Joint AIM - EHTEL Study Visits
with a focus on
Disease Management and Personal Health Services in Support of Chronically Ill Patients and Persons at Risk

Following current health needs, a paradigm shift “from acute care to prevention and proactive management of chronic conditions” is needed and some examples of early adopters of this trend may already be observed. To adjust health and social care to this paradigm, eHealth and telemedicine play a crucial role.

To better understand the (potential) contribution of eHealth telemedicine to an efficient organisation of health systems and services, to improve health care overall, to explore critical success factors and risks, to learn from the lessons of others and share experience about integrating telemedicine services into daily clinical practice, EHTEL and AIM have decided to join forces and to invite their respective constituencies to bi-annual telemedicine study tours from 2011 onward.

This study visit to Scotland is the second in this series of bi-annual telemedicine study tours.

Study Visit On

“Telehealth and Telecare Services within Scotland and Role of the First Line”

Edinburgh, Scotland
19 - 20 January 2012

Report Compilation:
Dr Stephan H Schug, MD MPH [EHTEL]
Content

1 Study Visit to Scotland January 2012 - Introduction and Site visit details ................................................................. 1


3 Overview of NHS 24 and the Scottish Centre for Telehealth and Telecare ................................................................. 5

4 Telehealthcare Services in Scotland .......................................................................................................................... 8
   4.1 Telescot Programme (University of Edinburgh) ................................................................................................. 8
   4.2 Ultrasound in the Community (use of remote Ultrasound to support the Ambulance Service) ................................................................................................................................. 10
   4.3 Telesstroke (NHS 24 and Telesstroke-Thrombolysis) .......................................................................................... 11
   4.4 Stroke Pathway (Scottish Ambulance Service and NHS 24) ................................................................................ 12
   4.5 Remote Pulmonary Rehabilitation ........................................................................................................................ 14
   4.6 Remote monitoring for patients with Cancer ........................................................................................................ 15
   4.7 Support for patients with Dementia ........................................................................................................................ 16
   4.8 Tele-Dermatology in Scotland — national approach to improve services ....................................................... 17
   4.9 CISCO telehealth and telecare technology ........................................................................................................ 17

5 NHS inform Health information via Web and Digital Television - NHS 24 Digital Television Channel (access to Primary Care Services) ........................................... 18

6 eHealth infrastructure and Health services support ................................................................................................. 20
   6.1 How Lothian is using technology to support patients and Primary Care ................................................................................................................................. 20
   6.2 Emergency Care Record ........................................................................................................................................... 20

7 Information Governance for Personalised Medicine ................................................................................................. 22

8 Meeting Conclusions .................................................................................................................................................. 23

9 Annex1: Profiles of the Presenters ............................................................................................................................ 24

10 Annex 2: Guide to front-line professionals at NHS 24 ......................................................................................... 26

11 Annex 3: Telescot principle investigation areas / telehealth services ........................................................................ 27

12 Annex 4: Scotland Telesstroke Networks ................................................................................................................ 30

13 Annex 5: National Audit Report on Telehealth in Scotland .................................................................................... 32

14 Annex 6: Visit as seen in the newsletter “Networker” of NHS 24 ........................................................................... 33
Preamble: Context of the AIM - EHTEL Study Visits on Telemedicine in Support to Chronic Disease Management

Health system paradigm shift

In any policy debate in the public health field, one can observe the request for a paradigm shift “from acute care to chronic care model”, motivated by the need to transform the health care system for improving the quality and accessibility of care and to adapt it to the chronic diseases, while containing costs.

eHealth and Telemedicine as facilitator tools

In the same period of time, the contribution of telemedicine to support the management of chronic disease is being recognised, as a tool to improve health care and one of the answers to the shortage of health professionals, thanks to the success of several pilot experimentations:

- Remote monitoring at home can indeed help early discharging patients from hospitalisation and enable clinicians to reduce the need for rehospitalisation, as well as
- Tele-consultation and tele-monitoring help to improve accessibility of care in regions where health care resources are scarce and also help offering new services such as health coaching. Health promotion and prevention can therefore be better personalised.

As a consequence, telemedicine and eHealth in general are now moving-up on the policy agenda at regional, national and European level. However, there are still some important issues to resolve before getting the promises of telemedicine:

- The scientific evidence of telemedicine as a mean to improve cost efficiency, quality of life, quality and accessibility of care is still to be established. The sustainable financing of telemedicine services integrated into daily clinical practice is still limited to some forerunner organisations.
- Furthermore, telemedicine and eHealth will have an impact on the redesign of the health system organisation and this is worth to explore it more detail.

EHTEL-AIM Study Visits

To explore these issues, to learn from the lessons of others and share experience about integrating telemedicine services into daily clinical practice, EHTEL and AIM have combined their efforts and invite their constituency to join in bi-annual telemedicine study visits from 2011 onward.

Two study visits are foreseen over one year and they will combine demonstration of real life telemedicine services with a use case analysis focusing on the organisational framework required for these services and the conditions for their sustainable funding.

An important aspect of these Study visits is to identify strategies and guiding principles that lead to successful and sustainable services and solutions to support patients and citizens at risk in illness management and illness prevention. Furthermore principles of good governance for information system in the health and social care sector shall be identified that also support personalised health services and patient-centred healthcare. The organising partners will use this information to promote good practices for the transformation of health systems towards integrated services.
1 Study Visit to Scotland January 2012 - Introduction and Site visit details

The study visit titled "Telehealth and Telecare - Services within Scotland and Role of the First Line" is the second trip under the umbrella of the "AIM - EHTEL- Study Visits on Telemedicine in Support to Chronic Disease Management". The visitors were more than thirty members of the two organisations and represented health authorities, health insurance organisations/payers, industrials, clinicians and members of eHealth-related not-for-profit associations. Participants on the Scottish side were practitioners (physicians, nurses), researchers and also administrative staff from NHS24 and other organisations, led by our host Professor George Crooks OBE, Medical Director for NHS 24, Director of the Scottish Centre for Telehealth and Telecare and Medical Director for the Scottish Ambulance Service.

The study visit provided an excellent overall understanding of the Scottish Healthcare System, the National Health Service and the role of telehealth and telecare actors like NHS24 in this framework.

In addition it provided the participants with lively insight and interactive demonstrations of some of the services like a remote consultation with a (simulated) stroke patient, remotely guided medical procedures like an ultrasound examination and even an interactive educational and training session (via video link) with a group for pulmonary rehabilitation. These impressions can hardly be reproduced by a written report (some images have been added though).

Thus - inspired by the report by Diane Whitehouse of the first study visit (to Odense, Denmark) the report does not aspire to describe the proceedings of the study visit in full detail. This document has been enriched by a compilation of background information drawn from publications and websites on the state of the art of telecare and telehealth in Scotland and summaries of the use cases presented. It provides the participants of the study visit with some additional insight why the services demonstrated evolved as they did and all audiences will find telehealth success stories and success factors.

The report follows roughly the chronological order of the presentations to the visitors. With some adjustments the logical order is now like this:

- The Actors: NHS 24 and the Scottish Centre for Telehealth and Telecare
- Telehealthcare Services in Scotland
- NHS inform: Health information via Web and Digital Television
- eHealth infrastructure and Health services support
- Information Governance for Personalised Healthcare

The Business Case for Telecare and Telehealth in Scotland is pre-defined by decisions of the Scottish Government towards a large scale transformation of health and social care through the organisational and technological means of Telehealthcare. One key milestone in this process has been the integration of the Scottish Centre for Telecare and Telehealth into the NHS24 service structure - thus integrating Telecare and Telehealth into standard care delivery. Since the Scottish "Telehealthcare" laboratory for Europe and the World is quite transparent and evaluates the individual interventions by a multitude of studies (cf. the Telescot section in this report), the global evidence of Telemedicine Services is permanently enhanced, providing guidance to AIM and EHTEL member organisations.

The joint AIM and EHTEL study group was hosted on/at:

- 19 January: CISCO at Trilogy Business Park, Eurocentral (between Glasgow and Edinburgh)
- 20 January: Scottish Health Service Conference Centre – Edinburgh
2 Healthcare in Scotland: Visions, Strategies, Facts and Figures

Our vision is that by 2020: Everyone is able to live longer healthier lives at home, or in a homely setting. We will have a healthcare system where we have integrated health and social care, a focus on prevention, anticipation and supported self management. When hospital treatment is required, and cannot be provided in a community setting, day case treatment will be the norm. Whatever the setting, care will be provided to the highest standards of quality and safety, with the person at the centre of all decisions. There will be a focus on ensuring that people get back into their home or community environment as soon as appropriate, with minimal risk of re-admission.

Professor George Crooks OBE, Medical Director, NHS 24 and Scottish Ambulance Service

Scotland has a population of 5.2 million, it has challenges of delivering care in large urban centres, for example Glasgow and Edinburgh and in rural and remote areas including a number of islands (Western Isles, Orkney and Shetland which is closer to Norway). The NHS is free at the point of delivery as in the rest of the UK. However, healthcare is devolved to the Scottish Parliament. This is why the NHS in Scotland is now radically different to that in England. The Scottish Government pursues a policy of integrating health and social care. Scotland has developed a fully integrated health system, with hospital and community services managed by a single organisation.

Scotland’s approach can be described as incremental and pragmatic, as it builds on existing concepts and seeks to fill gaps where necessary.

The Directorate of Health and Wellbeing of the Scottish Government is responsible for health policy and the administration of the NHS in Scotland. The government’s Chief Medical Officer for Scotland heads the Public Health Policy Unit and is the Health Minister’s chief medical adviser. The Chief Executive of the NHS in Scotland leads the central management of the service and is accountable to ministers for the efficiency and performance of the service. The Chief Executive leads NHS Scotland and oversees the work of the 14 area health boards. The health boards are responsible for the planning and commissioning of health services for their resident populations and the health boards are responsible for the provision of services.

NHS Scotland provides healthcare to Scottish citizens or UK permanent residents, that is free at the point of need and paid for from general taxation. Though the public system dominates healthcare provision, private healthcare, and a wide variety of alternative and complementary treatments are available for those with health insurance or who are willing to pay for the services directly themselves. For most people, contact with the NHS begins and ends in primary care. The professionals who provide these services are located in every community. They are composed of GPs, nurses, health visitors, community pharmacists, optometrists, dentists, physiotherapists, occupational therapists, podiatrists, speech and language therapists, and dieticians. They manage 90% of patient contacts with the health service, and co-ordinate the diagnosis, treatment and care of patients, while ensuring that more of these services are provided as close to home as possible. These professionals also have an important role in improving health, by helping patients to take more responsibility for actively managing their own health.

The key building blocks for primary care services are the Local Health Care Community Partnerships. These have developed into responsive and inclusive organisations. They are now the main focus for planning the development of community health services at the heart of a decentralised but integrated healthcare system in Scotland.
In June 2008, the Scottish Government published an “eHealth Strategy”\(^1\) for the period 2008 to 2011. This strategy is partly based on the goals defined in the “Better health, Better care”\(^2\) action plan from 2007 and successes the report “Building a Health Service fit for the future” and the policy document “Delivering for Health” from 2005\(^3\). The Scottish eHealth strategy targets key priorities that have been established as part of the wider vision for more integrated care and the use of information to promote better, more efficient and safer care for patients.

The strategy encompasses plans and actions concerning infrastructural, legal, financial issues, as well as standards and evaluations. Furthermore, specific applications are addressed, such as the goal that Scotland’s emergency care summary service will be enhanced through additional items concerning patient information and a wider user base. For telehealth and telecare, the strategy’s priorities are to support home based care for managing long term conditions, delivery of care in remote and rural settings, and improved ways of addressing unscheduled care. The strategy also has a specific section dedicated to financing models of eHealth.

Generally, the strategy document outlines the intention to provide technology in eHealth in Scotland to achieve improved outcomes for patients. It seeks to build on the progress previously made so as to move towards stronger and more integrated support for the provision of care. The description of eHealth is given as:

*Our vision for eHealth is simple: support for the overall NHS Scotland goals as set out in the Better Health Better Care Action Plan. This is about exploiting the power of electronic information to help ensure that patients get the right care, involving the right clinicians, at the right time, to deliver the right outcomes. It is therefore as much about transforming traditional processes as it is about technology.*\(^4\)

Scotland benefits from the fact that it has both a national strategy for the development and delivery of telehealth and telecare and also a single national delivery organisation. This has allowed Scotland to advance the development in this area at a faster rate than is currently possible in other regions.

The joint perspectives of telehealth and telecare are emphasised in an Action Plan on Telecare published in January 2011: "Telecare to 2012 - An Action Plan for Scotland\(^5\): "The Healthcare Quality Strategy will be implemented through a range of existing and new programmes of work […], recognising the potential role that technology enabled services can play in supporting the delivery of Scottish health, housing and social care priorities. Significant progress has been made by the Scottish Government on telecare and telehealth developments since 2006, with increasing convergence between these previously separate areas of activity over the past 18 months.

Very real benefits have resulted from collaborative and integrated working at both a national and local level, and the term ‘telehealthcare’ has been used to describe the coming together of these activities."

The strategy foresees a close integration of telecare and telehealth, cf. also the drawing below:

---

1. Scottish Government 2008
2. Scottish Executive 2007
3. Kathleen Robson and Jude Payne 2005
The Vision of the Telecare to 2012 Action Plan is: To support as many people as possible to live at home for as long as they want to, in comfort and safety, with the best possible health and quality of life. The Telecare Programme Board will promote technology enabled care as an essential means.

"We believe this next phase of development should focus primarily on actions which expand telecare as a mainstreamed service and integrate it with other provision and processes. This will;

⇒ enable greater access to telecare services for users and carers,
⇒ expand the awareness, confidence and proficiency of the health, housing and care workforce,
⇒ and provide a more robust platform from which more innovative technologies and services can spring. In the current financial and demographic"

The recent eHealth Strategy 2011 - 2017 builds on the direction and achievements of its predecessor (from 2008 to 2011). The new Strategy reaffirms the Government’s view that information and communication technologies are important to the improvements in quality and the ambitions set out in The HealthCare Quality Strategy for NHSScotland1 to actively support and enable quality improvements in healthcare services across Scotland.

The Strategy reinforces the move from a focus on technology products, services and their suppliers toward a focus on benefits and outcomes experienced by NHS Scotland professionals in helping them to re-design and improve services, and the citizens of Scotland who benefit from those improvements. It endorses the incremental approach to information and communication technology enabled changes, and that such changes will be planned and driven from closer to the front line of service delivery and aligned more closely with the improvement planning processes in Boards and workforce development. In particular, it recognises the importance of clinical leadership and clinical engagement in developing and delivering successful eHealth initiatives.

The strategy sets out five new strategic eHealth aims which will be developed with a focus on outcomes and real benefits delivered rather than technologies measured by the development or implementation of information and communication technology products or related services.
3 Overview of NHS 24 and the Scottish Centre for Telehealth and Telecare

⇒ Professor George Crooks OBE, Medical Director NHS 24
⇒ Justine Westwood, Head of Planning NHS 24

Figures on the NHS in Scotland: The NHS in Scotland has around 132,000 staff, including more than 63,000 nurses, midwives and health visitors and over 8,500 doctors.

There are also more than 7,000 practitioners, including GPs, dentists, opticians and community pharmacists who work as independent contractors. They perform a range of services for the NHS in return for various fees and allowances.

The Scottish Government Health Directorates provide the central management of the NHS, heading a Management Executive that oversees the work of 14 area NHS boards. These territorial boards plan and deliver health services for people in their area.

Services can be hospital or community-based and boards coordinated community health services through Community Health (& Care) Partnerships. These coordinate with local authorities and the voluntary sector to provide a comprehensive approach to care that centres on the patient.

Health services are delivered through 14 regional NHS Boards. These Boards provide strategic leadership and performance management for the entire local NHS system in their areas and ensure that services are delivered effectively and efficiently. NHS Boards are responsible for the provision and management of the whole range of health services in an area including Hospitals and General Practice. Out of the eight Special Health Boards the relevant for the study visit are:

⇒ **NHS24** is a telephone health advice and information service that provides 24 hour access to medical advice from clinical professionals (cf. details below).

⇒ **The Scottish Ambulance Service** provides an Accident and Emergency service that responds to 999 calls as well as a Non-Emergency service that performs an essential role in getting patients to and from health services.

NHS 24 is a national organisation and is the national provider of telehealth services for the whole of Scotland. This includes telephone services, telemedicine services, telecare and home monitoring as well as an increasing number of individual services exploiting all digital channels including web, mobile, digital TV as well as conventional contact centre operation.

The Scottish Centre for Telehealth and Telecare (SCTT) – since April 2010 part of NHS24 – undertakes research and implementation for telemedicine services. It has worked with the Joint Improvement Team, which leads on telecare, to develop a number of ‘telehealthcare’ services for patients in the community in Scotland. As part of the Partnership Improvement and Outcomes Division within the Scottish Government’s Health Directorates, the Joint Improvement Team facilitates the implementation of successful telecare projects and has secured £16 million funding for the National Telecare Development Programme. This programme aims to help more people in Scotland live at home for longer, in safety and security, by promoting the use of telecare in Scotland.

*From ‘Scottish Centre for Telehealth’ to NHS 24:* The Centre was established as Scottish Centre for Telehealth in 2006. It supports and guides the development of telehealth for clinical, managerial and educational purposes across Scotland. Its approach involves working across boundaries with industry,
local authorities and NHS Boards to develop recognised models for redesigning care. The focus is on the support for long-term conditions (with an initial emphasis on COPD\textsuperscript{6}, paediatrics, and unscheduled care and in remote and rural areas). Furthermore, the Centre provides advice to NHS Boards, and it helps to evaluate the potential benefits of these new technologies.\textsuperscript{7}

Challenging aspects of telehealth deployment have been identified by a review\textsuperscript{8} of the Scottish Centre for Telehealth that took place between November 2008 and January 2009. The recommendations made summarise several broad challenges that remain after almost three years of operation of the Centre. In response to the second challenge that was identified in the review, the Scottish Centre for Telehealth joined NHS24 in April 2010.

In a statement made to confirm these developments, the Scottish Government Cabinet Secretary said that "New technology offers some incredibly exciting possibilities for giving people better access to healthcare in the 21st century. The Scottish Centre for Telehealth has already been helping individual NHS boards devise ways of using technology to reach out to patients in our more isolated areas and those with mobility issues. But by integrating it within NHS 24, we can ensure that use of telehealth is spread right across Scotland and benefits patients in all our communities."\textsuperscript{9}

NHS 24 started out as nursing service and now holds many professions (cf. list of professions working at NHS24 in the annex). A large percentage of care is provided by non-clinicians.

The NHS24 mission can be simply defined keeping people out of the emergency rooms by providing qualified services via telephone and over the web.

In Scotland, the eHealth Directorate, through the eHealth Programme Board, is responsible for evaluating eHealth activities. It is stated that "[t]he eHealth Programme Board requires that the business case for any project funded by Scottish Government eHealth Directorate includes details of how the project will be evaluated. Project evaluation should address: measurable quality improvements; benefits realisation, and, where appropriate, efficiency savings. Projects must report regularly to the eHealth Programme Management Office, including details of progress against planned milestones, risks and issues."\textsuperscript{10}

Furthermore, "Audit Scotland"\textsuperscript{11}, that supports the Auditor General and the Accounts Commission to make sure organisations that spend public money in Scotland use it properly, efficiently and effectively, has carried out several evaluations of eHealth in Scotland, two of which address the telemonitoring and telecare sector.

A Review of the Scottish Centre for Telehealth\textsuperscript{12} assessed the Centre’s method and structures. It was published in October 2009 by the eHealth Directorate. Owing to the brief time permitted for the

---

\textsuperscript{6} Chronic Obstructive Pulmonary Disease

\textsuperscript{7} Scottish Executive 2007

\textsuperscript{8} eHealth Directorate 2009

\textsuperscript{9} Scottish Centre for Telehealth 2010

\textsuperscript{10} In reply to a written question in the Scottish Parliament about how the evaluation of eHealth projects through to implementation is carried out, Nicola Sturgeon replied, 16 July 2009; S3W-25263

\textsuperscript{11} Audit Scotland

\textsuperscript{12} eHealth Directorate 2009
review (which took three to four months), the document provides a high level assessment rather than a detailed analysis. The review aimed to:

- examine the Centre’s current method of working;
- examine the Centre’s success, or otherwise, in guiding the development and implementation of telehealth applications in Scotland;
- make a series of recommendations about the funding of telehealth beyond March 2009.

The assessment of these three aspects was encapsulated in the following main recommendations:

Recommendations with regard to the Scottish Centre for Telehealth:

- The Centre’s governance arrangements should be streamlined and improved;
- The telecare landscape should be simplified with the Centre joining one of the Special Boards (since a number of organisations have overlapping and complementary areas of responsibility): the best fit would be NHS24;
- Telehealth and telecare programmes should be more closely integrated, and the terms (and definitions) used should be simplified;
- The Centre should become more strategic, focusing on a few clinical areas initially, for example stroke and paediatrics, moving them from pilot to universal use;
- The Centre requires a telehealth strategy that is underpinned by an IT infrastructure plan;
- Action is required to improve bridging and videoconferencing services;
- Consideration should be given to the introduction of an element of core funding for national telehealth solutions.

As the result of this eHealth Directorate review, and the recommendations outlined above, the Scottish Government announced on October 2, 2009 that the Scottish Centre for Telehealth would be integrated into NHS24 in 2010. This re-organisation has taken place in April 2010.

One of the key enablers of the integrated community oriented services can be identified in the DALLAS programme: DALLAS – Delivering Assisted Living Lifestyles at Scale - comprises an £18m investment by the Technology Strategy Board and the National Institute for Health Research, with a further £5m contribution from the Scottish Government, Highlands and Islands Enterprise and Scottish Enterprise.

DALLAS will establish three to five communities of 10,000 people each or more across the UK, of which one will be in Scotland. These will show how assisted living technologies and services can be used to promote wellbeing, and provide top quality health and care, enabling people to live independently – including a preventative approach.

DALLAS is the next step towards the aspiration of providing assisted living services for millions of people across the UK. The program aims to explore new models of service to progress a sector that has previously been dominated by pilots and demonstrators.

Five new communities will be establish to address lifestyle needs enabled by technology which can work together (i.e., it is interoperable). The programme will include evaluation, networking and knowledge sharing activities. To be successful, DALLAS proposals must show significant advances towards interoperability.
4 Telehealthcare Services in Scotland

In Scotland, there are a range of terms and definitions used to describe this area of activity – telehealth, telecare and the convergence of these as ‘telehealthcare’.

The definitions published with the recent "Telecare to 2012 - An Action Plan for Scotland" are these:

- **Telehealth** is the provision of health services at a distance using a range of digital technologies. Examples of telehealth include video consultations to support diagnosis and management, clinical networks and health professional education.

- **Telecare** is the remote or enhanced delivery of care services to people in their own home or in a community setting by means of telecommunications and computerised services. Telecare usually refers to sensors and alerts which provide continuous, automatic and remote monitoring of care needs, emergencies and lifestyle changes using information and communications technologies (ICT) to trigger human responses or shut down equipment to prevent hazards.

- **Telehealthcare** is the convergence of telecare and telehealth to provide a technology-enabled and integrated approach to the delivery of effective, high quality health and care services. It can be used to describe a range of care options available remotely by telephone, mobile, broadband and videoconferencing.

4.1 Telescot Programme (University of Edinburgh)

Lucy McCloughan, Programme Manager, Telescot Programme

Telescot is a collaboration between a number of public, private and voluntary sector organisations supporting the development of innovative healthcare in Scotland, UK (Lothian region).

The motivation behind many of the programmes trialled at Telescot has been the observation that – while risks factors like obesity and high blood pressure are on the rise – the recommended self monitoring like e.g. home-measurement of blood pressure does not work well if persons remain in isolation at home. The conclusion is that just providing a gadget for people to use at home alone does not
help. What seems to work well on the other hand is to transmit the BP measurement to the GP or other responsible parties.

Telescot is a programme of academic research investigating telemetric supported (i.e. Internet technology enabled) self monitoring of a number of long term health conditions: hypertension, chronic obstructive pulmonary disease (COPD), congestive heart failure, and diabetes. Telescot research uses quantitative and qualitative methods to assess the potential of telemetric systems as a basis for early intervention, investigating clinical outcomes, cost efficiency, and user experience. Telescot is a collaboration involving public, private and voluntary sector organisations.

The Telescot programme is led by Prof. Brian McKinstry and managed by Dr Lucy McCloughan, both based at University of Edinburgh. The programme is supported by NHS Scotland and by Charities.

All studies at Telescot implement sophisticated statistical designs and use both quantitative and qualitative measurements. Results are reported in the literature and a host of information is accessible via the Telescot website at www.telescot.org: The eight study subjects given below (cf. Annex 2 for more details) are a fair reflection of the most relevant use cases and telemedicine service currently known and hence descriptions are quoted here in some detail. The basic questions raised by all of the studies are: 1) Are outcomes improved? 2) Is it cost effective? 3) Do people like it?

- **Hypertension**: The impact of a telemetric hypertension monitoring service. Context: Lowering blood pressure substantially reduces an individual’s risk of having a stroke or heart attack.

- **COPD** - The impact of a telemetric COPD monitoring service; Context: Technologies are now available which allow patients with chronic obstructive pulmonary disease (COPD) to monitor their own illnesses and automatically send the information by internet to a secure web site, which they and their clinicians can view. Such telemonitoring systems provide electronic reminders to patients to take measurements and medication, and alerts patients and clinicians if additional treatment may be needed.

- **Diabetes**: The impact of a telemetric monitoring service in diabetes type 2. Background: Poor glycaemic control and high blood pressure are largely asymptomatic so people with diabetes and hypertension who are not self-monitoring their glucose or blood pressure have little feedback on the impact of lifestyle changes or their medication between surgery visits. We are investigating whether giving general practices regular information on how people are self monitoring helps control blood glucose and reduce blood pressure in diabetic people who also have hypertension.

- **Stroke**: The impact of a nurse-led telemetric home blood pressure monitoring service in stroke or transient ischaemic attack/ TIA. If people who have previously suffered a stroke or TIA keep good control of their blood pressure (BP), they will be much less likely to have problems in the future.

- **Heart Failure**: The impact of a telemetric congestive heart failure monitoring service. Heart failure affects 900,000 people in the UK and is particularly prevalent among older people. Research indicates that care provided by effective multidisciplinary teams can have a positive impact on outcomes for patients and their quality of life. Early detection of deterioration of symptoms allows timely intervention.

- **Dementia** - The use of global position satellite tracking in wandering patients with dementia. Wandering in people with dementia often triggers admission to long-term care, causes harm and carer stress. One potential solution is to use satellite-tracking which can locate users and inform caregivers if they have left a pre-defined “safe zone”.

- **Depression /Help4Mood** (Online Avatar for managing (virtually) depression): Depression is one of the most common causes of short and long term disability in Europe. Help4Mood proposes to significantly advance the state-of-the-art in computerized support for people with MD by monitoring mood, thoughts, physical activity and voice characteristics, prompting adherence to CCBT, and promoting behaviours in response to monitored inputs through a Virtual Agent (VA) which can interact with the patient.

- **Integrating records**: The tele-integration project aims to make data available into GPs practices. This project explores the attitudes of clinical staff to integrating patient accrued data with the primary care electronic record. Although telehealthcare generates large quantities of potentially important clinical data, these are currently not routinely being integrated into the primary care electronic health care record.
The visitors' group highlights that it can be difficult to define baseline of the standard care without eHealth and telemedicine. For a sound measurement of the effects of Telemedicine, this baseline needs sound specification in the respective studies.

4.2 Ultrasound in the Community (use of remote Ultrasound to support the Ambulance Service)

⇒ Dr James Ferguson, Clinical Lead, SCTT
⇒ Gerry Egan, Paramedic Clinical Director, Scottish Ambulance Service

Dr Ferguson demonstrates two examples of remote support for performing medical procedures that can only be performed by an experienced expert. By providing remote instructions and supervision the expert guides a less experienced health professional or a lay person to perform the procedure.

⇒ Use case 1: The introduction of a laryngoscope, e.g. needed to prepare assisted ventilation is "remotely controlled" by seeing the video of an inbuilt camera and by providing the necessary instructions and feedback to another physician (procedure is done on a demonstrator device).

⇒ Use case 2: An ultrasound examination of the abdomen is done by a lay person. The resulting image information is transferred to a remote site, from where the health professional expert/sophisticated registrar can both provide instruction and feedback on how to perform the examination and a diagnostic assessment of the images (e.g. check for bleeding in the abdomen).

![Figure 3 - Remote Ultrasound by a lay person guided by remote expert](image1)

![Figure 4 - Remote Ultrasound by a lay person - view of the remote expert](image2)
4.3 Telestroke (NHS 24 and Telestroke-Thrombolysis)

Anne Reoch, Stroke and Cardiac Clinical Lead SCTT
Dr Mark Barber, NHS Lanarkshire

Stroke is the third most common cause of death in Scotland and the most common cause of severe physical disability amongst adults. Every day in Scotland it is estimated 35 people have a stroke, totalling 12,657 people every year. Hospital care for people who have had a stroke accounts for 7% of all NHS beds and 5% of the entire NHS budget. Against this background the Scottish Government has identified stroke as an NHS clinical priority.

The rationale for early treatment of stroke is the fact that the larger group of patients suffers from obstructed blood vessels as cause of the stroke symptoms. Early thrombolysis can partially or fully revert the obstruction and thus the symptoms and the prognosis of stroke patients are improved.

For Scotland there is a potential to save 140 patients per 1000 strokes from death and physical dependency or 12 patients from death per 1000 strokes.

The Scottish Government recommended that a National Telestroke Service, providing access to acute stroke thrombolysis (clot busting) for the areas unable to provide 24/7 stroke thrombolysis, was delivered by 2012. By May 2012 it is expected that all relevant sites will be fully operational.

Computed tomography (CT) modalities were already linked across all Scotland. CTs for stroke patients are judged by neurologists and not by radiologists. Liability of remote diagnoses has not the same importance than in some other European countries since all responsibility is shared across the NHS, there are no individual responsibilities like elsewhere.

There are now five acute telestroke networks across Scotland (cf. Annex 4 for a full display of the hub and spoke activities/roles in this network). The five networks cover 11 health boards; the telestroke update page provides the latest information on these. Most are now substantive services. The stroke managed clinical network is strong in Scotland. Working with the network allows identification of other areas where telehealth can improve service or enable services to be provided. The network also provides access to a spectrum of relevant stakeholders. This is particularly relevant in stroke rehabilitation and there are now several services and feasibility trials ongoing throughout Scotland, these can be found on the Telestroke Rehabilitation page.
Thrombolysis rates were quite low before the telestroke network started. Lysis was only performed in 3 to 4 highly specialised centres. Nowadays the thrombolysis rate is the third highest in Europe.

In the dialogue with the visitors' group the question pops up, what would be the next steps. Justine Westwood (NHS24) refers to a new National Telehealth Strategy for Scotland that is currently under preparation and is to be launched in the coming months.

Question is raised on the evaluation of the telestroke service. Scottish presenters highlight that evaluation is ongoing and publications from the group are upcoming.

Audit Scotland ("A review of telehealth in Scotland" – cf. Annex 4) based on their analysis outlines potential benefits of telehealth for patients, staff and NHS boards like this:

- Before telehealth: In NHS Borders, Fife, Forth Valley and Dumfries and Galloway, patients who suffered a stroke were only offered thrombolysis (clot-busting treatment) if they could reach a hospital with the appropriate scanning equipment, be seen by a stroke consultant on-site, and receive thrombolysis within 4.5 hours, in line with best practice guidance.

- Using telehealth: Patients suffering a stroke are taken to the nearest hospital with scanning equipment. An on-call stroke consultant based in NHS Lothian assesses the brain scan image electronically from their office or home, consults with the patient via video-conferencing, and then decides whether thrombolysis should be offered. Thrombolysis is then given to the patient by staff locally within 4.5 hours.

- Potential benefits of telehealth
  - Thrombolysis may reduce a patient’s length of stay in hospital and reduce the need for stroke rehabilitation services, improving the outcome for the patient and potentially reducing costs for the NHS board.
  - Patients receive a treatment they may not have previously been offered

Audit Scotland includes the need for evaluation in a summary of its key recommendations:

NHS 24/SCT should ensure that its new strategic framework, to be developed in 2012, contains specific and measurable objectives for developing telehealth, and is supported by a delivery plan which sets out a clear timetable for implementation [...] [and] promote good practice in NHS boards in evaluating telehealth initiatives, including cost-effectiveness, and routinely analyse and share completed evaluations among NHS boards.

Question is raised on the future plans for the video conference infrastructure that has been demonstrated as a tool being used within the Telestroke programme: A National video conference infrastructure is under preparation and will be supported from March 2012 by a National video conference programme. It is noted - also from some practical experiences made when using the network for connecting to sites in Belgium - that there is still some room for improvement of the interoperability and reliability of the particular infrastructure.

4.4 Stroke Pathway
(Scottish Ambulance Service and NHS 24)


cf. doc AIM EHTEL Scot Day 1-5b NHS 24 Malcom Alexander Stroke Pathway.pdf

⇒ Gerry Egan, Scottish Ambulance Service
⇒ Dr Malcolm Alexander, Associate Medical Director NHS 24
Another crucial element of the early therapy for stroke patients is the overall response time, i.e. the time from symptom onset to qualified diagnoses and therapy. Analyses of earlier processes within NHS and NHS 24 have demonstrated room for improvement concerning this span. As a consequence all patients with suspected severe stroke are immediately referred to the "999" Scottish Ambulance Service and transported to the nearest qualified hospital. As the diagram below demonstrates, the direct referral to SAS instead of the usual consultation process saves an average of 3 quarters of an hour, i.e. the CT scan starts already 1.75 hrs after symptom onset compared to 2.5 hrs. Given that evidence exists that thrombolysis allowed up to 4.5 hrs after the onset has a much better prognosis in the first than in the second half of this time window, that improves dramatically the prognosis.

![Diagram showing the process of stroke treatment]

**Figure 6 Best case Scenario Stroke to CT scan**

Another part of the strategy is to educate the public on the symptoms of a severe stroke. One part of the strategy to achieve this aim is to support lay persons, patients and carers by the FAST APP for smart phones: This APP guides through a quick check for face weakness, arm dropping and speech...
muddiness. If the result for any of symptoms is positive (i.e. showing a negative medical status) the APP supports to call the Scottish Ambulance Service via 999.

To conclude: While the Scottish Telestroke network enables more hospitals to receive and treat patients with acute stroke, the FAST approach enables patients to reach those hospitals in time.

**Overall Strategy for Scotland:** Those people admitted to hospital should be admitted directly to a specialist stroke unit with immediate access to appropriate imaging and other investigation facilities. The stroke unit team should have experience and training in stroke and provide high quality care. The clinical rules explained thus are:

⇒ Treat all strokes as an emergency

⇒ Best clinical choice:
  - <4 hours: an ambulance on systems with short scene times.
  - >4 hours: an ambulance not on systems with pathway into stroke care for advice or transfer to hospital.

### 4.5 Remote Pulmonary Rehabilitation

⇒ Christine McClusky, Service Development Manager, SCTT

cf. doc AIM EHTEL Scot Day 2-4 Christine McClusky Tele Pulmonary Rehabilitation.pdf

COPD is one of the major causes of morbidity and mortality within Scotland and currently accounts for over 10% of all acute hospital admissions and 30,000 deaths annually in Scotland and the UK. COPD is estimated to cost Scotland £818 million a year in direct medical costs excluding social services spending and morbidity costs (BTS 2000). A mapping exercise identified that a substantial proportion of the population with COPD (45%) lived in the most isolated areas. Statistics suggest that only 1.7% of those with COPD have access to PR.

**Figure 8 - Demo of the tele-pulmonary rehabilitation programme**

Aims of the programme:

⇒ Using video conferencing to deliver tele-pulmonary rehabilitation

⇒ Remove barriers of access experienced by people living with, and isolated by, lung disease

⇒ Improve skill mix within pulmonary rehab

⇒ Reduce travelling time for patients and staff

Key message: Data demonstrates that delivery of tele-pulmonary rehabilitation is at least as good as a traditional model and is acceptable to patients.
The Tele-pulmonary rehabilitation (tele-PR) project was designed to accelerate the pace of the adoption of a tele-pulmonary rehabilitation programme model in Scotland, based on a model developed in Tayside in 2008. A tele-PR model can play a vital role in enabling more people from across Scotland to access self management support services and be empowered to self manage their condition.

The key objectives for the project were:

- Improved patient access to information, support and resources, leading to better management of long-term lung disease
- Improved health, well-being and empowerment of COPD patients
- Increased physical fitness through the pulmonary rehabilitation and maintenance classes
- Reduced exacerbations and anxiety
- Improved quality of life and greater independence
- Reduced social isolation through peer support
- Fewer emergency admissions to hospital through improved access to information and advice
- Strengthening a self management model of tele-rehabilitation which can be applied to other long term conditions.

Throughput and Cost:

- Provision of tele-linked classes allowed an increased throughput of patients of at least 30%
- Costs of the Telehealth programme were £76 per patient compared with traditional model run in 2009/10 of £131 per patient.

Staff experience “we have really enjoyed the challenge of delivering pulmonary rehabilitation via the digital medium. Although initially unsure of how it would be accepted by the patients, any fears we had were unfounded. Patients are quite intrigued by it and are happy to interact this way. This is supported by the results of the client satisfaction questionnaire. Although we had initial difficulties due to the specification of the equipment initially in terms of sound and picture quality these were resolved when the proper equipment was delivered. The team looks forward to the next year and the challenge of delivering PR into the home.”

4.6 Remote monitoring for patients with Cancer

- Julie Cowie, Christine McClusky, Service Development Manager, SCTT

cf. doc AIM EHTEL Scot Day 2-5 Julie Cowie ASyMS Cancer Patients Support.pdf

The programme has originally been developed to help patients in the management of cancer related symptoms. Meanwhile additional conditions have been included to the same approach.

- Patients experience many symptoms related to cancer and cancer treatment
- Cause significant distress and can be life threatening
- Symptoms are poorly assessed and managed
- Can cause treatment delays/lead to early treatment termination

The Advanced Symptom Management System (ASyMS) has been developed over a period of ten years. It began as an EU funded study looking at a paper-based system assessing symptoms of patients undergoing chemotherapy. Quickly the potential to have a system to provide real-time assessment of symptoms was recognised, and an electronic version of ASyMS was developed. ASyMS
research has always been guided by the MRC complex intervention framework and has been driven by patients and clinicians.

Other functionality has been implemented like looking up historical data by graphical charts; library, defining their own alarms. Meanwhile a full family of applications i.e. patients replying to questionnaires, doing some risk assessment and then launching a reaction by a treatment team.

Outcomes and Cost-Benefit-Analysis is underway in collaboration with a Health Economist.

4.7 Support for patients with Dementia

Alison Deakin, Project Manager, NHS 24

cf. doc AIM EHTEL Scot Day 2-6 Alison Deakon Dementia NHS24 FocusGroup.pdf

Figure 9 ASyMS Family of SmartPhone Application

Figure 10 – Information elements for Support Prescription to be accessible via multiple channels.
The foreseen service to support dementia prevention and care is still in early project phase: The guiding principle would be a “Support prescription” that would include information to become available through various channels. So far the idea has been presented to user groups (focus groups) who confirmed that they would be interested to receive such a service.

Visitors comment that similar work has been done – not Dementia specific – by the Eurocarers Association based in Ireland. It is confirmed that also in Scotland the current plans foresee the inclusion of family carers in such a programme. Another question raised in the discussion regards the current protocol for patients diagnosed with dementia, i.e. what would change when establishing that add-on: Currently patient are not offered a systematic access to support sources.

4.8 Tele-Dermatology in Scotland – national approach to improve services

Dr Girish Gupta, Consultant Dermatologist, NHS Lanarkshire,
Anne Reoch, Service Development Manager, SCTT

Currently there is a mismatch of the number of referrals to secondary (skin) care with the capacities that the dermatologists in Scotland can offer. Teledermatology is already used – but not yet fully systematically to alleviate this bottleneck. The common principle is to provide images of the skin lesions to the specialists (secondary care). Those images are sometimes taken in the GP practice, by patients themselves or – in higher quality by sending patients to three hospital sites that provide the service to produce high quality photos which are then used for diagnosis or triage. Triage means that the specialists can prioritise those patients (e.g. with lesions suspicious for melanoma) for physical appointments that are most likely to benefits most of it. In NHS Lothian, an email service with image transfer saves 50 % of referrals to secondary care.

For the time being, according to Dr Gupta, Teledermatology in Scotland seems to be managed more by a few enthusiasts than having been systematically organised on a National level. Thus he calls for a more systematic and nationwide approach, based on practice standards for dermatology.

Furthermore, a better dialogue and a learning process between GPs and secondary care could lead to a better overall quality of the assessments by the GPs thus reducing the need for the consultation of expert dermatologists. Currently the gatekeeping could be improved: Out of 100 suspected melanomas only 2 % have been confirmed. Plus there are of course good and bad performers as in all businesses. Scotland also wants to share practices with colleagues in Europe.

The discussion reveals that the role of GPs in the system may need further consideration: If GPs would make no contribution to the diagnostic quality one could even think of bypassing them completely. This is what often happens in other European countries without an effective gate keeping system: Most patients would consult a dermatologist directly. Still another approach is reported from Switzerland where patients send in their pictures themselves. Lessons learned there indicate that 80 % of the patients and the lesions the pictures taken by the patients themselves are good enough.

4.9 CISCO telehealth and telecare technology

John Shaw, Cisco

As tool that is used to implement some of the service is the CISCO Telepresence Callway (delivers Telepresence as hosted service) extended to the CISCO Collaboration Cloud.
The idea behind telepresence is to establish a support network around a person (Norway has identified loneliness as No 1 illness). The callway service is currently offered in the US only, and it is now starting in Canada; other countries are in the process to be identified.

A typical scenario - confirmed by George Crooks - is homecare in remote areas. It has the potential to relieve the relatives of the patients of their anxieties, thus reducing (self) admissions to emergency rooms (where 5% of the patients account for 50% of the cost).

Figure 11 - Remote presentation of the CISCO telepresence system

Figure 12 - CISCO Health Presence system and the Service Continuum

5 NHS inform Health information via Web and Digital Television - NHS 24 Digital Television Channel (access to Primary Care Services)
⇒ Lynne Huckerby, Head of Health Information, NHS 24

cf. web Looking Local web version can be found at www.lookinglocal.gov.uk
All over the UK there is a strong tendency for watching TV in the general population, the average time being 28 hrs per week. Thus - to meet the need of local communities - it is straightforward to use digital television as part of a multi-channel strategy. Thus, NHS 24 has launched a new health information channel on three digital television systems, in a bid to improve access to advice for those without internet connections. The channel, available through Freesat, Sky and Virgin, is delivered in partnership with "Looking Local" and gives people access to health advice and information on local services. Apps for iPhones, iPads and Android smartphones also provide access to the digital service.

The service offers information from the NHS 24, NHS Inform and Care Information Scotland web services. NHS 24 hopes that the channel will improve access to health information for those that don’t have internet access at home. Adoption is good with 30,000 visits per month to the TV service.

NHS 24 is also using the system to pilot a scheme with Dunblane Medical Practice where patients can book appointments with their GP and which in future may allow them to order repeat prescriptions.

The evaluation is underway as part of the evaluation of the overall NHS 24 service and will try e.g to answer the questions whether the channel can help to reduce the number of patients returning to secondary care and whether access to health information makes any difference to the population.

Lynne Huckerby concluded that "more than three million people in Scotland now have access to digital television and it is vital that we are able to broaden our reach to as many people across the country as possible. The ability to get good quality health information is a right that everyone should have and by investing in this new service, we hope that we are opening up access to even more people."
6 eHealth infrastructure and Health services support

6.1 How Lothian is using technology to support patients and Primary Care

Dr John Steyn, Clinical eHealth Adviser, NHS Lothian

cf. doc AIM EHTEL Scot Day 2-3 John Steyn Lothian Technology Primary Care.pdf

Primary care in Scotland is supported by two types of clinical software: Vision and EMIS (50% / 50%). Nevertheless most practices use a “paper light” approach, i.e. the paper record is still in use, particularly for historic patient records. The National Docman system supports the scanning of paper records that are afterwards destroyed. Only two practices use still paper alone, i.e. they print out the information that they get.

Communication is enabled by the SCI Gateway for whole of Scotland that supports referrals by extracting data from GP practices. Hospitals are still paper based (and print out the information). SCI store – national repository holds all blood test for primary and secondary care. While both GPs and hospital doctors have access to the whole system, the person logged in only sees the records of the patient of its own practice (access control supported by a monthly list for auditing the data access). There exists one SCI store per health board, i.e. for Scotland. Patients access is overall not implemented. Diabetes and dialysis care start to let patient see the results.

Email connectivity is for now only secure within the health service. Messages from and to patients’ homes are not secure because they have to leave the secure network. Thus it is not allowed to send patient identifiable information out of the secure network of the health service. A patient portal is under preparation that will support secure communication.

6.2 Emergency Care Record

Scotland has developed the Emergency Care Summary which is widely used. It is a summary of basic information about those aspects of an individual’s health which might be important if urgent medical care is required. The Emergency Care Summary has been produced for all patients except for those who have exercised a right to opt out of the system. The data stored encompasses an electronic medication record, emergency care data and demographic details. More precisely, the following data is included:

Scottish Emergency Care Summary data:

- Name, date of birth
- Name of the GP surgery
- Identifying number (the Community Health Index [CHI] number)
- Information about medicines prescribed by the GP surgery and any adverse reactions to medicines that the GP knows about

If the patient is conscious, the individual must give explicit consent for healthcare staff to see the record. The individual can opt out of having an Emergency Care Summary by telling his or her GP surgery. The individual can also ask to see the Emergency Care Summary and ask for any incorrect information to be changed.

The Emergency Care Summary was set up as part of changes to the provision of out-of-hours services in NHS Scotland. It was initially rolled out in late 2004 and early 2005 in two regions of Scotland. The roll-out across the remaining regions was completed in August 2006. Initially, the Emergency Care
Summary got mixed reviews in Scotland: A report published by Audit Scotland\textsuperscript{13} noted that some healthcare staff expressed reservations about its contents. However, a 2009 issue of eHealth Insider\textsuperscript{14} reported that 99% of the Scottish population have an Emergency Care Summary, and that emergency care summaries for NHS patients in Scotland have been accessed more than 1.5 million times since 2006. The development of Emergency Care Summary standards is supported by the Primary Care Directorate within Scottish Government.

The electronic health record system is being implemented in a decentralised manner since the eHealth strategy states that a large single database is not preferred. Instead Scotland envisages to build up a clinical portal that presents information to clinicians from a variety of information systems. The aim of the eHealth Strategy is to build a virtual electronic record building on elements that exist and introducing new technology such as a clinical portal. The portal will enable clinicians to have a single point of access to many pieces of information seamlessly on site:

ECS – twice a day the information changed at the surgery is sent to the ECS (one part of the SPIN infrastructure). Out of 5 million in Scotland only one 1000 have opted out. When opening a patients record you are asked whether you have the permission to open this. A GP can access the information at any time since it is part of his information anyhow.

A subset (extra page / dataset to the EXCS is the palliative care for severely ill patients. It is added only with the consent of the patient. It holds also patient preferences like the living will. Another extension is the Key Information Summary (KIS). It aims improve sharing of key information for patients in Scotland who have Chronic Conditions or Mental Health problems. Key information including medical diagnoses, carer details and patient wishes for future care will be automatically downloaded from Primary Care systems into an easy to use interface for a wide range of clinical users, focusing on use in Emergency Care. KIS records are created for individual patients with their involvement and facilitate the sharing of patient centred information to improve communication between clinicians, promote patient centred care and reduce unnecessary admissions to hospital. KIS extends the information of the existing ECS system which has a shared record for every patient in Scotland. KIS should make care safer by reducing the risk of inappropriate care, reduce the need to fax or send paper records and make better use of clinical time. KIS records will be accessed through secure clinical portals using role based access and a clear consent process. A KIS will be created in partnership with any person for whom detailed information needs to be made available for healthcare workers providing care when the GP practice is closed. It is intended to replace the “special notes” for weekend care, faxed summaries for OOHs and anticipatory care forms for people with long term conditions. It will also be used for people with mental health issues or unusual conditions, who might have difficulty remembering crucial details if they become ill.\textsuperscript{15}

The vision is to have an ePCS and/or a KIS in place for everyone in Scotland who needs one.

\textsuperscript{13} Audit Scotland provides the Auditor General and the Accounts Commission with the services they need to check that public money is spent properly, efficiently and effectively.

\textsuperscript{14} eHealth Insider 14 May 2009

7 Information Governance for Personalised Medicine

John Crawford, IBM

cf. doc AIM EHTEL Scot Day 2-1 John Crawford Designing Personalised Healthcare.pdf

IBM Healthcare and Life Sciences exists to enable clients to transform the development and delivery of safer, more affordable and more effective diagnostics, drugs and medical care, through deep industry insight and the application of information technology.

The presentation highlights the Kaiser Permanente pyramid for chronic diseases; knowledge services and access to patients, personalised medicine, personalised healthcare and implications for National ehealth infrastructures (cf. the attached IBM White Paper).

![Image of changing Health information landscape]

**Figure 13 - The changing Health information landscape**

- From treatment to prevention
- From acute to chronic care
- From passive to activated patients

![Image of Health Information Landscape]

**Figure 14 - The Health Information Landscape**
8 Meeting Conclusions

NHS 24 Medical Director, Professor George Crooks OBE, our meeting host, stated in the NHS24 newsletter ‘Networker’: “We were delighted to welcome our European colleagues to showcase the innovative work of NHS 24 and SCTT and the real benefits that telehealth is bringing to patients in Scotland. […] “The event offered the ideal opportunity to highlight the work we are doing and also brought together likeminded people to discuss opportunities for the enhancement and development of telehealth services.” On a less formal note he explained the rationale of the orchestration of the study visit on behalf of the host: The idea was to demonstrate real-life services of different ripeness and thus to foster an open dialogue on the steps that are still necessary in Scotland or elsewhere in Europe. Also in Scotland, where huge progress has been made, there is still some need on service redesign. And – given the perpetual financial strains of healthcare services – there will remain a more or less permanent need to assess the financial advantages and disadvantages of our services. Overall he will welcome an ongoing mutual learning process between Scotland and Europe, for which the present visit proved to be an extremely useful start. Given the fact, that he has meanwhile been elected as the President of EHTEL, he will of course personally foster and enable this dialogue.

Marc Lange, EHTEL Secretary General, summarised the experience by the visitors in the same newsletter: “We were enthusiastic to learn from NHS 24 and SCTT about their experiences in deploying telehealth and telecare services in routine care. Our visit to Scotland allowed us to analyse how NHS Scotland uses telehealth innovations on a daily basis to bring benefits to patients on the frontline.”

Philippe Swennen, representing AIM, also expressed his appreciation and thanked the host and the meeting participants.

Options for the next study visit - probably in Germany to study services in a "Bismarckian" system are under investigation.
Annex 1: Profiles of the Presenters

Professor George Crooks joined NHS 24 in September 2006 and is now the Medical Director of both NHS 24 and the Scottish Ambulance Service.

George’s role with NHS 24 encompasses supporting the governance, quality and safety of all clinical services; developing new services in partnership with other NHS organisations; management oversight of the Scottish Centre for Telehealth and the National Telecare Development Programme; and leading information governance, business continuity and emergency planning.

George was a General Practitioner in Aberdeen for 22 years. He subsequently became Director of Primary Care for NHS Grampian, with responsibility for all community-based independent contractor services. George has a particular interest in the field of unscheduled care, including the development of common assessment and triage processes across the NHS and the use of technology to support the delivery of high quality patient care to the population of Scotland.

Justine Westwood joined NHS 24 in 2005 and is currently Head of Planning and Performance for the organisation. In this role, Justine provides professional leadership for the Corporate Planning and Performance functions within NHS 24, supporting the services delivered by the organisation. These functions include Strategic and Corporate Planning, Corporate Performance, and Strategic Programme Delivery. Justine is a member of the NHS 24 Executive Team, and is part of the senior management team of the Scottish Centre for Telehealth and Telecare.

Justine is a graduate in Music from Edinburgh University, and has extensive experience in both the private and public sectors, with a background in delivering IT and digital solutions.

Lucy McLoughan B.Sc. (hons) Psychology and Ph.D. Psychology.

Following Lucy’s early career in environmental psychology, she has worked in health services research for 14 years, mainly in optometry and primary care. Lucy is currently managing a programme of trials looking at the impact of telehealth of in primary care. Prior to this she set up and managed the Scottish Primary Care Research Network and then the Scottish Mental Health Research Network.

Dr James Ferguson was born and educated in Aberdeen at Robert Gordon’s College and Aberdeen University graduating in Medicine in 1983. He holds the Fellowship of the Royal College of Surgeons of Edinburgh in both General Surgery and Accident and Emergency Medicine. Emergency Medicine. Registrar training was undertaken in Manchester and as a Senior Registrar in Aberdeen. He was appointed as Consultant in Emergency Medicine with a specialist interest in Paediatric Emergency Medicine in 1994, acting as Head of Service of the Emergency Department of the Royal Aberdeen Children’s Hospital from 1994 - 2000. He was responsible for bringing the first Advanced Paediatric Life Support (APLS) course to Scotland in 1995.

The research interests of the Emergency Department in Aberdeen involved Telemedicine, Offshore Medicine and Prehospital Care. He was invited to become a Member of the Scottish Telemedicine Action Forum (STAF) in 1999, which developed Telemedicine activities in Scotland. He was appointed by the Scottish Executive as Clinical Lead of a £1.5 million project to establish a Telemedicine network for Emergency Care in the North of Scotland. He was part of the Unscheduled Care Group developing the National Framework for Service Change in the NHS in Scotland (Kerr Report). This report recommended the establishment of the Scottish Centre for Telehealth.

Other roles include Regional Advisor for Emergency Medicine training in the North of Scotland, Council Member of the College of Emergency Medicine, National Clinical Lead for Flow 1 of the...
Unscheduled Care Collaborative and Member of the Unscheduled Care Implementation Group of the recommendations of the Kerr Report. He has advisory roles to both the Scottish Ambulance Service and NHS24.

He is an Honorary Senior Lecturer in Emergency Medicine with Aberdeen University. He has several publications in the field of Emergency Medicine, particularly Paediatric Emergency Medicine. In addition, he has won prizes for publications on Telemedicine.

**Gerry Egan** is the Paramedic Clinical Director for the Scottish Ambulance Service. Gerry has been in the ambulance for over 33 years and has worked in all areas of the service including training and ambulance control. Gerry still undertakes an operational clinical role to keep his clinical skills fresh and his “back to the floor” knowledge up to date. Gerry works closely with NHS 24 and is involved in a number of NHS 24 projects and groups. Away from work Gerry is a keen photographer and enthusiastic musician.

**Dr Mark Barber** is lead clinician for the Lanarkshire Stroke MCN. He has an interest in telehealth after helping to develop an acute telestroke network in NHS Lanarkshire. He is also involved in a pilot of telerehabilitation with Western Isles Health Board.

**Anne Reoch**. Since joining the SCT in 2007, Anne’s main focus has been the Scottish Telestroke Programme, working in collaboration with the Stroke National Advisory Committee and Stroke Managed Clinical Networks. The main aim of the Programme is to improve access to acute stroke thrombolysis. Anne also managed the Telestroke TIA project, which won the Scottish Health Award for Improvement and Innovation in November 2008 and has more recently been working with stroke managed clinical networks and rehabilitation teams to explore and develop telestroke rehabilitation in both acute and community hospitals and in the patient’s home setting.

Anne is now clinical lead for the SCTT Cardiac and Stroke Programme, working with Health Boards across Scotland to identify and develop telehealth solutions for service innovation and improvement across all cardiovascular patient pathways. This work involves Stroke and Cardiac National Advisory Committees, regional planning groups, voluntary sector, territorial and special Health Boards, Local Authorities, operational teams and patients and public.

In addition, Anne is now facilitating the growth of tele-dermatology across Scotland.

**Dr Malcolm Alexander** has been the full time Associate Medical Director with NHS 24 since 2004 and a practising GP in unscheduled care. He has previously practiced as a remote and rural general practitioner for 13 of his 30 years in clinical practice. He has also held positions at health board level as Medical Director and as Director of Strategy for rural health care initiatives for the Scottish Government. He is currently engaged in re-design of call flow through NHS 24 and ensuring appropriate clinical content for multichannel delivery. Dr Alexander lives on the island of Bute in the Clyde estuary.

**Lynne Huckerby** took up the post of Head of Health Information Services in June 2010. Prior to this Lynne was seconded from NHS Borders in July 2009 to the role of General Manager for the Scottish Flu Response Centre managed by NHS 24. Lynne’s role in NHS Borders was the management of Unscheduled Care Services including Accident & Emergency and the GP Out-of-Hours Service. Lynne has also held a range of management positions across primary and secondary care in both NHS Lothian and NHS Borders. In her current role, Lynne is responsible for the Health Information Team to provide the strategic direction for the development of the service across the range of channels including,
but not limited to NHS inform Helpline, online services, Digital TV and social media channels. The team also supports the provision of health information to NHS 24’s unscheduled care service.

Dr John Steyn was a General Practitioner in Edinburgh for over 27 years, having trained in Aberdeen. In addition, he has been Clinical eHealth (IM&T) Adviser for NHS Lothian for over 22 years. This role involves ensuring that IT developments support, and deliver improvements to, patient care. The role extends across Primary Care IT, as well as communications to and from Primary and Secondary Care. He has been involved with the Lothian TeleHealth initiative since 2007.

Christine McClusky was born in Napier, New Zealand and studied for her BSc(Tech) degree at Waikato University before travelling extensively. She eventually settled with her husband in Elgin, Morayshire, and began working with the NHS in 1994. Christine worked in a variety of support and eHealth roles across the NHS in Grampian prior to joining the Scottish Centre for TeleHealth in April 2007.

Dr Julie Cowie will be presenting on The Advanced Symptom Management System (ASyMS) III. The project team comprises of Professor Nora Kearney, Dr Roma Maguire, Dr Julie Cowie, Mr John Conaghan and Ms Lisa McCann. ASyMS research has been on-going throughout the last decade, and focuses on real-time assessment of symptom to provide a rapid therapeutic response to toxicities reported by patients. The generalised ASyMS model has been applied to a number of different aspects of healthcare provision over the last ten years, from supporting teenagers undergoing chemotherapy to provision of palliative care support for children to haematological cancer patients improving the symptom experience of lung cancer patients receiving radiotherapy. In addition, the ASyMS model has been applied worldwide, with current projects being conducted in Australia, New Zealand as well as a number of UK based ASyMS projects.

In this presentation we will give a brief introduction to the ASyMS III project. ASyMS III research focuses on the evaluation of the impact of ASyMS on the care delivered to people with breast and colorectal cancer receiving adjuvant chemotherapy. An overview of the project will be given, and a brief demonstration of how the actual ASyMS remote monitoring system operates in clinical practice will be provided.

Dr Girish Gupta is a Consultant Dermatologist in Lanarkshire, Scotland. His special interest is cutaneous oncology. He has established a dedicated area wide skin cancer clinic and has set up an innovative electronic referral system using digital images, which has received funding from Centre for Change and Innovation. He is the chair of the West of Scotland skin cancer managed clinical network and a member of the European Organisation for Research and Treatment of Cancer. He is responsible for a number of clinical studies in cutaneous oncological disease.

Alison Deakin previously worked for Royal Bank of Scotland for 10 years in project management and has worked for NHS 24 since June 2010. Her current projects involve developing technology links for BSL users within NHS 24 services and involves the possibility of using video technology to provide an interpretation service, as well as developing links for those with Learning Disabilities. Her presentation today will focus on her third project- overcoming barriers of care for those with Dementia.

10  Annex 2: Guide to front-line professionals at NHS 24

⇒ Call handlers answer all calls to NHS 24 and direct you to the most appropriate person to deal with your situation. As NHS 24 does not hold your GP medical record the call handler will ask you some straightforward questions. This is important in case we need to get you help quickly.
or call you back. They may also deal with you themselves as they are trained to identify specific symptoms without the need to direct you to a nurse practitioner.

- Nurse practitioners will check your details and ask about your medical history and symptoms. They will advise you on what to do next, whether this is how to best look after yourself at home or, if face-to-face care is required, they will refer you to the appropriate location of care. This may be arranging a GP home visit, seeing a GP or other health professional at a primary care emergency centre, A&E, arranging an ambulance or perhaps asking you to call your GP practice when it reopens.

- NHS 24 pharmacists deal with medicine related calls. For example, they can give advice on how to take medication, information on what else can be taken alongside existing medication and possible side effects.

- Mental health nurse practitioners provide telephone triage and clinical assessment to patients presenting with mental health illnesses and conditions to ensure a safe and appropriate level of care.

- Health information advisors provide general information on a wide range of health subjects, including illnesses, other NHS services and support organisations. Health information advisors can also provide details of all pharmacies, GP practices and dental practices in Scotland, including their opening times.

- Dental nurses deal with dental-related calls quickly and efficiently. Dental nurses can offer advice about appropriate care and may direct patients to emergency dental treatment.

- Breathing Space advisors can help with a wide range of issues relating to mental and emotional wellbeing. Callers can be transferred directly to Breathing Space from NHS 24.

11 **Annex 3: Telescot principle investigation areas / telehealth services**

- **Hypertension**: The impact of a telemetric hypertension monitoring service (randomised controlled trial with nested qualitative study): Context: Lowering blood pressure substantially reduces an individual’s risk of having a stroke or heart attack. People now can, and do, buy equipment to measure their blood pressure at home, and in some cases use mobile phone and Internet technology to send results to a remote advice service. Aim: We are investigating whether changing NHS services to support this type of self care helps reduce blood pressure for hypertensive patients, whether it improves patient knowledge and sense of empowerment around blood pressure control and what users think of the service.

- **COPD**: The impact of a telemetric COPD monitoring service; Context: Long-term conditions are a major healthcare challenge. As the population ages more people are living with long-term
conditions rendering the current, clinician centred models of management unsustainable in the longer-term. NHS policy increasingly encourages people to self-manage their condition with additional professional support for those at greatest risk. Technologies are now available which allow patients with chronic obstructive pulmonary disease (COPD) to monitor their own illnesses and automatically send the information by internet to a secure web site, which they and their clinicians can view. Such telemonitoring systems provide electronic reminders to patients to take measurements and medication, and alerts patients and clinicians if additional treatment may be needed.

Existing research evidence indicates that engaging patients in telemetric self-monitoring and management can improve clinical outcomes in asthma, but the evidence in COPD is mixed. There remains a pressing need to evaluate rigorously such interventions in a UK NHS setting. NHS Lothian is investing in telemetric self-monitoring equipment for a range of conditions, including COPD, to develop a new, evidence-based model of care. The telemetric equipment being deployed provides information to patients and telemonitoring staff, facilitating rapid advice to patients. A patient recording a deteriorating symptom or parameter is immediately detected and contacted by telemonitoring staff allowing timely diagnosis and therapeutic intervention.

**Diabetes:** The impact of a telemetric monitoring service in diabetes type 2 (Background: Poor glycaemic control and high blood pressure are largely asymptomatic so people with diabetes and hypertension who are not self-monitoring their glucose or blood pressure have little feedback on the impact of lifestyle changes or their medication between surgery visits. Aims: We are investigating whether giving general practices regular information on how people are self-monitoring helps control blood glucose and reduce blood pressure in diabetic people who also have hypertension. Patients will have control of the measurement of their blood glucose and blood pressure. They will be able to get timely feedback on the impact of changes to lifestyle and medication and they will also be able to contact their practice nurse (who will be able to see their blood pressure and glucose record on the internet) via telephone or email. It is anticipated that this will provide increased motivation and facilitation for individuals to improve self-care. Professionals will have remote access at any time to self-monitored blood glucose levels and average blood pressure. The availability of the home monitoring results may give professionals more confidence in their assessment of the effectiveness of the patient’s self-care and medication and lead to effective regimens being established more quickly.

**Stroke:** The impact of a nurse-led telemetric home blood pressure monitoring service in stroke or transient ischaemic attack/TIA. Successful studies proofing some benefits. We know that if people who have previously suffered a stroke or TIA keep good control of their blood pressure (BP), they will be much less likely to have problems in the future. Using modern mobile technology, people can now easily take these measurements at home using a new kind of meter and send them to a secure website so that only they and their doctor or nurse can see the results. Their doctor or nurse can then make changes to their treatment if needed. Monthly printed summaries of blood glucose and blood pressure results can be sent to patients. If patients use the internet they can also see their record on the website and receive automatic feedback by email.

**Heart Failure:** The impact of a telemetric congestive heart failure monitoring service (qualitative study). Successful studies proofing some benefits. Context: Heart failure affects 900,000 people in the UK and is particularly prevalent among older people. The condition accounts for about 5% of all medical admissions to hospital, and rates of re-admission are also among the highest for
any common condition in the UK. Providing services to patients with heart failure costs the NHS an estimated £625 million each year. Research indicates that care provided by effective multidisciplinary teams can have a positive impact on outcomes for patients and their quality of life. Currently in Lothian care for patients with severe heart failure care is provided by specialist heart failure nurses in conjunction with GP colleagues. This involves home visits and telephone follow-up. Early detection of deterioration of symptoms allows timely intervention and may prevent hospitalisation. Deterioration can be detected using relatively simple measures (e.g. history of increasing tiredness, breathlessness, ankle swelling or palpitation) and a measure of the patient’s weight, blood pressure and pulse oximetry. Currently these measures are carried out by a visiting nurse on a relatively infrequent basis.

- **Dementia** - The use of global position satellite tracking in wandering patients with dementia. Context: Wandering in people with dementia often triggers admission to long-term care, causes harm and carer stress. There is no robust evidence that alternative community interventions can reduce wandering episodes safely. One potential solution is to use satellite-tracking which can locate users and inform carers if they have left a pre-defined “safe zone”. However, it is not clear what constitutes a “safe zone” or if satellite-tracking reduces harm and carer stress or delays long-term admissions.

- **Depression / Help4Mood** (Online Avatar for managing (virtually) depression): Depression is one of the most common causes of short and long term disability in Europe. It accounts for substantial costs both directly to health services and indirectly through lost productivity and the burden of caring. Most patients with Major Depression (MD) recover with treatment, which may be with antidepressant drugs, psychological therapy or, in severe cases, hospitalisation. However for many, that recovery is either slow or incomplete. Research shows that psychological therapies can be delivered effectively without face to face contact: computerised cognitive behavioural therapy (CCBT) is suitable for self-guided treatment in the individual’s own home. However, its value for patients is limited by the difficulty of staying engaged, and there are professional concerns that important changes in mood may be missed. Help4Mood proposes to significantly advance the state-of-the-art in computerized support for people with MD by monitoring mood, thoughts, physical activity and voice characteristics, prompting adherence to CCBT, and promoting behaviours in response to monitored inputs. These advances will be delivered through a Virtual Agent (VA) which can interact with the patient through a combination of enriched prompts, dialogue, body movements and facial expressions.

- **Integrating records:** (Key role of an integrated EHR) The tele-integration project aims to make data available into GPs practices. This project explores the attitudes of clinical staff to integrating patient accrued data with the primary care electronic record. Context: Telehealthcare uses remote information/communication technologies to enable the remote delivery of patient-centred care. Although the substantial resources being invested into telehealthcare are generating large quantities of potentially important clinical data, these are currently not routinely being integrated into the primary care electronic health care record. The flip side to this is that information overload is already a serious problem for primary care teams and it is not clear whether clinicians would want such patient-generated data uploaded into their systems and if so how these should best be presented.
12  Annex 4: Scotland Telestroke Networks

North Scotland Telestroke Network

- NHS Grampian (Aberdeen Royal Infirmary, hub): An acute stroke thrombolysis telemedicine service commenced in December 2008, providing 24/7 telehealth links from ARI acute site to the A&E assessment area in Dr Grays Hospital (spoke), (via IP and ISDN6/Gateway with a Codec and monitor at each site also planned consultant home links). This service has now extended to cover ARI with MOVI VC links to the consultants home.

- NHS Western Isles (spoke): A 24/7 acute stroke telemedicine service commenced in December 2009 serving Western Isles Hospital in Stornoway provided by the remote consultation site in Aberdeen Royal Infirmary hub (Via IP and ISDN6/Gateway with a Codec and monitor at each site also linked to the hub consultant homes). This is now a substantive service with a service level agreement in place.

- NHS Highland (spoke): Provision of an acute stroke telemedicine service for Lorne and Islands District General Hospital in Oban commenced in October 2011 and Caithness in April 2012. These are 24/7 substantive services with service level agreements in place (Via IP with a codec and monitor at the A&E referral site linking to the Aberdeen Royal Infirmary hub). The development of The Belford Hospital site is underway.

- NHS Tayside: Are providing OOH stroke thrombolysis in Ninewells and Perth Royal Infirmary using a rota provided by the emergency department consultants, who have been trained in stroke thrombolysis. There is potential to extend to the North Telestroke network in the future if required.

- NHS Shetland: Shetland now has a face to face thrombolysis service provided by their general medical consultant rota, during the time when CT head scanning is available. Shetland is not joining a telestroke network at this point.

- NHS Orkney: No immediate availability to CT imaging therefore no local thrombolysis service available; however there is a successful Tele TIA service in place. GPs with Special Interest (GPwSI) provide acute stroke cover, recently MOVI home links for the on call GPs have been put in place to speed up assessment and possible transfer to Aberdeen.
West of Scotland (3 telestroke networks)

⇒ NHS Lanarkshire Network: An out of hours thrombolysis service (9am-10pm, 7 days per week) for Wishaw Hospital, Monklands Hospital and Hairmyres Hospital is now in place. The rota is provided by stroke consultants from the three Lanarkshire Hospitals (a Codec and monitor is wall mounted at each acute site, laptops with video conferencing software are in the consultants’ homes. The links to the consultants’ homes are IP via individual BT N3 lines). To cover periods in hours when the Wishaw, Monklands or Hairmyres consultants are unavailable there is consultant cover via the acute telemedicine links within Lanarkshire.

⇒ NHS Ayrshire and Arran Network: Staff at the emergency department in Ayr Hospital are trained in telestroke. An internal telestroke link between Crosshouse and Ayr providing thrombolysis cover Monday - Friday 9 am – 5 pm is now in place (Trolley based Codec and monitor at each A&E site, also VC software and webcam in the stroke specialist’s office to provide consulting point if specialist out of main hospital). Home links for out of ours consultant cover, initially between 5 pm-8 pm, are now in place. (IP using individual BT N3 lines, laptops with VC software and headsets).

⇒ NHS Greater Glasgow and Clyde Network: EX series VC kit in use An acute telestroke telemedicine link to provide Inverclyde Royal Hospital in Greenock with 24/7 thrombolysis decision support from the specialist rota that covers the Southern General Hospital and the Victoria Hospital in Glasgow, is being developed (IP with trolley based codec and monitor at the patient referral site linked to trolley based VC unit at Southern General Hospital and a desktop VC unit at Victoria Infirmary) this service will be 9 am – 5 pm initially. Consultant home links are dependent on the availability of PACS at home access for Consultant Specialists in Greater Glasgow and Clyde out of hours).

South of Scotland Telestroke Network

⇒ NHS Lothian (hub): Dr Rustam consulting from the Western General Hospital to Edinburgh Royal Infirmary. An acute telestroke telemedicine service commenced in summer 2010 - Providing out of hours cover for all three acute Lothian hospitals. The 10 consultants covering this rota make up the specialist hub for the South Network which became fully operational on 20 March 2011. An evaluation of this service will be undertaken at six months and the outcome of this will decide how this service will be resourced in future.(IP with codec and monitor at each referral site, linking to PC with VC software for in hours cover and to consultant home links out of hours). This was evaluated at six months – it was agreed this service would continue as a substantive service.

⇒ NHS Borders (spoke): out of hours acute telestroke cover (trolley based codec and monitor in stroke unit linking to hub).

⇒ NHS Dumfries & Galloway (spoke): Out of hours acute telestroke cover for Dumfries Hospital and Stranraer Hospital (trolley based codec and monitor linking at both sites, linking to Lothian hub for out of hours cover). There is also an internal acute telestroke service in hours between the two Dumfries and Galloway hospitals.

⇒ NHS Fife (spoke): Out of hours acute telestroke cover for Victoria Hospital, Kirkcaldy (trolley based codec and monitor at A&E referral site linking to Lothian hub). There is also an internal acute telestroke service in hours, between Queen Margaret Hospital in Dunfermline and Kirkcaldy (wall mounted codec and monitor at Kirkcaldy A&E site)

⇒ NHS Forth Valley (spoke): Out of hours acute telestroke cover for Forth Valley Royal Hospital, Larbert (trolley based codec and monitor at A&E referral site linking to Lothian hub).
**13 Annex 5: National Audit Report on Telehealth in Scotland**

1 The use of technology in the NHS has the potential to improve the quality, delivery and efficiency of healthcare services. Telehealth is the provision of healthcare to patients at a distance using a range of technologies, such as mobile phones, internet services, digital televisions, video-conferencing and self-monitoring equipment. Examples of telehealth range from a consultation between a patient and a clinician at different locations using video-conferencing; a clinician diagnosing a patient’s condition remotely using images transmitted electronically, such as a scan or a digital photograph; and using technology to monitor patients with long-term conditions at home.

2 Telehealth can offer a number of potential benefits to patients and NHS boards, such as reducing the need to travel to outpatient clinics, providing a quicker diagnosis, and avoiding referrals to hospital for diagnosis or treatment. It also has the potential to help NHS boards deliver clinical services more efficiently.

3 Across Scotland, NHS boards are making use of telehealth in a range of clinical specialties, including stroke, dermatology and respiratory medicine. Since 2006, around 70 telehealth initiatives have been introduced in NHS boards but most of these are on a small scale, involving on average 34 patients. Around 40 per cent are pilots and 40 per cent are part of routine services. The remaining 20 per cent are either delivered on an ad hoc basis, are being evaluated, or have been discontinued. Telehealth is most well used in the north of Scotland. Our audit looked at the use of telehealth in the 14 territorial NHS boards in Scotland, including:

- the structural, organisational and funding arrangements in place to support the development and delivery of telehealth
- the benefits telehealth can deliver, and the barriers to NHS boards using it more widely
- the potential of telehealth to offer better value for money than more conventional models of patient care.

The audit focused on telehealth initiatives that deliver care to patients. It did not examine the use of technology for meetings, education and training, or to manage information such as patient records. The audit did not look at the use of technology provided mainly by local authorities to help people live more independently at home.

During the audit, we interviewed staff in three NHS boards and in national bodies (ie, the Scottish Government and NHS 24)

- interviewed NHS board medical directors
- reviewed information on telehealth initiatives from the 14 territorial NHS boards
- reviewed relevant documents
- carried out economic modelling to assess whether telehealth has the potential to achieve savings or free up NHS capacity.

**Key messages**

- The NHS in Scotland is facing growing demand for its services and NHS boards need to consider new models of care such as telehealth to help manage current and future demand. Targeted appropriately, telehealth offers the potential to help NHS boards deliver a range of clinical ser-
services more efficiently and effectively. NHS boards should consider the use of telehealth when introducing or redesigning clinical services.

- The Scottish Centre for Telehealth (SCT) was established in 2006 to support NHS boards in developing telehealth. There was a lack of clarity over SCT’s role and purpose in its first three years. The combination of the integration of SCT with NHS 24 and a new eHealth strategy provides a much stronger focus to drive the development of telehealth nationally. Although NHS boards are making use of telehealth, development and investment in this area has not been a priority.

- Telehealth offers a range of potential benefits for patients such as reducing travel, receiving a quicker diagnosis and avoiding hospital admissions. Patient experience is broadly positive and there are high levels of satisfaction. The experience of NHS staff involved in telehealth initiatives is also positive. However, opportunities for them to gain experience remain limited and more training and education are needed.

14 Annex 6: Visit as seen in the newsletter “Networker” of NHS 24

Euro spotlight on Scots telehealth work

AS SCOTLAND’S national telehealth provider, NHS 24 recently welcomed healthcare and technology professionals from across Europe and Scotland as part of a two-day study trip.

The visit was hosted by NHS 24 on behalf of the European Health Telematics Association (EHTEL) and the International Association of Mutual Benefit Societies (AIM). More than 30 representatives from healthcare organisations including Belgium, Sweden, Greece, Germany, Poland, Switzerland, Slovakia and Israel made the trip to learn about telehealth and telecare services within Scotland.

The delegates were given an overview of how NHS 24 and the Scottish Centre for Telehealth and Telecare (SCTT), along with, local Health Boards and academic Institutes are delivering both national and regional telehealth and telecare programmes. They saw demonstrations of initiatives, including the use of remote ultrasound to support the Scottish Ambulance Service and the development of a telestroke network which offers life-saving treatment to patients.

NHS 24 Medical Director, Professor George Crooks, who is a member of the Board of Directors of EHTEL said: “We were delighted to welcome our European colleagues to showcase the innovative work of NHS 24 and SCCT and the real benefits that telehealth is bringing to patients in Scotland. “The event offered the ideal opportunity to highlight the work we are doing and also brought together like-minded people to discuss opportunities for the enhancement and development of telehealth services.”

Marc Lange, Secretary General of EHTEL, said: “We were enthusiastic to learn from NHS 24 and SCCT about their experiences in deploying telehealth and telecare services in routine care.

“Our visit to Scotland allowed us to analyse how NHS Scotland uses telehealth innovations on a daily basis to bring benefits to patients on the frontline.”

For more information on the work of SCCT, turn to page three.

Figure 15 - This report in a nutshell - front page of "Networker" of NHS 24
IT-enabled personalized healthcare

Improving the science of health promotion and care delivery
To succeed in transforming healthcare, many countries will need to move to more personalized healthcare (PHC). Successful migration must encourage innovation, provide access to more complete patient information and incorporate advanced clinical knowledge into clinical decision making. Therefore, PHC will require a much more open, robust health information technology (HIT) environment than exists today. We have identified five major HIT-related challenges, as well as recommendations to foster HIT-enabled PHC.

Executive summary
Healthcare systems around the world are making great strides in technological, scientific and clinical innovations. Even so, many countries, even those with reputations for excellent care, are struggling to address increasing costs, poor or inconsistent quality and inaccessibility to timely care. Many believe that fundamental transformation is required for what are becoming increasingly unsustainable healthcare systems.

Three factors contribute to the unsustainability of healthcare: fragmentation, waste and inadequate science for health promotion and care delivery. Issues with fragmentation and waste are indeed daunting; they are a key focus of current U.S. health reform efforts, for example. Receiving less attention is inadequate science – more explicitly, problems involving the science of health promotion and care delivery. These issues impact both quality and costs, with estimates for unwarranted care – just one part of inadequate science – ranging from US$250 to $325 billion per year in the United States. This paper focuses on these inadequate science problems, which present significant barriers to realizing the vision and promise of PHC.

PHC could help address difficulties associated with the science of health promotion and care delivery by using broader and deeper patient information and applying more complete clinical knowledge to help promote patient-centered health and predict, prevent, aid in early detection of, treat and manage diseases. Through improved science, PHC has great potential to improve quality and reduce overall costs of health promotion and care delivery. However, it is incredibly information and knowledge intensive even compared to today’s complex needs, which already exceed human cognitive capacity. Access to and appropriate use of burgeoning volumes of patient information and clinical knowledge will require a powerful health information technology (HIT) environment.

A much more open, robust, flexible, standards-based HIT environment will be required to enable personalized healthcare. This environment must be capable of capturing, storing, analyzing and appropriately sharing information about individual patients and patient populations. It must be capable of rapidly generating new clinical knowledge, managing that knowledge and easily incorporating the knowledge into clinical processes and workflows for decision making for health promotion and care delivery.
This environment also must facilitate appropriate interactions among constituents, whether they involve patients communicating with their care delivery teams, communications among care providers or researchers working across traditional organizational, industry or country boundaries. However, these capabilities were not top priorities when today’s HIT systems were designed and implemented. Today’s systems were designed primarily to facilitate administrative functions such as billing and payments and to automate specific clinical encounters such as a doctor’s appointment or hospital inpatient stay.

To realize the vision of PHC, five interdependent HIT-related challenges must be overcome:

1. Lack of an interoperable HIT environment for care delivery and research
2. Prevalence of tightly coupled applications and data
3. Inadequate data and knowledge standards
4. Insufficient analytics capabilities
5. Absence of a clinical decision-making foundation.

These challenges are much more difficult to address than the HIT-related issues associated with healthcare’s fragmentation and waste problems. They are also more complex than the IT-related problems faced in other industries. Solutions will require sophisticated use of existing IT-related capabilities, as well as the development of new approaches.

While a robust HIT environment is necessary for PHC implementation, it is certainly not a panacea for success. Other hurdles, including those relating to policy, funding, education and ethics, must also be cleared. However, perhaps the first step is ensuring stakeholders have a clear understanding of PHC and its implications, followed by recognition that it must be a key part of the solution.

“Estimates suggest that as much as US$700 billion a year in healthcare costs do not improve health outcomes. It occurs because we pay for more care rather than better care. We need to be moving towards a system in which doctors and hospitals have incentives to provide the care that makes you better, rather than the care that just results in more tests and more days in [the] hospital.”

Peter Orszag, director of the White House Office of Management and Budget, during a National Public Radio interview

The need for PHC

Many healthcare systems today are not really “systems” at all. They are fragmented, resulting in poorly coordinated patient care and lack of accountability for overall costs and quality. It's estimated this fragmentation costs the United States US$25 to $50 billion annually. The accompanying lack of transparency into costs and quality makes it difficult to be an informed healthcare services consumer. The U.S. system further exacerbates these problems through a reimbursement system that rewards volumes of procedures, particularly major acute interventions, instead of value.

Many healthcare systems also suffer from tremendous waste (spending that can be eliminated without reducing the quality of care) resulting from clinical and administrative inefficiencies. In the United States, clinical waste includes factors such as inefficient, error-prone, labor-intensive processes (costing US$75 to $100 billion per year); duplicate diagnostic testing due to unavailability of results; and defensive medicine, coupled with high levels of fraud and abuse (estimated to be US$125 to $175 billion per year). And administrative inefficiencies are estimated to cost US$100 to $150 billion per year.

Again, these fragmentation and waste issues are at the heart of current U.S. health reform efforts (see Figure 1). However, this paper’s focus is on problems involving the science of health promotion and delivery, which receive far less attention. To achieve affordable, high-value healthcare that can appropriately tailor health promotion and care delivery to meet the needs of each individual – in other words, PHC – these inadequate science problems must be addressed in large part.