Saskatchewan Health Authority

Annual Report

Saskatoon Stroke Program

2024-2025

Neurosciences

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Provincial Stroke Program

The past year marked significant advancements in Saskatchewan's stroke care landscape. The post-pandemic resumption of the Stroke Expert Panel in November represented a pivotal step in collaborative efforts to improve stroke prevention, acute treatment, and rehabilitation across the province. Under the leadership of Dr. Brett Graham, Medical Director of the Stroke Prevention Clinic, and Lisa Korec, Director of Neurosciences, this panel underscores a commitment to enhanced provincial stroke management and interprofessional collaboration.

Stroke Care Initiatives

- Coffee and Cases
- Stroke Boot Camp
- Video Telestroke Care
- Rural and Remote Stroke Screen
- Melfort PSC implementation

As the province's sole Comprehensive Stroke Centre (CSC), the Saskatoon stroke team is a leader in guiding Saskatchewan's Stroke Strategy and supporting sustainability and ongoing enhancement of Saskatchewan's Acute Stroke Pathway. Much of the year has been dedicated to the continued strengthening of CSC support to Primary Stroke Centres (PSC), through on site and virtual engagement, including education opportunities, care enhancements, and provincial service expansion.

Stroke Metrics

Efforts to improve data reporting and metric tracking continued throughout the past year. In close collaboration with the Saskatchewan Health Authority (SHA) Strategy and Innovation and Digital Health partners, an automated data reporting process was developed that could better support independent, timely stroke metric reporting. Integration of the newly opened Melfort PSC into the Saskatchewan Stroke Registry was also achieved, further strengthening our understanding of provincial stroke care. This enhanced local and provincial access to stroke metric reporting was foundational to the team's ability to pursue stroke initiatives throughout the year.

Provincial Engagement

Over the past two years, PSC site visits highlighted several challenges within acute stroke care. One of the most pressing is Rehabilitative and Diagnostic Imaging team recruitment challenges, which impacted stroke alert responsiveness and contributed to delays in providing appropriate, timely acute and rehabilitative treatment. Stroke knowledge was also found to be varied across sites during hyperacute and inpatient acute stroke care. To address these challenges, our team introduced several strategies:

Coffee and Cases Pilot, which ran from October, 2023 to May, 2024, was an initiative seeking to provide front line support to PSC and regional stroke team members across nursing, physician, and allied health disciplines. The pilot offered multiple education topics and generic case-based discussions through a monthly virtual stroke rounds format. Participation exceeded 100 providers per session and showed positive qualitative outcomes of increased understanding and confidence in stroke care provision. Due to the success of this pilot, planning is underway to resume this support strategy in the new fiscal year.

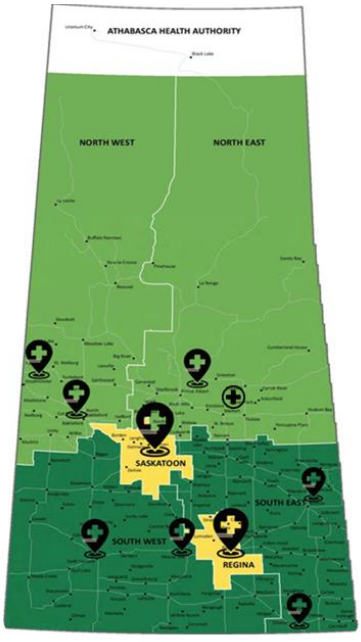
PSC Stroke Nurse Boot Camp was successfully implemented to enhance the knowledge, confidence, and competency of frontline PSC nursing staff in providing hyperacute and acute stroke care through combined classroom learning, practical workshops, and stroke simulations. This one-day event was held in Saskatoon, the site of the Saskatchewan's sole CSC, to also expose provincial stroke champions to components of care their patients may receive once transferred from their local facility. Participant feedback indicated perceived increased knowledge, confidence, and skill development, indicating success in further strengthening of the Saskatchewan Acute Stroke Pathway through improving stroke care delivery across the province's Hub and Spoke model.

Pictured above: PSC stroke champions learn about endovascular therapy received by some of their stroke patients upon transfer to the Comprehensive Stroke Centre (Saskatoon).

Sask Virtual Visit in Stroke Care Pilot introduced the use of SHA's video virtual platform during certain acute Telestroke Stroke Neurologist consultations, with the intention of enhancing hyperacute and acute stroke care assessment and treatment planning. However, due to variability in platform functionality in acute settings, usage remained low and lacked long-term sustainability for broader implementation. As an alternative, a pilot partnership with STARS was launched in June, linking into the STARS established virtual platform for stroke consultation calls in rural and remote areas. Early experiences indicate the platform has functioned consistently, which may demonstrate benefits in stroke assessment, treatment, and improving appropriateness with patient transfers.

Stroke Patient Process Design Workshop took place last October in Regina, Saskatchewan's sole tertiary stroke centre, to better understand opportunities for provincial alignment in stroke care and to optimize timeliness of rehabilitation referrals. The team created a detailed process map and successfully identified areas for improvement in stroke care, closing the day with a plan for the integration of provincial stroke discharge planning document, a strategy for increasing provincial Stroke Preprinted Order Set use, and exploration of applying standardized criteria for inpatient or outpatient rehabilitation admission or referral.

Saskatchewan Stroke Centre Locations



Perhaps the most pivotal development to positively impact Saskatchewan's stroke care system in the past year, was the **addition of a ninth PSC in Melfort**, which officially launched on August 19, 2024. With the support and commitment of the comprehensive stroke team through site visits, on-site simulation, standardization of care processes, and readiness assessments, the local Melfort team excelled at preparing for and implementing stroke care. This expansion continues to help alleviate pressures on other nearby high-volume PSCs, in addition providing excellence in stroke care closer to home for members of the Melfort community.

As the fiscal year ended, on-site PSC engagement resumed, following the successful acquisition of a Saskatchewan Health Research Funding (SHRF) Mobilize grant that could support this important endeavor. The stroke team visited North Battleford in March, with plans for additional engagement sessions at the remaining sites in the upcoming fiscal year.

Learning from Indigenous Partners

Understanding health systems and the priorities within Indigenous communities is of utmost importance to our team. To expand our learning, we looked first to First Nations and Metis Health partners for guidance on making meaningful connections, and to identify those from whom to seek knowledge sharing. Our journey has allowed us to connect with tribal councils and Northern Intra-tribal Health Authority representatives, including health service managers, homecare nurses, northern community and remote outpost providers, and rural and remote physicians. We have been privileged to engage in important discussions with many who have been willing to share the health care provider experience, and insight into the needs of rural, remote, and isolated Indigenous communities.

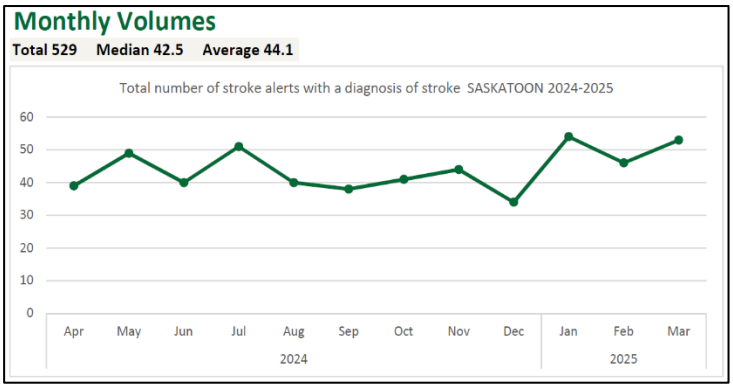
While addressing gaps in the existing provincial rural stroke screen, the unique needs of northern rural and remote communities were identified. Collaboration with northern care providers resulted in a revised Rural and Remote Stroke Screen, designed to acknowledge the unique needs of remote communities and decrease barriers to timely patient transport and treatment. Accompanied by virtual and in person education for users, the updated screening tool was officially launched in January and has since been met with positive feedback regarding its function.

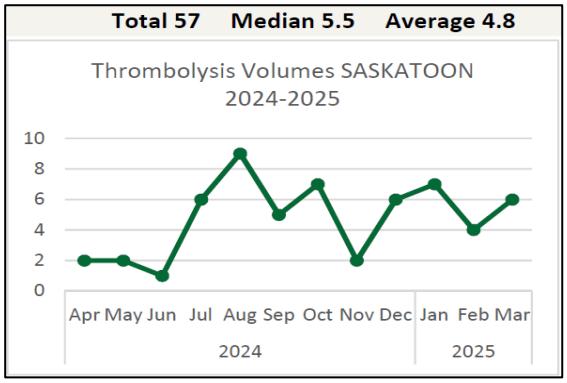
QR code access to SHA Rural and Remote Stroke Screen located

Collaboration continues with Indigenous partners to pursue additional opportunities to improve communication between SHA and other health service partners. This includes a focus on ensuring access to stroke education tools and stroke treatment awareness information in languages and formats applicable to rural, remote, and isolated Indigenous communities.

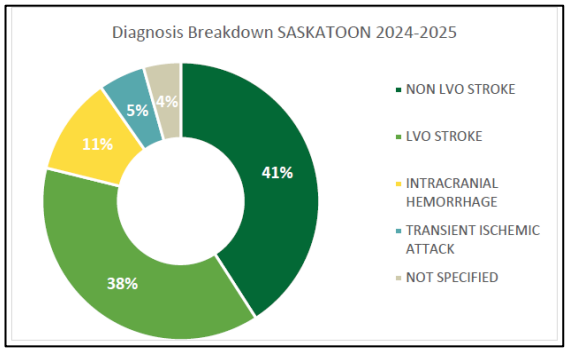
Saskatoon Stroke Program

Acute Stroke Services





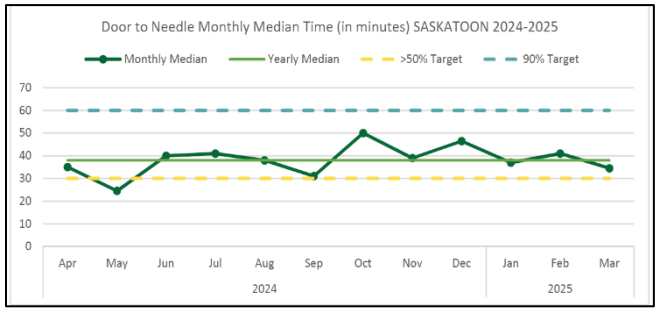
Overall, Saskatoon admitted and cared for a total of 637 strokes in 2024-2025, with 529 identified from incoming stroke alerts. 11% were hemorrhagic strokes, with the remaining 79% ischemic strokes. A total of 57 (10%) diagnosed stroke received thrombolysis, meeting the minimum threshold of 5% of those anticipated to receive thrombolytic treatment.

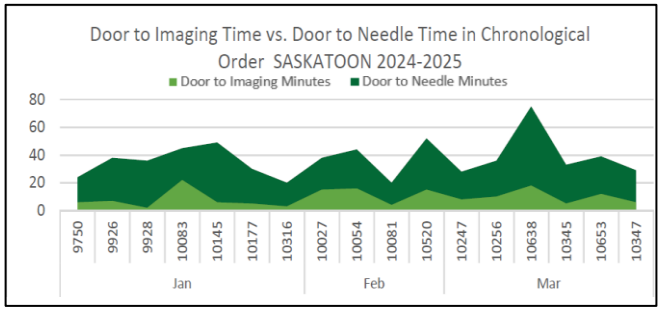


637
Total Strokes

Monthly median Door to Needle Times (DTNT) were well below the 60-minute target for 90% of cases. However, times remain beyond the 30-minute goal for 50% of cases. As displayed below, time variabilities between imaging and needle times contribute to this delay. In response, education with the ED team was provided regarding role and responsibility definition for optimizing stroke alert flow and minimizing delay between CT upload and stroke team viewing.

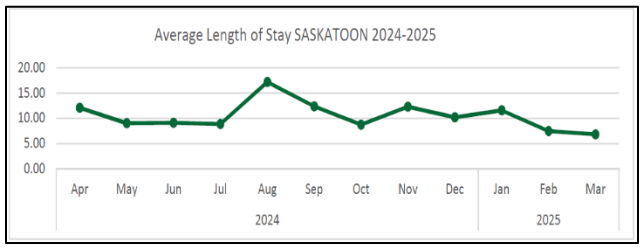
Capacity and optimized patient flow is also a persistent challenge within the CSC, with corrective measures currently prioritized and underway at a system level. Saskatoon averages 44 stroke alerts diagnosed as stroke monthly, with an average of five who receive thrombolysis. These volumes directly impact ED and Acute Stroke Unit (ASU) capacity. In turn, ongoing capacity concerns directly impact the timeliness of accessing the ASU, with extended ED waits occurring post-hyperacute stroke care.

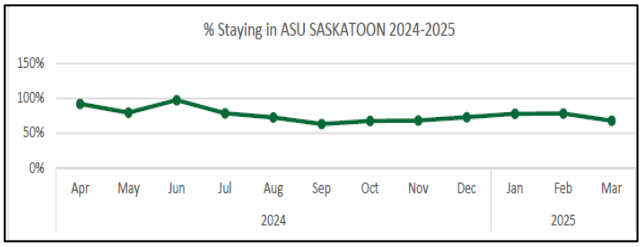


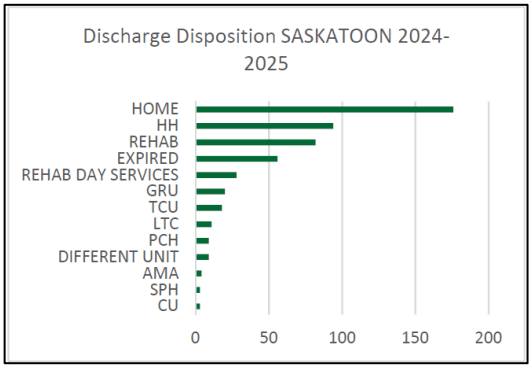


Acute Stroke Unit

Saskatoon is home to the sole ASU in Saskatchewan, which continues to meet best practice cohorting standards, enabling the highest quality of care. The ASU is embedded within the collective Neurosciences Unit, which includes high acuity and dedicated ICU step down space equipped to provide complex stroke care, including post EVT patients. Several staffing enhancements occurred over the past year, including the addition of Clinical Resource Nurse and Nurse Clinician positions, roles which augment patient discharge planning and mentoring of the front-line nursing team.







The median percentage of stroke patients cohorted to the ASU was 75%, exceeding the minimum threshold and matching the best practice target. For those admitted to the ASU, average length of stay was 10.4 days, well within the 14-day target. The overall rate of patients accessing inpatient rehabilitation was 7%, well below the minimum threshold of 20%. While there are system level contributors to this low volume, it must also be noted that this rate of patients does not capture those transferred for convalescence and reassessment for rehab closer to home. However, the ASU team continues to partner with rehabilitation colleagues in seeking solutions to ensuring timely rehab access. The AlphaFIM assessment tool, intended to measure patient functional ability in acute care, was relaunched in March 2025, accompanied by an updated process designed for long-term sustainability and supported by trained AlphaFIM champions among the ASU team. Associated metrics were also initiated to evaluate consistency in assessments and review outcomes associated with length of stay and discharge disposition.

Sustainability and consistency challenges with measuring admission, discharge, and 90-day NIHSS score for all stroke patients became apparent to stroke team clinical leaders. Targeted medical resident education was actioned to more effectively integrate this tool into admission and discharge assessments, which has resulted in significant improvements in admission and discharge measures. With continued physician support over the coming year, this will serve as the foundation for upcoming plans to contribute to national patient stroke outcome measures. A Vaccine Uptake Project, which was piloted October to March, successfully increased inpatient flu vaccination rates on the unit and contributed to valuable insights for future initiatives.

Patient Experience

In the past year, the ASU team continued to explore new strategies for supporting patients, including efforts to establish a patient peer support program. While resource advocacy remains ongoing, the Neurosciences team has benefited from collaboration with a committed patient partner, who is now actively engaged in the unit's quality and safety committee and providing support to patients through completion of Patient Experience surveys. To further enhance the patient experience, the unit has developed a welcome/information pamphlet, offering an overview of the unit's operations and a platform for collecting comprehensive patient experience feedback. Additionally, a pilot initiative, "Now That's a Good Question" was launched in March, focusing on a meaningful patient experience question each month, allowing for hands-on, inclusive participation.

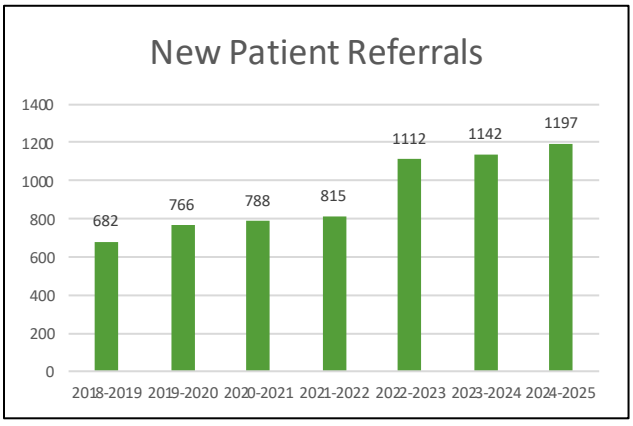
Pictured above: 6300 Neurosciences hands-on patient experience survey question board offers an alternative, easier way for patients to provide feedback.

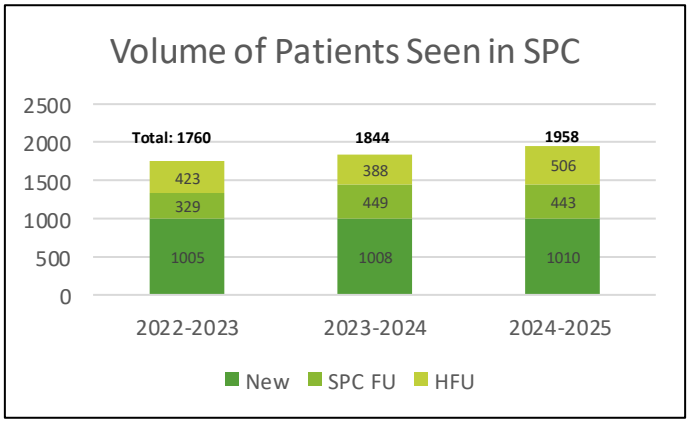
Quality Improvement

Another collaborative effort focused on improving Emergency Department stroke alerts. Working alongside EMS, Sask Polytechnic, and ED teams, the stroke program helped develop updated EMS education modules to be included in centralized provincial EMS training. Additionally, triage nurse education was provided through education days and creation of a training video, focused on knowledge reinforcement of emergency stroke care protocols.

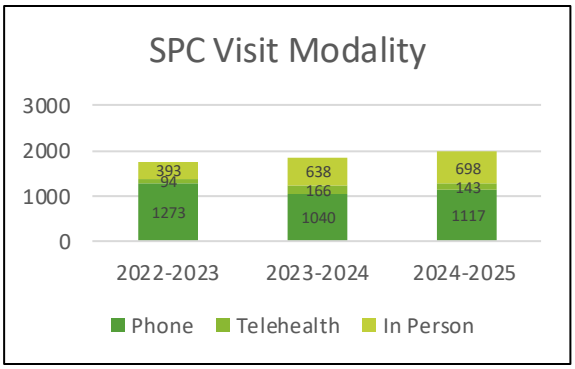
Stroke Prevention Clinic

Saskatoon's Stroke Prevention Clinic received 1197 referrals in 2024-2025, continuing an upward trend in volumes. As a result, SPC provided care to ~1200 patients newly experiencing transient or mild stroke symptoms, ensuring appropriate secondary stroke prevention and mitigation of more severe events. Total visits within the clinic have continued to grow, achieving 1958 visits throughout the year. Among these, the clinic maintains a robust post stroke hospital discharge follow-up clinic, with Neurologists seeing a growing number of patients previously admitted to ASU, which has enhanced secondary stroke prevention support, targeted a decreased risk of a repeat events, and facilitated timely discharge from hospital. In the years since the pandemic, the clinic has strived to offer a multitude of visit modalities to increase accessibility for patients,

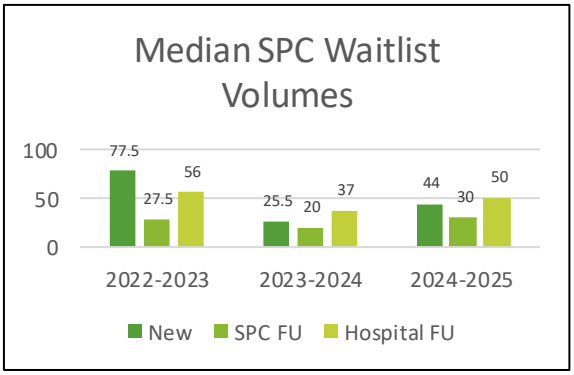




while maintaining high quality care and service. In person visits have doubled over the past two years, while Telehealth has become an increasingly sustainable clinic modality. Further enhancement of patient-centred care will be achieved by increasing capacity for in person visits but is currently limited by space availability. Work continues with system partners to progress towards expanded clinic space when feasible.



SPC has experienced ongoing evolution over the past four years. Throughout this time, variability in waitlist volumes have occurred for new and follow up patients, during which time a balance in responsiveness to all patient types, based on priority has been pursued. Throughout the year, new patient waitlist volumes were impacted by physician availability, which has since been targeted with increased clinics to course correct this trend. Despite variability in waitlist volumes, the clinic has been successful in decreasing wait times for patients at high risk for further stroke events, to be seen in a median of 8 days, decreased from 10 days in the previous year. This was a significant step towards achieving a sustained rapid access clinic for stroke patients. In addition, as we enter a new fiscal year, the clinic is on track to better maintain targeted best practice timelines to address incoming patient volumes.



Nursing Care in Secondary Stroke Prevention

Additional permanent funding for 1.5 nursing FTEs was operationalized this past year to support clinic operations allowed heightened support of increasing patient volumes and the opportunity to optimize RN follow-up services for stroke/TIA patients. Consistent nursing follow-up calls for patients previously seen in clinic, in addition to six-week post-ASU discharge phone follow ups was successfully embedded into clinic flow. Of the 96 SPC follow up calls, the nursing team identified 15% patients requiring further education regarding medication, risk factors or depression. Similarly, of the 195 ASU discharge follow up calls identified required follow up regarding test requisitions, interprofessional referrals, or education in 15% of patients.

Quality Improvement

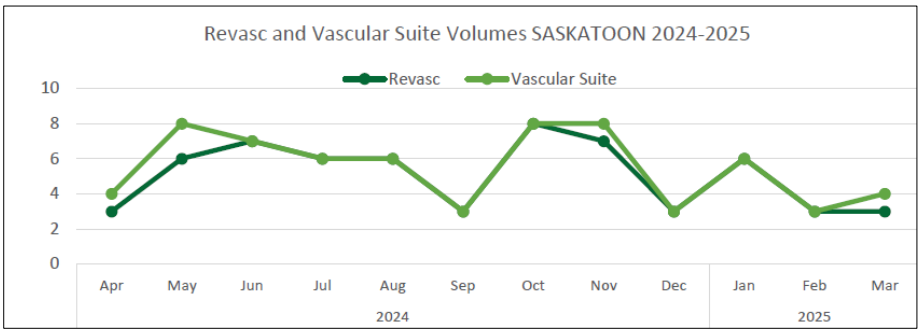
The Saskatoon Stroke Prevention Clinic (SPC) also finalized several major initiatives this year, including the completion of SPC patient information pamphlets, made available for use in April. A provincial SPC order set was also developed and finalized in January, ensuring consistency in stroke prevention protocols across all three provincial clinics.

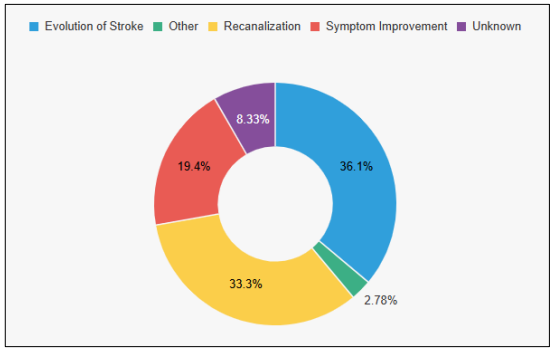
QR code access to SPC information pamphlets

Efforts to improve data tracking throughout the stroke journey led to piloting integration of electronic SPC data capture within the Saskatchewan Stroke Registry, providing a more comprehensive view of the stroke care continuum for all stroke alert patients with diagnosis of stroke. Further opportunity exists to augment data collection to capture all TIA patients.

Neuroendovascular/Cerebrovascular Program

Saskatchewan's Neuroendovascular/Cerebrovascular Program is currently comprised of three interventional neurosurgeons, a clinical nurse coordinator, and a research team, with further biweekly locum physician support, as available. The team performed 66 thrombectomy cases in 2024-2025, with revascularization observed in 92% of cases. Volumes indicate a decrease in cases by 20% from previous years, explained by revision of treatment criteria in December of 2024. This was in response to the finding of multiple negative medium vessel occlusion (MEVO) trials, in which no clinical benefit was found in the endovascular treatment of more distal vessel occlusions.

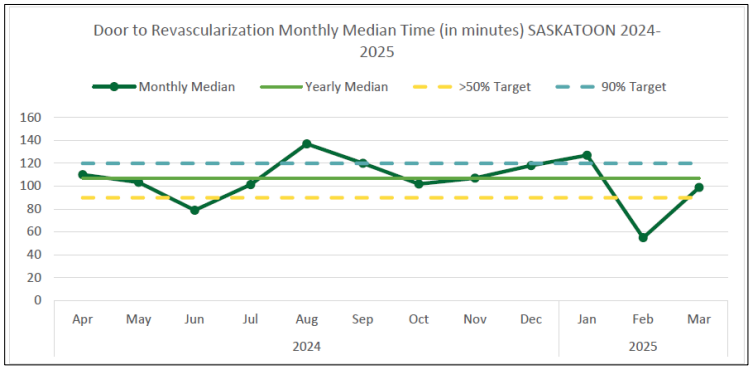




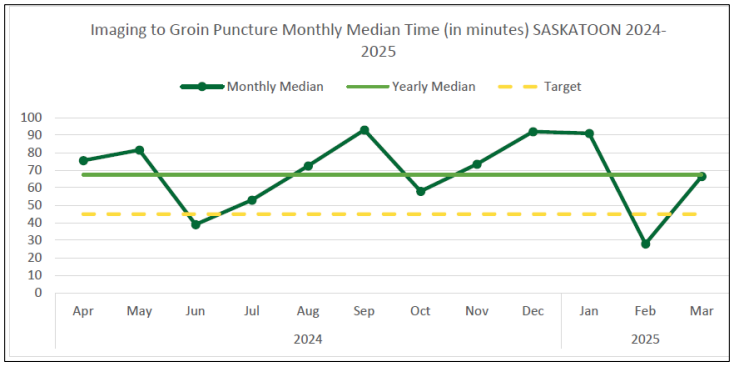
Provincially, 80% of PSCs are meeting the minimum 5% threshold for treatment with thrombectomy. Of those transferred to the CSC with intention to treat, 100 patients were not treated. Since the transition in thrombolytic to TNK, a higher frequency of recanalization en route to the CSC has been observed, but has not yet been supported by objective evidence. Should this be the case, change in thrombolytic may also be an added contributor to overall decrease in thrombectomy volumes. Greater than 30% of patients had experienced stroke evolution upon arrival to the CSC. Given that sensitivity in detection of stroke may impact treatment and transfer decision-making advocacy continues among the stroke team for the implementation of RAPID software, capable of improved accuracy in detection of stroke on imaging provincially and timely notification of the comprehensive team.

Positive outcomes were measured in 98% of thrombectomy cases, reflected by TICI scores ≥ Grade 2b, which indicates optimal radiological outcomes. Collection of longer-term outcome measures, using the Modified Rankin Scale (mRS) 90-day score is not consistently done due to resource limitations. Resumption of this meaningful outcome measure has been identified as a priority for future work, to be accommodated through further enhancement of electronic data collection within existing 90-day outpatient stroke follow up.

Monthly, annual medians exceed target 45-minute imaging to groin puncture. Unspecific to after-hours processes, vascular suite arrival to groin puncture median time has increased from previous years to 18 minutes, which contributes to this extended period between imaging to groin puncture. Contributing factors include common need to reimage incoming patients and use of general anesthetic and associated coordination required services. In addition, the team has experienced intermittent equipment issues, which have also contributed to delays in treatment times. Such delays are worth noting but it should also be noted that overall revascularization time meets the 120-minute target for 90% of cases, in addition to recent evidence indicating improved outcomes may occur in patients undergoing general anesthetic, a treatment component that contributes to greater time to groin puncture.



The Cerebrovascular Program strives for continuous enhancement of care and support provided to patient and families. Weekly accredited Quality Improvement Academic Stroke Rounds continue, which entails review and discussion of stroke patient imaging, management, transport, and pathway efficiency. This forum brings together neurology, vascular and neuroendovascular services, and administrative leaders. It occurs in a virtual format to ensure accessibility of care providers throughout the province wishing to participate. Cerebrovascular Telehealth Clinics involving consult and follow up visits for patients across Saskatchewan have expanded in volume to occur two days weekly, serving ~70 patients monthly.



The past year saw successful integration of system improvements. In partnership with Diagnostic Imaging, direct and timely access to hemostatic profile assessment was integrated in early 2025, positively impacting care delivery decision-making. Further refinement of systems following the 2023 transition to electronic procedure supply monitoring and documentation, facilitated more accurate surgical tracking and resource utilization, more comprehensive case documentation, and integration with electronic data collection systems, enhancing quality assurance and patient safety.

Future Directions

In addition to the resumption of PSC engagement throughout the new fiscal year, the team intends to continue to focus on several initiatives. Improving the accuracy of ED stroke alerts, resuming provincial educational rounding, pursuing additional supportive initiatives for PSC and EMS teams, expanding stroke awareness efforts, and refining metrics reporting through Digital Health partnerships are among the priorities.

Active recruitment for multiple international clinical trials in acute stroke therapies and secondary prevention is ongoing. Cerebrovascular practice continues to be informed by new research findings, with the team actively planning for participation in pivotal research throughout the upcoming year. In addition, the team will continue to collaborate with Diagnostic Imaging partners in the process to procure all equipment required for evidence-based practice changes and angiography suite upgrades.

Perhaps the most anticipated event in the coming year will be the completion of the Saskatoon Stroke Team's second Accreditation Canada Stroke Distinction cycle. This will be marked with a survey visit, during which the team looks forward to showcasing collaborative achievements to date and upcoming initiatives to the surveyors, in pursuit of Saskatoon Stroke Program's third Acute Stroke Care Stroke Distinction award. Accomplishments to date reflect the dedication and compassion of the multiple members participating in stroke care throughout Saskatchewan. Saskatoon Stroke Team wishes to acknowledge and extend sincere gratitude to ongoing support from all partners to bring the highest quality stroke care to our province.

Royal University Hospital
103 Hospital Drive
Saskatoon, SK S7N 0W8