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Delivering on the Data

More than 10 years in, where does NEMSIS stand?

By Jenifer Goodwin, associate editor

About five years ago, with evidence mounting that capnography was an important tool for EMS in determining if patients were properly ventilated, Leon County EMS's medical director wrote a protocol for using the capnography equipment found in each of the agency's ambulances. "We had assumed that since we wrote a policy, of course everybody was following it," says Mac Kemp, deputy chief of operations. "But you know the saying, 'It's not what you expect, it's what you inspect.'"

To determine adherence to the protocol, Kemp turned to the state EMS database, the EMS Tracking and Reporting System, or EMSTARS, which collects data based on the National EMS Information System (NEMSIS) standard. With the help of a report generated by the Florida Bureau of Emergency Medical Oversight (the state EMS office), Kemp learned that responders were using capnography when it was called for only about 70 percent of the time.

The report also included a comparison with other agencies that had a similar call volume, geographic area and population. Although Leon County was doing fine comparatively, they were still far below where they wanted to be—and after providing additional capnography education and training for their staff, their protocol compliance quickly rose to 94 percent. "With data being so new in EMS, there are really very few benchmarks for EMS performance out there. We are doing this by the seat of our pants and have been for years," Kemp says. "Now, for the first time, we have some solid data that we can compare ourselves against."

Launched in 2002 as a joint project of the National Association of State EMS Officials (NASEMSO) and the National Highway Traffic Safety Administration (NHTSA), NEMSIS is a standardized system of collecting, storing and sharing EMS patient care data at the local, state and national level. The goal is to use the information to help evaluate and improve EMS systems, and to provide evidence that the resources spent on EMS make a difference for patients, says N. Clay Mann, Ph.D., a professor and associate director for research at the University of Utah School of Medicine, home to the NEMSIS Technical Assistance Center. "The purpose of NEMSIS is to have a standardized approach to the collection of clinical and EMS resource information across the country, which allows for the ability to assess resources and to benchmark clinical performance across the state and nationally," says Mann.

Yet getting EMS agencies and states—not to mention dozens of EMS software vendors—on board and compliant with the NEMSIS standards has been a long and arduous process. Early on, NEMSIS supporters had to overcome skepticism within EMS that submitting data might reveal competitive secrets or cast agencies in a negative light. Protecting patient privacy was also a concern, Mann says, and states had to make sure they abided by or even changed regulations that prohibited or made it difficult to share EMS response and patient information. "When we first started, there was a lot of political distrust," Mann says. "It was, What are you going to do with this data? But I think we've proven ourselves over a period of time."

Today, more than 3,800 EMS agencies in 39 states and territories submit data to their state NEMSIS databases, a subset of which is then pushed to the national database.

Through the widespread adoption of the NEMSIS standard and the commitment among individual EMS providers to participate in building the state and national databases, EMS is showing that it can adapt to new health care realities—such as the move away from fee for service and toward pay for performance, and the need to easily share patient information to avoid redundancies and improve efficiency, experts say. "When you compare it to hospitals, clinics and other health care sectors, EMS is actually more electronic and more digital than they are at this point," says Greg Mears, M.D., principal investigator for NEMSIS when he was director of the EMS Performance Improvement Center at the University of North Carolina at Chapel Hill. "In many ways we are ahead of the game."

Just as important as building state and national databases is the way in which individual EMS agencies are starting to use the data to improve their own service, says Drew Dawson, director of NHTSA's Office of EMS. More and more often, state EMS officers, as well as Mann and his team at the Technical Assistance Center, are getting requests from local EMS agencies to supply benchmarking reports about specific aspects of EMS performance statewide and by agencies' service area size, call volume and population served.

"We talk a lot about how NEMSIS is important at the national level. But first and foremost, it's intended to be useful to the local EMS

provider and medical director,” Dawson says. “It’s medical legal documentation of the quality of care they provided. It provides opportunities for improving that care and to demonstrate to their funders about how they are doing—the number of calls they’re responding to, the types of calls and the quality of care they are administering.”

Overcoming hurdles

Yet all involved with NEMSIS agree: It’s still very much a work in progress. There’s more work to be done in building a truly national database—and in figuring out how to use the information to benefit EMS systems and their patients.

Among the hurdles: 23 states submit at least 95 percent of their EMS data, meaning they are capturing almost every EMS call in their state and reporting it to their state database, says Susan McHenry, a NHTSA EMS specialist. But that leaves 11 states that aren’t yet participating, and 16 states that are contributing only partial data, Florida among them.

Yet with more than 7 million records, Florida’s EMSTARS is the largest contributor to the national database. Submitting data is voluntary, however, and only 55 percent of EMS agencies—representing 66 percent of the state’s call volume—contribute, says Steve McCoy, quality control administrator for the Florida Bureau of Emergency Medical Oversight in Tallahassee.

McCoy was thrilled when one of the state’s largest agencies, Sunstar Paramedics in Pinellas County, recently came on board. But Miami-Dade Fire Rescue, another major EMS provider in the state, remains a hold-out. According to Michelle Fayed, a Miami-Dade Fire Rescue firefighter/public information officer, the agency is working to resolve security and patient privacy issues and has set a target of 2015 for submitting its data to NEMSIS. “When you have a massive department like ours, we are just trying to cover our bases,” Fayed says.

Timeliness is another issue. Two states—Utah and Pennsylvania—submit data to NEMSIS daily, while Alabama provides data to NEMSIS every two hours. Other states supply their data quarterly. Mann would like to see all states submit data at least daily, which could enable them to use NEMSIS data to monitor EMS resource utilization during serious weather events, flu outbreaks or other large-scale incidents, Mann says.

In the states that are still not participating, some individual EMS agencies have said they’d like to contribute, “but we have elected not to receive data from regions or individual agencies until the state has decided to pass the data on to us,” Mann says. Among the states not yet participating, state EMS officials have cited political, technical and economic reasons. “Some states traditionally haven’t shared information statewide, and there’s reluctance to change,” he adds.

Yet even in states that don’t have a state NEMSIS database, individual agencies that have adopted NEMSIS-compliant software are seeing the benefits of standardized data collection, Dawson says. San Diego’s Beacon Project, spearheaded by James Dunford, M.D., medical director for the city of San Diego, is one example. The Beacon Project is a federally funded initiative that’s working to improve STEMI care, boost immunization rates and reduce unnecessary emergency department visits or imaging tests by quickly sharing medical information among providers, including EMS, McHenry says. Although California doesn’t have a state NEMSIS database, San Diego’s NEMSIS-compliant patient care system is making this exchange of information with hospitals and other health care providers feasible.

“We are consistently working toward getting the states to report more runs from their states into the national EMS database so we can move toward a nationally representative sample so NEMSIS becomes even more powerful than what it is right now,” Dawson says. “It’s not a quick process, but we think we’re moving toward that goal with pretty deliberate speed.”

In Florida, McCoy isn’t waiting for Miami-Dade Fire Rescue or any other nonparticipants to move forward with what he sees as the true potential of NEMSIS: providing a record of the continuum of care for patients, from EMS to hospitals and even on to rehabilitation centers. McCoy, with the help of his NEMSIS team at the state office—which includes an epidemiologist, a biostatistician and a geographical information system expert—has linked EMS patient records with hospital records and a state brain and spinal cord injury registry. He also hopes to have the EMS and hospital data linked with trauma center, rehab center and crash data from the state department of transportation within 18 months.

“When you are looking at NEMSIS data, you are looking at a very short piece of time for that patient,” McCoy says. “When you look at the whole picture, you can look at the whole continuum of care, which can tell you what that EMS system did for that patient and whether there were downstream cost savings.”

Next steps: putting data to work

Figuring out how to collect such massive amounts of information on a national scale, and persuading states and their respective EMS agencies to make the investment in participating, is a big enough task. But for NEMSIS, an even bigger question looms: Now that you’ve got the data, what do you do with it, and is the information collected useful?

Quietly, some have questioned if NEMSIS is going to live up to its potential and actually result in better patient care and a more efficient use of resources. “Whenever anyone starts talking about data, you really need to start with, what are you trying to accomplish? Abstract things like, We want to be able to do research isn’t specific enough to be able to do something that matters,” says Mike Taigman, general manager for American Medical Response in Ventura County, Calif., and a member of the leadership team for AMR’s national clinical improvement collaborative. Without clearly thinking of the questions you want answered in advance, it’s easy to realize too late that the way the data was defined, collected or managed doesn’t really provide the information you need to draw any conclusions, he says.

Those concerns aren’t lost on Mears. “The type of information you collect to document an event is different from the information you need to really analyze an event,” he says.

To address those issues, NEMSIS recently released an updated version of the data dictionary (Version 3.0), which gets even more granular on providing data for time-sensitive calls. “Version 3 takes the Version 2 data set and expands it with an attempt to improve our ability to assess EMS clinical performance,” Mann says. For example, Version 2 asks providers to supply additional information about

ability to assess EMS clinical performance, Mann says. For example, version 3 asks providers to supply additional information about trauma patients, such as the mechanism of injury, the type of injury and the type of hospital patients were taken to, to determine if EMS providers followed the Centers for Disease Control and Prevention's Trauma Triage guidelines, with the ultimate goal of determining if those guidelines are working.

Another example: Version 2 asked providers if they gave aspirin to chest pain patients. Answering no was non-compliant with the current guidelines, says McHenry. Version 3 allows for an explanation of why aspirin wasn't given. For example, providers might indicate that it was given by a family member prior to arrival or contraindicated for another reason. "We've learned that there are some things we can do to improve the flexibility and the reliability of the data," McHenry says.

As health care moves to a pay-for-performance model, having comprehensive information about EMS will be critical in making a case that properly compensating EMS matters to patients and to system efficiency. "If there is ever going to be a change in reimbursement policy in this country, there is going to have to be some really good, solid info that supports a need for that change," McHenry says. "There are a number of areas of the country working with community paramedicine and doing some creative things with care in their community. But until we can sufficiently document that it makes a difference, it will be really difficult to change reimbursement policies at a national level."

Even in the absence of major changes to the way EMS operates, the impact of NEMSIS is starting to be measured in smaller ways. In Leon County, since their capnography analysis, Kemp has also turned to NEMSIS for an analysis of their use of lights and sirens to see if their rate fell within the norm for similarly sized agencies. (It did.) "I've been in EMS 37 years. This is the most important project EMS has ever participated in," Kemp says. "The data is going to lead us in new directions. We are going from anecdotal reasons why we treat patients

to scientific facts, and that's a huge leap for prehospital care."