"Population Level Synoptic Cancer Pathology Facilitates Timely Prognostic Factor Analysis and Quality Indicator Reporting"

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National Staging Initiative
Clinical Lead: Synoptic Pathology Reporting
Overview

- The Canadian Partnership Against Cancer
- Role of the Pathologist in the Cancer System
- The National Staging Initiative
- National and Provincial Projects Approaches
- An examination of Ontario(CCO) results to date
- Impacts on Cancer Registries
- Next Steps
The Partnership (CPAC) is an independent organization, federally funded, to accelerate action on cancer control for all Canadians.

- Focused approach to help prevent cancer
- Lessen the likelihood of dying from cancer
- Increase the efficiency and effectiveness of cancer control in Canada
- Enhance the quality of life of those affected by cancer
Our domain

Cancer control involves

- all aspects of the disease
- the entire population
Pathologists are “Diagnostic Oncologists”

- Anatomical pathologists are society’s diagnostic oncologists
- Activities cut across the entire cancer care continuum from prevention/screening to diagnosis to prognosis/prediction to disease monitoring
- At least 60% of the average pathologist’s time relates to cancer related activities
- In Ontario more pathologist FTEs are devoted to the cancer system than medical oncologists or radiation oncologists

The Patient Care Cancer Journey

Prevention → Screening → Diagnosis and Prediction → Treatment

Palliative Care End of Life

Recovery
Key dimensions of quality for Cancer Pathology Reporting

**Timeliness**
The degree to which the currency of the information meets the need for currency

**Accuracy**
The degree to which the data reflects the reality it was intended to record

**Completeness**
Extent to which important clinical content is included in the report

**Usability - Format**
The ease with which the data can be understood and used

Source: Cancer Care Ontario
## Spectrum of Cancer Pathology Reporting

### Basic vs. Cutting Edge

<table>
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</tr>
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<tbody>
<tr>
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<td>Narrative</td>
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<td>Level 2+</td>
<td>Level 3+</td>
<td>Level 4+</td>
<td>Level 5+</td>
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<tr>
<td></td>
<td>No CAP content</td>
<td>CAP content</td>
<td>Synoptic-like structured format</td>
<td>Electronic reporting tools using drop-down menus</td>
<td>Standardized reporting language</td>
<td>ICD-0 and SNOMED CT or other coding</td>
</tr>
<tr>
<td></td>
<td>Single text field data</td>
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*CAP: College of American Pathologists*
Simple concepts drive complex change management

Synoptics

Communities of Practice

True Synoptic Report

<table>
<thead>
<tr>
<th>Specimen type</th>
<th>left modified radical mastectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tumour site</td>
<td>left outer upper quadrant</td>
</tr>
<tr>
<td>Tumour size</td>
<td>3 x 2 x 1 cm</td>
</tr>
<tr>
<td>Histologic type</td>
<td>ductal, NOS</td>
</tr>
<tr>
<td>Histologic grade</td>
<td>2/3 (modified SBR)</td>
</tr>
<tr>
<td></td>
<td>tubules - 2/3;</td>
</tr>
<tr>
<td></td>
<td>nuclei - 2/3;</td>
</tr>
<tr>
<td></td>
<td>mitoses - 2/3</td>
</tr>
<tr>
<td>Margins</td>
<td>uninvolved by invasive carcinoma</td>
</tr>
<tr>
<td>Distance to closest margin</td>
<td>1 cm to deep margin</td>
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The formatting of a recipe can have a big impact on the quality of the cookies

Narrative Recipes

- Traditionally cookie recipes were passed from generation to generation in handwritten loose leaf notebooks leading to:
  - Missing ingredients
  - Wrong oven temperatures and cooking times
  - Misinterpretation of the recipe
  - Burnt cookies and eroded family confidence in the taste and quality of the cookies

Chocolate Chip Cookies

Combine 1 cup of butter with 1 cup of white sugar and one cup of brown sugar and two eggs. Add 2 teaspoons of vanilla extract and 3 cups of all purpose flour in one teaspoon of baking powder and two teaspoons of hot water and one half teaspoon of salt. Add 2 cups of semi sweet chocolate chips and add one cup of chopped walnuts. Prep time is 20 minutes and cooking time is 10 minutes. This makes 4 dozen of the best chocolate chip cookies you ever had.

Synoptic Recipes

Synoptic reporting which lists each ingredient and cooking parameter in pairs on separate lines leads to:

- All ingredients listed
- Decision-making for cooking temperature and time
- Analysis of ingredient combinations for maximum taste (more taste testing)
- Plenty of family confidence and request for more cookies

Synoptic Recipe

Oven temp: 350 degrees F
Cooking time: 10 minutes
Yield: 4 dozen

Ingredient:
Butter: 1 cup
White Sugar: 1 cup
Brown Sugar: 1 cup
Baking soda: 1 teaspoon
Chocolate chips: semi-sweet: 2 cups
Walnuts: chopped: 1 cup

All purpose flour: 3 cups
Salt: ½ teaspoon
Eggs: 2
Hot water: 2 teaspoons
Standardizing the format and content of the pathology and surgery OR reports

Narrative Report

Traditionally surgery and pathology reports have been narrative in format and may be missing critical information leading to:

- Mistakes
- Treatment delays or inaction
- Misinterpretation of the findings
- Eroded patient and provider confidence in diagnosis

Synoptic Report

Synoptic reporting which lists each diagnostic or prognostic parameter pair on a separate line improves:

- Quality of the data
- Decision-making for treatment
- Analysis of practice
- Communication between patients and providers

**True Synoptic Report**

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Communities of Practice: Dedicated to Better Cookies

Communities of Practice bring together:

• Leaders who organize the meetings

• Sharing of expertise and experience

• Communication of best ingredients and best practices

• Cooking classes and education
Pathology Communities of Practice: Dedicated to Better Patient Care

Communities of Practice:

- Champions and opinion leaders who promote best practices in pathology
- Pathologist mentoring
- Sharing of expertise and experience
- Education and stakeholder engagement
History of Cancer Care Ontario Synoptic Pathology Project

1999-2005
PIMS implementation
Focus on how to get the report
Evolution: Focus on what

2004
Reports not standardized
Mix of narrative and synoptic
Lack of content and informatics standards
Focus on Quality

2004-2007
CAP checklists: ON standard
Convened expert panels
Pathology completeness audits

2008-Present
Communities of Practice/ HWG
“Road show”
Support for electronic tools and implementation
Vendor engagement

✓ ON adoption of the CAP protocols
✓ Implementation of standardized electronic synoptic pathology reporting
CPAC National Staging Initiative and Synoptic Pathology Reporting

National population-based collaborative stage data collection for cancer cases diagnosed on or after January 1, 2010:

- Colorectal
- Breast
- Lung
- Prostate

Pathology was identified as a critical component of the National Staging project.

The project comprises a $20M investment that links together Pathologists and Cancer Registries

Registry systems, e-Path, *synoptic pathology solutions*
The National Staging Initiative
Provincial/Territorial Approaches

- New Registry
  - Includes YK
  - Includes NWT

- New Registry
  - e-Path reporting
  - Registry upgrade

- Synoptic Pathology
  - Includes reporting for NV

- Synoptic Pathology

- Synoptic Pathology

- New Registry
  - New Registry

- Synoptic Pathology

- Synoptic Pathology

- New Registry
History of the Synoptic Pathology Component of National Staging Initiative

 Initiation

- Partnership CAP-ACP
- National Pathology Standards Committee

 Endorsement

- "Road show"
- Pathologist lead education on synoptic reporting tools
- Professional endorsement of the CAP protocols as a pan-Cdn content standard

 Adoption

- KT sessions
- Implementation support
- WebEx library

 Sustainability

- Cdn protocol review panels
- Informatics standards
- Vendor engagement

- pan-Canadian adoption of the CAP protocols
- Pilot implementation of standardized electronic synoptic pathology reporting
Newfoundland and Labrador

Will meet project objectives in 2010/11

Scope: Synoptic pathology reporting pilot in 2 labs:

- Eastern Health
- Central Health

Status:

- Licensing Contracts signed – Meditech and CAP
- eCC Checklists – 4 main sites
- Paper Checklists – all other sites
- Meditech XML loader installed Eastern Health in Test Environment

Long Range Goal – Provincial Implementation
New Brunswick

Pathology Project

Will meet project objectives in 2011/12

Scope:
- Province-wide adoption of CAP protocols (7th edition TNM) for breast, lung, colorectal and prostate cancers
- Pilot electronic synoptic reporting tools in 4 of 8 labs
- Enable Cancer Registry access to lab and other clinical data through the iEHR

Status:
- Adoption of CAP protocols endorsed by NB Association of Laboratory Physicians and Dept of Health policy
- Meditech & Cerner solutions in early phases of implementation
Pathology Project

Quebec

Progressing towards project objectives for 2011/12

Scope:

- Implementation of electronic synoptic pathology reporting tools supporting the 2009/10 College of American Pathologists cancer protocols

Status:

- Project plan submitted
- Refinement of project plan continuing
- Vendor selection and implementation of electronic synoptic reporting tools in pilot hospital in 2010/11
Ontario/ Nunavut

Will meet project objectives in 2011/12

Scope:

- Implement electronic (discrete data field) checklist reporting (e-CC) for all mandatory disease sites in all pathology reporting hospitals by March 2012

Status:

- 5 electronic checklists implemented (lung, colorectal, endometrium, breast and prostate)
- Remaining mandatory electronic checklists to be implemented by March 2012
Ontario’s experience with the College of American Pathologists Cancer Protocols and Checklists
Pathology in Ontario

- About 400 Pathologists
- 110 acute care hospitals report cancer pathology to Cancer Care Ontario
- 90% of cancer pathology reported electronically to Ontario’s Cancer Registry at Cancer Care Ontario through the **Pathology Information Management System (PIMS)**
- >130,000 electronic cancer path reports received each year, by the Ontario Cancer Registry, via 50 hospital/lab hubs
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<td>➢ Level 3 +&lt;br&gt;➢ Standardized reporting language</td>
<td>➢ Level 4 +&lt;br&gt;➢ Data elements stored in discrete data fields</td>
<td>➢ Level 5 +&lt;br&gt;➢ ICD-O and SNOMED CT coding</td>
</tr>
<tr>
<td>% Hospitals 2004</td>
<td>5%</td>
<td>40%</td>
<td>50%</td>
<td>5%</td>
<td>0%</td>
<td>0%</td>
</tr>
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History of the CCO Pathology Audits and Data Use

**Audits**
- Audit of breast, lung, prostate, colorectal, and endometrium
- ON Disease Site Expert Panel

**Education**
- Path leads in each hospital
- Hospital working group sessions
- "Road show"

**Data Use**
- Completeness indicators
  - Surgical indicators
  - Stage indicators
  - CSQI

**Lessons**
- Manual audits not sustainable
- Need for informatics standards
- Demand for secondary use of the data

**Sustainability**
- Informatics standards
- Electronic tools
- Vendor engagement

- 2005-2007
- 2005-present
- 2005-present
- 2007-present
- 2008-present

Format and content standards drive completeness
Indicators (Path, Stage, Surgery) require standards and electronic innovations for sustainability
Comparison of reporting formats and completeness rates for common cancers (05-06 data)

<table>
<thead>
<tr>
<th>Site</th>
<th>No. cases</th>
<th>Synoptic</th>
<th>Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostate</td>
<td>828</td>
<td>97%</td>
<td>50%</td>
</tr>
<tr>
<td>Lung</td>
<td>533</td>
<td>86%</td>
<td>34%</td>
</tr>
<tr>
<td>Breast</td>
<td>1746</td>
<td>80%</td>
<td>43%</td>
</tr>
<tr>
<td>CRC</td>
<td>1431</td>
<td>78%</td>
<td>28%</td>
</tr>
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</table>

The difference in completeness rates between SYN and NAR cases was statistically significant for each tumor site (Chi-square and Fisher exact tests; p<0.0001).

Source: Cancer Care Ontario
Implementing the College of American Pathologists standard improved completeness of pathology resection reports in Ontario

**Compleness Results for CRC Cancer Resections 2005 and 2007**

**Findings:**

- 19% improvement in completeness of CRC path reports from 2005 to 2007

- In 2007, 12 of 14 LHINs met provincial standard of 90%

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Source: Cancer Care Ontario, Pathology Information Management System (PIMS)

Notes:
1. *April 1 - September 30, 2005 and September 1 - October 31, 2006*
2. In 2006, more clear, explicit statements around the involvement of the proximal, distal and radial margins were required compared to 2005.
Pathologists from early adopter hospitals have conveyed key benefits of synoptic reporting.

- Ensures all reports are complete with consistent format and language.
- Facilitates secondary use of rich data in pathology reports.
- Potential to reduce report turn around time by pathologists.*

Results in fewer calls from surgeons, oncologists and cancer registries.
Enables reporting of data quality, stage, pathology and surgical indicators.
Supports faster reporting back to surgeons, oncologists and cancer registries.

*with synoptic path reporting e-Tools and voice recognition dictation software
Synoptic pathology enables reporting of surgical and other clinical indicators to advance quality.

Percent of colorectal cancer cases with 12 or more nodes removed

Source: 2005 and 2006 Cancer Care Ontario Pathology Audit of Ontario hospitals, presented by hospitals in each LHIN health region.
Discrete synoptic pathology reporting is setting foundation for Ontario’s pathology data quality program

This indicator was developed using data from a labor intensive manual audit of electronic reports, reported 1 yr later.

Completeness Results for Lung Cancer Resections
Overall Completeness: 96 %

Target: 90%

Timeliness
Accuracy
Usability (Format)

Based on data from the 2005 and 2006 Cancer Care Ontario (CCO) Pathology Audit of Ontario hospitals, presented by hospitals in each LHIN health region.
True (discrete data field) synoptic reporting implemented in 80 hospitals through CCO and hospital partnership model.
More than 60% of 5 common CA path resection reports are being received in DDF synoptic format

Data Source: CCO PIMS Database; Reports received by month of date of surgery; from May 08 to Mar 10, as of May 11/10.
In March 2010, 96% of all DDF synoptic pathology reports were complete against CAP standard.

Data Source: CCO PIMS Database; Reports received by month of date of surgery; from May 08 to Mar 10, as of May 11/10.
Colorectal surgical pathology indicators are now available soon after surgery with synoptic reports.

Percent of Discrete Synoptic CRC Resection Reports reporting 12 or more nodes were examined.

Data Source: CCO PIMS Database; Reports received by date of surgery; from Jun 08 to Mar 10, as of May 11/10.
Prostate margin rates can be calculated using synoptic pathology data without labor intensive manual audits.

Percent of Discrete Synoptic pT2 Prostatectomy Reports reporting positive margins

Data Source: CCO PIMS Database; Reports received by quarter of date of surgery; from Jun 08 to Mar 10, as of May 11/10.
Standardized cancer pathology reporting development in Ontario will target level 6 reporting by 2012

<table>
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<tr>
<td>% Ontario Hospitals 2004-05</td>
<td>5%</td>
<td>40%</td>
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<tr>
<td>% Ontario Hospitals 2006-07</td>
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<td>5%</td>
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<tr>
<td>% Ontario Hospitals 2008-09</td>
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<td>0%</td>
</tr>
<tr>
<td>% Ontario Hospitals 2009-10</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>% Ontario Hospitals by 2012</td>
<td>0%</td>
<td>0%</td>
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Ontario hospitals refers to 65 hospitals/labs (44 primary and 21 secondary). Primary sites report through Ontario’s Pathology Information Management System (PIMS) and are considered reporting hubs, (secondary hospitals report through a hub). Excludes pediatric facilities.

08/09 CCO Standard (Top 5 cancer resection reports only) 2010 Standard CAP and NAACCR aligned All cancer checklists
CS replacing TNM as new stage reporting standard in Ontario and Canada

Schematic Diagram of Relationships of Inputs and Outputs for Collaborative Staging to TNM System

- CS Tumour Size (TS)
- CS Extension (Ext)
- CS TS/Ext Evaluation Method
- CS Lymph Nodes
- Regional Nodes Positive
- Regional Nodes Exam
- CS Reg Nodes Evaluation Method
- CS Mets at DX
- CS Mets Evaluation Method
- CS Site Specific Factors 1-6

Other input items always used: Histology

AJCC T

AJCC N

AJCC M

AJCC Stage Group

Other input items occasionally used: Age, Grade, Behavior
Achieving population based Collaborative Staging automated data capture is dependent on successful implementation of synoptic pathology reporting.
Feasibility study found that OLIS provides 65% more CS data for PSA results for prostate cancer patients than hospital record abstraction.

- OLIS data does not match manual abstraction
- OLIS data matches manual abstraction
- OLIS provides PSA result and not found from manual abstraction

Reasons for non-matched data:
1. Test performed at non-foundation adopter lab
2. Test performed before lab started reporting to OLIS
3. Data incomplete or hard to find in hospital health record
4. Data quality issue in manual abstraction
Starting with 2009 cases - stage capture will be automated from e-Path for four common cancers with new solution.

- Radiology Synoptic Tools
- Surgical Synoptic Tools
- Pathology Synoptic Tools

Ongoing manual supplementation from charts until e-Imaging and e-Surgery are developed.

Automated pre-population of all available synoptic data.

Electronic health records for all hospitals.

Remote access.
Impact on Cancer Registries

- Information received electronically: No paper reports or faxes
- More complete pathology reports
- Greater precision in pathology reporting with electronic tools and checklists—due to the use of “pick lists”, coders would not have to “interpret” complex or ambiguous dictated diagnoses
- Potential for fewer manual reviews of the Pathology reports
- Time savings statistically significant when discrete synoptic pathology data is used to pre-populated the patient’s CS abstract
- Fewer FTE’s required per above, freeing staff up for QA audits and other activities
Next Steps

- National sharing of lessons learned with Synoptic Pathology and Stage automation
- Continued vendor engagement
- Knowledge transfer
- 2012-2017: Planning for a multi-disciplinary synoptic strategy for cancer control
- International collaborations (CAP, RCPA, RCPath - UK)
- Continued promotion of pan-Canadian content, informatics and messaging standards
The Partnership is actively promoting the adoption and implementation of DDF synoptic reporting as a standard across multiple disciplines.
Questions?

Dr. John Srigley

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