The Advanced Stroke Life Support® Course Significantly Improves Knowledge of Stroke Diagnosis and Management for Prehospital and Hospital-based Providers

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Background

- Comprehensive stroke education is necessary for rapid and effective diagnosis and treatment of stroke victims, especially in the prehospital and emergency department settings.
- Early acute stroke recognition and appropriate treatment lead to improved patient outcomes.
- Prehospital and hospital-based health care providers can make the difference between the opportunity for recovery, or a life of long-term disability, and even death.
- The ASLS® course was originally developed in 1998 by a group of subject matter experts in stroke neurology, emergency medicine, neuroscience nursing, emergency medical services (EMS), medical education, and simulation.
- Previous studies have shown the effectiveness of the ASLS® course in improving stroke knowledge and skills in a smaller cohort.[1, 2]
- A study published in 2017 also showed that training EMS providers in ASLS® led to an increase in the number of stroke patients called to the ED as a pre-hospital stroke alert without sacrificing accuracy, therefore increasing the number of patients eligible for acute interventions.[3]
- As the ASLS® program has expanded, we wanted to evaluate educational outcomes on a large cohort of prehospital and hospital-based healthcare providers in diverse institutions throughout the United States (U.S.).

Purpose

- The purpose of this study is to evaluate the ASLS® course's impact on knowledge of stroke diagnosis and management among prehospital and hospital-based providers.

Methods

- Participants throughout the U.S. participated in Advanced Stroke Life Support® - a one-day, evidence-based, stroke course consisting of 3.5 hours of didactic lectures and 4.5 hours of interactive large- and small-group skills sessions.
- The didactic lectures consisted of discussions on stroke epidemiology, pathophysiology, anatomy, and recognition and management of major stroke syndromes and their mimics.
- The interactive sessions included video-based cases where the learners diagnosed and developed a management plan for patients with strokes or stroke mimics.
- In the skills sessions, learners used a standardized assessment tool [e.g., Cincinnati Prehospital Stroke Scale (CPSS)/FAST, Miami Emergency Neurological Deficit (MEND) Examination, National Institutes of Health Stroke Scale(NIHSS)] to examine simulated patients portraying major stroke syndromes, and determined a diagnosis and management plan.
- Learners participated in an interactive review game, "Who Wants to be a Strokologist?", prior to taking the postcourse examination.
- The course was taught at approved ASLS® training centers — or satellites by instructors who had successfully completed the ASLS® Instructor course, a comprehensive train-the-trainer program.
- Outcomes were measured using previously validated, 25-item, content-matched pre-course and post-course assessments linked to the course objectives.
- Prehospital and hospital-based healthcare personnel who completed an ASLS® course between November 19, 2014 and May 31, 2017, were included in the analysis.
- Data were analyzed with paired samples t-tests using IBM SPSS, v.24.

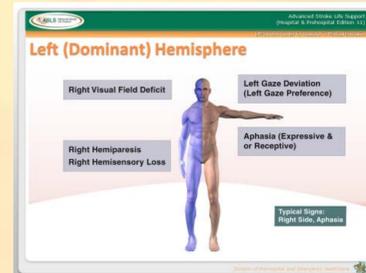## Curriculum Examples and Course Photographs

Figure 1: Example of didactic presentation showing findings of L Hemispheric Stroke Syndrome
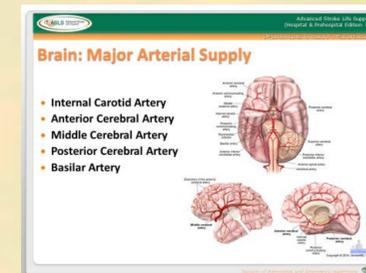

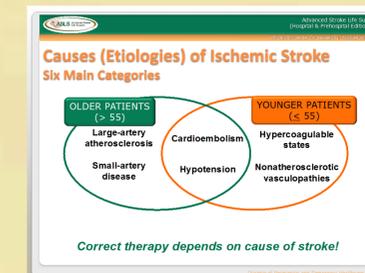Figure 2: Example of didactic presentation showing major arterial supply

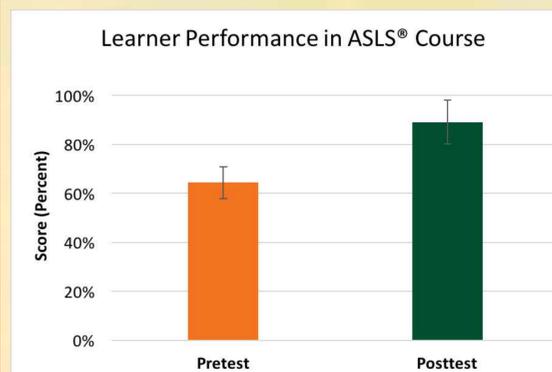Figure 3: Example of didactic presentation showing etiologies of ischemic stroke

Figure 4: Example of video case scenario used in teaching stroke detection and management

Figure 5: Nurse performing assessment on a standardized patient

Results

Graph 1: Results of Pre- and Post-Intervention Assessment [64.4% to 89.1% (p<0.001)]

Group	Pretest (%)	Posttest (%)	Change (%)	95% C.I.
All Learners	64.4	89.1	24.7	24.3-24.9
Pre-hospital Learners	63.8	90.0	26.2	25.7-26.7
Hospital-based Learners	64.8	88.6	23.8	23.5-24.1

Table 1: Results of Precourse and Postcourse Examinations

Results

- A total of 9,678 participants were included in statistical analyses
- Participants included nurses (62%), paramedics (24%), EMTs (10%), and other professions, including physicians, physician assistants, and occupational and respiratory therapists from agencies across 20 states throughout the United States.
- Learners demonstrated a statistically significant increase in knowledge from pre- to post-course assessment; from a pre-course mean of 64.4% to a mean of 89.1% at post-course assessment (p < .001).
- Statistically significant increases in knowledge also occurred within both learner groups. Performance for prehospital learners increased 63.8% to 90% (p < .001), and hospital-based learners increased 64.8% to 88.6% (p < .001).

Conclusions

- The early recognition of stroke is critical for providing appropriate care and timely management.
- Training healthcare personnel in a standardized, effective curriculum can lead to improved detection and management of stroke patients.
- Prehospital and hospital-based providers who participated in the ASLS® one-day course significantly improved their knowledge of stroke diagnosis and management.

References

1. Gordon DL, et al. Stroke training of prehospital providers: an example of simulation-enhanced blended learning and evaluation. *Med Teach*. 2005 27:2, 114 — 121.
2. Motola I, et al. Addressing the Need for Stroke Education Globally: Effectiveness of the Advanced Stroke Life Support Course (ASLS) for Prehospital and Hospital-based Healthcare Providers in Hong Kong. Presented at the International Stroke Conference Feb. 2011, Los Angeles, CA.
3. Henry-Morrow TK, et al. An educational intervention allows for greater prehospital recognition of acute stroke. *Am J Emerg Med*. 2017 Dec;35(12):1959-1961.

Acknowledgements