

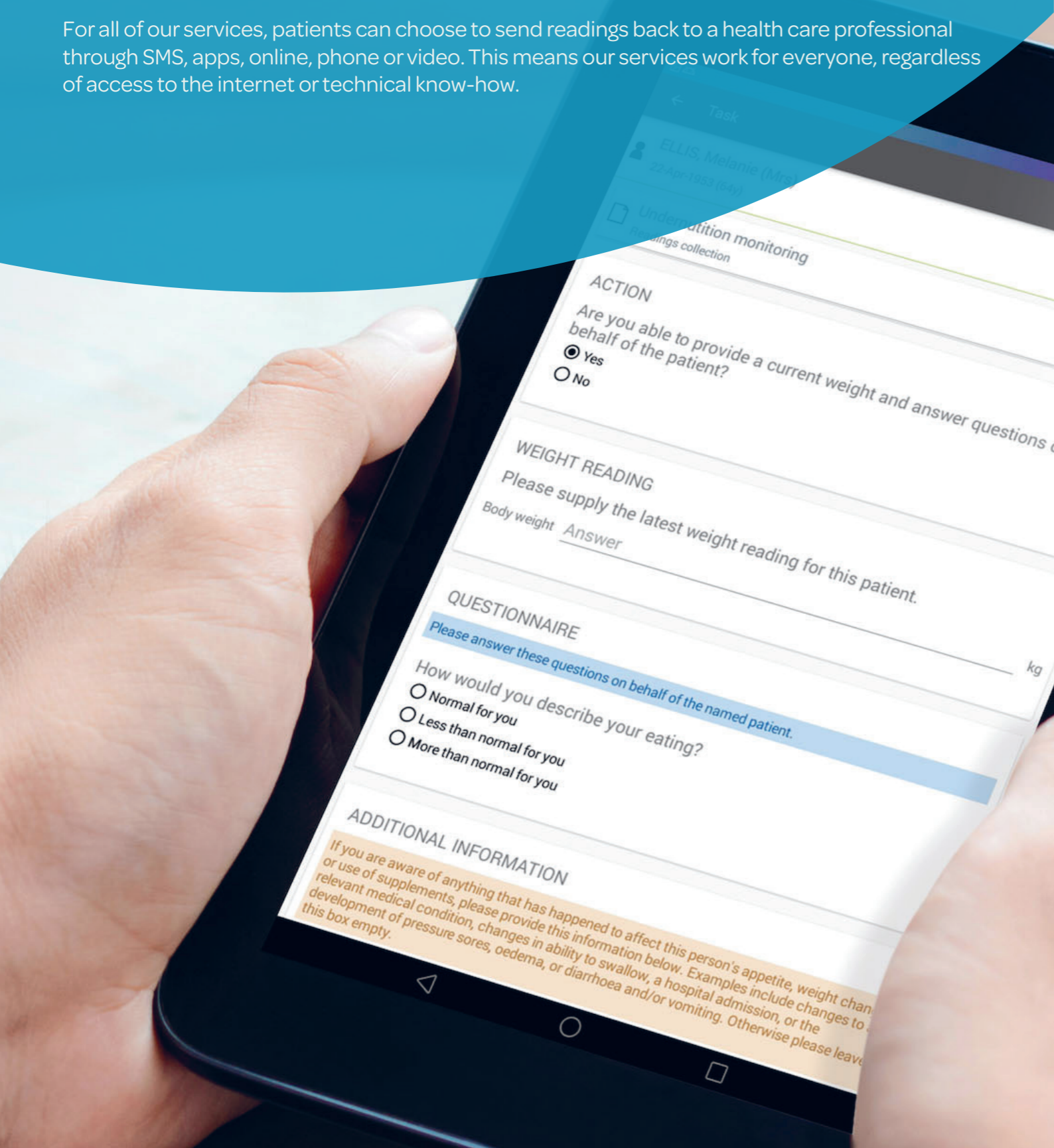


# REMOTE PATIENT MONITORING FOR LONG-TERM CONDITIONS

Remote monitoring allows patients with long-term conditions to be monitored safely at home, without needing to travel to a hospital or clinic. Digital health frees up NHS time, reduces costs and prioritises high-risk patients that need urgent attention.

Detailed below are some examples of remote monitoring pathways that we provide to NHS organisations across the UK. We have a library of over 100 digital health services, all clinically designed by our health and social care customers.

For all of our services, patients can choose to send readings back to a health care professional through SMS, apps, online, phone or video. This means our services work for everyone, regardless of access to the internet or technical know-how.



## COPD

The COPD monitoring pathway has been designed to allow healthcare professionals to automatically capture daily vital sign measurements from patients including SpO2, blood pressure, body temperature and heart rate and in addition responses to a health questionnaire.

The vital sign measurements and responses to the health questionnaire are captured from the patient and if they fall within expected thresholds the patient is contacted according to their next schedule.

If vital sign measurement and responses to the health questionnaire indicate the patient has fallen outside of thresholds but is within agreed levels then the patient must re-submit their vital sign measurements 30 minutes later. The patient re-submits their vital sign measurements and if the results now fall within thresholds the patient is automatically contacted according to their next schedule. Patient results that show deterioration are raised as a high priority alert.

Those that are still outside of threshold result in an alert for the triage team to investigate and patients who do not respond to the secondary contact have an alert created based upon their initial results.

Any vital sign measurements and responses to the health questionnaire that are outside of patient thresholds and outside of agreed levels result in the automatic creation of high priority alerts for the triage team to investigate.

This automated triaging of results has produced significant efficiencies for staff and allowed them to focus their attention on patients that have the highest need for their contact and clinical services.

Patients using the pathway have access to a suite of behavioural change content and information on their condition, which they are able to access and use at their own convenience.

## Heart Failure

The heart failure service allows recently diagnosed patients to be monitored within their own homes without the need for frequent visits.

Patients send vital sign measurements including blood pressure, SPO2, heart rate and body weight to their health care professional. The patients must also complete a health questionnaire.

The service uses automated rules to create alerts based upon the submitted vital sign measurements and whether they fall outside of organisation set parameters.

The pathway provides automatic triaging capability to contact patients if their vital sign measurements fall outside of patient thresholds but not outside of organisation set parameters as detailed within the COPD monitoring pathway.

Norfolk Community Health and Care NHS Trust have deployed the Heart Failure monitoring pathway and reported the following outcomes for patients:



## Warfarin management (Anticoagulation)

Inhealthcare's anticoagulation pathway for patients on warfarin transforms the way patients are monitored.

The innovation allows patients to test their INR at home without the need to attend clinics. It also reduces pressures to switch to more expensive medication (Direct Oral Anticoagulants, or DOAC) that do not require clinic visits. DOACs cost £744 per patient per year, compared to £26 for warfarin.

Patients who self-test reduce the risk of adverse events from 2.6% to 1.3%. They also reduce demand on hospital services.

Using a Roche personal INR testing device, patients test when requested by their care team. They submit the information by a method of their choice such as smartphone application, online portal or automated phone call. Importantly there is no requirement for the patient to have an internet connection or a smartphone, which means that nearly everyone is able to engage with the pathway.

The information is sent to the clinic and into the clinic's decision support software. A nurse reviews the recommended warfarin dosage and next test date, making changes if necessary before approving. Results are sent to the patient via their chosen communication method.

Patients on our service demonstrate significantly better INR control than outpatient based care. The marked improvement in TTR is expected to lead to a significant reduction in adverse events such as strokes.

The service has been in use at County Durham and Darlington NHS Foundation Trust since April 2014 and currently has 500 self-testing patients. The first 200 patients were evaluated for INR control after 6 months, and again after 24 months.

**After 6 months, 70% of the INR self-testing patients saw their time in therapeutic range (TTR) improve by 20% compared to 6 months before starting the pathway. The other 30% maintained their TTR. The average TTR across all patients in the group improved by 16%, from 59% to 75%.**

**After 24 months, the group's TTR remained high over the 2 year period, and increased slightly to 76%.**

These findings and the subsequent reduction in adverse events is consistent with INR self-testing patients globally. Patients in standard INR care have an incidence of thromboembolic events of 2.6% per year, whereas for patients that self-test, the incidence of events halved to 1.3%.

## Maternity pathways

Inhealthcare works with a number of NHS trusts across the UK providing digital maternity pathways that remotely monitor patients at risk of gestational diabetes and pregnancy induced hypertension (Pre-eclampsia).

The services allow expectant mothers to use a smartphone app, online portal or SMS to remain in contact with their healthcare professional.

The solutions allow expectant mothers to keep a digital log of their daily blood glucose and blood pressure measurements replacing their paper based diaries.

The results from patients are triaged using NICE guidance and individually set patient thresholds which will flag up any abnormalities for healthcare professionals to review.

These digital solutions provide the ability for two-way electronic messaging between healthcare professionals and patients within specific operating hours. The services give a helping hand to patients, whilst providing healthcare professionals with the ability to prioritise patients and reduce unnecessary face-to-face contact.

Through the pathways patients have access to tailored content and information on how they can manage their condition through changes in their behaviour.

Evaluations in organisations that have deployed the digital maternity pathways have reported the following savings:

Reduction of 3-4 patient visits over a 12 week period

**£1,092** cost savings per pregnancy

## Care homes

Inhealthcare currently delivers digital health pathways to more than 500 care homes across the UK including pathways used to monitor residents such as the National Early Warning Score (NEWS) and the unplanned triaging tools such as the Situation Background Assessment Recommendation (SBAR) pathway.

These pathways allow healthcare professionals to remotely monitor and triage residents within care homes, reducing the need for face-to-face contact. Care home staff capture resident vital sign measurements and responses to questionnaires using a smartphone app or online portal.

Based on the information entered, staff can receive recommendations and guidance on next steps and alerts can be generated within triage dashboards for healthcare professionals to review.

The solutions allow for two way messaging and video consultations between healthcare professionals and provides care home staff with a vital lifeline and assurance on the health and wellbeing of their residents.

**45%** Reduction in specialist nurse visits

**18%** Reduction in overall unplanned admissions

**13%** Reduction in out-of-hours unplanned admissions

**24%** Reduction in in-hour unplanned admissions



## Nutritional monitoring

Oral Nutritional Supplements (ONS) are within NHS Digital's Prescription Cost Analysis top 10 items within England. We have worked with a number of NHS organisations across the UK, Scotland and Northern Ireland on delivering digital pathways to remotely monitor patients who are on ONS within their own homes and within care homes.

The digital pathway regularly monitors those patients who are at risk of malnutrition and prescribed an oral nutritional supplement. The patients can interact with the digital pathway using a variety of different communication methods depending upon their access to technology.

The patient's responses are reviewed against the MUST (Malnutrition Universal Screening Tool) algorithm which determines whether patients are at low, medium or high risk of undernutrition. From these results, alerts are created which identify the high risk patients requiring intervention and separately the healthcare professionals are also notified of those patients at low risk so that they can review whether the prescription of ONS needs to continue.

The pathway was evaluated by Southern Health and Social Care Trust within Northern Ireland and below are the key outputs:

**90%**

Reduction in home visits

**4 week**

Reduction in waiting time

**1.75**

Average of hours saved per patient review

**5 month**

Reduction in time spent on pathway

## Hypertension

The Hypertension pathway allows General Practitioners to remotely monitor their cohorts of patients who suffer from hypertension.

The solution provides patients with the ability to send in their readings by using the communication channel of their choice, such as automated phone call, SMS, online portal or app.

The pathway has built in algorithms which provide triaging and only alert clinical teams when the patient has breached NICE or patient specific thresholds.

The information collected from the patients is automatically integrated back into the GP Electronic Patient Record in a SNOMED coded format for easy reporting.



We have a marketplace of more than 100 digital health services. Here are a few that have been co-created with our health and social care customers

Cardiovascular  
COPD and heart failure  
Hypertension  
Care Homes  
Digital Care Home Monitoring  
National Early Warning Score (NEWS)  
SBAR Assessments  
Dermatology  
Wound management  
Dermatology  
Diabetics  
Type 2 Diabetes  
Endoscopy  
Pre-endoscopy reminder

Falls  
Falls prevention  
Maternity  
Pregnancy induced hypertension  
Post-Natal hypertension  
Gestational diabetes  
Mental Health  
My Possible Self  
NHS Spine  
NHS Spine look up  
Nutrition and dietetics  
Undernutrition  
Weight management  
Orthopaedics  
Musculoskeletal (MSK)

Pathology  
INR Self-testing  
Smoking  
Smoking cessation  
Smoking status  
Urology  
Urinalysis  
Vaccinations  
Flu vaccinations  
Child immunisation  
General services  
Vital signs  
Medication reminders  
Post-Surgery follow up

Contact us

contact@inhealthcare.co.uk

01423 510 520

**inhealthcare**  
www.inhealthcare.co.uk