



DIAGNOSTIC SERVICES
MANITOBA

2016-2017



Annual Report to the Minister of Health

Results That Matter

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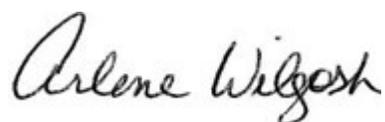
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Letter of Transmittal & Accountability

We have the honour of presenting the Annual Report for Diagnostic Services of Manitoba Inc. (DSM) for the fiscal year ended March 31, 2017.

This Annual Report was prepared under the Board's direction and in accordance with The Regional Health Authorities Act and directions provided by the Minister. All material including economic and fiscal implications known as of March 31, 2017 have been considered in preparing the Annual Report. The Board has approved this report.

Respectfully submitted on behalf of Diagnostic Services of Manitoba Inc.,



Ms. Arlene Wilgosh
Board Chair



Board Governance

DSM operates under the direction of a Board of Directors, which in turn is accountable to the Minister of Health. The Board plans and makes decisions based on established strategic plans and, together with the Chief Executive Officer, reviews DSM's measurable benchmarks to monitor performance.

Among the Board's responsibilities are overseeing the realization of our Health Plan, the proper allocation of funds and our compliance with provincial legislation, regulations and accreditation. To assist in achieving these goals, the Board has established the following committees:

- Quality and Patient Safety
- Finance and Audit
- Governance
- Executive

The Board's three main roles are:

- Strategic Leadership
- Oversight
- Governance

Major Activities and Decisions of the Board of Directors

New Members and Farewells

In the 2016-2017 fiscal year, DSM's Board of Directors said farewell to two directors, Dr. Hussam Azzam and Dr. Pat Baker.

Activities

Together with the DSM Senior Management Team (SMT), an annual Board visioning and strategic planning session was held in the fall of 2016 to outline the high-level strategic direction for the organization's upcoming year(s) and to ensure our directions are aligned with Government priorities. Strategic and generative discussions are held at each Board meeting to provide the SMT with valuable input, ideas and commentary to keep us on course and focused on strategic priorities. Oversight and governance include regular reporting from the CEO, an opportunity for a Question and Answer (Q&A) period as well as regular reports from Quality and Patient Safety Committee, Finance Committee and Governance Committee.

The Board's strategic priorities for 2016-2017 were:

Quality of Care and Patient Safety - The Board will continue to strengthen its role in providing strategic direction to and appropriate oversight of DSM performance in the provision of patient focused quality care and in ensuring patient safety; the Board will consider quality and patient safety in all Board decisions; the Board will assess itself regularly on progress in quality and patient safety.

Accountability/Dashboard - DSM Board prioritizes the development of a national-class accountability system which will include an informative dashboard of safety, quality and fiduciary metrics.

Provincial Leadership Diagnostic Services - The Board recognizes that DSM is uniquely positioned to provide leadership and drive innovation in diagnostics and to provide oversight and strategic direction to ensure consistency, coordination and integration of all diagnostic services across the province.

Engagement - To better understand and address the needs of DSM's key stakeholders, the Board recognizes the importance of integrating an engagement philosophy that aims to generate and include feedback from staff, patients, families, providers and partners in the planning, delivery and evaluation of services offered by DSM.

Sustainability - The Board will advocate for appropriate funding and ensure that DSM balances the provincial need for diagnostic services within the overall resources available to ensure a sustainable service going forward.

Major Consultations with the Public and Other Stakeholders

The Board held a public Annual General Meeting at DSM's Pathology Conference on September 16, 2016. The meeting was attended by the Minister and Deputy Minister of Manitoba Health, Seniors and Active Living, along with DSM staff and other partners in the health care system.

In addition to hosting its own AGM, DSM participate with the provincial Health Authorities in their delivery of AGM events. This ongoing engagement demonstrates our collaborative relationships and commitment to working jointly to deliver, plan and sustain quality health care services for Manitobans.

Board Oversight

The Board performs its fiduciary responsibilities to ensure that funds are allocated appropriately to support DSM's strategic priorities and monitor DSM's budget performance through its committees. The Board also sets and monitors quality and safety performance measures, completes annual board performance evaluations and ensures legislative, regulatory, and accreditation compliance.



2016-2017 Board of Directors

Ms. Arlene Wilgosh (Chair)

Dr. Shaun Gauthier, Chief Medical Officer, Prairie Mountain Health

Ms. Jean Cox, Assistant Deputy Minister of Regional Programs and Services, Manitoba Health, Seniors and Active Living (MHSAL)

Dr. Helmut Unruh, Surgery Lead, Department of Surgery, CancerCare Manitoba

Mr. Lee Manning, Executive Director, Manitoba Association of Health Care Professionals

Mr. Glenn McLennan, Chief Financial Officer, Winnipeg Regional Health Authority

Mr. Martin Montanti, Vice-President of Corporate Services, Southern Health Santé-Sud

Mr. Ron Van Denakker, Chief Executive Officer, Interlake-Eastern Regional Health Authority

Dr. Paul Van Caesele, Medical Director, Cadham Provincial Laboratory

Dr. Brock Wright, Senior Vice-President Clinical and Chief Medical Officer, Winnipeg Regional Health Authority

Organizational & Advisory Structure

Changes through retirements and departures are inevitable but through DSM's leadership development and succession planning, such changes are regarded as opportunities for renewal and strengthening of the organization:

- Pat Brennan, Chief Administrative Officer, retired from DSM and the functions of the position were distributed through a reorganization of the SMT.
- There were also some farewells and additions at the director level, including human resources and transfusion medicine.
- DSM assumed operational responsibility for the Purchasing Program formerly operated by the Regional Health Authorities of Manitoba; three staff members joined DSM's Contracts & Procurement Department and will continue to support the existing Purchasing Program as well as other DSM initiatives.
- Anticipating the increasing demand for genomics testing, DSM formally announced the creation of a Genomics discipline distinct from the previous Biochemistry & Genetics discipline; Drs. Michel Nasr and Beth Spriggs assumed leadership of the discipline as Medical Director and Associate Medical Director respectively.

Provincial Teams

Provincial Diagnostic Teams provide expertise in all of DSM's testing disciplines, guiding service delivery based on best practices, research and emerging trends and technology. As well as driving quality, standardization and continuous improvement initiatives, the Provincial Teams are a resource for DSM sites across Manitoba, contributing to a high standard of excellence province-wide.

DSM's complete list of Provincial Diagnostic Teams now includes:

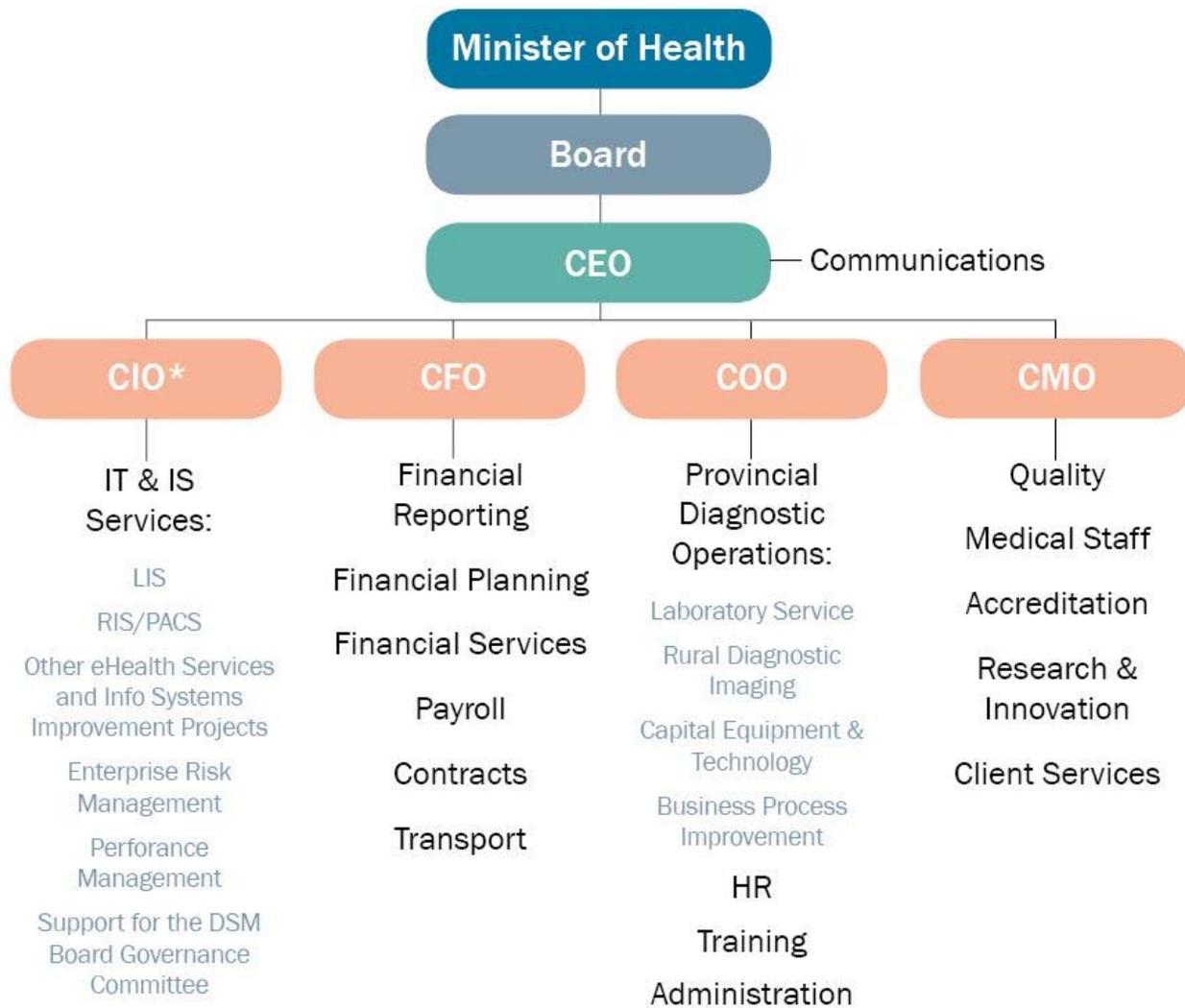
- Biochemistry
- Clinical Microbiology
- Diagnostic Imaging
- Genomics
- Hematology
- Immunology
 - Transplant Immunology
- Transfusion Medicine
- Pathology
 - Autopsy and Forensic Pathology

Health Authority Liaisons

DSM continues to work closely with its Health Authority partners through designed liaisons and participates in various provincial groups with Chief Executive Officers, Chief Medical Officers, Chief Financial Officers, Communications and other counterparts.

DSM Facilities

With 82 points of access to DSM’s provincial laboratory and medical imaging services, DSM is proud to be Manitoba’s leading provider of public laboratory and rural diagnostic imaging services. For a complete list of DSM sites, please visit our website at www.dsmanitoba.ca.



* shared position with eHealth

Annual Achievements

Provincial Leadership

Diagnostic services touch the entire scope of the health care system from prenatal testing to autopsy and forensics; from pediatrics to geriatrics; from medical and surgical programs to public health and mental health and all other health services in between them. DSM accounts for about 3.5% of the provincial healthcare budget, but influences over 80% of clinical decisions with laboratory and imaging results.

As Manitoba's provincial diagnostic health services organization, DSM defines its mandate through a philosophy of collaboration and relationship-building with key stakeholders: MHSAL, Regional Health Authorities, CancerCare Manitoba, Canadian Blood Services, Cadham Provincial Laboratory, community/private laboratories, Winnipeg Regional Health Authority (WRHA) and Brandon Diagnostic Imaging Programs, WRHA Departments and Department Heads in Medicine, Surgery and Family Practice.

DSM has continued to look for ways to integrate services and to support a more sustainable provincial model, decrease wait times for diagnostics, bend the curve on volume growth and cost per test. We have invested in advanced technologies for laboratory testing, diagnostic imaging and information systems and created a strong quality management system that has improved patient safety and quality of care. In fact, an esteemed and experienced laboratory professional who was inspecting DSM's laboratories as part of the College of American Pathologist's (CAP) accreditation process in early 2017 indicated that in his 25 years as an inspector, DSM is the best laboratory he had ever inspected.

In 2016-2017, DSM continued to ensure its plans and activities were aligned with the priorities of MHSAL. Additionally, DSM identified provincial priorities for diagnostic services to support our partners in health care and provide Manitobans with the best possible services, as well as organizational-level strategic priorities. DSM has defined its position as a leader in health care by focusing on creating internal operating efficiencies and collaborating with partners and stakeholders province-wide. Diagnostics can play a lead role in driving system improvements for patient care,

Diagnostic Services for Manitoba: Delivering Value for Money

1. Cost Savings – Efficiency
2. Appropriate Utilization – Effectiveness
3. Reduced Wait Times – Accessibility
4. Provincial Coordinated Services – Sustainability
5. Province-Wide Quality Assurance System – Quality

resulting in 'downstream' value across the health care system. For instance, genomics testing can determine a patient's eligibility and predict their response to specific drugs and therapies and avoid unnecessary treatments and surgeries.

As an organization, we are committed to delivering value for money. A major business focus for DSM throughout 2016-2017 was identifying and realizing initiatives to accomplish cost savings without negatively impacting the quality of our test results or service to Manitobans. We have built a culture from

within that supports the delivery of patient-centred, high quality, efficient, effective, accessible and sustainable diagnostic services. From leadership through to the frontlines, ideas and projects have been brought forward to improve efficiency, effectiveness and economy. Externally, this is most evident in the leadership role we have played in the Choosing Wisely initiative in Manitoba. As this Annual Report will demonstrate, however, there have been many internal initiatives that have made us better at providing quality services with improved value.

DSM's Strategic Plan is based on principles that reflect its original value proposition to find ways to improve diagnostic service integration and delivery while avoiding and reducing costs to the system. Building on a foundation of quality (including education and research), sustainability is supported on three equal pillars:

- Efficient (productivity and cost)
- Effective (providing the right services)
- Accessible (available where most appropriate).

"Sustainability cannot be supported on a weak foundation, or upon weak or unbalanced pillars." ...Jim Slater, CEO

Major Highlights of Our Achievements

Primary Health Care

Diagnostic services are an essential support for family doctors and other medical practitioners. With more health professionals able to order laboratory tests and diagnostic imaging under the Regulated Health Professions Act, there has been a significant increase in the volume of diagnostic services required of DSM. In 2016-2017, DSM continued to work with MHSAL, the RHAs and other professional groups to ensure capacity and access to diagnostic services for all ordering practitioners and their patients while simultaneously encouraging appropriate utilization.

Examples of such opportunities include:

- Diagnostics on a mobile healthcare bus.
- Point-of-Care-Testing (POCT) in rural/remote Manitoba.
- Remote support for laboratory services (e.g. new technology allows test review and reporting remotely).
- Diagnostic Services for First Nations, Métis, and Inuit Diagnostics Strategy - Pilot and research (e.g. phlebotomy on reserve clinics, POCT).

Other Strategies include:

- Connecting the Primary Care branch of MHSAL into provincial diagnostic strategies.
- Identifying issues and options for diagnostic services related to primary care networks and My Health Team.
- Developing and implementing the Provincial Strategy for Appropriate and Effective Use of Diagnostic Services, including POCT.
- Developing the Provincial Diagnostic Strategy for First Nations, Métis and Inuit.
- Developing the DSM Workforce Planning Strategy.

More information on these items is available in subsequent sections of this report.

Acute Care

Cancer Diagnosis and Treatment

With an estimated 6,900 new cancer diagnoses in Manitoba in 2016, supporting timely cancer diagnoses and treatment monitoring with quality diagnostics remains a high priority for DSM. Our role in patient's cancer journeys goes beyond turnaround time (TAT) as we continue to participate in key working groups and committees, provide expertise on cancer pathways and appropriate testing and look for new innovations in testing. Several disease specific working groups continue to monitor TAT and identify opportunities for process and TAT improvement.

DSM continues to focus on the key disease groups of breast, colorectal, lung and prostate cancers and lymphoma with plans to develop and implement similar pathways and improvement processes for all high-risk cancer patients to ensure that diagnostic procedures are completed within the recommended timelines.

DSM has been able to improve the quality and use of available data to inform priority areas for improvement.

DSM has remained consistent in meeting TAT targets for key disease groups:

- 92% of breast cases are reported within 8 days
- 90% of colorectal cases flagged as high-suspicion are reported within 7 days
- 93% of lung cases are reported within 12 days. The pathway for lung cancer is particularly complex given the multiple specimen types, subtyping of tumors and the ancillary studies that have become the standard of care for many clinical scenarios. DSM continues to collaborate with Oncology to reassess the algorithm and develop a more realistic target timeline as all medical disciplines are challenged in meeting the currently defined pathway and its corresponding targeted timeline.

Genomics Testing and Cancer Pathways

Cancer diagnosis, staging, monitoring and, most importantly, critical treatment decisions, are becoming increasingly dependent on Genomics Testing. Also known as Personalized Medicine, Genomics testing can increase positive outcomes for patients by improving health care delivery with more effective treatments, more predictability in treatment outcomes, more efficient use of resources, the avoidance of ineffective treatments and their often devastating side effects and earlier detection and prediction of future disease and potential interventions. Genomic testing can also provide benefits for families by facilitating more accurate genetic counseling.

DSM is highly engaged in the concept of personalized medicine, not only in offering the appropriate range of diagnostic testing, but in supporting practitioners in navigating genomics testing for their patients.

Diagnostic Services, Laboratory and Diagnostic Imaging Services

As Manitoba's provincial diagnostic services organization, DSM plays a role in coordinating and leading the development and implementation of a provincial strategic plan for the delivery of diagnostic services in Manitoba. In 2016-2017, DSM exercised considerable effort through strategic planning processes to identify ways to be more efficient and economical in all 82 diagnostic service touch points and all discipline areas. There were significant savings achieved by delivering appropriate services, reducing duplication and waste, and delivering services where they are most needed and make the most economic sense.

Provincial Transfusion Medicine Services

DSM continues to work in partnership with MHSAL, Office of Provincial Transplant and Transfusion Services, Canadian Blood Services (CBS), the Health Authorities and Health Senior Leadership Council (HSLC) to introduce an integrated vein-to-vein provincial transfusion service. DSM has assumed a greater clinical and operational role in Transfusion Medicine Services in Manitoba focusing on building relationships and collaboratives, defining roles and responsibilities and strengthening the functionality of the Transfusion Practice Committee (TPC). This year, DSM has delivered another level of integration and quality with improved blood product usage, delivering savings to the health system:

Reduction in Unnecessary Use of Intravenous Immunoglobulin

In the past, Manitoba has had the highest usage of intravenous immunoglobulin (IVIG) in Canada with the average treatment costing \$6,000 or more. Recognizing that there are instances where giving IVIG offers no clinical benefit for patients, the Transfusion Medicine Discipline Team worked collaboratively with physicians and Best Blood Manitoba in 2016 to minimize unnecessary use of IVIG. Together, they developed and introduced a new protocol that requires timely follow-up by clinicians to determine if there is clinical benefit to ongoing treatment. The results have been successful: first, fewer patients are being unnecessarily exposed to blood products, and second, costs associated with unnecessary treatments were avoided, thereby saving this valuable blood product for instances where it is clinically needed. Last year, we used 1,000 grams less of IVIG than the previous year.

Implementation of Transfusion Reaction Algorithm

Working in collaboration with Best Blood Manitoba, DSM developed a simple clinical tool for nurses that streamlines and standardizes the process for safely handling transfusion reactions. The algorithm identifies what nurses need to be watching for, what protocols to follow and how to stop reactions when they occur, ultimately keeping patients safer and helping nurses to feel more comfortable with the transfusion process.

Reduction of Patient Safety Risks with New Requirement for ABO Groupings

Working with CBS, DSM implemented a new requirement to have two patient samples tested prior to issuing ABO group specific blood. If only one sample has been tested, such as in the case of a new

patient without historical blood group listed in the Laboratory Information System, the patient will receive crossmatched group O (universal) red blood cells. This new process, which is required for the College of American Pathologists accreditation, will reduce the likelihood of transfusion reactions.

Provincial Pathology Services

DSM's Provincial Pathology Program includes services offered at the Health Sciences Centre, St. Boniface Hospital, Grace Hospital, Victoria General Hospital, Seven Oaks General Hospital and at Westman Lab in the Brandon Regional Health Centre. These services are strengthened by a provincial vision and strategy, standardized procedures and a systemic approach to quality. The discipline continues to work toward complete integration of pathology services in Manitoba including consistent standards, policies and procedures and continual enhancement of the Medical Quality Assurance Program in Pathology. The Provincial Pathology Program maintained its College of American Pathologists (CAP) Accreditation following a January 2017 inspection by a CAP Inspection team.

Pathology Medical Quality Assurance Program

DSM welcomed one of its pathologists to the role of Pathology Quality Director to lead the many facets of the Quality Assurance Program for pathology services within DSM. Through this leadership, pathologists have become more engaged in quality priorities which will serve to strengthen the overall quality foundation within the discipline. Priorities for the upcoming year include incorporating the use of root cause analysis to promote quality improvement initiatives and to strengthen the quality culture, especially as it relates to learning from errors with a focus on improvement over finding fault.

Technologies & Efficiencies

A number of measures have been undertaken within the program that have improved efficiencies and effectiveness and include the introduction of new technologies, process reviews and lean projects.

Automatic ordering and testing has been discontinued for a number of pathology procedures that have not been medically indicated and provided no value to clinical management with no impact to patient care.

A new fixation/imaging system has decreased the number of samples needed for breast cancer testing, creating workload efficiencies by reducing grossing and sampling volumes as well as improving result TAT

A Lean project in Cytology focused on testing processes for gynecological specimens to eliminate unnecessary hand-offs throughout the process, effectively streamlining workflow and improving TAT for cervical biopsy correlation cases

Modified screening practices for gynecological and non-gynecological cytology testing improved TATs while also improving quality.

Work continues on several initiatives that began in 2016-2017 to create new process and workload efficiencies as well as to increase productivity. This includes a project to assess the number of blocks per case that are sent for processing, and ultimately pathologist review. Colon cases are under review to ensure the most appropriate number of blocks per case is cut to improve efficiency without impacting quality. Full implementation of the Pathology LIS in winter 2017 will also contribute to a number of improvements that will positively impact all areas of the provincial pathology program from processes to patient safety. The Pathology LIS will better track patient specimens from receipt to results, contribute to medical quality assurance and provide structure and standardization to the electronic capture of clinical information (synoptic reporting) that will allow for improved data analysis that will measure performance and inform improvements.

2016 Pathology Conferences

Building on the success of our previous three Quality Improvements in Pathology Conferences, DSM hosted two conferences in 2016 that created learning and networking opportunities for our own pathology team as well as further showcased the leadership role of DSM in pathology quality in our province and nationally.

The Canadian Immunohistochemistry Quality Control held their annual conference in Winnipeg in June and partnered with DSM to present a Joint Symposium on Shaping the Future of Quality Improvements in Pathology.

Presented in partnership with Canada Health Infoway, DSM's Digital Pathology Symposium welcomed six leading authorities on digital pathology from four countries across North America and Europe in September. This was our best attended conference to date with registrations from seven Canadian provinces. Dr. Victor Tron, President of the Canadian Association of Pathology (CAP-ACP) moderated the panel discussion and addressed the symposium's presentations and discussions in an edition of the CAP-ACP newsletter, complimenting the "well attended and first-rate event".

DSM looks forward to hosting its sixth conference in the fall of 2017.

DSM SBH Pathology Lab Poised for Future Demands Following Complex Renovation

A year of complex renovations to nearly the entire frontline space in DSM's Pathology Lab at St. Boniface Hospital (SBH) has resulted in a redesigned lab space that not only accommodates today's workflow but which was planned with the lab needs of the future already in mind. Space within the lab's various departments and functions is now allocated and designed to best meet the needs of patient and staff safety as well as functionality and workflow. Each square foot is used to its full potential with specimens travelling the shortest and safest path through each pathology area to their final destination under a pathologist's microscope.

Although the renovation was among one of the more complex that the SBH facility has experienced, all work was managed without impacting the turnaround time for patient results or referring a single

sample to another facility due to the renovation process.



DSM acknowledges the amazing teamwork of pathologists, pathology staff and all SBH departments that worked alongside DSM leads to make the renovations possible, including SBH Project Management, Capital Planning and Facilities, Telecom, Housekeeping, IT and Protection Services.

Provincial Microbiology Services

DSM's provincial Microbiology program provides a coordinating and leadership role in the development and implementation of a provincial strategic plan for the delivery of microbiology services. DSM continues to work collaboratively with Cadham Provincial Laboratory and the private laboratories to ensure quality and to rationalize testing where most efficient, effective and sustainable while maximizing access for all Manitobans. As part of efficiency, effectiveness and sustainability efforts DSM continues to pursue planning for optimization of provincial microbiology diagnostics, which also takes specimen transportation improvements into account. Microbiology service optimization will better support staff competency, take advantage of new technologies and ultimately improve service quality and ensure timely results. Microbiology services are currently offered in eight DSM labs following the July 2016 consolidation of testing from DSM's spoke lab in Churchill to other regional centres.

Some of the system's most critically ill patients are treated 70% sooner thanks to growing improvements of MALDI-TOF Technology

Implemented in April 2015, leading-edge matrix –assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF) technology continues to make service improvements in Microbiology. Patients with positive blood cultures resulting from numerous types of sepsis and

infections can be some of the most critically ill patients in the hospital. The “rapid” ID of MALDI-TOF has improved turnaround time of blood culture results by an average of 18-24 hours, providing results in only four hours. Patients can be started on the most appropriate antimicrobial therapies sooner, which also assists with stewardship efforts as quicker results also prevent unnecessary treatments.

More Sensitive RSV Testing

Most common in the fall and winter months, respiratory syncytial virus (RSV) can be serious for young children, the elderly and those with weakened immune systems. New molecular testing was introduced that offers improved sensitivity over the previous RSV antigen test and viral culture. DSM provides RSV testing data to Cadham Provincial Laboratory to assist with documenting and tracking the spread of RSV in Manitoba for the purpose of better containing and preventing the spread of this virus to high-risk people.

Provincial Radiology and Diagnostic Imaging Services

DSM provides a coordinating/leadership role in the development and implementation of a provincial strategic plan for the delivery of radiology services, which has until recently been done independently by DSM, WRHA and Prairie Mountain Health (PMH). The three organizations now collaborate on multiple committees and initiatives that review technology, equipment, practice, accreditation and other operational components. DSM and its partners continue to work on an overarching provincial strategy to ensure consistency and integration across Manitoba.

Voice Recognition

The current voice recognition solution used for radiologist dictation will soon be off support and a replacement solution needs to be identified. Necessary work to upgrade and implement the current RIS PACS solution at some facilities was done in 2016-2017 as a precursor to the implementation of a new voice recognition solution. Work is now underway to select a new solution with implementation anticipated in 2016-2017.

Postprocessing

The method by which multiple one-dimensional images from CT and MRI scans are put together to form a three-dimensional image is called postprocessing. These three-dimensional images help to improve the radiologist’s visualization of anatomy and pathology for improved diagnosis. Work has been underway to identify DSM’s requirements and explore a standardized solution for post processing equipment that will bring consistency to processes and quality management. It is anticipated that new equipment will be implemented within 2016-2017.

Adoption of New Gastrointestinal Imaging Protocols

This year, the adoption of new gastrointestinal imaging protocols led to a decrease in fluoroscopy exams of the esophagus, stomach and colon. Because of these protocols, patients are being directed to more appropriate investigative tests such as endoscopy or being referred for other subspecialty consultation and/or medical management of symptoms. This results in savings due to

fewer inappropriate fluoroscopy exams, but also ensures patients are more quickly arriving at an effective method of diagnosing and/or treating their condition or illness.



Implementation of MRI in Selkirk

A significant accomplishment that occurred in early 2017-2018 but resulted from significant planning and time in 2016-2017 is the implementation of MRI in Selkirk. Selkirk's MRI will be used for both emergent situations and less urgent or out-patient medical diagnostics. While the availability of this MRI is closer to home for patients living in IERHA, DSM is anticipating that the machine will also contribute to increasing the

provincial appointment capacity and reducing Manitoba's MRI wait-times.

Installation of State-of-the-Art X-ray in Dauphin

DSM was pleased to install a state-of-the-art Digital Radiography Unit at the Dauphin Regional Health Centre (DRHC) in a newly constructed X-ray suite. DSM, MHSAL and PMH unveiled the new suite for patient examinations in August 2016 after completing staff training. The new unit offers significantly improved image quality over the older unit and reduces the radiation dose to patients. As well, due to an improved suite design, patients will have a safer and more comfortable experience getting on and off the X-ray table.

Provincial Strategy for Appropriate and Effective Use of Diagnostic Services

Unnecessary tests, treatments and procedures undermine our ability to provide care by potentially exposing patients to delay and even unintended harm. Unnecessary care takes away limited resources from our health care system. This issue is a global phenomenon with many jurisdictions realizing the importance of appropriate guidelines, engagement, and leadership. The concept of more is not always better in health care forms the basis for the Choosing Wisely campaign, which continues to gain momentum in North America, South America, the United Kingdom and in Australia.

Choosing Wisely Manitoba (CWMB) was originated by Diagnostic Services Manitoba (DSM) and has evolved into a partnership with the George and Fay Yee Centre for Healthcare Innovation (CHI). CWMB is an initiative to improve health outcomes, patient and provider experiences, and health system efficiencies and sustainability, sharing Choosing Wisely Canada's national goals of reducing unnecessary tests, treatments and interventions. CWMB is focused on addressing national recommendations that present opportunities specific to Manitoba to improve the appropriate use of health care resources by reducing tests, treatments and procedures where evidence overwhelmingly shows no clinical value or patient benefit.

Appropriate Use of Vitamin D Deficiency Testing

With an estimated 90% of Manitoba's historic vitamin D testing being performed without providing clinical value to a patient's treatment, supporting the appropriate use of this test quickly became a priority project for CWMB. A clinical practice change enforcing new evidence-based medical criteria and a new requisition for ordering the 25(OH) vitamin D test were fully implemented July 1, 2016. Unnecessary testing was effectively reduced by more than 80%, surpassing the project's goal of a

25% reduction, enabling significant funds to be redirected to other critical diagnostic areas



Improving Pre-Operative Diagnostic Testing

Supported by Choosing Wisely Canada and the Canadian Anesthesiologists Society and following extensive collaboration between surgery, anesthesia, primary care and family medicine, new preoperative testing guidelines and a new WRHA History & Physical Form were introduced in July 2016 to remove cues for unnecessary

preoperative testing. As the new guidelines and form are fully integrated into practice they are anticipated to reduce tests such as electrolytes, TSH, PTT, creatinine, INR, glucose, CBC, iron indices, urinalysis and tests related to liver function as well as chest X-rays, that have historically been performed on preoperative patients without medical indication. It is anticipated that the positive effects of this project will start to be realized by the third quarter of fiscal 2017-2018 and that preoperative testing can be reduced by as much as 25%.

Strengthening Medical Education and Practice

Resource stewardship is a central focus of the Choosing Wisely initiative and an important concept to reinforce early in medical education as its principles can be carried throughout a physician's career. A project to better emphasize this concept within the University of Manitoba's undergraduate medical education program (UGME) was funded through DSM's 2016 Summer Studentship program. Following a review of Manitoba's pre-clerkship medical curriculum, a variety of learning materials, including readings, interactive lectures, team-based learning sessions and online modules were developed, incorporating more than 120 Choosing Wisely Canada recommendations. The impact of these changes on students' knowledge and attitudes regarding resource stewardship are currently being assessed following the 2016-2017 academic year.

Improving the Appropriate Use of Pathology Testing

There are currently many specimens that are sent to pathology for analysis following surgeries, 'ectomies' and other procedures but which are done due to historical practice, rather than medical

indication. As a first step in reducing non-medically indicated pathology testing, CWMB set out to challenge the practice of pathology review on all orthopedic specimens from total hip and total knee arthroplasties. A retrospective review representing one surgeon's annual caseload was conducted to correlate pathology findings with the original diagnostic imaging report. The review supported existing evidence and expert views that pathology review of these specimens does not add clinical value to patient management. In most cases these tissues should be recommended for disposal and new standard operating procedures have been developed which have eliminated this testing from elective hip and knee replacement surgeries at Concordia Hospital, Grace Hospital and Boundary Trails Health Centre. Once fully implemented at all provincial orthopedic surgery sites, disposal of these tissues is anticipated to allow the redirection of \$180,000 annually to other needed areas of care as well as free pathologists' time in assessing these cases to improve turnaround time for other pathology work. Collaboration with surgeons continues to develop processes that will facilitate immediate disposal and improve workflow and efficiencies.

This project serves as a framework to reduce pathology testing from other areas of surgery and work is already underway to implement additional practice changes to improve appropriate pathology testing for specimens from otolaryngology, urology, plastics and other general surgical procedures.

This project was recognized by the American Society of Clinical Pathology as a finalist in the Best International Poster Award Competition at the 2016 Annual Meeting. In addition, DSM will add Manitoba data to the existing literature in support of the practice of disposing orthopedic tissues from elective hip and knee surgeries and will publish a paper that will help other jurisdictions implement similar processes.

Appropriate Use of FOBT

In the absence of a national Choosing Wisely recommendation on Fecal Occult Blood Testing (FOBT), CWMB engaged DSM and Gastroenterology specialists to conduct the research and present the evidence on appropriate use for FOBT. The Guaiac FOBT was designed to detect hidden blood in stool, making it an effective screening tool for colorectal cancer screening. However, the test is also commonly used (off-label use) in hospitalized patients to detect gastrointestinal bleeding in the investigation of anemia. In March a practice change was issued to support the recommendation that use of the guaiac FOBT should be restricted to the approved indication of screening for colorectal cancer in asymptomatic patients and should not be performed on hospitalized patients for investigation of anemia. CWMB has adopted this as its first recommendation and hopes to lead other provinces in moving toward enforcing the appropriate use of this test. As a follow up, this initiative will introduce physician and patient education material to support adoption of the changes.

Up & Coming Initiatives

As a result of the grassroots physician/practitioner engagement that CWMB has undertaken, momentum for CWMB continues to grow with more and more clinical champions and projects that demonstrate measureable results.

In addition to continuing engagement efforts, key areas of focus for the 2017-2018 year include:

- Reducing the use of MRI scans for lower back pain
- Improving patient care by reducing unnecessary thyroid treatment and improving the appropriate use of thyroid related lab and imaging tests and procedures
- Appropriate use of PSA (prostate specific antigen) testing
- Antimicrobial stewardship

Integrated Provincial Diagnostic Services

Integrated Provincial Diagnostic Services includes the core laboratory functions of Chemistry, Hematology and Immunology. Significant achievements were made in each discipline in 2016-2017 that built on previous successes and position us well for upcoming years.

Chemistry

CONSOLIDATION OF TESTING AND ELIMINATION OF REDUNDANCIES FOR SMALL GAINS TOWARD SIGNIFICANT SAVINGS

DSM developed a plan to centralize and consolidate several non-priority tests from urban community sites at Health Sciences Centre and St. Boniface Hospital, which also reduced unnecessary back-up at the community sites, thereby improving service to patients and achieving annual savings of over \$93,000

DSM consolidated Fecal Occult Blood Testing to a few sites in order to reduce quality control costs while a communication with ordering practitioners helped to reinforce appropriate use of the test. Quality control savings in PMH alone are more than \$3,000, which will be further improved when implemented in all the regions

By eliminating a Serum Pregnancy test redundancy at rural hub sites where there was an alternative and better method of testing, DSM achieved quality control savings of \$2,700

EDUCATION TO ENCOURAGE APPROPRIATE USE OF FLUID TESTS

Chemistry developed a new requisition to assist ordering practitioners to request the appropriate tests for fluid testing. Not only is inappropriate testing avoided when the correct tests are initially requested, but the laboratory is also able to provide better quality information to help the physician interpret the results.

IMPROVEMENTS IN DATA AND REPORTING FOR ANALYSIS OF QUALITY CONTROL ISSUES AND TURNAROUND TIMES

An update of the Biorad Quality Control management software, including the connection of nine rural hub sites, has helped the labs to better manage their quality control data and to review comparison reports between sites, which will help us to provide better centralized support and ensure quality of test results at all labs in the province

A searchable Microsoft Excel tool that enables DSM to drill into data from the LIS was created for HSC; the tool improves understanding of the journey specimens take, enabling us to see where delays occur in our system. Additionally, having access to this data enabled us to educate the Pediatric Endocrinology department to improve their processes around phlebotomy samples, which helped us improve relations with this department and to provide better service for pediatric patients

INNOVATION OF SERVICE PROVISION MODEL TO PROVIDE BETTER PATIENT CARE

Point of Care Testing offers both a risk and opportunity for patient care. This year DSM worked with a pilot site in PMH to develop a multi-disciplinary POCT program in which non-lab staff are trained to perform certain laboratory tests with appropriate quality oversight from DSM. If successful, the project will reduce off hour call-backs of lab staff, resulting in cost savings, while still providing timely results for patients and their physicians

REPATRIATION OF TESTING AND REVIEW OF REFERRAL LAB COSTS TO CREATE SAVINGS

Chemistry reviewed the menu of tests to repatriate certain tests that were being referred out and to refer others to external labs where it made the most economical sense, resulting in over \$90,000 in savings. Similarly, by reviewing referral lab costs, for Anti-Mullerian Hormone testing, DSM will be saving nearly \$120,000 annually without any sacrifice to quality or patient safety

CONSOLIDATION OF EXTERNAL PROFICIENCY TESTING

After reviewing DSM's External Proficiency Testing programs to identify redundancies and other accreditation issues, DSM consolidated EPT programs under a single vendor, resulting in over \$81,000 in savings annually without negatively impacting our accreditation status

Hematology

REDUCTION IN CLINICALLY UNNECESSARY COAGULATION TESTS

In 2016, DSM undertook an initiative to reduce unnecessary use of activated partial thromboplastin time (coagulation) tests to decrease the staggering numbers of tests and associated costs. By removing analyzers from small rural sites and centralizing routine tests in larger sites, DSM has achieved more than \$1.5 million in savings due to reduced service costs and reduced reagent costs. Small sites have also been equipped with I-STAT machines to perform these tests on an urgent and emergent basis.

AMALGAMATION OF ERYTHROCYTE SEDIMENTATION RATE (ESR) TESTS

In 2016-2017, DSM explored the potential to have ESR tests amalgamated at hub sites with equipment to automate the tests instead of the current manual testing. It is expected that this solution will be implemented in the next fiscal with estimated savings of more than \$90,000.

AMALGAMATION OF FLUID TESTING

In 2015-2016, the Provincial Hematology Team implemented Cellavision technology that improved efficiency and enhanced quality for certain tests. This fiscal, plans were made for Cellavision to be

validated to incorporate fluid slides being reviewed for potential abnormalities. This will decrease turnaround times for hematopathologist review. This also involves some centralization of fluid testing, which will improve quality and sustainability and result in cost savings.

Immunology

CENTRALIZATION AND REPATRIATION OF TESTING

Provincial Monoclonal Protein Investigation (MPI) testing has been centralized at DSM's Health Sciences Centre Immunology Laboratory. This centralization has provided quality improvement in standardization of testing and reporting. A more sensitive initial screening technique is now used for the whole province, which leads to earlier monoclonal protein detection for cancer patients. It has also provided efficiencies with elimination of equipment and service contracts.

Autoimmune testing for the province was centralized at the St. Boniface Immunology site with the exception of ANA screens, which are performed by Dynacare. The present test menu includes 29 assays but a considerable number of tests are sent to external reference laboratories.

Referral testing constitutes a significant portion of the current budget so this year, an extensive review of referred tests was conducted. Immunology repatriated some of these tests at a significant cost savings (approximately \$85,000), including:

- IgG Subclasses (1100 tests annually)
- Total Complement, CH50 (400 tests annually)
- C1 Esterase Inhibitor (400 tests annually)
- Alpha-1 Antitrypsin (3600 tests annually)

UPGRADE IN CYTOMETRY TESTING FOR ENHANCED EFFICIENCIES, IMPROVED REPORTING

Provincial Flow Cytometry testing for Leukemia, Lymphoma, Myeloma and other hematological disorders is performed at DSM's Immunology Laboratory at HSC. In 2016, a complete upgrade to 10 Color flow cytometry testing was completed, which created efficiencies through reduced use of reagents, decreased technologist preparation time and decreased analysis time. The upgrade also enabled the collection of more information for the reporting hematopathologist and decreased turnaround time for results.

Personalized Medicine: Provincial Genomics Strategy

Genomics Testing (Personalized Medicine) can increase positive outcomes for patients by improving healthcare delivery with more effective treatments, more predictability in treatment outcomes, more efficient use of resources, the avoidance of ineffective treatments and their often devastating side effects and earlier detection and prediction of future disease and potential interventions. Genomic testing can also provide benefits for families by facilitating more accurate genetic counseling. But the increasing demand for Genomics Testing has been described as a "tsunami" threatening our entire healthcare system and requires a paradigm shift in how medicine will be practiced in the future.



Establishment of the Provincial Genomics Testing Advisory Committee

In 2016, DSM, CancerCare Manitoba (CCMB) and WRHA assumed a provincial leadership role in developing an integrated provincial strategy for Genomics Testing and Personalized Medicine with a commitment to employing an evidence-based and business case approach in conducting evaluations and implementing tests. Known collectively as the

Provincial Genomics Testing Advisory Committee (P-GTAC), these partners are developing a collaborative strategy with input from clinicians, researchers and policy and funding authorities. Cancer is a major driver of the strategy, but not the singular focus as there are many non-oncology, chronic and inheritable diseases that can also benefit from genomics testing.

The collective resources of the P-GTAC and partners in research and clinical care offer Manitoba a unique opportunity to leverage the ongoing work of these organizations into an integrated provincial strategy – a “Manitoba Advantage.”

The purpose of P-GTAC is to:

- Make recommendations as to which genomics tests should be funded and whether they should be made available in Manitoba or referred-out to other qualified laboratories
- Evaluate genomics related tests and make recommendations
- Provide advice on the availability and potential impacts of new and emerging genomics related tests and technologies, particularly with respect to how they relate to approvals and funding for new drugs through the Common Drug Review (CDR) and pan-Canadian Oncology Drug Review (p-CODR).

Development of Manitoba’s Strategy for Genomics and Personalized Medicine

Work of the P-GTAC to date has demonstrated the need for a Provincial Strategy for Genomics Testing and Personalized Medicine to be integrated within the larger national and provincial ‘drug’ processes. It should aim to develop a consensus for prioritizing diagnostics that is evidence-based, best practice and supported by funding. Research findings will continue to put pressure on clinicians to treat with new drugs and treatment regimens and it is essential that there is a robust, yet nimble and flexible, provincial framework that connects the key stakeholders.

P-GTAC believes that it is essential that a framework for diagnostic decision-making and funding to be directly linked to MDSTC so that ‘drug’ decisions can be supported by quality, affordable and sustainable diagnostics. The goal of the strategy is to provide seamlessly integrated and comprehensive genomics testing that synergizes technologies and informs evidence-based, best practices for diagnosis, counseling and treatment decisions to support improved patient outcomes.

2016-2017 Operational Achievement in Genomics

The latest technology in genomics, called Next Generation Sequencing (NGS) was implemented for clinical use in June 2016. Testing for hereditary breast and ovarian cancer was improved by using NGS and the number of genes was expanded from 2 to 6. In addition, the turnaround times have drastically improved from > 12 months to approximately 3 months despite a significant increase in the number of patient samples received for this test.

DSM completed the validation of several fluorescent in situ hybridization (FISH) tests for lymphomas. These tests, which represent a multidisciplinary approach with expertise from genomics, pathology and hematology, are critically important for selecting appropriate treatment options.

Genomics has been actively evaluating a number of ‘hot-spot’ mutation panels for solid tumours. This test allows multiple variants to be tested simultaneously. With plans to implement this service in 2018, it is anticipated that by offering the test locally, DSM can offer improved turnaround times for cancer patients at a lower cost.

Diagnostic Services for Indigenous Peoples

DSM continued to work with its partners in the Health Authorities, First Nations Inuit Health Branch of Health Canada (FNIHB) and tribal health agencies to explore and implement alternative models of diagnostic services, such as:

- Phlebotomy services on-site at First Nations Medical Clinic (e.g. OHN).
- Accreditation support and operational management support (e.g. Norway House and Percy Moore).
- Consultation on construction of new facilities (new Cross Lake Health Centre)
- POCT at northern nursing stations and small, remote laboratory sites.
- Integration of key facilities into the Provincial Diagnostic Services Information Systems.

Corporate Support Services

Information Technology

The Provincial Laboratory Information System (PLIS) project consists of five closely interrelated provincial laboratory informatics sub-projects that continue to advance our goal of a sustainable diagnostic system for Manitobans. Over the last year, DSM has continued work on the five sub-projects of the PLIS initiative:

PROVINCIAL CORE LABORATORY INFORMATION SYSTEM

Significant progress was made in 2016/17 on extending the Delphic LIS throughout DSM Labs across the province. The implementation of Delphic into Westman Lab in Brandon (April 2016) was a particular achievement due to Westman's complexity as one of DSM's large referral sites. Following that implementation, an additional 23 Labs were brought onto the provincial LIS. As of March 31, 2016, 52 Labs had been implemented during the course of the project. Plans are in place to implement the remaining 15 DSM Labs by September 2017, which would complete the rollout. With the Winnipeg Labs added in – there will be a total of 77 DSM Labs operating from a single LIS, and transferring results electronically to other systems such as eChart Manitoba.

Westman Lab (Brandon)	Treherne	Deer Lodge Centre
Grandview	Eriksdale	(Winnipeg)
Minnedosa	Ashern	Erickson
Hamiota	Rivers	McCreary
Boissevain	Shoal Lake/Strathclair	Wawanesa
Deloraine	Oakbank	Rosburn
Melita	Lac du Bonnet	Birtle
Carberry	Whitemouth	Winnipegosis
Glenboro		

ANATOMIC PATHOLOGY LIS REPLACEMENT

The Pathology LIS Replacement project will replace the two existing pathology applications running in Winnipeg pathology labs and in Westman Lab (Brandon) with a single provincial solution. The project made significant progress in a variety of areas, including: establishing standardized workflows; refining workload distribution algorithms; developing and testing instrument interfaces to the pathology LIS; and review of management and statistical reporting. The project is targeting winter 2017 for implementation of the new system.

ELECTRONIC SYNOPTIC PATHOLOGY REPORTING

This project has been included as a part of the Anatomic Pathology LIS Replacement (above). DSM worked closely with Canadian Partnership Against Cancer (CPAC) on a data study of electronic synoptic pathology reporting indicators that included 4 other provinces. The new pathology LIS will introduce the use of synoptic reporting checklists for DSM pathologists.

GENOMICS LAB INFORMATION SYSTEM (G-LIS)

The DSM Genomics Lab area has numerous initiatives in flight and planned for new testing technologies and systems. To provide IT oversight to these projects a new Genomics Informatics Steering Committee has been formed. A replacement Genomics LIS is one of the key projects in this area, which will replace an outdated IT platform in place for some of the testing, and consolidate the bulk of Genomics testing and reporting in a single application. The project team has defined very detailed workflows for the Genomics tests and is documenting standard LIS related processes for the registration and reporting for the area.



DIGITAL PATHOLOGY AND MULTI-JURISDICTIONAL TELEPATHOLOGY (MJT)

The project to implement digital pathology slide scanners and an information system to manage images is effectively complete. The adoption and use of the new technology has surpassed expectations for use in the intended areas of pathology consultation and education. Additional Pathologists continue to show interest and receive training on the new system and equipment.

MJT offers the additional benefit of providing connectivity to support pathology consultation across other jurisdictions (Newfoundland, Labrador and the University Health Network in Toronto). DSM continues to work with the other jurisdictions and both vendors to integrate the technologies and enable cross-jurisdiction consultations and image viewing.

Health System Improvement

Provincial Procurement and Contracting Services

DSM Procurement (DSMP) continues to provide tendering and contracting services utilizing a flexible non-binding negotiated (NBN) bid process. This highly successful NBN process has resulted in a total cost savings of \$3.88M (\$572K derived from cost savings and \$3.3M from cost avoidance) for fiscal year 2016-2017. *(Note: Savings that most notably would not have been achieved without the NBN process.)*

The recent integration of the Regional Health Authorities of Manitoba (RHAM) into DSMP has resulted in the name rebranding of DSMP to DSM Provincial Procurement and Contracting Services (DSMPPCS). DSMPPCS will continue to support the regional health authorities providing contracting support while exploring future contracting and purchasing opportunities and cost savings. For greater clarity, DSMPPCS will be looking to maximize opportunities through provincial standardization (capital equipment, consumable supplies, and service contracts), contract consolidation, streamline processes and procedures with the aim to leverage economies of scale resulting in additional savings.

The integration of RHAM into DSMPPCS has resulted in the added benefit of DSMPPCS obtaining full membership and visibility to numerous HealthPRO (HP) contracts and pricing previously unobtainable. The ability to now analyze and potentially transition to various HP contracts may equally result in additional savings.

OVERCOMING BARRIERS & CHALLENGES

The Provincial Procurement Work Group (PPWG) with representation from DSMPPCS, WRHA, and CCMB continue to work collaboratively on several initiatives to achieve provincial standardization, leverage combined volumes to achieve economies of scale, develop lean tendering processes, eliminate duplicate administrative responsibilities, and resolve current regional distribution/logistical challenges all with the aim to reduce costs.

The addition of clinical resources to the PPWG has resulted a greater understanding of clinical requirements and product specifications.

The Provincial Procurement Steering Committee (to which the PPWG report to) has provided the governance and direction required to the PPWG

DSMPCS has seen significant improvements in:

- the ability to onboard onto WRHA contracts that historically have prone to be problematic (for instance, DSMPPCS is able to onboard onto a WRHA contract post award resulting in increased savings and reduced contracting responsibilities).
- open lines of communication between the organizations/ stakeholders.
- greater understanding of the specific needs of rural RHAs with respect to transportation challenges.

Provincial Collaborates currently under development by the PPWG include:

- GI Endoscopy Equipment & Service:
- IV Sets and Pumps
- Beds, Stretchers and Support Surfaces
- Cardiac Defibrillators
- Video Laryngoscopes
- Nurse Call System
- Total Joints- Hips & Knees
- PCH- Retail Pharmacy Services

2016-2017 ACHIEVEMENTS & ACCOMPLISHMENTS

Increased use of Health Pro contracts resulting in increased standardization:

- Clinical Oversight Committee: joined approximately 45 HealthPRO Clinical Contracts & 3 RHAMPP Clinical Contracts
- Non-Clinical Oversight Committee: joined 3 HealthPRO Support Services Contracts & 2 RHAMPP Support Service Contracts
- Exploring and collaborating on opportunities for multi-RHA capital equipment and service contracts.
- Home Oxygen Concentrator Program resulting in savings of \$200,000 annually or \$1M over contract term (5 years).
- Exploring and collaborating on standardizing minor equipment purchases.

Diagnosics Research Strategy

Since the Board of Directors identified research as an essential component of DSM's quality foundation, DSM has made a commitment to developing and implementing a Strategic Research Plan to support research in areas directly related to the services we provide.

The goals of DSM's Research Strategy are to:

- Provide support for research activities that are relevant to the services provided by DSM; and
- Create research and innovation opportunities for DSM staff working independently or in collaboration with other researchers.

Over the 2016-2017 year, DSM's achievements with respect to research include:

RESEARCH ADVISORY COMMITTEE

Last year, with input and direction from DSM's Board of Directors and Senior Leadership, a high level strategic direction for DSM research and innovation activities was established and plans for a Research Advisory Committee (RAC) were developed. This fiscal year, the RAC began meeting monthly. The mandate of the committee is to ensure that all access to tissue and related pathology data is documented, appropriate and equitable; and that clinical priorities and patient and sample anonymity continue to be respected and preserved.

RESEARCH SUPPORT OFFICE

DSM's Research Support Office (RSO) was established to provide a first point of contact for all researchers who need to access diagnostic services for their studies. Over the last year, the RSO has established two Winnipeg offices that provide virtual support to researchers throughout Manitoba. In the process of developing and establishing the RSO, DSM consulted with stakeholders, including site research groups, private companies, CancerCare Manitoba and others, and has continued to work closely to ensure we are adequately meeting the needs of researchers.

In the 2016/17 fiscal year, the RSO:

- Opened 71 studies
- Received 63 study submissions
- Closed 217 studies (some from the previous year and some whose paperwork was received due to the consolidation of offices)
- Average number of days from submission to lab impact approval: 39 days
- Average number of days from lab impact approval to all external approvals received (i.e. study activation for lab component): 51 days

2017 RESEARCH AND INNOVATION GRANT RECIPIENTS

Every two years, DSM's Research and Innovation Grant Competition provides funding for research with a focus on knowledge translation leading to adoption and implementation of evidence-based clinical practice and patient outcome improvements. This year, DSM was pleased to provide grants for three projects:

CREATING A NEW OVARIAN CANCER PATHOLOGY RESOURCE FOR RESEARCH AND INNOVATION IN MANITOBA

Principal Investigator: Dr. Mark Nachtigal (Biochemistry and Human Genetics, University of Manitoba and Senior Scientist, CancerCare Manitoba)

Co-Applicant: Dr. Cyrille Bicamumpaka (DSM/Pathology, University of Manitoba)

Project Summary: The objective of this study is to build an ovarian cancer tissue microarray (TMA) that can be used as an innovative research tool to advance ovarian cancer research and diagnostic capabilities in Manitoba.

SCLERAXIS AS A BIOMARKER FOR CARDIAC FIBROSIS IN HYPERTROPHIC CARDIOMYOPATHY

Principal Investigator: Dr. Davindar Jassal (Radiology and Physiology, St Boniface Research Centre)

Co-Applicants: Drs. Ian Kirkpatrick (Radiology) and Michael Czubryt (Dept of Physiology, University of Manitoba)

Project Summary: Sudden cardiac death (SCD) due to cardiovascular disease is a leading cause of death in Canada that is entirely preventable. In people younger than 40 years, hypertrophic cardiomyopathy (HCM) is a common cause of SCD. The objective of this study is to determine whether the scleraxis protein, which is a biomarker of cardiac fibrosis, is detectable and correlates with the incidence of cardiovascular disease in patients with HCM as seen in MRI images.

PROGNOSTIC SIGNIFICANCE OF TELOMERE LENGTH IN FOLLICULAR LYMPHOMA: A POPULATION-BASED STUDY

Principal Investigator: Dr. Michel Nasr (DSM, Pathology)

Co-Applicants: Drs. Arshad Ahsanuddin (DSM, Pathology) and Anamarija Perry (DSM, Dept of Pathology, University of Manitoba)

Project summary: This study aims to evaluate telomere length (TL) in a group of de novo follicular lymphoma (FL) patients in Manitoba. The prognostic significance of telomere length in FL patients treated with chemotherapy, as well as the correlation of telomere length with other clinical parameters and immunohistochemical markers, will be assessed.

SUMMER STUDENTSHIP PROGRAM

In the 2015-2016 fiscal year, DSM created another type of research award by establishing a program that generates opportunities for postsecondary students to participate in research with the Summer Studentship Program. This fiscal, DSM offered the program again, resulting in two research projects:

PROJECT 1: ORGANIZATION OF GROSS SURGICAL AND AUTOPSY PHOTOGRAPHS

Awarded to: Jarina Almaden

Supervisors: Drs. Camelia Stefanovici and Lance Fuczek

Project summary: Surgical pathology grossing rooms are fundamental in the work of pathologists. Likewise, they can play a significant role in teaching the art and science of

standardized dissection techniques to pathology students or others interested in research and diagnostic dilemmas. This project is meant to expand and develop the current knowledge and accessibility of 'Gross Digital Images' throughout DSM's pathology laboratories by organizing available images and information into appropriate categories for easy retrieval. The resulting systematic database of digital images, reports and/or ancillary studies would be a valuable resource for pathologists and a teaching tool for physicians, residents, pathology assistants and other allied health professions.

Project 2: Impact of Genetic Loss on Cell Viability, Cell Signaling Mitochondrial Metabolism and Cell Morphology in Leukemia Cell Line Models

Awarded to: Ryan Saleh

Supervisor: Dr. Versha Banerji

Project summary: Leukemia is characterized by an abundance of abnormal white blood cells. This may result from abnormal genes making abnormal proteins that promote cell growth and survival. The future of diagnostic tests and treatments, as well as prevention of this blood cancer, lies in our capacity to detect these abnormalities in each patient. Through personalized medicine, we can replace or interfere with the mutated genes that allow cancer cell survival, which in turn starves the cancer through lack of nutrition and ability to produce energy. In order to effectively target the genes, it is necessary to understand the biology behind the cancer cell survival and to perform experiments to see which patients will benefit from certain treatments over others. Being able to hone in on the specific gene abnormalities may prevent unnecessary treatments with standard chemotherapy that may have many side effects. These techniques will enable Diagnostic Services Manitoba to be on the cutting edge of cancer care for all Manitobans.

Provincial Funding Model

A significant achievement in 2016-2017 was the finalization of agreements for a provincial funding model for DSM. The funding model that had been used since DSM's inception in 2002 was based on the regional model for health services delivery and involved the transfer of funds from health authorities to DSM for diagnostic costs incurred in each health region (a cost recovery model). This model did not support the provincial nature of the DSM organization and represented a significant barrier to improving efficiency, effectiveness, access and sustainability.

The new provincial (or global) funding model offers the province, health system and DSM many benefits, the most significant of which is the ability for DSM to reallocate resources quickly in order to meet operational needs without first having to reach agreements with health authorities. The ability to move financial resources between sites located inside different health authorities will not change DSM's business model; the services currently being provided to each health authority will continue under the terms and conditions of the current Service Level Agreements. If a health authority plans to alter its programs or services in a way that alters test volumes, however, they will need to work collaboratively with DSM to ensure new funding can be secured to support the new volumes.

Other benefits of the new model include:

- Stronger ability to engage in long-term planning to improve access, effectiveness and efficiency across the province while continuing to meet regional needs;
- Provincial focus on diagnostic pressures and volumes with an improved ability to advocate for the appropriate resources required to meet those needs;
- More formalized, province-wide process for managing volume growth and improved utilization;
- Funding for diagnostic services cannot be diverted to other regional needs;
- Improved opportunity to increase billing for third party and uninsured services as practices could be standardized on a provincial basis; and
- Reduced administrative burden for both DSM and health authorities as time would no longer be required for funding allocations, variance analysis, reporting and billing.

Quality and Patient Safety

Quality and patient safety form the foundation of all services that DSM offers. With the introduction of College of American Pathologists Accreditation (CAP) in 2011, the organization's quality culture has shifted toward maintaining accreditation-ready operations at all times, which means that rigorous processes are always in place to monitor the key quality indicators that are used to assess our performance against industry standards. Our quality systems work to ensure that we are providing the right results to the right patient at the right time.

Quality plays a significant role in supporting the organization in moving forward with systemic efficiencies and adding clinical value to our care, which has become an increasing priority in supporting the sustainability of the health system. Through audit and data analysis, Quality supports and enables discipline and site operations to drive improvements that will improve aspects of our quality and our service. Several significant projects commenced in 2016-2017 that further demonstrate our commitment to patients and our health partners through efficient, sustainable and quality diagnostics.

PROVINCIAL PRE-ANALYTIC COMMITTEE

Pre-analytics includes all processes from ordering a diagnostic test to sample collection to the point at which the sample is analyzed and takes into consideration everything from requisitions to specimen containers and transportation of samples. A provincial Pre-analytics Committee was established in 2016-2017 to focus on these important aspects of the testing process and to see what efficiencies and economies could be gained. Representation from all diagnostic discipline areas and from multiple sites ensures that pre-analytics are assessed from a provincial perspective and that issues are resolved in a systemic way. Initial working group priorities have included the trending and assessment of specimen rejection, the exploration of process efficiencies related to the documentation and trending of errors and requisition consolidation. A working group has been

created to significantly reduce the number of laboratory requisitions. As well as contributing to improved service to our ordering practitioners, all accreditation standards for requisitions will be met as requisitions are revised.

Also related to pre-analytic processes, the framework for robust data collection and analysis is being developed that will allow for strengthened monitoring of key turnaround time indicators, including for high priority emergency testing. Data will be used to analyze the performance of each pre-analytic testing stage to see where TAT challenges may be occurring.

LABORATORY INFORMATION MANUAL EXPANSION

The use of the DSM Laboratory Information Manual (LIM) has expanded from a tool for phlebotomists and lab staff to a multi-disciplinary resource for all practitioners. A project is underway to make the LIM a more robust tool that will improve education and test utilization by providing important evidence-based information on clinical indication, best practice utilization, alternative tests and result interpretation. Diagnostic disciplines are engaged in reviewing their test menus to expand upon currently available information with the ultimate goals of improved service to physicians/practitioners and improved patient care through more appropriate test utilization.

QUALITY LEADERSHIP FOR POCT

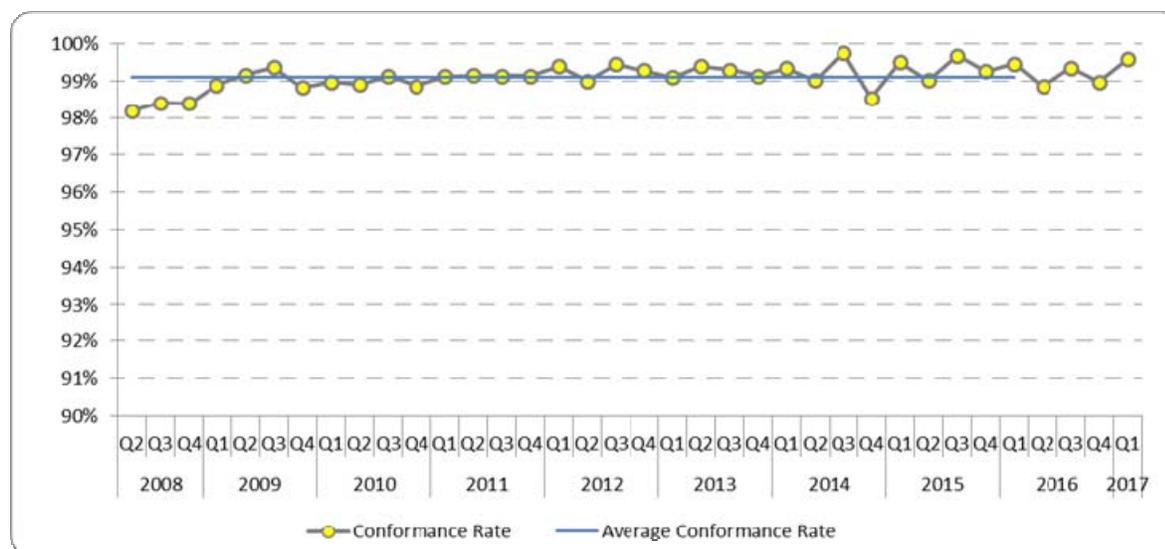
As the province's diagnostics leader, DSM has a significant role to play, not only in the delivery of our own services, but in guiding best practices for diagnostic across the province. DSM Quality has been providing leadership on the use of point of care testing (POCT) across the health regions, beginning with a pilot project at three WRHA Access Clinics to introduce POCT for INR (a critical test for patients taking anti-coagulants and blood thinners, typical for those who have had or are at risk of a heart attack or stroke). A less invasive finger poke replaces a blood draw and results in a much quicker procedure and an immediate result thanks to a handheld meter and test strips. Patients who require INR testing usually need frequent and life-long monitoring. POCT methods have reduced this burden for patients who have associated POCT with improving their lifestyle by providing greater peace of mind and improved ability to adjust medication doses as indicated by INR results.

DSM continues to provide the lab expertise needed to ensure that these positive service changes are supported by quality systems. This includes ensuring the necessary ongoing training, competency and proficiency testing support, which are fundamental to a strong POCT program and which will ensure that POCT accreditation requirements are met.

Work to support a roll-out of clinician performed POCT for urgent off-hour testing in Swan River has moved forward with plans to implement by mid-2016-2017. The initiative will provide better patient care to those who are acutely ill and need immediate chemistry, hematology and EKG testing and who would otherwise have to wait for laboratory call staff to arrive. Stat results will allow necessary care/treatment to be initiated sooner. DSM Quality has been among the key partners planning this initiative in collaboration with the site's laboratory, nursing and medical staff. Quality framework and resources have been developed by DSM, including, standard operating procedures, job aides and training documents. The project will serve as the pilot model for roll out at other health care facilities across the province.

PROFICIENCY TESTING

Proficiency Testing (PT) is a fundamental component of DSM's quality processes. PT helps to ensure that DSM's analytical systems are performing appropriately compared with expected results and peer labs. DSM participates in a robust PT program, which includes subscriptions to numerous laboratory PT organizations in Canada, the US and the UK. Thousands of tests across all laboratory disciplines are assessed through these PT programs multiple times per year.



CRITICAL INCIDENT REPORTING – APRIL 1, 2016 TO MARCH 31, 2017

DSM continues to report all Critical Incidents (CI) (incidents where patient harm has occurred) to MHSAL as per provincial legislation. In the interest of continual systemic improvement, DSM proactively expands upon this principle by investigating all incidents whether or not harm has occurred to a patient.

In the interest of providing our patients and the public with an understanding of the CI investigation and reporting process, the process and our commitment to the process is outlined on our website at www.dsmanitoba.ca.

Selected Patient Safety Learning Advisories are also posted on the MHSAL website.

Additional Information:

Critical Incident Reporting and Investigation:

<http://www.gov.mb.ca/helath/patientsafety/ci/index.html>

Summaries of Reported Critical Incidents:

<http://www.gov.mb.ca/health/patientsafety/report.html>

Patient Safety Learning Advisories

<http://www.gov.mb.ca/health/patientsafety/psla.html>

ACCREDITATION STATUS (AS OF MARCH 31, 2016)

Accreditation is a primary measure of how our quality management system is working and is a key priority for DSM. Our quality culture has shifted to maintaining accreditation-ready operations at all times, which further demonstrates our quality commitment to our clients/patients, the public and to our health care partners.

The Province of Manitoba requires that all medical laboratory and diagnostic imaging facilities be accredited by a third party agency. DSM uses two third-party accreditation agencies for the majority of its accreditation needs: The Manitoba Quality Assurance Program (MANQAP) and the College of American Pathologists (CAP). Additional third party accreditation agencies are also used for specialty areas and include the Canadian Association of Radiologists (CAR) for mammography; The American Board of Forensic Toxicology (ABFT) for Toxicology; and Public Health Agency Canada (PHAC) for Microbiology services at the Health Sciences Centre.

MANQAP

The Manitoba Quality Assurance Program (MANQAP) operates under the College of Physicians and Surgeons of Manitoba and is responsible for accreditation of laboratory and diagnostic imaging facilities and Patient Service Centres (PSC) in Manitoba. Accreditation is granted by the Program Review Committee (PRC) of the CPSM.

All DSM sites have achieved accreditation status from MANQAP. Accreditation of a facility is for a defined period of time, which is typically five years.

COLLEGE OF AMERICAN PATHOLOGISTS ACCREDITATION (CAP)

DSM is proud to be associated with the CAP Laboratory Accreditation Program, which is one of the highest ranked and most esteemed accreditation agencies for laboratories in the world. This relationship began in 2011 when our two largest laboratories, located at HSC and SBH were first accredited by CAP. In 2013 CAP accreditation was expanded to all pathology laboratories. CAP accreditation is maintained through a two –year inspection cycle that includes a biennial on-site unannounced inspection by CAP inspectors and an interim self-inspection performed by DSM team members in the alternate years.

2016-2017 was a year for the unannounced on-site inspection. DSM was highly prepared and anticipated high compliance and even so, inspection results and inspectors' feedback was exemplary. A highly experienced laboratory professional remarked that DSM is the best lab system he has inspected in his 25 years participating as a CAP inspector. His statement is a testament to the dedication of all staff and their persistent focus on doing the right thing for the patient.

DSM was in compliance with over 99% of the checklist requirements. Strong technical and clinical support, safety and quality oversight, excellent medical leadership, robust documentation, and excellent use of data were noted by inspectors. Praise was given for our emphasis on quality through our auditing and corrective action processes as well as through our biennial self-inspection process.



DSM's effective competency tool was just one of several processes that inspectors identified as wanting to replicate within their own respective facilities.

Commendations were given within each provincial program area, a few of the highlights include: perfect score in Immunology; scope and depth of our Toxicology program; our impressive media preparation room and cutting edge technology of MALDI-TOF in Microbiology; province-wide integration of Transfusion Medicine policies and compliance by nursing staff in all partner organizations (RHAs and CCMB); and the high level of standardization and quality improvement within Pathology. Special mention was also made of our Choosing Wisely Manitoba efforts to reduce unnecessary testing and the level of collaboration with all our clinical partners to support appropriate use of our diagnostic services. Our Provincial Genomics Laboratory also received praise for its 'flawless' implementation of Next Generation Sequencing (NGS) and for being so well-organized and well-run. The lead inspector was particularly impressed with our national recognition for Choosing Wisely and Personalized Medicine.

Because of DSM's systemic approach to quality, technical procedures and standardization, CAP's prestigious stamp recognizes excellence at DSM's CAP accredited facilities and is also a reflection of the quality services and staff expertise in each of DSM's rural and urban labs



Challenges and Future Directions

DSM continues to face challenges and pressures that are common across the diagnostic industry. Innovation, standardization, information systems and technology, and initiatives to reduce unnecessary testing are helping to alleviate some of these pressures, particularly with respect to volume and price increases, but there continue to be a number of issues that have implications to diagnostic services in Manitoba.

Workforce Education and Recruitment: Increased demand for services across the province, as well as demands for new or growing technical services, drives the need for more qualified staff. Recruitment continues to be a challenging area, especially for very specialized medical disciplines like genomics and for staff with technical knowledge, as in the case of ultrasound technologists. In addition, attracting experienced and knowledgeable staff to rural and remote locations can be difficult. In these locations, there is a need for staff that are dual-trained in laboratory and imaging, which often requires DSM to provide additional training on site. Succession planning has become a challenge as DSM has built a knowledgeable and experienced leadership team since 2002 when DSM was created; as retirements occur, a wealth of knowledge can be lost.

Staffing Model: DSM's staffing model requires review due to changing service levels at sites. DSM is constrained its ability to respond to changes in healthcare service delivery needs due to lack of staff mobility between sites.

Increasing Demand for Services/Utilization: DSM continues to see annual increases in test volumes due to rising standards of care, increases in preventative and specialty testing such as genomics, and expanding test menus. Although DSM has introduced many efficiencies to diagnostic operations, there is little control with respect to the volumes of tests being ordered. To this end, DSM has partnered with CHI in the Choosing Wisely Manitoba initiative, which endeavours to reduce unnecessary testing where appropriate. In addition, DSM will continue to explore partnerships with other service providers to respond to growing service demands and needs; for instance, partnership has enabled the offering Contextual Genomics services.

Physical Space: Health care facility space is at a premium and, in most cases, facilities were not designed to handle the volumes experienced today. Many of DSM's labs and imaging locations face space constraints with little room for expansion or process redesign. Likewise, many of these spaces were constructed decades ago and have significant "wear and tear." Renovations have both financial and service implications.

Aging Equipment: The ongoing need to continue to replace aging equipment has financial implications and can cause service interruptions when repairs and replacement are required. In addition, the increasing costs of service contracts to maintain equipment is challenging.



Increasing Quality Expectations: Accreditation requirements are continually increasing and often require compliance within short timeframes. This creates challenges for staff to balance ongoing clinical workloads with efforts to become compliant.

Rapidly Changing Technology: Increasing technological demands, such as automated instrumentation, require a different skills set and ongoing education for technical staff and often require new approaches to quality management.

Information Technology: Since DSM's inception in 2002, DSM has been working build a Provincial LIS system. Our core provincial laboratory information system is nearing completion and we are excited to complete the remainder of the project including Provincial Pathology LIS and Provincial Genomics LIS. DSM's IT team works closely with Manitoba eHealth to determine and manage ongoing technology initiatives.



Financial Information

Report of the Independent Auditors on the Summarized Financial Statements

To the Member of
Diagnostic Services of Manitoba Inc.

The accompanying summarized financial statements, which comprise the summarized statement of financial position as at March 31, 2017 and the summarized statement of operations for the year then ended, are derived from the audited financial statements of the Diagnostic Services of Manitoba Inc. ("DSM") for the year ended March 31, 2017. We expressed an unmodified audit opinion on those financial statements in our report dated June 9, 2017.

The summarized financial statements do not contain all the disclosures required by Canadian public sector accounting standards. Reading the summarized financial statements, therefore, is not a substitute for reading the audited financial statements of DSM.

Management's responsibility for the summarized financial statements

Management is responsible for the preparation of the summarized financial statements.

Auditor's responsibility

Our responsibility is to express an opinion on the summarized financial statements based on our procedures, which were conducted in accordance with Canadian Auditing Standards 810, "Engagements to Report on Summary Financial Statements".

Opinion

In our opinion, the summarized financial statements derived from the audited financial statements of the Diagnostic Services of Manitoba Inc. for the year ended March 31, 2017 are a fair summary of those financial statements.

Winnipeg, Canada
June 9, 2017

A handwritten signature in cursive script that reads "Ernst & Young LLP".

Chartered Professional Accountants



Diagnostic Services of Manitoba Inc.
Incorporated under the laws of Manitoba

SUMMARIZED STATEMENT OF FINANCIAL POSITION

[Expressed in thousands of dollars]
As at March 31

	2017	2016
	\$	\$
ASSETS		
Current		
Cash and cash equivalents	8,379	11,485
Accounts receivable	18,768	10,022
Prepaid expenses	1,312	1,428
Vacation pay recoverable from		
Manitoba Health, Seniors and Active Living	598	598
Regional Health Authorities of Manitoba	1,544	909
Total Current Assets	30,601	24,442
Capital assets, nets	58,787	67,131
Pre-retirement leave benefits recoverable	12,721	12,642
Future sick leave benefits recoverable	1,970	2,042
	104,079	106,257
LIABILITIES AND NET ASSETS (LIABILITIES)		
Current		
Accounts payable and accrued liabilities	16,513	13,404
Current portion of obligations under capital lease	-	8
Accrued vacation and overtime payable	10,467	9,514
Total current liabilities	26,980	22,926
Accrued pre-retirement leave benefits	13,964	13,701
Future sick benefits payable	2,405	2,456
Deferred contributions	61,706	66,682
Total liabilities	105,055	105,765
Commitments		
Net assets (liabilities)	(976)	492
	104,079	106,257

Signed on behalf of the Board:

Arlene Wilgosh
Board Chair

Glenn McLennan
Chair of the Finance and Audit Committee



Diagnostic Services of Manitoba Inc.
Incorporated under the laws of Manitoba

SUMMARIZED STATEMENT OF OPERATIONS

[Expressed in thousands of dollars]
As at March 31

	2017	2016
	\$	\$
REVENUE		
Manitoba Health, Seniors and Active Living operating income	181,659	31,499
Government of Canada Revenue	408	289
Recoveries from Regional Health Authorities	16,669	121,458
Revenue from non-resident out-patient services	7	5
Interest income	3	7
Other Recoveries	3,678	2,152
Loss on disposal of assets	(38)	(107)
Recognition of deferred contributions		
Capital – amortization	9,209	8,261
Expenses	647	990
	<u>212,242</u>	<u>164,554</u>
EXPENSES		
Direct operating		
Salaries and benefits	150,165	139,431
Communications	16	14
Equipment	8,208	8,039
External Consulting	314	296
Grants	85	105
Insurance	140	138
Interest	-	7
Laboratory and diagnostic supplies	32,710	3,717
Legal and audit	212	172
Meetings	17	170
Miscellaneous	894	375
Printer, paper and office supplies	843	847
Recruitment	99	158
Referred Out Services	8,251	228
Rent and Utilities	667	605
Staff training and development	833	774
Telephone	208	157
Travel	1,013	534
	<u>204,675</u>	<u>155,767</u>
Amortization of Capital Assets	9,035	8,323
	<u>213,710</u>	<u>164,090</u>
Excess (deficiency) of revenue over expenses for the year	<u>(1,468)</u>	<u>464</u>



Supplementary Information
For the year ended March 31
(unaudited)

ADMINISTRATIVE COSTS

The Canadian Institute of Health Information (CIHI) defines a standard set of guidelines for the classification and coding of financial and statistical information for use by all Canadian health service organizations. Diagnostic Services of Manitoba Inc. (DSM) adheres to these coding guidelines.

The most current definition of administrative costs by CIHI includes: General Administration (including Acute/Long Term Care/Community Administration, Patient Relations, Community Needs Assessment, Risk Management, Quality Assurance and Executive costs), Finance, Human Resources, Labour Relations, Nurse/Physician Recruitment and Retention and Communications.

The administrative cost percentage indicator (administrative costs as a percentage of total operating costs) adheres to CIHI definitions.

The figures presented are based on data available at time of publication. Restatements are made in the subsequent year to reflect the final data and changes in the CIHI definition, if any. Administrative costs and percentages for DSM are:

Administrative Cost Summary

	Mar-17		Mar-16	
	\$	%	\$	%
Corporate	4,099,756	2.04	3,921,076	2.55
Patient care related costs	1,484,389	0.74	1,720,420	1.12
Recruitment/Human Resources related costs	1,511,899	0.75	1,406,233	0.91
TOTAL Administrative costs	7,096,044	3.53	7,047,728	4.58

ADMINISTRATIVE FOOTNOTE

Effective April 1, 2017 DSM moved to a provincial funding model whereby all funding for DSM services flowed directly to DSM from Manitoba Health, Seniors and Active Living, rather than to the regions. The fiscal year 2017 was a transition year. While funding remained with the regions, DSM assumed the reporting responsibility for any surplus or deficit resulting from the provision of DSM services, and therefore included all funding and expense transactions related to those services in the annual financial statements.

The funding model change has an impact on the calculation of the administration ratio by increasing overall DSM costs by \$37m in relation to administrative costs. If DSM operated under the provincial funding model in the fiscal year 2016, a restated calculation would result in a total administration ratio of 3.62% in comparison to 3.53% for 2017.



Public Sector Compensation Disclosure

In compliance with The Public Sector Compensation Disclosure Act of Manitoba, interested parties may obtain copies of the Diagnostic Services of Manitoba Inc. public sector compensation disclosure (which has been prepared for the purpose and certified by its auditor to be correct) and contains the amount of compensation it pays or provides in the corresponding fiscal year for each of its officers and employees whose compensation is \$50,000.00 or more. This information is available in hard copy by contacting (204) 926-8005.

Public Interest Disclosure (Whistleblower Protection) Act

In accordance with DSM Policy 10-40-12, Public Interest Disclosure (Whistleblower Protection) Act, paragraph 3.2, a report must be prepared annually by the Designated Officer on disclosures that have been made and the action taken to address the disclosures.

There were no disclosures for the period April 1, 2016 to March 31, 2017.

Regional Health Authorities Act – Accountability and Transparency

DSM is in compliance with the applicable sections of The Regional Health Authorities Act and The Regional Health Authorities Amendment Act with regards to improved accountability and transparency and to improved fiscal responsibility and community involvement; specifically sections: 22 (terms and conditions of employment of the chief executive officer and designated senior officers); 23 (posting on the website of the regional health authority's strategic plan, and accreditation and publishing of the results); and 51 (restrictions on the rehiring of the chief executive officer and designated senior officers).

A handwritten signature in black ink, appearing to read 'C Burns'.

Catherine Burns, CFO
Designated Officer for Public Interest Disclosure
Diagnostic Services Manitoba

31 Mar 2017