

Paramedic - Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: *Pre-hospital thrombolysis and reduction of time to treatment in stroke patients*

Report By: *David Lubberts*

2nd Party Appraiser: *Jen Greene*

Clinical Scenario:

Paramedics arrive at a residence of a 58-year-old male presenting with a stroke. He has aphasia, facial droop, and unilateral weakness. Either through dispatch determinants or initial paramedic assessment a mobile stroke unit is sent to the residence. The mobile stroke unit consists of an advanced care paramedic and radiology technician with a CT-scanner and point of care lab. On-scene paramedic assessment, CT scan and point of care lab combined with a telemedical conference with a neurology stroke team allows tissue plasminogen activator (tPA) to be administered in the field. In a safe manner, time to thrombolysis from stroke onset is reduced compared to the time taken transporting the patient to a District Area Stroke Hospital plus door-to-needle time.

PICO (Population – Intervention – Comparison – Outcome) Question:

In patients suffering from an out-of-hospital stroke covered by a Canadian EMS system, would using a mobile stroke unit to administer pre-hospital thrombolysis instead of transporting the patient to a District Area Stroke Hospital reduce the time to reperfusion from symptom onset?

Search Strategy:

((("Ambulance-based" OR "out of hospital" OR "Pre-hospital" OR EMS OR Paramedic)) AND (Stroke OR "Ischemic Stroke" OR CVA OR Cerebral Vascular Accident)) AND (thrombolysis OR thrombolytic OR "tissue plasminogen activator" OR tPA OR fibrinolysis OR fibrinolytic))

Search Outcome:

285 search results



Paramedic - Evidence Based Medicine (P-EBP) Program

Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Ebinger M. MD. April 2014	6182 adult patients for whom a stroke dispatch was activated	Randomly assigned weeks with and without mobile stroke unit (MSU) availability This is a randomized control trial LOE: 1	The primary outcome was alarm-to-thrombolysis time. Secondary outcomes: thrombolysis rate Secondary intracerebral hemorrhage after thrombolysis 7-day mortality	3213 patients in MSU assigned week. 1804 when the MSU was available & deployed vs. 2969 control, When MSU deployed, mean alarm-to-treatment time (51.8 min; 95%CI, 49.0-54.6) was shorter by 25 minutes (95%CI, 20-29; P < .001) compared to control weeks.	The strengths were a large sample size. Regard for ethical considerations and limitations of the study were well documented. A weakness is that it could not be randomized on a patient basis but only through the time the MSU was available.
Itrat A. MD. February 2016	First 100 patients who had an acute onset of stroke like symptoms and were evaluated by a mobile stroke unit compared to 56 control patients evaluated at an emergency department.	Prospective Observational study LOE: 2	Compare the evaluation of stroke patients in a mobile stroke unit by remote neurologist to stroke patients evaluated in an emergency department	99 of 100 patients were evaluated successfully in the mobile stroke unit with remote neurologist. Median times from door to CT-completion was 13 minutes (IQR, 9-21 min) and door to thrombolysis time was 32 min (IQR, 24-47 min) compared with 18 minutes (IQR, 12-26) and 58 min (IQR 53-68) respectively for the control ER group. A median 16 minutes in total	+ The study was prospective with a clear goal - Not a randomized trial - small sample size and the populations of trial and control were not even - poor p-values for patient population



Paramedic - Evidence Based Medicine (P-EBP) Program

				<p>saved.</p> <p>There was no difference in the time of CT scan interpretation</p> <p>IQR = interquartile range</p>	
--	--	--	--	---	--

Comments:

The first study was conducted in Berlin where a neurologist was present on the mobile stroke unit. This contrasts with the intention of my PICO which was concerned with a paramedic based model of care. Unfortunately, no large studies exist yet based on a Canadian EMS model. The second study had the objective of testing the feasibility of a remote neurologist. It was a small observational study but showed promise that the model could work for Canadian EMS.

Consider:

Why would you NOT change practice, based on these articles?

The first article is from the European style of EMS where there are doctors on board the ambulances. Without a large study in Canada showing a significant benefit this is prohibitive. The labour and equipment cost would be out of proportion to call volume and population. Remote consult with neurologist shows promise but the time difference is in the tens of minutes. It may be more efficient fiscally to improve public education to have faster 911 activation time or to redistribute deployment plans to reduce response times.

Clinical Bottom Line:

A mobile stroke unit with paramedics and radiology technicians can improve stroke care prehospitally combined with telemedicine. Time is brain.

