CPAC National Staging Initiative: Synoptic Cancer Pathology Reporting

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

John Srigley MD FRCPC

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

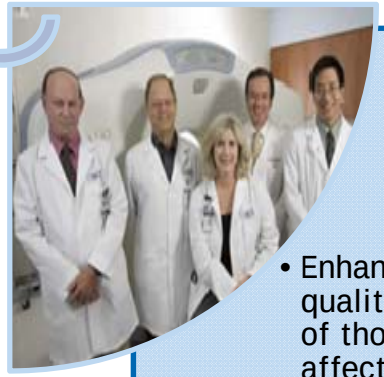
The Partnership(CPAC) is an independent organization, federally funded, to accelerate action on cancer control for all Canadians

- 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

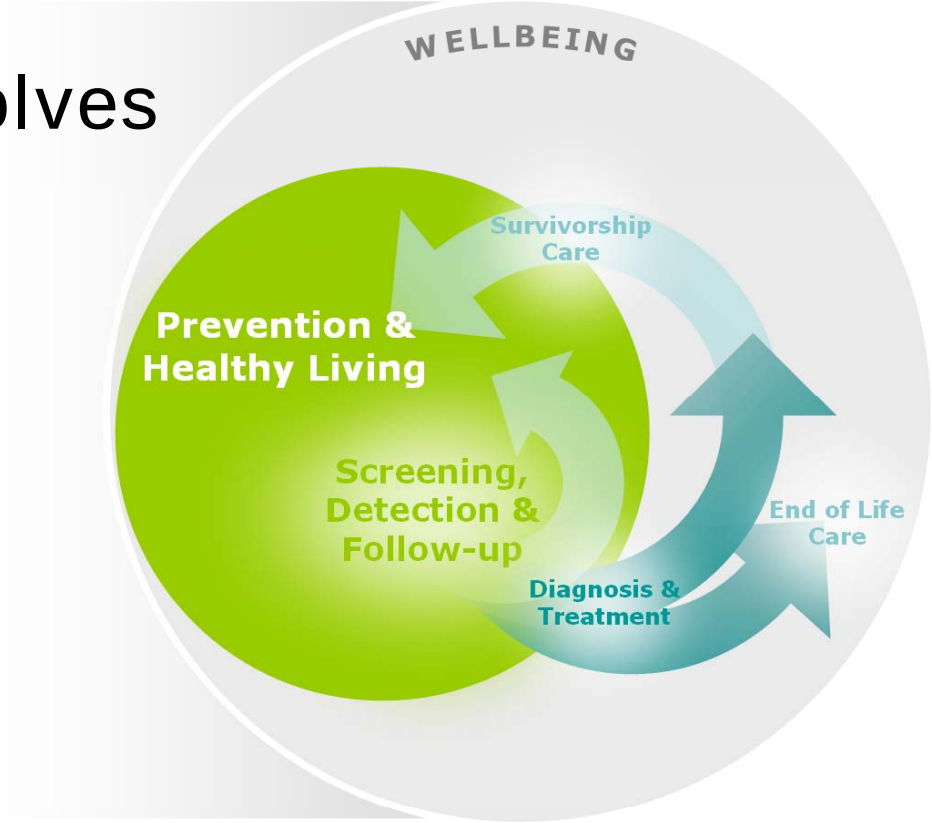


CANADIAN PARTNERSHIP AGAINST CANCER
PARTENARIAT CANADIEN CONTRE LE CANCER

Our domain

Cancer control involves

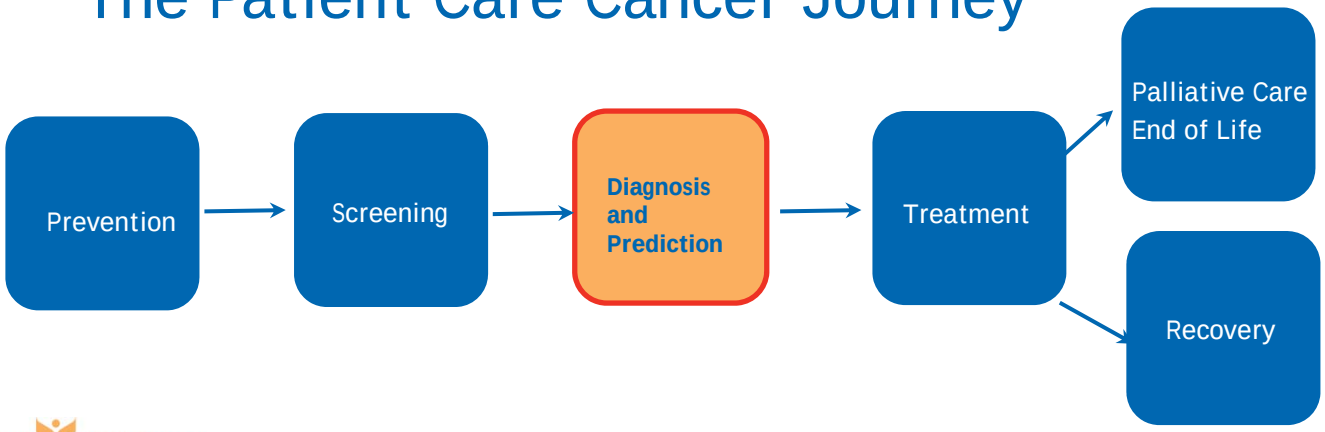
- all aspects of the disease
- the entire population



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



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

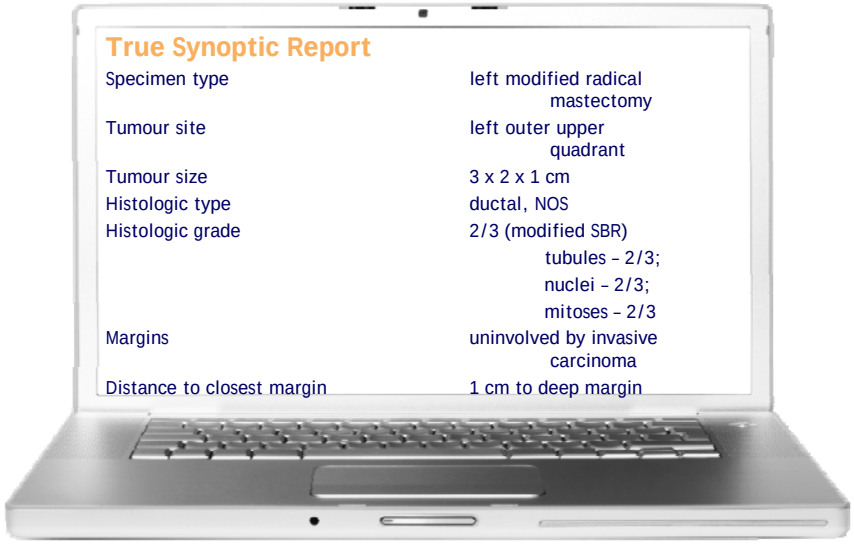
Spectrum of Cancer Pathology Reporting

Basic → Cutting Edge

Reporting level	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Description	• Narrative • No CAP content • Single text field data	• Narrative • CAP content • Single text field data	• Level 2 + • Synoptic-like structured format	• Level 3 + • Electronic reporting tools using drop -down menus	• Level 4 + • Standardized reporting language • Data elements stored in discrete data fields	• Level 5 + • ICD-O and SNOMED CT or other coding

Simple concepts drive complex change management

Synoptics



True Synoptic Report

Specimen type	left modified radical mastectomy
Tumour site	left outer upper quadrant
Tumour size	3 x 2 x 1 cm
Histologic type	ductal, NOS
Histologic grade	2/3 (modified SBR) tubules – 2/3; nuclei – 2/3; mitoses – 2/3
Margins	uninvolved by invasive carcinoma
Distance to closest margin	1 cm to deep margin

Communities of Practice

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 hand written 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 while sugar and one cup of brown sugar and two eggs. Add 2 teaspoons of vanilla extract and 3 cups of all purpose flowerMix in ine teaspoon of baking powder and two teaspoons of hot water and one half teaspoon of salt.Add 2 copus of semi sweet chiocolate chips and add one cup of chopped walmuts. Prep time is 20 minutes and cooking time is 10 minuest. Base at 350 degrees for 10 minutes. This makes 4 dozen of the best chocolate chip cookies you eve r had.

Synoptic Recipes

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

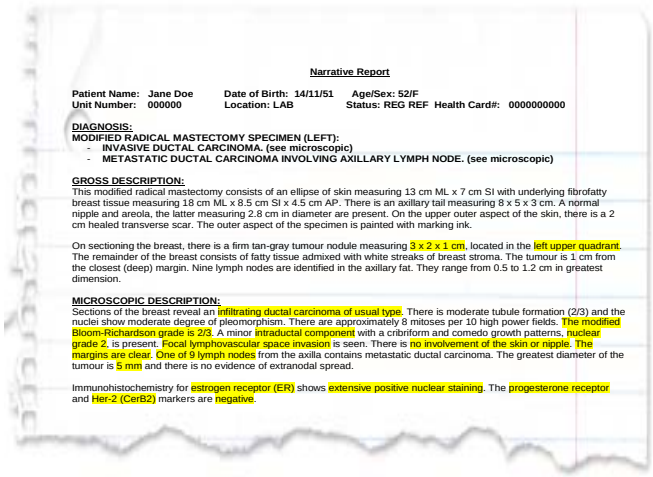
- All ingredients listed
- Decision-making for cooking temperature and time
- Analysis of ingredient combinations for maximum taste (more taste testing)
- Plenty of family confidence and request for more cookies

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



Narrative Report

Patient Name: Jane Doe **Date of Birth: 14/11/51** **Age/Sex: 52/F**
Unit Number: 000000 **Location: LAB** **Status: REG REF** **Health Card#: 0000000000**

DIAGNOSIS:
MODIFIED RADICAL MASTECTOMY SPECIMEN (LEFT):
- **INVASIVE DUCTAL CARCINOMA. (see microscopic)**
- **METASTATIC DUCTAL CARCINOMA INVOLVING AXILLARY LYMPH NODE. (see microscopic)**

GROSS DESCRIPTION:
This modified radical mastectomy consists of an ellipse of skin measuring 13 cm ML x 7 cm SI with underlying fibrofatty breast tissue measuring 18 cm ML x 8.5 cm SI x 4.5 cm AP. There is an axillary tail measuring 8 x 5 x 3 cm. A normal nipple and areola, the latter measuring 2.8 cm in diameter are present. On the upper outer aspect of the skin, there is a 2 cm healed transverse scar. The outer aspect of the specimen is painted with marking ink.

On sectioning the breast, there is a firm tan-gray tumour nodule measuring 3 x 2 x 1 cm, located in the left upper quadrant. The remainder of the breast consists of fatty tissue admixed with white streaks of breast stroma. The tumour is 1 cm from the closest (deep) margin. Nine lymph nodes are identified in the axillary fat. They range from 0.5 to 1.2 cm in greatest dimension.

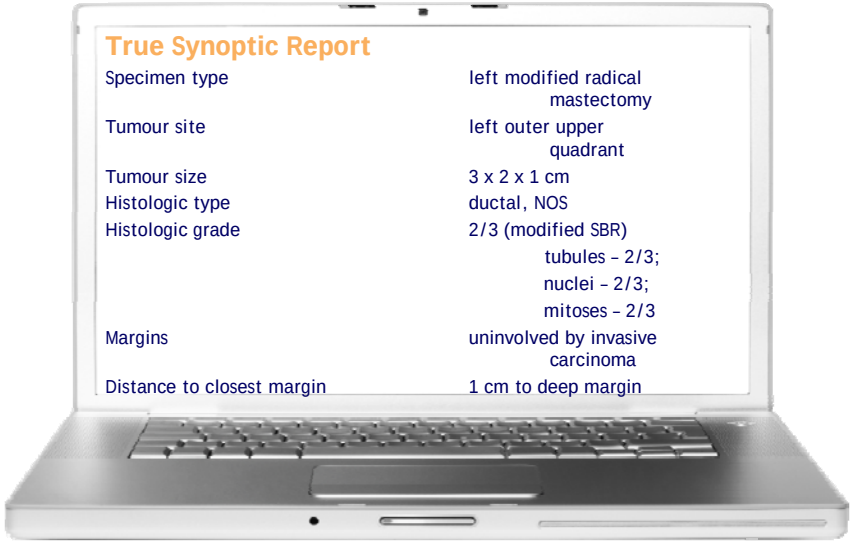
MICROSCOPIC DESCRIPTION:
Sections of the breast reveal an infiltrating ductal carcinoma of usual type. There is moderate tubule formation (2/3) and the nuclei show moderate degree of pleomorphism. There are approximately 8 mitoses per 10 high power fields. The modified Bloom-Richardson grade is 2/3. A minor intraductal component with a cribriform and comedo growth patterns, nuclear grade 2, is present. Focal lymphovascular space invasion is seen. There is no involvement of the skin or nipple. The margins are clear. One of 9 lymph nodes from the axilla contains metastatic ductal carcinoma. The greatest diameter of the tumour is 5 mm and there is no evidence of extranodal spread.

Immunohistochemistry for estrogen receptor (ER) shows extensive positive nuclear staining. The progesterone receptor and Her-2 (CerB2) markers are negative.

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



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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

Communites 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

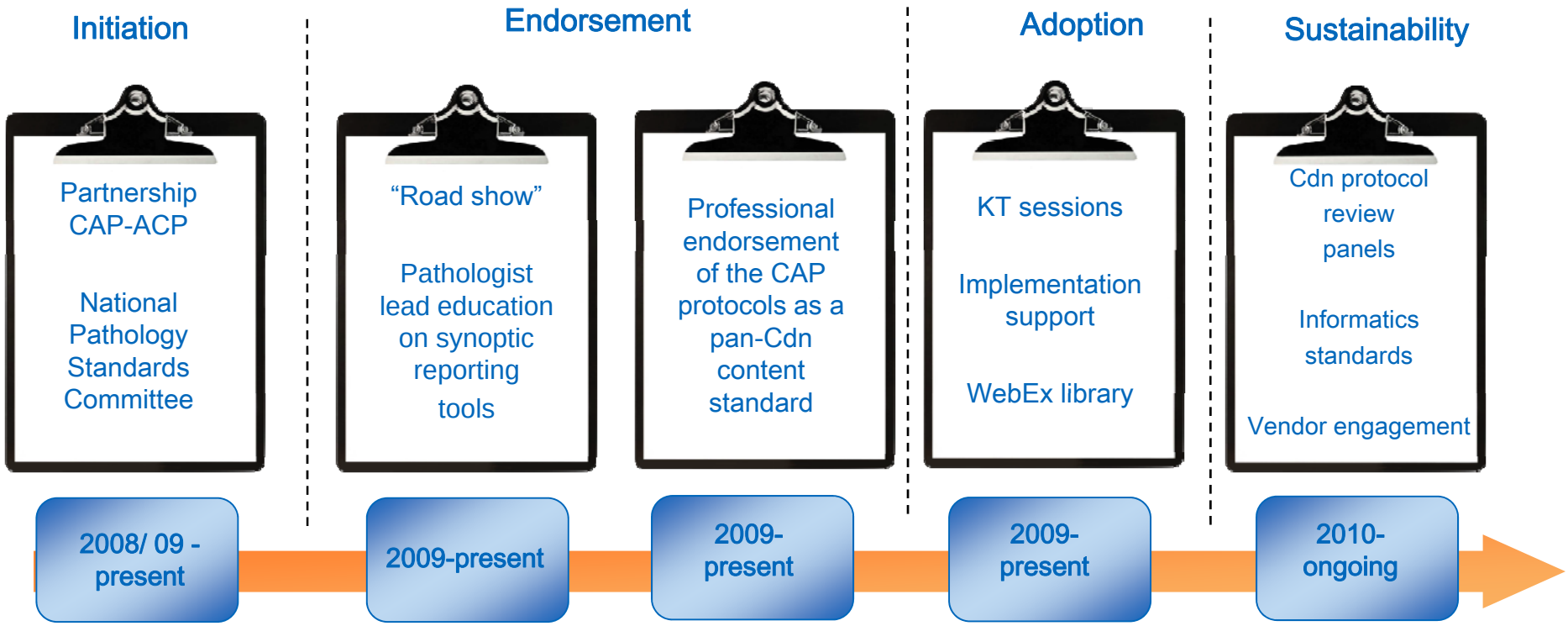
Pathology was identified as a critical component of the National Staging project.

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

History of the Synoptic Pathology Component of National Staging Initiative



- ✓ pan-Canadian adoption of the CAP protocols
- ✓ Pilot implementation of standardized electronic synoptic pathology reporting

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Newfoundland and Labrador

Pathology Project

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

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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

Quebec

Pathology Project

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

Pathology Project

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

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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

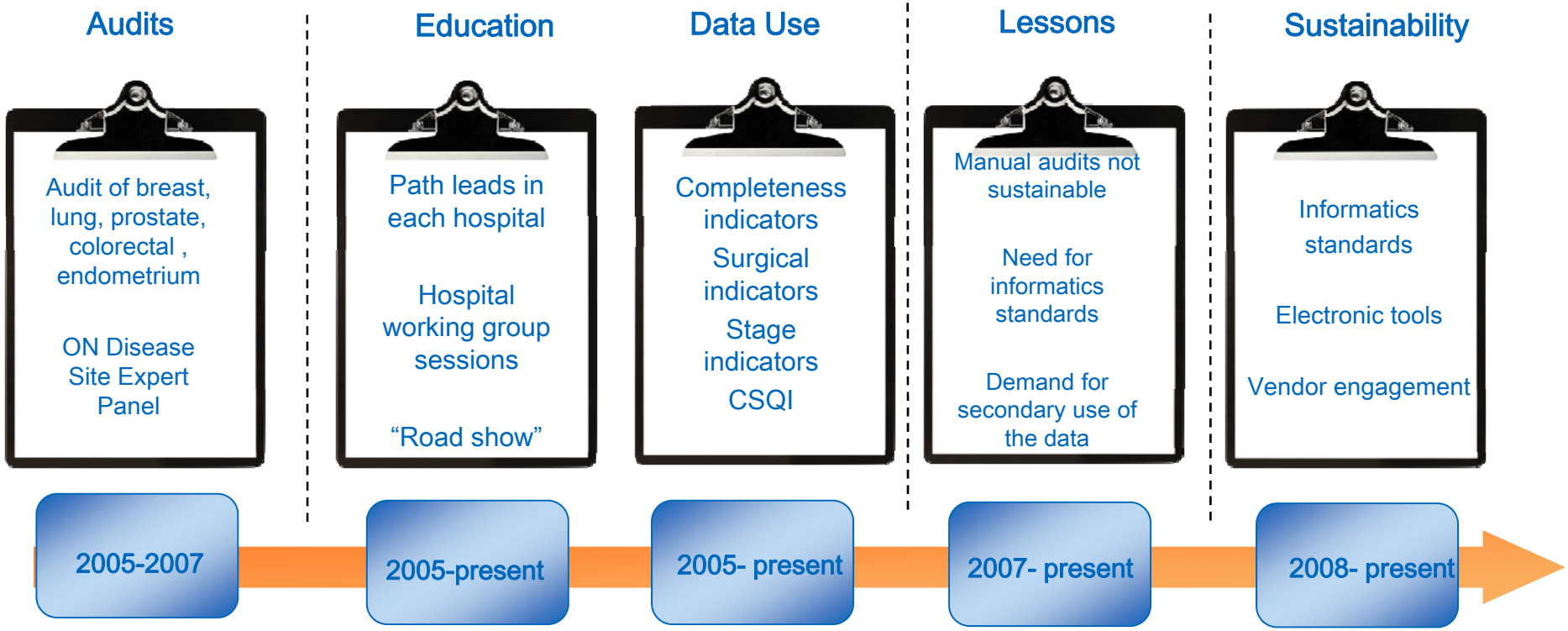
CANADIAN PARTNERSHIP AGAINST CANCER PARTENARIAT CANADIEN CONTRE LE CANCER

Pathology Reporting Standard Current State Analysis - 2004

Basic → Cutting Edge

Reporting Level	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Description	➢Narrative ➢No CAP content ➢Single text field data	➢Narrative ➢CAP content ➢Single text field data	➢Level 2 + ➢Synoptic-like	➢Level 3 + ➢Standardized reporting language	➢Level 4 + ➢Data elements stored in discrete data fields	➢Level 5 + ➢ICD-O and SNOMED CT coding
% Hospitals 2004	5%	40%	50%	5%	0%	0%

History of the CCO Pathology Audits and Data Use



- ✓ 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)

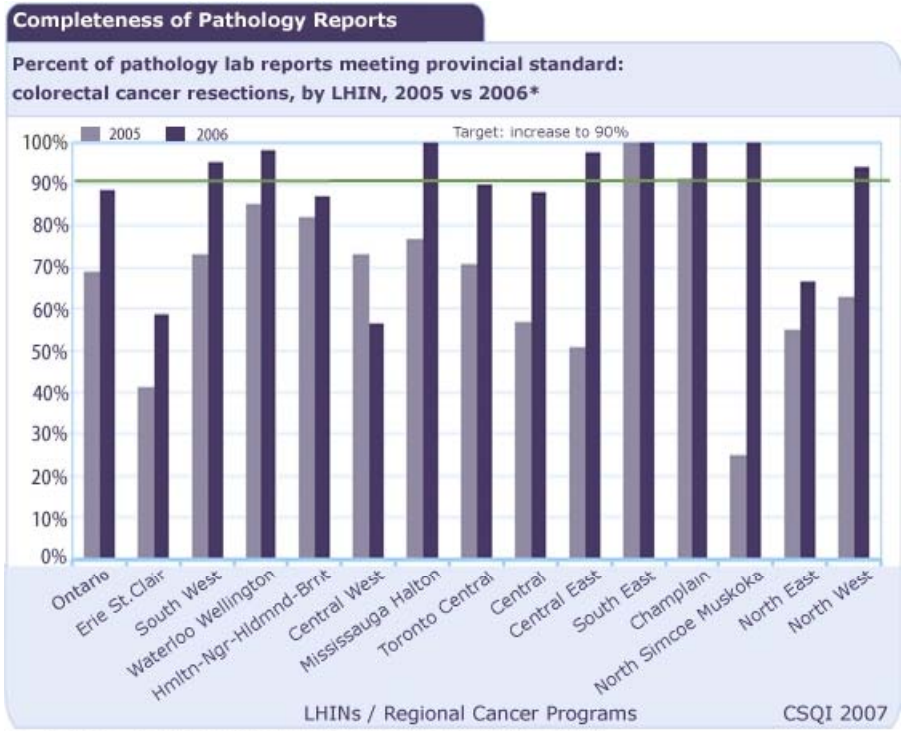
		No. of Cases (% complete)	
Site	No. cases	Synoptic	Narrative
Prostate	828	97%	50%
Lung	533	86%	34%
Breast	1746	80%	43%
CRC	1431	78%	28%

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

Completeness Results for CRC Cancer Resections 2005 and 2007



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

Findings:

- 19% improvement in completeness of CRC path reports from 2005 to 2007
- In 2007, 12 of 14 LHINs met provincial standard of 90%

Pathologists from early adopter hospitals have conveyed key benefits of synoptic reporting

Ensures all reports are complete with consistent format and language

Results in fewer calls from surgeons, oncologists and cancer registries

Facilitates secondary use of rich data in pathology reports

Enables reporting of data quality, stage, pathology and surgical indicators

Potential to reduce report turn around time by pathologists*

Supports faster reporting back to surgeons, oncologists and cancer registries

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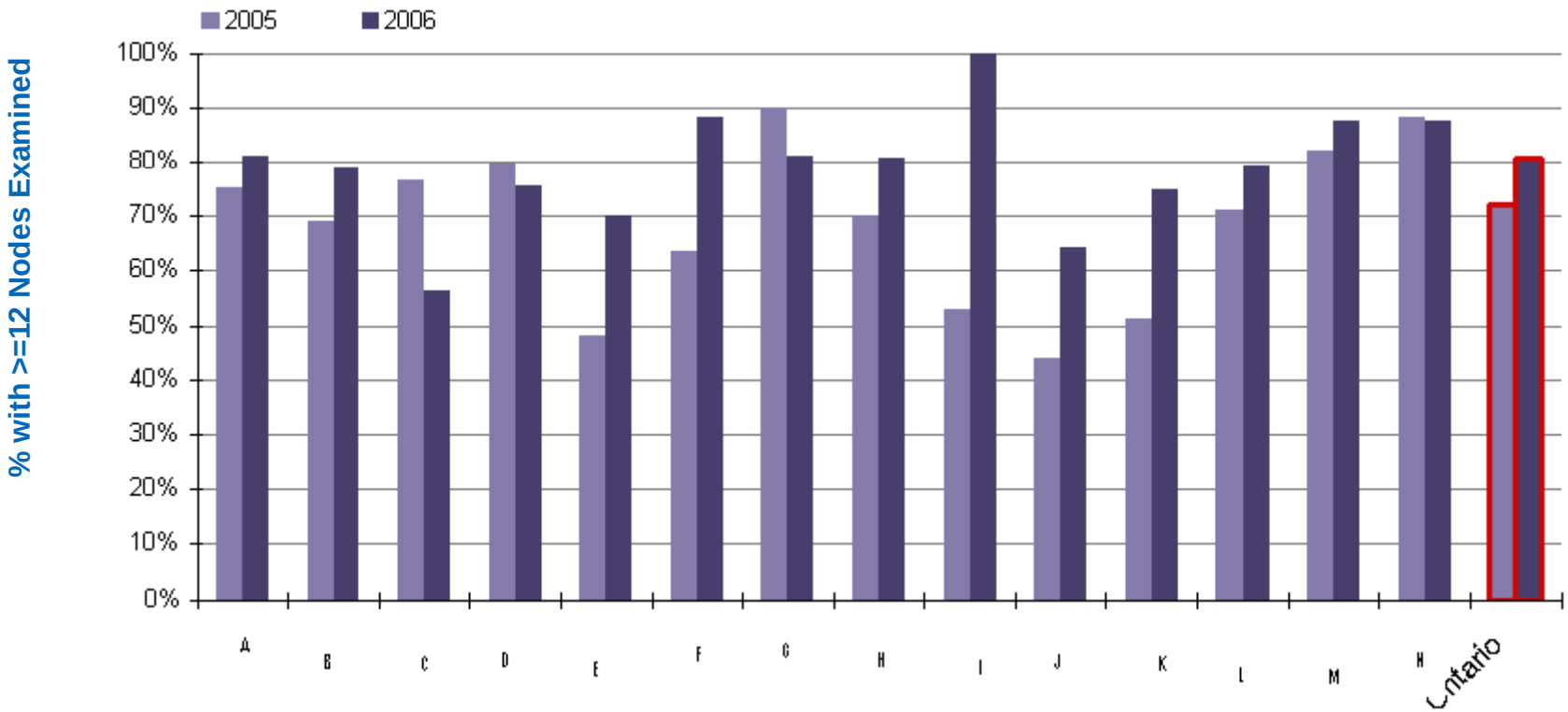
***with synoptic path reporting e-Tools and voice recognition dictation software**

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

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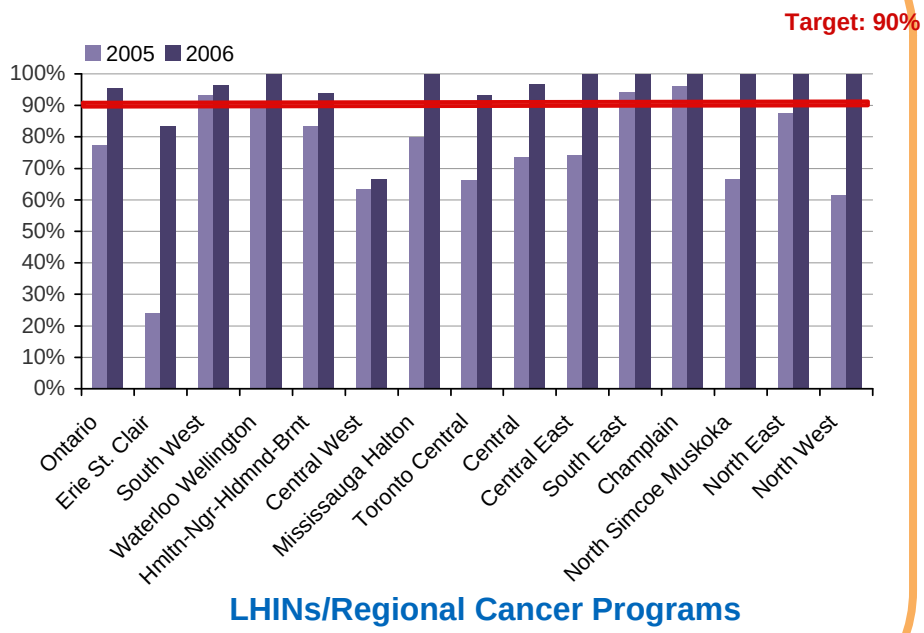
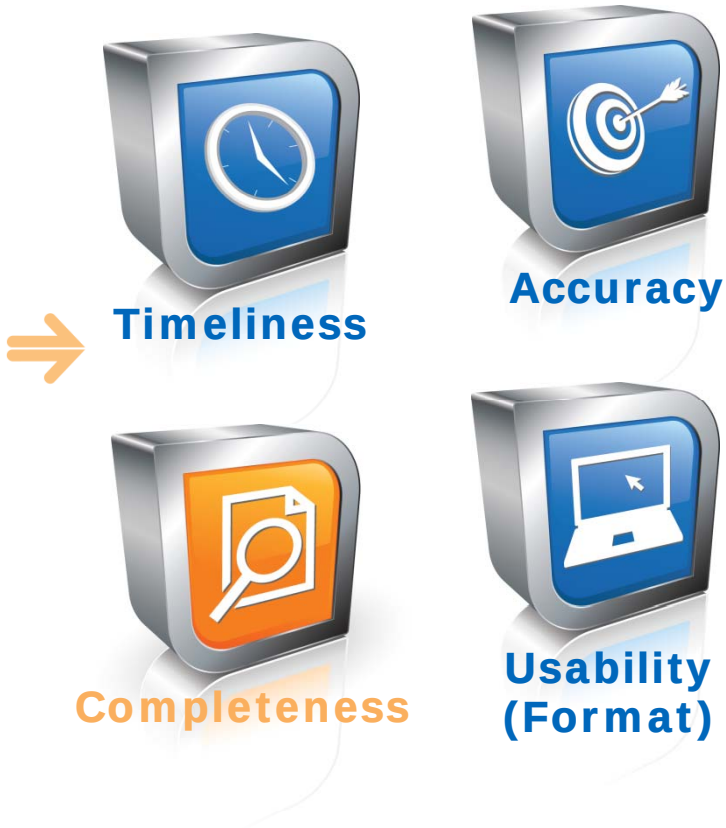
Discrete synoptic pathology reporting is setting foundation for Ontario's pathology data quality program

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





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

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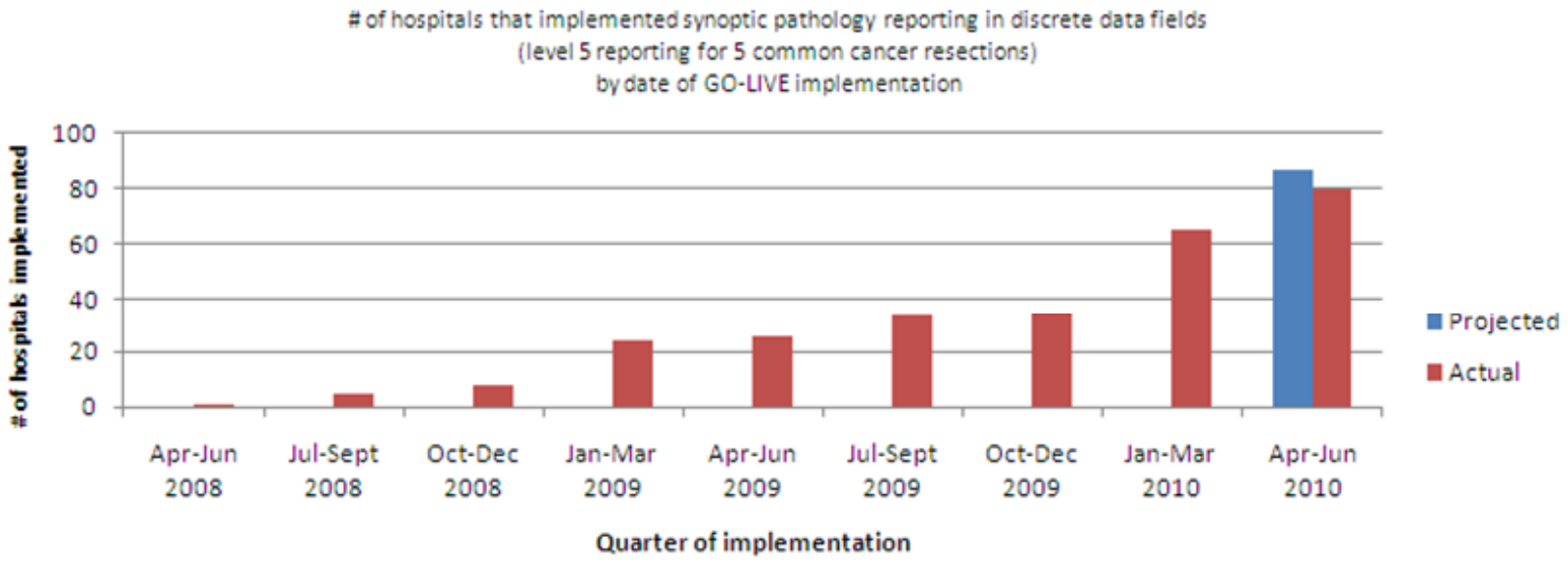
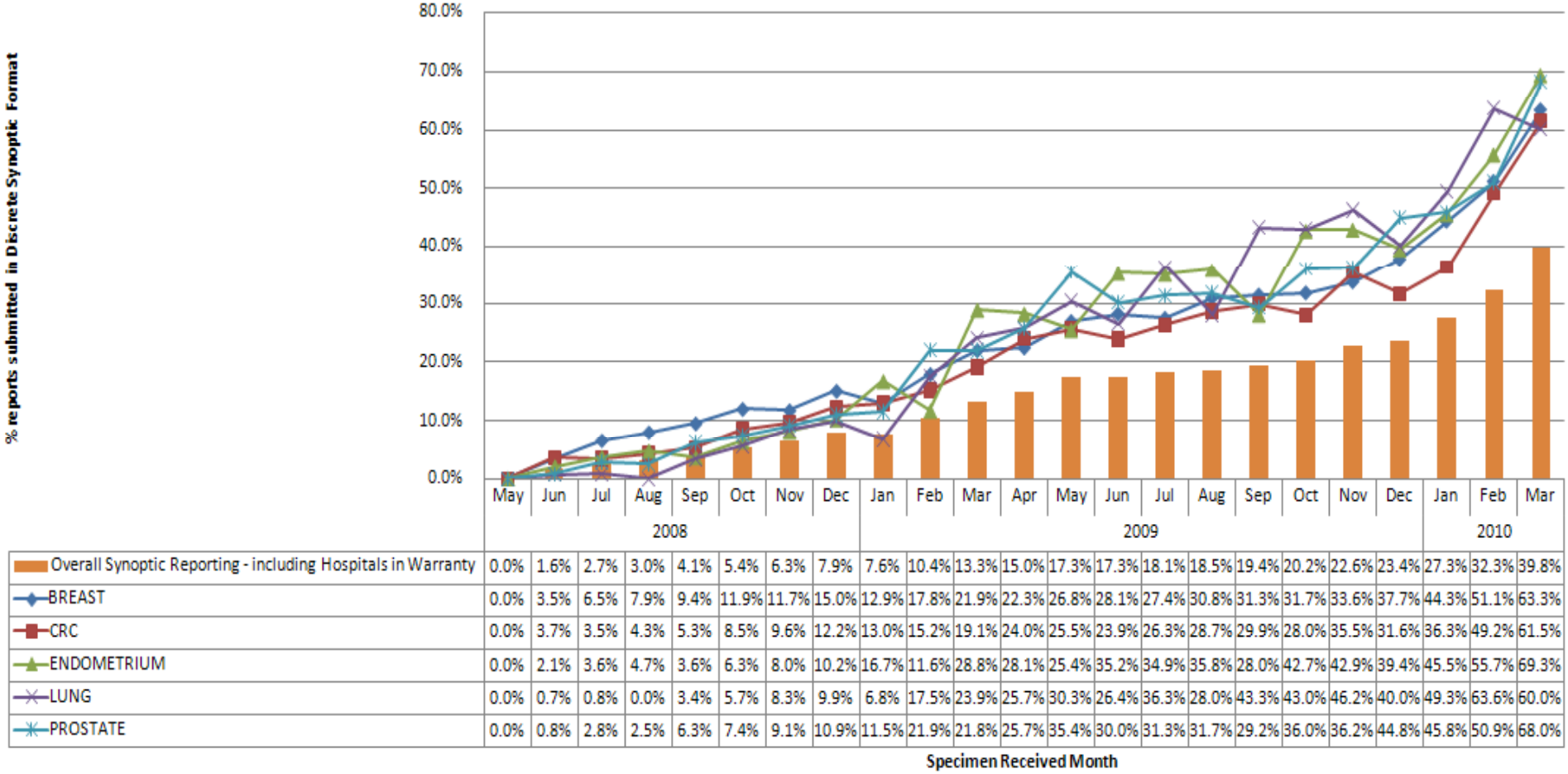
True (discrete data field) synoptic reporting implemented in 80 hospitals through CCO and hospital partnership model



More than 60% of 5 common CA path resection reports are being received in DDF synoptic format



	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Overall Synoptic Reporting - including Hospitals in Warranty	0.0%	1.6%	2.7%	3.0%	4.1%	5.4%	6.3%	7.9%	7.6%	10.4%	13.3%	15.0%	17.3%	17.3%	18.1%	18.5%	19.4%	20.2%	22.6%	23.4%	27.3%	32.3%	39.8%
BREAST	0.0%	3.5%	6.5%	7.9%	9.4%	11.9%	11.7%	15.0%	12.9%	17.8%	21.9%	22.3%	26.8%	28.1%	27.4%	30.8%	31.3%	31.7%	33.6%	37.7%	44.3%	51.1%	63.3%
CRC	0.0%	3.7%	3.5%	4.3%	5.3%	8.5%	9.6%	12.2%	13.0%	15.2%	19.1%	24.0%	25.5%	23.9%	26.3%	28.7%	29.9%	28.0%	35.5%	31.6%	36.3%	49.2%	61.5%
ENDOMETRIUM	0.0%	2.1%	3.6%	4.7%	3.6%	6.3%	8.0%	10.2%	16.7%	11.6%	28.8%	28.1%	25.4%	35.2%	34.9%	35.8%	28.0%	42.7%	42.9%	39.4%	45.5%	55.7%	69.3%
LUNG	0.0%	0.7%	0.8%	0.0%	3.4%	5.7%	8.3%	9.9%	6.8%	17.5%	23.9%	25.7%	30.3%	26.4%	36.3%	28.0%	43.3%	43.0%	46.2%	40.0%	49.3%	63.6%	60.0%
PROSTATE	0.0%	0.8%	2.8%	2.5%	6.3%	7.4%	9.1%	10.9%	11.5%	21.9%	21.8%	25.7%	35.4%	30.0%	31.3%	31.7%	29.2%	36.0%	36.2%	44.8%	45.8%	50.9%	68.0%

Data Source: CCO PIMS Database; Reports received by month of date of surgery; from May 08 to Mar 10, as of May 11/10.

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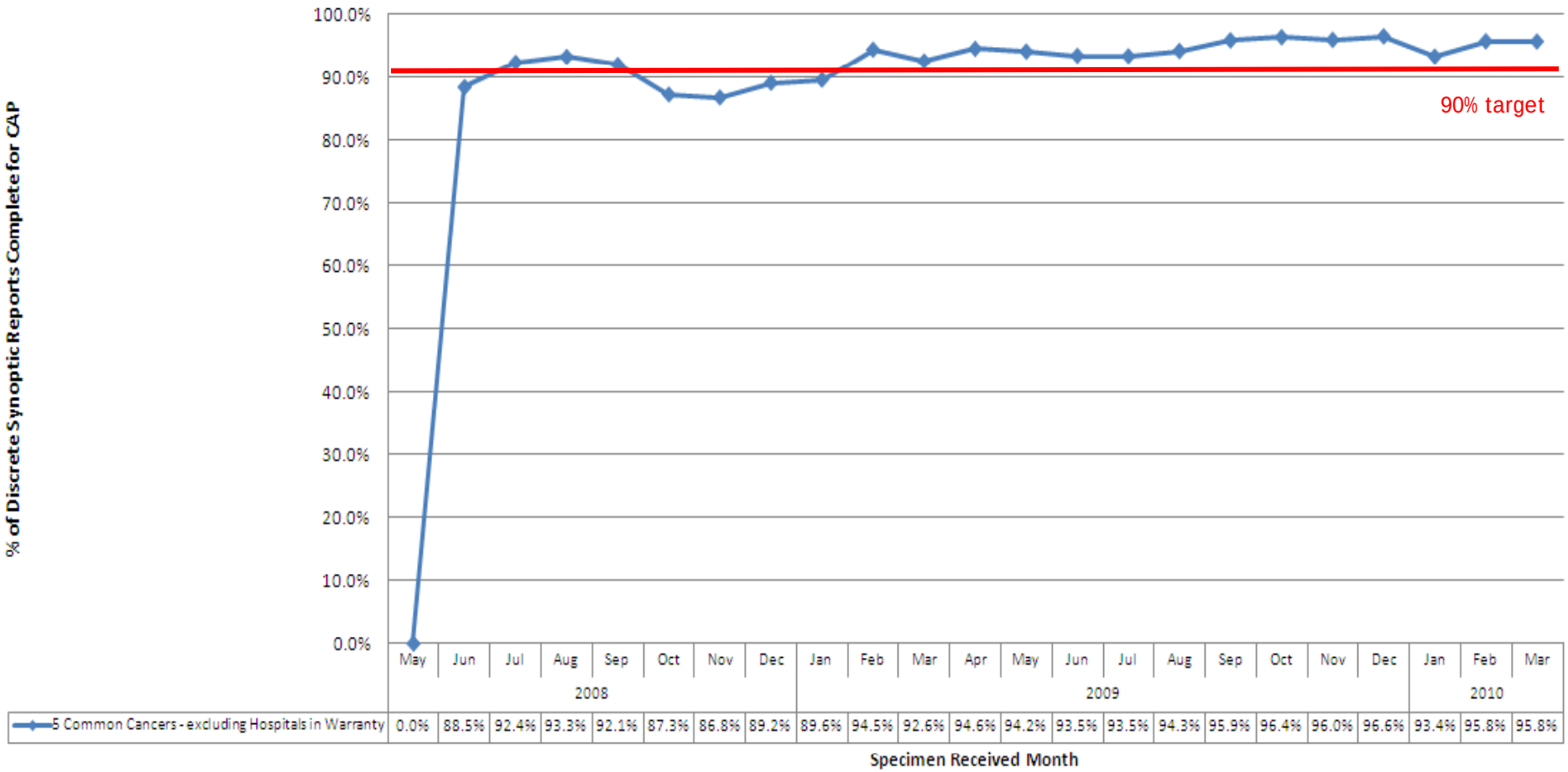
In March 2010, 96% of all DDF synoptic pathology reports were complete against CAP standard



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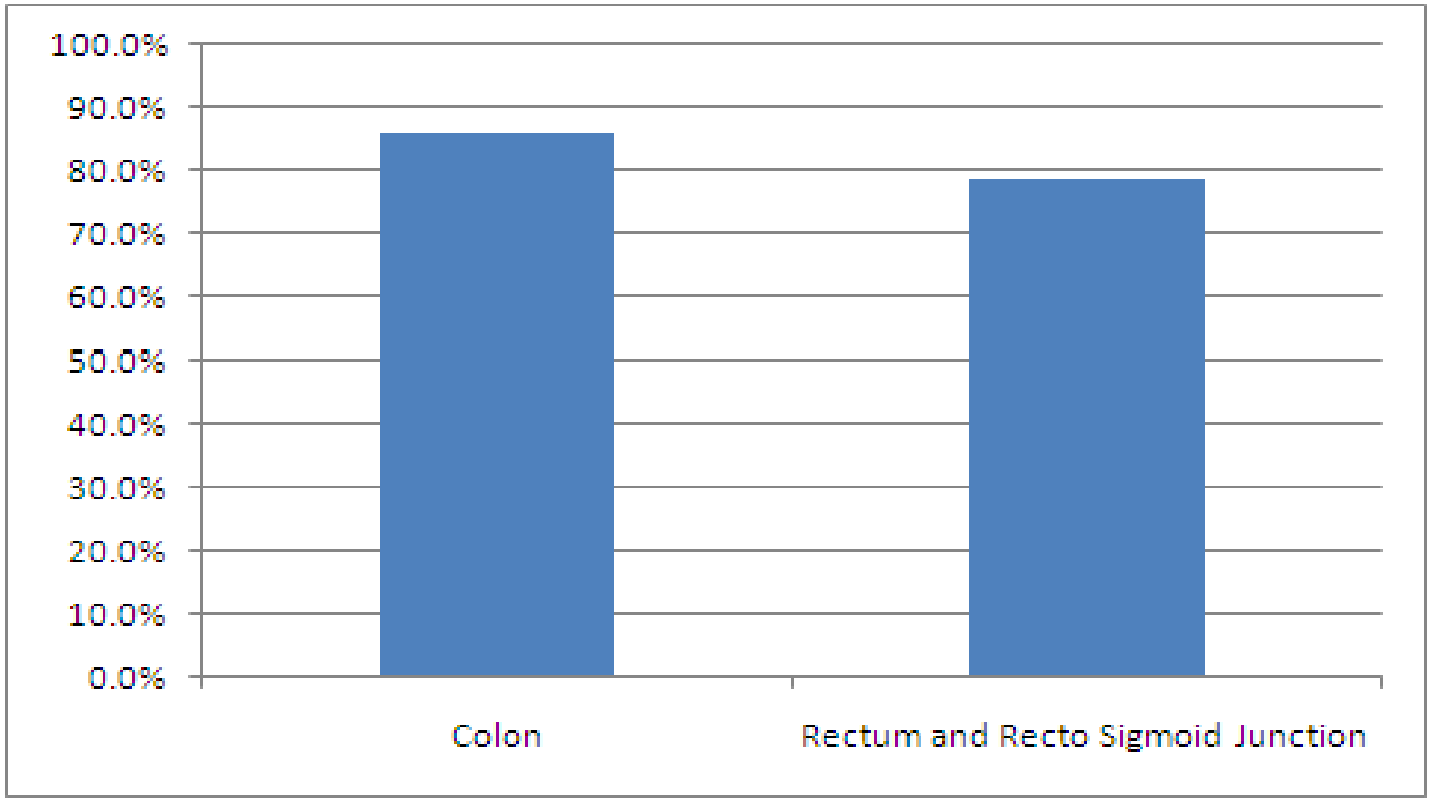
Colorectal surgical pathology indicators are now available soon after surgery with synoptic reports

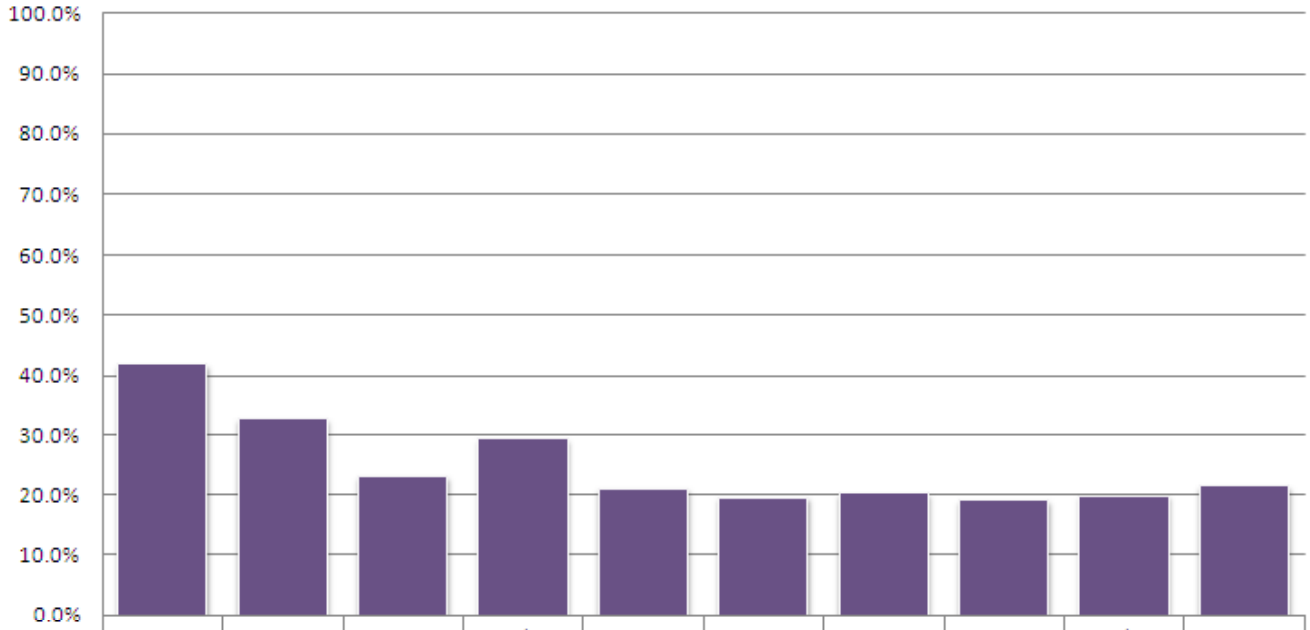
Percent of Discrete Synoptic CRC Resection Reports reporting 12 or more nodes were examined



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



	Quarter_2	Quarter_3	Quarter_4	2008/2009 Average	Quarter_1	Quarter_2	Quarter_3	Quarter_4	2009/2010 Average	Overall Average
	2008/2009				2009/2010					
Positive pT2 Prostate Margin Rate	41.9%	32.7%	23.1%	29.3%	21.1%	19.6%	20.3%	19.1%	19.9%	21.5%
Total # Reports	31	52	91	174	171	158	212	282	823	998
# Reporting Hospitals	5	8	24		26	33	34	62		

Data Source: CCO PIMS Database; Reports received by quarter of date of surgery; from Jun 08 to Mar 10, as of May 11/10.

CANADIAN PARTNERSHIP AGAINST CANCER PARTENARIAT CANADIEN CONTRE LE CANCER

Standardized cancer pathology reporting development in Ontario will target level 6 reporting by 2012

Basic → Cutting Edge

Reporting Level	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Description	• Narrative • No CAP content • Single text field data	• Narrative • CAP content • Single text field data	• Level 2 + • Synoptic-like structured format	• Level 3 + • Electronic reporting tools using drop -down menus	• Level 4 + • Standardized reporting language • Data elements stored in discrete data fields	• Level 5 + • ICD-O and SNOMED CT or other coding
% Ontario Hospitals 2004-05	5%	40%	50%	5%	0%	0%
% Ontario Hospitals 2006-07	0%	5%	70%	25%	0%	0%
% Ontario Hospitals 2008-09	0%	0%	25%	45%	30%	0%
% Ontario Hospitals 2009-10	0%	0%	0%	0%	100%	0%
% Ontario Hospitals by 2012	0%	0%	0%	0%	0%	100%

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

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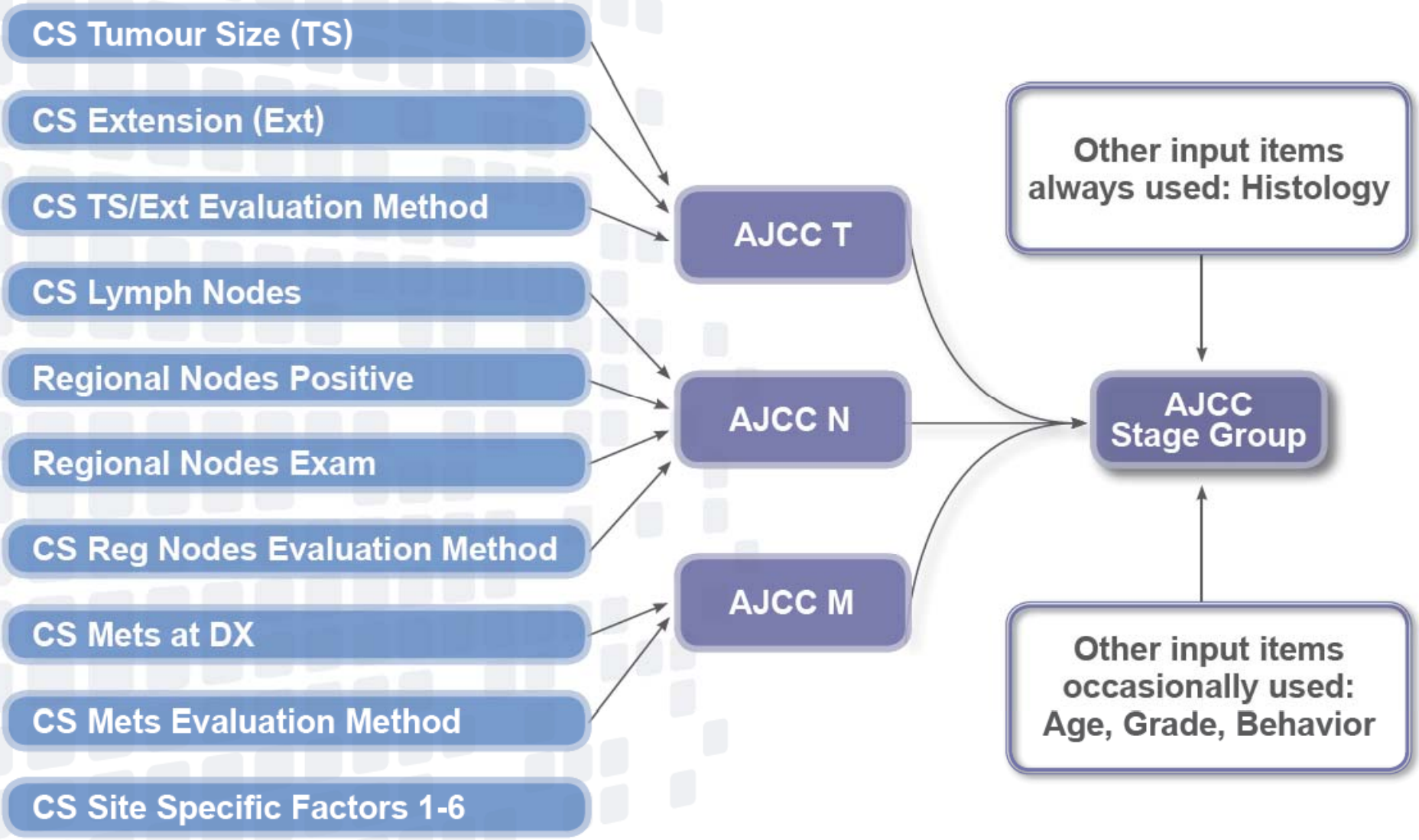
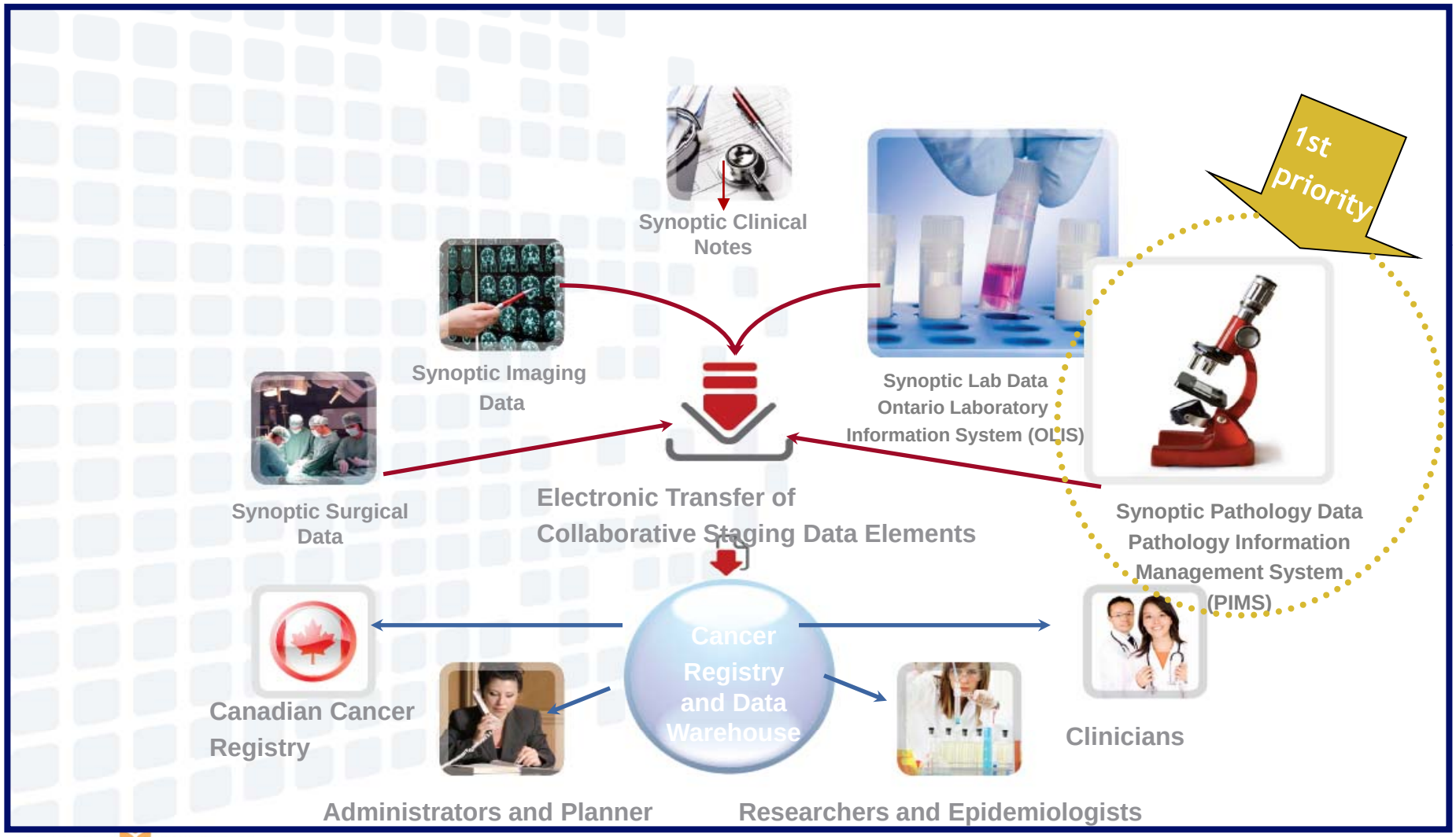
CS replacing TNM as new stage reporting standard in Ontario and Canada

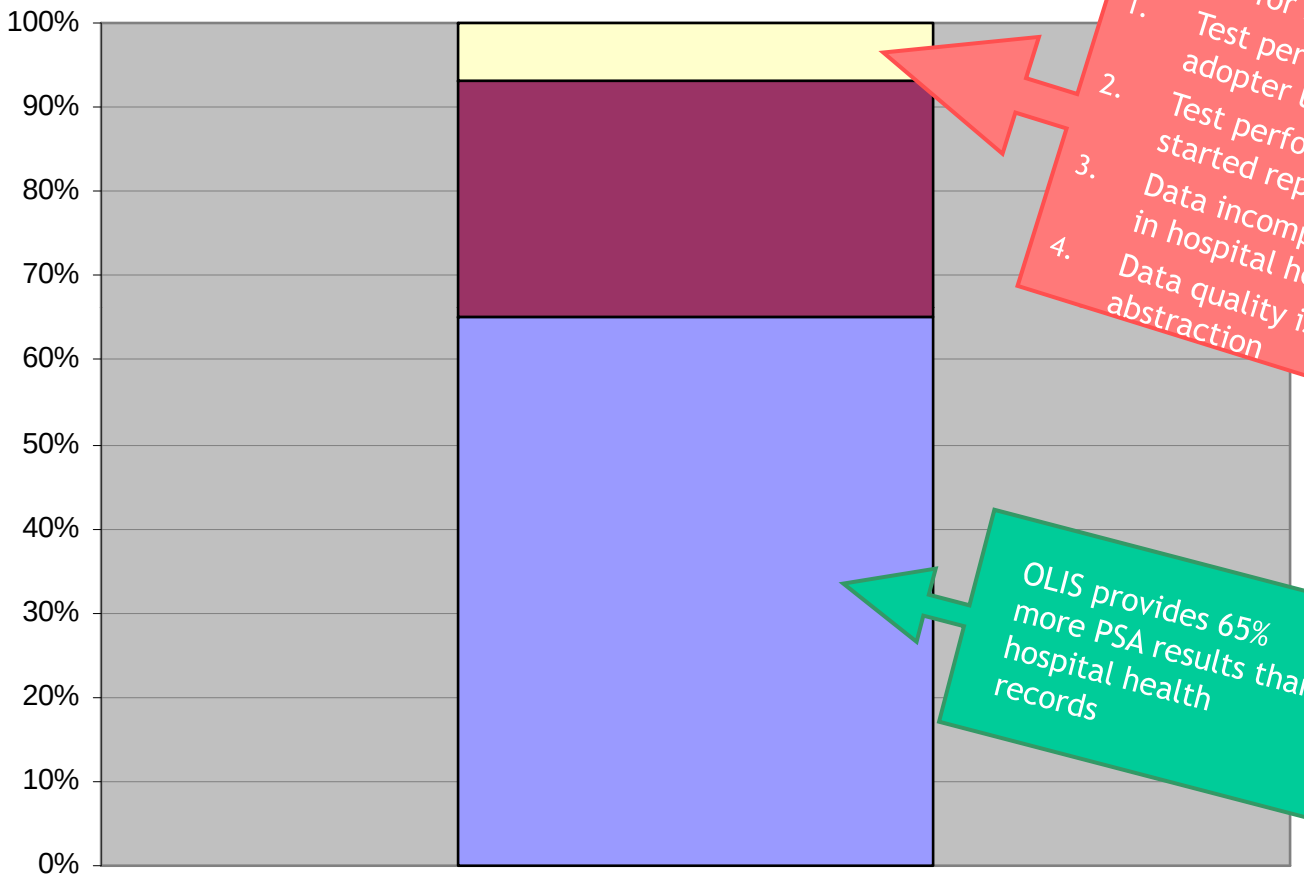
Schematic Diagram of Relationships of Inputs and Outputs for Collaborative Staging to TNM System



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

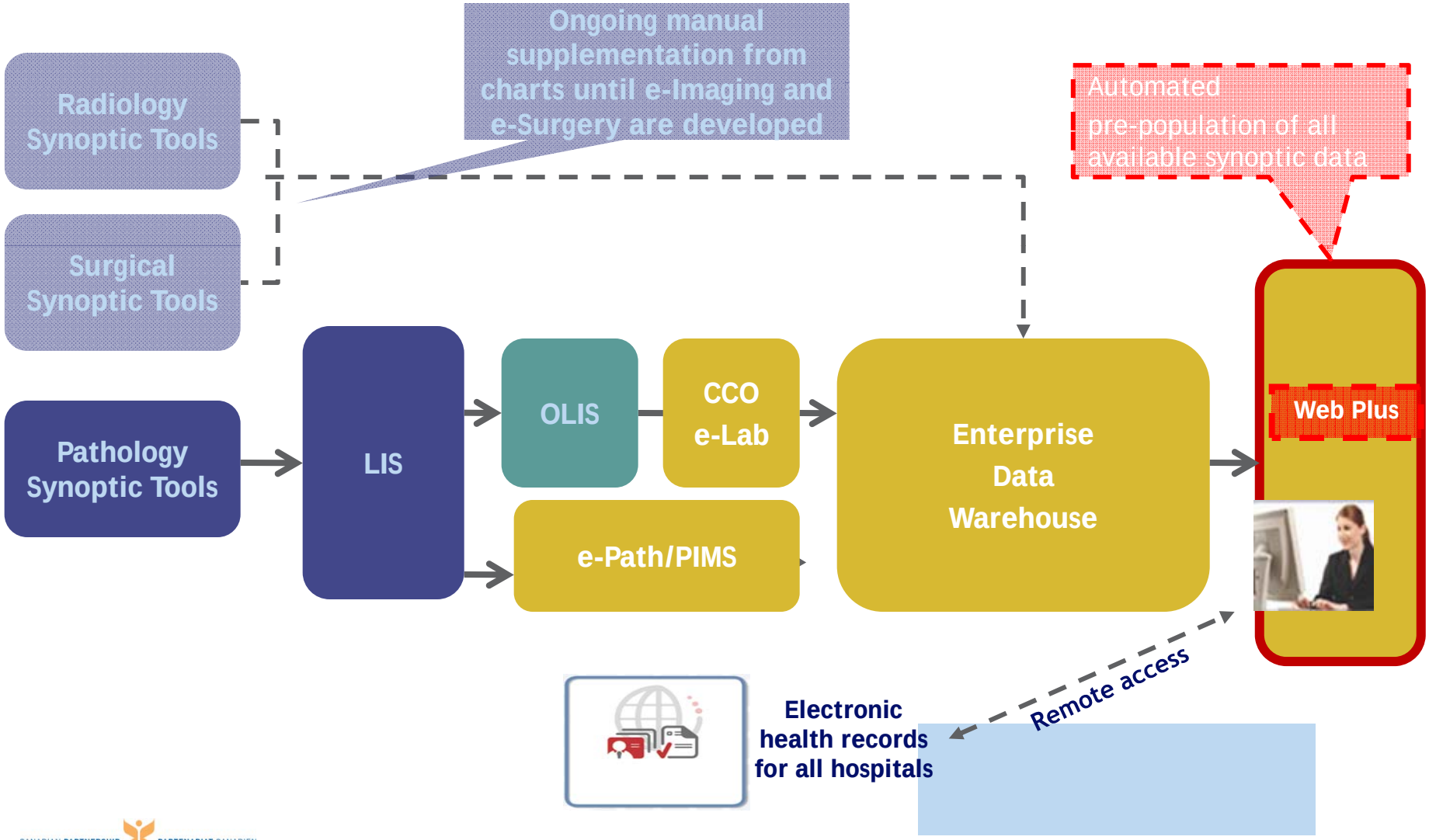


Reasons for non-matched data:

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

OLIS provides 65% more PSA results than hospital health records

Starting with 2009 cases - stage capture will be automated from e-Path for four common cancers with new solution



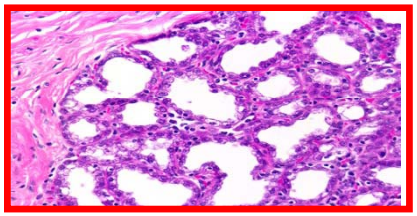
Impact on Cancer Registries

- **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

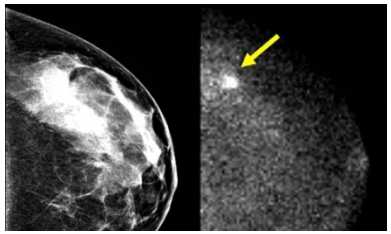


Synoptic Pathology Data

Synoptic Lab Data

Synoptic Surgery Data

Synoptic Clinical Notes



Synoptic Imaging Data

CANADIAN CANCER REGISTRY – REGISTRE CANADIEN DU CANCER –

CANADIAN PARTNERSHIP AGAINST CANCER PARTENARIAT CANADIEN CONTRE LE CANCER



Questions?

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