# AHA Spearheads STEMI Response Initiative

*The association is aiming to create a basic response system that can be tailored to different regions.*

BY MICHELE G. SULLIVAN
*Mid-Atlantic Bureau*

A community-based push to create standardized response systems could decrease mortality and streamline acute care for patients suffering an ST-elevation myocardial infarction.

The American Heart Association's ambitious "Mission: Lifeline" program will go far beyond past efforts at improving treatment times through public outreach and education, Dr. Alice Jacobs said during a press conference. "Regrettably, prior public awareness campaigns and community-based interventions have not yet been effective in reducing the time from symptom onset to first medical contact, or in increasing the number of patients who use emergency medical services [EMS] to get to hospitals where they can receive the appropriate care. We must have a system in place that will do this."

The need for systematic reform, beginning with patient education and continuing through emergency response and hospital systems, is sadly obvious, she said. "Despite the proven benefits of quickly restoring blood flow to the heart muscle during a heart attack, 30% of STEMI patients do not receive any reperfusion therapy," neither fibrinolytics nor primary percutaneous coronary intervention (PCI), said Dr. Jacobs, director of the cardiac catheterization lab at Boston Medical Center. "And only 50% of those who get fibrinolytics and 40% of those who undergo PCI do so within the recommended time frames."

Last year, the AHA convened a conference to devise an organized method of addressing these issues. The group's recommendations are published in the journal Circulation (DOI:10.1161/CIRCULATIONAHA.107.184043).

The ideal system would combine several key elements, she said.

► **Public education.** "We must start with patient education," Dr. Jacobs said. "People need to understand the signs and symptoms of a heart attack, and the importance of activating the EMS system as quickly as possible." Half of STEMI patients drive themselves to the hospital or get a ride from family or friends, "resulting in a delay of the treatment that EMS could provide.

► **Improving EMS diagnosis of STEMI.** "In the ideal scenario, the cath lab would be activated by EMS from the field, or by the emergency physician from the hospital, and the patient would be brought directly to the cath lab without wasting time in the emergency room," Dr. Jacobs said. "If EMS systems have the personnel, training, and appropriate resources, they can acquire, interpret, and transmit 12-lead electrocardiograms that can show the patient is having a STEMI heart attack."

► **Quick, efficient transfer to hospitals equipped with cardiac catheterization teams.** The majority of STEMI patients go to hospitals without on-site primary PCI capabilities, Dr. Jacobs said. Unfortunately, transfer delays are all too common. "Transfers are often a matter of the patient waiting for the next available ambulance. Under this system, patients transported to a non–PCI-capable hospital would remain on the stretcher with EMS personnel in attendance until the decision is made about whether to transport to a PCI-capable receiving hospital, which is always available and never on diversion, 24 hours a day, and 7 days a week."

► **Hospital incentives and certification.** "We will be working with payers and policy makers to ensure that mechanisms are in place for appropriate reimbursement," Dr. Jacobs said. This may eventually translate into one treatment fee that is split between the transporting, referring, and receiving organizations. A STEMI Center Certification program will establish treatment and accountability protocols for both referring and receiving hospitals.

Achieving these goals won't be quick or easy, said Dr. Raymond Gibbons, president of the American Heart Association. Stakeholders on every level—from patients in the community to local hospitals, legislators, insurance companies, and the federal government—will have to cooperate before Mission: Lifeline can become a reality.

The AHA will play a pivotal role in bringing these parties together, Dr. Gibbons said, beginning with an assessment of EMS effectiveness for STEMI patients. The AHA will use this information to construct a basic response system that can be tailored to different regions. The group will also convene meetings at the state and local levels to identify ways to implement the system, and to evaluate pilot programs.

Funding these systems, Dr. Gibbons said, will be largely left to localities. AHA will provide support in seeking the money necessary for implementation—industry grants, for example—but the group won't be contributing financially to any individual project.

"As an example, there may be a need to purchase the 12-lead equipment and train EMS staff," Dr. Gibbons said. "The AHA can look for mechanisms to support that. In the past, we have placed automatic external defibrillators with first-responder units by advocating for state grants or donor support. We're confident that similar tactics can be employed with Mission: Lifeline."

A few AHA-led pilot programs are already underway, Dr. Gibbons noted. A 2004 grant from The Annenberg Foundation made it possible for Los Angeles to create a response system that relies on 12-lead ECG readings by EMS providers. The AHA Greater Southeast Affiliate has convened a state-level STEMI task force and helped introduce a legislative bill to develop emergency angioplasty centers for STEMI patients. And in Texas, a task force met in January to discuss ways to more effectively manage STEMI patients.

Although establishing such a response system is an enormous challenge, the payoff is just as big, said Dr. Tim Henry, interventional cardiologist and director of research at the Minneapolis Heart Institute. Four years ago, the facility instituted a two-pronged standardized care system for STEMI patients based on their distance from a regional PCI-capable facility.

Outcomes have been very good, he said. "The in-hospital mortality for these patients is now 4%, even with 15% of them being older than 80 years. And close to 98% are getting appropriate adjunctive medication, which increases long-term survival. ... It proves that you can indeed develop these regional systems that will improve outcomes." ■

# Consider Vasculitis as a Differential in the Systemically Unwell

BY DAMIAN McNAMARA
*Miami Bureau*

BIRMINGHAM, ENGLAND — An examination of the systemically unwell patient should include screening for generalized vasculitis, a rare but sometimes life-threatening condition, according to a presentation at the annual meeting of the British Society of Rheumatology.

"Systemic vasculitis is a challenging diagnosis. It may require rapid action, so exclude other diagnoses as quickly as possible," Dr. Richard A. Watts said. "It may require treatment without a complete data set," he added. Vasculitis with renal involvement, in particular, can progress very quickly.

Assess organ involvement and classify the type of vasculitis as accurately as possible, said Dr. Watts, of the Ipswich (England) Hospital. The spectrum of vasculitis is very broad, from a minor rash with no organ involvement to a fulminating, life-threatening disease. Although vasculitis is rare, "it must be considered in severe multisystem disease." Dr. Watts cited a 45-year-old male teacher, unwell for 3 months, who presented to the emergency department with low-grade fever, myalgia, arthralgia, and recent weight loss. Physical exam revealed he was pyrexial with a temperature of 38° C (100° F), and an inconsistent faint systolic murmur. He was diagnosed with infective endocarditis and treated with antibiotics. Echocardiography was normal, indicating no significant structural abnormality. Blood cultures also were normal. The patient continued to worsen, so his antibiotics were changed. After 1 week in the hospital, the patient developed foot drop and red eye, and rheumatology was consulted.

The patient had nasal stuffiness, epistaxis, a lower-extremity rash, and poor vision in his left eye. A diagnosis of vasculitis was considered. The rheumatologist ordered a renal biopsy and a consultation with ophthalmology and neurology. The patient had a rapid response to prednisolone and cyclophosphamide, and a renal biopsy showed focal segmental necrotizing glomerulonephritis. He tested positive for antineutrophil cytoplasmic antibody (ANCA), ANCA with a cytoplasmic staining pattern (c-ANCA), and proteinase 3. Wegener's granulomatosis was the ultimate diagnosis. "He died last year after a relapse," Dr. Watts said.

In a second case, a 38-year-old steel erector presented reporting 4 days of epigastric pain, shortness of breath, and vomiting. He also described recent weight loss and flulike symptoms that persisted for 3 weeks, including headache, malaise, and myalgia. The patient was admitted under the care of surgeons and given medications including amoxicillin and tramadol. He had an elevated alanine aminotransferase (ALT) level of 45 U/L. Abdominal ultrasound did not yield any specific findings. On days 4 and 5, he developed a macular and erythematous rash on the left palm and right buttock, as well as diarrhea.

Rheumatology was consulted on day 6. The rheumatologist noted a pruritic rash, malaise, sore throat, and conjunctivitis. Mouth ulcers, some joint pain, and headache were other symptoms. Renal function was normal. A CT scan of the patient's abdomen revealed a thickened bowel wall indicative of vasculitis, Dr. Watts said. A renal biopsy revealed acute interstitial nephritis. He developed hemoptysis after about 1 week. Vasculitis was seen in only one artery, however. The patient continued IV methylprednisolone and was transferred for plasmapheresis. His respiratory function then deteriorated. "He had a massive pulmonary hemorrhage and died. This case illustrates the need for rapid diagnosis," Dr. Watts said.

"The key [to such cases] is to take a good history, asking for suggestive symptoms," Dr. Watts said. Malaise, fever, weight loss, arthralgia, and myalgia are general symptoms. Dermatologic symptoms include purpura, ulcers, and infarctions of the skin. Otolaryngology signs include epistaxis, crusting, sinusitis, and deafness. Gastrointestinal symptoms include mouth ulcers, abdominal pain, and diarrhea. Sensory and/or motor impairment can also occur, he added.

The next step is to assess the level of inflammation, Dr. Watts said. Order a complete blood count and differential white cell count. Look beyond the neutrophil count for eosinophilia or lymphopenia, he suggested. An acute phase response will feature elevated erythrocyte sedimentation rate (ESR) and C-reactive protein levels. Also order a viral screen and a cryoglobulins assay, Dr. Watts said. "We are always worried about infection" in the differential diagnosis, and urinalysis is critical, Dr. Watts said. Hematuria or proteinuria can signal renal involvement, and renal dysfunction, as noted earlier, can progress very rapidly. ■

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