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Evidence-Based Series 24-2 Version 2

Referral of Suspected Lung Cancer by Family Physicians and Other Primary Care Providers

Members of the Referral of Suspected Lung Cancer Expert Panel

A Quality Initiative of the
Program in Evidence-Based Care (PEBC), Cancer Care Ontario (CCO)

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An assessment conducted in March 2024 deferred the review of Evidence-Based Series (EBS) 24-2 Version 2. This means that the document remains current until it is assessed again next year. The PEBC has a formal and standardized process to ensure the currency of each document ([PEBC Assessment & Review Protocol](#))

EBS 24-2 Version 2 is comprised of 4 sections. You can access the summary and full report here:

<https://www.cancercareontario.ca/en/guidelines-advice/types-of-cancer/216>

Section 1:	Guideline Recommendations (ENDORSED)
Section 2:	Evidentiary Base
Section 3:	EBS Development Methods and External Review Process
Section 4:	Document Assessment and Review

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Guideline Report History

GUIDELINE VERSION	SYSTEMATIC REVIEW		PUBLICATIONS	NOTES and KEY CHANGES
	Search Dates	Data		
Original version 2011	2007 to 2011	Full Report	Web publication	NA
Current Version 2 January 2019	2011 to May 2018	New data found in Section 4: Document Assessment and Review	Updated web publication	2011 recommendations are <u>ENDORSED</u>

Evidence-Based Series 24-2 Version 2: Section 1

Referral of Suspected Lung Cancer by Family Physicians and Other Primary Care Providers: Guideline Recommendations

The 2011 recommendations have been **ENDORSED**, which means that the recommendations are still current and relevant for decision making. Please see Section 4: Document Assessment and Review for a summary of updated evidence published between 2011 and 2018, and for details on how this Guideline was **ENDORSED**. Modifications made in 2019 to the content of this recommendations section are shown in highlighted text.

QUESTIONS

Overall Question

In patients presenting to primary care services with signs and/or symptoms of lung cancer, what should the referral process include?

The following questions are the factors considered in answering the overall question:

1. What signs, symptoms and other clinical features are predictive of lung cancer?
2. What is the diagnostic accuracy of investigations for lung cancer?
3. What major, known risk factors are predictive of lung cancer?
4. Which factors are associated with delayed referral? Which delay factors can be attributed to patients, and which factors can be attributed to providers? Does a delay in the time to consultation affect patient outcome?

TARGET POPULATION

Patients presenting in primary care settings comprise the target population. This guideline does not provide recommendations for patients in a screening program.

INTENDED USERS

This guideline is targeted to family physicians (FPs), general practitioners, emergency room physicians, other primary care providers (PCPs) (nurse practitioners, registered nurses, and physician assistants), respirologists, thoracic surgeons, and radiologists. For the purposes of this document, we have referred to FPs, general practitioners, emergency room physicians, and other PCPs as 'FPs and other PCPs. The guidelines are also intended for policymakers to help ensure that resources are in place so that target wait times are achieved. They are also intended to help guide referrals to Diagnostic Assessment Programs (DAPS) in Ontario. DAPS provide a single point of referral, coordination of care using a clinical navigator, fast tracking of diagnostic tests and a multidisciplinary team approach. They are an Ontario-wide strategic

priority designed to improve patient access and outcomes, and are outlined in the Ontario Cancer Plan since 2005-2011 and 2011-2014 (1).

Added in February 2021: Formal Cancer Care Ontario DAPs no longer exist in Ontario, but many hospitals provide ongoing multidisciplinary team approaches to diagnosing colorectal cancer.

RECOMMENDATIONS

The following recommendations were adapted from the New Zealand Guidelines Group (NZGG) guideline Suspected cancer in primary care: guidelines for investigation, referral and reducing ethnic disparities and the National Institute for Health and Clinical Excellence (NICE 2005), Referral guidelines for suspected cancer (2,3).

The recommendations below reflect the 2019 endorsement by the PEBC Lung Cancer Referral Expert Panel, the integration of the NZGG 2009 and NICE 2005 recommendations, and the updated systematic review of the research evidence of those guidelines and consensus by the PEBC Lung Cancer Referral Working Group (see Section 2: Appendix 1) (2,3). Modifications made in 2019 to the content of this recommendations section are shown in highlighted text.

Special consideration for these recommendations:

Factors that Increase the Risk of Lung Cancer

The following factors have been shown to increase the risk of lung cancer and will be referred to in the recommendations below:

- Tobacco exposure by means of: current or previous smoking of tobacco using cigarettes, vaping, cigars, dry pipe or water pipe (bong); second hand exposure to tobacco smoke
- Previous exposure to asbestos or other known carcinogens (e.g., radon, chromium, nickel)
- Occupational exposure to dust or microscopic particles (e.g., wood dust, silica, diesel engine emissions, or chlorinated solvents)
- Personal or family history of cancer (especially lung, head and neck cancer)
- Lung Diseases (chronic obstructive pulmonary disease, asthma, pulmonary fibrosis)
- Infections (tuberculosis, HPV 16/18 of the respiratory tract, previous pneumonia, HIV)
- Occupations (miners, painters, iron and steel workers, bricklayers, welders)
- Environmental (in-home burning of coal and/or biomass, unventilated cooking over high heat, air pollution, low socioeconomic status, high caffeine intake)
- Other underlying health issues (lupus, rheumatoid arthritis, systemic sclerosis [scleroderma], diabetes, periodontal disease, increased abdominal obesity, dyslipidemia)

Indications for Referral to the Emergency Department

A person should be referred to the Emergency Department for the following:

- Stridor
- [Massive hemoptysis](#)
- New neurological signs suggestive of brain metastases or cord compression

Indications for Urgent Chest CT and/or Urgent Referral to DAP or Thoracic Surgeon

A person should be referred if presenting with any of the following:

- Persistent non-massive hemoptysis (Multiple episodes of coughing blood or blood-streaked sputum)

- Superior vena cava syndrome/obstruction

The ordering physician (i.e., FP or other PCPs, specialist, radiologist, or clinicians in the DAP) will depend on locally available resources and processes for expedited CT scans.

Indications for Chest X-ray

A person should have a chest X-ray within two working days if they present with any of the following:

- Hemoptysis
- New finger clubbing
- Suspicious lymphadenopathy
- Dysphagia
- [Features suggestive of lung cancer that has metastasized](#) elsewhere or other cancers that have metastasized to the lung
- [Features suggestive of paraneoplastic syndromes](#)

OR any of the following unexplained signs or symptoms:

- Cough
- Weight loss/loss of appetite
- Shortness of breath
- Chest, rib, or shoulder pain
- [Abnormal chest signs](#)
- Hoarseness
- Horner's syndrome
- Thrombocytosis, anemia, and leukocytosis

Patients with underlying chronic respiratory problems should have a chest X-ray if they have unexplained changes in existing symptoms.

The requisition for a chest X-ray should include the presenting history, including signs and symptoms suspicious of lung cancer and whether [risk factors](#) exist.

Chest X-rays should be completed, reviewed, and reported by the radiologist, and the report received by the FP or other PCPs within one week of being ordered. If the chest X-ray is suspicious for lung cancer, this must be clearly noted on the X-ray report. Radiologists should consider using two or more mechanisms to directly inform the FP or other PCPs of the suspicion of lung cancer. (e.g., fax, flagging, telephone call, email)

Indications for Chest CT scan

A person should have a chest CT scan within two weeks if they have any of the following:

- An [abnormal chest X-ray that reports suspicion of lung cancer](#)
- A normal chest X-ray, but there is a high suspicion of lung cancer, based on clinical judgement

The ordering physician (i.e., FP or other PCPs, specialist, radiologist, or clinicians in the [DAP](#)) will depend on locally available resources and processes for expedited CT scans.

Sputum Cytology

Sputum cytology is not recommended for the investigation of suspected lung cancer.

Follow-up to diagnostic investigations

A person who has consolidation or unexplained pleural effusion on an initial chest X-ray should be treated and have a chest X-ray repeated within four weeks to confirm complete resolution.

Indications for Referral to a Specialist (Respirologist or Thoracic Surgeon) or DAP

Patients should be referred and expect a consultation to a specialist or where locally available to a DAP within one to two weeks if they have any of the following:

- Persistent hemoptysis
- A chest X-ray suggestive or suspicious of lung cancer including:
 - A nodule or mass
 - Multiple pulmonary nodules
 - Non-resolving pleural effusion
 - Mediastinal or contralateral hilar adenopathy
 - Interstitial infiltrates
 - Slowly or non-resolving pneumonia or consolidation
 - Fibroapical disease suggesting possible tuberculosis
 - Unexplained elevated diaphragm
- A normal chest X-ray, but there is a high suspicion of lung cancer, based on clinical judgement

If promptly accessible, a chest CT scan can be simultaneously ordered with the referral while waiting for the DAP or the specialist's consultation. This will depend on locally available resources. If the CT scan is entirely negative, then further referral to a DAP or specialist may no longer be required.

To expedite the diagnosis and avoid duplication of investigations, at a minimum, the following information should be provided to the specialist:

- History of the patient, including all risk factors and signs or symptoms suspicious of lung cancer
- All efforts should be made to provide all pre-existing imaging results, including chest X-rays and CT scans (films and digital images should be available at the time of consultation)
- All relevant other medical conditions and medications taken by patient
- All recent blood work

Recommendations to Reduce Diagnostic Delay

There should be appropriate educational tools developed and disseminated that highlight the signs and symptoms of lung cancer for FPs and other PCPs and for patients.

FPs and other PCPs should have a high index of suspicion with a low threshold for investigation of suspected lung cancer in ordering chest x-rays and referral to lung cancer specialists or the DAP. Decision support tools should be readily available to assist FPs and other PCPs.

FPs and other PCPs should include as much information as possible in their referral letters and should ask patients to help retrieve electronic copies of their imaging tests to bring to specialist appointments.

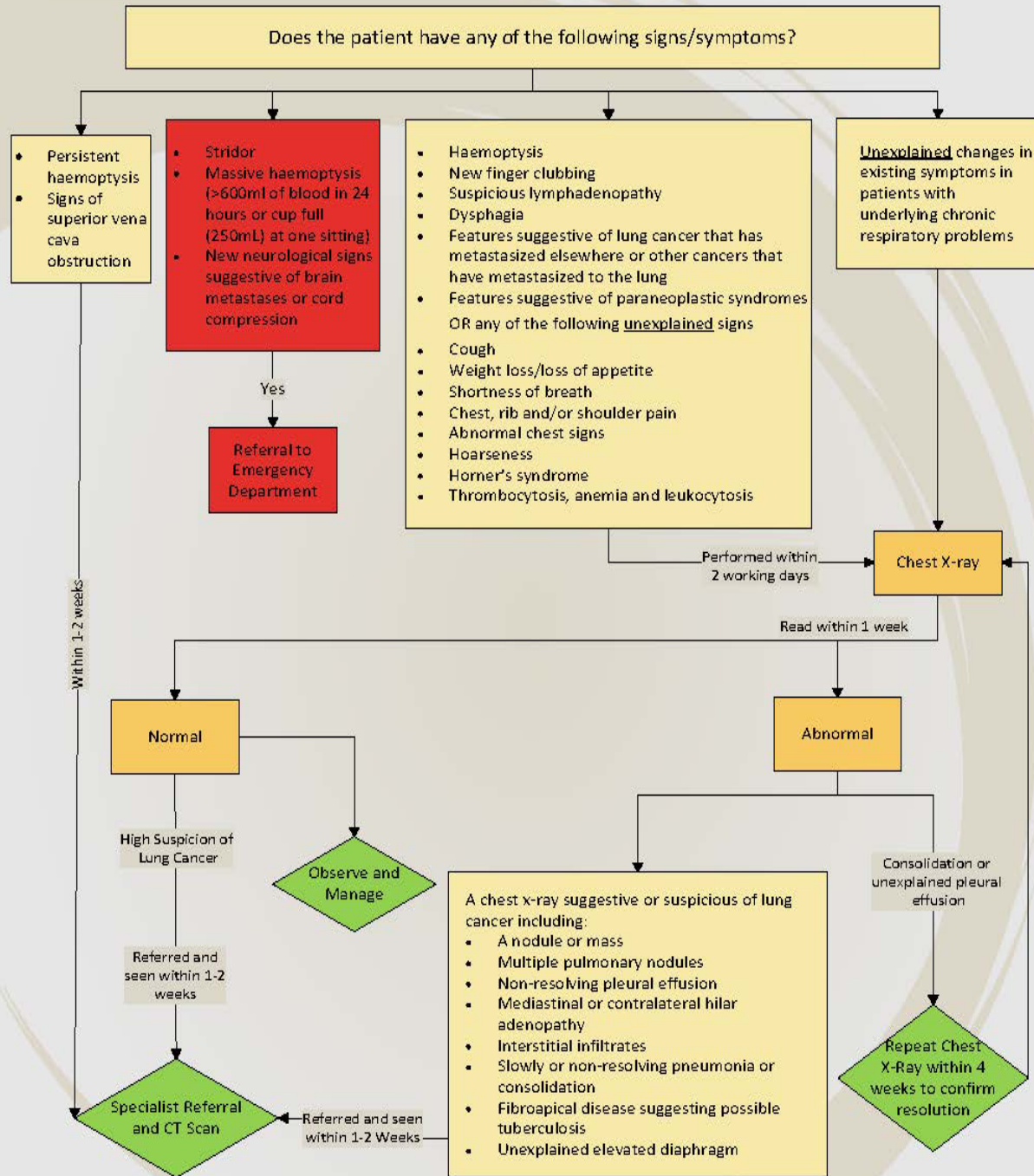
Counselling of patients should occur to address common fears and concerns.

Public health and other health agencies should work with local community leaders to address challenges, such as lower levels of education or demographic discrepancies in communities with high rates of lung cancer or known delays in lung cancer diagnosis.

There is a lack of awareness of changing epidemiology; with increasing numbers of young people and lifelong non-smokers being diagnosed with lung cancer. Therefore, a young age (<40 years) or being a lifelong non-smoker should not preclude investigation or referral if there is high suspicion of lung cancer, based on clinical judgement.

ALGORITHM

Lung Cancer Guideline Recommendations



***Risk factors:** Tobacco exposure by means of: current or previous smoking of tobacco using cigarettes, vapes, cigars, dry pipe or water pipe (bong), second hand exposure to tobacco smoke, previous exposure to asbestos or other known carcinogens, occupational exposure to dust or microscopic particles, diesel engine emissions or chlorinated solvents, personal or family history of cancer (especially lung, head and neck cancer), lung diseases (chronic obstructive pulmonary disease, asthma, pulmonary fibrosis, infections (tuberculosis, HPV 16/18 of the respiratory tract, previous pneumonia, HIV), occupations (miners, painters, iron and steel workers, bricklayers, welders), environmental (in-home burning of coal and/or biomass, unventilated cooking over high heat, air pollution, low SES, high caffeine intake) and other potential health issues (lupus, rheumatoid arthritis, scleroderma, diabetes, periodontal disease, increased abdominal obesity, dyslipidemia)

KEY EVIDENCE

- Many of these recommendations were adapted or endorsed from the NZGG 2009 or NICE 2005 recommendations (2,3). Signs and symptoms listed in the NZGG 2009 or NICE 2005 recommendations were derived from their systematic reviews, which mainly included case-series studies (2,3). The development of the recommendations in this guideline can be found in Section 3 of this report.
- There was no evidence found on wait times and their effects on patient outcomes. One study found that wait times to referral for specialist consultation for patients with signs or symptoms suspicious for lung cancer can be reduced from 20 days to six days with the implementation of a DAP (4). For this guideline, the wait times for diagnostic investigations and referral developed by the Lung Cancer Referral Working Group were chosen because they considered them to be achievable targets in the Ontario health care system, especially with the introduction of DAPs across the province.
- The list of risk factors was broadened to include all risk factors summarized by NZGG 2009 based on the review by NICE 2005 (2,3).

Indications for Referral to Emergency Department

- This recommendation was adapted from the NICE 2005 guidelines for immediate referral. New neurological signs suggestive of brain metastases or cord compression were included based on common practice in Ontario and massive hemoptysis was included based on the Time-to-Treat Program (4).

Indications for Chest X-ray

- This recommendation was adapted from the NZGG 2009 guidelines for urgent referral for a chest X-ray (3). Based on expert opinion, it was felt that, for new finger clubbing, features suggestive of lung cancer that has metastasized elsewhere or other cancers that have metastasized to the lung, and suspicious lymphadenopathy, the three-week time frame was not required for referral for a chest X-ray. The Working Group chose to include dysphagia as an indicator for a chest X-ray, because it was reported in the NICE 2005 review as a symptom of lung cancer and was found to be a major clinical symptom among lung cancer patients in a tertiary care setting (2,5). Furthermore, paraneoplastic syndromes were included as indications for chest X-ray based on the review by Spiro et al (2007) that reported that paraneoplastic syndromes may occur in 10% of patients with lung cancer (6).
- For patients with underlying chronic respiratory problems, the Working Group chose to adapt the recommendation from NICE 2005 (2).

Indications for CT Scan

- There was little evidence to inform these recommendations; therefore, the Working Group decided to develop their own recommendations based on experiences within their own practices.

Sputum Cytology

- The updated literature search found high specificity but variable sensitivity of sputum cytology in detecting lung cancer (7-11). Therefore, this recommendation was endorsed from the NZGG 2009 referral guidelines (3).

Follow-up to Diagnostic Investigations

- The recommendation for follow-up to consolidation on a chest X-ray was adapted from the NZGG 2009 referral guideline, which was based on the experience of their guideline development team (3). The Working Group chose to modify the NZGG's 2009 recommendation by including all patients rather than specifying only patients with risk factors for lung cancer. In addition to consolidation, the Working Group also included unexplained pleural effusion based on their experience in their practices.

Indications for Referral to a Specialist (Respirologist or Thoracic Surgeon) or the DAP

- These recommendations were adapted from the NZGG 2009 and NICE 2005 referral guidelines, which were based on expert opinion (2,3). Additional abnormal chest X-ray results were included from the Time-to-Treat Program (4). Unexplained elevated diaphragm was included based on the suggestion of an expert panel member.

Recommendations to Reduce Diagnostic Delay

- There is evidence to suggest that the following may delay the diagnosis of lung cancer (2,3,5,12,13):
 - Patient-Related Delay:
 - patient's lack of appreciation regarding the association of symptoms with lung cancer
 - fear of cancer diagnosis
 - Family Physician related delay:
 - not recognizing signs and symptoms suggestive of lung cancer
 - co-morbidity of conditions increased delay
 - multiple consecutive investigations in primary care
 - over-reliance on chest X-ray results to diagnose lung cancer
 - imaging follow-up failure
 - initial referral to a non-respiratory physician

Algorithm

- The process used to develop this algorithm can be found in Section 3.

FUTURE RESEARCH

Further studies could be designed to investigate the diagnostic performance of signs, symptoms, or tests for lung cancer in the primary care setting. In addition, studies are needed to determine which educational initiatives would be best at decreasing practitioner- or patient-related delay.

GLOSSARY

[Diagnostic Assessment Programs](#)

Diagnostic Assessment Programs, provide a single point of referral, coordination of care using a clerical navigator, fast tracking of diagnostic tests and a multidisciplinary team approach, thereby improving the quality of care and the patient experience. They are an Ontario-wide strategic priority designed to improve patient access and outcomes and outlined in the Ontario Cancer Plan since 2005-2011 and 2011-2014 (1).

[Abnormal Chest Signs](#)

e.g., crackles or wheezes

Abnormal Chest X-ray that Reports Suspicion of Lung Cancer

e.g., nodule(s), infiltrates, non-resolving consolidation or effusion despite treatment

Features Suggestive of Metastatic Disease

Clinical and Organizational Factors in the Initial Evaluation of Patients with Lung Cancer
Diagnosis and Management of Lung Cancer, 3rd ed: American College of Chest Physicians
Evidence-Based Clinical Practice Guidelines, 2013 Ost et al. (available at:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4694609/pdf/chest_143_5_suppl_e121S.pdf)

(6)

Massive Hemoptysis

>600 mL of blood in 24 hours or one cup full of blood (250 mL) at one sitting

Features Suggestive of Paraneoplastic Syndromes

Clinical and Organizational Factors in the Initial Evaluation of Patients with Lung Cancer
Diagnosis and Management of Lung Cancer, 3rd ed: American College of Chest Physicians
Evidence-Based Clinical Practice Guidelines. 2013 Ost et al. (available at:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4694609/pdf/chest_143_5_suppl_e121S.pdf)

(6)

Signs of Superior Vena Cava Obstruction

Swelling of the face and or neck with fixed elevation of jugular venous pressure

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