

**Hospital Name:**  
Duke University Hospital

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2006 ED Volume: 65,000  
Growth from 2005: 6.5%  
Total Staffed Hospital Beds: 924  
Acute ED Beds: 54  
Fast Track: No  
Clinical Decision Unit: No

**Problem to be Resolved:**  
Need to reduce door-to-balloon  
time for heart attack patients

**Key Words:**

- Door-to-balloon time
- ECG Transmission

**Lessons Learned:**  
Duke University saw significant benefits in terms of a reduction in door-to-balloon time for heart attack patients, however they recognize that similar trials will be needed in more diverse settings to determine whether or not their successes can be replicated. To address this issue, Duke researchers have organized additional studies in various settings across the country.

In order for such a project to be successful, it is absolutely necessary to train the participating EMTs to be able to identify abnormalities indicating a heart attack.

**Reason for Change:**

The American College of Cardiology and American Heart Association recommend that a heart attack patient receive an artery-opening procedure within 90 minutes of arriving at the hospital in order to increase chances of survival for the patient. Nationwide, the actual average door-to-balloon time is closer to 100 minutes. Duke Clinical Research Institute set out to try to decrease the time for this life-saving procedure.

**Implementation:**

Duke University Hospital began a new study to determine whether or not they could reduce the door-to-balloon time for heart attack patients by utilizing technology to get a patient's ECG into the hands of a cardiologist faster. They began having specially-trained EMTs electronically transmit ECG tracings from the ambulance to a cardiologist's PDA. If the cardiologist identified signs of a heart attack in the ECG, he may mobilize the catheterization lab while the patient is still in transit to the hospital. This process saves time over the usual method, in which the catheterization lab is not mobilized until after the patient arrives at the ED and a heart attack has been identified.

**Results/Impact:**

To determine the effects of this new procedure, Duke researchers examined the results from 101 self-transported patients with a suspected STEMI, 24 ambulance patients with a suspected STEMI for whom a wireless ECG was successfully transmitted to a cardiologist, and 19 ambulance patients with a suspected STEMI for whom a wireless ECG transmission was not successful. Researchers found that, on average, the door-to-balloon time for self-transport patients was 96 minutes, 78 minutes for those whose ECG transmission failed, and only 50 minutes for those patients whose ECG was successfully transmitted.

Additionally, during the four year testing period, the number of potential heart attack patients who transported themselves to the ED decreased, as people became aware of the study and the fact that ambulance patients were receiving necessary treatment sooner.