

The sociotechnical challenge of integrating telehealth into health and social care for the elderly

Ken EASON¹ and Patrick WATERSON²

¹ *The Bayswater Institute, 9 Orme Court, London, UK*

² *Loughborough Design School, Loughborough University, UK*

Abstract. Telehealth has been heralded as a major mechanism by which elderly people can continue to live at home but numerous pilot studies have not led to it becoming a mainstream contributor to healthcare. This paper concludes that effective telehealth implementation requires considerable organisational change: it is a sociotechnical design challenge. A review of the plans of 25 English health communities to introduce integrated health and social care concludes that they could lead to organisational environments conducive to mainstream deployment of telehealth. However, different kinds of integrated care are planned that make different demands on telehealth and pose different sociotechnical challenges.

Keywords: Sociotechnical Systems, Integrated Health and Social Care, Telehealth.

1. The demographic challenge

The population of elderly people in many developed countries is increasing rapidly and putting an ever-greater strain on healthcare and social services. As a result many determined efforts are now being made to treat elderly patients in their own homes rather than in hospitals. To achieve this objective major organisational changes are now being made to provide more health and social care in the community and the use of telehealth applications to connect patients at home with clinical services is seen as making a significant contribution to this goal. This paper examines efforts in England to introduce integrated health and social care for the elderly in the community that have been underway for a number of years.

2. The promise and disappointment of telehealth

There is widespread belief that telehealth can be used to help people live independent lives at home even when they are suffering from multiple conditions that are severely disabling. In England the Department of Health has launched the 3 million lives programme (<http://3millionlives.co.uk>) to encourage its widespread deployment in community care. Telehealth provides tools for health practitioners which, for example, enable test results to be collected at home and monitored by healthcare agencies. These applications may also enable the patient to monitor their own health and achieve a higher level of self-management of their long-term conditions. A wide variety of these applications have been developed over the past forty years and they have often been presented as heralding a new era of healthcare, one in which patients would not need to travel to see specialists, people can be kept safe in their own homes and there will be less need for expensive in-hospital treatment etc. However, despite numerous pilot studies, they have yet to become routinely adopted in the delivery of care to patients in the community. (Wyatt 2011; Steventon et al.,

2012). So the question remains; why does a technology with so much promise fail to deliver expected benefits?

One reason why telehealth has not realized its potential is that pilot applications tend to be techno-centric; the emphasis is upon getting equipment set up in the homes of patients and trying as much technology as possible. However, if this approach is to become a normal part of healthcare changes are also needed in organisational support systems: if telecare monitoring indicates a patient has had a fall somebody has to go to their aid, when a patient's condition changes someone has to assess what telehealth technology is appropriate, if the telehealth system monitors blood pressure, blood glucose levels etc somebody has to assess the results and take appropriate action. It is not the technology alone that can achieve benefits for patients but a sociotechnical system in which there are tight couplings between the functionality of the technology and the practices of all the healthcare agencies involved. We conclude that the problem is not just a technical one; it is about creating new sociotechnical systems for patient care (Eason and Waterson 2012). In England the healthcare agencies serving elderly people have been fractionated and it has been difficult to align them to support the use of telehealth. Lluch (2013) evaluated home care in eight EU countries and concluded that progress in the mainstream application of telehealth often went with progress towards the integration of health and social care. We undertook an evaluation to determine whether this was happening in England.

3. Organisational changes in Integrated Health and Social Care

We reviewed integrated care developments in 25 health and social care communities across England. Fourteen of these communities are designated 'Integration Pioneers' by the Department of Health (Department of Health 2013) and we added another 11 that have well-developed plans for integrated service development. We have reviewed case studies and evaluations of developments in these communities. These show that, whilst all of them have strategic plans to make transformational changes, none of them have gone for a 'big bang' strategy that introduces all aspects of integrated care at the same time. In every case a gradual process is underway in which changes to different parts of the service have priority.

Integrated Care Development Practices	No. of Services
Integrated Health and Social Care Organisation	5
Pro-active Care and Risk Stratification	13
Intensive Care at Home	5
Single Point of Access	21
Local multi-disciplinary care teams	17
Specific Long Term Condition Pathways	12
Social Care Re-ablement	6
Total (in 25 services)	79

Figure 1: Organisational Change Practices for Integrated Care

Figure 1 identifies seven major kinds of development in the 25 settings. In five of these

settings a ‘top down’, strategic change has led to a merger of local community health and social service agencies into one service. These developments are macro-organisational changes, spanning many of the health and social care agencies in a local community. However, the majority of developments are the creation of new front line practices by which integrated care can be delivered. These are ‘micro-developments’ that focus on links between some of the contributors to care at a specific point in the care process. The most frequently sought front line practice (21 cases) is the achievement of a ‘single point of contact’ for patients so that they do not have to deal with many separate agencies. In many cases the ‘single point of contact’ is a route to a local multidisciplinary team (17 cases), a team of nurses, therapists and social workers that can provide most of the care needed. In 13 of the services the main emphasis is upon General Practitioner (GP) clinics identifying older patients who are ‘at risk’ and creating ‘pro-active’ services with local community health and social care agencies to support these patients so that they remain healthy and safe. In five settings the focus has been intensive care for patients at home to avoid them being admitted to hospital. Older people tend to suffer from long-term conditions and another approach (12 cases) is to focus on developing integrated care around the health and social care pathways associated with each condition. Finally, a process called ‘re-ablement’, (six examples) involves assessing needs after an injury or illness and equipping the person or their home with facilities to help them live normal lives.

These different practices group as clusters around the agencies that are the prime drivers for their development. For example, if General Practice is the prime driver, pro-active care and ‘risk stratification’ are the main targets. If the driver is the integration of community healthcare and social care, the result is often local multi-disciplinary care teams that act as the ‘single point of contact’. If the development is a combined effort of hospital care and local community healthcare to keep people who are quite ill out of hospital the focus will be on ‘intensive care at home’. If the patient is suffering from a particular long-term condition the development of a pathway for each condition, e.g. diabetes, dementia etc, will involve local teams together with hospital-based specialists. In practice parts of the whole community care process are being re-organised into specific sociotechnical systems to deal with particular aspects of care.

4. Developing operational sociotechnical systems for new practices

In the 25 health communities we also looked for evidence of plans to develop telehealth applications. In the majority of cases the strategic plans for integrated care envisaged technical developments integral to the achievement of integrated care, the most common target being the development of shared electronic patient record systems. Although not top of the agenda, telehealth also figured prominently in many plans, cited 11 times in the 25 cases. Many had already undertaken trials of these technologies and were looking to develop them as mainstream parts of the care process. What is apparent, however, is that the different ways in which local communities are developing integrated care means that the form these technologies need to take will vary according to context. In practice it seems there will be many different sociotechnical systems within which telehealth will be embedded. Some of these differences are highlighted in figure 2 in which the different approaches being taken are placed on a scale of patient need. When a patient is first considered ‘at risk’, perhaps because of the development of a long-term condition, they remain quite capable of living independently. If the patient’s condition deteriorates so that they require regular treatment checks for several conditions, the health and social care may need to be ‘stepped up’ to enable them to live safely at home. Finally, if they suffer falls or other crises, the home care may need to ‘step up’ to an intensive care level if the patient is

not to become a ‘frequent flyer’, needing regular hospital treatment.

As figure 2 shows, the service design and the technological support that is appropriate to these three cases constitute three different sociotechnical systems. When the patient is healthy but ‘at risk’ the need may be for ‘pro-active care’ to help them remain healthy. The organisational structures and processes required usually involve the local GP and social services monitoring the condition of people ‘at risk’ and intervening as necessary. The requirements for telehealth at this level of care are relatively simple: to monitor vital health indicators such as blood pressure and provide alarms to indicate when the person needs help. When patients have multiple long-term conditions, for example, diabetes and dementia, they may need regular health and social care if they are to remain at home. The organisational resources for this purpose are local multidisciplinary teams of health workers reached through a ‘single point of access’ including specialists in long-term conditions.

The requirements for telehealth may now become more specialist, relating to the particular monitoring associated with each of the long-term conditions. When elderly people living at home suffer a crisis perhaps due to a fall organisational procedures need to be ‘stepped up’ to intensive care level to avoid admitting the patient to hospital. The use of telehealth in this environment could be of great value; it could, for example, provide almost constant remote monitoring of vital health indicators. However, the challenge is to install relevant specialist equipment quickly and to decommission it when the crisis has passed.

Integrated Care Strategy

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Progressively Greater Support Needs

Service Design	Pro-active care for older people ‘at risk’	Single ‘point of access’ to people with multiple care needs	Intensive care for patients in crisis in their own homes
Organisation	GPs and social services monitor large ‘at risk’ population	Local multi-disciplinary teams care for people with multiple long term conditions	Multi-disciplinary teams provide short term intensive care at home
Associated Technologies	<ul style="list-style-type: none"> • ‘Risk Stratification’ • Shared health and social care records 	<ul style="list-style-type: none"> • Shared health and social care records • Mobile working 	<ul style="list-style-type: none"> • Shared health and social care records • Mobile Working • ‘Virtual Wards’
Telehealth/Telecare Contributions	Simple telehealth and telecare for large population monitoring	<ul style="list-style-type: none"> • Specialist telehealth/telecare • Self-management aids 	All available dynamically tailored to emergent needs

Figure 2: Three levels of care and associated technological support

These different scenarios show that, as a patient’s condition gets worse, the potential value of using telehealth becomes greater. However, the task of setting up the technologies and using them also becomes greater. These technologies have to be tailored to the needs of each patient and they have to support the work of a growing number of healthcare staff as the patients’ needs become greater. The plans of the 25 local communities focus on the developments needed at different stages of the continuum from pro-active care to intensive care. The focus adopted defines the particular set of organisational front-line practices to be developed and sets up particular conditions for the adoption of telehealth. Each stage of the continuum constitutes its own local sociotechnical challenge to establish an appropriate linked set of organisational structures and procedures and technologies, telehealth and others. There is evidence that many of the 25 communities are moving beyond pilot uses of

telehealth to the use of these technologies as an integral part of integrated health and social care. In those settings that are focusing on pro-active care there is now widespread application of simple telecare alarm systems to provide alert services in patients and clients get into difficulty. There are also examples of simple forms of telehealth that are being used by many patients, for example, enabling patients to text blood pressure results to an assessment centre. The main forms of telehealth that are reaching normal practice in the care of people with multiple long-term conditions are applications that support healthcare pathways for single diseases e.g. COPD (Chronic Obstructive Pulmonary Disease) and Diabetes. The implementation of telehealth systems to support intensive care of patients at home is even more challenging. In Walsall, for example, as part of the development of a Frail Elderly Patient Pathway, telehealth equipment proved difficult to set up and use in the short time scales involved in the intensive care of patients (Eason and Waterson 2012).

There is evidence therefore that, where organisational forms are being created for integrated care of the elderly in the community, the conditions may be favourable for telehealth to become part of the normal way in which care is delivered. However, the many different circumstances in which care may be delivered and the particular organisational forms created in each locality mean that each telehealth development poses a specific kind of sociotechnical systems design challenge: one in which local organisational structures and processes, other technical systems and forms of telehealth need to be knitted together to produce a coherent system capable of delivering the kind of integrated care that is required.

5. Conclusions: Getting sociotechnical systems from pilots to mainstream

The history of telehealth is an example of a problem encountered many times in the development of sociotechnical systems. It can be challenging enough to set up a pilot sociotechnical system to undertake real tasks. However, the challenge is much greater when the intention is for a new technical system to become part of the normal operation of an existing, complex, sociotechnical system. But if there are broader developments underway that are changing the larger system, they may provide opportunities for local, micro developments that will enable the adoption of the new technology system. These are reminders that any sociotechnical system is an open system and that success in any kind of change process is dependent on understanding and working with the broader systemic environment within which the change must take place.

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