

ER protocols needed for treating cardiac patients—STAT

Every year, half a million Americans die of heart attacks,¹ making acute myocardial infarction the number 1 health problem in the United States. Fortunately, half of these deaths can be prevented by accelerating our efforts in re-educating patients, nurses, emergency department physicians, and other healthcare professionals who treat patients with myocardial infarction. The goal is to develop a team approach so that patients who come to the emergency department are treated with the same urgency as major trauma victims.

In June 1991, the National Heart, Lung, and Blood Institute addressed this problem with a major re-education effort. Specifically, experts from 39 national scientific and professional organizations were recruited to develop the National Heart Attack Alert Program (NHAAP). These experts had an interest in the early identification and treatment of acute myocardial infarction and the prevention of sudden cardiac death. The coordinating committee first published its recommendations in September 1993.² The resulting booklet represents the first national effort to influence the practice patterns of physicians who treat patients with myocardial infarction.

Specifically, the booklet examines the emergency department's contributions in treating these patients and challenges emergency department physicians to "strive to treat all acute myocardial infarction patients within 30 minutes of arrival."²

The scientific basis for early treatment of myocardial infarction is well established. As early as 1986, the Gruppo Italiano per lo Studio della Streptochinasi nell'Infarto (GISSI) Miocardioco trial³ found a startling reduction (47%) in mortality in patients who were treated with intravenous streptokinase within 1 hour of the onset of chest pain. More recently, the Global Utilization of Streptokinase and Tissue Plasminogen Activator for Occluded Arteries (GUSTO I) trial⁴ and the Myocardial Infarction Triage and Intervention (MITI II) project⁵

have shown absolutely a survival advantage of 50% among patients treated with thrombolytic agents within the "golden 1-hour window."

These trials have also uncovered our shortcomings as physicians in treating patients on a timely basis. Only 3% of the patients in the TIMI II trial,⁶ 2.6% in the GUSTO I trial, and less than 11% of patients in the GISSI I trials were treated within the first hour of having chest pains. These trials also demonstrate a clear prejudice against the elderly. Only 33% of the patients with myocardial infarction who come to the emergency department for treatment receive thrombolytic therapy. However, less than 5% of these patients are aged 75 years or older.⁵ The data are interesting in light of the GUSTO I data, which found that older patients benefit the most from thrombolytic therapy.

The American Heart Association recommends that all patients who are eligible to receive thrombolytic therapy be treated within 30 to 60 minutes of arrival to the emergency department. The NHAAP coordinating committee supports this goal but strongly advocates initiation of thrombolytic therapy within the first 30 minutes.

The only way to achieve this goal is for all emergency departments in the United States to develop guidelines, protocols, or critical pathways for the treatment of acute myocardial infarction. With that in mind, the NHAAP has identified four critical stages through which all patients with acute myocardial infarction must pass.² Dubbed the "4 Ds," the critical pathway includes:

- *Door* represents the time delay from the patient's arrival at the emergency department to undergoing the initial electrocardiogram (ECG). The two most important components at this stage are proper triage and obtaining the ECG. The NHAAP guidelines list specific steps to follow to obtain a focused history and to assess the patient's chest pain. The *doorkeeper* is the emergency department triage nurse, who should be well versed in

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risk stratification protocols for patients with chest pain. Heaviness, indigestion, shortness of breath, weakness, or loss of consciousness should be addressed immediately. This immediacy is especially necessary if the patient has a history of known coronary artery disease (myocardial infarction, angina, coronary artery bypass graft, percutaneous transluminal coronary angioplasty), or diabetes mellitus. Diabetic patients often have atypical symptoms and should raise a "red flag" to all triage nurses. Triage ends with the order for an ECG—STAT.

■ *Data* is the second step, with the ECG being the most important of data. The NHAAP describes minimal recommendations for the ECG. Specifically, ECG technicians should be available in the emergency department within 5 minutes of paging. The NHAAP guidelines strongly recommend that the emergency department has its own ECG machine and that emergency department nurses be trained to record 12-lead ECGs and recognize ECG changes of acute myocardial infarction. The time that the ECG is taken should also be recorded.

■ *Decision* to treat represents the greatest delay in the treatment of patients with acute myocardial infarction.⁷ Several factors are responsible for this delay. They include the difficulty in interpreting the ECG, concern about complications of thrombolytic therapy, and the necessity for a consultation with a cardiologist. In fact, cardiac consultations are responsible for the greatest delay, creating a full 15-minute delay.⁴ Therefore, the NHAAP recommends that protocols be developed so that emergency department physicians are vested with the authority and responsibility to initiate thrombolytic therapy in all patients with myocardial infarction who are eligible for treatment with thrombolytic agents. Communication with cardiologists by way of telephone and telefaxing of ECGs can facilitate this process.

■ *Drugs*, namely, thrombolytic agents (tissue plasminogen activator, streptokinase) should be kept and administered in the emergency department. Today, no rational exists for delaying treatment until the patient arrives

at the critical care unit or until blood is drawn and tests are run. Arterial blood gases should not be measured in patients with acute myocardial infarction, and procedures, such as subclavian vein catheterizations, should be avoided. Administration of other medications (aspirin, heparin, nitrates, β -blockers) are not as time-dependent as thrombolytic agents; nonetheless, such therapy should also be started in the emergency department. The patient should always be informed of the risks (including stroke), benefits, and alternatives to thrombolytic therapy.

Remember, the goal is "Door-to-Needle-Time" within 30 minutes. To reach this goal, we *must* develop protocols that effectively coordinate the efforts of emergency department physicians, nurses, internists, and cardiologists. In short, teamwork lies at the heart of success. Without it, the patient could miss the biggest goal of all—life. ♦

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References

1. *Morbidity and Mortality: Chart Book on Cardiovascular, Lung and Blood Diseases*. Bethesda, Md, National Heart, Lung and Blood Institute, National Institutes of Health, US Department of Health and Human Services, Public Health Service, January 1992.
2. *Emergency Department: Rapid Identification and Treatment of Patients With Acute Myocardial Infarction*. National Heart, Lung and Blood Institute, US Department of Health and Human Services, NIH 93-3278, September 1993.
3. Effectiveness of intravenous thrombolytic treatment in acute myocardial infarction. Gruppo Italiano per lo studio della streptochinasi nell' Infarto Miocardico (GISSI): *Lancet* 1986;1:397-401.
4. The GUSTO Investigators: An international randomized trial comparing four thrombolytic strategies for acute myocardial infarction. *N Engl J Med* 1993;329:673-682.
5. Weaver WD, Cerqueria M, Hallstrom AP, et al: Prehospital intervention vs hospital-initiated thrombolytic therapy: The Myocardial Infarction Triage and Intervention Trial. *JAMA* 1993;270:1211-1216.
6. The Thrombolysis in Myocardial Infarction Study Group: Comparison of invasive and conservative strategies after treatment with intravenous tissue plasminogen activator in acute myocardial infarction: Results of Thrombolysis in Myocardial Infarction phase II trial. The TIMI Study Group. *N Engl J Med* 1989;320:618-627.
7. Kline EM, Smith DD, Martin JS, et al: In-hospital treatment delays in patients treated with thrombolytic therapy: A report of the GUSTO Time-to-Treatment Substudy. *Circulation* 1992; 86 (4 Suppl 1):702.