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Conference Abstract

Integration of cardiac monitoring with video to enable service transformation

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Abstract

The future of digital care will be significantly enhanced by the integration and interoperation of systems and services. Collaboration between clinicians and service providers will allow combined services to be shaped such that the whole is greater than the sum of the parts. In future services need to enable people to continue with their lives whilst being supported, rapidly and appropriately when required.

We present the results of a project to use an innovative cardiac event loop recorder (ELR) and screening service in cooperation with the use of video consultations. The ELR service detects and records abnormal ECG traces. The connected consultant can choose to receive a PDF of any abnormal trace within seconds or have the trace pre-screened by a cardiac physiologist. The consultant can then initiate a video call to the person and discuss the event. The patient might then attend a consultation in person. The goal is to significantly improve the detection of abnormal events and offer immediacy of support and diagnosis i.e. quality improvement by early diagnosis and potential cost saving in the immediate term by reducing surveillance appointments and in the long term by reducing burden of disease e.g. stroke reduction by earlier AF detection

This approach facilitates two modes of care delivery that are innovative:

The first is the capture of infrequent events. An example case involved a 66-year-old hypertensive female who suffered from 2 years history of palpitations and had been treated for anxiety and ventricular ectopic beats. Physical examination was normal. Echocardiography showed structurally normal heart.

Her electrocardiogram showed normal sinus rhythm with normal PR and QT segments

Since several 24 hours Holter monitoring episodes had proved to be unsuccessful in the past it was decided to monitor the patient with the smart event ELR.

The patient was equipped with a one-channel smart ELR that was used over a period of 2 weeks of continuous monitoring. The recorder was programmed to automatically send both manually triggered cardiac events as well as automatically triggered events for atrial fibrillation (AF). For the latter, the automatic AF detection algorithm had been activated. All events were automatically transferred using GPRS (tele-ECG option) and in virtually real time.

Over the course of the next days the recorder sent in ECGs, which showed clear evidence of paroxysmal atrial fibrillation (PAF) as a cause of her intermittent palpitation. During these episodes, she felt unwell with erratic heart rate and light-headedness. The episodes lasted between 30 seconds and up to 2 minutes, confirming the diagnosis of PAF.

For patients with long-term conditions that include cardiovascular disease the approach offers a pro-active and supportive way to manage people in their own homes.

Both approaches address several of the NHS Outcomes Framework domains, specifically:

- reducing premature mortality.
- ensuring people feel supported to manage their condition.
- reducing the amount of time spent in hospital.
- improving people's experience of outpatient care.
- improving hospital's responsiveness to patient's needs.

During the presentation there will be a live demonstration of the cardiac monitoring and the video service.

Keywords

cardiology; ECG; telemedicine; e-consultation; integration
