Background: LungRAMP

- The UHN Lung Rapid Assessment and Management Program (LungRAMP) is an outpatient diagnostic and treatment program, launched in 2010 to assess and manage patients with presumed lung cancer in the shortest possible timeframe.

DAP Goals

- Decrease wait times
- Improve the quality of care
- Improve availability of resources for both patients and referring physicians
- Improve the patient experience
- Improve patient outcomes
- Reduce system waste
LungRAMP PIP Project Overview

REASON FOR ACTION:

• Ensure LungRAMP is consistently meeting CCO and UHN wait time targets from DAP referral to cancer diagnosis

• Identify opportunities for improving the quality of care provided to LungRAMP patients through the patient journey (from diagnosis to their transfer to treatment)

• Reduce CT guided lung biopsy wait times because of the affect on diagnostic timelines of LungRAMP patients

CCO Wait Time Target = 28 days (60th percentile)
UHN Stretch Wait Time Target = 21 days (90th percentile)

Baseline Wait Time = 53 days (90th Percentile) 36 days (60th Percentile)

Source: LungRAMP Database Jan 2013 – Apr 2014
Diagnosis date taken as date tissue sample was taken

The Lean Journey

Management
Leverage refined and purposeful facilitation
Employ defined project methodology
Ensure transparency and ongoing communication

Diagnostics
Build relationships of trust
Develop vision for future
Understand current state
Identify areas for improvement

Improvements
Employ specific tools and methodologies
Analyze & collaboratively problem solve
Implement solutions to achieve vision
Drive change via performance metrics

Sustainability
Develop infrastructure to maintain and initiate new improvements

Source: LungRAMP Database Jan 2013 – Apr 2014
Diagnosis date taken as date tissue sample was taken
Project Approach

LungRAMP Value Stream Mapping (VSM) May/June 2013
- Conduct initial assessment via interviews and process observations
- Collaboratively analyze LungRAMP patient journey current state by process mapping
- Identify and prioritize opportunities for improvement

Deliverable: Identify high impact current state opportunities

Solution Development August – October 2013
- CT guided lung biopsy day of exam Rapid Improvement Event
- CT guided lung biopsy booking working group
- LungRAMP improvement working group
- Develop solutions to address identified areas of opportunity

Deliverable: Create sustainable solutions

Implementation/ Sustainability Ongoing
- Monitor impact and feasibility of new processes
- Iterative solution development
- Working group meetings with leadership to monitor progress of solution implementation, key performance indicators and take action as required

Deliverable: Continuous quality improvement

Solution Overview

Baseline: 53 day wait time
Target: 21 day wait time

Baseline: 19 day wait time
Target: 10 day wait time

Baseline: 8 day BTAT
Target: 2 day BTAT
Solution Overview
LungRAMP Patient Intake and Care Planning Processes

Issues Implemented Solutions

Nurse Navigator (NN) overloaded with appointment scheduling
- Appointment booking conducted by secretaries and communicated to NN via regular huddles

No consistent point of contact for LungRAMP patients
- Initial patient call from secretaries establishes consistent single point of contact
- NN conducts follow-up call within 3 days to assess patient's complexity and explain care pathway

Delays and inconsistencies in care planning for patients
- Secretaries manage care planning for standard patients
- NN supports surgeon with care planning for complex patients

Unclear which patients are LungRAMP throughout the patient journey
- Secretaries flagging patients in EPR to ensure all departments are aware a patient is in LungRAMP

Solution Highlight
Nurse Navigator Workflow

Change Management Tools
- 3 day VSM with front line staff from medical imaging, thoracic surgery, radiation/medical oncology, and pathology
- Multiple sessions of process mapping with LungRAMP staff
- Weekly huddles with Nurse Navigator and LungRAMP Coordinator
- Multiple Q&A sessions with Secretaries to launch new processes

Outcomes
- Right person doing the right role; clerical tasks owned by Secretaries
- Clear workflow established for Nurse Navigator in patient care planning
- Partnerships between Nurse Navigator and Secretaries created to plan patient journey
- Collaboration between thoracic surgery department and medical imaging to achieve cross-departmental goals
Solution Overview
Lung Biopsy Booking Processes

<table>
<thead>
<tr>
<th>Issues</th>
<th>Implemented Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of transparency into booking processes and patient status within the booking journey</td>
<td>✓ Master tracking sheet for appointment scheduler to monitor all steps of procedure booking</td>
</tr>
<tr>
<td>Incomplete biopsy requests create delays in booking and wasted time for clerical staff to find required information</td>
<td>✓ Referral requirements and acceptance process to inform referring physicians when and what information is missing</td>
</tr>
<tr>
<td>Paper process for radiologists to review and approve biopsy requests creates delays in booking process</td>
<td>✓ Online biopsy consult review and approval process</td>
</tr>
<tr>
<td>Inefficiencies in booking workflow; unnecessary printing, “phone tag”</td>
<td>✓ Appointment scheduler using two monitors to eliminate need for printing</td>
</tr>
<tr>
<td></td>
<td>✓ Appointment scheduler directly calling patients to inform them of their appointment</td>
</tr>
<tr>
<td></td>
<td>✓ Complete standard of work for biopsy booking process</td>
</tr>
<tr>
<td></td>
<td>✓ Cross train all Toronto General Hospital Booking Office staff to book biopsy patients</td>
</tr>
<tr>
<td>Last minute cancellations because patient unclear of procedure expectations and arrives unprepared</td>
<td>✓ Patients informed by medical imaging of the appointment requirements</td>
</tr>
<tr>
<td></td>
<td>✓ Reminder call to patients the day before their appointment</td>
</tr>
<tr>
<td></td>
<td>✓ Short call list of patients willing to accept last minute appointments</td>
</tr>
</tbody>
</table>

Source: Baseline: RIS: July 2012 to June 2013; Current: RIS Sept 2nd 2013 – May 26th 2014; Booking Turnaround Time is defined as the 90th percentile time between requisition received and appointment made.

Solution Highlight
Biopsy Booking Workflow

Change Management Tools
- Weekly working group meetings with front line clerical staff, Supervisors and Managers
- Observations of process flow
- Analysis of booking processes; implementation of a tracking sheet to capture all steps in the booking process and find bottlenecks
- Process mapping events to develop new processes and workflow

Outcomes
- ✓ Redesigned clerical workflow
- ✓ Plan for paperless booking for internal biopsy orders
- ✓ Improved communication and tightened connections between medical imaging and referring physicians

UHN Toronto General Toronto Western Pometta Marguerit Toronto Rehab
### Solution Overview

**Lung Biopsy Day of Exam Process**

<table>
<thead>
<tr>
<th>Issues</th>
<th>Implemented Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lost slots due to patients arriving unprepared and no shows</td>
<td>✓ Patients informed by medical imaging of the appointment requirements</td>
</tr>
<tr>
<td></td>
<td>✓ Reminder call to patients the day before their appointment</td>
</tr>
<tr>
<td></td>
<td>✓ Calling patients that no show to understand reason why</td>
</tr>
<tr>
<td>Delay in Medical Imaging Day Unit (MIDU) to consent and</td>
<td>✓ Improved signage to direct patients to MIDU and waiting room</td>
</tr>
<tr>
<td>prepare the patient for their procedure</td>
<td>✓ Nurse prioritization of lung biopsy patient upon arrival in MIDU</td>
</tr>
<tr>
<td></td>
<td>✓ Radiologists/fellow check with MIDU upon arrival at hospital</td>
</tr>
<tr>
<td></td>
<td>✓ Radiologists/fellow agreement to provide consent within 5 mins of call from MIDU</td>
</tr>
<tr>
<td>CT Technologist going to MIDU to pick up patients delays</td>
<td>✓ Radiologist/fellow transport patient from MIDU to scan room after consenting patient</td>
</tr>
<tr>
<td>scan start and room turnaround time</td>
<td>✓ Radiologist/fellow conducting narcotics count to allow CT tech to clean scan room</td>
</tr>
<tr>
<td>Delays in review of post-procedure x-ray and patient discharge</td>
<td>✓ Process change to allow for any radiologist to review x-ray</td>
</tr>
<tr>
<td></td>
<td>✓ Training fellows to place additional x-ray orders in the hospital's order entry system</td>
</tr>
<tr>
<td></td>
<td>✓ When longer than expected biopsies prevent discharge another radiologist can discharge on behalf of the performing radiologist</td>
</tr>
</tbody>
</table>

**Source:**
Baseline: RIS: July 2012 to June 2013; Current: RIS Sept 2nd 2013 – May 26th 2014. On Time Scan Starts is defined as the percentage of exams +/- 10m to scheduled appointment time; excludes any patient who arrives 30 minutes or less prior to the biopsy scheduled time.

### Solution Highlight

**Lung Biopsy Day of Exam Process**

**Change Management**

- Observations of process flow
- 2 day RIE with front line staff, Managers, Supervisors and radiologists
- Data analysis of DOE processes; implementation of a tracking sheet to ensure timely execution of process steps
- Weekly working group meetings with, Supervisors and Managers to tweak processes and discuss issues
- Weekly data review with Clinical Manager and instant issue escalation

**Outcomes**

- ✓ Increased communication between staff on the day of the exam
- ✓ Increased satisfaction amongst staff
- ✓ Increased transparency and accountability for hand-offs
- ✓ Standards of work created for all staff involved in the process
The following sustainability tools were implemented to monitor improvements and sustain a culture of continuous improvement.

<table>
<thead>
<tr>
<th>Tool</th>
<th>Timeframe</th>
<th>Achievements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action Plan</strong></td>
<td>• Reviewed weekly</td>
<td>✓ Clinical staff driving improvements</td>
</tr>
</tbody>
</table>
| **Performance and Data Monitoring** | • Weekly reporting of tracker data                                      | ✓ 12 rounds of weekly tracker reporting  
• Weekly performance data monitored by leadership | Manual collecting 20 time stamps  
• Online dashboard built for long term performance management |
| **Performance Huddles**     | • Bi-weekly on Thursdays,                                                 | ✓ Facilitate on-the-spot problem solving amongst staff                     |
| **Strategy Wall**           | • One per clinical area (tech, MIDU, clerical)                           | ✓ CT, clerical and nursing area strategy wall implemented and used in bi-weekly huddles |
| **Leadership and Process Audits** | • Monthly, first round completed Oct 2                                  | ✓ CT and nursing completed audits with positive feedback on the process |
| **Report out Presentations** | • Oct 17 (30 days)  
• Nov 28 (60 days)                                                      | ✓ 30 and 60 day report out completed                                         |

**LungRAMP Patient Wait Times**

*Overall Wait Time – CCO Targets*

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Wait Time (Days)</th>
<th>90&lt;sup&gt;th&lt;/sup&gt; Percentile</th>
<th>60&lt;sup&gt;th&lt;/sup&gt; Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 13/14</td>
<td>34</td>
<td>90&lt;sup&gt;th&lt;/sup&gt;</td>
<td>60&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Q2 13/14</td>
<td>34</td>
<td>90&lt;sup&gt;th&lt;/sup&gt;</td>
<td>60&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Q3 13/14</td>
<td>75</td>
<td>90&lt;sup&gt;th&lt;/sup&gt;</td>
<td>60&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Q4 13/14</td>
<td>78</td>
<td>90&lt;sup&gt;th&lt;/sup&gt;</td>
<td>60&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

**Solution Implementation**

(August-Nov 2013)

Source: LungRAMP Database April 2013 – April 2014

*CCO requests only patients who receive a positive or negative diagnosis for cancer in that quarter be included in wait time data, this excludes follow-up and exited patients that are managed in LungRAMP.*
LungRAMP Patient Wait Times
Overall Wait Time – CCO Targets

<table>
<thead>
<tr>
<th>Wait Time (Days)</th>
<th>90th Percentile</th>
<th>60th Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>55</td>
<td>32</td>
</tr>
<tr>
<td>Q2</td>
<td>45</td>
<td>25</td>
</tr>
<tr>
<td>Q3</td>
<td>35</td>
<td>20</td>
</tr>
<tr>
<td>Q4</td>
<td>25</td>
<td>15</td>
</tr>
</tbody>
</table>

Source: LungRAMP Database April 2013 – April 2014
*Referral volumes is a count of all LungRAMP patients referred in the month, regardless of final diagnosis.

Fluctuations in wait time are a result of seasonal variation

CT Guided Lung Biopsy Wait Times
Strategic Overview

<table>
<thead>
<tr>
<th>Wait Time (Days)</th>
<th>90th Percentile</th>
<th>60th Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Q2</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>Q3</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Q4</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: RIS April 2013 - April 2014

Fluctuations in wait time are a result of seasonal variation
CT Guided Lung Biopsy Wait Times

Booking Overview

- 90th Percentile: 7 days
- 60th Percentile: 4 days

Medical Imaging Improvements (Sept 2013)

Source: RIS April 2013 - April 2014

CT Guided Lung Biopsy Wait Times

Performance Metrics Overview

<table>
<thead>
<tr>
<th>Metric</th>
<th>Baseline</th>
<th>Current</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam Wait Time</td>
<td>19 days</td>
<td>26 days</td>
<td>10 days</td>
</tr>
<tr>
<td>Scheduled Scan Time*</td>
<td>12:45 h/w</td>
<td>13:00 h/w</td>
<td>15</td>
</tr>
<tr>
<td>On Time Scan Starts*</td>
<td>53%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Room Turnaround Time</td>
<td>0:28 hrs</td>
<td>0:27 hrs</td>
<td>0:20</td>
</tr>
<tr>
<td>Pre-Procedure Time</td>
<td>1:45 hrs</td>
<td>1:42 hrs</td>
<td>1:30</td>
</tr>
<tr>
<td>Same Day Cancellations</td>
<td>24%</td>
<td>3%</td>
<td>0</td>
</tr>
<tr>
<td>Booking Turnaround Time</td>
<td>10 days</td>
<td>5 days</td>
<td>2</td>
</tr>
</tbody>
</table>


7 Wait times impacted due to holiday closures

*Scheduled scan time excludes any appointment that is cancelled in advance of the exam date; baseline is based on 1 year of data divided by 50 weeks

*On Time Scan Starts excludes any patient who arrives 30 minutes or less prior to the biopsy scheduled time
Lessons Learned

- Improvements take time
- Must understand current state so you can improve the future
- Strong, active leadership is essential
- Dedicated project management resources are critical
- Cross-departmental initiative gave better understanding of opportunities for improvement

Conclusion

- Successfully decreased the wait time from referral to diagnosis and improved the quality of care provided to patients in their diagnostic journey.
- Significant gains were made through Lean Process Improvement in the Medical Imaging department - CT guided lung biopsy procedure.
- Cross departmental collaboration with Thoracic Surgery, Medical Imaging and Pathology enabled improvement across the entire patient journey.
- Demonstrated that process redesign and efficient use of existing resources can make high impact and sustainable improvements to patient care.
Contact Information

For more information please contact Alice Tsang, Business Analyst for the Joint Department of Medical Imaging at UHN at alice.tsang@uhn.ca

Thank you for your interest in the LungRAMP Process Improvement Project.