

Rural Healthcare **Quality** Network

Hospital Peer Alert

August 2008

Hospital Peer Review is a monthly newsletter sponsored by the Rural Healthcare Quality Network to alert Critical Access Hospitals regarding findings from the Peer Review Program. Summarized are a few of the key findings and best practices that would be helpful for other critical access hospitals to be knowledgeable about. This newsletter is edited by Myron Bloom, Medical Director and he can be reached at drmbloom@msn.com.

Save Minutes, Save Muscle

“STEMI patients presenting to a hospital without PCI capability, and who cannot be transferred to a PCI center and undergo PCI within 90 min of first medical contact, should be treated with fibrinolytic therapy within 30 min of hospital presentation as a systems goal, unless fibrinolytic therapy is contraindicated.”

Note **“medical contact”** is defined as the “time of EMS arrival on scene” after the patient calls EMS/9-1-1 or the “time of arrival at the emergency department door” (whether PCI-capable or non-PCI-capable hospital) when the patient self-transport.

American College of Cardiology

In an acute ST elevation myocardial infarction (STEMI) saving minutes saves muscle reducing mortality and improving quality and duration of life. Irrespective of which reperfusion strategy is chosen, be it thrombolytic or Primary Percutaneous Intervention (PPCI) time consciousness counts.

Generally PPCI is preferred with a 2 to 3% mortality benefit over lytics, but it is critically time dependent to save that advantage. Thrombolytic is almost as good at saving lives but only accomplishes adequate reperfusion in two thirds of the cases and has greater risk of re-thrombosis as well as bleeding; but with the advantage of being deliverable by paramedics in the field or at a rural non PCI capable hospital. In either strategy, time counts.

Two salient papers were published in 2006 addressing PPCI times and mortality in the Journal of the American College of Cardiology. In January, an analysis of 2300 consecutive cases at one PCI center showed a mortality of 4.9% if PPCI was accomplished by 90 minutes, 6.1% if by 120 minutes, 8% if by 180 and over 12% if over 180 minutes. Another paper in June, was the analysis of over 29,000 Swedish STEMI cases presenting within 6 hrs of symptom onset and taken to PPCI showing a mean door to balloon time of 102 minutes with an inpatient mortality of 4.5%. The mortality ranged from 3% for cases performed by 90 minutes to 7.5% for cases that took more than 150 minutes. By their calculations, the odds ratio for inpatient mortality rose 8% for each half hour delay in D2B time regardless of duration of symptoms prior to presentation. Consistent findings showing that time delay increases mortality.

In the August 2007 issue of Circulation, two different reperfusion protocols for rural STEMI patients based on time were published. The Mayo protocol stratified rural patients by duration of symptoms: patients presenting with chest pain of less than three hours were immediately given

thrombolytic and had an in hospital mortality of 3.1%, while patients with more than three hours of symptoms were transferred for PPCI and had an in hospital mortality of 5.7%. Neighboring Abbott Northwest Minnesota Heart Hospital strategized patients by time to PPCI patients who could be delivered to the Cath Lab for PPCI within 90 minutes of symptom onset were immediately transferred, while those who could not make PPCI by 90 minutes were given a half dose of thrombolytic before being transferred. The combined in hospital mortality of the MHI strategy was 4.2% while the half dose lytic facilitated group had a 5.2% in hospital mortality. Until further studies are done, "facilitated PCI" or a "pharmaco-invasive" strategy is given a level 2b recommendation by the American College of Cardiology as compared to their one size fits all recommendation of Lytics within 30 minutes if PPCI cannot be accomplished within 90, which has a 1b recommendation.

The analysis in the October 2006 issue of Circulation of 192,000 STEMI cases by Pinto et al. suggests that for certain patients the benefits of PPCI are lost earlier (younger, symptoms less than two hours, anterior STEMI) while for others the benefit may extend to three hours additional delay in reperfusion (over 65, more than two hours of symptoms, non-anterior infarction – thrombo-resistant clot and higher risk of complications). So the simple "30 minute 90 minute" rule needs to be customized to the particulars of the case. Unless there are absolute contraindications to lytics, the controlling factor in picking a strategy is time - minimum time to transfer to a PCI capable facility. Knowing the least time of transfer given best conditions can allow the rural practitioner to predict the best option for the majority of cases (please see attached list of questions).

Unfortunately, the average time from symptom onset to presentation is three hours like it was 10 years ago and more than a third of STEMI patients do not get reperfused. Furthermore, less than 5% of the rural transfer for PPCI patients have it performed by 90 minutes (NRMI 5 mean time is 143 minutes). So there is much to do in educating the public and developing systems of cardiac care. The Spokane region has begun the process with a Level One Protocol.

Calling a "Cardiac Alert" to assemble resources and having a pre-printed protocol with a standard set of customizable orders will save minutes to diagnosis and initial therapy. Knowing the minimum time of transfer given current weather conditions will determine whether a PPCI strategy is an available option. Calling the cardiologist before calling for transport and initiating therapy wastes time and muscle. The choice between immediate lytics and PCI for reperfusion can then be made in consultation with cardiology in a timely fashion, or the rural practitioner may have to "pull the trigger" and make the decision asking forgiveness rather than waiting for permission if the clock is running out of time. Time is muscle.

Irrespective of which reperfusion strategy is chosen, the STEMI patient should be immediately transferred. When thrombolytics are given, they fail to reperfuse one third of the time and the patient may rethrombose. If the ST elevation is not more than 50% reduced by 90 minutes, the patient is a candidate for immediate "rescue" PCI. Therefore an emergent transfer strategy is necessary for all STEMI patients regardless of initial reperfusion strategy.

HOSPITAL DELAYS IN REPERFUSION FOR ST-ELEVATION MYOCARDIAL INFARCTION, IMPLICATIONS WHEN SELECTING A REPERFUSION STRATEGY, Pinto DS et al, Circulation. 2006; 114: 2019–2025

EFFECT OF DOOR-TO-BALLOON TIME ON MORTALITY IN PATIENTS WITH ST- SEGMENT ELEVATION MYOCARDIAL INFARCTION, J Am Coll Card June, 2006

DOOR-TO-BALLOON TIME WITH PRIMARY PERCUTANEOUS CORONARY INTERVENTION FOR ACUTE MYOCARDIAL INFARCTION IMPACTS LATE CARDIAC MORTALITY IN HIGH-RISK PATIENTS AND PATIENTS PRESENTING EARLY AFTER THE ONSET OF SYMPTOMS J Am Coll Card January, 2006

Questions for facilities that are not PPCI capable to expedite STEMI reperfusion therapy

Your Facility:

- Have you implemented a “Cardiac Alert” protocol to facilitate your evaluation and initial treatment of potential ACS patients by maximizing your available resources?
- What percentage of your chest pain (and chest pain equivalent) patients have an ECG performed and evaluated within 10 minutes of arrival? How can this be improved?
- Have you established a minimum default treatment recipe for all ACS patients with a customizable preprinted order set with prompts to ensure that all pertinent issues are addressed?

Transfer System Issues:

- What is the probable minimum time from arrival to departure at your facility for a STEMI patient? Do you monitor this? What delays can be identified and avoided?
- What ACLS providers provide cardiac transportation for your patients and how long does it take to assemble a team and for their arrival at your door?
- What is the minimum transfer time to each potential cardiac catheterization capable receiving facility by ground and/ or by air?
- What is the likely minimum total time from arrival at your facility to arrival at the receiving facility; a composite of your time spent in diagnosis and stabilization, waiting for departure and in transport to the referral hospital?

Referring Cardiology Centers:

- To whom do you refer acute coronary syndrome STEMI patients? Which physicians and what institutions? How meaningful and timely is the feedback received on cases transferred?
- How is the referral made? Whom do you call and how many calls are required? How can the referral / transfer process be streamlined and simplified?
- What is the expected cath lab arrival to balloon inflation time for your transferred patients? What is their average time currently and what are the percentages under 90 & 120 minutes? How does it change by time of day, day of week, and practitioner?

Patient Characteristics for choosing initial reperfusion strategy:

- How much time has elapsed since the onset of symptoms to presentation for care?
- What is the ECG suggested infarct location?
- What is the patient’s age?
- What is the patient’s coronary and renal history?
- Does the patient have contraindications to thrombolytic therapy?

The minimum reliable time of transfer and PPCI performance given the current transfer conditions will suggest a preferred initial reperfusion strategy (immediate thrombolytic or PPCI) for patients with different clinical characteristics (contraindications, time since onset of symptoms, age, infarct location).