

Getting an ECG over-read makes great clinical sense... Better, faster patient care

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For the GP:

ECG interpretation can be very difficult. An over-read by a Cardiologist means a more accurate diagnosis of ECG. This leads to greater patient and doctor satisfaction, less need of referring patient to hospital and more decision making can take place at primary care level. This creates reassurance, confidence and costs less (Black N 2012).

Clinical evidence shows that GPs fail to detect atrial fibrillation on ECG in over 20% cases; An ECG overread service provides 98% detection. In the same study up to 40% of MIs may be also missed on ECG (Mant J 2007).

Our own pilot study of 74 consecutive patients from 3 GP practices showed that ECG overread by a Cardiologist reduced the need for patient referral to hospital/ clinic in over 50% of cases (Black N 2012).

For the Patient:

Access to Cardiology clinics and hospitals in Ireland can take several weeks of waiting and usually costs more to arrange privately. An ECG over-read service helps the GP to confidently assess and interpret the cardiology problem and usually there is significantly less need for the patients to be referred to hospital/ clinic. The reduction of referrals improves access to Cardiology hospital services for those patients who need it most.

For the Cardiologist:

A close relationship between GP and Cardiologist is good for patients, GPs and the Cardiologist. It allows for direct communication between GP and Cardiologist which helps to improve Cardiology decision making in primary care. It also helps to prioritise access to Cardiology for patients who have the greatest need.

Clinical trials have showed that 10-15% of patients referred to Cardiologist for “abnormal ECGs” do not have an abnormal ECG and may not require referral (White 1995, Zwietering P 1996).

Background

Cardiovascular disease remains the leading cause of death in the Western world. ECG is a routine investigation that helps to detect coronary artery disease, advanced blood pressure, cardiomyopathy, and many heart conditions.

Stroke prevention may be possible by detecting atrial fibrillation (AF) on ECG. In fact 32% of ECGs performed in GP surgery have an arrhythmia. Detecting and treating AF on ECG may help to reduce subsequent fatal and disabling strokes. Younger patients, especially sportspeople, who have concerns about exercise-induced symptoms such as chest pain, dizziness, syncope, or sudden cardiac death may benefit from ECG to detect rare causes of risk.

ECG testing also helps to monitor drug therapy, including safety of antipsychotic drugs in patients with mental illness, or retroviral therapy in HIV patients, methadone treatment patients, cardiac drugs used for rhythm management and several other drug treatments.

An ECG may also benefit risk assessment in situations of symptomatic heart disease, family history of same, higher risk patients (smoking, obesity, diabetes, high cholesterol, family history) and in several medical conditions associated with heart disease such as rheumatoid arthritis, depression, and peripheral vascular disease.

Limitations with ECG testing

ECG testing is very sensitive test for heart disease but lacks specificity in all patients tested (VanMieghem 2004). There is a high false positive rate that translates into over 15% inappropriate hospital admissions (White 1995). In many cases this is due to poor quality tracings: incorrect lead positioning, incorrect patient preparation, technical faults with recording and an overlap of medical conditions that create ECG abnormalities. Therefore education and training of those who perform and read ECG is essential.

Clinical trials have showed (SAFE study) that this difficulty of interpreting ECG in the community leads to an increase in referral of patients to hospital where many might be avoided. In fact this study goes so far as to suggest that a central reading service for ECG would clearly help (Mant J 2007).

In Cardiology practice, the current training requirement to read and interpret ECG is 500 ECG and 100 per year to maintain competency. Formal training is undertaken in all Cardiology training programmes. For general practice the turnover of GP trainees may limit access to enough ECG reading experience. Similarly knowledge to read an ECG may diminish with time without up to date training and education (Waxman HS 2003, Weitz H 2001).

Solution

An ECG over-read service for GPs, provided by fully trained, accountable Consultant Cardiologists through a secure accessible network would overcome all these issues. GPs could send an ECG for reading to a central cloud-based ECG station where the Cardiologist reads and reports the ECG helping GP to make quick decisions around patient management. Patients can be treated more efficiently and in less time and GPs avoid having to refer most patients to hospital

clinics, shortening the referral time to treatment. Overall, this means greater satisfaction for patient and GP.

Connected Diagnostics

Connected Diagnostics is a company set up to provide telemedicine-based health services including ECG and Holter monitor over-read capability. It is based in Ireland.

The co-founder and clinical director of Connected Diagnostics is Dr Robert Kelly MD FRCPI, FACC, FESC, Consultant Cardiologist. Dr Kelly saw the need for a community based ECG over-read service from several years in practice, where many patient referrals were not always essential as many ECGs were actually normal. "I observed that over 40% of ECG concerns could be dealt with in this way without the need for patients to see a cardiologist". The addition of Holter monitor over-reading service means that GPs also have direct access to this service in their own practice without an undue wait for outpatient clinics (often months)..” This means many more patients get access to quality over-read tests and do not need hospital referral. Many more can have arrhythmias like Atrial Fibrillation detected and treated early to prevent life threatening consequences like stroke.

Dr Robert Kelly MD FRCPI FACC FESC is Chief of Cardiology and a Consultant Cardiologist at UPMC Beacon Hospital, Dublin, Cardioclinic Naas Co Kildare, and Mount Carmel Hospital Dublin. He specialises in all aspects of Cardiology, especially Imaging (including Cardiac CT) and Interventional Cardiology (Coronary, Peripheral and Structural heart disease).

Dr Kelly graduated from RCSI Medical School in 1992 and obtained MRCPI in 1994. He completed Irish Cardiology SpR training and was conferred MD by thesis by NUI in 2000, based on clinical research of vascular disease undertaken in Ninewells Hospital, Dundee, Scotland.

After a 2 year Interventional / Cardiology Fellowship at the University of North Carolina he was appointed to position of Assistant Professor of Cardiovascular Medicine and Consultant Interventional Cardiologist at Division of Cardiology UNC, Chapel Hill, North Carolina, USA. He returned to practice Cardiology in Ireland in May 2007.

Dr Kelly has an extensive publication record in non-invasive / imaging and interventional cardiology and is the recipient of a number of distinguished awards, including the Society of Cardiovascular Angiography and Intervention BRACCO Fellowship and the Young Investigator Award of the Irish Cardiac Society. He is also a Fellow of the American College of Cardiology, the European Society of Cardiology and Royal College of Physicians in Ireland.

Dr Kelly has a special interest in the value of telemedicine in cardiology and he has published manuscripts on role of ECG to detect culprit lesion location in MI patients. He is the 2011 recipient of the Noel Hickey Bursary of Irish Cardiac Society based on ongoing research of a novel blue-tooth outpatient cardiac monitor test to detect atrial fibrillation in patients at high risk for a stroke.

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