



National EMS Information System (NEMSIS)
Helping Unify EMS Data

In this issue of The NEMSIS TAC Best Practices Spotlight, we focus on The Arizona Department of Health Services Bureau of Emergency Medical Services & Trauma System and their use of NEMSIS compliant data. The Arizona Bureau of Emergency Medical Services (BEMS) has prepared several reports that outline performance improvements in areas such as cardiac arrest, stroke, ST-Elevation Myocardial Infarctions (STEMI's), and major trauma.



The NEMSIS compliant dataset used in these reports is from the Arizona Prehospital Information and EMS Registry System (AZ-PIERS).

Performance measures are outlined for each report to analyze time, documentation, frequency of transport decisions, as well as linkage to Hospital Discharge Data (HDD).

The preparers of these reports have stated that the purpose of presenting these data is to provide agencies with a level of comparison on their performance in each of the areas previously mentioned. They can also be used to support Quality Assurance initiatives in their communities.

About Spotlight

This newsletter was developed to highlight utilizations of NEMSIS data to improve healthcare systems and EMS performance. Each issue will highlight successful programs/attributes associated with state or local EMS agencies that are integrating EMS data to serve local and state public health and safety needs.

In each quarterly issue we will focus on a state program or implementation strategy that has been successful in utilizing NEMSIS data to enhance patient care, ensure workforce training and safety, reduce healthcare spending, or advise healthcare reform.



Out of Hospital Cardiac Arrest, OHCA

On May 10, 2014, The Arizona Prehospital Information & EMS Registry System (AZ-PIERS) was analyzed to find records where Cardiac Arrest occurred using the following criteria:

- Unit notified date range of July 1, 2013– December 31, 2013
- Patient disposition equal to “dead at scene”, “treated and transported” or “treated and transferred”
- Procedures, protocols, prior aid contains “CPR” or “Defibrillation”

There were 715 OHCA cases reported between July 1, 2013 and December 31, 2013. Of this sample, 290 people were pronounced dead at the scene and were not considered in the rest of the report.

Of the 425 patients in the remaining sample, only 10% received bystander CPR prior to being transported to the hospital. Preparers of this report stated:

“Surviving an out of hospital cardiac arrest (OHCA) is strongly associated with starting chest compressions as early as possible.”

The main focus of this report was to analyze the linked data between out of hospital cardiac arrest cases and hospital discharge data (HDD). As stated in this report, “Accuracy in these fields by EMS agencies and hospitals results in a more successful ‘link’ that allows for systematic improvements in patient care.”

Patients who met the inclusion criteria were linked to HDD through:

- Unit notified by dispatch date/time
- Patient last name, patient first name
- Patient gender
- Date of birth



“Surviving an out of hospital cardiac arrest (OHCA) is strongly associated with starting chest compressions as early as possible.”

Linked OHCA Cases to Hospital Discharge

Hospital discharge status	N	%
Total linked cases	129	100%
Discharge status of linked cases		
Home	6	4.6%
Transferred to Acute Care	1	0.77%
ALF/Rehab/SNF/ Long Term	1	0.77%
Expired	117	90.7%
Hospice	4	3.1%

Discharge Status Improvement Plan

Of the 129 cases, a vast majority of patients died as a result of their OHCA (94%). Arizona has initiated various strategies to improve survival for OHCA such as training the public to perform quality bystander CPR. Also, they have provided training for

providers and dispatch to rapidly identify cardiac arrest and perform or instruct a bystander in using, proper CPR technique respectively.

Stroke

On June 13, 2014 AZ-PIERS was analyzed to find occurrences of ‘suspected stroke’ using the following criteria:

- Unit notified date range of January 1, 2013– December 31, 2013
- Patient disposition equal to ‘dead on scene’, ‘treated and transferred’ or ‘treated and transported’
- Provider’s primary impression, providers secondary impression or dispatch complaint report equal to ‘stroke/ CVA’

Due to a low number of linked stroke records and hospital discharge data, this report mostly focused on ‘suspected strokes’.

Improving the documentation of patient “last known well time” is the first performance measure addressed in this report.

Out of 3,891 patients that met the above criteria in AZ-PIERS, a third of the patients were missing “last known well time” in their documentation. As stated in this report, “Through this information, EMS agencies can target their education to areas in their communities where strokes are not being recognized by the public.”

The next performance measure identified a need to increase documentation of appropriate assessments in stroke patients. Included in these assessments are:

- Blood glucose
- Stroke scale
- Neurological assessment

Stroke symptoms can be easily mistaken for diabetic issues so a blood glucose test can help to eliminate that uncertainty. Stroke scales and neurological assessments should be used to identify a suspected stroke.

The key indicators assessed are facial droop, speech slurring and arm drift. Of the 1,359 assessments, the most common positive indicator for a stroke was the arm drift (73.4%).

The remaining performance measures included increase frequency of hospital pre-notification for a stroke patient and increase frequency of transport to a stroke center.

In determining the efficacy of these measures they were linked to Hospital dispatch data using the following criteria:

- Unit notified by dispatch date/time
- Patient last name, patient first name
- Patient gender
- Date of birth

There were a total of 714 suspected stroke cases linked to hospital discharge data in the time span previously mentioned. 300 of those patients (42%) were discharged to a facility that provided additional services to their patients (ie: assisted living facilities and skilled nursing facilities).

It was stated in this report that, “future initiatives should look at a more thorough understanding of a patient’s functional abilities following their stroke.”

“Stroke treatments are founded on the ability for patients to receive care in a timely manner.”



STROKE is an Emergency.
Every minute counts.
ACT F.A.S.T!

	F ACE	Does one side of the face droop? Ask the person to smile.
	A RMS	Is one arm weak or numb? Ask the person to raise both arms. Does one arm drift downward?
	S PEECH	Is speech slurred? Ask the person to repeat a simple sentence. Is the sentence repeated correctly?
	T IME	If the person shows any of these symptoms, Call 911 or get to the hospital immediately.

STEMI

On May 10, 2014 the Arizona Prehospital Information & EMS Registry System (AZ-PIERS) was analyzed for records of STEMI occurrences using the following criteria:

- Unit notified date range of January 1, 2013-December 31, 2013
- Patient disposition equal to 'Dead on scene', 'Treated and transferred', or 'Treated and transported'.

A total of 562 STEMI patients were matched in this search. The majority of the patients documented were white, however in half of the cases, the race variable was not recorded.

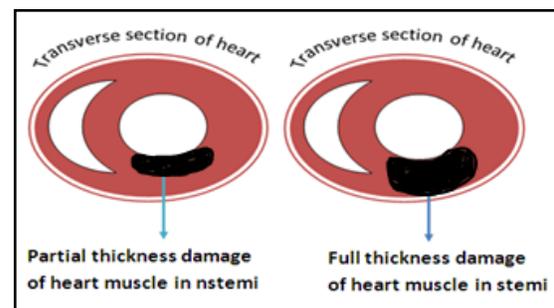
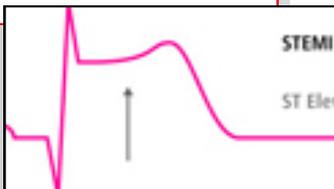
More than two thirds of the patients were male and the median age was 65.

Of the 562 STEMI cases, an ECG was only performed on 32.5% of the patients. Of the cases where an ECG was performed 58% were confirmed STEMI cases. This information was provided with verification through the SHARE STEMI registry and AZ-PIERS.

Scene arrival to 12-lead ECG time for the 562 patients had a median of 8 minutes. A 12-lead ECG was performed within 20 minutes of arriving on scene in 90% of the cases. However, the scene arrival to ECG time was missing in 401 of the records.

The majority of patients went to a cardiac center and were discharged home. However 10% of STEMI patients died as a result of this condition.

“ It is important to transport patients to the most appropriate level of care in a timely manner. ”



Performance Improvement Measures

In an effort to improve performance, The Arizona Department of Health Services has used EMS data to analyze four performance measures which are:

- Reduce the length of time from arrival on scene until a 12-lead ECG is acquired
- Increase the frequency of hospital pre-notification for STEMI patients
- Increase the frequency that STEMI patients are transported to a cardiac receiving/referral center
- Increase the frequency that STEMI patients receive prehospital aspirin and oxygen therapy.

When comparing these performance measures with current data, agencies can see what they are doing well and where they could stand to improve. It is possible to keep track of their progress by pulling the same data each year and comparing outcomes in each area.

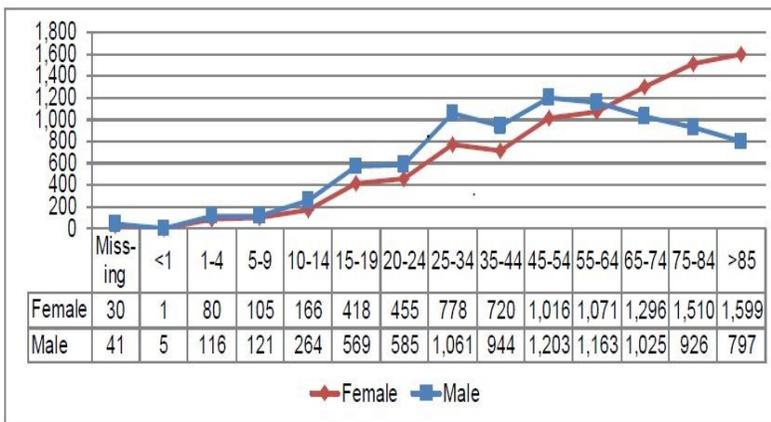
Major Trauma

On April 30, 2014 AZ-PIERS was analyzed to find records where traumatic injury occurred using the following criteria:

- Unit notified dated range of July 1, 2013– December 31, 2013
- Possible injury equal to ‘Yes’
- Protocols used that included a range of traumas
- Patient disposition equal to ‘Treated, Transported by EMS’, ‘Treated, transported by EMS (ALS)’, ‘Treated, transported by EMS (BLS)’, or ‘Treated, transferred care’.

As shown in the graph below, adults older than 65 years of age made up 49% of all EMS calls. The individuals involved in preparing this report suggest that, “there may be various explanations for the trends presented related to traumatic

injuries. This analysis demonstrates that the EMS system in Arizona would benefit in training and resources that target older adults.”



“If an EMCT suspects a TBI has occurred, they should consider transporting them to a trauma center.”

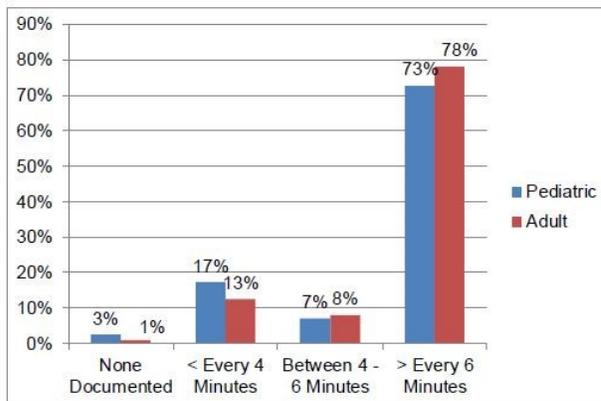
Traumatic Brain Injury, TBI

Arizona hospitals had 9,075 TBI cases between July 1, 2013 and December 31, 2013. When linked with hospital discharge data for the same date range there were 912 total cases.

Trauma centers provide specialized care which can be crucial for the survival of a TBI. However, 33% of the linked patients were not transported to a trauma center. In this report it is stated that, “If an EMCT suspects a TBI has occurred, they should consider transporting them to a trauma center.”

Of the 912 TBI patients, 5.5% died while a majority of the patients (70.5%) were discharged home. In the future, initiatives will be made to look at the Functional Independence Measure (FIM) score of patients who were discharged home to determine quality of life.

Vital signs should be recorded every five minutes in cases of suspected TBI. Positive outcomes of TBI cases have been correlated to patients that maintain an end tidal CO2 between 35-45% and pulse oximetry above





National EMS Information System (NEMSIS)
Helping Unify EMS Data

Reference Materials

www.nemsis.org

Contact Us

Phone: 801-585-1631

Fax: 801-581-8686

Email:

Clay.Mann@hsc.utah.edu

Monet.lheanacho@hsc.utah.edu

Address

295 Chipeta Way #2E600

Salt Lake City, UT 84108

Social Media

 [Facebook.com/NEMSISTac](https://www.facebook.com/NEMSISTac)

 [Twitter.com/NEMSISTac](https://twitter.com/NEMSISTac)

Do you know of an agency or project that deserves to be in the “Spotlight”?

As you have seen in this issue, we intend to highlight systems that have utilized NEMSIS compliant data to improve health systems, and to shorten the gap between EMS field care and hospital care.

In order to be featured in a future issue of The NEMSIS TAC Best Practices Spotlight, gather your relevant data, graphs and narratives and submit them to The NEMSIS TAC using the contact information provided.

Technical Assistance Center
 Salt Lake City, UT

