The Alberta Thoracic Oncology Program

Expediting Lung Cancer Diagnosis and Management for Patients with Suspected Lung Cancer

“A Whirlwind Tour”

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Alberta Thoracic Oncology Program
April 26, 2014
I have no conflicts of interest associated with my presentation
Goal of Presentation

Encourage participants to consider novel approaches in developing process improvements for expediting lung cancer diagnosis and management in your own health centres.
Primary Goal:

To address time delays for patients in Alberta, the Alberta Thoracic Oncology Program’s inter-professional team including nurse practitioners, pulmonologists, radiologists, and thoracic surgeons, have developed innovative approaches to expedite the detection, diagnosis, and specialty consultation for patients with suspected lung cancer.
Outline

The Lung Cancer Problem
  ◦ Current and future

Cancer Care Strategic Clinical Network/ Lung Cancer Initiative

Potential delays in diagnoses of lung cancer

Impact of delayed prognosis for patients

Approaches developed through ATOP to reduce delays and expedite lung cancer diagnosis
**FIGURE 3.2** Percent distribution of estimated cancer deaths, by sex, Canada, 2013

<table>
<thead>
<tr>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>39,400 Deaths</td>
<td>36,100 Deaths</td>
</tr>
<tr>
<td><strong>Lung</strong></td>
<td><strong>Lung</strong></td>
</tr>
<tr>
<td>27.2%</td>
<td>26.3%</td>
</tr>
<tr>
<td><strong>Colorectal</strong></td>
<td><strong>Breast</strong></td>
</tr>
<tr>
<td>12.7%</td>
<td>13.9%</td>
</tr>
<tr>
<td><strong>Prostate</strong></td>
<td><strong>Colorectal</strong></td>
</tr>
<tr>
<td>10.0%</td>
<td>11.6%</td>
</tr>
<tr>
<td><strong>Pancreas</strong></td>
<td><strong>Pancreas</strong></td>
</tr>
<tr>
<td>5.5%</td>
<td>6.0%</td>
</tr>
<tr>
<td><strong>Leukemia</strong></td>
<td><strong>Ovary</strong></td>
</tr>
<tr>
<td>3.8%</td>
<td>4.7%</td>
</tr>
<tr>
<td><strong>Bladder</strong></td>
<td><strong>Non-Hodgkin lymphoma</strong></td>
</tr>
<tr>
<td>3.8%</td>
<td>3.3%</td>
</tr>
<tr>
<td><strong>Esophagus</strong></td>
<td><strong>Leukemia</strong></td>
</tr>
<tr>
<td>3.8%</td>
<td>3.1%</td>
</tr>
<tr>
<td><strong>Non-Hodgkin lymphoma</strong></td>
<td><strong>Body of uterus</strong></td>
</tr>
<tr>
<td>3.6%</td>
<td>2.5%</td>
</tr>
<tr>
<td><strong>Stomach</strong></td>
<td><strong>Brain</strong></td>
</tr>
<tr>
<td>3.2%</td>
<td>2.2%</td>
</tr>
<tr>
<td><strong>Brain</strong></td>
<td><strong>Stomach</strong></td>
</tr>
<tr>
<td>2.9%</td>
<td>2.2%</td>
</tr>
<tr>
<td><strong>Kidney</strong></td>
<td><strong>Kidney</strong></td>
</tr>
<tr>
<td>2.8%</td>
<td>1.8%</td>
</tr>
<tr>
<td><strong>Liver</strong></td>
<td><strong>Bladder</strong></td>
</tr>
<tr>
<td>2.0%</td>
<td>1.7%</td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td><strong>Multiple myeloma</strong></td>
</tr>
<tr>
<td>2.0%</td>
<td>1.7%</td>
</tr>
<tr>
<td><strong>Multiple myeloma</strong></td>
<td><strong>Esophagus</strong></td>
</tr>
<tr>
<td>1.8%</td>
<td>1.2%</td>
</tr>
<tr>
<td><strong>Melanoma</strong></td>
<td><strong>Melanoma</strong></td>
</tr>
<tr>
<td>1.6%</td>
<td>1.1%</td>
</tr>
<tr>
<td><strong>Larynx</strong></td>
<td><strong>Oral</strong></td>
</tr>
<tr>
<td>0.8%</td>
<td>1.0%</td>
</tr>
<tr>
<td><strong>Breast</strong></td>
<td><strong>Cervix</strong></td>
</tr>
<tr>
<td>0.2%</td>
<td>1.0%</td>
</tr>
<tr>
<td><strong>All other cancers</strong></td>
<td><strong>Liver</strong></td>
</tr>
<tr>
<td>12.3%</td>
<td>0.7%</td>
</tr>
<tr>
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</tbody>
</table>

**Analysis by:** Chronic Disease Surveillance and Monitoring Division, CCIDP, Public Health Agency of Canada

**Data source:** Canadian Vital Statistics Death database at Statistics Canada

*Canadian Cancer Statistics 2013*
FIGURE 5.1 One, three, five and ten-year relative survival ratios (RSR) for the most common cancers, Canada (excluding Quebec*), 2006–2008

Analysis by: Health Statistics Division, Statistics Canada
Data sources: Canadian Cancer Registry and Canadian Vital Statistics Death databases and life tables at Statistics Canada

*Data from Quebec were excluded, in part, because its method for ascertaining the date of cancer diagnosis differs from the method used by other provinces and territories and because of issues in correctly ascertaining the vital status of cases.

Note: These data are based on people aged 15–99 years at diagnosis.
Lung Cancer Cases – Alberta 2000-2030

Figure 1. Number of Lung Cancer Cases in Alberta per Year

Data Source: Alberta Cancer Registry, 2012

The number of lung cancer cases will continue to rise in Alberta

<table>
<thead>
<tr>
<th>Lung cancer</th>
<th>Canadian registries</th>
<th>Alberta</th>
<th>British Columbia</th>
<th>Manitoba</th>
<th>Ontario</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1995–99</td>
<td>38.7%</td>
<td>36.4%</td>
<td>36.6%</td>
<td>41.7%</td>
<td>39.6%</td>
</tr>
<tr>
<td>2000–02</td>
<td>39.7%</td>
<td>36.3%</td>
<td>37.5%</td>
<td>44.1%</td>
<td>40.5%</td>
</tr>
<tr>
<td>2005–07</td>
<td>43.1%</td>
<td>41.5%</td>
<td>43.0%</td>
<td>42.7%</td>
<td>43.4%</td>
</tr>
<tr>
<td>5 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1995–99</td>
<td>15.7%</td>
<td>13.8%</td>
<td>13.9%</td>
<td>16.6%</td>
<td>16.6%</td>
</tr>
<tr>
<td>2000–02</td>
<td>15.9%</td>
<td>13.1%</td>
<td>14.0%</td>
<td>19.4%</td>
<td>16.7%</td>
</tr>
<tr>
<td>2005–07</td>
<td>18.4%</td>
<td>15.1%</td>
<td>17.7%</td>
<td>20.1%</td>
<td>19.1%</td>
</tr>
</tbody>
</table>
Identify the problem
Cancer Care Strategic Networks: Purpose of the Lung Cancer Initiative

**Coordination** of lung cancer diagnosis across the province through promoting the uptake of a provincial clinical care pathway and development of Rapid Access Clinics → Alberta Thoracic Oncology Program.

**Timely access** to critical diagnostic tests (bronchoscopy/EBUS, diagnostic imaging/PET, surgical staging)

**Improved accuracy of lung cancer diagnosis** and treatment associated with improved treatment selection and ultimately clinical outcomes

**Increased system efficiency and capacity** due to more effective selection of diagnostic testing and more accurate clinical decision making
Lung Cancer: High-level Clinical Pathway

Integrated Clinical Pathway
(Navigation, Availability, Monitoring)

Target: 4 weeks (measured, evaluated and improved through performance management)

Suspicion of lung cancer

CT Scan or Suspicious x-ray

Primary Care Physician

Central Intake

Review Referral

Diagnosis and Staging

PET Scan
Mediastinoscopy
Endoscopy
EBUS
DI Biopsy

Order Appropriate Tests

Decision for Definitive Therapy (Supported by Care Navigation)

Co-morbid Disease
Demographics
Psychosocial Issues
Performance Status
Patient Factors
Multidisciplinary Consultation

Decision to Treat

Rad Onc
Med Onc
Nurse Practitioner
Surgeon

Rad Onc

Med Onc

Referral

Order Appropriate Tests

Suspected lung cancer

Standard referral form

Suspicion met to refer to program

Benign

Pre-Treatment Phase

Start of Treatment

Entry point into clinical pathway

Treatment Options

Monitor / Assign Prognosis

Surgery

Radiation

Chemotherapy

Palliative care

* Elements that require net new resources to implement provincially
Expedited Management of Lung Cancer Program (the “Program”) Components

**Program Foundations:**
- Radiation therapy
- Palliative care
- Medical oncology
- Lab medicine
- Program administration
- Data analytics
- Project management
- Scheduling and IT systems
- Provincial access and triage

**Integrating:**
- a provincial vision
- provincial standards
- local implementation
- shared accountability and evaluation

**Improved access for lung cancer**
- Rapid Access Clinic
- Dyspnea Clinic
- Interventional Pulmonary Suite
- Thoracic Oncology Surgery
- Molecular Testing of Cytopathology
- Diagnostic Imaging
- Prep for Lung Cancer Screening
- Performance Measurement

**Integration/Coordination**
Delays in Diagnosis

Evidence suggests that reducing the delays between lung cancer diagnosis to treatment may increase the number of resectable lung tumors and ultimately improve prognosis (Salomaa, et. al., 2005).

Dx in late stage of lung cancer = poor prognosis


“General practitioners should immediately refer patients with clinical evidence of lung cancer to a respiratory physician, and that patient should be seen within one week of referral receipt in a respiratory physicians clinic”

Canadian Society of Surgical Oncology (CSSO)

“patient consultation within two weeks of referral to a thoracic surgeon and to allow treatment including surgery to be initiated within the two weeks of completion of any preoperative tests” (www.cos.ca/csso/)
Alberta Lung Cancer Thoracic Surgery Timelines

International guidelines suggest target of 60 days from referral to surgery

CT → Request Surg Consult → Surg consult → OR

29 days / 79 days → 17 days / 25 days → 69 days / 85 days

Median 130 days / 75th percentile 182 days
Building a Solid Foundation
Expediting Lung Cancer Diagnosis in Alberta

- NP led triage to ATOP
- Increased availability to PET CT scans and CT guided biopsy
- Direct referral to ATOP through radiology driven referral process
- Measurement of progress through a provincial database
- Collaboration with rural resources – eg. Nurse Navigators
- Not discussed in this presentation
  - Lung Cancer Screening
  - Dyspnea Clinic
  - EGFR testing
  - Provincial database
Where do Our Referrals Come From?

Majority of referrals for patients with no diagnosis or needing more tissue for treatment planning

- Community Care Provider
- PCAT
- TBCC
- Thoracic Surgery
- And “NEW” direct referral from radiology
# ATOP Patient Triage and Flow

<table>
<thead>
<tr>
<th>Thoracic surgery</th>
<th>IPM</th>
<th>NP</th>
</tr>
</thead>
<tbody>
<tr>
<td>• SPN</td>
<td>• Clearly bronchoscopy</td>
<td>• Typical NSCLS/SCLC</td>
</tr>
<tr>
<td>• No large nodes</td>
<td>• Vasculitis</td>
<td>• Advanced mediastinal/metastatic disease</td>
</tr>
<tr>
<td>• Anterior mediastinal mass – eg. thymoma</td>
<td>• Immunocompromised</td>
<td>• CT guided bx</td>
</tr>
<tr>
<td>• Smoker/non-smoker</td>
<td>• ILD</td>
<td>• Subcentimeter nodules</td>
</tr>
<tr>
<td></td>
<td>• Lymphoma vs sarcoidosis</td>
<td></td>
</tr>
</tbody>
</table>
Diagnostic Imaging – PET/CT

Critical test in staging of lung cancer patients

At onset of initiative:
- 38% of Calgary surgical patient got PET
- Median wait for PET 40 days (65 days 90th)

Limits related to capacity
- 1 scanner, 1 shift / day
- No local isotope production

Separate initiative approved
- 2nd shift started November 2011
- 2nd scanner June 2012
Diagnostic Imaging – PET/CT scan

75th percentile in Waiting Days/Month in Calgary

Wait Time for PET CT Requested to Performed (target 7 days)

In Calgary, Median PETCT wait was 40 day (65 days 90th) in 2011
Median 7.5 days over past 18 months
Diagnostic Imaging – IR guided biopsies

CT guided biopsies identified as significant delay in patient work-up. In Calgary, Median 17 days / 90th P 23 days (2011)

Discussion with stakeholders identified lack of Day Medicine / Day Surg beds a main choke point

Space / unstaffed beds available in new McCaig Day Surg
Diagnostic Imaging – IR guided biopsies

Implementation and funding of specific day surgery beds at FMC for lung cancer cases (ATOP or not)

Median time to biopsy 8 days (from 17) over past 12 months

Wait Time for US/CT guided Biopsy Requested to Performed

75th Percentile Wait Time in Days

Month US/CT Guided Biopsy Performed
Substantial delay exists between date of CT scan suspicious for lung cancer and referral to lung cancer specialist.
Radiologist is usually “first to know” that a lung cancer may be present

If radiologist could trigger lung cancer specialist review of case at the time of reporting (ie. ATOP NPs)

Investigations and management could be expedited
Radiologist review of suspected lung cancer

Radiologist review of image (START)

CT non-calcified nodule $\geq 8$mm without prior evidence of stability?

- Yes
  - Growing nodule (any size)?
    - Yes
      - Finding suspicious of lung cancer
    - No
      - Persistent ($\geq$2 CTs) ground glass opacification?
        - Yes
          - Mediastinal mass or Mediastinal adenopathy (not typical for sarcoidosis)
            - No
              - Finding not suspicious of lung cancer
            - Yes
              - Send copy of suspicious finding report to ATOP
        - No
          - Send report of non-suspicious finding to PCP

- No
  - Send report of non-suspicious finding to PCP
Diagnostic Imaging – Radiologist Referrals

- ATOP NP reviews radiology report and Netcare.
- Determines if the patient meets criteria for a radiology referral
- Faxes a letter to ordering physician → Offers assistance in evaluating patient *
- Phone call → 72 hours if no reply received by “referring physician”
- In exceptional cases, direct patient contact may be performed
- Triage process also ensures
  - referral to most appropriate health care provider
  - Reduce chance of lack of f/u on abnormal imaging

Please advise us on how you would like us to proceed:

- I am aware of the report and I will organize appropriate investigations and/or referrals.
- Please arrange for an appointment for this patient with the ATOP program. I have advised the patient of this referral.
Diagnostic Imaging – Radiologist Referrals

Conducted a small pilot project within the FMC 5 Chest Radiologist at FMC

Preliminary data on initial 69 cases (Jan – Dec 2013)

Usual

Median / 75th P time CT - appointment 19 / 23.5 d. 26/31 d

Rads

27% / 20%
Diagnostic Imaging – Radiologist Referrals

Fine tuning:

• Added a sentence on our letters → tentative app’t time

• Open up to 2 clinic spots/ week to manage radiology referral patients
Moving toward the Future
Thank you!
References


