

*“mTuitive proved to be the golden solution for our problem of having to unite five different health authorities and five different lab information systems, into one integrated solution.”*

- Dr. Nicholas van der Westhuizen, Chair BC Electronic Synoptic Pathology Program



## Provincial Laboratory Medicine Services Unifies Synoptic Pathology Reporting Across Province, Creates Central Data Repository for Reporting using mTuitive

### Situation

The Provincial Laboratory Medicine Services of British Columbia (commonly referred to as PLMS) has a mandate to work collaboratively with the Ministry of Health, five regional health authorities, and First Nations health authority partners to help advance the shared goal of better serving BC patients with a more integrated system of care. British Columbia, the westernmost province in Canada, has a population of 5.1 million.

As part of its efforts to provide a more integrated system of care, PLMS wanted to integrate its reporting of required data to BC Cancer. BC Cancer provides the full spectrum of cancer care from prevention, screening,

diagnosis and treatment, to research and education. An integral part of BC Cancer's mission is to collect and analyze data about cancer services and combine it with evidence and research that is shared with the healthcare community in the form of guidelines and standards.

An important element of this effort was capturing synoptic pathology reporting of cancer cases using standardized criteria established by the College of American Pathologists (CAP) as implemented with CAP electronic Cancer Checklists (eCC), the electronic version of the CAP Cancer Protocols.

The challenge for PLMS, was that its combined five regional health authorities had 23 pathology sites and 225 pathologists. A further



**Provincial Laboratory Medicine Services of British Columbia deployed mTuitive xPert For Pathology to standardize synoptic reporting, and to create a centralized data repository for the province.**

complication was that BC regional health authorities were using five different laboratory information systems (LIS), which made it impractical for BC Cancer to create the centralized data repository it needed for analyzing service delivery across the province. Pathology data was available only in text-based reports. This limited BC's ability to measure the quality of pathology reporting in BC, to see where reporting was done consistently and to see where variations existed. In contrast, with synoptic pathology reporting, all findings would be stored as discrete data elements, making them easy to find and combine with simple database searches.

"We needed standardized synoptic pathology reporting unified in a centralized data

repository," says Dr. James Cupples, Vice President, Medical, BC Clinical and Support Services. "A small committee was formed to study this, which resulted in our issuing an RFP [request for proposals]."

## Solution

PLMS analyzed the responses to its RFP and found that their obvious choice was mTuitive xPert for Pathology, which expedites completion of CAP eCCs. Dr. Cupples notes: "mTuitive had a working product that we could see, and lots of reference customers. Our other alternatives didn't have product, and wanted to create something new, but there are millions of examples of people developing software that

doesn't work as designed. So, it was easy for us to choose mTuitive."

All of the province's five regional health authorities have deployed mTuitive xPert for Pathology, which integrates with each of the five different LIS systems used in the province. All five regional health authorities feed into the mTuitive centralized data repository, which forwards a copy of the synoptic data directly to the BC Cancer Registry. PLMS contracted with a third-party to create dashboards to provide comparative feedback reports for analytics and reporting from the data in the centralized data repository.

## Deployment Process

The PLMS implementation team created a logical step-by-step path to deployment of their province-wide reporting solution. Basic steps included:

- **Deploying mTuitive xPert for Pathology.** PLMS sought to unify the five LIS systems in use across the province, including:
  - Meditech Client Server
  - Meditech Expanse
  - Cerner CoPath
  - Cerner Millennium
  - Sunquest CoPath

PLMS uses mTuitive xPert for Pathology as a middleware service to unify data from the LIS systems at regional health authorities into a CAP-compliant synoptic data store.

"mTuitive provided an excellent middleware solution to the problems that we were facing in trying to get a single solution to electronic synoptic pathology reporting in British Columbia," says Dr.

Nicholas van der Westhuizen, Chair of the BC Electronic Synoptic Pathology Program.

- **Creation of a Centralized Data Repository.** As part of its solution, mTuitive created a centralized data repository to hold all CAP eCC discrete data elements, along with other data, to enable global searches and to support dashboard reporting for comparative feedback reports. In addition to holding all synoptic reports submitted from regional health authorities, a copy is automatically forwarded to BC Cancer. Dr. van der Westhuizen notes: "The CDR mTuitive created was a huge help in unifying our data for use in knowledge mobilization."
- **Checklist Champions: Customizing Terminology to Meet Regional Needs.** Along the way, the implementation team used the Agile Author feature of mTuitive xPert to customize the terminology used in synoptic reporting. An important element in this process was assembling a collection of "Pathology Checklist Champions" from each of the regional health authorities, to discuss variations in how different discrete elements of the CAP electronic checklists were to be named for provincial use (for example: "negative margins" versus "uninvolved margins"). "This process helped tremendously, because anyone could volunteer to work on their own checklists of interest, and we involved pathologists from across the province," says Dr. van der Westhuizen. "I think this also helped with gaining acceptance, because everyone had a voice."
- **Dashboards for Easy Reporting.** PLMS worked with a third-party to create comparative feedback reports that drew data from the central data repository. This meant, for example, that pathologists and surgeons could see anonymized data to gauge how their metrics compared with site or provincial averages. It also allows PLMS

to use the centralized data repository for research.

- **Ongoing Role of Checklist Champions.** PLMS continues to involve its Pathology Checklist Champions whenever CAP releases new versions of its electronic checklists. Using mTuitive's Agile Author, terminology is agreed upon for uniform synoptic reporting.
- **CAP Checklist Distribution.** mTuitive xPert for Pathology makes it simple for PLMS to publish updated CAP checklists—after being customized as needed by the Checklist Champions. "Publication of CAP updates is simple now," says Brigitte Rabel, Provincial Synoptic Reporting Coordinator. "We used to have to customize new CAP releases for five different LIS systems. Now we can just push out one, which is a major time saver that helps ensure everyone is using the latest releases."
- **Strong Project Management.** The province-wide deployment benefitted from the concentrated efforts of Project Manager Kathy Chambers, who would later lose her life to cancer. "Kathy Chambers was a spectacular project manager," Dr. Cupples says. "There were many obstacles to overcome in such a province-wide project, and she was tenacious. Whatever obstacles came up, she pushed right through them. I can't say enough good things about her." Dr. van der Westhuizen agrees: "Kathy Chambers was a dynamo, and we greatly miss her. Often when I'm doing a synoptic, I think of her."

## Benefits

PLMS has enjoyed a number of benefits since adopting mTuitive's xPert for Pathology, including:

- All data unified in a central data repository
- Central data repository yields quality metrics via dashboards



Dr. James Cupples

- Central data repository opens research opportunities
- Mandatory fields ensure report completeness
- Faster workflow for pathologists
- Commentary fields for nuanced reporting
- Ability to customize definitions using mTuitive Agile Author
- Easier to update checklists and distribute across the province
- mTuitive "A great company to work with"

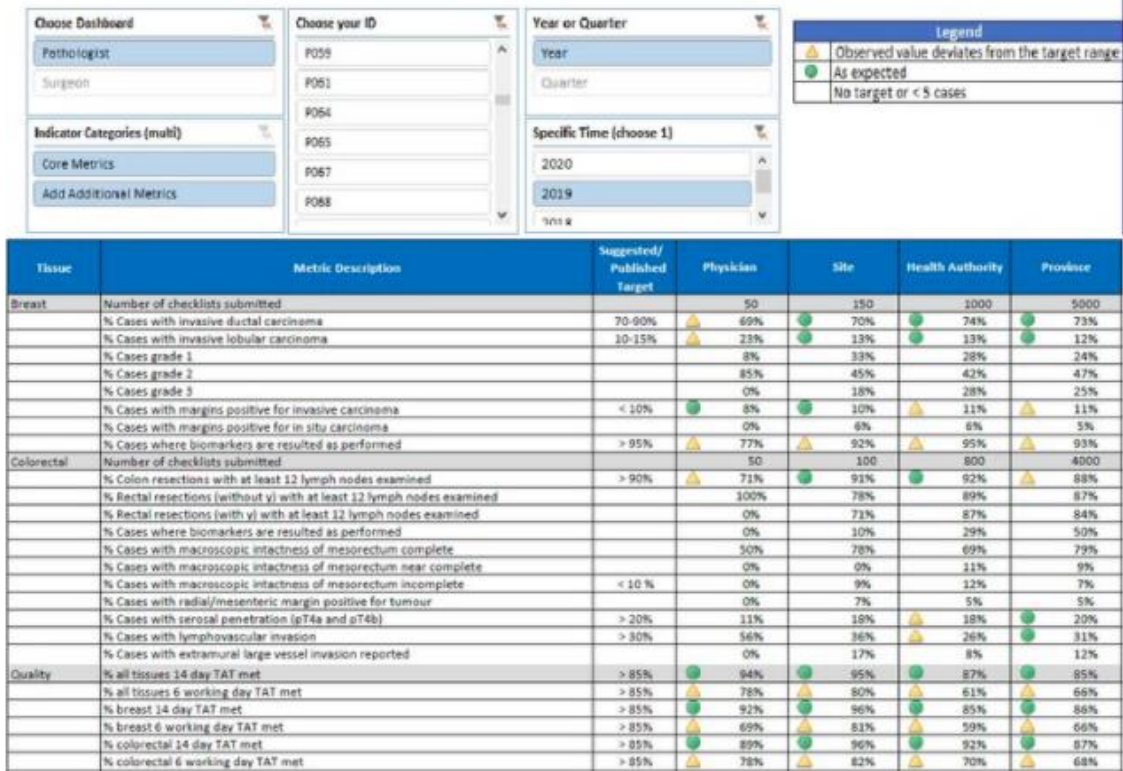
## All Data Unified in a Central Data Repository

Deploying mTuitive xPert for Pathologists to unite synoptic data from the province's five regional health authorities into a central data repository "answered the need for structured reporting that PLMS had been wanting to implement for several years," notes Dr. Cupples.

Dr. van der Westhuizen adds: "Prior to deployment of mTuitive each of our health authorities had their own form of checklist synoptic reporting that was at a Level 3 or Level



## Synoptic Reporting Pathologist Dashboard



\*Note: the image above contains fictitious data.

Dashboards, powered by the mTuitive central data repository provide ready insights.

4. mTuitive brings us up to Level 6, which is the highest level of synoptic reporting, with one system for the whole province, and all items collected as discrete data elements.”

PLMS values that the mTuitive central data repository provides a copy of all data for easier reporting. “We needed to have a centralized copy of the data,” Dr. van der Westhuizen says. “Otherwise, the data is spread across separate information systems.”

The central data repository means that the data is fresh and up to date, which wasn’t the case before.

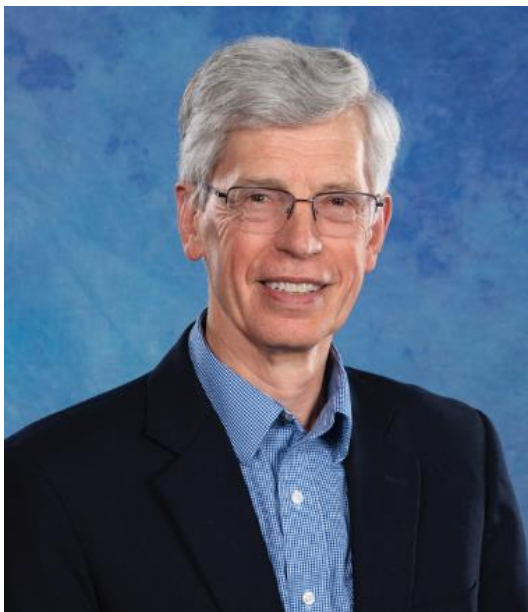
“Previously, data from all BC surgeries was available in the BC Tumour Registry,” Rabel says. “But there was only limited data available in discrete searchable format. Data could be requested but results were often from cases performed three years earlier or even older, because compiling the data was a slow process. With our mTuitive solution we can easily search, and our data is always current.”

Dr. van der Westhuizen sums it up: “mTuitive proved to be the golden solution for our problem of having to unite five different health authorities and five different lab information systems, into one integrated solution.”

## Central Data Repository Yields Quality Metrics via Dashboards

The central data repository feeds two dashboards commissioned by PLMS—one for pathologists and another for surgeons.

“Both dashboards enable pathologists and surgeons to see individual feedback reports that provide individual metrics such as lymph node harvest rates and margin positivity rates,” Rabel



Dr. Nicholas van der Westhuizen

says. “Individuals can compare their results against averages from their site, their health authority or the province, to see how their work compares to others.”

“Every metric that's entered as a discrete data element in the synoptic report can be looked at, so there's tremendous potential,” Dr. van der Westhuizen says. “The metrics also include turnaround time. We're constantly monitoring two turnaround times. One is the Canadian

standard and the other is the standard for the diagnostic accreditation program in British Columbia, which is slightly different. The metrics, to an extent, can be used as a proxy for patient care, which PLMS is always seeking to improve. The metrics may show variability from site to site and between health authorities opening up opportunities for quality improvement.”

The metrics also help identify outliers, which can then be explored and, where possible, remediated to enhance delivery of services and patient care.

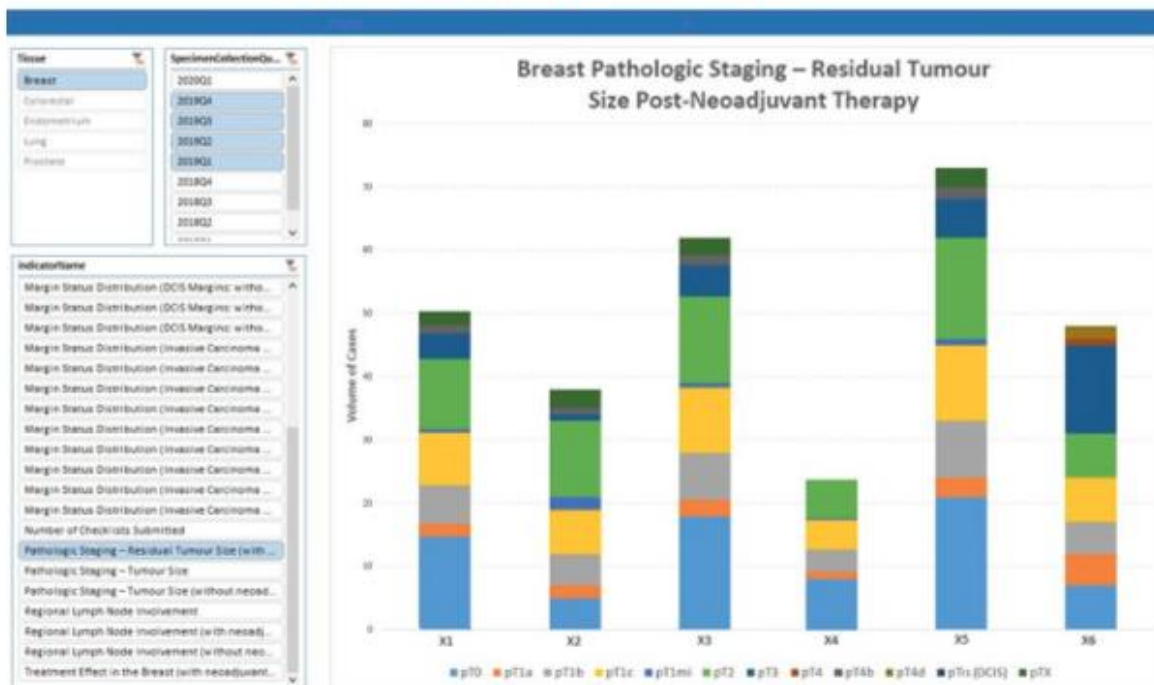
## Central Data Repository Opens Research Opportunities

The central data repository created by mTuitive is opening doors for research that wouldn't have been practical before.

“The central data repository is an absolutely fantastic solution in many different ways,” says Dr. van der Westhuizen. “In addition to providing a direct feed to the BC Cancer Registry, which prior to deploying the mTuitive CDR, was a manual process with people at the BC cancer registry looking at reports and extracting data. It is also a powerful resource for research as all the data is stored as discrete data elements and therefore easily searchable. We are still in the early stages of using it this way, but we see great potential.”

Research requests for anonymized data are reviewed by a provincial advisory committee, which forwards approved requests for data compilation. The data is returned to the advisory committee for delivery to the researchers, to ensure privacy and ethical requirements are maintained throughout.

## Synoptic Reporting Quarterly Report



\* Note: the image above contains fictitious data

**Dashboards also generate quarterly reports.**

PLMS is currently using central data repository information as part of a study examining the effect of delayed cancer surgery and screening due to COVID-19 on cancer staging in BC. Researchers can look at data since the central database repository was first deployed.

“We were able to quickly gather baseline data from 2017 to 2020 for 27 checklists and we will continue to compile quarterly data over the next three years,” Rabel says. “This would not have been possible without the CDR. We are also providing data to other research projects, including studies related to rates of distant metastasis, and treatment effect in breast invasive cancer specimens.”

Underscoring the value of being able to search for discrete data elements across the province from a central data repository, Rabel says: “Prior to having the discrete data in the CDR, any data investigations were done by reading through long, text-based pathology reports. Extracting information from the old text-based reports was slow and tedious, and so we rarely did any of investigation like we're able to do now.”

### Mandatory Fields Ensure Report Completeness

PLMS has benefitted from the ability to use mTuitive xPert for Pathology to specify which criteria for any given checklist are considered

mandatory. By flagging elements as mandatory, mTuitive xPert for Pathology, requires the data fields be filled before a pathologist can sign out a report.

“The value of mandatory elements ensures that all of the required elements for prognosis and treatment is within the synoptic report,” says Dr. van der Westhuizen. “So, we see it as an absolutely essential part of electronic synoptic reporting.”

PLMS includes all mandatory elements as specified by the College of American Pathologist, while adding additional elements it deems mandatory for the province.

“We have a committee that determines which optional criteria we want to reclassify as mandatory because of the importance we see for treating patients in BC,” Dr. Cupples says. “This is to help ensure that the oncologist or other doctors to whom the patient is referred have a complete report. This also reduces phone calls back to pathology asking for measurements that weren’t included, which helps avoid delays for the patient being treated.”

“Prior to the implementation of synoptic reporting, if something was missing from a report, for example, a margin measurement, the surgeon would call the pathologist,” Rabel says. “The pathologist would have to retrieve the case slides, look at the slides again, create an amended report, and then reissue that report. So, having all of those mandatory fields included in the original report saves all that time and effort, and of course, it's better for patient care.”

## Faster Workflow for Pathologists

Both Dr. van der Westhuizen and Dr. Cupples have found it is faster to complete a report using the mTuitive checklist than using traditional dictation methodology.

“I’ve found it faster to use the xPert product, than trying to memorize the data elements that



**Brigitte Rabel**

are required, or trying to compare that to a printout that you've made of the CAP cancer protocols, and then making sure you dictate that in a synoptic way by hand,” Dr. van der Westhuizen says. “Using mTuitive makes it faster. There are two options. You can either point and click the different fields or you can use Dragon [voice recognition]. And, very importantly, it makes sure that no mandatory elements are excluded, as the report can't be signed out without all the mandatory fields being completed.”

Dr. van der Westhuizen notes that another time saving is that with dictation, there is a time gap



awaiting transcription, after which you may need to review the slides again before sign out.

“mTuitive is very logically laid out for each checklist,” Dr. Cupples says. “Working from the screen, just ticking things off with the mouse, I believe to be a much faster process than dictation. And you don’t get to the end and find you’ve left something out.”

As noted earlier, the ability to enforce completion of mandatory elements before report sign-out, also contributes to faster report processing—by eliminating the need to re-open cases.

Dr. van der Westhuizen notes: “The number of phone calls we get related to missing report information has diminished tremendously.”

## **Commentary Fields for Nuanced Reporting**

Dr. Cupples likes that mTuitive xPert for Pathology includes commentary fields for synoptic reporting.

“Most pathologists don’t want to simply enter a bare metric for things like tumor size or margins,” Dr. Cupples says. “They want to provide the explanatory rationale for how they reached those figures. mTuitive provides commentary fields so pathologists can provide nuanced commentary, which I think is critically important.”

## **Ability to Customize Definitions Using mTuitive Agile Author**

As noted earlier, PLMS made good use of the Agile Author feature of mTuitive xPert for Pathology, to alter field labels as needed from

those used by CAP to those more commonly used within the province.

“Looking at biomarkers, for example, our pathologists in the province had their own ways of reporting, so we were able to change from the standard CAP terminology, to our provincial terms whenever it was decided to be beneficial by our committee of pathologists,” Rabel says. “If we forced the pathologists to use a CAP checklist strictly as it was, there would have been resistance. So, the ability to tweak a CAP checklist to better match our practices really helped with adoption.”

## **Easier to Update Checklists and Distribute Across the Province**

Provincial standardization on mTuitive xPert for Pathology has greatly simplified the process of updating CAP eCC checklists, and rolling out the updated versions.

“Before we started using mTuitive xPert, some of the regional health authorities within the province were finding they couldn’t meet their deadlines for updating CAP checklists,” Rabel says. “We heard of similar problems in other provinces.”

Those problems have disappeared for PLMS, as all checklists can be updated centrally and sent out to the regional health authorities.

“As the provincial coordinator for synoptic pathology reporting, I use Agile Author, to edit a checklist, and once I edit the checklist and get all changes approved, I can deploy to all five LIS systems at once,” Rabel says. “We just had some CAP updates that went into effect on January 1st, and I was able to deploy to all of the LIS systems at the same time. This is important because it allows all pathologists to

know that they're using the most current cancer staging system in their synoptic reporting.”

## **mTuitive “A Great Company to Work With”**

During the implementation phase, Rabel was impressed with the depth of knowledge mTuitive demonstrated for all five of the LIS systems it integrated into the mTuitive xPert for Pathology solution. “We’ve continued to be impressed with the company because of the responsiveness of its ongoing support,” Rabel says. “Whenever we have a question, or encounter an issue, they provide immediate and expert guidance. mTuitive is a great company to work with.”

Dr. van der Westhuizen agrees: “Working with mTuitive has proven to be a great collaboration.”

## **About mTuitive**

mTuitive, Inc. develops data capture and synoptic reporting software to assist health care professionals in recording clinical findings and maintaining compliance with established protocols and guidelines. Our unique method of capturing structured information provides valuable data for pathology, surgery, oncology and cancer staging applications. Our products allow the clinical decision maker to conveniently receive alerts and reference materials directly at the point of care. mTuitive solutions improve care to the patient through quality assurance and error reduction while standardizing and automating manual reporting processes, reducing both time and labor costs. For more information, visit us at [www.mtuitive.com](http://www.mtuitive.com).