

Body Sensor Networks for Cardiology: Breaking the Episodic Limits

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Over the last ten years, there has been a rapid development of new implantable monitoring and interventional medical devices. Existing examples include devices for monitoring the blood glucose level, controlling insulin delivery, multi-programmable brain stimulators and implantable pacemakers and cardioverter defibrillators (ICD) that prevent sudden cardiac death. At best, some of these devices provide a record of their activity which needs to be downloaded periodically by bedside telemetry at specialist clinics.

Shorter hospital stay and greater out-of-hospital management of health and long-term (chronic) illness is the trend of health care provision, and in order to facilitate this, better monitoring of patients in the community will be essential. Wireless networks in the community that could interact with implanted and worn biosensors would allow such devices to interact with centres of care to enable continuous monitoring of patients with immediate feedback and access to specialist advice and care if needed. This will reduce hospital-dependency and help individuals with clinical conditions to lead a “normal” life.

Widespread minimally-invasive and wearable biosensors will eventually facilitate continuous wireless monitoring, initially of at-risk patients, but extending to an increasing proportion of the population. It is possible to envisage a significant percentage of the population eventually having permanent implants which would provide continuous monitoring of the most important physiological parameters for identifying precursors of illness. Such technological development echoes the social, industrial, and clinical perspectives of future healthcare delivery.