

Mayo Clinic Newsletter

Monday, March 26, 2007

Mayo Clinic Says New Process to Treat Heart Patients Quickly Saves Lives, Heart Damage

NEW ORLEANS -- Mayo Clinic has designed a new system to speed critical care to acute heart attack patients that dramatically reduces the time that elapses before patients undergo a life-saving procedure -- by as much as 45 percent in some cases. This rapid response -- dubbed by Mayo Clinic as the FAST TRACK protocol -- saves both heart muscle and patient lives. Mayo researchers will report their results on March 26 at American College of Cardiology's 56th Annual Scientific Session

The most serious type of heart attack is known as an ST-elevation myocardial infarction -- STEMI for short. In a STEMI, critical arteries supplying the heart with blood are blocked. Previous studies have shown that the best treatment for STEMI patients is to open the blocked artery by inflating a balloon at the blockage site within 90 minutes of arriving at a hospital that has emergency angioplasty services. The 90-minute window is called door-to-balloon time. The shorter the door-to-balloon time, the greater the chance of survival, studies show.

In 2003, physicians at Mayo Clinic recognized the urgent need to expedite care for STEMI patients, says Henry Ting, M.D., the lead author and a cardiologist at Mayo Clinic who coordinates quality improvement efforts for cardiology services.

At that time, patients with STEMI arriving at Saint Marys Hospital on the Rochester Mayo Clinic campus had an average door-to-balloon time of 98 minutes. Even more concerning is the fact that STEMI patients who first reported to an outlying regional community hospital and then transferred to

Saint Marys Hospital in Rochester had an average door-to-balloon time of 202 minutes.

"We knew we could do better -- and save more lives in the process. And the tremendous team effort of caregivers this required proved us right," Dr. Ting says. "Mayo's new FAST TRACK STEMI protocol dramatically reduced the time that elapsed from hospital arrival to balloon procedure -- nearly halving the time in the case of transfer patients arriving from regional hospitals to Saint Marys Hospital."

The study shows that Mayo Clinic treated 597 consecutive patients from May 2004 to December 2006. Data were logged for two patient groups: those presenting to the hospital in Rochester and those who reported first to a regional hospital -- sometimes as much as 150 miles away -- and then transferred to Saint Marys Hospital. For patients nearest Saint Marys Hospital, the median door-to-balloon time was improved by almost 30 minutes, decreasing by 31 percent, from 98 to 69 minutes. For farther-out patients from one of the 28 regional community hospitals who required transfer to Saint Marys Hospital, the median first door-to-balloon time improved by almost 90 minutes -- a 45 percent decrease, from 202 minutes to 116 minutes.

"In cardiac emergencies, time is heart muscle -- the more treatment is delayed, the more the heart suffers," Dr. Ting says. "This is why time is the most important tangible measure of quality for caregivers to optimize in order to save more lives in patients presenting with STEMI."

Mayo's system of care to speed the process of taking care of these critically ill heart patients includes these key elements:

- Single-call instant alert to the care team. For patients arriving at Saint Marys Hospital, emergency room physicians can directly activate the catheterization lab team, without review of the case or approval by a cardiologist, by calling a single automated phone number that sends a simultaneous pager alert to all catheterization staff who are on-call days, evenings, nights, weekends and holidays.

- Electrocardiogram within five minutes of arrival to the ER. Patients with symptoms suggestive of heart attack who arrive at Saint Marys Hospital or one of the 28 regional hospital emergency departments in Minnesota, Iowa and Wisconsin receive within five minutes an electrocardiogram, a test that quickly identifies a STEMI.
- Direct line of communication to all care team principals. For patients arriving at regional hospitals, emergency room physicians can call one single phone number to speak immediately with an on-call cardiologist and simultaneously activate the catheterization lab staff and the air ambulance transport team at Saint Marys Hospital.
- Rapid loading by air ambulance. The air ambulance transport team developed an innovative "hot load" procedure where the helicopter engine is left on and the time to pick up a patient from landing to take-off is less than 10 minutes -- similar to a MASH unit.
 - 24/7 readiness. The Mayo system was designed to provide this expedited care to achieve the best door-to-balloon time during regular hours -- as well as during off-hours on weekdays, weekends and holidays.

Before 2004, there were several delays in care of STEMI patients. These were due to processes for evaluation and various procedures required to activate the catheterization lab, Dr. Ting says. "These previous systems had been part of our health care delivery system for several decades, and it really took a team effort from highly committed physicians, nurses, technicians in the emergency room, cardiology, cath lab staff and medical transport crew members to redesign an entirely new system of care," he says. "It's been worth it, because we are delivering the best care -- opening a blocked artery -- faster and saving more lives. We also are actively sharing our learning and innovations to improve the system of care at all our hospitals in the Mayo System, including Mayo Clinic Arizona, Mayo Clinic Jacksonville and Mayo Health System, as well as collaborating with the American College of Cardiology on the national door-to-balloon quality initiative. Our solutions are simple and easy to disseminate and replicate for other health care systems in the United States."

Co-authors of the study are Luis Haro, M.D.; Bernard Gersh, M.B.Ch.B.; Christine Bjerke; Choon-Chern Lim; Ryan Lennon; John Bresnahan, M.D.; Allan Jaffe, M.D.; David Holmes, M.D.; Malcolm Bell, M.D.; and Charanjit Rihal, M.D.

Outcomes that Matter: Quality Health Care Improvements Save Lives

Today much is being written about quality in health care, and the need to improve what we do and how we do it. A number of organizations, including the government, have been measuring physicians and hospitals to determine if their performance is the very best it can be.

This has led to a number of pay-for-performance projects sponsored by government purchasers such as Medicare and Medicaid; large employers who purchase health care for their employees; and health care coalitions. In these projects, providers are paid for doing very specific things for patients in a very specific way, with an emphasis on the processes of care. Recently, Denis Cortese, M.D., president and CEO of Mayo Clinic, and Robert Smoldt, the clinic's chief administrative officer, explored this phenomenon in a commentary they published in Mayo Clinic Proceedings, entitled Pay-for-Performance or Pay for Value? They emphasize that it's patient outcomes -- not process -- that should be the focus of quality improvement efforts.

"Most of these incentive programs target a mix of process and structural measures with less emphasis on patient satisfaction and overall patient outcomes. Programs have varying payment approaches, but quality bonuses are most common. In this scenario, payers give physicians and medical institutions an annual 'bonus' or percentage for meeting a goal (such as prescribing aspirin at discharge after an acute myocardial infarction) or withhold a small percentage of payment until requirements are met.

Mayo Clinic recently hosted its first National Symposium on Health Care Reform, at which 300 national leaders convened and reached consensus on the direction that reform must take. Two of the key recommendations dealt with value. Participants agreed that the health care system needs to deliver value to all stakeholders and that payment should be based on results of coordinated care delivered over time.

We must move away from pay-for-performance approaches that reward process achievement and move toward paying for value. Patients want health care that is a good value -- high-quality health care (good outcomes, safe care, and great service) at a reasonable price."

This value equation would move away from the current emphasis on processes and focus instead on patient outcomes. Improving processes of care is still important, but making sure that the processes result in improved care for patients will result in increased value and increased patient satisfaction.

$$\text{VALUE} = \frac{\text{QUALITY (outcomes of care, safety, service)}}{\text{COST PER PATIENT OVER TIME}}$$

An example of this is Mayo Clinic's STEMI project: a time-shaving approach to help more patients survive the most serious heart attacks.

The goal: Streamline care so time elapsed from when a patient enters the emergency department door to the moment a tiny balloon opens a blocked artery in the cardiac catheterization laboratory -- balloon angioplasty -- is 90 minutes or less. Few hospitals (less than 40 percent for non-transferred patients and less than 5 percent for transferred patients) meet this objective. The approach is dubbed door-to-balloon (D2B) time. The American College of Cardiology in collaboration with the American Heart Association and other organizations launched a national campaign to improve D2B times in 2006.

Mayo Clinic began its initiative in 2004, according to Henry Ting, M.D., the Mayo cardiologist who headed the multidisciplinary team effort. In two years, the median D2B time decreased from 92 minutes to 60 minutes for patients who come to Saint Marys Hospital in Rochester.

This quicker response saves the lives of patients with ST-elevation myocardial infarction (STEMI), a type of heart attack with total blockage of an artery (about 20 percent of all heart attacks). "Every 30-minute delay before opening the artery increases relative mortality by 8 percent," says Dr. Ting. "For these patients, time is muscle damage, time is cell death, and every minute counts."

Dr. Ting's team also focused on improving results regionally. "Even with our efforts here, we weren't helping most of the people in the region," says Dr. Ting. That's because most community hospitals, where patients go first, aren't equipped to perform balloon angioplasties.

The solution was Fast Track for Heart Attack. Mayo Clinic coordinates with 28 regional hospitals within 200 miles. When a patient's electrocardiogram indicates a STEMI, the Fast Track protocol kicks in. The community hospital starts the right medications and activates the Fast Track with a single phone call. The air ambulance transport and preparations for an angioplasty procedure in Rochester are set in motion.

The median D2B time within 200 miles of Mayo Clinic is 108 minutes, compared to 180 minutes nationally. Sixty of the 108 minutes are to transport the patient to Rochester via helicopter.

"STEMIs are one of the true medical emergencies," says Dr. Ting. "By streamlining the care, we've been able to dramatically improve outcomes."