

### *1. A specific list of the conditions that most need immediate attention from EMS:*

In consultation with the EMDAC membership, I've prepared this list of medical conditions that require emergent medical care:

#### 1-2 minute delay can affect outcome:

- Anaphylaxis (allergic reaction)
- Choking
- Complicated childbirth
- Asphyxic (severe) asthma
- Exsanguination (massive bleeding)
- Hanging
- Drowning
- Cardiac arrest
- Unstable dysrhythmia (too fast or too slow)
- Respiratory arrest
- Opiate overdose (e.g., Heroin)
- Poisoning (Carbon Monoxide, Cyanide, Nerve Agent)
- Burns (active burning, airway)

#### 10-15 minute delay can affect outcome:

- STEMI (severe heart attack)
- Stroke
- Snakebite (venomous)
- Hypoglycemia
- Pulmonary Edema
- Pulmonary Embolus (blood clot in lung)
- Status Epilepticus (continuous seizure)
- Sepsis (severe infection)
- Penetrating or blunt injury or pelvic fracture with major hemorrhage
- Tension pneumothorax (collapsed lung)
- External hemorrhage (needing pressure/tourniquet)
- Late pregnancy bleeding
- Retinal artery occlusion (causing permanent blindness in affected eye)
- Aortic dissection
- Ruptured Abdominal Aortic Aneurysm
- Heat stroke
- Profound hypothermia
- Respiratory Failure/Hypoxia (inadequate oxygen)
- Coma (any cause)

A further description of medical conditions and EMS treatment can be found in "EMS Makes a Difference: Improved clinical outcomes and downstream healthcare savings." (1)

### *2. Percentage of 911 calls that are for conditions on that list:*

The best approximation for this is from investigations that examine the outcome of patients transported to hospitals by EMS systems. Hettinger (2) looked at a Northeastern U.S. county of 735,000 population. Of the 27,000 patients transported by EMS to the subject hospital, 30% died or were admitted for further treatment (too ill or injured to return home).

*3. Any figures on average cost and/or length of hospital stay for cardiac patients that do receive immediate medical attention by EMS vs. those that do not:*

There are limited data specific to “cardiac patients”, but cost analyses have been done for EMS patients as a whole and for other conditions.

In the Salt Lake City Study (previously cited) Wilde states “These results show that response times affect the likelihood of being admitted to the ED.” “Response times also significantly affect the condition of the patient as assessed in the ED. Patients with longer response times are more likely to be considered at high risk of mortality and to have more severe conditions.”

Studies on two specific conditions evaluated the cost savings of prompt EMS care:

Silbergleit (3) reported that for patients with status epilepticus (continuous seizures), a new treatment that shortened the total seizure time by 1.7 minutes resulted in a 14% reduction in hospital admissions and 24% reduction in ICU admission (the ICU is a more costly site of care).

For patients with acute respiratory failure (minutes away from respiratory or cardiac arrest), Thompson (4) demonstrated that treatment with Continuous Positive Airway Pressure (CPAP) reduced the need for endotracheal intubation (ETI - tube in the windpipe with a ventilator) by 30% and mortality by 21%. Also for acute respiratory failure, Hubble (5) found that CPAP reduced hospital costs (in 2006) by \$4075 – by reducing the need for ETI and ICU care.

References:

1. EMS Makes a Difference: Improved clinical outcomes and downstream healthcare savings. A Position Statement of the National EMS Advisory Council. December 2009.
2. Hettinger AZ, Cushman JT, Shah MN, Noyes K: Emergency medical dispatch codes association with emergency department outcomes. *Prehosp Emerg Care*. 2013 Jan-Mar;17(1):29-37.
3. Silbergleit R, Durkalski V, Lowenstein D, et al: Intramuscular versus intravenous therapy for prehospital status epilepticus. *N Engl J Med*. 2012 Feb 16;366(7):591-600.
4. Thompson J, Petrie DA, Ackroyd-Stolarz S, Bardua DJ: Out-of-hospital continuous positive airway pressure ventilation versus usual care in acute respiratory failure: a randomized controlled trial *Ann Emerg Med*. 2008;52:232-241
5. Hubble MW, Richards ME, Wilfong DA: Estimates of cost-effectiveness of prehospital continuous positive airway pressure in the management of acute pulmonary edema. *Prehosp Emerg Care*. 2008 Jul-Sep;12(3):277-85.