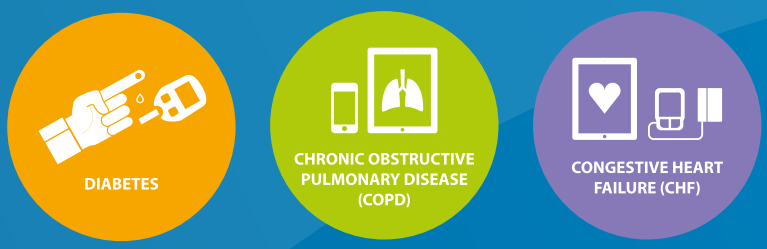
United4Health

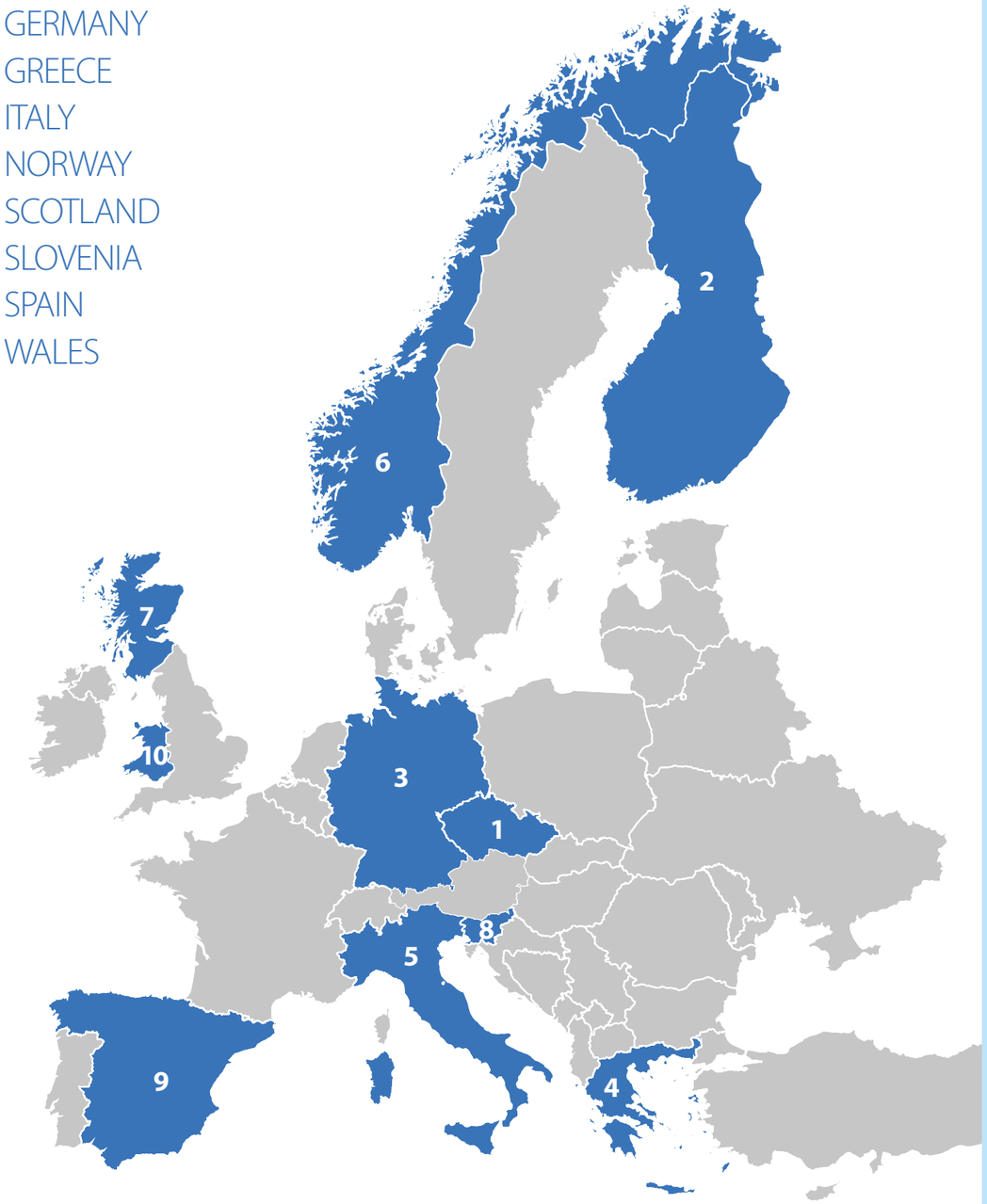
Telehealth in Practice

Care Delivery Models from 14 Regions in Europe



United4Health DEPLOYMENT SITES

1. CZECH REPUBLIC
2. FINLAND
3. GERMANY
4. GREECE
5. ITALY
6. NORWAY
7. SCOTLAND
8. SLOVENIA
9. SPAIN
10. WALES



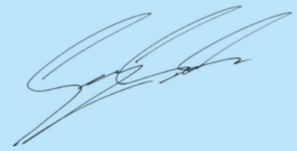
United4Health is a European large-scale deployment project that has successfully implemented and assessed the impact of innovative healthcare services for the remote monitoring of patients with chronic conditions.

The project has included 19 service models in 14 regions in 10 countries. The sites have deployed telemonitoring focused on managing and supporting patients with diabetes mellitus, chronic obstructive pulmonary disease, congestive heart failure or hypertension. The sites have procured any necessary technology, integrated it into their existing health care services and redesigned care pathways as necessary. The project has also undertaken a comprehensive evaluation examining different aspects of the deployment.

Telehealth, if designed and integrated into mainstream service provision can offer more accessible, equitable and sustainable services for the benefit of people in Europe. It does this in the face of considerable challenges to the sustainability of Europe's healthcare systems. In recent years, we have witnessed convergence between telehealth, mHealth, health analytics and electronic record systems in many United4Health deployment sites. This convergence will gather pace as healthcare systems are able to embrace "bring your own device" solutions and respond to the increasing realisation that telehealth is a critical component of the transformation of Europe's healthcare.

The United4Health project provides a unique insight into the challenges and opportunities that come from attempting to transform mainstream service delivery. For too long we have relied on small scale, stand-alone research orientated pilots to provide a template for telehealth delivery. This has not served Europe well. If we are serious about transformational change and scaling up the use of technology as a catalyst for person centred sustainable service delivery we need to learn the lessons from projects like United4Health and build on the knowledge base created by the project. This is the commitment already made by the deploying regions within United4Health.

The contents of this brochure describe and illustrate how each deployment site has embedded their telehealth technology solution into their care pathways and how the models of chronic conditions care management have been designed to improve the levels of self-management and enable more timely care and support to be provided by care practitioners.



Professor George Crooks,
Medical Director, NHS 24
Project Co-ordinator, United4Health

CONTENTS

Telehealth in Practice

Pflegewerk, Berlin, Germany - Chronic Obstructive Pulmonary Disease (COPD)

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Ambition

The overall aim for implementing telehealth into the care management programme for patients living with COPD who monitor their own or have help in monitoring their vital signs in the Berlin deployment site, is to reduce their risk of having an exacerbation of their COPD resulting in a hospital admission.

COPD **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
Patient, Carer, GP, Home-visiting nursing service, social support worker.

Level 3 : Specialist Supported Self-management
Patient, Carer, GP, Home-visiting nurses, Hospital specialists, Hospital social/case manager.

COPD **TELEHEALTH** ENABLED CARE MODEL

Level 1 : Self-management
Patient/carer trained in use of telehealth and self-management.

Level 2 : Supported Self-management
Shared telehealth monitoring information available to GP and home visiting nurse, Hospital based teams through EHR. Alert response, text messaging, health coaching provided.

Level 3 : Specialist Supported Self-management
Home-visiting nurses, GP, specialist services, Hospital-based teams have access to shared telehealth monitoring information. Alert response, text messaging, health coaching provided.

COPD Care Management – routine care
The provision of COPD services in Berlin comprises various settings. United4Health has included the Pflegewerk healthcare provider which delivers the COPD disease management programme (DMP) as part of its integrated care contract with health insurance companies. Some patients live in their own home or flat fully independently, take their measurements on their own and are visited by the nurse as needed (Green). Others live in their own home and are visited regularly, but still take the measurements independently (Green). Some patients involved in U4H lived in assisted living units that belong to Pflegewerk, where they are assisted to take measurements regularly (Amber), but they still conduct a fairly independent lifestyle, with community rooms where they eat, chat, play cards, watch TV and conduct social life all together. Those patients most in need live in nursing homes, where they are supervised 24/7 and nurses take the measurements and provide the necessary care (Amber).

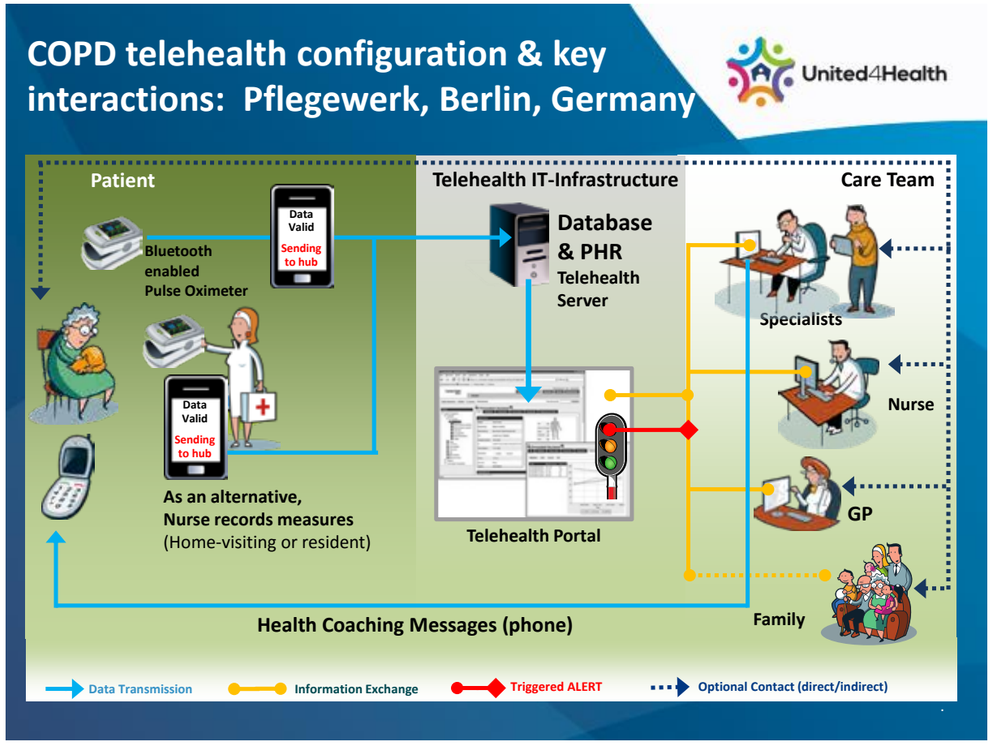
The DMP, following clinical practice guidelines published by various national and international COPD agencies, is delivered by a wide range of professionals including GPs, consultants, specialist COPD teams as well as other primary and secondary care professionals.

Pflegewerk are contracted to provide regular face-to-face visits to the patient's home by GPs or specialist doctors and nurses. During these visits, the patient's health and wellbeing is reviewed and their care plan and self-management plan adjusted accordingly.

Patients receive specialist COPD care when they attend the emergency department or have an emergency admission to hospital (Pink).

U4H Telehealth Enabled COPD Care Management
Berlin provides life-long monitoring services for patients living with COPD. Patients either take their own blood pressure and pulse, peak flow using a spirometer and blood oxygen with a pulse oximeter daily, are assisted in using their telehealth or have their measurements taken for them by a nurse. The system uses Bluetooth technology to transmit the readings to a Smartphone which then uploads the data to a central database as well as into the electronic Patient Health Record (PHR). The telehealth system generates alerts if measurements are outside the patient's personalised parameters and according to the service protocol. The alerts are sent to one or more people, such as doctor, care home nurse, family member, patient themselves, or other person explicitly authorised by the patient in order for appropriate action and/or response to be taken. These authorised members of the patient's care team can access the PHR to gain further information on the health status of the patient. Remote contacts with the patients are by telephone.

Pflegewerk have plans to integrate the telehealth data into the patient management software and the nationwide infrastructure, supporting eg electronic case records, in Germany.



Telehealth in Practice

Kristiansand, Southern Norway - COPD

wenche.tangene@sshf.no

Ambition

The aim of the telehealth service for patients living with COPD is to support self-management through the provison of an appropriate level of telemonitoring that is flexible and can respond with fluctuations in their health status and thus avoid future emergency hospital admissions due to a COPD exacerbation. In addition, telehealth is being considered as one possible solution which will help meet the challenge of a lack of medical staff within the healthcare system in Southern Norway.

COPD **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
Patient, Carer, GP Practice, Home-visiting nursing service from Municipality as appropriate.

Level 3 : Specialist Supported Self-management
Patient, Carer, GP electronic referral and discharge communication to GP and Municipal Assignment office if relevant, Hospital-based respiratory specialist doctors and nurses .

COPD **TELEHEALTH** ENABLED CARE MODEL

Level 1 : Self-management
Patient/carer trained in the use of telehealth and self-management.

Level 2 : Supported Self-management
GP has no access to the telehealth web portal but is notified of patients on telehealth.

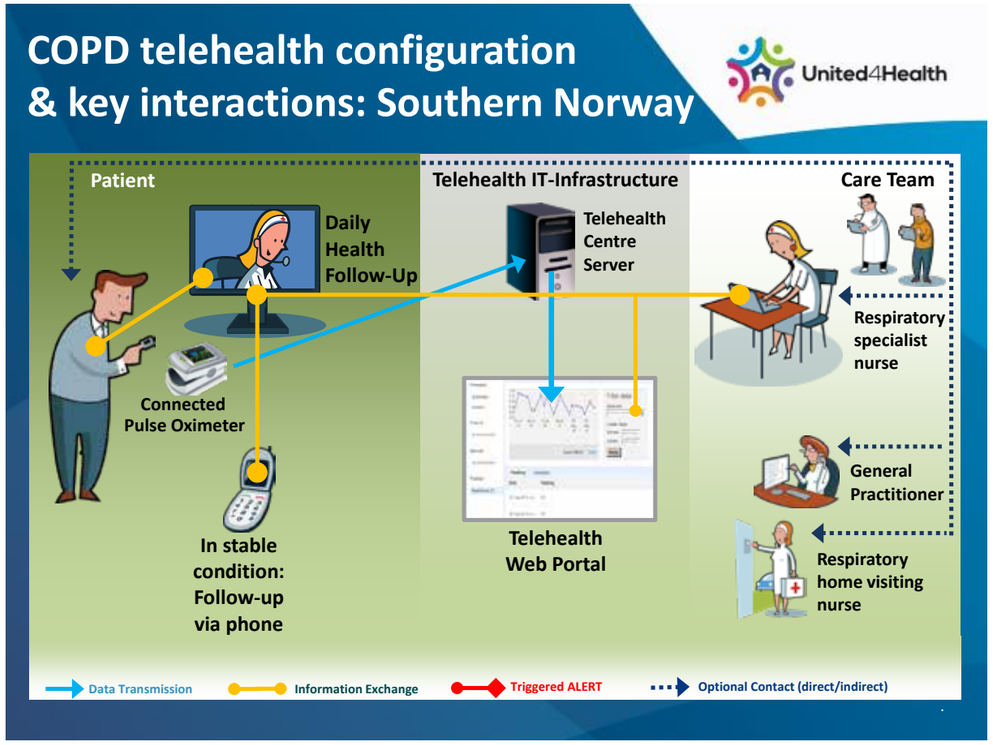
Level 3 : Specialist Supported Self-management
Telemedical Centre nurses who delivers care via VC, remote monitoring, alert response, telephone/text messaging. Hospital respiratory specialist and GP as necessary.

COPD Care Management – routine care
The diagnosis and treatment of COPD in secondary and primary care in Agder counties is delivered according to locally adapted guidelines on prevention, symptoms, diagnosis, treatment, rehabilitation and follow-up, and mostly adhering to the GOLD guidelines as published in 2013. This guidance offers all patients with COPD support for self-management (Green), single dose pneumonia vaccinations, flu vaccinations, inhaler technique instruction, spirometry, and quality of life assessment according to the CAT questionnaire, pulmonary rehabilitation, COPD educational self-management programmes, non-invasive ventilation, and home oxygen.

If a patient has an emergency admission to hospital they may be referred to the home healthcare service on discharge. In addition, they may need to be reviewed by their GP (Amber) and/or be followed-up in a hospital outpatient consultation with either a respiratory specialist nurse or doctor (Pink). If a patient's health and social care status indicates, they can be discharged to a short-stay nursing care institution in the municipality.

U4H Telehealth Enabled COPD Care Management
A member of the hospital specialist services team trains the patient in the use of the telehealth solution (tablet) before they are discharged following an exacerbation of their COPD. Each day for approximately 14 days post-discharge, the patient undertakes daily measurements of their oxygen saturation and pulse through a wireless oximeter and completes symptom questions (Green). The data is recorded on the tablet and uploaded via the secure Norwegian Health Network to one of three Telemedical Centrals which cover 30 municipalities. Once the data has been received, a nurse trained to respond to the COPD telehealth service has a video conference with the patient during which any changes to their care plan are discussed and agreed, involving the patient's GP or hospital specialist if necessary (Amber/Pink). After the initial high intensity period, the patient continues to measure their oxygen saturation and pulse and enter the results into their electronic personal journal held in the Norwegian Health Network, by answering simple questions for approximately another 14 days with the option of a video consultation with a nurse at the Telemedical Central if their condition deteriorates (Green/Amber/Pink).

When the patient has recovered from the initial exacerbation they will continue self-managing by recording their symptoms on paper and make telephone contact with a nurse at the Telemedical Central if they experience any worsening symptoms (Amber/Pink). The patient's GP is sent an electronic message from the Telemedical Central to inform that that they are on telehealth and the nurse may liaise with the GP following any patient contact as needed. During the U4H project GPs were unable to have access to the telemonitoring information. In the future GPs will be provided with access to the telehealth system.



Telehealth in Practice

Tromso, Norway - COPD

info@telemed.no

Ambition

United4Health offered the opportunity to provide better support to patients following discharge from an emergency hospital admission due to an exacerbation of their COPD. In addition, it was anticipated that the new service would reduce future admissions and enable the patient to have greater confidence in following their medication and treatment care plan agreed with their hospital clinicians.

COPD **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
Patient, Carer, GP Practice, Home-visiting nursing service from Municipality as appropriate.

Level 3 : Specialist Supported Self-management
Patient, Carer, GP electronic referral and discharge communication to GP and Municipal Assignment office if relevant, Hospital-based respiratory specialist doctors and nurses.

COPD **TELEHEALTH** ENABLED CARE MODEL

Level 1 : Self-management
Patient/carer stepped down from Amber level telehealth and self-management.

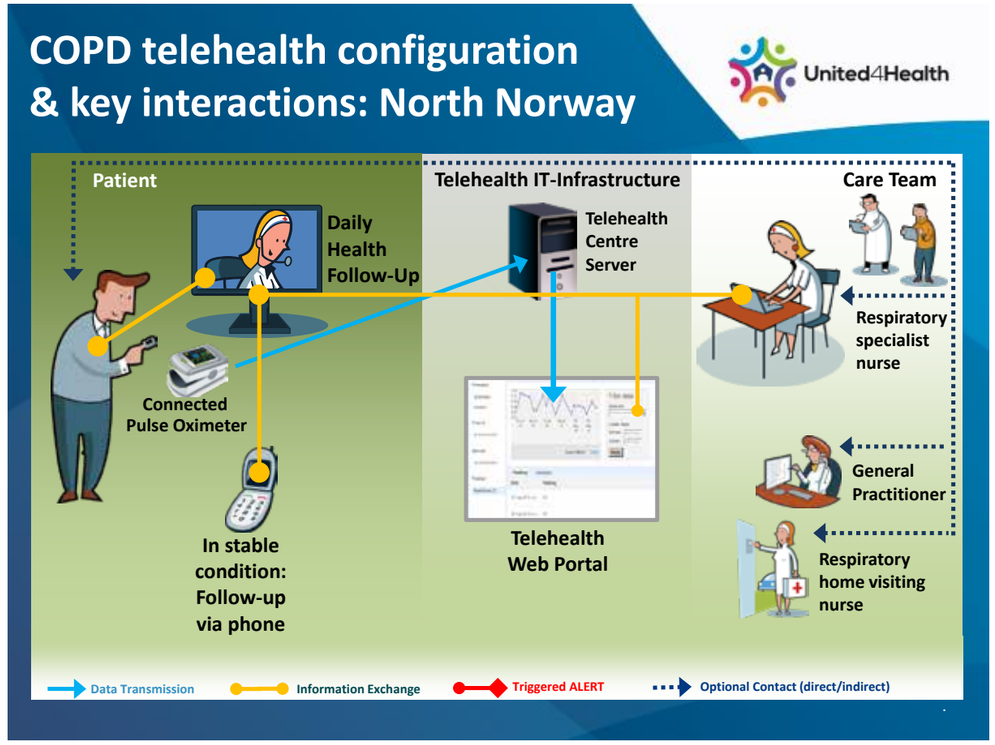
Level 2 : Supported Self-management
Municipality home-visiting nurse who gives telehealth training only to patient. GP or Municipality nurse has no access to the telehealth web portal.

Level 3 : Specialist Supported Self-management
Hospital respiratory specialist team including specialist home-visiting telehealth nurse who delivers care via VC, remote monitoring, alert response, telephone/text messaging.

COPD Care Management – routine care
Patients living with COPD are routinely managed by their GP and supported to self-manage (Green/Amber). If a patient has an emergency admission to hospital following an exacerbation of their COPD, they are admitted to the Lung Department (Pink). The patient's GP will provide an electronic referral containing patient-related information as well as whether the patient receives a Municipality home-nursing service. When a patient is discharged, their ongoing care is provided by their GP and Municipality home-nursing service if the patient is eligible (Green/Amber). Electronic discharge communication is sent to both the GP and Municipality, if relevant, providing in particular any revisions to their care plan including medication (Pink).

U4H Telehealth Enabled COPD Care Management
The telehealth service has been designed to provide specialist support to patients upon discharge from an emergency hospital admission following an exacerbation of their COPD (Pink). The telehealth service is provided in collaboration with the Municipality home-nursing service if appropriate. With the agreement of the hospital nurse and medical specialists, patients meeting the eligibility criteria are offered the telehealth service whilst an inpatient. The Municipal Assignment Office organises the telehealth and patient training immediately following the patient's discharge. In the hospital, the patient will be given their telehealth solution to take home in preparation for the visit by the COPD home-nursing service. Once the patient has been given telehealth training by the COPD home-nurse/technician, the patient undertakes their physiological measurements, uploads the data to the Telemedical Centre where a nurse reviews the data and initiates a video conference with the patient (Pink). The home-nurse only visits the patient after one initial visit to provide training on the telehealth device if they receive the home-nursing service as part of their care plan. Neither the patient's GP or home-visiting nurse has access to telemonitoring data. After the initial high intensity period, the patient continues to measure their oxygen saturation and pulse and enters the results into their personal journal by answering simple questions for approximately another 14 days with the option of a video conference with the COPD home-nursing service.

When the patient has recovered from their initial exacerbation they will continue self-managing by recording their symptoms on paper and make telephone contact with their COPD home-nurse (Green). If they experience any worsening systems they will be treated according to local standard protocols, eg GP appointments (Amber), emergency room attendance or hospital admission (Pink).



Telehealth in Practice

Ayrshire & Arran, Lanarkshire, and Greater Glasgow & Clyde Scottish local partnership areas - COPD

United4health@nhs24.scot.nhs.uk

Ambition

The aim for implementing telehealth into the care management for people living with COPD is to improve health outcomes through the appropriate use of telemonitoring combined with clinical input, enabling patients to achieve more effective self-care and self-management of their own condition, leading to earlier interventions and better co-ordination of care supporting the reduction of unnecessary and inappropriate reliance on hospital services caused by exacerbations.

COPD **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
Patient, Carer, GP, GP Nurse, Home-visiting nursing service, Therapists.

Level 3 : Specialist Supported Self-management
Patient, Carer, GP, Home-visiting specialist nurses, Hospital specialists.

COPD **TELEHEALTH** ENABLED CARE MODEL

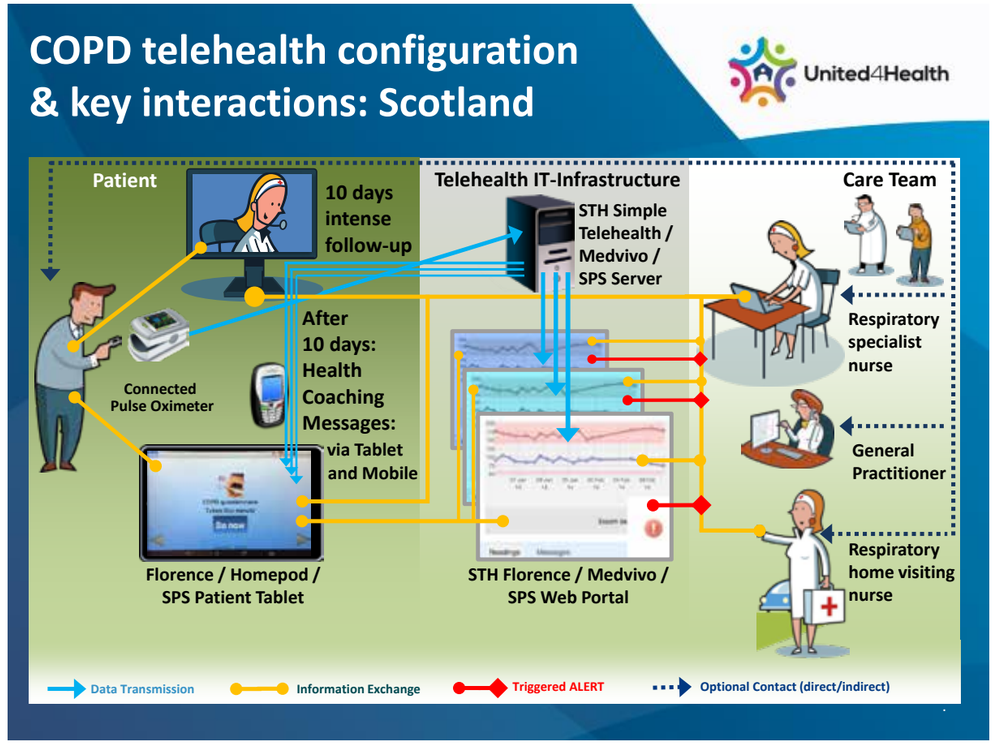
Level 1 : Self-management
Patient/carer trained in use of telehealth solution.

Level 2 : Supported Self-management
Telemonitoring information shared with GP, GP Nurse and Home-visiting nurse, Therapists. Routine GP-based disease management services (QOF).

Level 3 : Specialist Supported Self-management
Telemonitoring information shared with eHealth Centre and/or Specialist Home-visiting nurses, Therapists. Hospital-based specialist advice.

COPD Care Management – routine care
The routine care for patients with COPD living within Scotland takes place predominantly within primary care, unless there are exacerbations which require an A&E attendance and/or admission to hospital. Patients self-manage (Green) and have an annual review scheduled with a Practice Nurse within the GP practice (Amber). When a patient requires hospital admission (Pink) they may be seen by a respiratory specialist and their GP practice is sent a discharge notification which will include any changes in the patient's care plan and medication (Amber). Many patients will also be referred to a specialist respiratory nurse who works collaboratively with the patient's GP in caring and supporting the patient at home until their health status stabilises again. Treatment options and management of COPD in NHS Scotland is evidence based and places greater emphasis on reducing exacerbations, improving quality of life, early symptom management and supported self-management.

U4H Telehealth Enabled COPD Care Management
Patients were offered a telehealth service as an integrated part of their care plan either on discharge or shortly after an emergency hospital admission for a COPD exacerbation. Care pathways have been developed in each of the deployment sites, NHS Ayrshire and Arran, NHS Greater Glasgow & Clyde and NHS Lanarkshire. The telehealth care pathways provide three categories of telemonitoring with the most intensive service being provided by the specialist respiratory nurses or Advanced Nurse Practitioner (ANP) for up to 10 days post-discharge (Pink). During this initial period, patients take their physiological measurements and upload the data via the telehealth device and then receive a daily teleconsultation (usually by telephone) from their specialist nurse. Clinical alerts are forwarded directly by the telehealth system to their specialised nurse (decentralised model) or for one area, managed initially by a centralised triage service which operates through a local telehealth hub. The patient transitions, when clinically safe, to a moderate level of support and self-management education from a nominated clinical team member for up to 3 months (Amber/Pink). Their care plan is updated and telehealth measurement and alert parameters adjusted as appropriate. Following this period, patients can be offered the low level service which provides regular motivational health coaching messages and support for up to 12 months (Green). The patients will still have the annual review by a Practice Nurse and involvement of the GP, emergency room or hospital admission as required (Amber/Pink).



Telehealth in Practice

Galicia, Spain - COPD

europrojects.acis@sergas.es

Ambition

The aim of the telehealth service for patients living with COPD is to provide an alternative way support self-management through the provison of an appropriate level of telemonitoring that is flexible and can respond with fluctuations in their health status and thus avoid future emergency hospital admissions due to a COPD exacerbation.

COPD **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
Patient, Carer, GP, GP Nurse – including home-visiting if required. All have access to shared EHR .

Level 3 : Specialist Supported Self-management
Patient, Carer, Hospital specialists, Specialist Nurses. All have access to shared EHR.

COPD **TELEHEALTH** ENABLED CARE MODEL

Level 1 : Self-management
Patient/carer trained in use of telehealth and self-management.

Level 2 : Supported Self-management
Shared telehealth monitoring information available to GP and GP Nurse through EHR and they provide alert response, telephone, health coaching provided.

Level 3 : Specialist Supported Self-management
Shared telehealth monitoring information available to Hospital Specialists and Specialist Nurses through EHR and they enrol patients onto telehealth and provide advice as necessary to GP and GP Nurse.

COPD Care Management – routine care
Routine care for patients with COPD is undertaken by the patient themselves (Green) supported predominantly by their GP and GP nurse who also undertakes home visits in accordance with the patient's health status (Amber). Clinical information is recorded in the shared EHR. Following the GesEPOC guidelines published in 2013, patients are invited to have scheduled appointments to review their treatment and self-management plan. Patients are able to be referred to medical and nursing COPD specialists in the hospital if required (Pink).

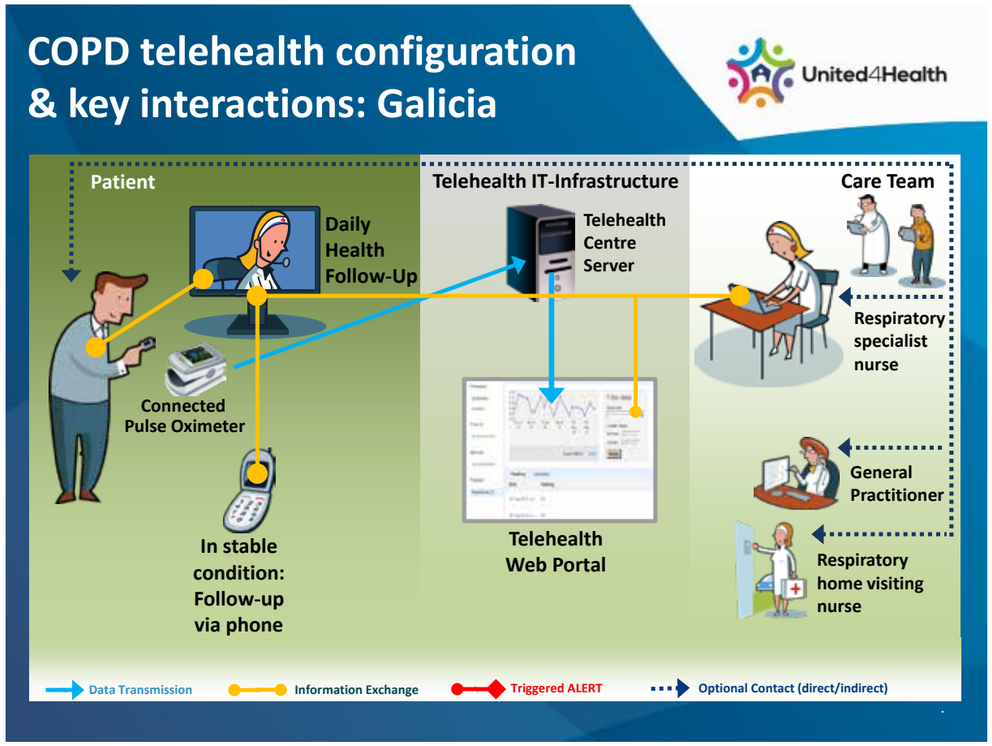
U4H Telehealth Enabled COPD Care Management
The telehealth service has been designed to help patients self manage (Green) and enhance the routine COPD care service model delivered by professionals working in primary care settings (Amber) by strengthening self-management with health coaching interventions and support.

Patients are enrolled into the telehealth service upon discharge from a hospitalisation following an exacerbation of their COPD and information is entered into the patient's EHR (Pink). The GP Nurse receives an appointment (day and time) notification through the EHR indicating that the patient is being discharged from hospital and requires the telehealth service. The Nurse emails a request to the telehealth provider (Enterprise) detailing the date and time of installation, patient details including physiological measurement parameters set by the hospital specialists. The patient receives the telehealth equipment and receives training from the Enterprise staff member.

The patient's telemonitoring information is received by the GP Nurse who makes the daily video call to the patient (HLTM) for up to 30 days dependent on the individual patient's health status. The GP Nurse also enters the telemonitoring information into the patient's shared EHR (Amber). The GP Nurse continues to receive the telemonitoring information on a daily basis (MLTM) and responds to any alerts and seeks advice from the GP and hospital specialists as required. Health coaching is provided via a video call for patients receiving the HLTM and MLTM service. The GP nurse reviews the patient's health status regularly and decides when the telemonitoring equipment can be removed from the patient's home for the patient to continue to self-manage, contacting the GP nurse by telephone if required. During any telephone consultation, the patient will be guided through the symptom management questionnaires (LLTM) for up to 12 months.

Any worsening systems will be treated according to local standard protocols, eg GP consultation or the patient can attend the emergency room following which they may be admitted. The GP can also refer the patient for a outpatient appointment with the hospital specialist. (Pink).

During the final phase of U4H, Galicia integrated the telemonitoring information automatically into the EHR which means telemonitoring is now one of the "prescriptions" available upon discharge.



Telehealth in Practice

Hywel Dda University Health Board, Wales - COPD

telehealth.hdd@wales.nhs.uk

Ambition

The aim of the telehealth service for patients living with COPD is to support self-management through the provison of an appropriate level of telemonitoring that is flexible and can respond with fluctuations in the patient's health status and thus avoid future emergency hospital admissions due to a COPD exacerbation.

COPD **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
Patient, Carer, GP, GP Nurse, Home-visiting nursing service.

Level 3 : Specialist Supported Self-management
Patient, Carer, GP, Home-visiting specialist nurses, Hospital specialists.

COPD **TELEHEALTH** ENABLED CARE MODEL

Level 1 : Self-management
Patient/carer trained in use of telehealth solution.

Level 2 : Supported Self-management
Telemonitoring information shared with Specialist home-visiting nurse who responds to alerts via SMS or telephone. GP, GP Nurse and Home-visiting nurse, Therapists can also have access to data. Routine GP-based disease management services (QOF).

Level 3 : Specialist Supported Self-management
Telemonitoring information shared with Specialist home-visiting nurses, and available to specialist services and Hospital-based teams.

COPD Care Management – routine care
Patients with COPD who are admitted to hospital due to an exacerbation of their COPD are usually referred to the specialist home-visiting nursing service on discharge. The nurse, together with the patient's GP, provide ongoing post-exacerbation care and support (Amber/Pink) designed to enable the patient's symptoms to stabilise and for them to self-manage (Green). Depending on the severity of patient's COPD, 'stable' patients will be discharged from the specialist home-visiting nursing service and return to having their COPD care management from their GP and GP nurse. Routine care for all patients with COPD includes the offer of annual flu vaccinations, single dose pneumonia vaccinations, appropriate inhalers, spirometry, and MRC score review, pulmonary rehabilitation, COPD Educational Programme for Patients, non-invasive ventilation, home oxygen and palliation according to the severity of their disease.

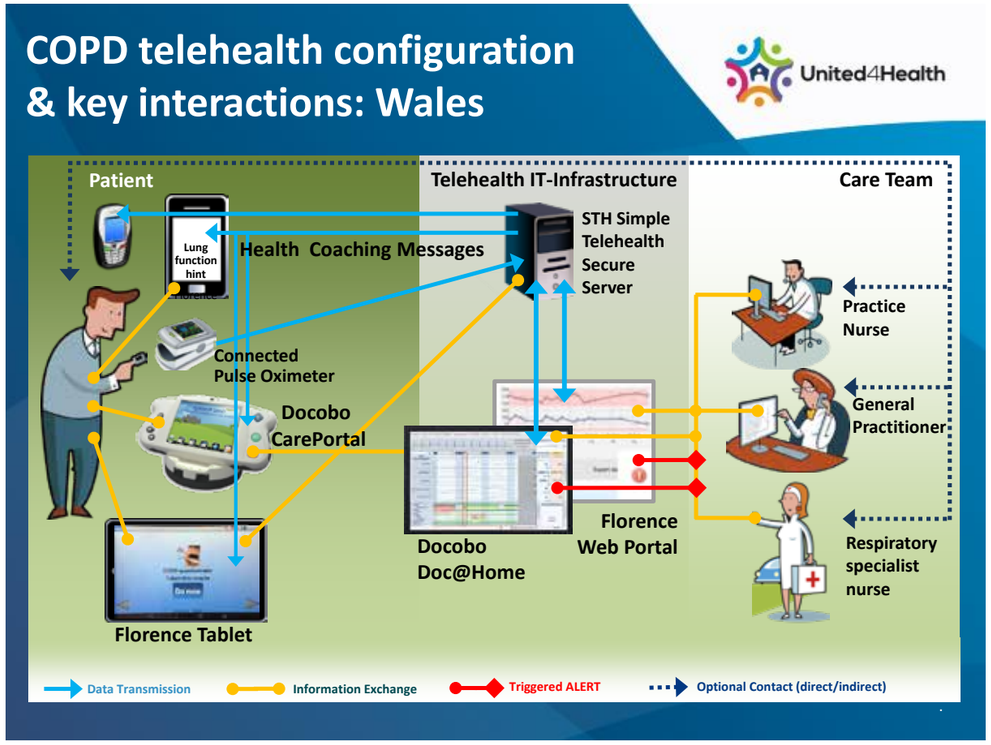
Patients are able to be referred to medical and nursing COPD specialists in the hospital and/or community services if required (Pink).

U4H Telehealth Enabled COPD Care Management
Patients living with COPD enrolled into U4H project received either the Florence (NHS developed Simple Telehealth www.getflorence.co.uk), GPRS software system or the Docobo landline system (www.docobo.co.uk).
A patient or their carer performs the blood oximetry, temperature and symptom questions daily. The oximetry and temperature recordings are sent to the hub either via Bluetooth (Florence) or by wired connection (Docobo), and transferred to a computerised decision tree. The symptom questions are responded to manually by the patient, and answers are entered, either by the patient or their carer via Flo/Docobo (Green). For the first 7-10 days patients also received a daily telephone call from their specialist home-visiting nurse (Pink). (A video conference was unable to be performed due to the lack of reliable broadband and 3G coverage).

The patient continues to take their vital signs and symptom questions for at least 30 days after commencing the telehealth service up to a maximum of 3 months (Amber). Florence responds to the symptom question data according to an individualised set of parameters, and provides instant feedback to the patient via their computer tablet along with locally agreed advice messages every three days. The Docobo did not provide feedback direct to the patient. Alerts are sent to the patient's key healthcare professional if readings and responses are outside the patient's personalised parameters. The professional will contact the patient either by SMS or telephone (Pink).

After recovery from the initial exacerbation, patients are transferred on to the low intensity telemonitoring service and receive advice and motivational messages every three days (Green).

Healthcare professionals can access the results uploaded to Flo and Docobo, via a secure internet connection, at any time.



Telehealth in Practice

Northwest Moravia, Czech Republic - Congestive Heart Failure (CHF)

info@ntmc.cz

Ambition

The overall aim for implementing telehealth into the care management programme for patients living with congestive heart disease is to support and improve the individual patient's endeavours to self-manage and lead a lifestyle to reduce their risk of exacerbation and improve their quality of life.

CHF **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
GP practice not funded to provide CHF disease management.

Level 3 : Specialist Supported Self-management
Patient, Carer, Hospital Cardiologists and Specialist Nurses.

CHF **TELEHEALTH** ENABLED CARE MODEL

Level 1 : Self-management
Patient/carer trained in use of telehealth by eHealth technician and self-management.

Level 2 : Supported Self-management
GP practices have no access to the telemonitoring information.

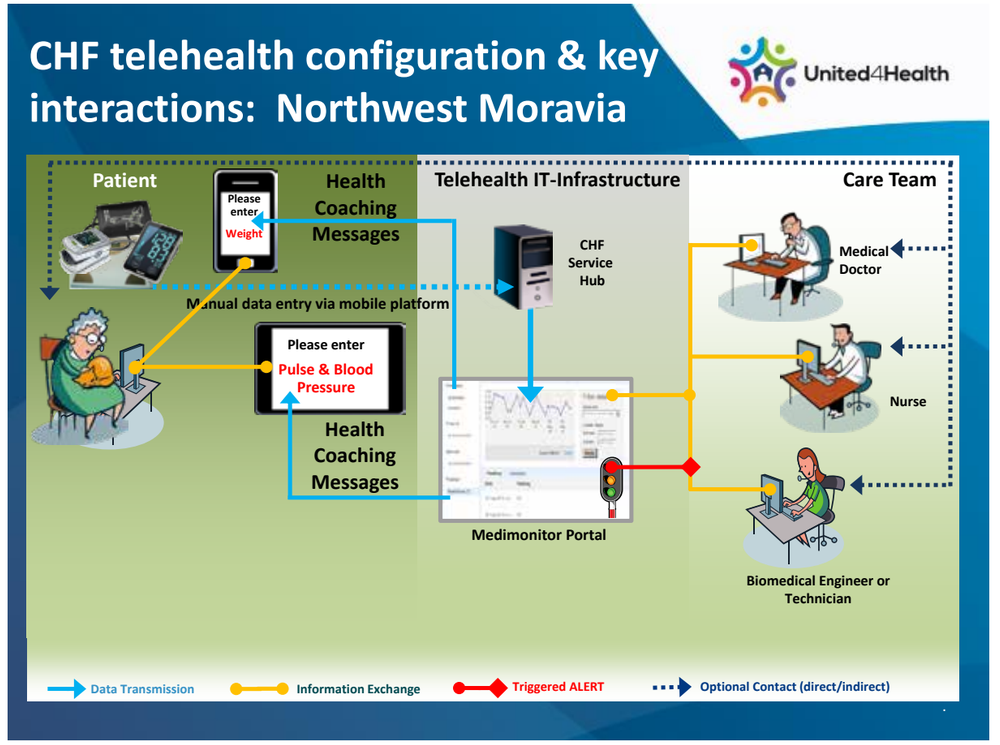
Level 3 : Specialist Supported Self-management
Hospital-based specialist teams have access to shared telehealth monitoring information. Alert response via text messaging, email, telephone.

CHF Care Management – routine care
The routine care for patients living with CHF takes place at the University Hospital Olomouc and follows the Czech Society of Cardiology Guidelines for the diagnosis and treatment of chronic heart failure. Patients self-manage (Green) and have scheduled outpatient consultations in accordance with their ongoing health status and disease progression although most patients are seen every 3 months by the hospital specialists (Pink) in order to review their physiological measurements, and make any adjustments to their medication and treatment. GPs are not funded to provide CHF care management (Amber).

U4H Telehealth Enabled CHF Care Management
Patients are provided with a smartphone or tablet, blood pressure meter, pulse oximeter and weight scales and are given training to use software application called Medimonitor on the smartphone (Green). The smartphone or tablet acts as a gateway to upload the vital signs readings daily to the telemonitoring centre located in the hospital's Cardiology Clinic. Doctors, specialist nurses and biomedical engineers are able to access the telehealth portal with collected data via internet using a web browser with secure login (Pink). The Medimonitor system generates alerts in response to:

- A patient's vital signs readings are outside their threshold parameters. Patients will be contacted by a specialist nurse who will assess the severity of the situation. If the patient's treatment and self-management plan needs adjusting, the cardiologist will contact the patient to make the necessary adjustments and/or invite the patient to attend an unscheduled outpatient appointment.
- If there is missing or incomplete measurement uploads twice in a row – either a biomedical engineer or nurse will contact the patient by telephone, SMS or Medimonitor message and provide additional training in the use of the smartphone or tablet if required.

The scheduled outpatient consultations are enhanced through the availability of the telemonitoring information which is also able to be accessed by hospital specialists in a patient's symptoms worsen and they are admitted to hospital. The system can also receive data from INR measurements (anticoagulation therapy) using the Medimonitor if required as part of the patient's care management.



Telehealth in Practice

Ayrshire & Arran, Lanarkshire, and Greater Glasgow & Clyde Scottish local partnership areas - CHF

United4health@nhs24.scot.nhs.uk

Ambition

The aim of the telehealth service for people living with CHF in Scotland is to support the treatment and management of CHF by enabling earlier detection of deterioration allowing timely intervention, better care co-ordination, fostering increased patient self-management and preventing unplanned crisis episodes requiring hospital admission or readmission.

CHF **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
Patient, Carer, GP, Home-visiting nursing service, therapists.

Level 3 : Specialist Supported Self-management
Patient, Carer, GP, Home-visiting nurses, Hospital specialists.

CHF **TELEHEALTH** ENABLED CARE MODEL

Level 1 : Self-management
Patient/carer trained in use of telehealth and self-management.

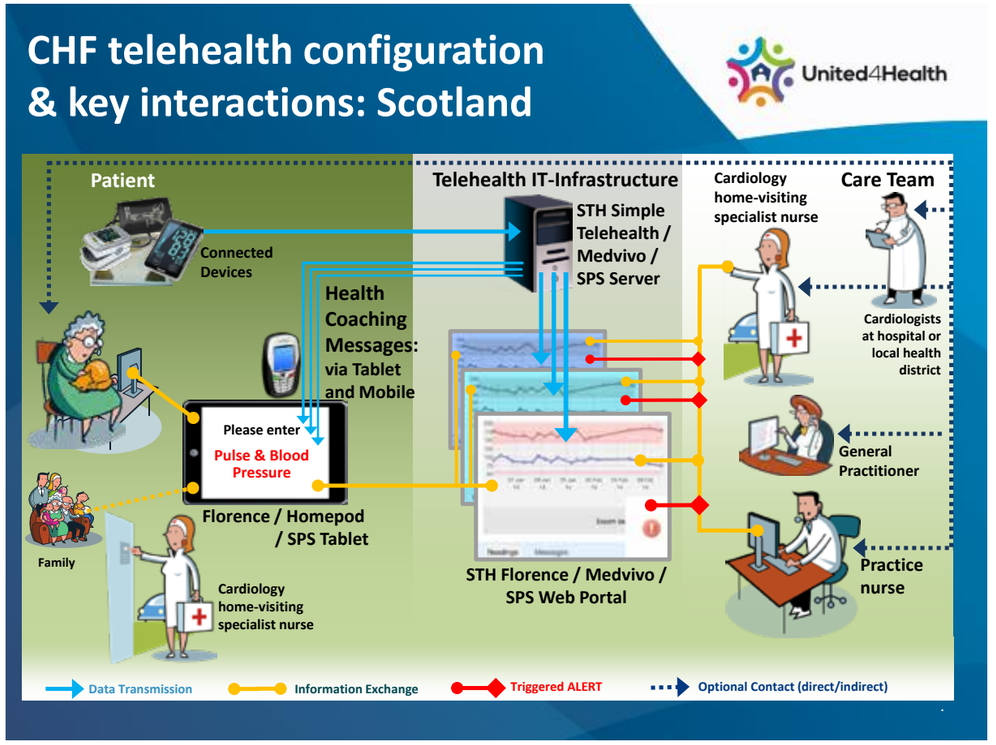
Level 2 : Supported Self-management
Shared telehealth monitoring information available to GP and home visiting nurse, Hospital based teams through EHR. Alert response, text messaging, health coaching provided.

Level 3 : Specialist Supported Self-management
Home-visiting nurses, GP, specialist services, Hospital-based teams have access to shared telehealth monitoring information. Alert response, text messaging, health coaching provided.

CHF Care Management – routine care
The routine care for patients living with CHF is provided by specialist nurses working as a key intermediary between patients and other healthcare practitioners including cardiologists in secondary care and staff in GP practices. Patients are reviewed and assessed by specialist Heart Failure (HF) nurses in a variety of settings: outpatient clinics, community clinics, and in their homes to detect early clinical deterioration or offer additional support post hospital discharge. (Amber). Patients undertake daily weight monitoring and report any increase (Green) to their main healthcare practitioner. If a patient requires hospitalisation, they will be referred to a home-visiting HF nurse who will visit the patient at home within a week of being discharged. One month after discharge patients are offered an outpatient consultation with the hospital cardiac team. Patients and families are encouraged to make contact in the event of problems or changes in their condition by telephone, eg to specialist HF nurse. Subsequent visits and contacts are determined by individual patient needs. The specialist nurses implement agreed care plan protocols, including any prescription changes, in liaison with the Cardiologist and information is sent directly to the GP (Amber/Pink). Most specialist HF nurses also offer facilitation of self-management to practice nurses and GPs.

U4H Telehealth Enabled CHF Care Management
Patients are offered a telehealth service as an integrated part of their care plan either on discharge or shortly after an emergency hospital admission for a crisis episode. Care pathways have been developed in each of the deployment sites - NHS Ayrshire and Arran, NHS Greater Glasgow & Clyde and NHS Lanarkshire. The telehealth care pathways provide telemonitoring which is co-ordinated by the specialist CHF nursing teams based within the community services or on an outreach basis from hospital cardia departments. For one site, installation and referral co-ordination is supported by a Telehealth Hub (contact centre).

Patients are provided with a monitoring device and peripherals (weighing scales, blood pressure cuff) within 24 hours of discharge. The device is installed and training provided by the nursing or Telehealth Team alongside education in self-management principles. The physiological measurements taken by the patient (Green) are uploaded via the telehealth device and made available to the CHF nursing team who review the measurements against set individual clinical parameters and make any necessary changes to the patient's medication or care plan. Depending on the status of the readings, the patient can receive a teleconsultation (usually by telephone) from their specialist nurse who, if required, will arrange an urgent outpatient appointment or home visit. Throughout the monitoring period, patients using SMS devices will receive motivational health and wellbeing coaching messages from the HF team. (Green). Across all sites, patients continue to provide data uploads for initially up to 6 months or until their CHF is stable after which care management is co-ordinated by the GP practice or practice nurses. Patients continue to have outpatient appointments as required with their Cardiologist or GP, A/E or hospital admission as required. (Amber/Pink).



Telehealth in Practice

Ljubljana, Slovenia - CHF

info@mks.si

Ambition

The aim of the telehealth service for patients living with CHF is to promote self-management and enable bi-directional communication, as required, between the patient and specialist more frequently than the routine care periodic follow-up schedule. In addition, the service has been designed to enhance the level of care provided and improve clinical outcomes, quality of life and be cost effective.

CHF **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
Patient, Carer, GP, GP Nurse, Home-visiting nursing service.

Level 3 : Specialist Supported Self-management
Patient, Carer, Home-visiting nurses, Hospital specialists in Outpatient Clinic.

CHF **TELEHEALTH** ENABLED CARE MODEL

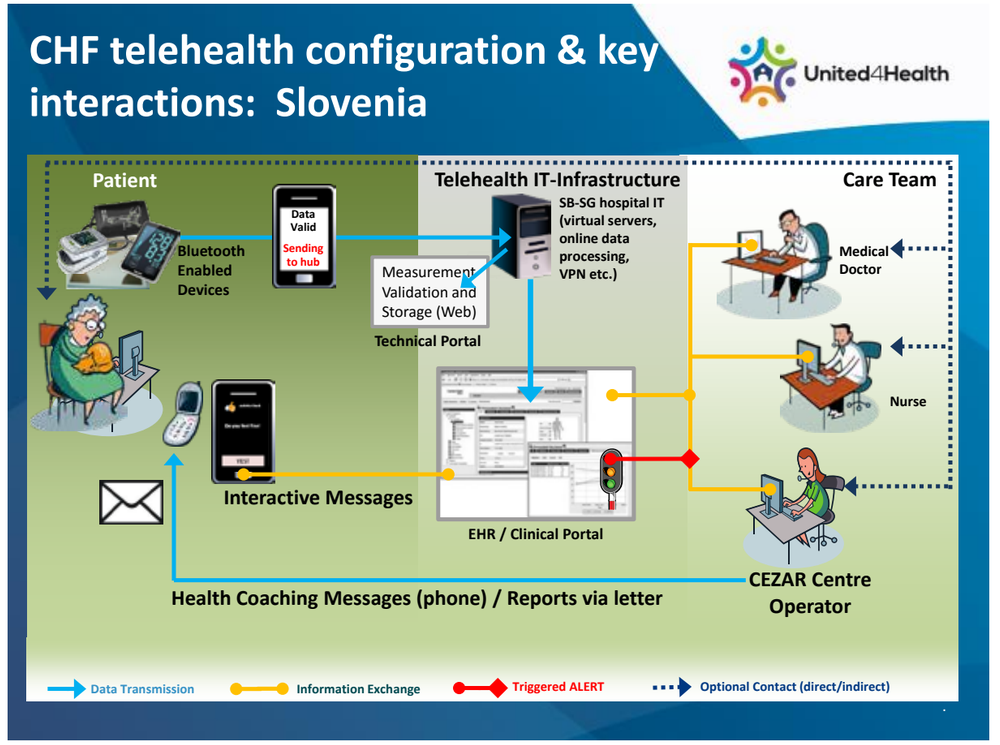
Level 1 : Self-management
Patient/carer trained in use of telehealth and self-management.

Level 2 : Supported Self-management
GP, GP nurse and home-visiting nurse do not have access to telemonitoring information. eHealth Co-ordinator communicates by phone with GP and home-visiting nurse.

Level 3 : Specialist Supported Self-management
Telemonitoring information shared with eHealth Centre specialist nurse/ Co-ordinator, Hospital cardiologist. Alert response by telephone, SMS, email. Specialist routine CHF care management.

CHF Care Management – routine care
Patients with CHF implement their self-management plan (Green) and have regular (6 monthly if stable) specialist consultations in hospital outpatient clinics and health centres in the Koroška region (Amber/Pink). Routine care management aims to achieve personalised goals in relation to their blood pressure, weight and blood oxygen levels. Patients enter their measurements in a booklet, the information in which is reviewed by the specialist at regular scheduled consultations. All patients are given personalised advice in relation to their diet according to their blood pressure and weight. If their physiological measurements are not well controlled (Amber/Pink) they are reviewed in the hospital outpatient clinic or regional health centre more regularly than every 6 months.

U4H Telehealth Enabled CHF Care Management
The telehealth service is provided by the Telemedicine Service Centre CEZAR from the Slovenj Gradec regional hospital. Using physiological measurement devices (blood pressure meter, pulse oximeter, weight scales), patients take their measurements daily at home. The readings are transmitted over Bluetooth to a Smartphone provided by U4H and subsequently uploaded to the CEZAR Centre at the hospital (Green). An alert is generated when, according to the clinical protocol, the telehealth system detects that one or more reading is outside the patient's set parameters. In such case, an eHealth coordinator from the CEZAR centre contacts the patient by phone to check the data upload (Pink). If the data is correct, the coordinator contacts a hospital cardiac specialist seeking advice on further action, eg change in therapy or unscheduled hospital consultation. Any changes are communicated to the patient by phone followed up by a paper report sent by postal mail. The coordinator may need to communicate with the patient's GP and/ or home-visiting nurse if there are changes, for example, to the patient's medication regime (Amber). In addition, cardiologists and specialist nurses periodically review all patients on telehealth to determine whether any changes to their care and self-management plan is required and if this is the case, a paper report is once again, sent to the patient.



Telehealth in Practice

The Basque Country, Spain - CHF

Kronikgune@kronikgune.org

Ambition

The aim of the telehealth service for patients living with CHF is to support and improve levels of self-management and achieve equally good clinical outcomes as routine care, particularly in relation to body weight, blood pressure and cholesterol, quality of life and cost-effectiveness.

CHF **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
Patient, Carer, GP, GP Practice Nurse (home visits if necessary).

Level 3 : Specialist Supported Self-management
Patient, Carer, GP,GP practice nurse (home visits if necessary), hospital cardiologist, hospital nurse.

CHF **TELEHEALTH** ENABLED CARE MODEL

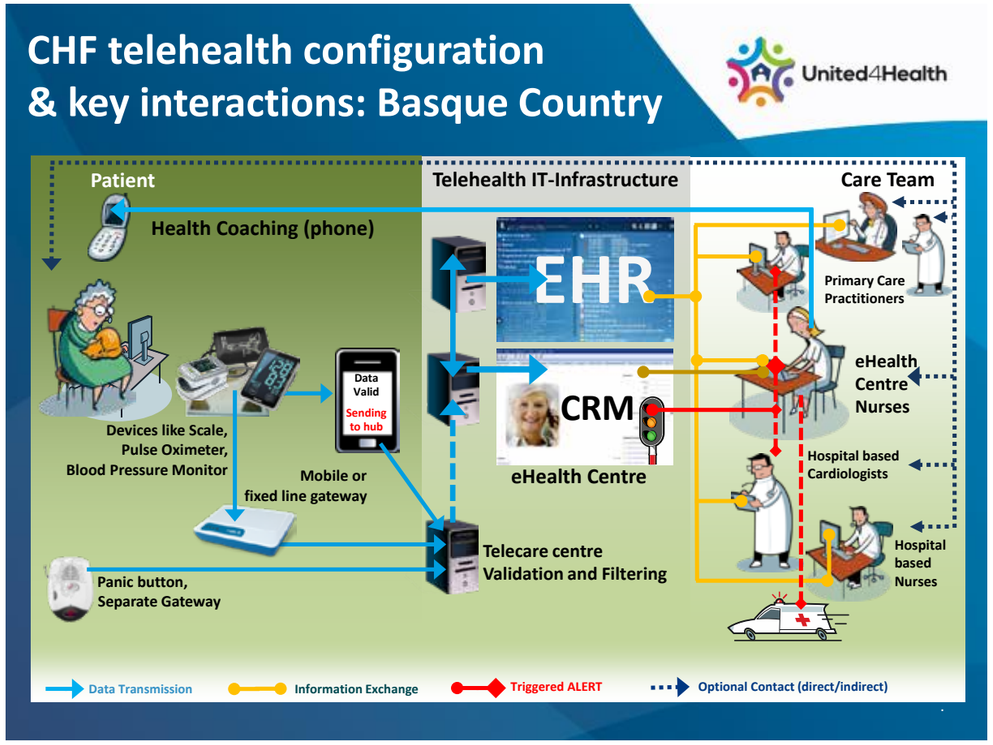
Level 1 : Self-management
Patient/carer trained in use of telehealth and self-management.

Level 2 : Supported Self-management
GP, GP practice nurse (home visits if necessary), eHealth centre, Telecare centre. All healthcare professionals access telehealth monitoring information. Alarm management, health coaching provided.

Level 3 : Specialist Supported Self-management
GP, GP practice nurse (home visits if necessary), cardiologists, hospital nurse, eHealth centre, Telecare centre. All healthcare professional access telehealth monitoring information. Alarm management, health coaching provided.

CHF Care Management – routine care
Patients with CHF in The Basque Country have their CHF care management regularly reviewed and are supported to self-manage by the primary care nurses (Green and Amber). Between 48-72 hours after discharge following a hospital admission, a patient is contacted by telephone by a nurse from the eHealth centre. The nurse will ask structured, validated questions to elicit up-to-date information on the patient's health status and how they are coping. The nurse will decide on the appropriate next steps in line with answers given by the patient. These options for further care, support, and/or treatment include the patient being seen by the GP or GP nurse in the health centre within 24-48 hours, 48-72 hours or a week later depending on the severity of the patient's health status. During the consultation the GP and/or the GP nurse will assess the patient and determine whether any further tests and investigations are required as well as agree appropriate self-management and patient empowerment support. One month after hospital discharge, the patient will be offered an outpatient consultation with the Cardiologist in the health centre (Pink). A medication review will be undertaken, together with any additional laboratory tests and ECG. Once the patient's condition has stabilised again, they will be reviwed by the GP and GP nurse on a six-monthly and three-monthly basis respectively (Amber).

U4H Telehealth Enabled CHF Care Management
A patient will follow the routine care model until their telehealth solution has been installed and training given by the Telecare Centre. This period usually covers 5-10 days post discharge. Once a patient has commenced transmitting their physiological measurements, a Cardiologist reviews the data uploaded and adjusts their care plan and medication regime as necessary. During ongoing telemonitoring (Green), an operator from the Telecare Centre monitors the data uploads and if any alerts are generated as a result of readings being outside the patient's parameters, the patient is contacted to verify the uploaded data. If the alerts are corroborated and the patient's health status has worsened, the call is transferred to a nurse at the eHealth Centre (Amber). Depending on the severity of the situation, the nurse will follow the clinical protocol and take the necessary action which could involve scheduling an appointment with the patient's GP (face-to-face or phone consultation), referral for a specialist appointment (face-to-face or phone consultation), or activate an ambulance for transfer to the emergency room. The Cardiologist will also continue to regularly review the telemonitoring data until the patient (Pink) is considered stable and then responsibility for ongoing CHF care management and proactive follow-up is transferred to the GP and GP nurse. If the GP or GP nurse has any cause for concern in relation to the patient's CHF health and wellbeing, they will contact the patient, re-assess the care and self-management plan and revise as necessary.



Telehealth in Practice

Northwest Moravia, Czech Republic - DIABETES

info@ntmc.cz

Ambition

The overall aim for implementing telehealth into the care management programme for patients living with Type 2 diabetes who monitor their blood glucose levels, is to support and improve the individual patient's endeavours to self-manage and lead a lifestyle to reduce their risk of developing diabetes-related complications through new treatment pathways.

DIABETES **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
GP practices are not funded to provide diabetes care management.

Level 3 : Specialist Supported Self-management
Patient, Carer, Hospital Diabetologist and Specialist Nurses.

DIABETES **TELEHEALTH** ENABLED CARE MODEL

Level 1 : Self-management
Patient/carer trained in use of telehealth and self-management.

Level 2 : Supported Self-management
Telemonitoring information not accessible by GP.

Level 3 : Specialist Supported Self-management
Telemonitoring information available to Hospital Specialists to provide alert response, SMS, telephone, email and health coaching messages. Telemonitoring data available to enhance hospital outpatient appointments.

Diabetes Care Management - routine care
The routine care for patients living with Type 2 diabetes takes place at the University Hospital Olomouc and follows the Czech Diabetes Society Guidelines on diabetes mellitus Type 2 treatments. Patients self-manage (Green) and have scheduled outpatient consultations in accordance with their ongoing health status and disease progression although most patients are seen every 3 months by the hospital specialists (Pink) in order to review their blood glucose measurements that can be provided via their diary, patient's glucometer memory and any HbA1c laboratory tests. GPs are not funded to provide diabetes care management (Amber).

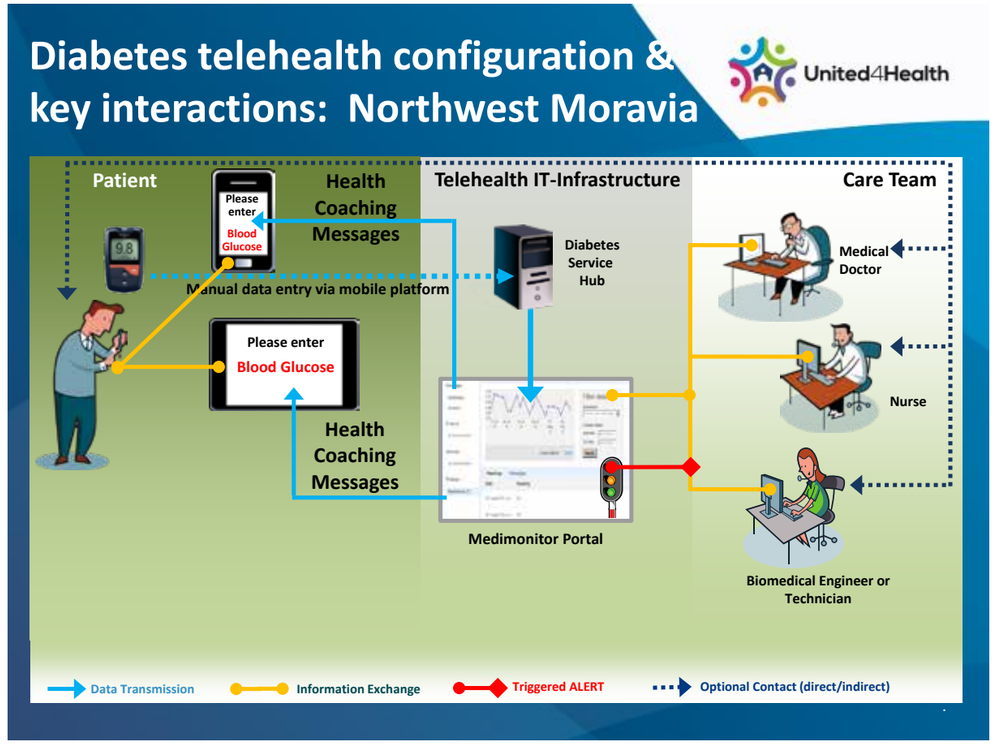
U4H Telehealth Enabled Diabetes Care Management
Patients are provided with a smartphone or tablet, glucometer and test strips and are given training to use software application called Medimonitor (Green).

The smartphone or tablet acts as a gateway to upload vital signs including blood glucose readings according to their individualised self-management plan, to the telemonitoring centre located in the hospital's Cardiology Clinic. Doctors, specialist nurses and biomedical engineers are able to access the telehealth portal with collected data via internet using a web browser with secure login (Pink).

The Medimonitor system generates alerts in response to:

- A patient's vital signs readings are outside their threshold parameters. Patients will be contacted by a specialist nurse who will assess the severity of the situation. If the patient's treatment and self-management plan needs adjusting, the diabetologist will contact the patient to make the necessary adjustments and/or invite the patient to attend an unscheduled outpatient appointment.
- If there is missing or incomplete measurement uploads twice in a row – either a biomedical engineer or nurse will contact the patient by telephone, SMS or Medimonitor message and provide additional training in the use of the smartphone or tablet if required.

The scheduled outpatient consultations are enhanced through the availability of the telemonitoring information which is also able to be accessed by hospital specialists in a patient's symptoms worsen and they are admitted to hospital.



Telehealth in Practice

South Karelia, Finland - DIABETES

Mira.Pakanen@eksote.fi

Ambition

The overall aim for implementing telehealth into the care management programme for patients living with Type 2 diabetes who monitor their blood glucose levels, is to help patients self manage and to reduce their risk of developing diabetes-related complications. South Karelia is also assessing whether patients who effectively self-manage using the telemonitoring service require the same routine diabetes clinic follow-up twice yearly regime as patients who do not telemonitor.

DIABETES **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
Patient, Carer, GP, GP Nurse, local diabetes clinics.

Level 3 : Specialist Supported Self-management
Patient, Carer, Hospital Specialists.

DIABETES **TELEHEALTH** ENABLED CARE MODEL

Level 1 : Self-management
Patient/carer trained in use of PHR, telehealth and self-management.

Level 2 : Supported Self-management
Telemonitoring data available in eHealth portal/ PHR accessed by eHealth centre nurses, GP and local diabetes clinic specialists. Secure messaging and telephone between patient and eHealth centre nurses, GP, local diabetes clinic.

Level 3 : Specialist Supported Self-management
Hospital attendance/admission specialists have access to eHealth portal/PHR/secure messages.

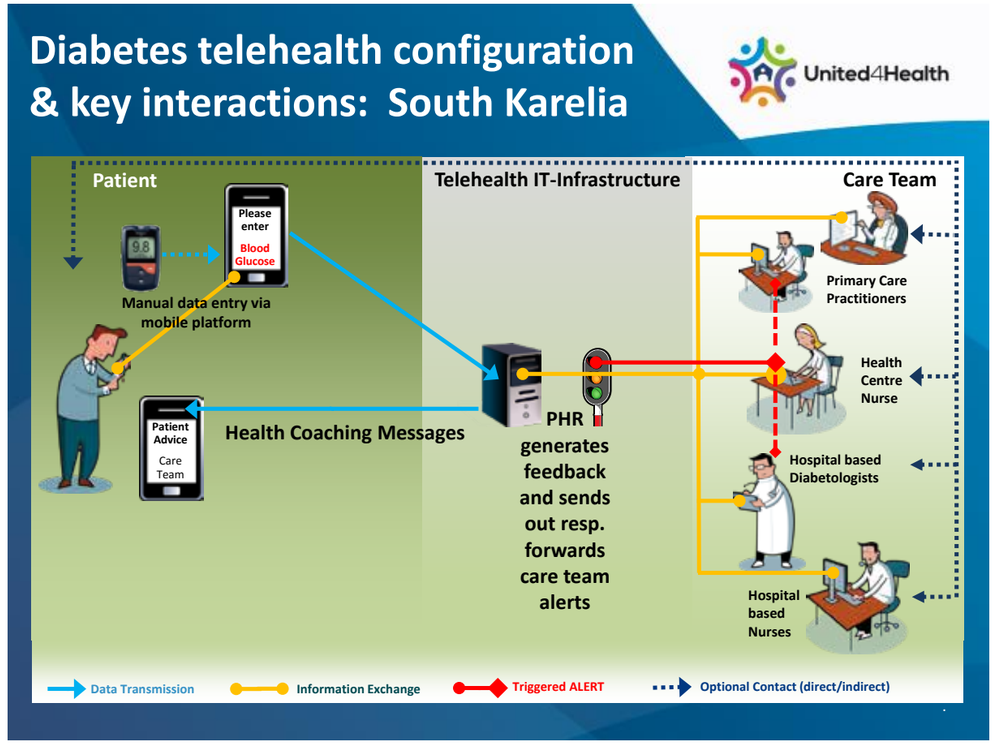
Diabetes Care Management - routine care
When patients are first diagnosed with diabetes their GP and GP nurse provide their care management and education about diabetes in order for the patient to be able to carry out effective self-management (Green) and update their Diabetes Record book regularly. Patients have two follow-up face-to-face appointments with GP nurse or diabetes specialist nurse, each year to review their diabetes care and adjust their treatment if necessary (Amber). Patients whose diabetes is not well controlled are also able to be reviewed by their GP at these clinic appointments. Hospital specialists are not involved in the management of patients with Type 2 diabetes unless they have a hospital admission (Pink). There is a shared electronic health record (EHR) which contains all the healthcare information for an individual patient irrespective of whether the care takes place in a hospital or GP practice.

U4H Telehealth Enabled Diabetes Care Management
The telehealth service has been designed to help patients self manage (Green) and enable them to seek remote advice from their diabetes care team (Amber).

Patients take and enter their blood glucose levels in accordance with their self-management plan into their Personal Health Record (PHR) which is part of the eHealth portal (www.hyvis.fi). If their readings are outside the agreed parameters or they are experiencing a worsening in their symptoms, patients can message their diabetes care team through the secure messaging function within the eHealth portal. The GP Nurse or diabetes specialist nurse is able to respond to the patient's message through the eHealth portal and provide them with any necessary health coaching information. The diabetes specialist nurse is also able to seek advice from a GP through the secure messaging function if required. Clinicians gain access to the eHealth portal through the use of their smart card and patients use their bank authentication device and logon details.

When a patient attends the diabetes clinic twice a year, their telemonitoring information and any secure messages are available to enhance the information exchange during the review consultation.

If a patient attends the emergency room or has a hospital admission, the telemonitoring information is available to the hospital specialists through the eHealth portal (Pink).



Telehealth in Practice

Pflegewerk, Berlin, Germany - DIABETES

eu-projekt@medinet-berlin.de

Ambition

The overall aim for implementing telehealth into the care management programme for patients living with Type 2 diabetes who monitor their own or have help in monitoring their blood glucose levels in the Berlin deployment site, is to reduce their risk of developing diabetes-related complications and improve self-management where appropriate.

DIABETES **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
Patient, Carer, GP, Home-visiting Nursing Service, Social Support Worker

Level 3 : Specialist Supported Self-management
Patient, Carer, GP, Home-visiting Nurses, Hospital Specialists, Hospital Social/ Case Manager

DIABETES **TELEHEALTH** ENABLED CARE MODEL

Level 1 : Self-management
Patient/carer trained in use of telehealth and self-management.

Level 2 : Supported Self-management
Shared telehealth monitoring information available to GP and Home Visiting Nurse, Hospital based teams through the Pflegewerk EHR. Alert response, text messaging, health coaching provided.

Level 3 : Specialist Supported Self-management
Home-visiting Nurses, GP, Specialist Services, Hospital-based Teams have access to shared telehealth monitoring information.
Alert response, text messaging health coaching provided.

Diabetes Care Management – routine care
The provision of diabetes services in Berlin comprises various settings. United4Health has included the Pflegewerk healthcare provider which delivers the diabetes disease management programme (DMP) as part of its integrated care contract with health insurance companies. Some patients live in their own home or flat fully independently, take their measurements on their own and are visited by the nurse as needed (Green). Others live in their own home and are visited regularly, but still take the measurements independently (Green). Some patients involved in U4H lived in assisted living units that belong to Pflegewerk, where they are assisted to take measurements regularly (Amber), but they still conduct a fairly independent lifestyle, with community rooms where they eat, chat, play cards, watch TV and conduct social life all together. Those patients most in need live in nursing homes, where they are supervised 24/7 and nurses take the measurements and provide the necessary care (Amber).

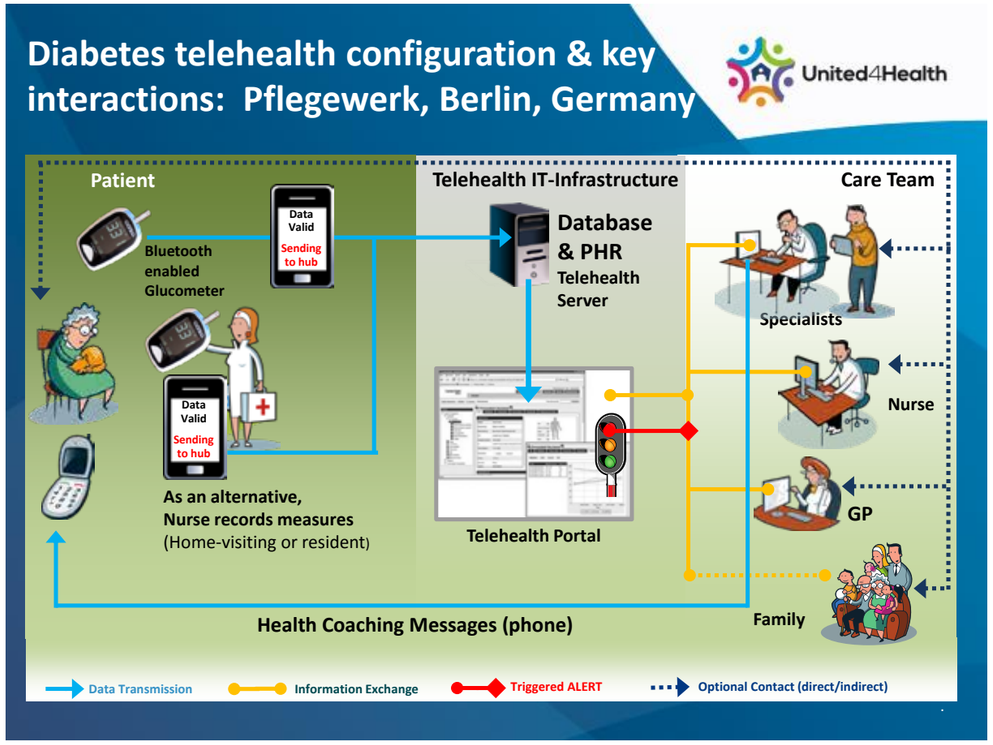
The DMP, following clinical practice guidelines published by various national and international diabetes agencies, is delivered by a wide range of professionals including GPs, consultants, specialist diabetes teams as well as other primary and secondary care professionals.

Pflegewerk are contracted to provide regular face-to-face visits to the patient's home by GPs or specialist doctors and nurses. During these visits, the patient's health and wellbeing is reviewed and their care plan and self-management plan adjusted accordingly.

Patients receive specialist diabetes care when they attend the emergency department or have an emergency admission to hospital (Pink).

U4H Telehealth Enabled Diabetes Care Management
Berlin provides life-long monitoring services for patients living with diabetes. Patients either take their own weight, blood pressure and pulse and blood glucose measurements with a frequency prescribed by the specialist on first contact (in the project the frequency was once a week at least, unless prescribed differently by the doctor), are assisted in using their telehealth or have their measurements taken for them by a nurse. The system uses Bluetooth technology to transmit the readings to a Smartphone which then uploads the data to a central database as well as into the electronic Patient Health Record (PHR). The telehealth system generates alerts if measurements are outside the patient's personalised parameters and according to the service protocol. The alerts are sent to one or more people, such as doctor, care home nurse, family member, patient themselves, or other person explicitly authorised by the patient in order for appropriate action and/or response to be taken. These authorised members of the patient's care team can access the PHR to gain further information on the health status of the patient. Remote contacts with the patients are by telephone.

Pflegewerk have plans to integrate the telehealth data into the patient management software and the nationwide infrastructure, supporting eg electronic case records, in Germany.



Telehealth in Practice
Central Greece - DIABETES

info@e-trikala.gr

Ambition

The overall aim for implementing telehealth into the care management programme for patients living with Type 2 diabetes who monitor their blood glucose levels is via the support of a single entry point to existing health and social services. Medical intervention and social support is combined based on the telehealth service, which becomes a catalyst to break the silos between the two different organisations (Regional Health Authorities and Municipal Social Services), aiming to provide an integrated ICT based health and care service for patients with Type 2 diabetes.

DIABETES **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
Primary care is not funded to provide diabetes care management.

Level 3 : Specialist Supported Self-management
Patient, Carer, GP, Hospital Diabetologist, Home-visiting Nurses.

DIABETES **TELEHEALTH** ENABLED CARE MODEL

Level 1 : Self-management
Patient/carer trained in use of telehealth and self-management.

Level 2 : Supported Self-management
Telemonitoring information not accessible by GP.

Level 3 : Specialist Supported Self-management
Telemonitoring information available to Hospital Specialist, Alert response and health coaching. Data available to support hospital diabetes appointments.

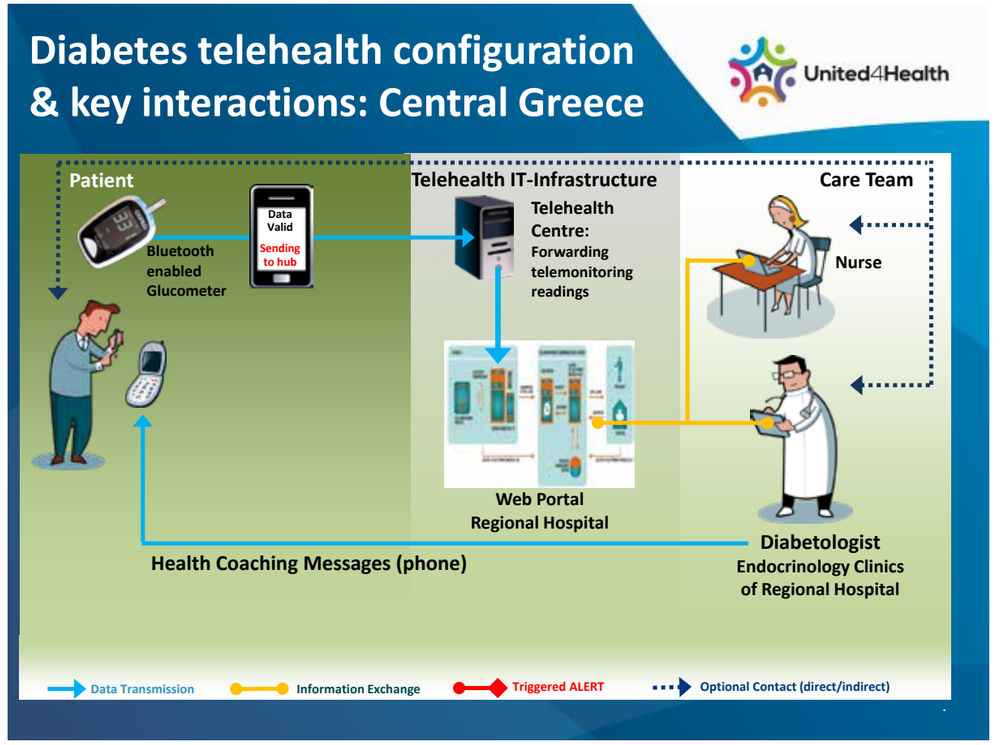
Diabetes Care Management - routine care
Routine care for patients with Type 2 diabetes is undertaken by the patient themselves (Green), supported every 3 months by their diabetologist/endocrinologist at the outpatient department of the Regional University Hospital (Pink). In addition, on monthly or up to 3 months basis, their family doctor (GP) prescribe their medication and give advice when needed (Amber). Patients are invited to have, as a minimum reviews include testing their HbA1c and blood pressure every 3 months, periodic assessment of renal function and lipids, and undertaking a micro vascular/neuropathic assessment, and providing them with health and lifestyle advice as part of each consultation. In addition, patients receive a retinopathy screening appointment annually. Patients are able to be referred by their family doctor (GP) to other medical specialists in a hospital.

In case of an emergency, the patient has to refer themselves to the EMS (emergency medical services). Any patients with comorbidities, disabilities or lack of support from informal caregivers, are eligible to receive home care nursing services provided by the Municipalities.

U4H Telehealth Enabled Diabetes Care Management
In addition to routine care, individual patients were equipped with light-weight handheld physiological measurement devices as well as a suitable mobile phone to undertake regular telemonitoring as part of their self-management (Green). They received training on the telehealth equipment from the nurses within the municipal homecare service (Amber). The patients record their vital signs at home, and these were then uploaded (via the Telehealth centre) to the Regional University Hospital of Larisa (endocrinology clinics), over internet and GPRS. The diabetologist reviews the telemonitoring data and provides feedback to the patient by phone or via a request for a physical consultation in the outpatient department (Pink).

The telehealth service has been designed to help patients self manage and enhance the routine diabetes care service model delivered by health professionals working in home care settings by strengthening self-management with health coaching interventions and support. The homecare service has been expanded to include patients who have health problems, as well as those to those with social needs and disabilities. The access of the patients to their diabetologist/ endocrinologist is also more frequent than the routine care model.

In case of an emergency, the patient has to refer themselves to the EMS (emergency medical services). The telemonitoring does not provide an emergency service.



Telehealth in Practice

ARSAN, Campania, Italy - DIABETES

report@arsan.it

Ambition

The overall aim for implementing telehealth into the care management programme for patients living with Type 2 diabetes with complications who monitor their blood glucose levels, is to support and improve the individual patient's endeavours to self-manage and lead a lifestyle to reduce their risk of exacerbation and of developing further diabetes-related complications.

DIABETES **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
Patient, Carer, GP, Diabetologists and Specialist nurses in the Community-based diabetic centre.

Level 3 : Specialist Supported Self-management
Patient, Carer, Diabetes specialist nurses in the Community-based diabetic centre, Hospital-based specialists only involved if patient attends emergency/admitted.

DIABETES **TELEHEALTH** ENABLED CARE MODEL

Level 1 : Self-management
Patient/carer trained in use of telehealth and self-management.

Level 2 : Supported Self-management
Diabetologist in Community-based diabetes centre receives telemonitoring information, responds to alerts by telephone, SMS and/or email. Routine diabetes care management consultations. GP informed of patient on telemonitoring but has no access to web portal.

Level 3 : Specialist Supported Self-management
Diabetologist in Community-based diabetes centre as Level 2. Hospital-based teams do not have access to telemonitoring information.

Diabetes Care Management - routine care
Routine care for patient with Type 2 diabetes varies according to the severity of their disease and the level of patient self-management (Green) and is part of an integrated care model as follows:

- Patients with no complications are managed by GPs, who receive the patient's individual care plan from the diabetologist which includes their blood glucose levels and monitoring regime. The patient's GP is contracted to monitor their anthropometric indices (height, weight, waist circumference), provides educational reinforcements at least every 3 months, and HbA1c values at least every 6 months. In addition, the GP ensures the patient is referred for relevant specialist assessments including the screening for any complications annually (Amber).
- Patients living with unstable diabetes and related complications are managed by the diabetologists in the community based Diabetes Centres. Their follow up (including the assessment and screening for complications) is in accordance with their individual care plan and review (Pink).

Patients are able to be referred to medical specialists in the hospital and/or community services if required.

U4H Telehealth Enabled Diabetes Care Management
The telehealth service is only offered to patients living with unstable diabetes and related complications and has been designed to improve the routine care service model delivered by specialists working in the community-based Diabetes Centre by strengthening interventions and support to help patients self-manage (Green/Amber).

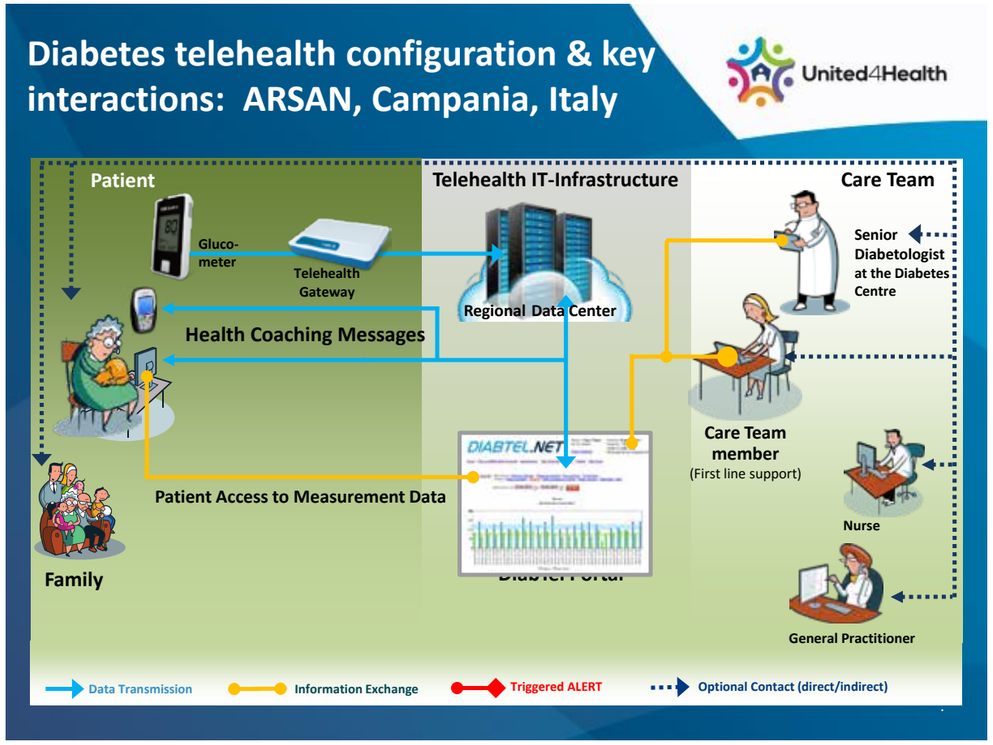
Patients take and upload their blood glucose readings using the glucometer and telehealth device gateway provided by the Diabetes Centres according to the regime agreed between the patient and the diabetologists (Pink).

On a weekly basis, a member of the patient's care team reviews the patient data uploads received and contacts the patient by phone, SMS or email if data is missing and they will offer the patient additional telehealth training and support if considered necessary. If the data upload review shows that a patient's blood glucose readings are outside their agreed parameters, the care team member will seek advice from the diabetologist on how to proceed. The diabetologist would contact the patient to elicit additional information to assess the severity of the situation and take one or more of the following actions:

- health coaching to reinforce their diabetes self-management education, psychosocial support and/or motivational guidance, in order to improve their adherence to their self-management plan and to facilitate lifestyle changes;
- self-management plan changes, eg diet or activity level
- an unscheduled outpatient consultation for further investigations or if a change in their blood glucose monitoring regime is required.

Remote contacts with the patients are by e-mail, text or telephone according to the preferences, capabilities, and individual needs of the patient.

GPs and home nurses, if relevant, are notified when a patient has the telehealth service added to their care plan.



Telehealth in Practice

ASP Cosenza, Italy - DIABETES

aspcosenza.contact@gmail.com

Ambition

The overall aim for implementing telehealth into the care management programme for patients living with Type 2 diabetes who monitor their blood glucose levels, is to support and improve the individual patient's endeavours to self-manage and lead a lifestyle to reduce their risk of developing diabetes-related complications.

DIABETES **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
Patient, Carer, Diabetologists and Specialist nurses in the Community-based diabetic centre. GP's are not involved in Diabetes care management.

Level 3 : Specialist Supported Self-management
Patient, Carer, Diabetes specialist nurses in the Community-based diabetic centre, Hospital-based specialists only involved if patient attends emergency/admitted.

DIABETES **TELEHEALTH** ENABLED CARE MODEL

Level 1 : Self-management
Patient/carer trained in use of telehealth and self-management.

Level 2 : Supported Self-management
Telemonitoring data available in eHealth portal/ PHR accessed by eHealth centre nurses, GP and local diabetes clinic specialists. Secure messaging and telephone between patient and eHealth centre nurses, GP, local diabetes clinic.

Level 3 : Specialist Supported Self-management
Home-visiting Nurses, GP, Specialist Services, Hospital-based Teams have access to shared telehealth monitoring information. Alert response, text messaging health coaching provided.

Diabetes Care Management - routine care
On a daily basis, patients with Type 2 and Type 1 diabetes monitor their blood glucose levels (Green) with any routine care predominantly undertaken in the Community Based Diabetes Centres by diabetologists and diabetes specialist nurses (Amber/Pink). Patients have follow-up appointments according to their individual care plan and as a minimum are offered an annual review which includes testing their HbA1c, renal function, lipids; measuring their blood pressure, and follow-up/secondary prevention of complications with specialist consultation (cardiology, neurology, nephrology, oculist). Patients are able to be referred to medical specialists in the hospital if required.

U4H Telehealth Enabled Diabetes Care Management
The telehealth service has been designed to enhance the routine diabetes care service model for patients living with Type 1 and Type 2 diabetes, by strengthening interventions and support to help patients self-manage (Green).

Patients send their blood glucose readings using the glucometer and the Eurotouch Home® PHR according to the regime agreed between the patient and the diabetologists (Amber/Pink).

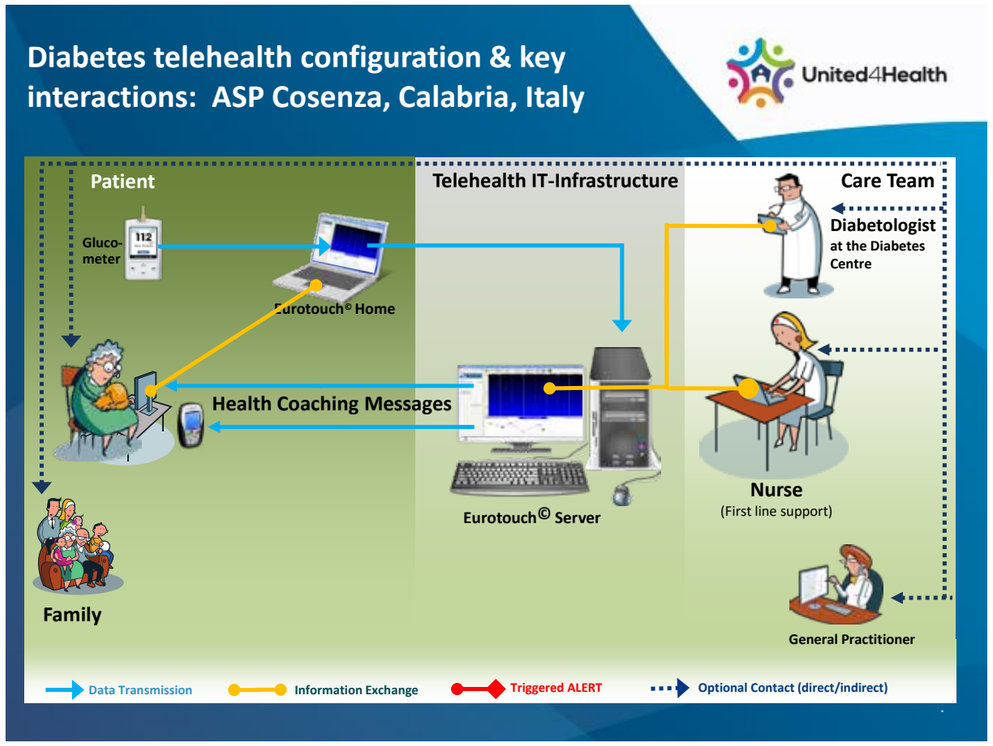
Biweekly, diabetologists review the patient data uploads received and contact the patients if data is missing or readings are outside the parameters set for the patient.

Patients can be offered:

- additional telehealth training and support if required;
- health coaching to reinforce their diabetes self-management education, psychosocial support and/ or motivational guidance, in order to improve their adherence to their self-management plan and to facilitate lifestyle changes;
- self-management plan changes, eg diet or activity level
- an unscheduled outpatient consultation for further investigations or if a change in their blood glucose monitoring regime is required.

Remote contacts with the patients are by email, SMS or telephone according to the preferences, capabilities, and individual needs of the patient.

GPs and home nurses, if relevant, are notified when a patient has the telehealth service added to their care plan.



Telehealth in Practice

Ayrshire & Arran, Lanarkshire, and Greater Glasgow & Clyde Scottish local partnership areas - DIABETES

United4health@nhs24.scot.nhs.uk

Ambition

The aim of the telehealth intervention for patients living with Type 1 and Type 2 Diabetes is to improve self-management and support and enable positive changes to behaviour/lifestyle through digitalised self-monitoring of blood glucose to reduce the risk of developing disease related health complications.

DIABETES **ROUTINE** CARE SERVICE MODEL: TYPE 1 & 2

Level 1 : Self-management Patient and Carer.

Level 2 : Supported Self-management
Patient, Carer, GP, GP Nurse, Home-visiting Nursing Service.

Level 3 : Specialist Supported Self-management Patient, Carer, Home-visiting specialist Nurses, Hospital Specialists.

DIABETES **TELEHEALTH** ENABLED CARE MODEL

Level 1 : Self-management
Patient/carer trained in use of digital blood glucose monitoring and introduced to MDMW including their EMR (diabetes) and self-management.

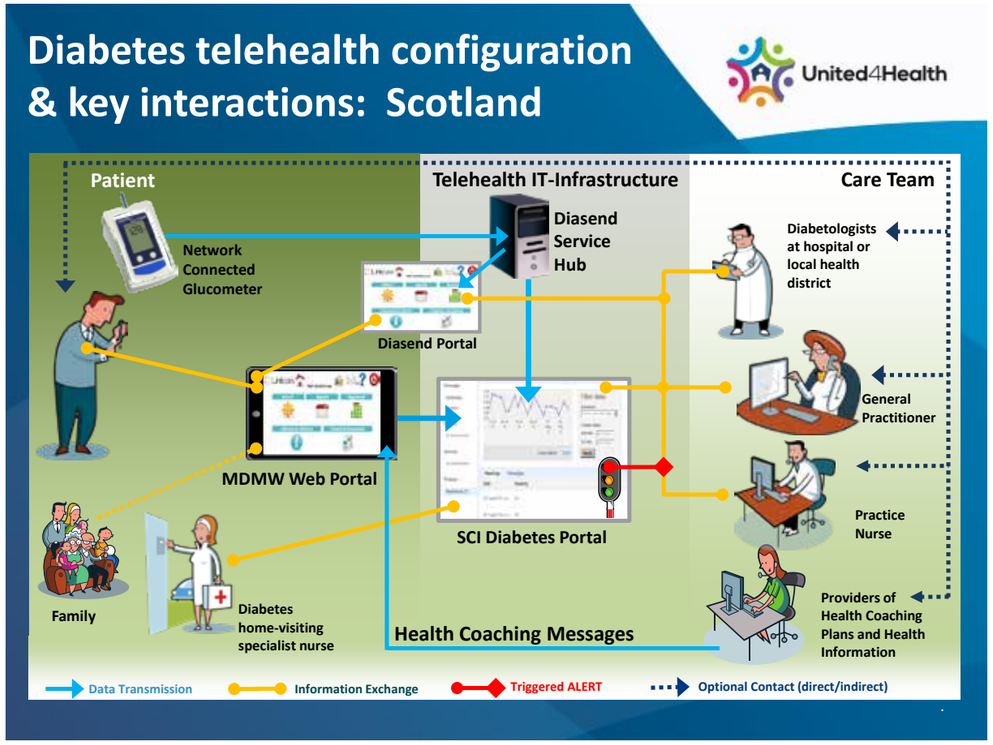
Level 2 : Supported Self-management
Shared blood glucose monitoring information available to GP and Practice Nurse and uploaded via Diasend to SCI EMR (diabetes). GP-based routine disease care management services (QOF), health coaching through MDMW.

Level 3 : Specialist Supported Self-management
Patient, Carer, Home-visiting nurses, Hospital-specialists.

Diabetes Care Management - routine care
Routinely, patients with Type 1 and Type 2 Diabetes monitor their own blood glucose levels and are supported to self-manage (Green) through coordinated services delivered in primary, community and secondary care sectors. New patients diagnosed with Type 2 diabetes and those stabilised on insulin therapies are managed by primary care and have an annual review as part of the Quality and Outcomes Framework (QOF) in their GP practice diabetic clinic (Amber), whereas patients living with complex Type 2 and Type 1 diabetes have their annual reviews during an outpatient consultation in secondary care as these patients are predominantly managed by hospital-based diabetes specialists who also assist patients to self-manage (Pink). A range of healthcare practitioners including diabetologists, diabetic specialist nurses, and community/home-visiting nurses. GPs and online digital services and platforms (NHS Inform, My Diabetes My Way) currently provide information support and advice to patients and carers regarding self-management, symptom management and prevention of long term diabetes-related complications.

U4H Telehealth Enabled Diabetes Care Management
The Telehealth Care model deployed within United4Health has enhanced the national NHS Scotland's My Diabetes My Way (MDMW) interactive website designed to support people who have diabetes Type 1 and insulin dependent Type 2 diabetes to better self-manage and control symptoms. MDMW allows patients access to their own diabetes electronic medical record and patients involved in U4H are now able to upload their blood glucose readings into their record (Green). This functionality is achieved through the integration of software (Diasend) which links the MDMW website and an electronic diabetes medical record (SCI-Diabetes). The patient at home uses their NHS-provided home glucose monitoring device and downloads the DIASEND software to their own Internet-enabled device (smartphone/tablet/computer). This software allows the transmission of the measurements to the patient's secure area of the self-management website, MDMW (http://www.mydiabetesmyway.scot.nhs.uk/). The measurements are integrated into the patient's medical record within SCI Diabetes, thus allowing both patients and clinicians a digitally captured, up-to-date picture of an individual's blood glucose measurements and trends, a summary of which can be produced anytime. This integrated use of MDMW and Diasend strengthens self-management and self-care provision and enhances routine care services by enabling more flexible treatment and care options including more remote clinical consultations which are provided either in the patient's GP practice or community and hospital specialists as required (Amber/Pink).

my diabetes * my way
www.mydiabetesmyway.scot.nhs.uk



Telehealth in Practice

Ljubljana, Slovenia - DIABETES

info@mks.si

Ambition

The aim of the telehealth service for patients living with diabetes is to support and improve levels of self-management and achieve equally good clinical outcomes as routine care, particularly in relation to glycated haemaglobin HbA1c, body weight, blood pressure and cholesterol.

DIABETES **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
Patient, Carer, GP, GP Nurse, Home-visiting nursing service.

Level 3 : Specialist Supported Self-management
Patient, Carer, Home-visiting nurses, Outpatient And/or Primary Health Care Centre.

DIABETES **TELEHEALTH** ENABLED CARE MODEL

Level 1 : Self-management
Patient/carer trained in use of telehealth and self-management.

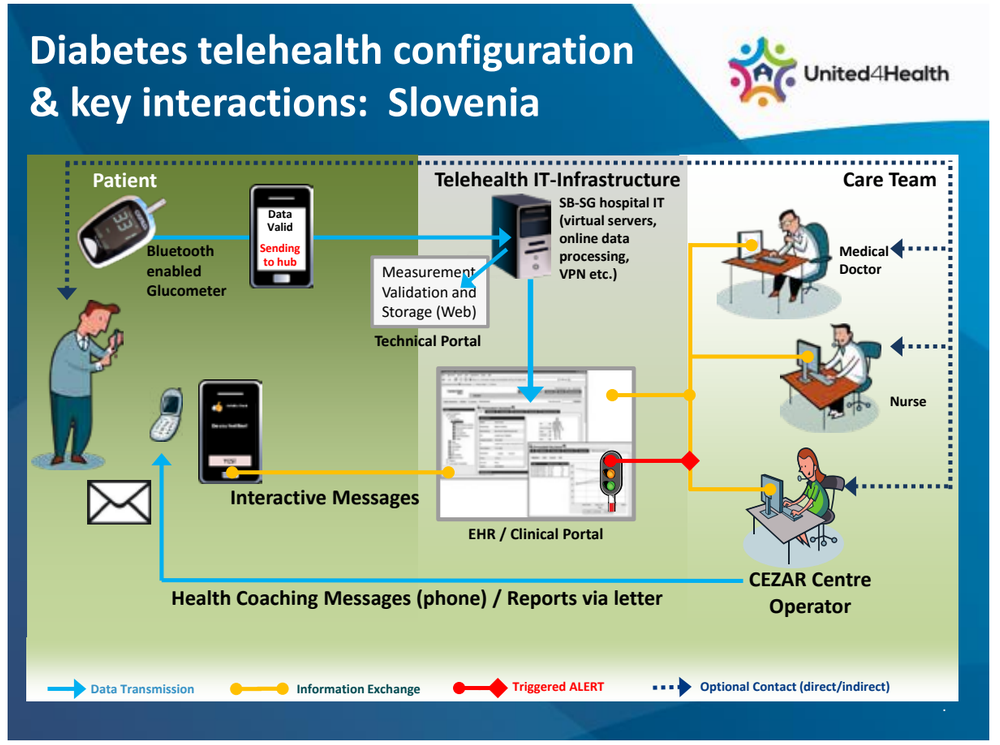
Level 2 : Supported Self-management
GP, GP nurse and home-visiting nurse do not have access to telemonitoring information. eHealth Co-ordinator communicates by phone with GP and home-visiting nurse.

Level 3 : Specialist Supported Self-management
Telemonitoring information shared with eHealth Centre specialist nurse/Co-ordinator, Hospital diabetologist, Primary Health Care diabetic centre. Alert response by telephone, SMS, email. Specialist routine diabetes care management.

Diabetes Care Management – routine care
Patients with diabetes implement their self-management plan (Green) and have regular (6 monthly if stable) specialist consultations in hospital outpatient clinics and health centres in the Koroška region (Amber/Pink). Routine care management aims to achieve personalised goals in relation to glycated haemoglobin HbA1c. Patient self-management plans vary according to their disease level with the frequency of blood glucose monitoring varying for those on insulin, oral medication or diet only. Patients enter their blood glucose measurements in a dedicated diabetes booklet, the information in which is reviewed by the diabetologist at regular scheduled consultations. All patients are given personalised advice in relation to their diet and activity according to the blood glucose levels. If their blood glucose levels are not well controlled (Amber/Pink) they are reviewed in the hospital outpatient clinic or regional health centre more regularly than every 6 months.

U4H Telehealth Enabled Diabetes Care Management
The telehealth service is provided by the Telemedicine Service Centre CEZAR from the Slovenj Gradec regional hospital. Using physiological measurement devices (glucometers), patients take at home their blood glucose measurements once a week 3-6 times during that day (whole daily profile). The readings are transmitted over Bluetooth to a Smartphone provided by U4H and subsequently uploaded to the CEZAR Centre at the hospital (Green). An alert is generated when the service system detects that the blood glucose readings are outside the patient's set parameters. In such cases, an eHealth coordinator from the CEZAR Centre contacts the patient by phone to check the data upload (Pink). If the data is correct, the coordinator contacts a hospital diabetes specialist seeking advice on further action, eg change in therapy or unscheduled hospital consultation.

Any changes are communicated to the patient by phone followed up by a paper report sent by postal mail. The coordinator may need to communicate with the patient's GP and/or home-visiting nurse if there are changes, for example, to the patient's medication regime (Amber). In addition, diabetologists and specialist nurses periodically review all patients on telehealth to determine whether any changes to their care and self-management plan is required and if this is the case, a paper report is once again, sent to the patient.



Telehealth in Practice

Hywel Dda University Health Board, Wales - DIABETES

telehealth.hdd@wales.nhs.uk

Ambition

The overall aim for implementing telehealth into the care management programme for patients living with Type 2 diabetes who monitor their blood glucose levels, was to support the individual patient's endeavours to self-manage and lead a lifestyle to reduce their risk of developing diabetes-related complications.

DIABETES **ROUTINE** CARE SERVICE MODEL

Level 1 : Self-management
Patient and Carer.

Level 2 : Supported Self-management
Patient, Carer, GP, GP Nurse, Home-visiting Nursing Service.

Level 3 : Specialist Supported Self-management
Patient, Carer, GP, Home-visiting Nurses, Hospital Specialists.

DIABETES **TELEHEALTH** ENABLED CARE MODEL

Level 1 : Self-management
Patient/carer trained in use of telehealth and self-management.

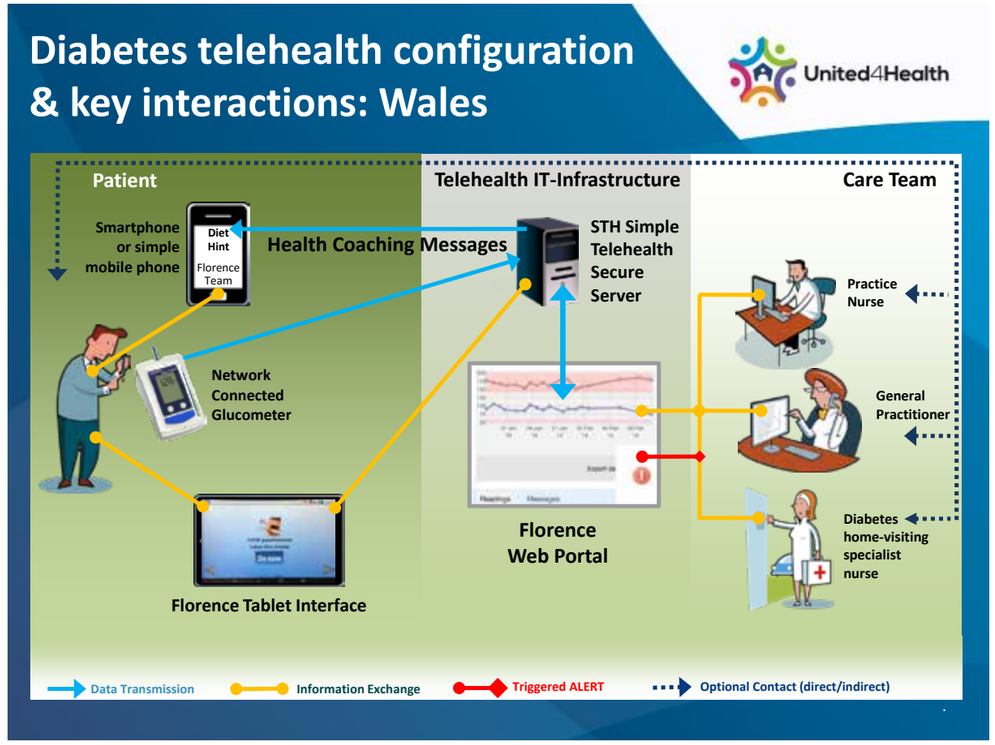
Level 2 : Supported Self-management
Shared telehealth monitoring information available to GP and Practice Nurse. Alert response, text messaging, health coaching. GP-based routine disease care management services (QOF).

Level 3 : Specialist Supported Self-management
Home-visiting Nurses, Specialist Services, Hospital-based Teams.

Diabetes Care Management - routine care
Usual care for patients with Type 2 diabetes is undertaken by the patient themselves (Green) supported predominantly by their GP and GP practice nurse who has a special interest in diabetes in primary care (Amber). Patients are invited to have, as a minimum, annual reviews as part of the Quality and Outcomes Framework (QOF) which includes testing their HbA1c and renal function, measuring their blood pressure and lipids, undertaking a microvascular/neuropathic assessment, and providing them with health and lifestyle advice. In addition, patients receive a retinopathy screening appointment annually. Patients are able to be referred to medical and nursing diabetes specialists in the hospital and/or community services if required (Pink).

U4H Telehealth Enabled Diabetes Care Management
The telehealth service has been designed to help patients self manage (Green) and enhance the routine diabetes care service model delivered by professionals working in primary and home care settings (Amber) by strengthening self-management with health coaching interventions and support.

Patients receive automated text message reminders from Florence© (Flo) to perform their blood glucose readings using their own glucometers according to the regime agreed between the patient and their GP practice. The Simple Telehealth program analyses the patient's readings according to their individualised parameters agreed between patient and clinical team, and 'Flo' provides instant feedback to the patient via their mobile phone along with locally agreed advice and health coaching messages if required. Should a parameter be critically breached, the patient will be advised on what immediate action to take and who to contact. An alert message is also sent to their nominated diabetes care professional (either Practice Nurse, GP or Home-Visiting Specialist Nurse), and this can be reviewed immediately via a secure internet connection, or the next working day if the anomalous parameter occurred out of working hours. The patient continues on low-level telemonitoring, receiving on their mobile phone and web links to be viewed via the Internet on a device of their choice, different text prompts via Florence©, Simple Telehealth web-based monitoring system (Stoke-on-Trent, NHS England) for up to 12 months following enrolment. Any worsening symptoms will be treated according to local standard protocols, eg GP appointments with the option of referral to the home-visiting diabetes specialist nurse, emergency room attendance or hospital admission (Pink).



Notes

"Transforming the patient experience with telehealth in Europe"

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www.United4Health.eu

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