

An Educational Intervention Allows for Greater Prehospital Recognition of Acute Stroke.

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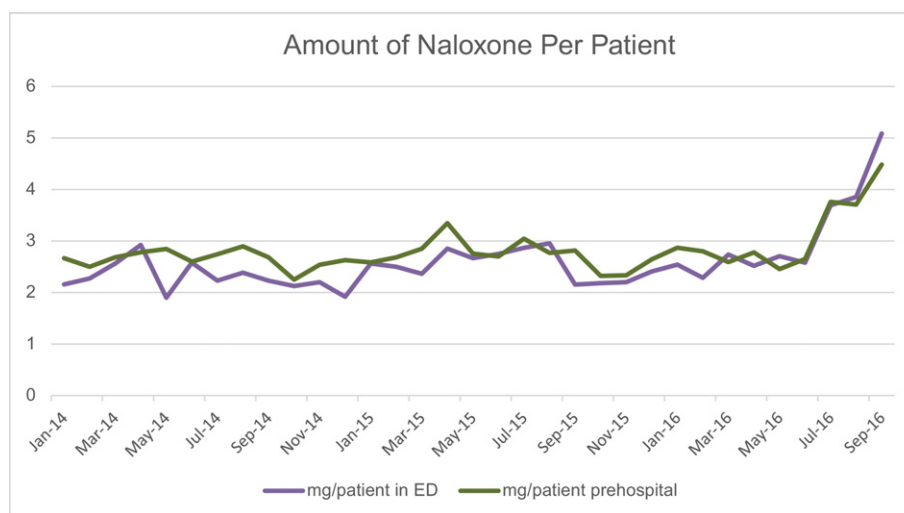


Fig. 2. Prehospital and ED naloxone given per patient.

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An educational intervention allows for greater prehospital recognition of acute stroke☆☆☆



To the Editor:

We performed a study to determine whether a brief educational intervention directed at pre-hospital providers would increase the identification of stroke victims in the pre-hospital setting. The purpose of this IRB approved, before-and-after research project was to determine whether the implementation of Advanced Stroke Life Support Class

(ASLS) [1] training for pre-hospital providers would lead to improved field identification of stroke.

In June 2014 we presented a didactic and scenario-based 8 h class teaching the Miami Emergency Neurologic Deficit, (MEND) exam [2] as part of the ASLS class which emphasizes the pre-hospital recognition and management of acute stroke to the 25 full-time and 15 part-time paramedics at a local ambulance service with approximately 16,000,911 calls/year. The receiving hospital is a 900-bed suburban teaching hospital with a yearly census of 80,000 and is a JCAHO approved comprehensive Stroke Center. The course consists of lectures, hands on instruction, and small group stations, which included standardized patients mimicking specific stroke syndromes. At each station, the participants were required to complete a patient assessment, identify the stroke syndrome (left brain, right brain, brainstem, cerebellum and subarachnoid hemorrhage) and recognize candidates for IV tPA. A pre- and post-test was completed on the same day.

The total number of pre-hospital stroke alerts (PHSA) called by the cohort after taking the course was compared to the stroke alerts called by the same ambulance service in the period prior to the intervention. Period A represented the number of PHSA calls during the 19 months prior to any formal instruction. Period B represented PHSA calls 19 months after the class. For both periods we collected the total number of stroke alerts called, the number of strokes correctly identified and the number of PHSAs incorrectly called by this service. We also collected data on interventions (either IV tPA or EVR) for each period.

After the educational intervention (Period B) there were a total of 82 PHSA called (4.0 PHSAs/month). In Period A, there were 38 PHSA called (2.0/month). The number of pre-hospital stroke alerts called per total number of 911 calls were as follows: Period A: 38/17477 (0.22%) and in Period B: (82/24,090, 0.34); 911 calls in Period B had 1.57 times the odds of having a pre-hospital stroke alert called compared to Period A (95% CI 1.07–2.30). The absolute number of alerts called doubled in Period B (82 vs. 38) without sacrificing accuracy (see Table 1).

According to the American Heart Association (AHA), every 40 s a person in the United States suffers from an acute stroke [3]. Current AHA/American Stroke Association (ASA) guidelines state that the use of IV tPA improves functional outcomes at 3–6 months if given within

☆ There was no external funding for this project.

☆☆ The abstract was presented at the national ACEP meeting in Las Vegas, NV, October 2016.

Table 1
Characteristics of pre-hospital stroke alerts Period A versus Period B.

	Period A (N = 38)	Period B (N = 82)	p-Value
Mean age	75 ± 14.3	75 ± 15.6	0.82
Gender (% female)	13 (54.2)	47 (57.3)	0.78
True strokes	30 (79.0)	57 (69.5)	0.28
Non-hemorrhagic strokes/not TIA	20 (66.7)	45 (79.0)	
Intracranial hemorrhage	4 (13.3)	6 (10.5)	
TIA	6 (20.0)	6 (10.5)	
Received IV tPA	10 (38.0)	21 (42.0)	0.77
Received IV tPA alone	8 (32.0)	16 (32.0)	1.00
Received EVR	2 (8.0)	9 (18.0)	0.32
Received EVR alone	0	4 (8.0)	0.29
Received both IV tPA and EVR	2 (8.0)	5 (10.0)	1.00
Final diagnosis other than stroke	8	25	0.44
Seizure	2	8	
Hypertensive urgency	0	1	
Complex migraine	2	3	
Psychogenic	1	4	
Brain tumor	1	1	
Bell's palsy	1	0	
Syncope	0	2	
Encephalopathy	0	2	
Other	1	4	

4.5 h and recommends its use in patients meeting eligibility criteria [4]. It has been shown that favorable outcomes are inversely related to the time between symptom onset and time of treatment [5–6]. A recent study conducted in San Francisco found that up to 39% of acute stroke patients were not identified as having stroke symptoms, demonstrating missed opportunities for treatment of acute stroke [7].

Prior to the intervention, the ambulance service studied utilized the Cincinnati Prehospital Stroke Scale (CPSS), which takes about 30 s to perform and assesses the presence or absence of facial droop, arm drift and slurred speech [8–10]. The MEND exam utilized in this course incorporates the CPSS and elements of the NIHSS; it takes about 3 min to complete and should be performed en-route to the hospital [2,11]. It has been shown to correlate with the NIHSS [12] and use of the CPSS has been shown to increase EMS stroke identification sensitivity and positive predictive value [13]. The results of the pre- and post-test in the current study demonstrate mastery of the material with a dramatic improvement in scores and were consistent with those in the initial study [11].

The current study demonstrates that a brief educational intervention increased the number of stroke patients called to the ED as a pre-hospital stroke alert without sacrificing accuracy, thus increasing the number of patients eligible for acute interventions. It is not clear whether the increase in the number of stroke alerts called was partially a result of the Hawthorne effect or whether the confidence gained by successful completion of a course emphasizing identification of stroke syndromes and the possibility of therapeutic intervention was responsible. The fact that the improvement was maintained over a nineteen-month period suggests it was the latter.

In our quite typical EMS system an educational intervention that emphasized early stroke recognition doubled the rate of prehospital alerts and increased the absolute number of therapeutic interventions. The proportion of patients correctly identified as stroke and the proportion of patients receiving intravenous lytic therapy or endovascular reperfusion remained constant.

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Can we imagine a survival chain also for ischemic stroke?



I read with great interest the article about the University of Amiens experience in the management of acute stroke [1] and the concept of “door-to-needle” time, so similar to the best known “door-to-balloon” one. During my recent training period in an excellent Stroke Unit, I've directly experienced a quite brand new concept, brought by mechanical thrombectomy, the “door-to-reperfusion” time. We know from meta-analysis data that for every 9-minute delay in reperfusion, 1 of every 100 treated patients had a worse disability outcome (+1 point on MrS scale) [2]. As Emergency Physicians we are called to improve the in-hospital chain, making the CT angiography the pivotal and immediate exam after the basal CT in severe ischemic stroke (NIHSS >10) [3–4], and maybe, someday, even in mild-to-moderate symptoms [5]. As we learned the Echocardiogram to better assess acute AMI in pre-hospital setting, we may learn pre-hospital transcranial color-coded sonography [6–7] and early sonotrombolysis [8–9], which have been proved to be effective, timesaving and safe. We have available solid and exciting techniques to fight Stroke disability, structured chain protocols and widespread formation in our Emergency Departments are now strongly needed.

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Non-compliance in the Emergency Department: Is there a difference between medical and psychiatric patient's reasons and use of the ED[☆]



Patient non-compliance to medication results in Emergency Department (ED) visits, and various complications which cost about \$8.5 billion annually [1]. Medication non-compliance is reported to be a serious issue with about 50–70% of patients in the United States [2]. Reasons for non-compliance are varied and include medication affordability, lack of time to obtain or refill prescriptions, side effects, and understanding and perception of need of medication [3–5] According to Harmon et al. when physicians are initiating treatment in patients they often do not identify barriers to medication adherence and actively engage patients [2]. This is especially true for patients that have chronic illness with complicated medical regimes [6–9].

Research has also shown that individual patients have variation and often distinct adherence to different medications [10–13]. This problem increases with patients who are diagnosed with a mental illness [10]. Compliance has been shown to vary by type of mental illness with depressed patients being three times more likely to be non-compliant with treatment recommendations than are non-depressed patients [12,13]. The question of what, if any, differences there are between medical versus psychiatric non-compliant patients led us to a conduct a study with regard to use of the ED and reasons for non-compliance.

The study was a random sample of patients who present to the ED for medical or psychiatric illnesses who state that they are non-compliant with their medicine. They were given a section of the validated National Health Access Survey. The survey asked about sources of medical care, drug compliance and reason for non-compliance such as access and cost of health care and medication. A comparison of the results was made between the two non-compliant populations in order to determine what the reasons for non-compliance were.

There were a total of 300 participants in the study, 161 of which were medical and 139 were psychiatric, whose ages varied with 30–39 (15%), 40–49 (23%), and 50–59 (30%). There were more males (56%) than females (44%) and the majority were African American (77%) or Hispanic (15%). They took on average between 2 and 6 medications per day.

There was no significant difference in the reason both medical and psychiatric patients gave for being non-compliant with their medications that resulted in their ED visit. Each group cited cost as the number one reason (67%) for not taking their medication as prescribed. They chose non-compliance versus skipping doses due to cost (62%), taking less medicine due to cost (61%), or asking about lower cost medicine from doctor (65%). Both groups stated they had a usual source of medical care (82%) and no trouble finding medical providers (76%). This indicates there are ways to address the issue of medical non-compliance that require less from the ED and more from the patient's own PCP or specialist. This could include the exchange of information on such issues as cost, benefits, reasons for regimen, side effects and need for adherence between patients and their PCP and specialist.

There was a difference between medical and psychiatric non-compliant patients in this study. The psychiatric patients were more likely to get admitted ($p = 0.00$), state they could not afford mental health care ($p = 0.01$), and felt they could not get care from other places thus used the ED for their psychiatric care ($p = 0.02$).

The finding that patients with psychiatric diagnoses were more likely to be admitted than patients with medical diagnoses, could be due to the more severe negative outcomes of non-compliance for this patient population. The need to be admitted (50%) with (8%) of the patients having to be sent to another medical facility means that the potential cost of non-compliance in this population was higher.

[☆] There is no conflict of interest to report with regard to this study.