

# Getting to the Right Place First: Milwaukee County EMS Stroke Patient Transport

Stroke care is changing rapidly. Current guidelines recommend the development of regional systems of care to ensure rapid, efficient, and seamless care of acute stroke patients. To provide this care in Milwaukee County, the EMS providers needed additional education and training to assist them in identifying strokes in the field caused by a vessel blocking the blood flow to the brain, known as a large vessel occlusion (LVO). New evidence strongly supports improved outcomes of LVO patients when EMS directly transports patients to a Comprehensive Stroke Center (CSC), a hospital capable of administering more advanced treatment options.

In many areas of the state, EMS transporting directly to a CSC is not an available option. However, in Milwaukee County, it was realistic to develop a regional approach to destination planning. Endovascular therapy (EVT) is a time-sensitive treatment offered by CSCs and it's the standard of care for those acute ischemic stroke patients who have an LVO. Performing EVT utilizes advanced imaging to remove the clot and restore blood flow to the brain. Bypassing a Primary Stroke Center (PSC) that does not offer this treatment for a CSC is a feasible option in Milwaukee County and will reduce the risk of delayed treatment and hospital transfers. Secondary hospital transfers have the potential to delay treatment by hours, whereas initial transport to a CSC allows for specialized care and advanced imaging within the first 30 minutes of care.

Nationwide, larger EMS agencies are starting to adopt hospital bypass processes where the stroke patient is screened and determined to likely have an LVO. Last year, Milwaukee County EMS, which includes 13 EMS agencies, started to explore the opportunity of training EMS providers in identifying LVO in stroke patients and adopting a bypass protocol. EMS leadership worked to develop a centralized training for EMS providers on the science, identification, and assessment of LVO and identified a protocol for transport that best serves patients. LVO screening tools incorporated into this improvement process include the BE FAST screening tool.

The geographic layout of Milwaukee County is conducive to this change. No one health system would be excluded due to hospital bypass. Of the existing receiving hospitals in the county, all are capable of administering the clot busting drug alteplase, and higher level care is no more than a few additional miles from these hospitals. Because timely treatment is extremely critical when treating a patient with a stroke, if transport to a CSC is more than 15 minutes away, an additional policy safeguard dictates transport to a PSC.

Milwaukee County EMS worked to create a culture of change surrounding patient transportation by convening the three local health systems, including emergency departments, medical directors, administrative directors, and stroke interventionalists, as partners in this improvement process. As conveners, Milwaukee County EMS educated partners on the new evidence-based transport practice to ensure citizens likely to have an LVO receive EVT in an effective and timely fashion.

Milwaukee County EMS providers started using the LVO hospital bypass process on March 1, 2018. Since implementation of this improvement process, there has been an increase in the number of interventions, both EVT and alteplase administration, and a decrease in the amount of time to treatment.

## The Players

**M. Riccardo Colella, DO, MPH, FACEP:** Professor and Chief, Section of EMS Medicine, Departments of Emergency Medicine, Pediatrics and The Institute for Health and Equity  
**Office of Emergency Management  
Milwaukee County EMS (all 13 agencies)**

**Milwaukee County Health Systems:** Froedtert & the Medical College of Wisconsin, Aurora Health Care, Ascension Health

## What They Did

**Trained paramedics on emergent stroke science.** Developed centralized education and training in identifying LVO in stroke patients.

**Streamlined stroke patient transport process.** Adopted a protocol that bypassed other hospitals in favor of a CSC to eliminate unnecessary delays in treatment due to secondary hospital transfers.

**Convened partners.** Included local health systems in operationalization of the new policy.

**Committed to improving care of stroke patients.** Collected and evaluated intervention data and started to explore opportunities to further evaluate patient outcomes.

## Accomplishments

**Improved** the quality and standards of stroke care in Milwaukee County. Increased interventions in EVT and alteplase among ischemic stroke patients.

**Proved** that implementing bypass has not increased the time or distance to care and has provided access to care that people would not otherwise receive.

# Know the signs of a stroke!

# BE FAST



## TIME TO CALL 9-1-1

**BALANCE**  
**EYES**  
**FACE**  
**ARM**  
**SPEECH**  
**TERRIBLE**  
**HEADACHE**



**"The first hospital that you land at is probably the biggest determinant of your outcome for any conditions. Getting to the right place first is so important." – Dr. Ricardo Colella**

## Lessons Learned

**Involve key stakeholders.** It is important to have hospitals at the table, as they are key in obtaining desired outcomes. Health systems play a major role in the care of stroke patients in Milwaukee County, and are important to successfully implementing policy and process changes.

**Continuous quality improvement is critical.** Continued data collection, evaluation, and rapid cycle improvement are the tools utilized by Milwaukee County EMS. They have demonstrated a commitment to continuous quality improvement and will adjust the new patient transport process as supported by data. According to Dr. Ricardo Colella, they will continue to ask, "What is the data telling us? Does it support the process?"

## Success Factor

**Patient-centered policy decision.** One of the biggest factors of success was making the process a patient-centered decision. "First and foremost you have to think about this solely from the perspective of a patient," said Dr. Ricardo Colella. While Milwaukee EMS recognized the implications of how the LVO hospital bypass affects the volume and distribution of patients among local hospitals, they worked to ensure that patient benefit was the primary driver of this policy change.

**Buy-in from EMS providers.** The enthusiasm of Milwaukee County EMS greatly contributed to the success of the LVO hospital bypass process. The EMS providers were a captive audience to the new training and protocol and were excited to be able to offer this improved process to patients and learn about emerging stroke science.

## Barriers and Challenges

**Buy-in from health systems.** Change is difficult. Health systems were somewhat hesitant to adopt the LVO bypass model due to patient volume redistribution. Milwaukee County EMS made sure to explain the strong science behind their decision to change policy and focus on potential benefits to the citizens of Milwaukee County. Communicating that this was an evidence-based process helped get the support and partnership of area health systems.

**LVO Screening Tools.** There is no perfect screening tool, which may be a limitation for paramedics. Milwaukee County EMS has opted to use the BE FAST screening tool and the SNO scale (speaking difficulty (S), neglect (N) and ocular deviation (O)), which focus on the core signs that highly predict an LVO stroke.

## Maintaining Success

Milwaukee County EMS will continue to evaluate data and work with hospitals to gather additional information on patient functional outcomes. Additionally, Milwaukee County EMS is looking into further opportunities for prehospital providers to improve care and outcomes, such as conducting a functional assessment as part of initial care.

## Wisconsin Coverdell Stroke Program

The Wisconsin Coverdell Stroke Program works with hospitals, emergency medical services, and professional organizations across the state to support a healthier Wisconsin by improving community awareness and the quality of stroke care. Wisconsin EMS agencies and hospitals of all types and sizes are invited to be part of the Wisconsin Coverdell Stroke Program. For more information, please visit the Wisconsin Coverdell Stroke Program's website.

