



Official Academy Position

MPDS Stroke Diagnostic Tool

Use and Rationale

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Since the North American release of the MPDS version 12.1 in March of 2010, the Academy has received some inquiries regarding Protocol 28 - Stroke (CVA), and the required *Stroke Diagnostic Tool*. The following represents the Academy's official position on the use and rationale of this evolving protocol:

Evolution

Since the actual treatment of ischemic stroke became a possibility and then a more viable reality in many EMS systems, the IAED has worked with several stroke centers, experts, and early on, the National Institutes of Health (NIH) to concurrently evolve the Dispatch Life Support (DLS) treatment of stroke patients. A joint position statement was crafted by the Academy with the lead stroke researcher at NIH, Dr. John Marler. That document is included in the Principles of EMD textbook given to all EMD students and is available on the Academy web site under the Resources/Research link.

As has been the case with heart attack patients, a clinical focus has evolved to recognize the symptoms of stroke early on, contact EMS, and provide treatment appropriate to the underlying cause within a time window appropriate to that treatment. Because the various treatments for stroke are dependent both on time and the underlying cause, which must be definitively diagnosed at the hospital, stroke predictability through field diagnostics has become an important factor enabling earlier hospital notification, just as 12-lead ECG analysis has for heart attack patients. A recent field protocol effort in Toronto has reported a 4-fold increase in the number of patients arriving at a stroke center within 2.5 hours of symptom onset.

The Academy's Council of Standards has evolved and approved the new Stroke Diagnostic (Dx) Tool in an effort to better predict the outcome of stroke early on in the EMS response, not only to enable early hospital notification in the interest of prompt and effective patient care, but as a study methodology to measure and improve the outcomes of stroke patients. The new protocol was released and used extensively in the UK for about a year prior to its release in North America, with excellent results and positive feedback.

Response to Stroke Patients

The Academy is aware of the fact that some EMS agencies do not alter their response to stroke patients based on the standard, Protocol 28 Key Question evaluation or the use of the Stroke Diagnostic Tool. With the exception of the lone 28-A-1 (Breathing normally <35) code, the general recommendation is an ALS response varied from HOT for Not Alert or Abnormal Breathing codes, to a COLD ALS response for those without priority symptoms. First responders are not recommended for any of the stroke determinant codes. However, some systems send first responders on the C-1 and C-2 codes. These local response options are important to this discussion because, although some agencies choose to limit response options by Determinant Level, i.e., sending the same response to all codes within a given level without specific regard to Descriptor or Suffix, many other agencies take advantage of the Protocol's inherent response option design by utilizing the vast array of response options available. Indeed, for many MPDS users, varied response based on Descriptor and Suffix coding is used in the interest of safety, resource management, and patient care.

A Matter of Patient Care

While response options are necessarily defined locally because of the great variance that exists among agencies with regard to resources and geography, the DLS aspects of the MPDS are unified worldwide, with only minor, cultural modifications. The Stroke Dx Tool has been developed as a patient care tool to enhance the recognition and expedite the treatment of stroke and, as such, is a universal, DLS standard of care.

It has been shown in a well-done study by Jim Dunford, et al., in San Diego, that while EMDs using v11.2 of the MPDS (prior to the Stroke Diagnostic Tool release) achieved the same specificity as scene paramedics in identifying stroke victims (44% to 43%) they had twice the sensitivity (83% to 44%). A primary goal of the new Stroke Dx Tool involves the ability to identify, study, and achieve "zero minute" stroke predictability at the dispatch level, enabling the immediate notification of Stroke Centers in an effort to enable and expedite the care of more stroke patients. Additionally, a high degree of stroke predictability will obviously expedite scene processing and result in significant time saved in that area, and ultimately better serve potentially treatable stroke patients.

Several agencies have stated that because field stroke diagnostic procedures are already in place, there is no need to implement a DLS diagnostic. In addition to the potential time saved through earlier hospital notification by dispatch, some reported stroke symptoms due to small strokes and TIAs may not be present when the scene crew evaluates the patient. The Academy believes documentation and action on EMD-determined stroke information may play a very important role in such cases, since EMS responders could miss these less obvious strokes, as the San Diego study suggests.

While every system may not choose to alert Stroke Centers of DLS assessments and study stroke patient outcomes, the Stroke Dx Tool provides an excellent and detailed method for doing so, and the Academy highly recommends taking advantage of this evolving standard of care. It is because of these common efforts that the Academy is able to make the great progress in evolving the MPDS that it has in recent times.

Time on Call

A common concern of nearly all EMS agencies is time spent during caller interrogation. Unfortunately, this is often a concern motivated by political pressures rather than patient care as the vast majority of EMS calls are not second critical from a pre-arrival standpoint and, the ones that are can be identified early on in the interrogation sequence. Nevertheless, the addition of the Stroke Dx Tool has raised some concerns regarding time on call for stroke patients.

Overall, the chief complaint of stroke accounts for about 1.4 to 2.0% of all MPDS cases. In comparison, the Chest Pain protocol accounts for about 9%, Difficulty Breathing about 14%, and Sick Person about 10%. Dr. Jane Brice at the University of North Carolina, the first group to study the on-line use of the Stroke Dx Tool reported: "Telephone administration took an average of 34 seconds with the longest Diagnostic Tool processing time of 58 seconds." This amounts to one half a percent of a three-hour treatment window, and 0.37% of a 4-hour timeframe, which has appeared in recent studies. Given the potential positive downstream effects that a more accurate, early stroke identification tool can have in the hands of a trained EMD, the Academy believes this is time well spent.

The Critical Patient

A final argument involves the potential for delaying life saving interventions for the critical stroke patient by utilizing the Stroke Dx Tool. Most importantly, when an initial presentation involves grave priority symptoms, Protocol 28 is not an appropriate chief complaint selection. Non-breathing or ineffectively breathing medical patients should be cared for using Protocol 9 – Cardiac or Respiratory Arrest or Protocol 6 – Breathing Problems, and unconscious but still breathing patients should be managed using Protocol 31 – Unconscious/Fainting. Much of this confusion surrounding protocol selection for critical patients involves a misinterpretation of the dispatch-defined term INEFFECTIVE BREATHING. When INEFFECTIVE BREATHING in the medical patient is discovered at Case Entry, and as defined on the Case Entry Additional Information protocol, an appropriate ECHO-level protocol should be selected. Protocol 28 – Stroke (CVA) is not an ECHO-level protocol and should not be used for patients in need of rapid, critical interventions. In the event the more stable stroke patient develops INEFFECTIVE BREATHING during Key Questioning on Protocol 28, the EMD should consider the Stroke Dx Tool NOT COMPLETED and immediately proceed to the appropriate DLS link after sending the appropriate response. The presence of INEFFECTIVE BREATHING is a clear contraindication for the selection of the Stroke protocol and, therefore, the administration of the Stroke Dx Tool. In addition, patients with critical priority symptoms are very unlikely to qualify for stroke center triage and/or thrombolytic care.

Use of the Stroke Dx Tool

After much discussion at the Academy, both before and after the release of the Stroke protocol modifications, the use of the Stroke Diagnostic Tool in the Stroke Protocol evaluation will remain a non-user-defined part of the dispatch protocol application. The rationale for this decision, as described above, relates to the Academy's commitment to

setting the DLS standard of care for stroke patients. In short, the potential minutes saved through earlier stroke predictability and subsequent hospital notification are well worth the seconds spent administering this simple diagnostic that also enables better outcome studies in the interest of patient care.

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