The use of telemedicine to support a specialist cardiology clinic from a community hospital to an urban specialist centre
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Summary

30 patients were seen at a telecardiology clinic in rural Mid Argyll linked to a cardiology interventionalist via videoconferencing unit to Glasgow Royal Infirmary. Cardiac investigations including clinical examination, ETT, echocardiogram and ECG were carried out remotely. Only 4 of these 30 patients required onward referral for cardiac intervention or thallium scan. Patients attending the telecardiology clinic saw an estimated 79% reduction in travel miles. In rural areas with very limited public transport links this is a huge benefit to the patient.
The pilot study has identified key issues with staffing in a remote area but is replicable to cardiology and other specialities to support onward development of remote specialist clinics to rural populations

Introduction

Health services across the UK are under pressure to find new ways of delivering quality and effective services in the current financial climate. Additionally the changing demographic picture will put a real burden onto healthcare services in the future; people are living longer with long term conditions while the birth rate is falling. (Scottish Government 2009) The use of technology to support the development of more locally based, accessible services will ensure the continued development of safe and effective healthcare. Technology such as telehealthcare has been widely utilised worldwide to meet the increasing demands of health care services and is particularly relevant to rural areas. (Davis et al 2001) This paper will discuss the evaluation results of a pilot study on telecardiology with a focus on rurality.

Background

Argyll & Bute is a rural area covering a land mass of 2,600 sq miles and 26 inhabited islands. It forms part of NHS highland covering 41%of Scotland landmass but with only 1.7% of the population. Access to specialty services is an issue especially as they are predominantly delivered by neighbouring NHS GG&C. Delivering local sustainable services is not always an option due to the sparseness of the population.

Mid Argyll Community Hospital, based in Lochgilphead, covers a catchment population of around 9,000. Patients from Mid Argyll area travel to Glasgow for most specialist clinic appointments. This involves a 2 to 2 ½ hr journey one way. Public transport links are not good; no trains are available, and buses take a longer route. Road travel is on country roads for most of the journey. Clinic appointments often require a follow up; and for some specialties not all the assessments can be completed in one appointment - this is often the case with cardiology.

Several telemedicine initiatives have been tested world wide with favourable results. In Scotland Sable and Cummings et al (2004) tested the use of real time echo transmission from community hospitals to a specialist neonatal cardiology centre. Their findings suggested that telecardiology is accurate, improves patient care, is cost effective and reduces unnecessary patient travel while still accessing specialist cardiology support. The evidence from this project influenced
the development of the telecardiology clinic at Mid Argyll hospital.

METHODOLOGY

A base line audit was carried out reviewing numbers of Coronary Heart Disease (CHD) patients referred to Glasgow in the preceding year. Patient pathway and treatment plans were also reviewed.

A bi-weekly cardiology clinic was planned, linking patients attending as an outpatient in Mid Argyll Hospital to a Cardiologist at Glasgow Royal Infirmary via a videoconferencing unit. A trained cardiovascular nurse facilitated the clinic and carried out the initial patient consultation. Exercise Tolerance Tests (ETT), echocardiography and ECG testing were carried out by a cardiac physiologist with cardiovascular nurse assistance.

Results were viewed by the cardiologist, and the management plan for the patient agreed at the time of the video conference consultation.

The set up of the equipment, clinic and training involved while working across two health boards was also captured.

We undertook a qualitative study at the clinic set up in Mid Argyll Hospital as well as an in-house audit of the first year of the telecardiology clinic.

Patient questionnaires captured the views of the patients attending the clinic as well as capturing their estimated travel time to the clinic. Estimated Travel time to Glasgow was included as a comparison. Staff questionnaires captured the views of the staff involved in the clinic.

Audit data was captured of numbers attending the clinic and their outcomes.

Other areas evaluated were:
- What is the impact on travel?
- How many journeys to Glasgow have been saved?
- What is the impact on length of time from referral to intervention (i.e. first cardiology appointment)?
- Patient satisfaction
- Staff satisfaction
- What has been the impact on workload and working practices?
- Has the development of expertise and availability of telehealth equipment led to the use of the technologies in other clinical disciplines?

Findings

Patient Numbers and Referral Patterns

Pre Telecardiology Clinics

Eighteen patients from the Lochgilphead practice were seen during the 6 month period reviewed – 9 patients travelled to a sub-specialty clinic in Glasgow, 4 patients travelled to Oban and 5 patients were seen as an outpatient at Mid Argyll Hospital in Lochgilphead. Overall, these patients travelled an average of 183 miles for their appointment in Glasgow, 97 miles for their appointment in Oban, and 18 miles for their appointment in Lochgilphead.

First 12 months – Telecardiology clinic in Lochgilphead

33 patients were referred directly to the telecardiology clinic at the Mid Argyll Hospital. Of these 30 were seen at the telecardiology clinic, 3 were referred elsewhere.

Impact on Travel

The following graph shows the significant reduction of travel for patients attending the telecardiology clinic during the first 12 months.

Overall, 1500 less miles were travelled by patients in each 6 month block of the telecardiology clinics, a reduction of 79% in travelling miles for patients.
Waiting times - referral to first clinic appointment
Information on date of referral and date for first clinic appointment from the records reviewed for a six month period before the beginning of this project was difficult to find and analyse. The average waiting time for first appointment pre telecardiology was 39 days.
For the 30 patients seen at the telecardiology clinic in the first 12 months, the average waiting time for first appointment was 12 days.

Follow-up Appointments in Glasgow for Specialist Intervention
Only 4 patients seen at the telecardiology clinic in the first 12 months were sent to Glasgow for specialist intervention. All remaining telecardiology clinic patients were discharged to GP with medical or other management advice. One patient has been referred for specialist respiratory advice.

Patient satisfaction
All patients were asked to complete a questionnaire about their experience at the clinic. The following are some of the comments from the patients:

Positive comments:
- Avoids travelling
- No tiring journey
- Face to face with the Consultant, not a different Registrar every time
- Consultation was good, it went well but I found screen interaction strange only because it was my first time
- Local appointment more relaxed... rather than long travel to busy distant hospital. Less time off work....I felt this consultation allowed me to be more comfortable than other clinics I’ve attended in Glasgow
- Clearly preferable to going to Glasgow when only stage one on an initial examination/survey
- Excellent — saving time and money (friendly staff)
- I feel it is a positive strategy for many patient/specialisations.

Negative comments:
- One slight drawback- no real opportunity to have a “discussion” about diagnosis. Consultant has gone before patient has had time to absorb what we’ve been told and maybe have further questions of serious nature
- Not all patients will be comfortable with it

Staff Satisfaction
The staff directly involved in the delivery of the telecardiology clinic were asked for their views on the clinic, and the impact on workload and working practices for them. The following comments were given:

Positive comments:
- This is a fantastic idea
- I see immense benefits to the patient in a more rural setting. Also may be good for nurse specialists to use technology to support each other especially when working rurally
- Ability to include additional staff (e.g. Specialist Registrars) from Glasgow Royal Infirmary to sit in during a consultation by VC
- No problems with clinic. It is a good thing, so we need to work with GPs to improve numbers, for example, to get referrals from other practices in the CHP area. Also, could use the facilities for other clinical work such as post surgical CABG and stent patients.
- Report writing is more efficient – report is available for GP at end of the day of the clinic.
- Patients love it, especially not having to travel

Negative comments:
- More time constraints on staff
• Only three trained staff available for clinic which could cause difficulty in times of absence
• Equipment is not used for anything else. VC equipment could be used to link to clinical meetings. Treadmill cannot be moved, so this limits the use of the room.
• Some of the GP referrals have been inappropriate

Other information
_Scheduling clinics_
There were five (5) telecardiology clinics that were unable to run. The reasons were due to conflicting annual leave and/or study leave:
Further to this 1 clinic did not run as there were no patient referrals - December 2009.

_Video conferencing connection failure_
On two consecutive clinics the video conference connection was unavailable. However a telephone consultation was carried out with the consultant on both occasions - The patients were not involved in the telephone consultations.

_ETT recording failure_
On two occasions ETT has been unable to be retrieved in order to be viewed - cause unknown.

Discussion
The telecardiology pilot has clearly shown that this type of clinic can be developed with a link from a community hospital to an urban specialist centre. However there are some key areas for further exploration within Argyll & Bute. These need to be addressed before the clinic will become sustainable in the longer term. Key areas for further exploration are

_Clinic provision during staff absences_
This remains an issue to be resolved. Options are being explored, including identifying the key skills required to enable cover from other specialist nurses and exploring support from other physicians to deliver the clinic.

_Increasing use of equipment_
There is potential for other uses of the videoconferencing equipment for remote clinics such as rheumatology, dermatology etc

_More robust technical support_
Good IT support at the Glasgow end remains an issue.

_Other cardiology uses_
There may be potential to widen the scope of patients attending this type of clinic. Routine cardiac intervention follow up and possibly heart failure patients could be included.

_Pressures on echocardiology service and cardiac physiologist time_
The project remains dependant on the one cardiac technician post. Other options need to be explored to make sure their time is used efficiently.

_Data collection_
The pilot has improved this by providing a speedy, concise letter back to the GP practice.

Conclusion
The first 12 months of the telecardiology clinic at Mid Argyll Hospital has shown that the use of telehealth can support the delivery of cardiology outpatient clinics in the Mid Argyll Hospital. But it has also highlighted some key challenges on sustaining this type of specialist clinic in rural areas where access to suitably trained staff to support the remote clinic can be an issue.
The telecardiology clinic has improved access to the cardiology services in rural Argyll, and reduced the need to travel to Glasgow for cardiac investigations. When patients are required to travel to Glasgow it is for specialist intervention services which are not available in Lochgilphead or anywhere in Argyll & Bute.
The other key outcome from this pilot is that it has evidenced that telemedicine is an option for the delivery of specialist clinics from rural community hospitals, allowing local accessible, effective
specialist care to be delivered in rural settings. Crucially while this pilot has been identified as replicable what it has highlighted is the need for champions to drive it forward supported by proactive and dedicated project management.

References
