

Prehospital 12-Lead ECG: Saving Time and Saving Lives

The following story is not a new one, and is replayed with frightening frequency all over the United States (and the world). It started out much the same way for Tony M., who awoke one night to yet another bout of indigestion. “I shouldn’t eat such rich food so late in the evening,” he scolded himself. “After all, at fifty-six I’m not as young as I used to be”.

After taking more antacids, Tony fell into an uneasy light sleep. Two hours later, the indigestion was back with a vengeance and woke Tony up immediately. “I probably need some of those heartburn pills I see on TV”, he thought. With the plan to make an appointment to see the doctor in the next week or so, he attempted to get some rest before he had to get up and get ready for another day at his real estate office.

Tony had recently quit smoking, and was seriously thinking about exercising. His latest cholesterol readings brought a disapproving frown to his doctor’s face, and Tony supposed he ought to start watching his diet one of these days.

But now ... was he starting to feel clammy? His arm felt a little funny, too. It couldn’t be a heart attack- it didn’t feel like “an elephant on his chest”, like he heard some people describe their experiences. Tony began to get a little anxious and was torn between calling an ambulance and wanting to wait until this indigestion attack faded on its own. Finally, his common sense and escalating fear won out and he called 911.

The EMS team arrived within twelve minutes, and began to assess Tony’s condition. His blood pressure by this time was 180/100, with a heart rate of 100. His lungs were clear and no murmurs or bruits were detected. One of the paramedics applied electrodes to Tony’s chest and performed a twelve lead cardiogram with a handheld Instromedix Micro 12 ECG; the ECG results were immediately relayed transtelephonically to the on-call cardiologist at Fairlakes Medical Center, located thirty miles away.

As the team was preparing Tony for transport, it was notified by the Fairlakes E.D. (Emergency Department) that Tony was in the midst of an evolving inferior MI (myocardial infarction) and should have thrombolytics started at once, according to protocol. Tony was surprised to learn that he was having a heart attack, and the paramedics explained the differences in symptoms each person may experience as they drew blood for laboratory studies, started an additional IV line and administered morphine to ease his discomfort. Tony didn’t have any contraindications to thrombolytic agents; he received the infusion without complications during transport to the Medical Center.

Because the E.D. team was notified ahead of time, all was in readiness, from cardiologist to waiting catheterization lab if needed. Although Tony’s MI could not be reversed, the cardiac muscle damage he suffered was minimal because of early intervention by the Emergency Medical System and the use of thrombolytics in the field. Tony’s blood pressure returned to normal levels after the acute phase of his attack, and he was discharged home after five days of hospitalization, with renewed motivation to improve his lifestyle per physician recommendation.

Devices such as the Instromedix Micro 12 ECG allow paramedics in the field to easily and quickly perform electrocardiograms before or while the patient is transported to the hospital. The Micro 12 literally brings the office or clinic to the patient. Furthermore, the data can be instantly downloaded transtelephonically, so that treatment can be started at once, if it is indicated. And finally, the staff at the receiving E.D. can be completely prepared for the arrival of the patient after he has been treated and stabilized (if necessary).

In the event that such protocol is not in place for thrombolytic administration in the field, prehospital ECGs remain invaluable by virtue of early transmission of the cardiogram, resulting in preparedness of ED personnel. “Door to needle time” is also reduced : prehospital 12 lead ECGs take roughly five minutes to perform and transmit, and are estimated to shorten time of in-hospital treatment by 30 to sixty minutes.¹

¹Gibler, et al. Prehospital diagnosis and treatment of acute myocardial infarction: a North-South perspective. Am Heart J 1991; 121(1,Part1):1-11.



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