

A publication from the Maine EMS Quality Improvement Committee

STROKE AND STROKE CARE, A TWO-YEAR FOLLOW-UP



OVERVIEW

In 2020, cerebrovascular accidents were the fifth leading cause of death in the State of Maine, with 694 deaths and a mortality rate of 33 deaths per 100,000 people. It is critical that Emergency Medical Dispatchers (EMDs) and EMS clinicians can readily identify strokes within the field to successfully activate the complex response systems that are in place to provide treatment and care. In 2001, Congress funded the establishment of the Paul Coverdell National Acute Stroke Registry (now Paul Coverdell National Stroke Program) in memory of the late U.S. Senator Paul Coverdell of Georgia, who suffered a fatal stroke. Seven performance measures pertain to Maine EMS: Duration of On-Scene Time; Glucose Measurement; Pre-Notification of Receiving Stroke Facility; Completion and Documentation of a Stroke Screening; Last Known Well Documentation; Documentation of Time of Discovery; and Completion of the Thrombolytic Checklist.²

1. Centers for Disease Control and Prevention. (2022, February 14). Maine. Centers for Disease Control and Prevention. Retrieved August 26, 2022, from <https://www.cdc.gov/nchs/pressroom/states/maine/me.htm>

2. Paul Coverdell National Acute Stroke Program Resource Guide. (2016). [online] Available at: <https://emsa.ca.gov/wp-content/uploads/sites/71/2019/02/USCDPCP-Paul-Coverdell-Nation-Acute-Stroke-Prog-Resource-Guide-10-24-16.pdf> [Accessed 27 Jan. 2020]

TAKE AWAYS:

- Minimize on-scene time to 15 minutes or less
- Assess and treat conditions that mimic strokes by performing complete assessments on all patients with neurological deficits (i.e. hypoglycemia)
- Early notification of the receiving hospital of a patient with stroke symptoms is vital to activate resources and expedite the delivery of definitive care
- Complete and document the FAST-ED Screening tool for all patients presenting with any neurological deficits
- Document the last known well and time of discovery in the patient care report because they are critical to determining eligibility for thrombolytic therapy

Quality improvement leaders should think about the following items:

- Are your clinicians spending more than 15 min on scene for stroke patients?
- Are your clinicians measuring BGL for suspected stroke patients?
- Are your clinicians notifying the receiving hospitals sufficiently?

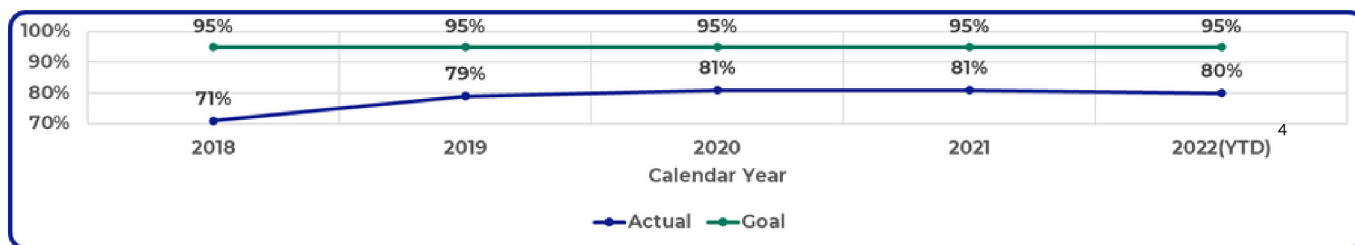
Time Spent On-Scene

Patients having a stroke present a unique challenge in pre-hospital emergency medicine because stroke is the only major time-sensitive condition for which we have no therapy. These patients need quick recognition, supportive care, and expedited transport for possible thrombolytics and/or thrombectomy. Time is brain! In 2019, the average on-scene time for stroke patients was 16 minutes and 22 seconds (16.37 minutes). The AHA recommends a maximum scene time of 15 minutes whenever possible.³ In 2022, the average on-scene time increased to 18 minutes and 34 seconds (18.57 minutes).



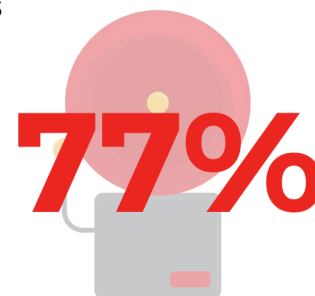
Obtaining and Documenting a Blood Glucose

One of the most common stroke mimics includes metabolic disorders such as hypoglycemia, amongst other conditions. A lack of proper and timely diagnosis of stroke or stroke mimic can lead to irreversible complications.⁵ Our 2019 Stroke and Stroke Care newsletter noted that 78% of stroke patients had an associated blood glucose assessment. Identification and treatment of hypoglycemia often resolve symptoms related to hypoglycemia. As shown below, we are not yet at our goal of having 95% of patients experiencing stroke-like symptoms assessed for hypoglycemia.



Documentation of Stroke Alerts

Thanks to the incredible work of EMS clinicians and quality improvement efforts, Maine has increased its notification efforts in the first quarter of 2022 to 77% compared to 2019, which was at 18%. Why is this so important? Stroke activations enable the receiving facility to prepare staff and resources for a potential stroke patient (e.g., CT scanner, neurology, pharmacy, laboratory, phlebotomy, etc.). In stroke care, where the priority is the minimization of time to intervention, it is imperative to make early stroke notifications a part of stroke care to ensure that definitive care can be provided as quickly as possible (i.e., door-to-lytic or door-to-thrombectomy). Remember, every minute a large vessel ischemic stroke (LVOS) is untreated, the average patient loses 1.9 million neurons.⁶ Hence, every minute that EMS can help reduce will save millions of brain cells, improving the chance of meaningful recovery of stroke patients.



3. Cash, R. E., Boggs, K. M., Richards, C. T., Jr, C. A. C., & Zachrisson, K. S. (2022, February 3). Emergency medical service time intervals for patients with suspected stroke in the United States. *Stroke*. Retrieved August 26, 2022, from <https://www.ahajournals.org/doi/10.1161/STROKEAHA.121.037509>

4. 2022 consists of data reviewed between January 1, 2022, and June 30, 2022.

5. Hosseinezhad, M., & Sohrabnejad, R. (2017). Stroke mimics in patients with clinical signs of stroke. *Caspian journal of internal medicine*. Retrieved August 26, 2022, from

[https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5596193/#:~:text=In%20various%20studies%2C%20the%20most,6\)%2C%20infectious%20disorders%20\(e.g.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5596193/#:~:text=In%20various%20studies%2C%20the%20most,6)%2C%20infectious%20disorders%20(e.g.)

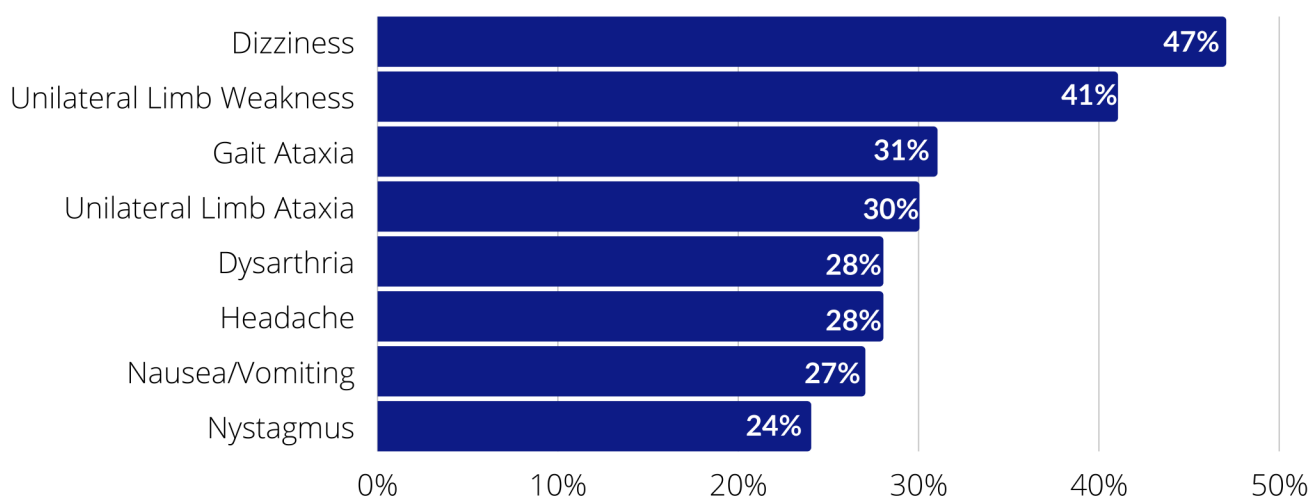
6. Saver, J. L. (2005, December 8). Time is brain-quantified. *Stroke*. Retrieved August 26, 2022, from

<https://www.ahajournals.org/doi/abs/10.1161/01.STR.0000196957.55928.ab>

Posterior Circulation Strokes

Posterior circulation strokes (PCS) account for about 20% of all acute ischemic strokes. While one in five stroke victims suffer from a PCS, clinicians often miss these on initial presentation. Identifying posterior circulation strokes is challenging as they have a wide array of vague symptoms and present very similarly to other benign, treatable, time-healing conditions. The graph below represents the common signs and symptoms and associated prevalence for persons experiencing a PCS. Delayed or missed diagnosis of PCS can have devastating consequences. Members of the Maine Stroke Alliance have created an online education in MEMSED to help EMS clinicians improve their recognition of PCS. Early recognition, timeliness, and proper treatment can lead to vastly different outcomes, as with all time-sensitive illnesses. Educating yourself will improve your ability as a clinician to recognize a PCS and potentially improve your patient's outcome.

Posterior Circulation Stroke Signs & Symptoms ⁷



International Academies of Emergency Dispatch (IAED) Data Center

This dashboard (available by scanning the QR code below) reflects voluntarily submitted data from Accredited Centers of Excellent (ACE) and non-ACE IAED Priority Dispatch System users. Two-hundred and thirty-one user agencies worldwide share their de-identified data, with over 13.4 million case records contributed since July 2019. Viewers can filter the dashboards to compare agency data with median call processing statistics for various scenarios. It may be useful when considering focused review metrics or quality improvement initiatives. For example, the median call processing time (time to SEND) for Alpha-level stroke calls is 94 seconds, and the median call processing time for Charlie-level stroke calls is 92 seconds. How does this compare to your EMD center's call processing times? An EMD center can use this tool for training to improve call-taker confidence in identifying stroke symptoms from case entry, using the stroke diagnostic tool, or as an opportunity to praise EMDs who excel in this area by comparison.

Frenza's Law states, "A thing not looked for is seldom found."⁸

We challenge you to take a look!

We would also like to recognize Cumberland County Regional Communication Center's early commitment to share their agency data with the Data Center.

7. Searls D, Pazdera L, Korbel E, Vysata O, Caplan L. Symptoms and Signs of Posterior Circulation Ischemia in the New England Medical Center Posterior Circulation Registry. Arch Neurol. 2012;69(3):346-351. doi:10.1001/archneurol.2011.2083 <https://jamanetwork.com/journals>

8. Clawson, J., Patterson, B., & Scott, G. (n.d.). Overlooked, seldom found. IAED Journal. Retrieved August 26, 2022, from <https://www.iaedjournal.org/overlooked-seldom-found>



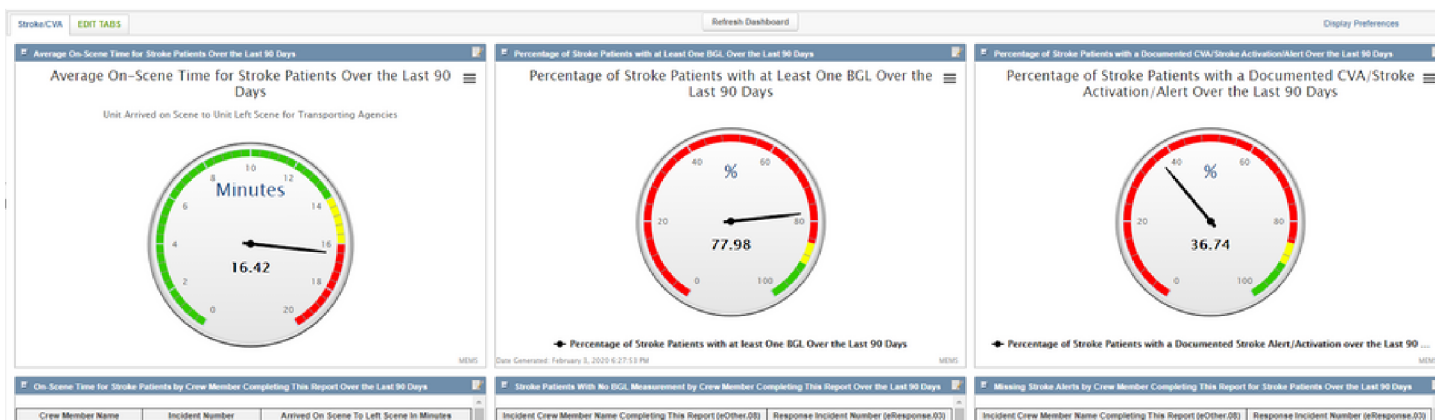
FAST-ED for Large Vessel Occlusion Strokes

In December 2019, Maine EMS implemented the FAST-ED score to the MEFIRS system screening tool for Large Vessel Occlusion Strokes (LVOS) in all patients with suspected stroke (positive Cincinnati Stroke Scale). The FAST-ED scale categorizes patients into three possible groups and the likelihood (sensitivity) of LVO stroke.⁹ Proper utilization of the FAST-ED scale guides EMS clinicians in transporting patients to the most appropriate receiving hospital that can best manage the patient’s condition. Before the 2019 Maine EMS protocol update requiring FAST-ED assessments, 62% (Jan. 1 - Nov. 30, 2019) of suspected stroke patients received a complete and properly documented stroke assessment. In 2021, 73% of suspected stroke patients had a documented screening assessment representing an 11% improvement. While this increase demonstrates improvement, EMS clinicians must ensure that all patients with suspected stroke receive the appropriate triage, a FAST-ED score, and that score is shared with the receiving facility.

Score	Likelihood of LVO Stroke
0-1	less than 15%
2-3	Approx. 30%
Greater than or equal to 4	Approx. 60% or higher

How To See Your Own Data on Our Stroke/CVA Dashboard

Maine EMS has created a new dashboard within the MEFIRS Report Writer tool called "Stroke/CVA." On this dashboard agencies and providers will be able to see three reports detailing the respective entity's performance with the EMS-related Coverdell measures over the last 90 days. The gauges allow agencies and providers to quickly determine their average on scene time, percentage of stroke patients receiving a blood glucose measurement, and the percentage of times a CVA/Stroke alert was documented in the patient care report for stroke patients. Below these gauges are drill down reports that allow continuous quality improvement (CQI) officers and providers to better understand and identify opportunities for improvement in the area of stroke care. If you click on the incident number hyperlink, it will take you directly to the call in question.



9.Lima FO;Silva GS;Furie KL;Frankel MR;Lev MH;Camargo EC;Haussen DC;Singhal AB;Koroshetz WJ;Smith WS;Nogueira RG; (n.d.). Field assessment stroke triage for emergency destination: A simple and accurate prehospital scale to detect large vessel occlusion strokes. Stroke. Retrieved August 26, 2022, from <https://pubmed.ncbi.nlm.nih.gov/27364531/>

Additional Stroke Quality Improvement Resources in MEFIRS:

Coverdell Stroke Performance Over the Last 90 Days



This report will provide you with a 90-day look back for all 911 stroke patients. The Report provides information on all the EMS-related Coverdell measures, and also includes the documentation of the FAST-ED Stroke Assessment. This report is available in Report Writer, by going to *Tools, Report Writer*, and searching for "Coverdell Stroke Performance Over the Last 90 Days."

Incident Number	Incident Date	Incident Crew Member Full Name List (eCrew.01)	Unit Arrived On Scene To Unit Left Scene In Minutes	Type Of Scene Delay List	Pre Arrival Alert Type	Pre-arrival Alert Activation Date Time	Initial Blood Glucose Level	Last Blood Glucose Level	Last Known Well Date Time	Stroke Scale Facial Droop	Stroke Arm Drift	Stroke Scale Speech	Vitals Stroke Scale Score (eVitalia.29)	Stroke Scale Facial Palsy	Stroke Scale Arm weakness	Stroke Scale Speech Changes	Stroke Scale Eye Deviation	Stroke Scale Denial/Neglect	FAST-ED SCALE TOTALS
Incident Crew Member Name Completing This Report (eOther.00):																			
			5		Emergency Department	01/09/2020 22:00:00	122	122	01/09/2020 21:00:00	Abnormal	Abnormal	Abnormal	Positive						

Stroke CQI

Maine EMS has added a CQI Category titled "Coverdell Stroke Performance." This CQI category offers the opportunity for those responsible for the Quality Improvement process to see all the Stroke/CVA incidents in one list, with simple questions to answer regarding each incident, and an ability to provide feedback to the clinicians who provided care.

Notes on the Data:

The data included in this report is retrospective and originates from the 272 EMS agencies and the approximately 5,500 EMS clinicians in the state of Maine who provide data to the EMS Run Reporting system. This analysis includes records of patients that interacted with EMS as part of a 911 scene call or 911 intercept. This newsletter covers the months of January 1, 2019, to June 30, 2022.

Maine EMS QA/QI Committee

For more information on continuous quality improvement (CQI) and the tools within MEFIRS, feel free to attend a Maine EMS QA/QI Committee Meeting which are held on the third Wednesday of every month at 1:30 P.M. Meetings are held via zoom and are open to the public.

The Maine EMS Quality Improvement Committee is a standing committee of the Maine EMS Board and is comprised of 15 members representing the medical director's community, regions, EMS agencies, and at-large representatives. The Committee is focused on continuous quality improvement of the EMS system. As part of their charge, they review statewide, de-identified information to better understand a variety of topics affecting EMS including, but not limited to: naloxone administration, strokes, out-of-hospital cardiac arrest, airway management, and chest pain.

Disclaimer: The purpose of this newsletter is informational only and is not intended to be a comprehensive review of the entire EMS system, nor is it intended to be a scientific review. Rather, this is intended to offer a snapshot of the performance surrounding specific EMS run types.