

Aurora System: Developing a Door-In-Door-Out Process for Thrombectomy Eligible Patients

“Time is brain” is a common mantra heard at stroke centers. Patients experiencing an acute stroke need to receive timely care before suffering permanent damage. One promising treatment option, a thrombectomy or mechanical endovascular reperfusion (MER), surgically removes the clot or large vessel occlusion (LVO) from a blood vessel in the brain. The MER procedure was first used in 2015 for eligible acute stroke patients. Not every hospital has the capacity or physician specialists trained to perform this critical procedure. In those cases, stroke patients must transfer from the smaller local hospital (spoke) to either a larger tertiary center (hub) or hospital with trained specialists and a multi-disciplinary staff available to care for the acute patient before, during, and after the procedure.

In 2022, the Aurora hospital system analyzed their transfer times, often referred to as “door-in-door-out” or DIDO times, between spoke to hub hospitals to see if there were opportunities for improvement. DIDO times were, on average, more than two hours. According to Paul Vilar, System stroke program director, “We weren’t doing well enough.” Seeking opportunities for improvement, the Aurora team reviewed the process for ST-elevation myocardial infarction (STEMI), a type of heart attack, which experiences transfer issues and processes similar to ones for stroke. Data from the STEMI process indicated areas of effectiveness, so the Aurora stroke team decided to mirror the STEMI approach.

The [DIDO for LVO patients process](#) was developed inclusive of the spoke hospitals, hub hospitals, and emergency medical services (EMS), who are frequently the stroke patient’s first encounter with medical professionals. The Aurora Tertiary Access Program (TAP) was an important department to engage with, as they coordinate the transfer process from the spoke to hub hospital. The Aurora team needed to educate healthcare professionals that time is critical at every step in the process of stroke care (time is brain) and used the STEMI process as an example of how efficient processes lead to better outcomes. Dr. Thomas Wolfe, Interventional neurologist and Aurora St. Luke’s Medical Center (ASLMC) stroke program medical director, was integral in creating the process and assisted in setting time goals, which are evident throughout the DIDO process for LVO patients.

An additional DIDO LVO process was developed for [helicopter transfers via Flight for Life](#). As time is of the essence, flying acute stroke patients to tertiary centers is oftentimes the fastest, most efficient mode of transportation.

The Players

Alan Davies, Emergency services community educator, Aurora Medical Center Summit and Washington County

Thomas Wolfe, MD, Neuroendovascular medical director, Aurora St. Luke’s Medical Center

Carolyn Henderson, Stroke coordinator, Aurora Burlington

Emily Smith, Stroke coordinator, St. Luke’s Medical Center

Emily Williams, Stroke coordinator, Aurora Lakeland

Jessica Baerwald, Stroke coordinator, Aurora Washington County

Katie Neuman, Stroke coordinator, Aurora Grafton

Paul Vilar, Stroke system program director

Ray Swan, Stroke coordinator, Aurora Summit

Rick Boeshaar, Executive director EMS

**Aurora System
Stroke Care Centers**

What They Did

Created a Door-In-Door-Out process for Thrombectomy-eligible patients to decrease their average Door-in-Door-Out time by 42-minutes!



Lessons Learned

Communication was key to meeting the goals of this process. Health care providers along every step of the process need to know how they are doing, where they can do better, and where they are successful. ASLMC provides regular feedback and data to the team with the three fastest DIDO times are tracked annually. This tracking leads to healthy competition and celebration of the involved teams' success. Members of the care team at every level receive feedback. Transparency and sharing of best practices ensure that critical information is not siloed at one hospital but is available for replication.

Review of the developed processes is ongoing and has led to several lessons learned. One finding was stroke coordinators (SC) needed additional support. The overall goal of providing extra support to SCs is to reduce turnover and increase consistency at each hospital. The SC role is critical, as they oversee the program, provide support, and ensure the overall quality of stroke care.¹ Katie Neuman, SC Aurora Medical Center Grafton, states, "the support of a dedicated SC is crucial and helps with the overall success." The SCs meet monthly to facilitate relationship building and to learn from each other by sharing successes and concerns.

Data are continually reviewed to discern where processes are working well and where additional work needs to occur. There have been continued improvements in DIDO times since the implementation of the process. In the first quarter of 2022, the DIDO median time was 2 hours and 10 minutes. In the first quarter of 2024, it decreased to an impressive 1 hour and 28 minutes, or a 42 minute decrease!

As with any process encompassing many different entities and caregivers along the continuum of care, challenges occur. Each region had existing regional processes to be carefully considered. Discovering how to foster a unified versus siloed approach was critical, as was developing strong and trusting relationships for collaboration.

According to the Aurora team members, many factors contributed to the success of the DIDO effort: persistence, perseverance, motivation, simplifying processes, streamlining communication, sharing outcomes, and looking for creative solutions.

The Wisconsin Coverdell Stroke Program, through the data they provide, assists the Aurora Stroke Team to investigate potential improvements in stroke care across Wisconsin. This partnership also allows organizations to learn what other hospital systems are doing to improve stroke care in their regions of the state.

Wisconsin Coverdell Stroke Program

The Wisconsin Coverdell Stroke Program works with hospitals, EMS, and professional and community-based organizations (CBO) across the state to support a healthier Wisconsin by improving community awareness and the quality of stroke care. Wisconsin CBOs, EMS agencies, and hospitals of all types and sizes may be part of the Wisconsin Coverdell Stroke Program. For more information, please visit the [Wisconsin Coverdell Stroke Program's website](#).

