

Using real-time video to get the doctor to the patient in emergencies

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Credit: Jeanne Caffrey

An EU initiative has tested a wearable video device that can help medical professionals remotely diagnose emergency conditions. This will support first responders in saving lives and help to reduce hospital costs.

The EU's healthcare system is burdened by an ageing population, chronic ailments and rising costs. A quick diagnosis in an emergency can help save lives, curb costs and maintain resources.

The EU-funded project Q4HEALTH aimed at providing "quality real-time video streaming to allow remote doctors to help paramedics treat patients in emergency situations," says project coordinator Donal Morris. It tested aspects of a video streaming solution over the 4G mobile communications standard.

Project partners developed pioneering tools, a result that paves the way for other applications beyond emergency situations. In a medical emergency such as a heart attack or a stroke, it's important to provide rapid treatment. "There's a '[golden hour](#)' during which rapid treatment is important, and a patient's brain or heart tissue can be saved," explains Morris. "But it can take some time for an ambulance to arrive and bring the person to a hospital."

Six experiments to overcome hurdles

In conducting six separate experiments, the researchers faced a variety of challenges along the way. These include the inability of applications to negotiate agreements with the network, delays introduced on live video, the appropriate scheduling of algorithms on access nodes, service availability on indoor scenarios and communication between geographically correlated entities.

To achieve an acceptable video stream, they proved the programmability of the 4G mobile network to cut or slice through the network virtually. The network slice created includes all the functionalities of the conventional network, from structural parts such as antennas to control software. It's separate from the rest of the network and allows priority communications between paramedics and hospital doctors.

The traditional method for creating a network slice is to contract an operator who guarantees the quality of service. However, this method means the [emergency services](#) don't have total control over the network: they remain dependent on the operator. With Q4HEALTH technology, emergency services have real control over upstream and downstream data traffic.

Quality video in crowded places

"Healthcare professionals can send a video stream independently of the geographical area's general mobile data traffic," says Morris. "This is important in crowded places such as an emergency situation at a concert, in a full stadium, or in a terrorist attack where it would normally be very difficult to stream a good quality [video stream](#) in 4G using existing systems."

The mobile device used for slicing and video streaming was BlueEye, a professional wearable high-definition video camera mounted on safety glasses. Such devices can support acute pre-hospital patient triage decisions, remote diagnosis, treatment and monitoring.

Patients get earlier diagnosis and treatment in emergencies and potentially better outcomes. Health funders realise greater efficiency by pre-hospital triage, and reduction in transfers and hospital bed costs if patients are stabilised at home.

Following completion of the project, the next stage is to commercialise the BlueEye camera. According to Morris, other potential markets could be utilities and security and police services.

"We are seeking hospitals that would like to pilot the technology using the BlueEye glasses-mounted video camera alongside our cloud software and viewing software," concludes Morris.

Provided by CORDIS

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