed the risk of bias of each of the included studies using a study design specific assessment tool and where necessary pre-specified criteria. For all quality assessment tools, see link to pdf.

Any disagreements were adjudicated by a third reviewer.

For all included articles, the relevant data was extracted and summarised in study characteristics and evidence tables. Each data extraction was checked by a second assessor. These tables are available in the appendix of each question.

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2.9.4.3.2 Step 3b. If a relevant clinical practice guidelines was found and assessed as suitable for adaption

Undertake systematic literature search update for the question of the existing clinical practice guideline If an existing clinical practice guideline of high quality was found that directly addresses the clinical question to be reviewed, an update search of the original systematic literature search was performed covering the time period between the literature cut-off of the original review until now across all relevant databases (see also Conducting the systematic literature search according to protocol).

2.9.4.3.2.1 Screening of literature update results against pre-defined inclusion and exclusion criteria

All retrieved literature results from the update search were screened against the pre-defined inclusion and exclusion criteria in two stages.

a) First screen – During the first screening round, the titles and abstracts of all retrieved literature were screened by 1 reviewer. All irrelevant, incorrect and duplicates were removed.

b) Second screen – A second screen was undertaken based on the full article. Two reviewers assessed each article for inclusion against the pre-defined inclusion and exclusion criteria for each question. In the case of a disagreement between the reviewers, a third independent reviewer assessed the article against the inclusion and exclusion criteria. Articles that met the inclusion criteria were forwarded for quality assessment and data extraction.

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2.9.4.3.2.2 Critical appraisal and data extraction of each included article

Two assessors independently assessed the risk of bias of each of the included studies using a study design specific assessment tool and where necessary pre-specified criteria. For all quality assessment tools, see link to pdf.

Any disagreements were adjudicated by a third reviewer.

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2.9.4.4 Step 4. Summarise the relevant data

The study results, level of the evidence, risk of bias due to study design and the relevance of the evidence for each included study were summarised in a body of evidence table.

When a systematic review from an existing guidelines was updated to answer and develop recommendations for a clinical question, the new evidence was added to the existing body of evidence table. Where required, the levels of evidence were translated to the NHMRC levels of evidence. The NHMRC levels of evidence are outlined below:

2.9.4.4.1 Table 1. Designations of levels of evidence according to type of research question (NHMRC, 2009)

Level	Intervention	Diagnosis	Prognosis	Aetiology	Screening
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
		A study of test accuracy with: an independent, blinded comparison with a			A randomised

II	A randomised controlled trial	valid reference standard, among consecutive patients with a defined clinical presentation	A prospective cohort study	A prospective cohort study	controlled trial
III-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 patients 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 III-1 evidence	Analysis of prognostic factors amongst untreated control patients in 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	Diagnostic case-control study	A retrospective cohort study	A case-control study	A comparative study without concurrent controls: Historical control study

	Interrupted time series without a parallel control group				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 patients at different stages of disease	A cross-sectional study	Case series

Source: National Health and Medical Research Council. NHMRC additional levels of evidence and grades for recommendations for developers of guidelines. Canberra: NHMRC; 2009. (https://www.nhmrc.gov.au/_files_nhmrc/file/guidelines/developers/nhmrc_levels_grades_evidence_120423.pdf)

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2.9.4.5 Step 5. Assess the body of evidence and formulate recommendations

The body of evidence table for each clinical question was forwarded to the lead author for assessment. The lead author in collaboration with the systematic reviewer (who conducted the systematic reviews and extracted the data and performed risk of bias assessment) assessed the body of evidence and completed the evidence assessment matrix in regard to the volume of the evidence, its consistency, clinical impact, generalisability and applicability and developed evidence statements for each recommendation.

The process is described in NHMRC additional levels of evidence and grades for recommendations for developers of guidelines (2009).[7]

Following grading of the body of evidence and development of evidence statements, authors were asked to formulate evidence-based recommendations based on the results of the systematic review summarised in the body of evidence table. The method of grading recommendations is shown in Table 2.

2.9.4.5.1 Table 2. Grading of recommendations

Component of Recommendation	**Recommendation Grade**			
	A **Excellent**	**B** **Good**	**C** **Satisfactory**	**D** **Poor**
	one or more level I	one or two level		

Volume of evidence [1**]	studies with a low risk of bias or several level II studies with a low risk of bias	II studies with a low risk of bias or a systematic review/several level III studies with a low risk of bias	one or two level III studies with a low risk of bias, or level I or II studies with a moderate risk of bias	level IV studies, or level I to III studies /systematic reviews with a high risk of bias
Consistency [2**]	all studies consistent	most studies consistent and inconsistency may be explained	some inconsistency reflecting genuine uncertainty around clinical question	evidence is inconsistent
Clinical impact	very large	substantial	moderate	slight or restricted
Generalisability	population/s studied in body of evidence are the same as the target population for the guideline	population/s studied in the body of evidence are similar to the target population for the guideline	population/s studied in body of evidence differ to target population for guideline but it is clinically sensible to apply this evidence to target population[3]	population/s studied in body of evidence different to target population and hard to judge whether it is sensible to generalise to target population
Applicability	directly applicable to Australian healthcare context	applicable to Australian healthcare context with few caveats	probably applicable to Australian healthcare context with some caveats	not applicable to Australian healthcare context

[1] Level of evidence determined from level of evidence criteria

[2] If there is only one study, rank this component as 'not applicable'

[3] For example results in adults that are clinically sensible to apply children OR psychosocial outcomes for one cancer that may be applicable to patients with another cancer.

[**]For a recommendation to be graded A or B, the volume and consistency of evidence must also be graded either A or B!

Source: National Health and Medical Research Council. NHMRC additional levels of evidence and grades for recommendations for developers of guidelines. Canberra: NHMRC; 2009. (https://www.nhmrc.gov.au /_files_nhmrc/file/guidelines/developers/nhmrc_levels_grades_evidence_120423.pdf)

The overall recommendations grade are shown in Table 3.

2.9.4.5.2 Table 3. Overall recommendation grades

Grade of recommendation	Description
A	Body of evidence can be trusted to guide practice
B	Body of evidence can be trusted to guide practice in most situations
C	Body of evidence provides some support for recommendation(s) but care should be taken in its application
D	Body of evidence is weak and recommendation must be applied with caution

Source: National Health and Medical Research Council. NHMRC levels of evidence and grades for recommendations for developers of guidelines. Canberra: NHMRC; 2009. (https://www.nhmrc.gov.au/_files_nhmrc/file/guidelines/developers/nhmrc_levels_grades_evidence_120423.pdf)

The NHMRC approved recommendation types and definitions are shown in Table 4.

2.9.4.5.3 Table 4. NHMRC approved recommendation types and definitions

Type of recommendation	Definition
Evidence-based recommendation	A recommendation formulated after a systematic review of the evidence, indicating supporting references
Consensus-based recommendation	A recommendation formulated in the absence of quality evidence, after a systematic review of the evidence was conducted and failed to identify admissible evidence on the clinical question
Practice point	A recommendation on a subject that is outside the scope of the search strategy for the systematic review, based on expert opinion and formulated by a consensus process

Source: National Health and Medical Research Council. Procedures and requirements for meeting the NHMRC standard for clinical practice guidelines. Melbourne: National Health and Medical Research Council, 2011

In addition to developing evidence-based recommendations as a result of the systematic review for a clinical question, expert authors could also draft consensus-based recommendations in the absence of evidence after having performed a systematic review or practice points, when a matter was outside the scope of the search strategy for the systematic review.

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2.9.4.6 Step 6. Write the content narrative

For each question, the assigned lead authors were asked to draft their guidelines chapter using the following format:

- Background to the clinical question, including its clinical importance and historical evidence, where relevant
- Review of the evidence, including the number, quality and findings of studies identified by the systematic review
- Evidence summary in tabular form including evidence statements, levels of evidence of included studies, and reference citations
- Evidence-based recommendation(s) and corresponding grade(s), consensus-based recommendations and practice points
- Discussion, including unresolved issues, relevant studies currently underway, and future research priorities
- References.

The content draft was then reviewed by all sub-committee members. The draft documents underwent several iterations until agreement between the members of the sub-committee on these drafts was reached.

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2.9.5 Review of the draft chapters

Draft content was circulated to the working party. The whole group was asked to review the content and submit feedback. Members were asked to submit further suggestions on consensus-based recommendation and practice points.

A face-to-face meeting with all working party members was scheduled to review and finalise the draft content for public consultation. Prior to this meeting, the latest iteration drafts were circulated. All panelists were asked to review the content, individual recommendations and practice points in detail, identify and note any controversies and points to be discussed at the meeting. During the meeting, each recommendation and practice point was tabled as an agenda point. Each was reviewed and approved by consensus, which was reached by voting. The Chairperson nominated a particular recommendation/practice point to be reviewed and the panelists had the opportunity to discuss any issues and suggest revisions to recommendations and practice points. Each recommendation and practice point was approved once the eligible panelists reached consensus.

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2.9.6 Public consultation

The first set of completed draft clinical questions was sent out for public consultation from xxx to xx. Submissions were invited from the general public and professional societies and groups and other relevant stakeholders. Relevant professional societies and groups, consumer groups and other relevant stakeholders were contacted.

All feedback on the draft received during the consultation period in Australia will be compiled and sent to the relevant Question Specific Author Team to review their draft content, assessing and considering the submitted comments. Each additional submitted paper during public consultation will be assessed by the methodologist team against the review protocol.

Another meeting of the working party will be organised in order to review all public consultation comments and suggested amendments. Subsequent changes to the draft will be agreed by consensus, based on consideration of the evidence and, in the absence of evidence, expert opinion. The same consensus process that was followed during the face to face working party meeting prior to public consultation was followed again. All changes resulting from the public consultation submission reviews will be documented and made accessible once the guidelines are published.

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2.9.7 Dissemination and implementation

A multi-strategy approach will be followed for the dissemination and implementation of the guidelines, as this has shown to positively influence guidelines uptake.[8][9]

Once all clinical questions that are part of the guidelines revision are completed, the guidelines will be distributed directly to relevant professional and other interested groups and through meetings, national and international conferences, and other professional development and continuing medical education (CME) events. Local expert leaders will be identified and approached to facilitate dissemination and act as champions for the guidelines.

A significant effort will be made to have the guidelines introduced to senior undergraduate medical students and to encourage the relevant learned colleges to support the guidelines and to foster their integration into hospital and community practice through resident and registrar education activities.

The guidelines will be made available as online guidelines via the Cancer Council Australia Cancer Guidelines Wiki. The online guidelines version increases availability as well as accessibility, and usage will be tracked and analysed with a web analytics solution. The Cancer Guidelines Wiki is a responsive website that is optimised for mobile and desktop access.

Interlinking and listing the guidelines on national and international guideline portal is also an important part of the digital dissemination strategy. Important Australian health websites, such as EviQ and healthdirect Australia will be approached to link to the online guidelines. The guidelines will also be listed on national and international guideline portals such as Australia's Clinical Practice Guidelines Portal, Guidelines International Network guidelines library and National Guidelines Clearinghouse.

The Cancer Guidelines Wiki is based on semantic web technology, so the guidelines are available in a machine-readable format, which offers the possibility to easily integrate the guidelines content with systems and web applications used in the Australian healthcare context. Use of the guidelines as part of core curriculum in specialty exams will be encouraged.

It is recognised that a planned approach is necessary to overcome specific barriers to implementation in particular settings and to identify appropriate incentives to encourage uptake of guidelines recommendations. Implementation of the guidelines will require a combination of effective strategies and may include further CME initiatives and interactive learning, the development and promotion of computer-assisted decision aids and electronic decision-support systems, and the creation of audit and other clinical tools.

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2.9.8 Future updates

The handbook Development of Clinical Practice Guidelines Using Cancer Council Australia's Cancer Guidelines Wiki. Handbook for section authors and the guideline working party. outlines Cancer Council Australia's guidelines updating processes. The incoming literature updates will continue to be monitored for each systematic review question. The Working Party will notify the Technical Team if any clinical question requires revision because new high level evidence has been published. External stakeholders are encouraged to use the comment feature and notify us of any new evidence for a specific topic.

No comment pages found

2.9.9 References

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2.10 List of clinical questions

List of clinical questions

2.11 Working party members and contributors

to be added

2.12 Conflict of interest register

to be added