



## **MALT – Overcoming the Barriers to Mainstreaming Assisted Living Technologies**

### **Summary research report**

**The MALT Study Consortium  
November 2014**

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## 1. Introduction

The future expansion of Assisted Living Technologies crucially depends on establishing cost-effectiveness and patient benefit at scale. This entails overcoming the barriers to adoption, and devising viable service and business models. This project – MALT: Overcoming the Barriers to Mainstreaming Assisted Living Technologies was funded by the Technology Strategy Board<sup>1</sup> through the Assisted Living Innovation Platform, with support from the Economic and Social Research Council.

The programme of research commenced on 1<sup>st</sup> June 2011 and completed on 30<sup>th</sup> November 2014. A multi-disciplinary consortium of researchers and technology industry experts from the Universities of Sheffield, Leeds and Manchester, and the Advanced Digital Institute collaborated on the project. The overall aim of the research was to identify, explore and seek to overcome the key barriers to delivering telehealth at scale within four specific sites in the Yorkshire and Humber region. Within the research, telehealth was defined as remote monitoring of patients with long-term conditions at home, with a specific focus on Chronic Heart Failure and Chronic Obstructive Pulmonary Disease. There were four key streams of work within the project: financial modelling; business modelling; staff adoption and implementation and patient acceptance.

This short summary report documents the background to the research, aims, methods and key messages from across the MALT project. In addition, the final section of this report provides a series of recommendations for the future of mainstreaming telehealth and other technology enabled care services. The project is reported in this way so that it is accessible to a wide readership. A series of academic publications from the project are already available<sup>2</sup>, with numerous other papers in preparation at the time of writing. These outputs are in addition to the localised reporting to each research site during both phases 1 and 2 and the internal reporting to the TSB throughout the lifetime of the project.

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<sup>1</sup> The Technology Strategy Board were re-branded as Innovate UK in 2014.

<sup>2</sup> Brewster et al. (2013); Thokala et al. (2013); Gorst et al. (2014) and Taylor et al. (2014)

## 2. Background to the research

Like other advanced nations across the world, the UK has an ageing population (Office for National Statistics, 2012). Combined with a growth in the number of people living with long-term conditions and increasing concerns about the health of younger generations, policy has turned its attention to how the UK will be able to support the rising number of people requiring regular health and social care, both financially and with regards to meeting their needs for good quality care (Department of Health (DH), 2012a). In 2012, the DH (2012a) estimated that one in three people live with a long-term condition, and predicted that by 2018 around three million people will have three or more long-term conditions, and the majority of whom will be older people.

In response to these trends, there has been progress in the development of a range of technologies to assist with the management of long-term conditions, which enable people to live for longer and lead more active and independent lives (Car et al., 2012). More recently, industry has focused on how to utilise new information and communication technologies to develop equipment that will help people with long-term conditions better manage their health at home (Sanders et al., 2012). Telehealth interventions are one form of Assisted Living Technologies currently being introduced across health and social care services in the UK (DH, 2012a).

There has been sustained policy support for the expansion of telehealth in recent years. This comes in several guises, including the Department of Health's 3 Million Lives programme which was launched in 2012 (DH, 2012b) and aimed to increase the number of people who benefit from telehealth, telecare and telecoaching to 3 million by the year 2017. Although the initiative had financial backing from industry suppliers, there was no DH money for expansion and in 2013 the programme was superseded by NHS England's Technology Enabled Care Services directive (NHS England 2014). Most recently, the publication of the joint National Information Board and DH report (2014) signified the ongoing cross-government commitment to modernising the NHS through the better use of data and technology.

As well as these health policy initiatives, the Technology Strategy Board funded DALLAS (Delivering Assisted Living Lifestyles at Scale) programme was launched in 2011, providing £23 million to roll out Assisted Living Technologies within a number of communities across the UK (TSB, 2011). In addition to this, Scotland's National Delivery Plan for Telehealth and Telecare was published in 2012, aiming to provide telehealth and telecare for an additional 300,000 people living in Scotland by 2015 (The Scottish Government, 2012). These mainstreaming programmes illustrate the on-going government and industry commitment to increasing uptake of technologies within the UK throughout the lifetime of the MALT project.

Despite this, the UK has experienced slower progress towards large-scale deployment than was originally anticipated, in part because of significant changes to the funding and commissioning of NHS services, with the introduction of Clinical Commissioning Groups (CCGs) in 2012, and in part due to the absence of an evidence base to definitively support 'at scale' mainstreaming (Car et al., 2012; Hendy et al., 2012). A key issue here continues to be the Whole Systems Demonstrator Trial, one of the largest and most influential studies about telehealth (and telecare) conducted to date (Steventon et al., 2012), not least because the published findings have been interpreted as less promising than early indications from the Department of Health seemed to suggest (DH,

2011; Greenhalgh, 2012). Moreover, the results are mixed and difficult to interpret due to the range and interplay of factors that can influence the effectiveness of the delivery of telehealth.

Since the MALT project was commissioned in 2011, the landscape for and level of mainstreaming telehealth and other Assisted Living Technologies has remained stable, with little increase in activity. This ensured that understanding the barriers to greater adoption and acceptance has remained important.

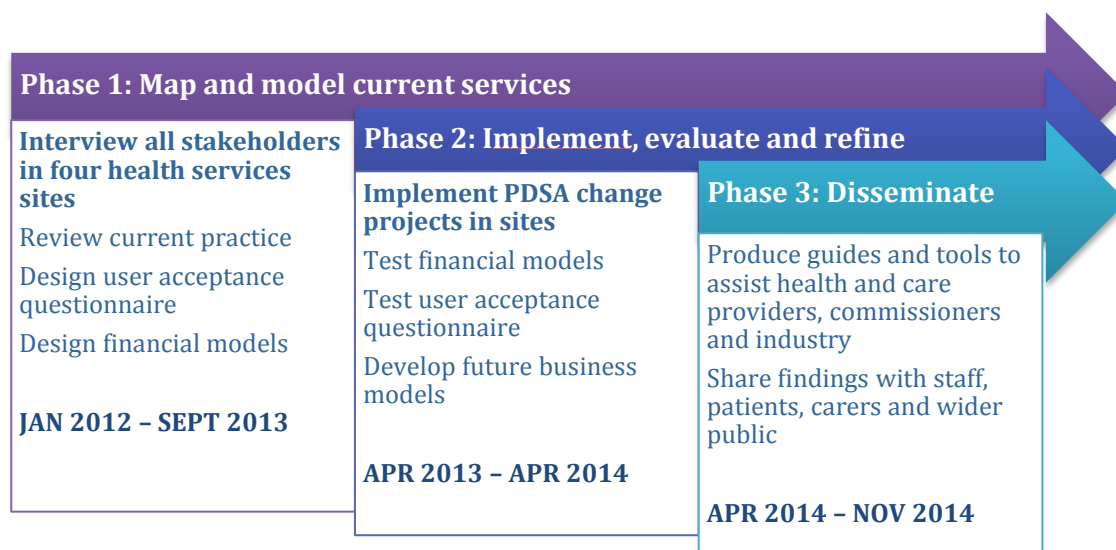
### 3. Aims of the research

The aims of the overall study were to:

1. Create a health economic model of two long-term conditions (Chronic Obstructive Pulmonary Disease (COPD) and Chronic Heart Failure (CHF)) clinical pathways that allows current and potential telehealth deployments to be tested for cost effectiveness at different scales and within different configurations of deployment;
2. Refine these models with commissioners and service providers in four areas<sup>3</sup> in Yorkshire and Humber where telehealth is being deployed;
3. Study user, carer and staff acceptance and uptake of telehealth, thereby deepening understanding of technology acceptability and the effects of non-acceptance upon clinical and cost effectiveness;
4. Design strategies for service delivery optimising cost-effectiveness and uptake of telehealth deployments and evaluating these strategies in four areas<sup>3</sup>;
5. Test models and strategies and adapt them as agreed with stakeholders through cycles of action research in the four areas<sup>4</sup>;
6. Work with industry to identify and develop business models which will optimise and service market need for current and future technology deployment; and
7. Produce evidence and tools for policy makers, commissioners, providers and industry which will support future large-scale assisted living technology deployment.

The research worked through a series of phases as shown below in figure 1.

**Figure 1: MALT study phases**



A more detailed explanation of the research methods used in phases 1 and 2 is given in section 5 below. Prior to that, a short description of the research sites and their recruitment to the study is given next in section 4.

<sup>3</sup> The original project brief was left open, so that the project could be completed in ‘three to five areas’. In Autumn 2012, the consortium agreed to complete the research in four areas due to a) researcher capacity and b) prior issues in securing participation from other areas in the Yorkshire and Humber region.

<sup>4</sup> Again, this aim was adapted from the original ‘adapting and apply these models and strategies to innovative emergent assisted living technologies developed in other projects funded through the Technology Strategy Board to test their likely incremental benefits’ due to its limited feasibility and the need to focus the research on telehealth. This decision was agreed by the consortium in Autumn 2012.

#### 4. Research sites

The four research sites were purposively selected and recruited through professional contacts from within the research consortium, based on their adherence to the following inclusion criteria:

- a. Geographical – located within the Yorkshire and Humber health region of the North of England, United Kingdom;
- b. Clinical application – using telehealth with patients with COPD and CHF; and
- c. Organisational context– delivery of telehealth within community health setting

Beyond these criteria, the aim was to capture some variety in relation to the size of services and the underlying service model for technology usage, and stakeholder groups involved in telehealth provision locally. For context, the key characteristics of each site are shown in Table 1.

**Table 1 – Case study site characteristics**

Research Site Identifier	SITE A	SITE B	SITE C	SITE D
<b><i>Telehealth deployment</i></b>				
Original introduction of telehealth	2007	2009	2006	2010
No. of telehealth units in use*	104	39	200	34
<b><i>Referral routes into telehealth</i></b>				
Community Matrons	✓	✓	✓	✓
Case Managers	✓			✓
Specialist Respiratory Nurses	✓	✓	✓	
Specialist Heart Failure Nurses	✓	✓	✓	
GPs	✓			
<b><i>Stakeholders involved in telehealth</i></b>				
NHS Community Healthcare Provider	✓		✓	✓
NHS Hospital Trust	✓			✓
Clinical Commissioning Group		✓	✓	
Equipment Manufacturer	✓	✓	✓	✓
Local Authority	✓	✓	✓	
Community Interest Group Provider		✓	✓	
Private Company			✓	

\* At end of phase 1 in each site

#### **Ethical approval and governance**

Ethical approval for the conduct of the research was granted by UK National Research Ethics Committees (references: phase 1 - 11/YH/0034; phase 2 - 13/SW/0036 and 13/SC/0138 for the patient survey). Access to individual sites was granted via local health service research governance offices.



## 5. Research methods

### 5.1 Phase 1

During phase 1, a qualitative case study design was applied across the project to understand how telehealth was being utilised locally in each site. Access to both staff and patients was negotiated through the local lead collaborator – who typically held a central role in telehealth delivery or management. All staff were recruited through purposive or snowball sampling strategies that permitted the capture of diverse perspectives on telehealth usage. All patients (and their carers) were recruited via local services who sent out recruitment letters and information sheets, and those who were interested opted in by returning a reply slip. The researchers followed up with all interested patients and staff to arrange mutually convenient times to complete the interviews.

A total of 157 qualitative interviews were completed across the four sites – as shown in table 2. There were 105 interviews with staff and the median duration was forty-five minutes (minimum of 11 minutes and maximum of one hour and thirty-six minutes). Staff roles typically included technical and clinical frontline nursing staff (community matrons, specialist respiratory and cardiac nurses) and senior staff held a variety of operational, strategic and commissioning managerial roles. A total of 52 patients and carers took part in interviews, and the median duration was forty-one minutes (minimum of 11 minutes and maximum of two hours and twenty-two minutes). All data were collected between May 2012 and June 2013.

**Table 2: Participant characteristics – phase 1**

Research Site Identifier	SITE A	SITE B	SITE C	SITE D	Total
Frontline staff	21	17	21	25	84
Managerial staff	6	6	7	2	21
Patients	9	6	12	13	40
Carers	1	1	4	6	12
Total	37	30	44	46	157

All of the interviews were transcribed verbatim for data analysis; the purpose of, and approach to which varied across the four packages of research according to their substantive focus, as follows:

**Financial modelling:** framework analysis (Spencer, Ritchie and O'Connor 2003) was used to identify the key themes in potential future model users' (senior commissioning and managerial staff, as well as telehealth industry leaders<sup>5</sup>) needs from a financial model for telehealth. This analysis informed the structure of the model, which was subsequently developed using literature reviews, analysis of hospital episode statistics and survey data (from phase 2, see below).

**Business modelling:** a socio-technical approach (Clegg 2000) was used to structure the analysis. This is a systems approach which treats telehealth as part of a wider work system, composed of people, goals, culture, processes, technologies and infrastructure.

<sup>5</sup> A total of eight industry representatives from commercial telehealth companies were also interviewed to ascertain their financial modelling needs and feed into the structure of the resulting model.

**Staff adoption and implementation:** framework analysis (Spencer, Ritchie and O'Connor 2003) was used to explore the usage and acceptance of telehealth among frontline staff with a view to identifying key barriers and facilitators.

**Patient acceptance:** interpretative phenomenological analysis (Smith, Flowers and Larkin 2009) was used to identify the key barriers and facilitators of telehealth acceptance by patients. The findings from this stage were used to develop a draft patient acceptance questionnaire which was refined using the 'think aloud' (Ericsson and Simon 1993) technique prior to phase 2.

In addition to this, at the end of phase 1, workshops were held with each research site to share the findings and develop next steps for phase 2. Each site was also given detailed and summary reports which covered the socio-technical analysis and barriers and facilitators for staff and patients.

## 5.2 Phase 2

The research methods used in phase 2 were tailored by each package of research between April 2013 and April 2014. In summary, this was as follows.

**Financial modelling:** The model was applied in two of the research sites to test out hypothetical service-design scenarios to help feed into a) development of a new cardiac rehabilitation service using telehealth; and b) explore costs and benefits from telehealth over a five year timeframe to feed into decisions about future funding and procurement. Summary reports were produced for both sites and feedback was gathered from a small number of stakeholders in each locality.

**Business modelling:** The objective was to develop new sustainable business models for telehealth using 'Alternative Futures' workshops that were run in two of the research sites. In total, eight people attended workshop 1 and nine people attended workshop 2, representing frontline staff, local authority, industry, commissioners and technology and service leads.

**Staff adoption and implementation:** Using the findings from phase 1, the research team established a process of action research in each site as they aimed to improve their telehealth service, increase staff adoption and secure resources for longer term investment. Two cycles of action research were conducted in each site over a six month period. The process and outcomes of the action research were examined through observation during multi-stakeholder workshops, analysis of implementation plans and documentation, and focus groups with participants. In total across the four sites, fifty-seven staff and one patient engaged in the action research (see table 3).

**Table 3: Participant characteristics – phase 2 action research**

Research Site Identifier	SITE A	SITE B	SITE C	SITE D	Total
Community matrons & nurse specialists	8	4	5	4	21
Other frontline staff & support staff	1	1	7	7	16
Managers	5	2	8	5	20
Patients	0	1	0	0	1
Total	14	8	20	16	58

Patient acceptance: During phase 2, a two-wave longitudinal postal survey of current telehealth users in six NHS sites was completed to determine predictors of patients' uptake and sustained usage of telehealth. The postal survey was distributed by participating sites on behalf of the MALT study team and contained an invitation letter; participant information; consent form; telehealth acceptance questionnaire and prepaid return envelope. The survey was based on the qualitative research completed with patients in phase 1 and based on the Theory of Planned Behaviour (Ajzen 2006). The survey was opt-in and all interested patients completed the questionnaire and returned this by post. In wave 1, the survey was issued to 738 current telehealth users, and the response rate was 36% (n=263). In wave 2, six months later, the follow up questionnaire was distributed to all wave 1 responders, and the response rate was 58% (n=152).

## 6. Research findings

In this section, the key messages from across both research phases are summarised for each distinct package of research. That is, financial modelling (6.1), business modelling (6.2), staff adoption and implementation (6.3) and patient acceptance (6.4).

### 6.1 Key messages on financial modelling

1. Telehealth can be effective in reducing mortality, hospitalisations and improving health, but the existing evidence of effectiveness is variable.
2. Telehealth needs system change in order to be delivered effectively and this needs to be supported by an implementation plan, not just a final service model. Telehealth is about more than boxes in houses; the way in which staff, organisations and patients behave and interact all need to change. Changes in staff mix, roles or referral pathways are also needed; and what changes, when they happen, and how much it will cost to change, are all important.
3. Whether telehealth is cost-effective depends on implementation, as well as the final service model. Implementation costs are part of the decision about whether to adopt telehealth, and implementation also impacts on the effectiveness of the final service model.
4. Understanding the changes over time is essential, not just the steady state costs of the final service model. In addition, implementing service change is not immediate, nor are the health changes.
5. Knowing the purpose of your service is essential as this drives key parameters. These include, which patients are eligible and how long will they use telehealth for; is this a temporary deployment for teaching self-management, or long-term support for the highly vulnerable; is this for all patients, or 'frequent fliers' (people frequently admitted to hospital); and is this 'one size fits all' or will multiple systems be utilised in the service?
6. Mapping out stakeholders, together with their financial and operational relationships to one another is key to documenting and understanding the complexity of service models. It is useful to consider who does what, with whom, for how much and depending on what within the service model?
7. Data is important – gathering appropriate data to monitor and evaluate service delivery and performance takes away a lot of guesswork. Service delivery includes number of patients, drop-outs, duration of monitoring and redeployment time. Performance includes hospitalisations, nurse visits and alerts.
8. Informed contracting is only possible with sufficient data, and a good understanding of implementation, the system and the final service model. Knowing whether it is worth it is essential, as too, is knowing why it's not worth it. The 'whys' may be solved by an alternative contracting arrangement that can be discussed with other stakeholders.

## 6.2 Key messages on business modelling

1. Telehealth stakeholders in health and social care face many difficulties when innovating new business and organisational models. Uncertainties over future funding, technological possibilities and the variety of potential roles within commissioning and Assisted Living Technology market development impact on people's ability to think about the future in this domain.
2. The socio-technical systems approach and scenario planning techniques can help NHS sites design new ways of working. Scenario planning reveals that current telehealth service design is entrenched in existing ways of working and operating. Devising new, innovative, future business and organisational models requires a move beyond examining the constraints of existing services. Seeing telehealth services as one part of a socio-technical work system provides holistic insight into the spectrum of issues that interplay within the delivery of telehealth services.
3. Four alternative futures were developed to help NHS sites to design their preferred future during 'Alternate Futures' workshops. These futures reflect the dilemmas stakeholders faced when designing telehealth service business and organisational models; and were named *Hub Central*, *Thousand Flowers*, *Navigating Networks* and *Laissez Faire*<sup>6</sup>. The preferred future is a hybrid predominately based on *Hub Central* and *Navigating Networks*; with some element of statutory provision for ALTs provided and organised within a hub structure, yet with a network also being hosted alongside; allowing people to step down from more intensive models of care to more proactive health maintenance and self-monitoring.
4. Adopting a socio-technical approach can help to align social and technical aspects of the telehealth service during implementation. It is important that there is investment in planning the effective visualisation of the preferred future service model, and ensuring aligned goals, values, infrastructure, processes, support, roles etc. are in place.
5. It is essential for there to be collaborations and links made between NHS and industry stakeholders when designing new ways of working in Assisted Living Technology markets. Both the business to business, and business to consumer markets will exist in the future, and Assisted Living Technologies will not mainstream from just one market. The futures themselves highlight this dual nature, and the preferred future (hybrid of *Hub Central* and *Navigating Networks*) highlights the way in which a network could act as a point between these two markets.

## 6.3 Key messages on staff adoption and implementation

1. Clinicians are end-users of remote care technologies. Minimising the impact on workload, challenging myths and misconceptions that can occur around the introduction of new technologies, and maximising benefits for patient care and clinical practice, are crucial in

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<sup>6</sup> These four scenarios can be described in brief, as follows: *Hub Central*: a central technology hub is commissioned that offers a range of standardised ALT services to a large number of users; *Thousand Flowers*: individual care provider organisations commission small scale applications of ALTs for specific user groups; *Navigating Networks*: an e-based network to help individual users navigate a selection of ALTs using personal health budgets to purchase; and *Laissez Faire*: open market and individual consumerism drive the development, use and acceptance of ALTs.

driving up adoption. Sharing good practice and stories of success can ensure that the benefits of telehealth are identified and realised in practice; however GPs are yet to be convinced of the benefits for primary care, and public awareness remains very low, which limits demand at present.

2. Telehealth champions and local enthusiasts can engage and train staff, and drive forward service improvements. However, the effort required to sustain momentum can be significant and a formalised role supported by management can be more effective. Working in partnership with frontline staff throughout implementation, and allowing for an 'experimental phase' to enhance learning and enable staff to develop trust and confidence in telehealth are also important.
3. Action research and service improvement tools can facilitate opportunities for shared learning, and bring together multiple stakeholders to work together on improving processes and practices for telehealth. However, without explicit support from leaders and decision-makers, securing long-term investment and tackling wider organisational barriers are a challenge.
4. Establishing a remote care pathway from referral to discharge, and ensuring that resources are in place to deliver this, can enhance success and address key implementation barriers before they would normally occur in practice. Having a clear pathway can also facilitate better assessment and audit, and ensure that the most suitable patients are referred, that monitoring is tailored to need, and that patients are monitored for the optimal duration.
5. Whilst a systems approach is useful in identifying the range of factors affecting implementation, technology plays a key role in whether or not telehealth is successful. Inappropriate, unreliable and inflexible technologies can limit success, affect acceptance among users, and lead to increased workload as staff 'work-around' design flaws. Core design features can also shape the way in which care is delivered, and in ways that are not always anticipated.
6. The technological infrastructure within the statutory sector cannot currently support the mainstreaming of remote care technologies. A key benefit of telehealth is the ability to obtain data from patients remotely, and to use and share this data to make decisions about care, without always having to see a patient. Having multiple platforms and patient recording systems limits the potential to do this; something which is further compounded by strict regulations concerning access to patient data.
7. Evidence of success is important to all stakeholders; however, different types of evidence are preferred by different stakeholder groups. The current focus on cost-effectiveness within policy and commissioning, the problems with measuring cost-effectiveness of complex interventions, and on-going ambiguities about why to use remote care technologies cause decisional uncertainties about whether or not to invest, and how to measure success.
8. Enduring organisational barriers, including the multi-stakeholder landscape, continue to prevent mainstreaming of telehealth and other remote care technologies despite policy support and enthusiasm among core clinical teams. Recent and on-going changes within

health and social care continue to cause uncertainty about what to invest in and how new technologies should be used, and this uncertainty is mirrored in both policy and practice.

#### **6.4 Key messages on patient acceptance**

1. Home telehealth can provide considerable benefits to people with heart failure and chronic obstructive pulmonary disease, yet evidence suggests that 32% of patients refuse telehealth and 20% abandon it. Identifying the factors that affect whether or not patients take up and continue using telehealth is therefore crucial to the goal of mainstreaming telehealth.
2. Some patients believe that using telehealth would be unnecessary; therefore it would be useful for healthcare professionals to ensure that patients who are being offered telehealth understand why they are being asked to use it and the benefits it can provide.
3. Longstanding technical problems can lead patients to question the benefits of telehealth and may lead patients to abandon usage. However, these problems could be minimized by patients having access to well-designed, patient focused telehealth equipment and also good technical support, so that any problems can be quickly resolved, thus resulting in purely minimal issues for patients, which is consequently likely to facilitate sustained use of telehealth.
4. A preference for in-person care has been identified as being one of the main barriers to patient acceptance of telehealth. Patients anticipate that using telehealth would result in fewer in-person visits from clinicians. Thus, it may be useful for healthcare providers to offer telehealth to patients at an earlier stage than it is currently offered, before they become accustomed to in-person visits. However, clinicians should also be aware that telehealth is not ideal for all patients and some may never want to use telehealth or be well enough to do so.
5. Increased access to healthcare services is a key driver of patients' satisfaction with telehealth. Thus, it may be beneficial for clinicians to inform patients that using telehealth would not involve them having to manage their health condition alone, nor would it diminish the contact they have with their healthcare provider, but rather it would lead to more regular and frequent contact. However, some patients will have a preference for in-person care, as a result of the social support provided by nurses.
6. The majority of patients report better health management as a main benefit of telehealth use. Patients report improvements in self-management as a result of using telehealth, due to having a greater responsibility for their own health. They also report improvements in their health knowledge due to the frequent provision of health status information, which helps them to learn about their health condition. However, not all patients experience these improvements, particularly those who live alone, and previous research has found self-care to be relatively greater amongst patients who live with others.
7. It might be useful for healthcare professionals to emphasise the use of telehealth as a tool for self-monitoring to patients considering using telehealth. This recommendation is consistent with both theory and evidence, which show that people who are actively involved in the self-monitoring of their health condition experience improvements in self-management.

8. Patients deem peace of mind to be a great benefit of using telehealth, as it reduces worry and enables them to feel safer. This finding supports previous research, which has also found that patients felt reassured by having someone 'watching over them', and so they report a sense of security in being monitored by telehealth daily. Communicating the potential for peace of mind, to uncertain patients, might be useful in promoting uptake and encouraging usage.
  
9. It is possible to develop a tool designed to measure predictors of patient motivation to use telehealth, which has face validity. A telehealth acceptance questionnaire was developed and modified and is now a validated measure, which can be used as a tool by healthcare professionals to assess motivation to use telehealth amongst current users, with the aim of identifying those patients who are likely to abandon telehealth.



## 7. Conclusions and recommendations

This section summarises the key messages and conclusions from the project and makes recommendations for the future of mainstreaming telehealth and other technology enabled care services.

### 7.1 Key messages from across the project

Looking across the programme of research, it is evident that wider adoption of telehealth is hindered by several interrelated issues, all of which must also be considered within the context of the significant level of change affecting the NHS during the period of study. These issues are as follows:

1. Evidence and evaluation: There are ongoing difficulties in demonstrating evidence of benefit from telehealth, and a lack of consistent and robust evaluation data.
2. Stakeholders and rationales: The stakeholder map for telehealth is complex, varies between services, and is changeable over time. This creates confusion over who should lead telehealth implementation and how benefits can be realised.
3. Staff adoption: Uncertainty amongst clinical staff about the benefits of telehealth limits adoption and acceptance, especially where they act as the gatekeepers to patients.
4. Patient acceptance: Uncertainty amongst potential patient and carer users about the availability and value of telehealth limits acceptance.
5. Business modelling: There is not, and will not be one single effective business model for telehealth.
6. Implementation: Existing implementation has not taken into account the complexity of the commissioning, delivery, management and acceptance of telehealth, or the links between these domains.

### 7.2 Recommendations

The MALT project has shed light on the intricate web of barriers to greater adoption of telehealth. In order to overcome this and make the policy aspirations for technology usage a reality within the NHS, we make the following summary recommendations:

1. Evidence and evaluation: There is a need for an improved and consistent evaluation dataset that reflects the diverse aims of telehealth and needs of stakeholders.
2. Stakeholders and rationales: Greater recognition of the complexity and diversity of stakeholders (and their varied functions, motivations and rationales) is important.
3. Staff adoption: Raising awareness of telehealth and its potential benefits to clinical practice will help increase adoption, provided that implementation is also well supported.
4. Patient acceptance: Improving awareness of telehealth and its perceived benefits for patients and carers will help stimulate demand amongst the general public.

5. Business modelling: Scenario planning provides a useful mechanism and process for developing business models that take into account the key issues in telehealth, and can help secure seed funding and sustainability.
6. Implementation: Greater recognition of the complexity and interrelatedness of operational, organisational and financial barriers to the acceptance of telehealth is a critical first step to expanding services.

To help support the implementation and expansion of telehealth, the MALT project has produced a toolkit of resources relating to each of these domains, which are all available free via the project website (see appendix for more details). Future research in this area should focus on, amongst other things, exploring which patients are most likely to derive benefit from telehealth, and support the development of more robust evaluation frameworks that can capture the complexity of telehealth service delivery and impacts.

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## Appendix

### Summary of MALT toolkit of resources

All MALT tools are available free via the project website – [www.malt.group.shef.ac.uk](http://www.malt.group.shef.ac.uk). We have also produced a short animation which provides a guide to the toolkit of resources and signposts potential users to relevant tools.

### Financial modelling

An online version of the financial model for telehealth is available at [www.malt.shef.ac.uk](http://www.malt.shef.ac.uk). This allows users to test out the costs and outcomes of various telehealth service models and is designed for use by a range of telehealth stakeholders, including health service managers, commissioners and policy makers, and industry representatives. Based on user inputs and data parameters, the model estimates the costs of telemonitoring, costs of usual care, number of patients alive each year, number of hospitalizations and total quality adjusted life years. These are then displayed in various formats, showing the breakdown of costs by activity, stakeholder, patient group and/or year.

### Business modelling

A scenario planning toolkit was designed to help overcome uncertainties relating to business models, and prepare organisations for increased technology use. The toolkit consists of 3 separate tools to assist telehealth decision making:

Tool 1: Alternative futures tool - Based on respondents' answers to 5 dilemmas relating to mainstreaming telehealth (standardisation, the care model, technology distribution, purchasing, and responsibility for choice), a preferred potential 'future' is generated through this Excel based tool. The alternate future represents a potential service model, and provides new perspectives from which to explore and discuss possibilities for mainstreaming telehealth.

Tool 2: The Telehealth-Readiness Index - Within this tool, users are guided through a series of questions concerning different aspects of organisational functioning, designed to analyse the organization's readiness for change, with the aim of increasing the chances of successful implementation of the new technology.

Tool 3: ST Hex-Telehealth - The ST Hex is a web based app (that can be downloaded through iTunes), that is based on socio-technical systems theory. At the time of writing, this is still in prototype form.

### Staff adoption and implementation

The toolkit of resources to support staff adoption and implementation, and increase awareness of telehealth incorporates the following tools:

MALT Mythbusters – Four myth busting information sheets have been developed to help reduce uncertainty and increase knowledge about telehealth using the research findings, because misunderstandings about telehealth and what it can achieve were key barriers to staff acceptance. These cover the following areas: 'What is telehealth?'; 'Does telehealth work?'; 'Why is telehealth used?' and 'What encourages adoption of telehealth?'.

**MALT Video Case Studies** - Four video case studies documenting the use of telehealth in community health settings have been produced to help raise awareness of telehealth. The videos do not make claims about evidence of benefit from telehealth, but rather demonstrate the ways in which this is used (1) by patients at home; (2) within nursing teams; (3) in practice to support patients and nurses and (4) within a telehealth hub. All videos were recorded in Rotherham, Doncaster and South Humber NHS Trust. The videos are hosted on the MALT Project vimeo account ([www.vimeo.com/maltproject](http://www.vimeo.com/maltproject))

**Quick Guide to Implementing Telehealth**: This online tool is designed to help services and commissioners involved in the development or re-design of telehealth identify the range of factors to consider before and during implementation, partly to enhance success and increase adoption, but also to avoid some of the challenges that are likely to occur following deployment. This tool draws on the barriers and facilitators identified from the case studies, and the subsequent action research in MALT.

In addition to this, there are also two information sheets:

**Design and Implementation**: based on findings from the research, this details the key features of telehealth that can help to facilitate successful remote monitoring of patients, and increase acceptance and adoption among frontline staff.

**Barriers and enablers**: based on a table published in the Journal of Advanced Nursing (Taylor et al 2014), this summarises the key barriers to and facilitators of telehealth adoption and implementation.

### **Patient acceptance**

The telehealth acceptance measure was developed through the project is available as a tool that can be used by healthcare professionals to assess motivation to use telehealth amongst current users, with the aim of identifying those patients who are likely to abandon telehealth.