EMS and Stroke--- You mean we really make a difference
The Power To Change

Marilyn McLeod, MD, FACEP
September 18, 2012

Smoothed County Stroke Death Rates:
Adults 35 and Older, 1991-98

Emergent Stroke Care and the Chain of Survival

Disclosure
I must disclose that I get nothing from anybody for anything at all that I discuss today, but I would really like to......
What are the levels of EMT

- PS if you are in EMS you may not answer....

What do different levels of EMS provider mean

- EMT-B – 111 hours of classroom and 10 hours of clinical rotations
- EMT-Enhanced – 80 hours of classroom and 48 hours of clinical rotations
- EMT-I 272 hours of classroom and 68 hours of clinical rotation
- EMT-P 800 to 1200 hours of classroom and 168 hours of clinical experience

Where we used to be in EMS

- Stroke was untreatable
- No rush, no special hospital
- Ride to the hospital
- We did not do EKGs
- ER docs fighting for ability to activate cath lab

Where we used to be

- But we knew about golden hour
- We still push 10 minute scene time with trauma

The EMS Image

The EMS Image
Where is EMS now?
- EMS System Response Time
- Acute Trauma Care
- Cardiac Arrest Care
- Acute Cardiac (STEMI) Care
- Acute Stroke Care
- Acute Pediatric Care

STEMI
- Great system in place
- Almost all EMT-Bs can do EKG and transmit
- By end of the year if EMT B cannot do EKG they will not be able to function
- Super system of no fault, great feedback

The EMS Image

Acute Trauma Care
- Scene time decreased with care en route
- Appropriate transport vehicle to appropriate receiving facility
- We no longer flood them with IV fluids
- Pleural decompression

We are EMS and we are proud

We know where to take this patient
Cardiac Arrest

- In infancy, but improving
- Following new guidelines
- Using hypothermia
- Understanding of importance of compressions
- Learning about resuscitation centers

Local EMS Response Times

- LFD 5 minutes 39 seconds on average 90 percent of the time
- Campbell County 12.9 minutes average
- Amherst County 10 minute average
- Bedford County 9.3 minute average

EMS Response Times

- Varies between city and rural areas
- Extended times for some responses in volunteer areas

Did you know?

- There was a 40 minute response time to location 9 miles from LGH – Are you kidding me?
Acute Stroke Care

- Do all EMS providers know the difference between time last seen normal instead of symptoms onset?
- Do they know where to take the patient?
- Do they know or follow appropriate management?
- Do they know appropriate assessment?
- Some know it all, some know some, and some know none of it

Do you know what your EMS squads are doing?

- Let me hear from you….
- Once again if you are an EMS provider you may not answer

What we are doing right?

- Great stroke team
- RNs in ED can activate stroke alert
- Stroke team is amazing with very close follow up and excellent feedback
- Stroke unit very skilled

One Volunteer Agency

- I will leave them nameless to protect the guilty
- By protocol can not check glucose levels on stroke patients
- Often give glucose to these patients since hypoglycemia can mimic CVA

What are we doing wrong?

- Very little attention to EMS system
- EMS activation of stroke alert not 100 percent yet
- We could develop a better, more robust feedback system
- Very little community wide education
Protocols

- BREMS protocols - see copy
- Are we doing all we can do?
- Are we going to correct facility?
- Should we be treating hypertension?

REMEMBER

- LAST SEEN NORMAL
- Important to bring meds
- Bring family member since EMS is typically in a rush and forgets meds, pt's name, and neurologist are hesitant to give tPA when patient’s family or witness to time not available
- Its not that we don’t trust you we just don’t trust you

Initial Problem

- Onset of symptoms
- Woke up at 7 with symptoms reported as onset at 7 am
- How do we fix “time last seen normal”

Other management of CVA

- Airway management
- Breathing - use oxygen as needed, but stop the use of too much oxygen
- Circulation - at what point do we treat hypertension
- Disability - is there really any reason not to do glucose check

Identify Time “Last Seen Normal”

54 year old male spoke to his daughter at 8pm last pm without symptoms. She arrives at 7am the following am to find he is still in the bed with right sided weakness. What is his time of onset of symptoms?

62 year old female went shopping and left store @ 1pm, cashier stated she seemed fine at 1pm. She staggered back into store @ 3pm unable to speak. What are her onset of symptoms?

Trauma and CVA

- Sometimes assume that a ground level fall is trauma when it could disguise a stroke
- Is it really a head injury or CVA
- We must keep scene times minimal, but obtain an accurate history
**BREMS Prehospital Stroke Screen Proposed**

- Patient Name: ____________________________
- PREHOSPITAL PROVIDER Name: ____________________________
- STROKE SCREEN Date: ____________________________

**Screening Criteria**

- Yes No
- 2. Age over 65 years
- 3. No prior history of stroke disorder
- 5. New onset of neurologic symptoms in less than 24 hours
- 7. Patient was ambulatory at baseline (prior to event)
- 8. Blood glucose between 80 and 450
- 9. Exam: look for obvious asymmetry
  - Normal
  - Weak
- 10. Facial smile / grimace: Droop Droop
- 11. Grip: Weak Grip No Grip Weak Grip No Grip
- Based on exam, patient has only unilateral (and not bilateral) weakness: Yes No
- 12. If Yes (or unknown) to all items above screening criteria met: Yes No
- 13. If criteria are not met (or unknown) to all items above screening criteria met: Yes No
- 14. Based on exam, patient may still be experiencing a stroke if even one item above criteria is not met.

**BREMS STROKE WORKSHEET**

- Stolen and adapted from Los Angeles County

**What is EMS Peer Review?**

EMS peer review is the process by which a committee of EMS professionals investigates the patient care rendered in order to determine whether accepted standards of care have been met.

**What is the Purpose of EMS Peer Review?**

- Monitor EMS Service Delivery
- Monitor EMS Personnel Performance
- Monitor Resource use, need, and effectiveness
- Ultimately monitor patient care
BREMS PEER REVIEW

- Due to multiple agencies it is very difficult to develop a robust peer review.
- Multiple providers sometimes are running 3 to 4 calls per month so difficult to maintain competency.
- Often with providers having other jobs it is difficult to do widespread education.
- Very little on your own reading by EMS providers.

Importance to work together

- Examples…. EMS knew that patient names were important for STEMI to get old EKGs prior to arrival, but CentraOne did not.
- CentraOne may pick up a stroke patient from EMS, but no family at rendezvous site.
- EMS in Farmville not notified that we were using SOC, so still trying to do immediate transport to another facility.

New Quality Improvement System

- In its infancy.
- All agencies asked to submit 10 ALS runs.
- Reviewed by regional OMD with follow up to providers.
- Will use these to do case reviews with EMS groups.
- There is no region wide way to review CVA charts.

What do we need to do to improve EMS management of stroke

- Improve knowledge of identification of stroke signs and symptoms.
- Develop rapid assessment process.
- Facilitate transfer of stroke patients to a Primary Stroke Center in the quickest and safest manner.
- Accept pre-notification with no fault response to error, but feedback on all cases.

3 hours by boat to medical care

- Encourage family member or witness familiar with the patient to either ride with the transfer vehicle or provide a phone number when they are not able to ride.
- Bring meds with patient.
- Improve protocols so that all patients have a glucose check.
- Work hard to get a last seen normal time.

Continued
Continued

- Be better at Cincinnati Stroke Scale
- Provide the receiving hospital with a quick, complete verbal report

How do we train EMS providers

- Include them in QA/QI
- Include them in notifications of changes
- Lectures by specialists
- Online training
- Respect, friendliness, and instant follow-up by ED personnel

We should aggressively teach AIS mimics

- Bell's Palsy
- Todd's Paralysis
- Hemorrhagic Stroke
- Subdural hematoma
- Hypoglycemia
- Complex migraine

National Stroke Association

- EMS System Medical Directors should have a process to identify and provide transport protocols to authorize EMS to transport stroke patients to the nearest appropriate hospitals, including recognized stroke centers

EMS providers are lining up to learn

911 activation

- What can we do to improve our calls and our response
Consistency

- The only way to improve these times are through education to the public.
- Georgetown study... 89 percent said they would call 911 for stroke symptoms.
- 50 percent of inpatients actually called 911.
- Many called family first, waited for symptoms to resolve, and many didn’t know there was a treatment for stroke.

EMS

- Continue to educate EMS.
- Include them in process evaluation.
- Robust QI/QA program with honest feedback for every case.
- Accept false negatives as clinical expertise improves with more experience.

Dispatchers

- LFD went to EMDs about a year ago.
- Amherst, Campbell, and Bedford Counties all use EMD.
- Continue to push for EMDs.
- My dream.

EMS future

- Maintain a robust research review to keep up with changes.
- Be open to changes even when EMS providers are scared.

Why EMD

- Use of 911 system is recommended for symptoms of stroke.
- Many callers do not use the word stroke.
- EMDs are trained to recognize the seriousness of stroke and the symptoms.
- Algorithm is used to guide professional to ask appropriate questions.

New Advances-Telemedicine

- Robust QI/QA program with honest feedback for every case.
- Accept false negatives as clinical expertise improves with more experience.

Be open to changes even when EMS providers are scared.

- My dream.
Telemedicine at Southside

- Did it change EMS process flow
- 2 cases

Prehospital diagnosis of MCA occlusion in stroke patients is feasible using portable duplex ultrasonography with or without administration of a microbubble contrast agent. Prehospital neurological as well as transcranial vascular assessments during patient transport can be performed by a trained neurologist with high sensitivity and specificity, perhaps opening an additional therapeutic window for sonothrombolysis or neuroprotective strategies.

Can we use it in EMS unit

- LFD already working on camera with ability to send to LGH
- Could we add TCD and give tPA on the scene
- WAY COOL..... Okay maybe a little far fetched for now

Therapeutic hypothermia

- Recommended therapy for comatose survivors of out of hospital cardiac arrest
- Feasibility study done in stroke – further work ongoing


- Source

Department of Neurology, University of Regensburg, Bezirksklinikum Regensburg,

+ Prehospital diagnosis of MCA occlusion in stroke patients is feasible using portable duplex ultrasonography with or without administration of a microbubble contrast agent. Prehospital neurological as well as transcranial vascular assessments during patient transport can be performed by a trained neurologist with high sensitivity and specificity, perhaps opening an additional therapeutic window for sonothrombolysis or neuroprotective strategies.
Pre-hospital Magnesium

- Novel system in LA county
- IV magnesium sulfate given to patients identified in the field with severe acute ischemic stroke
- www.fastmag.info

There is a light at the end of the tunnel

Communication

- When is evidence enough to make changes
- How do we ensure that when the stroke team makes changes EMS knows about them
- Does the stroke team know that we already do hypothermia for other illnesses

So, now what is really important

- Time, Time, Time
- We have improved hospital times
- Time to improve how fast patient calls 911
- How fast the dispatcher responds to patient
- How fast EMS reaches patient
- How fast we get patient to hospital in a safe manner

Thank you!!

Marilyn McLeod, MD, FACEP
434-841-0093
Marilyn.mcleod@centrahealth.com