

# A Roadmap to Transnational Exchange of eHealth Innovation



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## Preface

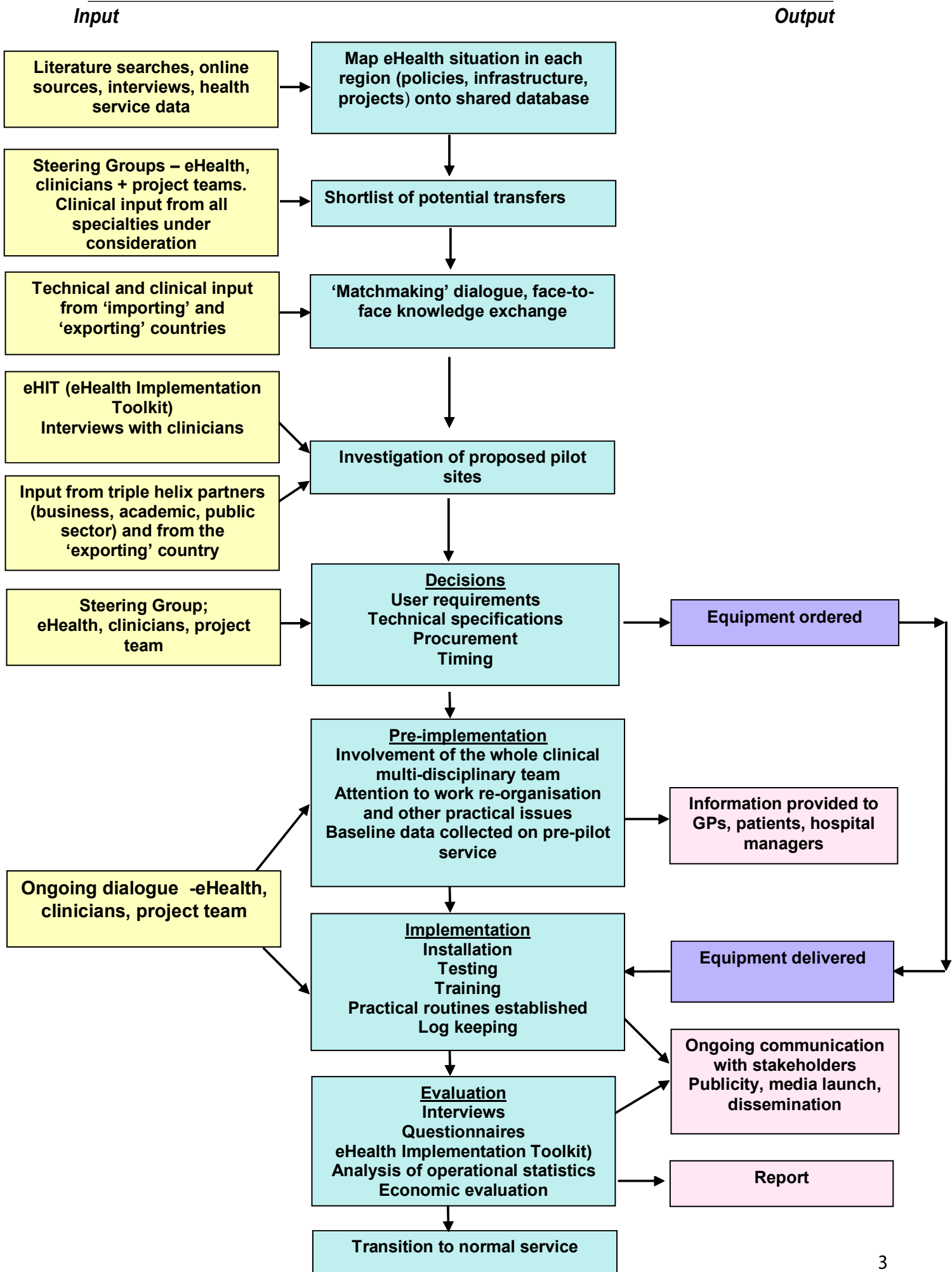
The aim of the *Competitive Health Services* project was to enhance provision and accessibility of health services in the sparsely populated regions of Europe by developing and implementing innovative eHealth solutions and promoting transfer of the best eHealth practices across the Northern Periphery. Altogether eight eHealth services were piloted in the project - four in Finland, two in Scotland and one in Sweden and Norway.

This roadmap describes the methodological approach that was used in the development of eHealth services and exemplifies the lessons that were learnt in the implementation process.

The project was part-financed by the European Union (European Regional Development Fund) through the Northern Periphery Programme.

For an electronic version of this report, please visit [www.ehealthservices.eu](http://www.ehealthservices.eu).

*Competitive Health Services implementation process 2008-2010*



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# What were the lessons learnt : A Roadmap for implementing a transnational eHealth service

We identified 8 steps in the process of choosing an eHealth service from one country and adapting it for routine use in another region which faces comparable challenges.

In the case of the Northern Periphery, these challenges include:

- long distances between remote communities and medical facilities
- harsh winter conditions which make travel difficult for both patients and healthcare staff
- an increasingly elderly population with multiple health concerns

Similar circumstances prevail in other sparsely populated areas of Europe, such as mountain regions, which could also benefit from effective eHealth solutions trialled elsewhere, with particular reference to the European context. Such transfers avoid duplication of effort in developing new eHealth services from scratch, and provide advice on benefits and pitfalls.

The eight steps are:

- 1. A database of existing eHealth applications in Europe**
- 2. Identifying a service of potential interest**
- 3. Investigating pilot sites**
- 4. Making the decision**
- 5. Pre-implementation phase**
- 6. Implementation phase**
- 7. Evaluation**
- 8. Sustainability**

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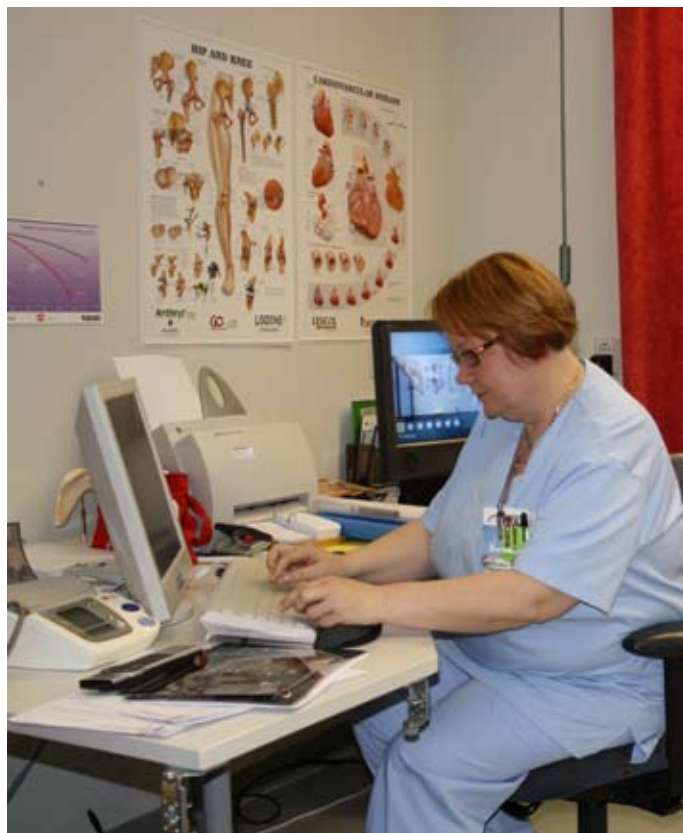
## 1. Database

The database created for this project could, with some adaptation, form the basis of an ongoing repository of working eHealth solutions, gathered from the whole Northern Periphery region and possibly beyond. It should act as a practical resource for the European Network of Rural Health Care, as it develops. Such a database would enable potential project initiatives to identify current best practice across the region.

The existence of this database of European telehealth initiatives should be widely publicised, once it is operational.

From our experience, a European eHealth database should:

- Be easy for all parties to operate and update
- Use a standardised format for entries (such as checklists)
- Offer a versatile search facility (by keywords, country, user group, medical condition)
- Be maintained by one organisation which accepts responsibility for maintenance, reminding other countries to update their entries at regular intervals



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## 2. Identifying a service of potential interest

**What are the primary considerations when selecting a possible eHealth solution?**

- **Clinical need**
- Compatibility with infrastructure
- Affordability
- Sustainability

**What groups should be involved in selecting and subsequently managing a transnational eHealth solution?**

The project needs to be managed on several levels:

- **Project team** – a small group focusing on the practical issues, and liaising with the ‘exporting’ country
- **Steering group** - representing the wider group of stakeholders; these should include those responsible for health provision, (both eHealth experts and clinicians) and ideally one or more mediators from an outside body, eg an academic research centre or national telemedicine organisation
- **Local Expert Forum** – the regular steering group should be augmented occasionally to benefit from the perspectives of local or national businesses in the telemedicine sector, government agencies etc.

The ‘triple helix partnership’ model - combining expertise from the public sector, academia and private sector businesses - was extensively used in the Competitive Health project and was found to be of benefit.

### ***Scotland steering group***

- NHS Highland (a senior eHealth manager and a senior clinician with eHealth responsibility)
- Scottish Centre for Telehealth
- Academic research centre (Centre for Rural Health)

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### **Finland Local expert group**

- Northern Ostrobothnia Hospital District
- University of Oulu
- Product Testing Unit of the Technology Health Care Centre of Oulu

## **How should the ‘Matchmaking’ dialogue process be handled?**

In the Competitive Health project, a formal ‘Matchmaking Conference’ was convened in Inverness in February 2009. Its purpose was to enable partners from four countries to learn more about those eHealth services in which they had provisionally expressed interest. Experts from the exporting countries met with potential transfer partners over two days, and were able to narrow down their options as a result of the knowledge gained.

From the experience of our ‘Matchmaking’ process, the following recommendations can be made:

- Obtain as much information about the innovation as possible in advance from the ‘exporting’ country; request technical data from suppliers, reports on implementation from the health service which uses it, journal articles where these can be traced, data on economic evaluation, patient/staff satisfaction etc.
- A face-to-face meeting between all parties is highly beneficial, if at all possible, with input from both the exporting and importing country
- Combined technical and clinical involvement is critical at all stages of ‘matchmaking’ and beyond.

### **Matchmaking Conference - Teledialysis**

**From Norway** – the renal project manager from NST

**From Scotland** – eHealth managers, renal consultants & nurses, Scottish Centre for Telehealth staff

### Matchmaking conference - Palliative care

**From Scotland** – a palliative care consultant from Highland Hospice and a research nurse with experience of home care of terminal patients

**From Norway** – an oncology nurse from the University hospital in Tromsø and community nurses from rural municipalities responsible for providing home care to cancer patients

### Matchmaking conference - Remote monitoring (the Checkup Bag)

This service was of interest to both Finland and Norway.

**From Finland** – Oulu University Hospital representatives, the product testing specialist from the Technology health care centre and eHealth experts from the University of Oulu

**From Norway** – A nurse, leader of the reorganization of GP services in 4 neighbouring municipalities in Northern Norway

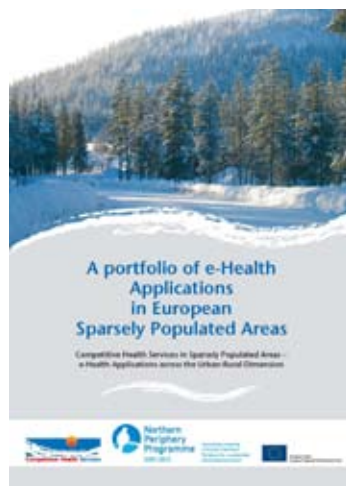
**From Sweden** – the service provider (a business representative)

### Matchmaking conference - Mobile Eye Unit

**From Finland** – the chief administrative physician from Oulu University Hospital

**From Sweden** – project team members from Umeå University, representing the health service providers of Västerbotten County Council

The mapping and identification of services in the Competitive Health Services project was summarised in a report: ***A portfolio of e-Health Applications.***



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### 3. Investigating pilot sites

#### Clinical priorities should drive the choice of site(s)

Where several potential pilot sites exist, clinical advice should be sought to narrow down the field. The service has the best chance of success if it delivers tangible benefits at that site to clinicians and patients alike.

#### Scotland - Teledialysis

Out of three satellite renal units, clinicians had strong views on which to use as pilot site (the one with most patients, offering the greatest potential time savings). The Wick renal unit was chosen on this basis to be the first pilot site.

#### Finland

**Wound care:** Clinical need for remote consultations; service supports increased role of wound nurses in patient care

**Remote monitoring:** In line with current health care strategies as encourages and promotes patients' active involvement in their own health care



Photo: Hannu Marjamaa

### **Norway**

The reorganization of GP services in the Senja island placed all GPs in one office. The local health care staff could use the CheckUp Bag and patients would not have to travel long distances to the GP office.

### **Sweden - Mobile Eye Unit (EyeMo)**

Reasons for choice of running EyeMo from Lycksele regional hospital:

Serves a remote area, scattered population, high volume of ophthalmology referrals, staff shortages and need to bring specialist services to remote areas. The service supports existing work patterns.

## **Practical considerations may modify the ideal choice of site**

The available infrastructure (broadband speed, network access etc) should also be considered, and may modify the original choice.

### **Scotland - Speech therapy**

The therapist who championed telemedicine most strongly was the one who had furthest to travel to see patients (in the northwest). Pragmatic considerations later switched the focus of the pilot to where existing VC equipment is located (along the east coast).



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## Use of eHIT as a tool

The eHealth Implementation Toolkit offers a structured way of considering all the relevant issues when deciding whether or not to implement a new eHealth service in a specific context. It can be completed with minimal guidance by senior managers or clinicians, and provides immediate feedback in the form of graphs indicating the degree of compatibility between the context, the intervention and the workforce. It combines quantitative features (scores out of 10) with opportunity for free text comments.

It can be used with individuals or groups.

### **Finland**

eHIT was used with groups of staff at a health centre and hospital departments.

### **Sweden**

A modified version of eHIT was used at multiple health centres initially. The focus then shifted to concentrate on one hospital site once the pilot innovation was decided.

### **Norway**

eHIT was used with individual health care professionals in municipality health care services and hospitals.

## Build up an accurate picture of the *existing* service

Supplementary interviews with key figures are helpful for gathering data about how the service works at present, highlighting areas of work practice which may need to be reorganised if a new eHealth service is introduced.

### **Scotland - Teledialysis**

A 'before and after' picture of the work pattern at Raigmore and Wick renal units was created, using information from interviews with staff.

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### **Sweden - Mobile Eye Unit**

Staff from ophthalmology unit at Lycksele hospital visited EyeMo in Finland and had a chance to talk to the staff and see the mobile eye unit. Several meetings with the ophthalmology staff and project members took place in order to prepare for the pilot.

## **Discuss the proposed outcomes of the *new service***

Health service providers require a clear statement of the outcomes of any proposed service change, reflecting for example patient benefits, staffing improvements, efficiency savings.

## **Check the practical and technical readiness of the sites**

This stage covers, for example, checking that network connections are in place at the pilot site, and what equipment is already available for use, as well as what equipment needs to be procured.

### **Scotland - Teledialysis**

NHS Highland eHealth staff tested wireless connectivity at the main renal unit and installed additional network points at Wick, which at that time did not have wireless capability.

### **Finland**

Surveys of the technical readiness of pilot sites were carried out to see if existing equipment could be utilized and to ensure smooth pilot launch.

### **Norway**

Project members checked if the nursing home had access to the health net and what would be needed for a secure connection

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## Pay attention to work reorganisation required

Human and organisational factors are critical to the success of a new and innovative service, and should not be sidelined by concentration on the new technology itself.

The use of the eHIT-tool is described in detail in a report:



### ***Utilization of the eHIT-tool eHealth Implementation Toolkit Identification of pilot services in Finland, Scotland, Sweden and Norway***

#### **Scotland - Teledialysis**

- The timing of blood samples from dialysis patients at the satellite unit had to be changed to fit with remote consultations
- Rotas and booking forms were drawn up for use of VC equipment
- Thinking about where the VC equipment was going to be stored when not in use

#### **Finland - Wound care**

The remote wound care clinic supported current work reorganisation as it enabled the specially trained wound nurses to have a more independent and active role in patient care.



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## 4. Making the decision

### User requirements

Care needs to be taken at this stage to find out exactly how the end users – health staff and patients - will make use of the service and equipment. It is particularly important to establish the clinical considerations. Clinicians and technical (eHealth) experts must talk and listen to each other throughout the process. It can be helpful to have a project team member who occupies a neutral role between the two parties to ensure that dialogue takes place and relay information. Technical experts need to understand how clinicians will expect to use a piece of equipment, what information they need it to give them, and clinicians need to understand the capabilities and limitations of the proposed technology.

Where a multi-disciplinary team is involved in patient care, as is often the case, the whole team should be drawn in to these discussions.

#### **Scotland - Teledialysis**

At first it was thought that just doctors and nurses would be involved; others with a role in renal patient care – such as dieticians and pharmacists - were drawn in later. Ideally they should have been involved from an earlier stage. The physiotherapist was particularly interested in using VC to monitor patients' exercise regimes remotely.

#### **Norway**

The GP thought that the clinical data from the CheckUp Bag should be integrated with the electronic patient record.

#### **Finland**

Setting up the remote wound clinic required technical expertise at the University Hospital and at the remote health care centre. It would have been useful to have the IT experts from both sites present in the initial meetings as they had an active role when the service was launched.

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## Technical specification

Once the user requirements are clearly understood, attention can be paid to sourcing technology that matches these, and checking that it complies with regulations, for example, of the medical physics department of the hospital, or with national legal conditions for data protection.

### Sweden

The mobile eye unit was able to use the secure hospital network to access and store patient data. The wireless connection did not work but the staff was able to solve the problem by using cables.

### Scotland

A less expensive mobile stand was sourced for the teledialysis VC units after it was established that a medical grade integrated unit was not required, as patients would not be attached to the equipment

### Norway

Data server - data protection laws did not allow patient data to be stored outside Norway, on the Swedish manufacturer's server and accessed via the Internet, so a separate server was set up in Norway.



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## Timing

Timing can be critical when introducing a new initiative into a health service setting, and affect its chances of success. It is important to consider when it will cause least upheaval to staff and patients.

For example, a clash with another new process or system should be avoided, as it could lead to an innovation overload.

Consultation is important, and users' views should be seriously considered at every stage.

### **Scotland**

The proposed start date for the teledialysis pilot was modified to fit in with planned introduction of a major electronic patient record system into the renal service, affecting both the main and satellite units. Renal staff expressed a strong preference for allowing the new IT system to become familiar before introducing videoconferencing, and this (along with procurement delays) determined the eventual start date.

## Funding

Negotiations on how a new eHealth initiative is to be funded should start at an early stage, as it may well take more time than anticipated to research options. Different models may be considered, eg renting or purchasing equipment.

## Procurement process

This process can, in practice, take longer than anticipated, so implementation timescales need to remain flexible, and able to accommodate delays in delivery of equipment.

### **Scotland - Teledialysis**

The components of the mobile VC equipment were sourced from three different suppliers. Delayed delivery of one component caused the installation date to be postponed more than once – however, the enforced delay offered more time to prepare participants thoroughly for the new initiative.

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## 5. The pre – implementation phase

Keep all parties informed of new developments

### Scotland

**Teledialysis** – key renal staff visited Tromsø to see the Norwegian service shortly before going live in Scotland.

**Speech therapy** – two therapists travelled to Sweden at a later stage, when initial trials had been completed.

Both groups of clinicians appreciated the opportunity to see well-established eHealth services functioning in their home settings, and the opportunity to learn from colleagues.



Photo: Robert MacDonald

### Sweden

Regular meetings were held between the local expert group, ophthalmology staff and project team to ensure good flow of information and to motivate the staff involved in the pilot.

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## 6. The implementation phase

### Installation and testing

It is wise to allow ample time for this stage, to be sure that the equipment will work correctly from the outset. This is especially crucial when direct patient interaction via video links is involved – first impressions count, and a service is more likely to gain wide acceptance if patients report favourably on their experience.

### Training

Provision of clear, hands-on training to all health staff who are expected to use VC, or patient monitoring devices, is an important part of creating the confidence to use it in practice.

#### Scotland

The lead speech therapist arranged for all therapists and therapy assistants working in the North Highland team to receive practical training in using VC at the outset.



#### Norway

Practical training sessions were arranged in using the medical equipment and communication tools.

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## Practicalities

The rooms used for videoconferencing should ideally be purpose designed, but where this is not possible, careful attention should be paid to lighting, acoustics and the background against which the video image appears. The clinicians should bear in mind that narrow stripes and fiddly patterns on their clothing can cause a distracting flicker when viewed on a video screen.

The move to delivering an established service in a new way, using eHealth technology, will involve changes to routines and work practices, and these need to be thought through in advance. New rotas may need to be introduced, and adjustments made to the timing of associated procedures.

### Scotland - Teledialysis

The timing for taking blood samples from Wick haemodialysis patients was brought forward to an earlier date in the month, to allow sufficient time for results to be recorded in the patients' electronic records ahead of the virtual ward rounds.

### Sweden

Letters were sent to patients informing them about the changed location of the screening well in advance. The patients also received information of the project and the purpose of the mobile unit on site.



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## Log keeping

Record keeping is an important aspect of introducing a new eHealth service, for example the number of patients treated remotely, any technical difficulties, a scale for staff to register their level of satisfaction with each session.

## Management of publicity, media

When informing the media of a new eHealth initiative which is going live, or about to do so, be prepared for TV to want to film patient/clinician interaction, as this makes for interesting TV news coverage. Consent should be obtained in advance from staff and patients and measures taken to minimise disruption to clinical areas, and other patients who are not directly involved in the media activity.

### Scotland

A joint press release regarding the teledialysis launch was issued by the health service (NHS Highland) and the academic partner (University of Aberdeen). This resulted in approaches by national TV, local radio and local and regional newspapers to cover the story.

### Finland

A press release regarding the launch of remote wound clinic and remote speech therapy was issued in cooperation with the triple-helix partner and it attracted press and media interest.

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## 7. Evaluation

Careful thought needs to be given to how the new service will be evaluated, and who will be directly interested in the evaluation results - hospital boards, primary care bodies, health service organisations in other parts of the country/region with similar needs, patient organisations, etc.

A clear picture is required of the situation before any innovation is introduced, for example, baseline measures of the number of patients treated under the old system, travel times and costs, to enable comparison with the new system.

The eHIT online questionnaire can be used as part of an evaluation as well as at the pre-implementation stage. This is particularly useful if it is completed by the same personnel before and after, to see if their views and scores have been modified by their practical experience of the innovation.

Other interviews or surveys with staff and patients may be conducted to build up a rounded picture of how satisfied they are with the new way of delivering a service.

Quantitative data can be obtained by asking health staff to keep written records of every time the new equipment is used, to score their satisfaction on each occasion and to record any problems, technical or other.



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## 8. Sustainability

### Factors to consider

The eHIT surveys should highlight any areas of particular concern, for example over changes to work patterns, relationships between staff groups, and willingness to embrace new technology solutions. Reluctance to embrace the new service or technology is likely to undermine efforts to embed it in normal service delivery.

The technology itself should be considered in terms of its sustainability; will it require regular maintenance or upgrading? If it is designed to be used directly by patients, is it easy and reliable to use?

If funding has been granted for a pilot phase, how will ongoing use of the new service be funded? Should equipment that has been rented for a short experimental period be purchased in the longer term? If the innovation is successful in one setting, how feasible and affordable is it to roll it out to other similar settings, for example from one health centre to multiple centres?

Health staff who are prepared to act as champions are an important resource when it comes to maintaining and expanding a promising new service.

#### **Scotland - teledialysis**

A crucial factor in the smooth transition from a pilot phase to ongoing use in normal service was the decision of the health board to purchase its own videoconferencing equipment and integrate it into the management system for all its VC operations, with dedicated support on hand to deal with technical problems and provide training.

Ownership of the equipment has increased motivation by renal staff to use it consistently and to develop new applications for it on their own initiative.

#### **Sweden**

The County Council of Västerbotten is exploring the possibilities to build a mobile eye unit and increase the services provided at the unit to include several diagnosis groups and specialities.

## Scotland

**Teledialysis** and **speech therapy** are both being expanded in NHS Highland as a direct result of experience gained during the pilots. A further set of mobile VC equipment has been purchased to link one other satellite renal unit to the central hospital, and tests are being carried out with a VC unit owned by a neighbouring island health board.

Investment has also been made in additional VC equipment for use by speech therapists and other allied health professionals in the community.

## Finland

VC equipment used in the remote wound consultations and speech therapy was rented and had to be returned after the pilot period. Due to our encouraging experiences, an extensive regional VC network is now being planned, which enables expansion of services to other medical specialities as well.



Photo: Pekka Falin

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## Further information

### Final pilot reports

Final report from teledialysis and remote speech therapy in Scotland

Final report from the remote wound clinic, remote speech therapy, remote monitoring of personal health data and remote monitoring of cardiac patients in Finland

Final report from the mobile eye screening unit in Sweden

Final report from the remote monitoring of patients Norway



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