

# Calling an ambulance improves heart attack survival

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The Acute Cardiac Care Congress 2012 is the first annual meeting of the newly launched Acute Cardiovascular Care Association (ACCA) of the European Society of Cardiology (ESC). It takes place from 20 to 22 October in Istanbul, Turkey, at the Istanbul Lufti Kirdar Convention and Exhibition Centre (ICEC).

Primary [percutaneous coronary intervention](#) (pPCI), also called balloon treatment, opens the coronary vessel and is preferred over intravenous (IV) medicine (called thrombolysis) to dissolve [blood clots](#) in patients with heart attacks. To deliver this care, patients must be transported to a hospital that can provide balloon treatment. This requires well functioning treatment networks which integrate the pre-hospital and in-hospital phases of patient management so that even patients in remote areas receive high quality treatment that adheres to ESC Clinical Practice Guidelines.

"Transporting patients to hospitals with balloon treatment capacity often involves bypassing local hospitals in the vicinity of the patient," said Dr Mikkel M. Schoos from the University Hospital of Copenhagen, Denmark. "Pre-hospital triage involves digital transmission of the ambulance electrocardiogram (ECG) using telemedicine to the attending cardiologist at the hospital with the balloon capacity who can decide if the patient needs balloon treatment."

He added: "In this way, patients can be referred directly to the hospital that can perform balloon treatment, without first being seen in a local

emergency room. This saves important time. We know from previous studies that reduced time to treatment equals greater salvage of the [heart tissue](#) near the blood clot after a [heart attack](#)."

Dr Schoos' study investigated the quality of these treatment networks in Denmark. The researchers found that 75% of all patients can be transferred directly to hospitals with balloon treatment capacity using pre-hospital triage.

But even when well functioning pre-hospital triage with telemedicine is in place, for 25% of patients it is not possible to deliver treatment within the time targets recommended by ESC Clinical Practice Guidelines if only ground ambulance is used. These are patients who live more than 100km (60 miles) away from the hospital with balloon treatment facilities and patients who go to a local hospital first.

The study showed that patients who are first brought to a local hospital lose important time and this increases their risk of death. "The time delay caused by first being taken to a local hospital that does not have the treatment facilities the patient needs is bad for the patient," said Dr Schoos. "Our study also shows that this system delay predicts all cause mortality in these patients who have big heart attacks. That means that a pit stop at a local hospital increases the risk of death."

There are several reasons why patients might go to the local hospital first. One is that the heart attack is not developed enough to be detected and diagnosed by the ambulance ECG. Dr Schoos is currently investigating ways to improve early diagnosis with ECG or biomarkers in the blood. A second reason could be a failure to transmit the ambulance ECG to the hospital. A third reason is that emergency medical personnel are not confident that the patient is stable enough for further transport and decide to do a pit stop at a local hospital.

Dr Schoos said: "By doing that they postpone the only right treatment. The majority of patients with acute heart attacks can be safely transported to a hospital with the needed treatment capacity, even if these hospitals are further away than smaller local hospitals."

He added: "Even though patients might get arrhythmias, which are bad heart rhythms, as a consequence of their blood clot, these can easily be treated in the ambulance by well educated emergency medical staff."

Ambulance staff must also be educated to perform and transmit the ECGs. "We need people with the right education in the ambulance for these treatment networks to function properly," said Dr Schoos.

Dr Schoos continued: "Patients and their relatives should call the emergency telephone number (112 in Denmark and Turkey) at the first symptoms of a heart attack. Valuable time is lost when patients drive themselves to emergency rooms or are driven there by relatives and they could develop a bad heart rhythm on the way. Ambulance staff can do an ECG straightaway, even in the patient's home, and ensure that patients are taken to the right hospital immediately."

He added: "Calling emergency is also important in countries that don't use pre-hospital triage with telemedicine because ambulance staff can give anti-thrombotic medicine to dissolve or stop the development of a blood clot."

To improve treatment for patients who live more than 100km away from a hospital with balloon treatment, Dr Schoos recommended arranging the catchment area of a hospital into geographical zones. This would make it possible to identify patients who might have long treatment delays because they live further away.

Geographical zone 1 could be for patients who live within 100km of the

balloon treatment centre. These patients can receive pre-hospital triage with telemedicine. Geographical zone 2 is for patients more than 100km away. These patients could be transferred by helicopter, or be treated first with clot dissolving drugs (thrombolysis) followed by balloon treatment when they arrive at the centre.

In the second study, Dr Burcu Demirkan from the Turkiye Yuksek Ihtisas Hospital in Ankara, Turkey, investigated the factors influencing the use of an ambulance among Turkish patients with an acute coronary syndrome (ACS).

"Until recently there was a limited ambulance service in Turkey but the Ministry of Health has now made it available for the whole country," said Dr Demirkan. "The service is free of charge and quicker than in the past. Despite these improvements most patients still prefer self transport instead of using an ambulance when they have acute chest pain."

For the study the researchers collected data from 330 patients with ACS from 2 hospitals (a state hospital without pPCI capability and an education and research hospital that could perform pPCI).

The study found that just 29% of patients went to hospital by ambulance. This was despite the fact that 68% of patients knew the emergency telephone number (112). There were no differences in age, gender and marital status between patients who called an ambulance and patients who did not.

Patients who called an ambulance had a higher level of education, greater knowledge of the risk factors for coronary artery disease, and greater awareness of the fact that chest pain is related to heart attack and patients should quickly seek medical care. These patients were also more likely to have ST-elevation myocardial infarction (STEMI) (as opposed to non-STEMI), vertigo, syncope/near syncope, nausea, vomiting and

more severe chest pain.

Among patients who did not use an ambulance, 37% were given a lift, 14% drove their own car, 26% took a taxi, 12% used public transport and 11% walked to the hospital.

Most patients (whether they used an ambulance or did not) were accompanied by family members or friends during transportation to the hospital.

Dr Demirkan said: "Less than one third of Turkish ACS patients used an ambulance for transportation to the hospital even though this service is free. This rate was lower than rates from previous studies in European countries and Australia but similar to rates in China."

She added: "The perception of symptoms as not serious or not of cardiac origin was the most common reason for not calling an ambulance. However among the patients who considered the symptoms to be serious, most of them thought that self transport would be faster. Contrary to the assumption of these patients, we found that ambulance users arrived at the [hospital](#) more quickly."

Dr Demirkan continued: "Instead of using an ambulance most of our patients used transportation that was unsafe and inappropriate for ACS patients, who urgently need reperfusion therapy. This situation was due to patients' misperceptions about the symptoms of a heart attack or false assumptions that self transport would be quicker."

She concluded: "Our study improves understanding of the reasons why patients do not call an ambulance and will help with planning health education programmes to increase [ambulance](#) use. Such programmes should teach [patients](#) about the characteristics of chest pain related to heart attack and the importance of calling 112 when they experience

these symptoms."

Provided by European Society of Cardiology

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