EVALUATING USE OF TELEMEDICINE WITHIN A MINOR INJURY UNIT

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This article outlines a pilot study using telemedicine to assess chest pain in a minor injury unit. It discusses how the pilot was set up and the benefits of telemedicine for both patients and staff. Bridgwater Community Hospital has recently won an award from the Community Hospitals Association for its use of cardiology telemedicine in its unit.

The minor injury unit at Bridgwat er Community Hospital is clinically managed by advanced emergency nurse practitioners and supported by staff nurses. It had over 20,500 new patient attendances in 2007. However, the term ‘minor injuries’ is a misnomer, as a review of 2007 data indicated that over 200 patients presented to the unit with chest pain.

Nurse practitioners must be able to recognise and initially manage all acute presentations and rapidly identify patients needing definitive care in another facility.

Chest pain is a worrying symptom for both patients and nurse practitioners. Patients know that it occurs in a heart attack and nurse practitioners are aware that symptoms of MI or other acute coronary events can be very different from classical descriptions in textbooks.

The 12-lead ECG is a standard diagnostic tool used to assess patients with chest pain. While all nurse practitioners in the unit have emergency medicine backgrounds, the fact that only about 7% of our patients require an ECG led staff to raise concerns over their ability to remain competent in advanced ECG interpretation.

CHEST PAIN ASSESSMENT
The assessment and evaluation of chest pain was considered an area of potential clinical risk. In the past, all patients with chest pain of whatever origin or known cardiac conditions were automatically referred to the neighbouring acute trust. However, this approach was time-consuming, often stressful for patients, and placed a significant workload on acute care and the ambulance service.

Alternative services to ECG interpretation were considered, including remote ECG interpretation carried out with the help of acute care providers. This involves 12-lead ECGs being faxed to emergency medicine or cardiology services.

However, this represented a drain on acute resources, while there was no guarantee of a rapid response as clinicians are not always available for immediate analysis. Likewise, there was no guarantee of a sufficiently senior expert opinion. A more detailed analysis was required than that used by the ambulance service, which essentially identifies acute MI suitable for pre-hospital thrombolysis.

Grimshaw et al (2005) found that NHS ECG telemetry practice in the UK was far from standardised. The approach favoured at Bridgwater Community Hospital was a cardiac telemedicine service provided by Broomwell HealthWatch (www.broomwellhealthwatch.com).

This is an NHS-accredited national cardiology reporting service with clear operational guidelines and defined responsibilities supporting best practice.

PILOTING TELEMEDICINE
A study proposal was presented to the PCT, stressing the importance of quality diagnostic support and clinical risk management benefits. A pilot study was established with Broomwell HealthWatch, which involved transmitting 12-lead ECGs from the unit for formal diagnostic evaluation by cardiologists, with a detailed analysis usually returned within 10 minutes.

A six-week pilot was carried out, based on 32 patients presenting with chest pain or ‘brief collapse of unknown cause’. Of these, 24 (75%) indicated no need for referral based on ECG (supported by clinical examination, history and risk factors). Five (16%) had subtle ECG abnormalities that were not identified by the nurse practitioner managing them. However, two of these were referred to acute care based on clinical features, and three with subtle non-acute ECG changes were referred back to their GP for non-urgent investigation.

Three patients (9%) were identified with a cardiac cause. One of these had complete heart block, an elderly woman presenting with vague abdominal discomfort but no chest pain was found to have had an MI, and a 26-year-old man, whose initial presentation was feeling faint, had supraventricular tachycardia.

The clear clinical benefit was dramatically demonstrated during the pilot, when a patient who had fallen presented with a closed fracture of the distal radius and ulna.

IMPLICATIONS FOR PRACTICE
- The use of telemedicine has informed and enhanced clinical decision-making and has greatly assisted in clinical risk management.
- This initiative has also provided an essential educational element by significantly increasing awareness of ECG interpretation in the primary care setting.
- The project has increased the number of patients safely managed as complete episodes of care in the minor injury unit and reduced demand on both the emergency ambulance service and local acute trusts.
BACKGROUND

In England more than 700,000 people each year visit emergency departments and minor injury units complaining of chest pain. Acute chest pain accounts for up to 30% of acute hospital admissions (National Institute for Health Research, 2008).

Rapid, accurate assessment is essential to ensure that patients with chest pain due to a serious cardiac problem receive appropriate hospital referral, and those whose pain is not serious go home reassured with advice on what to do should symptoms recur.

Only 10% of the UK population are free from all the major risk factors for coronary heart disease. People with no obvious risk factors are still more likely to die of myocardial infarction (MI) than from any other cause (Moulton and Yates, 2006).

The nurse practitioner identified bradycardia, and the subsequent ECG showed complete heart block (probably the cause of the fall). This patient was transferred to the acute trust’s coronary care unit for urgent pacing, and his displaced fractured radius and ulna were repaired when he was clinically stable. The pilot proved successful and was duly adopted by the unit.

BENEFITS OF TELEMEDICINE

A key element in this new approach is the assessment and diagnosis, where possible, of non-cardiac chest pain in the community hospital. The ECG analysis service has proved to be a vital diagnostic aid for nurse practitioners in making informed clinical decisions and in improving outcomes.

The service has helped provide robust clinical risk management. The diagnostic evaluation of chest pain relies on a combination of detailed history-taking, risk factor assessment and comprehensive physical examination by nurse practitioners, along with the expert ECG analysis. The introduction of telemedicine without appropriately educated and experienced emergency nurses should be avoided.

All patients treated in the unit’s emergency room are entered into the resuscitation log. This provides an accurate record of patient dependency, clinical interventions, diagnosis and outcome. Unusual cases are presented at monthly nurse practitioner meetings along with ECG traces. A regular critical review of referral feedback forms takes place with any learning points acknowledged.

The obviously ill patients are relatively easy to manage. They receive prompt intervention, stabilisation, rapid referral and transfer to the appropriate facility, usually bypassing the emergency department. Patients with subtle clinical signs and symptoms are more challenging, and this is where the interpretation service is of most benefit.

The ultimate clinical responsibility rests with the nurse practitioner managing the patient. All staff are very aware that a normal ECG does not exclude a developing myocardial or other serious non-cardiac event. All chest pain patients and collapses are treated cautiously (Paynter, 2007). However, the ECG interpretation service has proved to be a valuable clinical aid.

The response from patients has been overwhelmingly positive. The interpretation service brings elements of emergency department diagnostic standards into the community hospital. It is also more convenient for patients to attend their local community hospital than travel some distance for non-emergency care. They are often much less stressed and anxious, especially elderly patients.

At a local level the use of the interpretation service has resulted in more patients being managed as complete episodes in the minor injury unit, fewer referrals to acute care and fewer ambulance transfers. Importantly, its use has supported good clinical risk management principles.

REFERENCES


OTHER PILOTS

Bridgwater Community Hospital has not been alone in using telemedicine to improve patient care.

A number of pilots across the UK have highlighted the benefits of telemedicine ECG services and how telemedicine has been harnessed to reduce avoidable hospital admissions.

A six-month study of cardiac telemedicine has been undertaken, involving 15 GP practices and two NHS walk-in centres in Cumbria and Lancashire. This has demonstrated the potential to avoid 90,000 emergency department visits and 45,000 hospital admissions each year in England (NHS North West, 2006).

The study also estimated the minimum savings to the NHS from using telemedicine ECG tests to be £46m per year.

CONCLUSION

The combination of senior and experienced emergency nurse practitioners and cardiac telemedicine can result in the safe and effective management of patients presenting to primary care-managed minor injury units with chest pain. •