



By  
Navin Nikam, M.D.  
Nik Nikam, M.D.

When someone feels some chest discomfort, the first reaction maybe that it is probably related to gas or something that person ate. It may also be related to a heart attack.

When someone is actually having a heart attack time is of the essence. Every minute you delay in getting the necessary medical help, there is ongoing damage to the heart muscle. The longer you wait the more damage there is to your heart muscle. The extent of heart muscle damage that you sustain during a heart attack determines your survival chances and resulting development of heart failure.

Almost 40% to 50% of the people who develop a heart attack do not make it to the hospital. They die either from severe heart muscle damage or a fatal heart arrhythmia. Among those who make it to the hospital, another 7% to 9% die in the hospital from complications related to a heart attack.

How can we minimize heart muscle damage, save lives, and improve quality of life following a heart attack? This involves a team approach from the public,

the EMS service, the hospitals, and the physicians involved in taking care of heart attack patients. Education, training, expedience, and appropriate application treatment options can reduce morbidity and mortality following a heart attack.

### ***What Causes Heart Attacks?***

Heart attack results from a total occlusion of a blood vessel supplying a region of a heart muscle. Initially, there is build-up of an atherosclerotic plaque (hardening of the arteries) that develops over decades. The final 5% to 10% of the blockage leading to a total occlusion results from a clot development due to slowing of circulation in that region, due to severe obstruction. When this total blockage goes untreated, there is complete damage to the heart muscle which is eventually replaced by a scar tissue (assuming that you survive the initial threat and seek timely medical help).

### ***What is the Urgency?***

As I mentioned at the beginning, it is of paramount importance to unclog the artery to restore the blood circulation with the hope of minimizing the heart muscle damage and improving survival. If we can unclog the artery within 60-90 minutes after the onset of a heart attack, we can reduce the in-hospital mortality from 7%-9% to around 2% to 3%. This underscores the urgency in seeking medical help, making prompt diagnosis, and immediate mechanical intervention in the

cardiac catheterization laboratory to unclog the artery within 90 minutes to preserve heart muscle and protect lives. That involves increased public awareness of the urgency and heart attack symptoms; and an emergency medical team (EMT) that understands the problem and transport a suspected heart attack patient to an appropriate facility that has a round-the-clock rapid response team to get the patient into the cardiac catheterization laboratory and unclog the artery.

### ***Public Education***

Not all chest pains mean a heart attack, but the ones that result from a heart attack need immediate attention. How can we tell the difference? Sometimes it is impossible to tell the difference without appropriate tests which can only be done in a hospital setting. Any sudden chest pain or discomfort that lasts more than ten minutes should be of concern and needs immediate attention. If you have associated sweating, dizziness, or weakness, you need help. Sometimes the pain could be in the epigastric area (just below the rib cage) which can be confusing. If you have similar symptoms or if you are not sure, the best advise is to get someone else to rush you to the nearest emergency center, preferably to one that is equipped to handle heart attack patients in an expeditious manner. These symptoms in a patient with previous heart disease should also signal urgency in seeking medical

help. If you cannot get someone to take you to a hospital, call 911.

### ***Emergency Medical Team***

As we understand and underscore the urgency in treating a heart attack patient, we need a knowledgeable and qualified emergency medical team (EMT) responding to 911 calls from chest pain patients. The EMT should be able to reach the site in a swift manner and diagnose the problem. The present-day technology can enable an EMT to get a 12 lead electrocardiograms on-site and send it to a hospital facility that has the rapid response team to handle such emergencies. The EMT also needs education in recognizing EKG abnormalities related to a heart attack and anticipate the immediate complications such as arrhythmias or drop in blood pressure. They need to have the resources to treat the patients until they arrive at a hospital facility. Also, the EMT needs to be familiar with facilities that have rapid response teams, including the routes- they have to take during peak and off-peak hours to transport heart attack patients in a timely manner. This involves the city management, the EMT, and the nearby hospitals to work in concert.

### ***Hospital Rapid Response Team***

It takes tremendous resources to create, establish, and manage a rapid response team to deal with heart attack patients year round. It involves informed emergency personnel, qualified cardiologists and cardiac

surgeons, a ready cardiac surgery team, and round the clock operational cardiac catheterization laboratory with trained people. It needs an administrative team that is willing to commit time, personnel, and finances to see that the system performs with laser-precision at all levels.

It involves a more synchronized team effort than a symphony orchestra. In a symphony, everything is choreographed, rehearsed, and etched on music sheets. And, above all you have a conductor to keep things in order and motion. Here, we have teams with different members who do things differently on a broad general scheme of action-plans. The problems are unknown at the offset, and the treatment options are highly variable from doing nothing to performing a coronary intervention with a stent or sending a patient for an emergency heart surgery in the face of a major heart attack. All patients get an EKG in the emergency room, aspirin, and in most cases a blood thinner such as Plavix. You may also receive morphine for pain and oxygen before you are transported to the cardiac catheterization laboratory.

Finally, as an educated healthcare consumer, you need to know that time is heart muscle and life, when to seek help, where to go, and where you have the best survival chance. The next time you visit your family doctor or your cardiologist, be sure to ask these prudent questions.

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Nik Nikam, M.D. P: 281-265-7567  
[drniknikam@gmail.com](mailto:drniknikam@gmail.com)