

EMS Insider

JULY 2009
VOLUME 36
NUMBER 7

ALS FIRST RESPONSE CUTS SCENE TIMES

Preliminary results released on EMS time trials for cardiac & trauma calls

Trauma and cardiac patients get definitive care significantly faster with ALS first response, according to "preliminary results" of EMS "time-to-task" experiments conducted as part of the ambitious "Multi-Phase Study on Firefighter Safety and the Deployment of Resources." The International Association of Fire Fighters, International Association of Fire Chiefs, National Institute of Standards and Technology, Worcester Polytechnic Institute and Center for Public Safety Excellence are conducting the study. (See "Staffing Patterns Affect EMS Task Times, Study Finds," June *EMS Insider*.)

Co-Principal Investigator Lori Moore-Merrell, DrPh, MPH, EMT-P, assistant to the IAFF general president, released the preliminary results at the IAFF EMS conference June 8.

Montgomery County (Md.) Fire Rescue Service and Fairfax County (Va.) Fire & Rescue Department performed the EMS field experiments in April, using 15 different staffing and deployment patterns to respond to two simulated incidents: a trauma involving a fall from

a ladder on a hard-to-access construction site and a cardiac arrest call requiring CPR and the transport of a patient down several flights of stairs.

"This was to measure the time to access the patient, do a basic medical history, start an IV and package the patient on a backboard," said FCFRD Captain Philip Pomeroy, NREMT-P. The crews also performed some ALS procedures.

Crew configurations

When they compared various ALS and BLS crew configurations on the trauma scenario, scene times were 2.3 minutes shorter when one paramedic arrived on a fire truck and one on an ambulance, when compared with a BLS first response coupled with two paramedics on an ambulance, and 1.8 minutes shorter than when a paramedic arrived on an engine accompanied by a BLS ambulance.

"On the trauma scenarios, when there was not an ALS first responder, it was significantly slower to perform the tasks than when at least one ALS responder was

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NEW NFPA COMMITTEE BEGINS DEVELOPING AMBULANCE STANDARD

Process ensures transparency & multiple opportunities for input

The National Fire Protection Association has selected a "start-up" committee to develop its first ambulance-design standard, and the committee held its first meeting June 17. (See "NFPA Will Create New Ambulance Standards," January *EMS Insider*.) NFPA, a nonprofit that creates and promotes codes and standards related to fire prevention and public safety, expects ambulance manufacturers and the federal government to adopt the standard instead of the federal KKK standard currently used.

"This was pretty much an organizational meeting at NFPA headquarters in Quincy, Mass., and a chance to get acquainted with the process and each other, to look at the task at hand and how they might approach it," said NHTSA EMS Chief Drew Dawson. "I'm a nonvoting

member on the committee with the understanding I could solicit the appropriate expertise from NHTSA."

When NFPA announced its plans in late 2008, many in the private sector expressed concerns the project could result in more costly units and create standards that would adversely impact the design of van-style ambulances used primarily for interfacility transport. But NFPA charged the committee with "primary responsibility for documents on design and performance of ambulances used to provide patient care and transport *under emergency conditions* (emphasis added)."

The players

"We have a 23-member start-up committee that we're

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on the first unit in,” said North Carolina EMS Medical Director Greg Mears, MD, who serves as medical director for the EMS segment of the study and helped design the EMS time trials. “I think the key is that splinting and spinal immobilization are basic skills, but they get done in a quicker fashion when there’s an ALS person on scene faster.”

On the cardiac scenario, Moore-Merrell said, “The crews with one ALS provider on the engine and one on the ambulance performed all tasks two minutes faster than the crews with no ALS on the engine and one paramedic on the ambulance.” Scene times were similar whether an engine with one paramedic arrived with a BLS ambulance or with an ambulance carrying one paramedic. “The overall difference in scene time was under 30 seconds on average, which was not statistically different from zero,” she said.

However, scene times were two minutes longer *without* ALS first response, whether one paramedic or two arrived on an ambulance.

Mears noted that the OPALS (Ontario Prehospital Advanced Life Support) Study failed to show an impact of having ALS professionals on cardiac arrest calls “because they couldn’t find a difference in [patient] outcomes. But we found an impact of ALS in both cardiac and trauma scene times. So if the chance of survival for a cardiac-arrest patient drops by 10% with each minute until defibrillation, this can impact survival.”

Number of first responders

The experiments also sought to determine whether the number of first responders (regardless of skill level) makes a significant difference in scene times, and according to the preliminary data, it does.

On the trauma scenario, they found that a three-person first responder crew (when coupled with a two-person ambulance crew) cut 1.7 minutes from scene times (compared with two-person first responder crews with two on the ambulance) and a four-person first responder crew cut scene time by another 1.7 minutes, for a total time saved of 3.4 minutes.

On the cardiac scenario, a three-person first response crew (with a two-person ambulance crew) cut 1.5 minutes from scene times (compared with two-person first responder crews plus two on the ambulance) and a four-person first response crew with two-person ambulance crew performed on-scene tasks 2.6 minutes faster than the two-person first responder crews.

“Although not statistically significant due to the small sample size, the four-person crew with two people on the ambulance performed 1.2 minutes faster than the three-person first responder crews,” Moore-Merrell said.

“By comparing two-, three- and four-person first responder crews, there’s a statistical trend that the more people, the better for packaging the patient and performing procedures that must be done,” Mears said. “We tried to make these very common scenarios that any EMS system might see frequently, not to show the need for more people, but to show the optimal configuration.”

Nuts & bolts

The trauma scenario used both live “patients” and manikins, but the cardiac scenario used only manikins, so medics could intubate and start IVs. They also took a standard medical history and pain survey with a proctor answering the question via a microphone behind a one-way window. “Each experiment was run with all 15 [crew configurations], and we ran each [configuration] three times, so he had to answer each question 45 times,” said Pommerening.

About a dozen paramedics from each department were involved, “and they all agreed these scenarios were *bona fide*,” he said.

“We don’t want just two people carrying full-grown patients down stairs—for our safety and the patient’s safety,” Pommerening said. “With a two-person crew, you’re going to end up walking some patients who shouldn’t be walked and have paramedics with back injuries.”

“This was a lot of work, but we actually had fun doing it,” said MCFRS Assistant Chief Michael McAdams. “It was exciting to watch; intuitively, you understand it

should take longer with two people providing care, but when you see the difference with two and with three and four and five people, it’s incredible!”

Moore-Merrell stressed that ongoing analysis should produce many more details and numerous publications. “We have not yet completed analysis of time to ALS interventions or the impact of having one or two paramedics on the scene or the impact of where the paramedic rides,” she said.

Bottom line

According to Mears, the “bottom line” preliminary findings are:

- For EMS events with significant patient packaging, a large number of needed skills or a minimal scene-time requirement, the more people assisting, the better.
- Configurations with one ALS crew member on the first-in unit resulted in a more rapid completion of non-ALS tasks.
- Configurations with two ALS crew members performed the tasks quicker than with one ALS responder in any configuration.
- For trauma, one ALS provider on the first-in unit was significant in completing the tasks more quickly.

“I think this is really important and has a lot of implications for EMS on the best crew configurations,” Mears said. “We have a shortage of paramedics, and this shows where you put those paramedics can make a big difference.”

“This time-to-task study should provide some data to help departments and communities make data-based decisions,” McAdams said. “It should help us say, ‘This is what we can do; if you want us to do more, these are the resources we must have.’” ■

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