



**A Case Study in
Improved
Workflow
on Patient Care Pathways**

Saskatoon
Health Region,
Canada



Optimizing Saskatoon Health Region's Imaging Departments to Enable Improved Workflow on Patient Care Pathways

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Finding Efficiencies

Saskatoon Health Region (SHR) is the largest health region in the province of Saskatchewan serving over 336,000 residents in over 100 cities and communities across the province. Services are provided in over 75 healthcare facilities including three tertiary hospitals with approximately 808 acute care beds. With a fairly new CEO on board, SHR is driving a philosophy throughout the organization of “getting today’s work done today” as part of a larger process improvement agenda.

A major part of realizing this aspiration is to provide state-of-the-art imaging options to patients, helping to quickly diagnose diseases and identify best possible treatments. Diagnostic imaging, including MRI services, is currently provided at the Royal University Hospital, Saskatoon City Hospital and St. Paul’s Hospital sites.

SHR is committed to maximizing customer value while minimizing waste. Key to achieving this is identifying new efficiencies and ensuring that all equipment and services are utilized to their full potential. LEAN has been embraced by SHR hospitals and several ‘rapid process improvement’ workshops have been held in the hospital, including one involving diagnostic imaging and scheduling, which resulted in department processes running more smoothly.

Following the success of this workshop, the management for diagnostic services wanted to see what else could be done to optimize its MRI capabilities. With this in mind, Shane Timm, Director, Medical Imaging and Nuclear Medicine, and Dr. Paul Babyn, Head of the Department of Medical Imaging, University of Saskatchewan and Saskatoon Health Region, enlisted the services of Siemens Healthineers Transformation and Advisory Services to examine its MRI services and identify efficiencies that could help promote best practice, increase throughput, decrease wait times and ensure maximum use of the hospital’s MRIs.



Getting Started

The primary objective was to evaluate the current state of MRI services in order to identify service gaps, create additional system capacity, and to make recommendations for further improvement in order to achieve best practice.

“The main challenge we faced was wait times for both inpatients and outpatients to access MRI services,” said Shane Timm. “Previously we had implemented a patient flow strategy to reduce patient length of stay which improved patient access to MRI services. We enlisted Siemens Healthineers Enterprise Services Transformation and Advisory Services so they could share their knowledge and expertise, and help us pin-point some options to optimize our MRI services.”




Siemens Healthineers Enterprise Services provides consultancy, change management, transformation and advisory services, and workflow optimization services to enable healthcare providers. One goal was to identify and share best practices and create plans for clinical excellence thus improving clinical outcomes and patient experience, while lowering costs. This is the value a partner like Siemens Healthineers can bring.

With a rapidly growing and aging population in Saskatchewan, demand on MRI services is at a peak. However, as with many healthcare institutions across Canada, and further afield, funding is not keeping pace with demand, creating a major funding gap and requiring smarter solutions.

Waiting times for MRI scans in Saskatchewan were reported by the Canadian Institute for Health Information (CIHI) to be 28 days at the 50th percentile and 88 days at the 90th percentile in 2013. In addition, the Canadian Press reported on October 17, 2014, 23 days of waiting time for urgent cases, 93 days for semi-urgent cases, and 140 days for non-urgent MRI cases. Understanding that reducing wait times supports earlier diagnosis and improved patient outcomes, SHR took action by reaching out to its trusted partner.

Growing numbers of exams make optimization critical

The SHR oversees three hospitals that provide MRI exams. All three hospital locations have experienced a spike in the number of exams performed year over year.

Facility	Description	Operating hours	Patient Demands
 <p>Source: Wikipedia, Drm310</p> <p>The Royal University Hospital</p>	<ul style="list-style-type: none"> • 455 acute beds • The facility operates two MRIs; one 3 Tesla and one 1.5 Tesla machine 	<ul style="list-style-type: none"> • Operating for 16.5 hours daily Monday to Friday, and for eight and a half hours on weekend days 	<ul style="list-style-type: none"> • 14,271 exams in 2014/15, an increase of 32% over 2013/14
 <p>Saskatoon City Hospital</p>	<ul style="list-style-type: none"> • 150 acute beds • One MRI machine 	<ul style="list-style-type: none"> • Operating for 14 hours a day, seven days a week 	<ul style="list-style-type: none"> • Performed 4,283 exams in 2014/15, a rise of 10% over previous year • A rise of 11% in the numbers of out-patients receiving MRI scans over the last year
 <p>Source: www.stpaulshospital.org</p> <p>St. Paul's Hospital</p>	<ul style="list-style-type: none"> • 230 acute beds • One MRI machine 	<ul style="list-style-type: none"> • Operating for 16.5 hours weekdays and for 7.5 hours on weekends 	<ul style="list-style-type: none"> • Performed 5,490 total exams in 2014/15, a 21% increase over the previous year. It too has witnessed a steep rise in the number of outpatients it sees, rising 24% in 2014/15 compared to 2013/14

"As the numbers demonstrate, demand for services is rising substantially every year, sometimes by double digits," commented Shane Timm. "Increasing throughput would be an easy task if there was ample funding available, but the funding doesn't match the demand, so we needed to find other ways to ensure capacity keeps pace with growing demand."



Instigating change to grow capacity

Interviews were carried out with 13 different staff, ranging from Directors of Medical Imaging and Nuclear Medicine, to technologists and schedulers to understand the current state of operations and identify areas for advancement.

“The recommendations Siemens Healthineers put forward, from the simple to the more complex, were all actionable, well-thought out, considered, and based on real thorough investigations and understanding of not only global and national best practices but our operations,” said Christine Dawson, Manager of Nuclear Medicine and PET/CT Services at Saskatoon Health Region. “It was great to know that the Siemens Healthineers advisory team working with us had a background in diagnostic imaging, meaning there was very little learning curve, and they could hit the ground running. Our experience working with Siemens Healthineers services staff in maintaining our MRI equipment was what made us think of Siemens Healthineers when we needed some consultancy advice and insight.”

One of the early opportunities that was identified by the Siemens Healthineers team was to increase the collaboration between the two radiologist groups that provide services to SHR’s three hospital sites.

More co-ordination could easily lead to increased service consistency and standardization of processes, both of which were desired by hospital management. Alignment of protocols, approval processes and scheduling has been initiated and will go a long way in helping collaboration to improve efficiencies across SHR’s three sites. Other recommendations put forward ranged from changing the booking and scheduling processes, to implementing new staff shift times, reflecting data gathered on peak times for MRI exams.

Key Siemens Healthineers recommendations at a glance

- Increase the collaboration between the two radiologist groups that provide services to SHR’s three hospital sites
 - More co-ordination could easily lead to increased service consistency and standardization of processes, both of which were desired by hospital management
 - Alignment of protocols, approval processes and scheduling has been initiated and will go a long way in helping collaboration to improve efficiencies across SHR’s three sites
 - Changing the booking and scheduling processes, to implement new staff shift times, reflecting data gathered on peak times for MRI exams
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Data at your fingertips

Previously, Diagnostic Imaging Managers at each site were not receiving MRI utilization management reports for their systems across the three hospitals. This has now been initiated along with training, and managers are able to better spot trends and respond to them proactively. In addition, new data and measurements have been added to existing reports, helping the leadership team with continuous refinements to services and ensuring full utilization of the available MRI technology.

The data review on utilization management reports spanned 14 months for all sites¹. Access to detailed data, such as the MRI volumes by hour of day (see chart below), provided insights into workflow and processes, specifically exam volumes by time-of-day and day-of-week, wait times, exam durations and no-shows. This data helped establish when the equipment was being used at a high capacity level and times of days where the machines were idle. The data review identified that there were low volumes of exams performed between 8 a.m. and 9 a.m. and 7 p.m. and 9 p.m. at all hospitals; useful information to know when scheduling future exams.

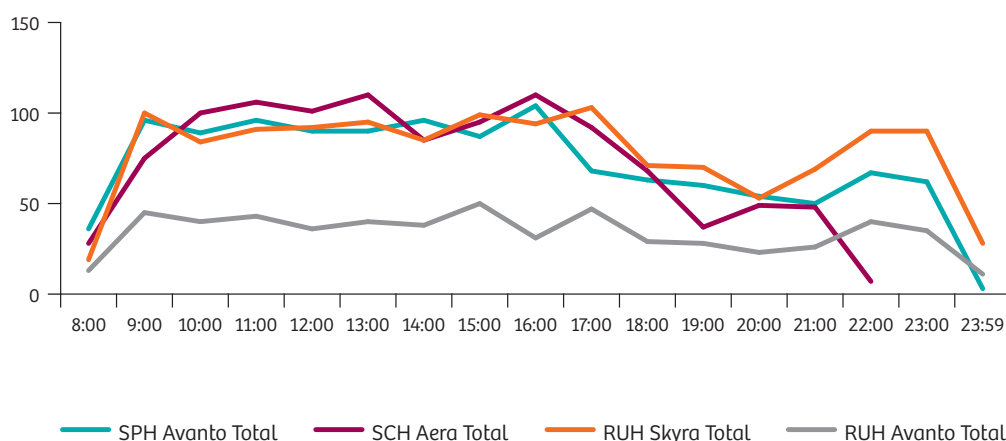
This data also provided the average exam times for all three hospitals. In some cases, this demonstrated that allocation times for exams were longer than the actual time the exam took to be performed.

By discovering periods of low utilization (for example from 8 a.m. until 9 a.m.) many more exams could be performed across the three sites annually by scheduling additional exams in periods of low-utilization.

Knowing when peak and low utilization periods occurred also provided the opportunity for SHR to alter shift patterns for technologists and other staff, helping to see more patients every day, while ensuring that staffing levels aligned with patient-flow for MRI, thus enhancing departmental efficiency.

MRI Utilization Management Report at SHR Hospitals

January to March 2015



¹Utilization management reporting for the Avanto MRI at Royal University Hospital started mid-February resulting in the indication of lower volumes than other sites.



Scheduling makes for smoother operations

A number of recommendations provided by Siemens Healthineers were related to scheduling efficiencies. Data reviewed showed that there was additional capacity throughout the system. In the case of non-contrast patients, exam slots could be reduced from one hour to 45 minutes, meaning 15 minutes more for additional utilization capacity. Overall, it was identified that over 1,500 additional exams annually could be performed by scheduling additional patients, as a result of improved utilization management.

The possibility of moving to a web-based direct order entry for all referrals was also recommended to help eliminate missing information and reduce time requirements for follow-up by scheduling staff. An auto-notification function could also be incorporated to remind patients and GPs about appointments, helping to reduce the incidence of no-shows.

The sharing of staffing schedules by different departments with each other in advance would help with ensuring exams are carried out efficiently, with staffing availability and shortages not holding up the exam process and resulting in the need for re-scheduling.

Implementing change – realizing benefits

“The Siemens Healthineers recommendations were broad in scope; from small changes we could implement immediately, to large process ones requiring more time and wider stakeholder involvement. All the recommendations were insightful and solid,” said Shane Timm.

Some of the key changes SHR has already made include:

- Making simple staffing changes to ensure maximum coverage and utilization throughout the day
- Changes in processes regarding patient bookings and scheduling, saving time and simplifying the process
- Working to secure additional technology, like a new online booking system, to ease the burden of requisitions all coming through one machine, and potential risks with lost faxes
- Starting to look at staffing shifts and staggering shifts to make use of the quiet times and ensure full utilization to maximize the amount of exams that can be performed

Christine Dawson commented: “The insights that come from working with an organization with the experience of Siemens Healthineers provides us with the analysis and knowledge on which to build that we otherwise might not have obtained. Having an external party come in and objectively examine workflow has been a great experience with tangible results. Having a different perspective from an organization that has seen it all is invaluable in implementing our ongoing improvement agenda. The other value is that we know they will be with us not only today but in the long run, helping to coach us along the way.”

“We have already made many changes based on the evaluation and recommendations from Siemens Healthineers,” said Shane Timm. “While our implementation schedule is ambitious, as with any change, it takes time. Changing protocols requires the involvement of many other stakeholders, and while immediate benefits will be realized from those changes we’ve already made, we are looking forward to working with our colleagues and the wider community involved with SHR in making some of the more long-term improvements.”



Checking performance on an ongoing basis

While results from the changes already implemented are bearing fruit, it is paramount that continuous measurement and analysis is undertaken on a regular basis.

That's why the Siemens Healthineers advisors worked with SHR to identify what metrics should be tracked and incorporated into SHR's medical imaging balanced scorecard. The team recommended that 11 new metrics should be incorporated to help in ongoing identification of trends and further changes to improve workflow and optimize SHR's imaging services.

"Working in the healthcare field, while challenging, is probably one of the most rewarding careers I could ever think of having," said Shane Timm. "SHR's improvement agenda really is driving the future of healthcare delivery in Saskatoon, and we all come to work every-day with the philosophy of 'getting today's work done today'. We live this in all we do, and that's one of the reasons we were keen to embark on this review, and why we chose Siemens Healthineers; a company that shares our values and is passionately committed to helping healthcare institutions like ours fine-tune their operations to deliver the best possible services while recognizing the restraints all of us in the healthcare field face."

In the short term, the following metrics will be tracked and incorporated into the Saskatoon Health Region medical imaging balanced scorecard for quality

- Patient volumes by site by referring physician (named) who were not notified by their respective physician of the appointment, tracked and reported monthly.
 - Average delayed start times of first cases, tracked and reported annually.
 - Wait time in days for inpatients - date of admission to date of MRI, tracked and reported quarterly.
 - No show rates, times and reasons for the no show (obtained when rebooking) for all sites reported monthly.
 - Requisition error or information omission rate by floor by site.
 - Requisition error or information omission rate by site and by referring physician.
 - Requisitions for in-patient exams faxed to central scheduling instead of directly to the hospital.
 - In addition, the following metrics are also monitored through the utilization management reports:
 - Average meantime between exams tracked and reported quarterly.
 - Average duration per exam tracked and reported quarterly.
 - Average duration of exams without contrast tracked and reported quarterly.
 - Average duration of exams with contrast tracked and reported quarterly.
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The products/features and/or service offerings (here mentioned) are not commercially available in all countries and/or for all modalities. If the services are not marketed in countries due to regulatory or other reasons, the service offering cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

The statements by Siemens Healthineers customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results.

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Siemens Healthineers Headquarters

Siemens Healthcare GmbH
Henkestr. 127
91052 Erlangen, Germany
Phone: +49 9131 84-0
siemens-healthineers.com