PERSONAL VIEW

Proposed telemedicine booth

GSD Peterkin

Grampian Primary Care Trust, United Kingdom

ABSTRACT

Change is inescapable. For the rural and remote population the world over, changes to society's view of doctors, and to doctors' view of their role and place in society have lead to a decline in the number of rural practitioners. This personal view of change, and the impact of technology on change, comes from the Grampian area of Scotland, where the traditional remote community of villagers, school, doctor, bank and church is in rapid decline. In response to the steady reduction in medical services to remote areas, a telemedicine booth (a site where a variety of technologies can be brought together) has been proposed to support generic health workers provide acceptable and effective care to isolated patients. Not only will the technology enable patient consultation with a distant physician, if it is developed in partnership with a commercial firm, it also offers the possibility of an 'electronic community' where medical care and other social or commercial services may be delivered in tandem, at a distance. This idea, that addresses the needs of remote populations and their health workers the world over, was presented to the 5th WONCA World Conference on Rural Health in Melbourne, Australia in 2001 by the author, a medical practitioner and health administrator from Grampian, Scotland.

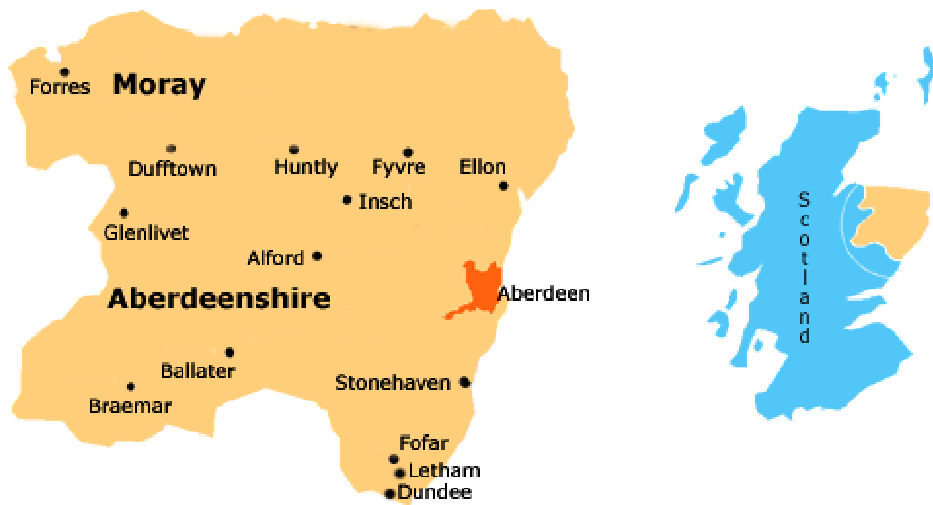**Key words:** technology, telemedicine, Scotland.

Figure 1: The Grampian area of Scotland, site of the telemedicine booth trial.

Introduction

In the movie 'Braveheart', the Scottish national hero William Wallace is played by an Australian who was born in America. This is merely a metaphor for the concept that while we come from different places we all share similar difficulties. The problems that we deal with in national contexts are likely to be global problems. It is in this spirit that I introduce my own place in the world and discuss a health-service problem that we are currently managing with the use of technology in the form of a telemedicine booth - a site, virtual or actual, where a variety of technologies are brought together for the benefit of the rural patient.

The place

The Grampian area of Scotland covers 3720 square miles (approximately 6000 km^2), which includes Balmoral, many fine distilleries and the Cairngorm Mountains (Figure 1). Within this area are 365 general practitioners (GPs) in 96 practices, which range from a sole practitioner who serves 484 patients to a 12-partner practice in an area of 20 000 people - this does not include approximately 120 GPs who work less than full time hours. The Grampians Primary Care National Health Service (NHS) Trust (the local primary health-care organisation), of which the author is medical director, has a staff of approximately 4000 for a total Grampian population of 540 000. Half of this population lives in the largest city in the area, Aberdeen – the 'oil capital' of Europe. Area industries are fishing, farming, financial services, oil and associated engineering functions, and there is a medical school, two universities, a college of nursing and teaching programs for physiotherapy, occupational therapy, dietetics and pharmacy students.

Social change

The developed world faces some interesting changes. In the United Kingdom (UK) NHS there is an increasing emphasis on consumerism where previously the service provider was regarded as a 'charitable, semi-religious' organisation and the 'supplicant' patients as lucky to be treated. This view has changed, due to an informed patient group, a less respectful tabloid press, and anxious politicians in a newly devolved Scottish Parliament. However, with no direct consumer–supplier payment in the NHS, the service provider responds to a funding body, rather than the consumer - and the consumer–producer model runs into difficulties.

The role of the health professional in developed societies is changing. In the UK, particularly because of the activities of people like Harold Shipman (a general practitioner in Hyde,

Greater Manchester who in January 2000 was convicted of murdering 15 of his patients) and generally because of society-wide changes, medical practitioners are involved in more regulation, appraisal, revalidation and general standard setting than ever before. No longer is it enough to say, 'Trust me, I'm a doctor'. Single-handed general practice is becoming increasingly unpopular. In remote areas, time off is at a premium, isolation is unwelcome and it's hard to keep up with current practice without the daily discussion with colleagues. The traditional small rural community with bank, church, school and doctor is changing. Each year in the Highland region of Scotland a significant number of single-handed practitioners leave to work in larger practices.

The power of the UK guilds is declining. As information becomes more generalised these long-established and powerful professional organisations are losing their ability to dictate terms to government. As standards come to be set by commercial health-care organisations, the guilds, or colleges of medicine, may merely support their members through educational experiences.

In addition to structural change, demographic trends have workforce implications: a declining birthrate means fewer young people. We are told that 2.2 births per fertile female are necessary to maintain the population. In Germany, the birthrate per fertile female is now 1.3, and the UK is not far behind. And of university-educated adults, more than 50% of medical graduates are now female (who want to work part-time), while many male graduates want portfolio careers with a variety of jobs (eg administrative and clinical). In the UK, the European working-time directive (restricting work to a 35 hour week in shifts, where earlier generations worked 48 hours on over a weekend) is creating a workforce that will work shifts but not weekend on-call. This group has a differing set of priorities from the previous generation.

Historical underpinning of social change

In the Grampian area, there are 20 so-called community hospitals. They developed for two reasons in a burst of activity associated with World War I. The first and main reason was to do with a new technology, and this was anaesthetics. The development of anaesthesia meant that operative procedures could be carried out in situations where resources such as operating theatres, staff and beds were concentrated. For the first time surgery could be carried out close to home in local communities, and a wave of philanthropy created the first examples of community hospitals–like Huntly Hospital in rural Aberdeenshire.

The second reason for the development of community hospitals was generated by loss. When World War I resulted in 10 million dead and the same number permanently disabled, community grief dictated that the memory of those lost be translated into something tangible. This resulted in the construction of the well-loved 'memorial hospitals', funded by public subscription or philanthropy. That public attitudes to other community hospitals (evolved from workhouses) are subtly different reflects the importance of history in the creation of memorial hospitals. If respect for the past is one of the key features of transformational change – as in the technology and social change that produced these elderly structures – a different technology is changing our lives today.

Technology

The personal computer has transformed aspects of the health professional's traditional role. When the computer is used to automate process, to manage continuity of care, or to analyse data, it replaces the health professional as a repository of information. In Grampian, this same technology has been used to support remote health professionals. With support from the Scottish Telemedicine Action Forum[1], a telemedicine network links 12 minor-injury units in community hospitals to Jim Ferguson Hospital's accident and emergency department at Aberdeen Royal Infirmary, providing supported care at a distance. The project was designed to support the nurse, paramedic or generic healthworker in a remote situation where there is no longer a full-time doctor, or where demand exists but physician coverage is not viable.

The pilot project for this model took place in a village called Letham, some 6 miles from the market town of Forfar (Figure 1). There, nurse Sylvia Harvey satisfied the demands of the Letham population for a branch surgery with the aid of a supported diagnostic service run with basic video conferencing material: Integrated System Digital Network (ISDN) and a British Telecom Videoconferencing 7000. The system is linked to the main surgery in Forfar and a GP called William Peterkin (no relation to the author). At present we are developing the ability of the system to use more technical inputs, such as a digital stethoscope, auroscope, ECG and other evaluative tools.

Trials of the developed system will be carried out in the safe setting of Letham and then in a more remote site, Braemar, where there is both opportunity and threat. The threat is the plan to create a national park, which will extinguish any chance of future building development; the opportunity is a tight time scale, which will force the pace of development of new facilities before park status is approved. If opportunity prevails, the ambulance and local government and health services will be brought into the system, and a new building will be provided for the doctor's surgery, ambulance and associated services. This remote but scenic rural community will still have a doctor but the pressure on him will be relieved – as will the pressure on the NHS Trust to recruit his successor or to provide medical staff for a duty rota.

Technology is our hope to address the loss of single-handed medical practitioners in rural areas. In re-engineering terms, new technology is integrative. It will draw together other contributing elements such as new teams, education programs and building projects. A telemedicine link based in community resources as disparate as the local hotel or police station may allow patients with clinical problems to be examined at a distance by a physician, with just the attendance of a nurse or care assistant. Consideration has been given to the level of digital information useful in such situations. Evaluation of the use of standard examination techniques coupled with electronic stethoscopes, auroscopes, ECG and other digital inputs, is made from a patient and clinical governance perspective. The overriding principle is whether the technique used is safe, acceptable and effective.

Partners

Grampian is well placed for innovation but an overarching consideration is what synergy can be obtained from partnership with others in the public and private sectors. Because the project proposal needs funding for further development, and then to make it a reality, the collaboration of individuals and commercial organisations is essential. When nurse Sylvia Harvey's pilot in Letham is translated into the larger pilot in remote Braemar, our partners will be local government, the ambulance service, the National Cash Register Company (NCR), Remote and Rural Areas Resource Initiative and others. The digital stethoscope is being evaluated in partnership with Dr Alison Douglas of Grampian Doctors On Call Service (GDOCS) an out-of-hours cooperative[2]. The Department of Telemedicine at Aberdeen University[3] with Dr John Brebner provides academic back-up and support for developments and linking with other universities, such as Abertay in Dundee. It may be possible to combine aspects of the clinical service with other services delivered at a distance, such as banking or benefit support. Discussion with NCR has indicated that there may be ways to share costs with commercial partners.

Editor's note

That was the state of play in 2001. In the intervening year, Dr Peterkin reports that the evaluation of the electronic stethoscope has 'gone live' between GDOCS and one of the other Grampian sites, and that the planning process is moving ahead in Braemar.

References

1. Scottish Executive Health Department. *Scottish telemed initiative.* (On-line) 7 August 2000. Available from: http://www.show.scot.nhs.uk/telemedicine/ (accessed 2 Dec 2002).

2. G-docs. *Grampian doctors on-call service*. (On-line) 2001. Available from: http://www.gdocs.org.uk (accessed 2 Dec 2002).

3. University of Aberdeen. *Telemedicine*. (On line) undated. Available from: http://www.abdn.ac.uk/general_practice/telemedicine/ (accessed 2 Dec 2002).