HeartCare at Home- the development of a remote monitoring programme for patients with Heart Failure

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Background

Heart failure is a complex clinical syndrome of signs and symptoms which suggest the ability of the heart to pump effectively is impaired. Conservative estimates suggest 90,000 people in Ireland have a diagnosis of heart failure. The prevalence of heart failure rises steeply with age, with the average age of diagnosis 77 years (NICE, 2018). Heart failure is primarily managed reactively on deterioration of symptoms, at times requiring hospitalisation and IV diuretics. Heart failure related costs to the health service are predicted upwards of €660 million, with 47% of this related to direct hospital costs (The Cost of Heart Failure in Ireland, 2012). An aging population, increased myocardial infarction survival rates, ongoing suboptimal treatment of hypertension and improved prognosis for those with heart failure are all contributory factors in driving the continuous increase in heart failure costs.

Aim and Objectives

Heart Care at Home is a remote monitoring programme for patients with a diagnosis of heart failure. A dedicated HeartCare at Home nursing team, working within cardiologist approved protocols, monitor and intervene in deterioration of heart failure systems at the earliest opportunity. This is a collaborative study between Roche Diagnostics and Centric Health. The aim of this study is to examine the impact of remote monitoring on GP attendances, A&E presentations and hospital admissions. Secondary outcomes will examine the impact on participants quality of life, clinical outcomes and safety end points.

Methods and Materials

Ethics approval was granted by Royal College of Surgeons Ireland (RCSI) (REC 202102005). All eligible patients are referred to the study by their GP. Consent is obtained by phone by a trained nurse. Participants are provided with a weighing scales, blood pressure monitor, and smart device as required. The team supports the participant to download and set up the Luscii app (https://luscii.com/) and educated them how to take their blood pressure, weight and heart rate correctly (Figure 1). The participant is requested to input their weight, height, blood pressure, mood and symptoms twice weekly. The team monitors the data and is alerted if a patient's measurements fall outside pre-determined parameters. Where required, the team will support the patient to titrate their diuretics as per cardiology approved protocols (Figure 2). Patients are monitored daily for two weeks following titration. Participants complete a research review at day 30, 180 and 365.

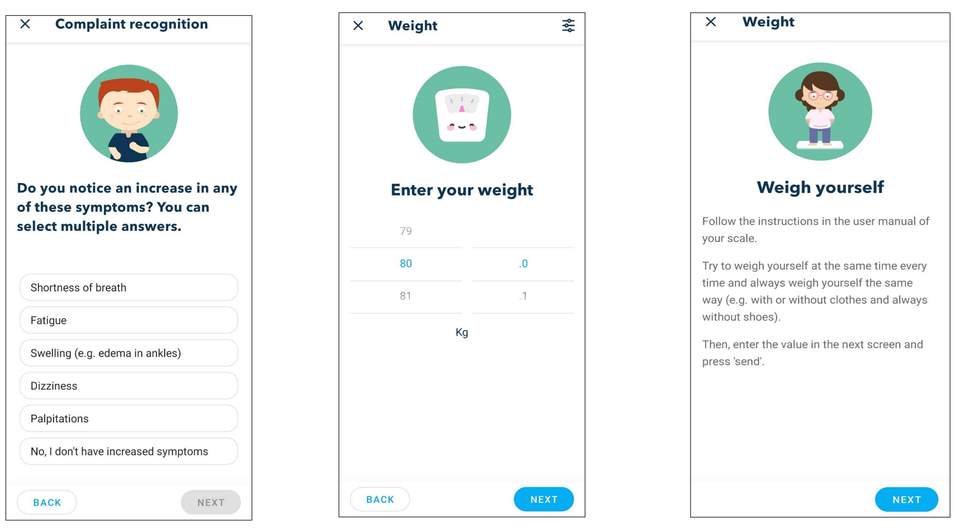

Figure 1. Luscii app for recording patient measurements

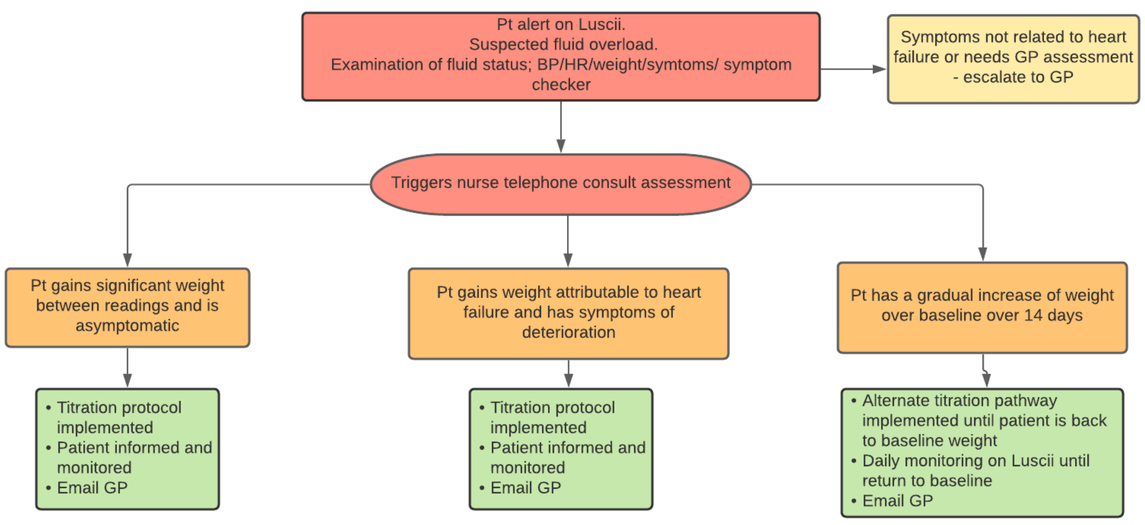

Figure 2. Protocol for changing loop diuretic dose in suspected fluid overload

Results

One hundred and fifty-two patients have commenced the programme (50% female; median age 79 years, IQR, 72-84) from 30 GP practices across Ireland.

Twenty eight percent of participants have heart failure with preserved or mildly reduced ejection fraction (HFpEF), 28% have heart failure with reduced left ventricular (LV) ejection fraction and 44% have undifferentiated heart failure. ECHO results are only available for 33% of patients. Over 29,000 measurements have been collected, of which 26% have triggered an alert (Table 1 & 2).

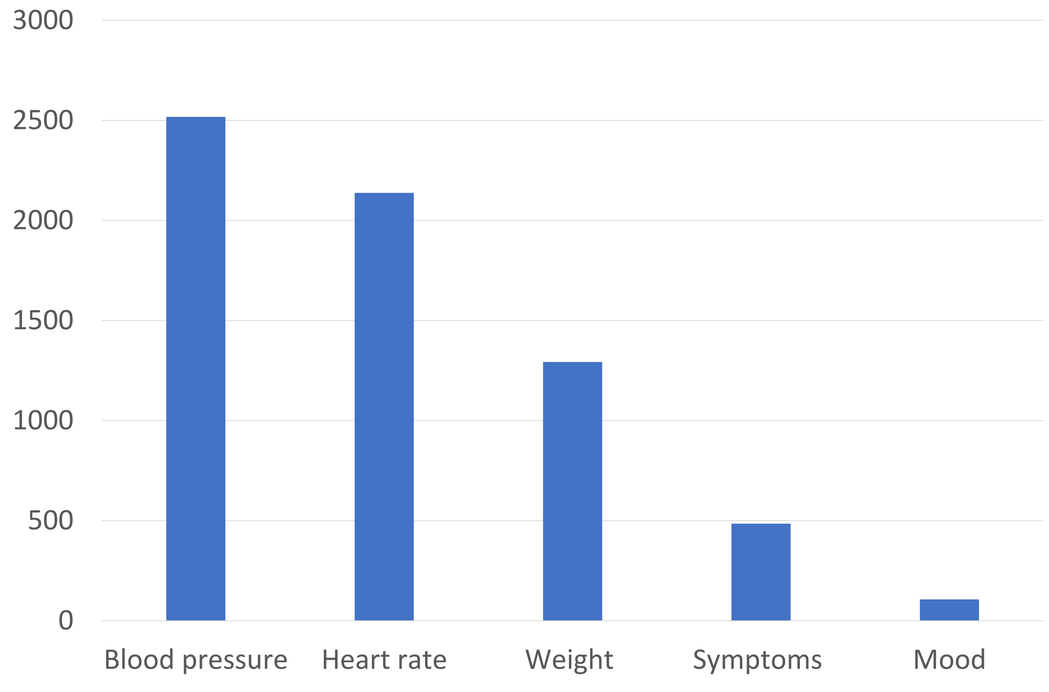

Table 1. Type of alerts generated by data inputted by patients into the Luscii app.

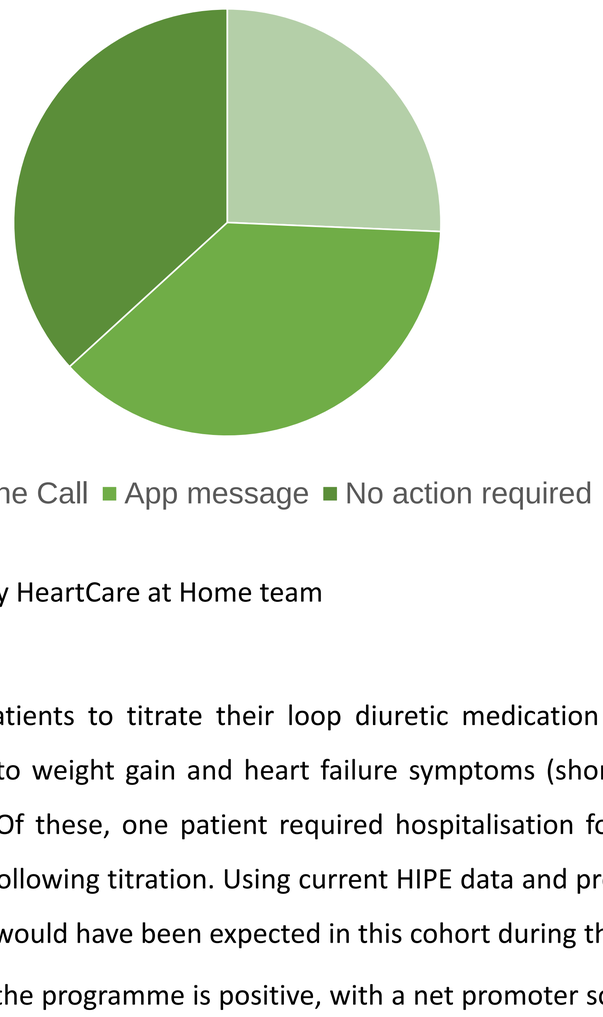

Table 2. Response to alerts by HeartCare at Home team

The team has supported patients to titrate their loop diuretic medication in 48 cases. All titrations were in response to weight gain and heart failure symptoms (shortness of breath, oedema, leg swelling, etc). Of these, one patient required hospitalisation following titration and 3 required a GP review following titration. Using current HIPE data and previous literature, an estimated 16 admissions would have been expected in this cohort during this time frame.

Patient and GP feedback on the programme is positive, with a net promoter score of 68 on the Luscii app.

Conclusion

Initial data suggests home monitoring, with direct clinical support, has the potential to significantly reduce hospital admissions. Further research is ongoing to examine the positive healthcare effects of remote monitoring in patients with heart failure.

References
NICE (2018), Chronic heart failure in adults: diagnosis and management. Viewed 18 March 2021, https://www.nice.org.uk/guidance/ng106
The Heartbeat Trust, Irish Heart Foundation, NUI Galway (2015) The Cost of Heart Failure in Ireland: The social, economic and health implications of Heart Failure in Ireland. Dublin: The Heartbeat Trust