Preclinical Telemedicine

Stroke-Emergency-Mobile (STEMO) – An innovative telemedicine supported preclinical care concept.

STROKE-EMERGENCY-MOBILE

The motivation of STEMO is to improve the clinical care that stroke patients receive within the limited time window of between 3 – 4 hours from the onset of first signs of stroke to the optional administering of the lysis therapy.

STEMO

With time of the essence, one key factor in delivering the right kind of clinical care for stroke patients is pin-pointing the actual timing of the onset of stroke by the individuals themselves or by their relatives. In addition to this, the informational and organisational improvement of the entire rescue-sequence including the preclinical laboratory, the inspection with medical devices and the neurological examinations are significant factors in time.

It should also be noted that the emergency department of a hospital is also admitting and caring for other patients 24/7. The result of all these attendant factors is that the critical period is extended before possible treatment can begin. The analysis of such process steps leads to the perception, that the execution of all operational procedures without any external distraction, improves the diagnosis and therapy of stroke. As a result any delivery times between procedures can be reduced and the distraction from other emergencies can be avoided.

To that end, such a scenario can consequently be implemented by a special equipped emergency vehicle. Furthermore, the presence of a stroke physician on-board the emergency vehicle adds to crucial argument of the improvement of care for the patient. The opportunity to begin treatment within the first hour of the stroke onset (the golden hour) on-board the emergency rescue vehicle has a significant effect on the wellbeing of the stroke patient.

Development Partnership with the Center for Stroke Research of Charité Universitätsmedizin as the lead of consortium and Berlin Fire Department.

CHARITÉ UNIVERSITÄTSMEDIZIN BERLIN

BERLINER FEUERWEHR

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MEYTEC

As part of a research project the development and implementation of a new pre-clinical care concept was started in Berlin, Germany in 2010. Subsequently, in a clinical study the outcome of this new approach has been explored. The focus of the research project was the creation of a new specialised rescue vehicle called "Stroke-Emergency-Mobile" - STEMO. The project was driven by a consortium consisting of the Charité-University Medicine Berlin, the Berlin Fire Department, BRAHMS GmbH and MEYTEC GmbH. It builds on the idea to integrate a CT-scanner into the emergency rescue vehicle and to add all further necessary devices and systems, so that essential diagnostics and therapy is allowed for the apoplexy affected patient, comparable to that found in a specialist hospital. The resulting solution delivers all relevant procedures, clinical and operational within a specialised emergency rescue vehicle. An essential component that leads to the successful deployment of the emergency rescue vehicle, is a specially designed questionnaire completed by trained staff in the rescue center of the Berlin Fire Department, this ensures that the assumed stroke affected person is correctly evaluated. With a successful diagnosis rate of 50% during initial trials, a good percentage in view of how many other affections present similar symptoms to apoplexy, the aim is to refine the procedure further to avoid unnecessary deployment of STEMO.

It would be accurate to describe the "Stroke-Emergency-Mobile" - STEMO as a mobile hospital specialising in apoplexy, where the ergonomically designed interior space is fully equipped with laboratory devices, x-ray-equipment and further devices for clinical diagnostics, enabling the safe administering of the lysis therapy on-board. Once the lysis therapy is started STEMO will then ensure safe transportation of the patient to a specialist hyper-acute centre for stroke for further monitoring.

STEMO acts as mobile radiology centre, equipped with a state-of-the-art, CT-scanner and the required built-in radiation protection components conforming to radiation protection regulations.

Furthermore there is a comprehensive telemedicine solution on-board, including a high-quality tele-radiology solution enabling immediate reporting by a neuro-radiologist and the immediate documentation of all clinical procedures and their results. Reports are generated by web-based documentation software in real time, enabling the bi-directional medical audio-visual communication between medical professionals at the stroke unit and the stroke patient on STEMO. This ensures that there exists sufficient support for the neurologist or emergency stroke physician on board STEMO. As is the case in a normal hospital, all medical data generated inside the "Stroke-Emergency-Mobile" is encrypted and transferred to the attendant hospital in line with the highest data protection rules.

In addition to the "Stroke-Emergency-Mobile's" use in pre-clinical acute care it can be used as a research platform for new pharmaceutics or biomarker, through the in-built technologies that provide access to research databases. Advanced mobile radio technology is used to transmit media such as 3G and in the future 4G. In countries with poor mobile radio presence the satellite radio connections can be utilised.

In summary, this pioneering practicable pre-clinical care represents major progress in the emergency care for the apoplexy patient. Early indications are that through regular use, the mean reduction of time between the onset of the signs of stroke and the start of treatment amounts to 30 minutes. Such a reduction in time represents a significant break-through in stroke care. Not only can the STEMO save the life of an apoplexy patient, but also the swiftness of diagnosis and subsequent treatment can help avoid significant or permanent disability.

As stroke continues to be the world's single biggest cause of disability, the cost of on going care and rehabilitation on the healthcare sector also continues to grow in line with an aging world population. Governments and healthcare strategists are looking to invest in new technology as a way improve early diagnosis and treatment of stroke, which will in turn, reduce the levels of disability resulting from stroke. STEMO is at the forefront of this global initiative in healthcare and represents a viable solution for hyper-acute stroke pathway for urban and rural areas.

From January 2012, STEMO will be marketed by MEYTEC GmbH worldwide. MEYTEC engineers will execute delivery, Installation and implementation, with service provision delivered by certified MEYTEC global partners. MEYTEC have already received significant interest for STEMO from both the developed and emerging economies of the world, which are committed to investing in the kind of technology that will improve the medical care for their respective populations.

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