Disclaimer
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**Pathway Disclaimer**

This pathway is a resource that provides an overview of the presentation and clinical work-up of a cancer diagnosis that an individual in the Ontario cancer system may receive.

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**Pathway Consideration**

The family physician should be informed of all tests and consultations and usual ongoing care with the family physician is assumed to be part of the pathway.
Lung Cancer Diagnosis Pathway

Visit to Family Physician or Other Primary Care Provider

- Patient presenting with any of the following:
  - Hemoptysis
  - New finger clubbing
  - Suspicious lymphadenopathy
  - Dysphagia
  - Features of metastatic lung cancer
  - Features suggestive of paraneoplastic syndromes
  - Refer to EBS #24-2

- Patient presenting with any of the following unexplained symptoms for > 3 weeks (or sooner if patient has known risk factors):
  - Cough
  - Weight loss/loss of appetite
  - Shortness of breath
  - Chest and/or shoulder pain
  - Abnormal chest signs
  - Hoarseness
  - Refer to EBS #24-2

- Patient with underlying chronic respiratory problems presenting with unexplained changes in existing symptoms
  - Refer to EBS #24-2

- Persistent hemoptysis
  - Refer to EBS #24-2

Visit to Other Health Care Provider

- Patient presenting with abnormal imaging that reports suspicion of lung cancer (e.g., x-ray)
  - Refer to EBS #24-2

- Patient presenting with any of the following:
  - Superior vena cava obstruction
  - Stridor
  - Massive hemoptysis
  - New neurological signs suggestive of brain metastases or cord compression
  - Refer to EBS #24-2

Visit to Emergency Department

- Patient presenting with any of the following:
  - Hemoptysis
  - New finger clubbing
  - Suspicious lymphadenopathy
  - Dysphagia
  - Features of metastatic lung cancer
  - Features suggestive of paraneoplastic syndromes
  - Refer to EBS #24-2

- Patient presenting with any of the following unexplained symptoms for > 3 weeks (or sooner if patient has known risk factors):
  - Cough
  - Weight loss/loss of appetite
  - Shortness of breath
  - Chest and/or shoulder pain
  - Abnormal chest signs
  - Hoarseness
  - Refer to EBS #24-2

- Patient with underlying chronic respiratory problems presenting with unexplained changes in existing symptoms
  - Refer to EBS #24-2

- Persistent hemoptysis
  - Refer to EBS #24-2

- Patient presenting with abnormal imaging that reports suspicion of lung cancer (e.g., x-ray)
  - Refer to EBS #24-2

- Patient presenting with any of the following:
  - Superior vena cava obstruction
  - Stridor
  - Massive hemoptysis
  - New neurological signs suggestive of brain metastases or cord compression
  - Refer to EBS #24-2

*Known Lung Cancer Risk Factors:

- **Current or ex-smoker or significant second-hand exposure to tobacco smoke**
- **History of chronic obstructive pulmonary disease**
- **Previous exposure to asbestos or other known carcinogens**
- **Other occupational lung cancer risk factors (radon, exposure to dust and to microscopic particles, chemical carcinogens, etc.)**
- **Personal or family history of cancer (especially lung, head & neck)**
- **Silicosis, tuberculosis**

**The following information should be included with the referral:

- **History of patient (risk factors and signs or symptoms suspicious of lung cancer)**
- **All pre-existing imaging**
- **All relevant medical conditions and medications taken by the patient**
- **All recent blood work**

Visit to Family Physician or Other Primary Care Provider

- Chest X-Ray
  - Refer to EBS #25-1-2

- Chest X-Ray Report Reviewed by Primary Care Provider

Direct Referral to Diagnostic Assessment Program (DAP) or Specialist

- Family Physician or Primary Care Provider

DAP or Specialist (thoracic surgeon, respirologist or other as appropriate)

- Referral information

- Proceed to DAP or Specialist Referral Diamond on the Initial Presentation and Imaging Pathway (page 4 of 7)

Chest X-Ray or Other Imaging as Appropriate

- Proceed to Initial Presentation and Imaging Pathway (page 4 of 7)
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**Initial Presentation and Imaging**

**CT Chest**
- May include upper abdomen
- To determine initial staging and tumour type, and assess fitness for future therapeutic procedures

**Additional CT Scan**
- As required to determine extent of disease and if initial scans look suspicious

**Baseline Blood Work**
- CBC, liver function, calcium, INR, PTT

**Bone Scan**
- If bone pain or elevated alkaline phosphatase

**MRI Brain or CT Brain**
- If neurological symptoms

**Suspected Mass**
- Proceed to Diagnostic Procedures (page 5 of 7)

**Normal Imaging Results**
- CT Chest may include upper abdomen

**DAP or Specialist (thoracic surgeon, respirologist or other as appropriate) Referral information**

**Known Lung Cancer Risk Factors:**
- Current or ex-smoker or significant second-hand exposure to tobacco smoke
- History of chronic obstructive pulmonary disease
- Previous exposure to asbestos or other known carcinogens
- Other occupational lung cancer risk factors (radon, exposure to dust and to microscopic particles, chemical carcinogens, etc.)
- Personal or family history of cancer (especially lung, head & neck)
- Silicosis, tuberculosis

**The following information should be included with the referral:**
- History of patient (risk factors and signs or symptoms suspicious of lung cancer)
- All pre-existing imaging
- All relevant medical conditions and medications taken by the patient
- All recent blood work

**Follow-up with Patient**
- To encourage smoking cessation
- To discuss further diagnostic studies

**Non-Resolving Consolidation or Pleural Effusion Despite Treatment**
- Refer to EBS #24-2

**Consolidation or Unexplained Pleural Effusion**
- Follow-up Chest X-Ray
- Refer to EBS #24-2

**Chest X-Ray Report Reviewed by Primary Care Provider**
- (from Suspicion Pathway, page 3 of 7)

**Possible Sputum Culture**
- Abnormal
  - Suspected Unresolved Infectious Disease Process
    - (e.g., pneumonia, tuberculosis)
  - Treatment with Antibiotics
  - Potential for unwanted cycling
  - Repeat Chest X-Ray
- Resolved
- Not Resolved

**Suspected Chronic Obstructive Pulmonary Disease (COPD) or Other Benign Lung Disease**
- Referral to Respirologist (or internist)

**Consolidation or Unexplained Pleural Effusion**
- Normal
  - But high suspicion of lung cancer based on clinical judgment
- Abnormal
  - Suspicious of lung cancer
  - Normal or Abnormal
    - Lung cancer not suspected

**Suspected Infectious Disease Process**
- (e.g., pneumonia, tuberculosis)

**Suspected Lung Cancer**
- Resolved
  - Potential for unwanted cycling
- Not Resolved
**Lung Cancer Diagnosis Pathway**

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### Suspected Mass Type (based on initial imaging)

- **Peripheral Mass or Suspicous Pulmonary Nodule(s)**
  - Interventional Radiology (IR): Needle biopsy
  - Core Biopsy (CB) or Fine Needle (FN) Biopsy: Choice is based on the expertise of the radiologist and pathologist and the ability to obtain sufficient tissue for a histological and molecular diagnosis. Refer to EBS #7-20
  - Needle Biopsy Not Possible or Inconclusive and High Index of Suspicion
  - PET/CT Scan: Refer to EBS #7-20
  - Positive for Suspicous Metabolic Activity (malignant)
  - Negative for Suspicous Metabolic Activity (benign)
  - If bronchoscopy not possible
  - Bronchoscopy: Based on mass location
  - Mediastinoscopy or Endobronchial Ultrasound (EBUS): If there is CT evidence of hilar or mediastinal lymphadenopathy

- **Central Mass**

- **Suspected Stage IV (based on scans and/or patient history)**

- **Pleural Effusion**

### Core Biopsy (CB) or Fine Needle (FN) Biopsy

- **Pathology and/or Cytology**
  - Results go to ordering surgeon, respiratory or interventional radiologist, and family physician
  - Positive for Suspicous Metabolic Activity
  - Negative for Suspicous Metabolic Activity
  - Change in Result
  - Thoracoscopic Wedge: Decision based on size of lesion and local resources

### Tests on Pleural Fluid:
- Cytology (cell block should be obtained)
- LDH
- Protein concentration
- Glucose
- Amylase
- Cell count and differential
- Culture and sensitivity

### Pathology and/or Cytology Results go to ordering surgeon, respiratory or interventional radiologist, and family physician

### Core Biopsy (CB) or Fine Needle (FN) Biopsy: Choice is based on the expertise of the radiologist and pathologist and the ability to obtain sufficient tissue for a histological and molecular diagnosis.

### Needle Biopsy Not Possible or Inconclusive and High Index of Suspicion

### PET/CT Scan: Refer to EBS #7-20

### Positive for Suspicous Metabolic Activity (malignant)

### Negative for Suspicous Metabolic Activity (benign)

### If High Suspicion of Lung Cancer

### Thoracoscopic Wedge: Decision based on size of lesion and local resources

### Thoracoscopy (for diagnostic purposes)

### Open Thoracotomy

### Thoracotomy (intraoperative staging)

### Thoracic Surgery

### Thoracic Surgery (for diagnostic purposes)

### if High Suspicion of Lung Cancer

### If bronchoscopy not possible

### Bronchoscopy: Based on mass location

### Core Biopsy (CB) or Fine Needle (FN) Biopsy: Choice is based on the expertise of the radiologist and pathologist and the ability to obtain sufficient tissue for a histological and molecular diagnosis.

### Needle Biopsy Not Possible or Inconclusive and High Index of Suspicion

### PET/CT Scan: Refer to EBS #7-20

### Positive for Suspicous Metabolic Activity (malignant)

### Negative for Suspicous Metabolic Activity (benign)

### If High Suspicion of Lung Cancer

### Positive for Cancer

### Negative for Cancer but High Index of Suspicion

### Positive Results

### Negative Results

### Core Biopsy (CB) or Fine Needle (FN) Biopsy: Choice is based on the expertise of the radiologist and pathologist and the ability to obtain sufficient tissue for a histological and molecular diagnosis.

### Needle Biopsy Not Possible or Inconclusive and High Index of Suspicion

### PET/CT Scan: Refer to EBS #7-20

### Positive for Suspicous Metabolic Activity (malignant)

### Negative for Suspicous Metabolic Activity (benign)

### If High Suspicion of Lung Cancer

### Positive for Cancer

### Negative for Cancer but High Index of Suspicion

### Positive Results

### Negative Results

### Core Biopsy (CB) or Fine Needle (FN) Biopsy: Choice is based on the expertise of the radiologist and pathologist and the ability to obtain sufficient tissue for a histological and molecular diagnosis.

### Needle Biopsy Not Possible or Inconclusive and High Index of Suspicion

### PET/CT Scan: Refer to EBS #7-20

### Positive for Suspicous Metabolic Activity (malignant)

### Negative for Suspicous Metabolic Activity (benign)

### If High Suspicion of Lung Cancer

### Positive for Cancer

### Negative for Cancer but High Index of Suspicion

### Positive Results

### Negative Results

### Core Biopsy (CB) or Fine Needle (FN) Biopsy: Choice is based on the expertise of the radiologist and pathologist and the ability to obtain sufficient tissue for a histological and molecular diagnosis.

### Needle Biopsy Not Possible or Inconclusive and High Index of Suspicion

### PET/CT Scan: Refer to EBS #7-20

### Positive for Suspicous Metabolic Activity (malignant)

### Negative for Suspicous Metabolic Activity (benign)

### If High Suspicion of Lung Cancer

### Positive for Cancer

### Negative for Cancer but High Index of Suspicion

### Positive Results

### Negative Results

### Core Biopsy (CB) or Fine Needle (FN) Biopsy: Choice is based on the expertise of the radiologist and pathologist and the ability to obtain sufficient tissue for a histological and molecular diagnosis.

### Needle Biopsy Not Possible or Inconclusive and High Index of Suspicion

### PET/CT Scan: Refer to EBS #7-20

### Positive for Suspicous Metabolic Activity (malignant)

### Negative for Suspicous Metabolic Activity (benign)

### If High Suspicion of Lung Cancer

### Positive for Cancer
Lung Cancer Diagnosis Pathway

**Pathological Small Cell Lung Cancer Diagnosis (SCLC)**

- MRI Brain or CT Brain (if MRI is not available or is contraindicated)
- Bone Scan (if suspected metastasis, serum calcium and alkaline phosphatase abnormal)
- CT Chest and CT Upper Abdomen with Contrast (if not already performed or outdated [> 8 weeks])
- PET/CT Scan

**Pathological Non-Small Cell Lung Cancer Diagnosis (NSCLC)**

- PET/CT Scan
  - **Refer to EBS #7-20**
  - Alternatively, if PET/CT is not available or is contraindicated:
    - Bone Scan (if suspected metastasis, bone pain or abnormal alkaline phosphate)
    - CT Chest and CT Abdomen (if not already performed or outdated [> 8 weeks])

**Final Staging**

- Mediastinum Negative
  - Negative for Metastasis / Potentially Resectable
    - Refer to EBS #17-4
  - Mediastinum Positive
    - Refer to EBS #17-6

- Mediastinoscopy
  - Refer to EBS #17-6

**Negative for Metastasis**

- Refer to EBS #7-20

**Mediastinum Negative by PET/CT and CT Scan and Small Primary Tumour**

- Refer to EBS #17-4

**Mediastinum Positive by PET/CT or CT Scan or Central Tumour or Large Tumour (T2)**

- Refer to EBS #17-4

- Endobronchial Ultrasound (EBUS)
  - Available only in some centres

**Positive for Metastasis**

- Refer to EBS #7-20

**Staging**

- Thoracic Surgeon
- Radiation Oncologist
- Medical Oncologist
- MCC
- Bone Scan
  - (if suspected metastasis, serum calcium and alkaline phosphatase abnormal)
- CT Chest and CT Upper Abdomen with Contrast
  - (if not already performed or outdated [> 8 weeks])
- PET/CT Scan
  - Not part of routine care for all patients; indicated for limited stage SCLC only

**Limited SCLC (stage I-III)**

- Medical Oncologist
- MCC
- Thoracic Surgeon

**Extensive SCLC (stage IV)**

- Medical Oncologist
- Radiation Oncologist
- MCC
- Thoracic Surgeon

**Not Resectable**

- Complex Treatment Algorithm
  - Refer to appropriate specialist, dependent on individual care

**Resectable & Fit for Surgery**

- Medical Oncologist
- Thoracic Surgeon
- MCC

**Resectable but Unfit for Surgery**

- Medical Oncologist
- Thoracic Surgeon
- MCC

**If emergency situation, symptomatic brain metastases, superior vena cava obstruction, spinal compression or limited stage disease**

**Pathological Small Cell Lung Cancer Diagnosis (SCLC)**

- Medical History and Physical Exam
  - Blood work (if not done already)

**Pathological Non-Small Cell Lung Cancer Diagnosis (NSCLC)**

- Medical Oncologist
- Radiation Oncologist

**If appropriate (uncommon)**

**If limited disease**

**Thoracic Surgeon**

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**Staging**

- Thoracic Surgeon
- Radiation Oncologist
- Medical Oncologist
- MCC
- Bone Scan
  - (if suspected metastasis, serum calcium and alkaline phosphatase abnormal)
- CT Chest and CT Upper Abdomen with Contrast
  - (if not already performed or outdated [> 8 weeks])
- PET/CT Scan
  - Not part of routine care for all patients; indicated for limited stage SCLC only

**Limited SCLC (stage I-III)**

- Medical Oncologist
- MCC
- Thoracic Surgeon

**Extensive SCLC (stage IV)**

- Medical Oncologist
- Radiation Oncologist
- MCC
- Thoracic Surgeon

**Not Resectable**

- Complex Treatment Algorithm
  - Refer to appropriate specialist, dependent on individual care

**Resectable & Fit for Surgery**

- Medical Oncologist
- Thoracic Surgeon
- MCC

**Resectable but Unfit for Surgery**

- Medical Oncologist
- Thoracic Surgeon
- MCC

**If emergency situation, symptomatic brain metastases, superior vena cava obstruction, spinal compression or limited stage disease**
Lung Cancer Diagnosis Pathway Endorsements

The following individuals have endorsed Version 2012.2 of the Lung Cancer Diagnosis Pathway (Pathway), in their capacity as clinical experts, as listed below. They have reviewed the content of the Pathway and confirm that, with respect to their medical specialty and to the best of their clinical judgment and opinion, the Pathway depicts evidence-based best practice and is informed appropriately by expert opinion where evidence is conflicting or missing. The following individuals support the release of the Pathway on the external CCO website and they consent to their names being listed as endorsers of the Pathway.

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