British Heart Foundation

Treating heart failure patients in the community with intravenous diuretics

Norah Taggart has had heart failure for more than three years. On two occasions her body has retained a significantly high amount of excess fluid – a symptom of her condition.

The first time, she spent three weeks in hospital and was connected to an intravenous drip to treat the problem. But in June 2012 when she stopped responding to her usual tablets, she received a second intravenous regime – but this time in the comfort of her own home.

Mrs Taggart, 84, who lives in Bexhill-on-sea said:

"It was just so much more comfortable. It's all the little things, like being able to go to the loo when you want without waiting around, or being able to go to bed when you like."

Community Intravenous (IV) Diuretics intervention will:

- ✓ Reduce hospital admissions.
- ✓ Support early discharge.
- ✓ Provide a better experience for patients and carers.
- ✓ Educate patients and carers about heart failure.
- ✓ Enhance patient self-management.
- ✓ Empower the patient and carer to manage the condition more actively.
- ✓ Review and improve the patient's wider care planning.
- ✓ Support people when their condition becomes more advanced.
- ✓ Enable patients to have choice to remain at home during end of life care.[5]

FIGHT FOR EVERY HEARTBEAT

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Summary

The British Heart Foundation (BHF) funded and evaluated a two year project with 10 NHS organisations across the UK to determine whether funding a home or community based intravenous (IV) diuretic service is safe, clinically effective, cost effective and well received by patients and carers. It was also anticipated that the intervention had the potential to help prevent the often reported "revolving hospital door" of avoidable hospital admissions in people living with heart failure (HF).

The programme was led by heart failure specialist nurses (HFSNs) working within existing HF teams. This builds on existing evidence that HF patients under the care of an HFSN are five times less likely to be hospitalised compared to all HF patients.[1, 2]

HF is a common chronic condition affecting about 550,000 people in the UK[3] with increasing prevalence due to the combined effects of improved survival after heart attacks and an ageing population.[1, 4] Annually HF accounts for around 2% of the total NHS budget (approximately 70% of this cost is due to the cost of hospitalisation), more than 1 million inpatient bed-days per year and accounts for 5% of all emergency medical admissions.[1, 4]

Evidence summary

- ✓ The intervention has been successfully implemented.
- ✓ The intervention has been successfully replicated.
- ✓ The intervention is linked to NICE guidance, NICE quality standards and National Heart Failure Audit in England and Wales.
- ✓ The intervention is supported by several national organisations.
- ✓ Evaluation of the effects of the intervention has been carried out.
- ✓ There are publications relating to the interventions.

The evidence

Over the two year evaluation period across the 10 sites:

- ✓ 126 interventions administered to 96 patients.
- ✓ Mean age 75.
- ✓ 76% male.
- ✓ 70% lived with a spouse or other family member.
- ✓ All but one patient had a wide range of co-morbidities (averaging five per patient).
- ✓ **54 patients (56%) had a previous HF related hospital admission in the year prior to the intervention**.

IV diuretics in hospital

13 days - average length of hospital stay for a heart failure admission

£3796 - approximate cost per episode

70% of costs for heart failure are due to hospitalisation

1 million patient bed days resulting from heart failure per year

Impact of the community based IV diuretics intervention

79% avoided hospital admission

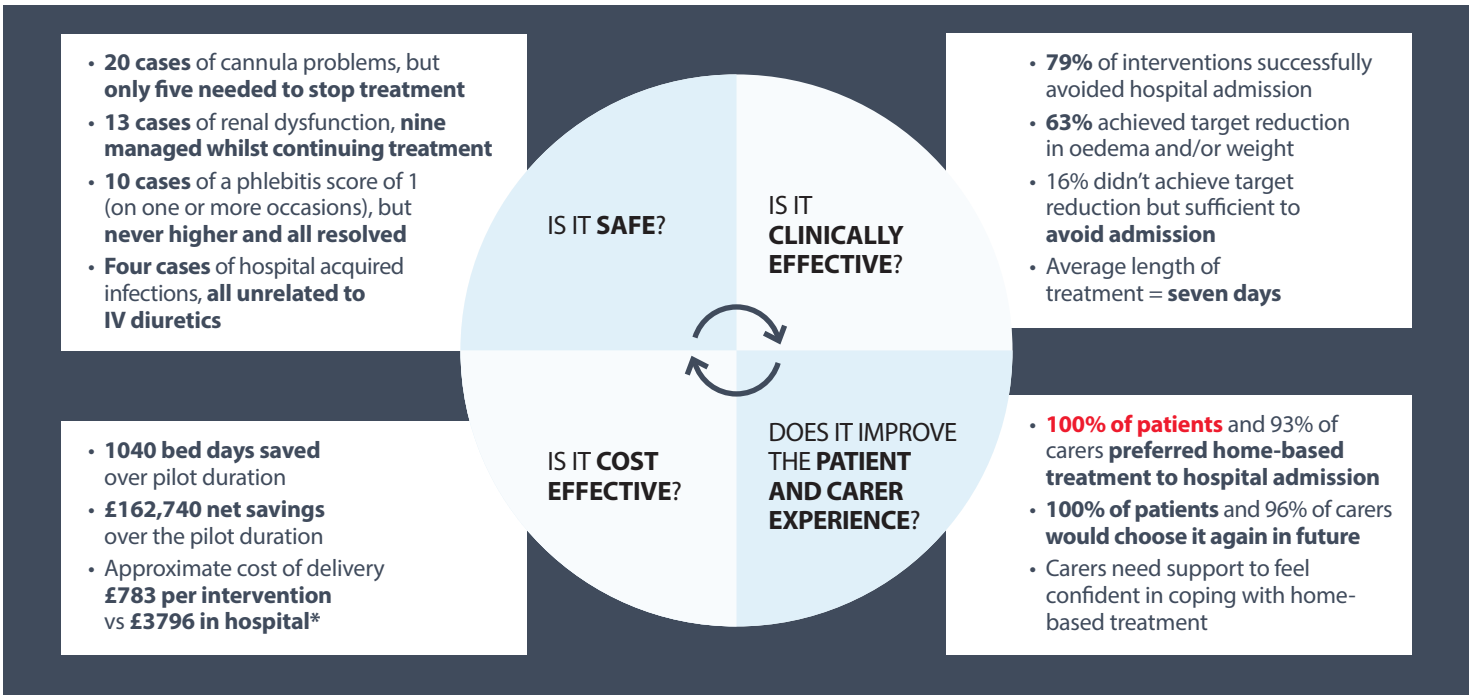
1040 patient bed days saved over two year project duration

£3013 - average saving per community based intervention (£793 community based IV diuretics vs £3796 hospital based IV diuretics)

63% achieved target reduction in oedema and weight loss

100% of patients and **93%** of carers preferred community based treatment to hospital

Improving quality of care and reducing costs



Independent external evaluation of the project demonstrated that the administration of IV diuretics in a community setting is safe, clinically effective, cost effective and importantly, valued by patients and carers. With the right infrastructure and resources, existing HFSN teams can provide a service that enables patients to have IV diuretics delivered effectively and safely in the comfort of their own home.[5]

SAFETY

- Overall the pilot data suggests good levels of safety. The most common challenges faced were:
  - **Cannula insertion to patients:** This generally only required the HFSN to re-site the cannula and resume treatment. Shared learning during the project guided cannula choice and IV diuretic doses.
  - **Renal dysfunction:** The renal function of all patients was monitored on a daily basis during their IV diuretic treatments.
- In both patient groups, there were no incidences of healthcare associated infections that were attributable to the IV diuretic treatment[5].

CLINICAL EFFECTIVENESS

- **79% of the patients subject to this intervention avoided hospital admission.**
- The majority of the treatments achieved effective target weight loss and/or oedema reduction and/or reduction of patient symptoms.

PATIENT AND CARER EXPERIENCE

- Feedback was consistently positive, with all patients stating they would opt for the treatment at home again in the future. Inevitably, a small number of carers found the responsibility of having the patient at home during a complex treatment a challenge, but only a small number would prefer hospital admission.
- Patients and carers reported confidence in the teams providing the intervention, and were particularly satisfied with the information they were given about the service, which helped them understand what would be required of them and who to contact in an emergency.

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Patients indicated that they gained a wide range of personal benefits from staying at home including:

- being able to stay with loved ones
- convenience and minimal disruption to day-to-day life
- time to do what they want
- being comfortable and relaxed, not stressed.

Carers who indicated that they felt this treatment was better than staying in hospital reported this was because the person they cared for:

- had access to home comforts
- had time and independence to do what they want
- avoided trauma associated with hospital stays and admission
- could carry on with their family life.

COST EFFECTIVENESS

Once a service is established, there is potential to generate significant savings in bed days and delivery costs compared with admitting patients to hospital. The start-up costs are relatively modest but essential. The time required to develop and establish the service appears to be prohibitive within 'business as usual', and therefore requires a dedicated start up resource.

The pilot demonstrated:

- 80 successful interventions in a cohort of 96 patients.
- The average length per intervention is 13 days according to the data from the HF audit.[3]
- Based on the hospital admissions tariff, 80 interventions would cost **£303,680*** for in-patient treatment.
- In comparison, the same treatment administered at home or in a community setting cost **£140,940*** based on a salary of 0.5 FTE nurse (for each pilot site) with allowance for travel and equipment.
- This demonstrates cost savings of £162,740* and 1040 avoided inpatient bed days.

*This analysis is based on the HF auditdata[1] and therefore does not correspond to the costs savings calculated in the IV diuretic final report which preceded the HF audit. It should also be noted that the costs savings based on the pilots are an underestimation as the HFSN role was working below full capacity due to a low number of patients.

The proposal

THE PROPOSAL	Develop and evidence the case for a community based IV diuretic service to enable people living with heart failure to be managed safely and effectively at home.
PURPOSE OF CHANGE	Prevent avoidable hospital admissions and give people the choice to receive IV diuretics, enable them to make decisions about their own care, in the comfort of their own homes or community setting.
THE HEART FAILURE CHALLENGE	• HF affects about 550,000 in the UK and the prevalence could rise as a result of improved survival after a heart attack and an ageing population.[3] • HF is a clinical syndrome, with symptoms such as fatigue, breathlessness and fluid retention, arising from the heart's inability to pump sufficient blood around the body.[1, 4] • The most common cause of HF is coronary artery disease (70% of patients have had a previous heart attack).[4] • Outcomes are consistently poor for patients who receive sub-optimal care, however input from HF specialists and prescription of evidence based HF therapies have a significant impact on prognosis and life expectancy.[1]
SERVICE DESIGN AND APPROACH	• The projects were originally implemented as a stand-alone home-based IV diuretic service. • They have evolved over the course of the project and delivery of IV diuretics is now integrated into wider HF care packages, with some sites now providing seven day services. • A range of models and diuretic treatment options enables an approach that is tailored to the needs of each individual patient.[5] • This integrated approach appears to be the route to sustainability. • The majority of the interventions were delivered by the HFSNs. • One site demonstrated the potential to deliver the intervention via the district nursing team, rapid response team or a community resource team, with appropriate HFSN supervision.[5] • Training on cannula insertion was a key learning development requirement. • The clinical responsibility remained with the HFSNs working with a BHF guidance document adapted to local governance context. • Cardiologists were consulted to discuss variances and complexities not covered by the guidance document however, a patient did not have to be seen by a nominated cardiologist before starting IV diuretic treatment at home. • Decision to commence IV diuretic treatment, was taken by Healthcare Professionals (HCPs) after increased prescribed doses of oral loop diuretics and/or added metolazone or thiazides had been tried. Where this was insufficient to improve fluid retention, patients were offered the option of community based IV diuretics, which were administered once or twice daily as bolus dose, usually via a peripheral line. Doses were usually stepped, and ranged from 40mg to 250mg (for furosemide). Higher doses were given via an infusion pump over periods of up to one hour.

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	• All treatment changes and decisions were communicated to the GP. Little input was required from the GPs, however they were supportive and informed about all aspects of the service. • Most of the sites developed patient/carer information leaflets.[6]
FIT WITH NHS POLICY AND CONTEXT	An ageing population and associated increase in people living with one or more long term conditions has driven UK wide health policy focus towards integrating secondary and primary health services to enable access to safe and cost effective care as close to home as possible, providing support to patients and their carers to self-manage their conditions and make informed decisions about their care. • **The NHS Cardiovascular Disease Outcomes Strategy for England, the Heart Disease Improvement Plan for Scotland, Together for Health – Heart Disease Delivery Plan and the Prudent Healthcare plans for Wales and the Service Framework for Cardiovascular Health and Wellbeing in Northern Ireland all state their overarching ambition is to improve outcomes in terms of clinical effectiveness, safety, a high quality patient experience and cost effectiveness.** • Home based IV diuretics is effective across all these domains and can therefore be considered an exemplar of service improvement within the strategy. **In particular:** • Patients having access to what is recognised as the right treatment, including specialist teams. • Improving care for patients living with cardiovascular disease (CVD), and empowering and supporting them to live as full a life as possible after diagnosis or an acute event. • Improving end of life care for patients with CVD and enabling them to be cared for in their usual place of residence when they are approaching the end of their life.
RELATED GUIDANCE AND STANDARDS	**NICE Clinical Guideline 108:** Management of chronic heart failure in adults in primary and secondary care. August 2010 **NICE Clinical Guideline 187:** Diagnosing and managing acute heart failure in adults. October 2014 **SIGN Guideline 95:** Management of chronic heart failure. February 2007 **National Heart Failure Audit** 2013 **NICE Quality Standard:** The NHS operating Framework 2012/2013 states: '2.17 There is strong evidence that early treatment supports better clinical outcomes. There are a number of key areas where commissioners and providers can work together to ensure earlier diagnosis and treatment.' **Cardiovascular Outcomes Strategy** 2013 (England) **NHS England Outcomes Framework** Domains 2,3,4 and 5, 2013/14 **NHS Quality Premium for Clinical Commissioning Groups in England** 2014/15 **Department of Health: End of Life Care Strategy** 2010

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	Quality, Improvement, Productivity and Prevention (QIPP) 2013 **Together for Health – A Heart Disease Delivery Plan** 2011-2016 (Wales) **Prudent Healthcare Plan** 2015 (Wales) **Heart Disease Improvement Plan** 2014 (Scotland) **Service Framework for Cardiovascular Health and Wellbeing** 2014-2017 (Northern Ireland)
EVIDENCE FOR THE EFFECT ON QUALITY AND PRODUCTIVITY	In view of the early success of the evaluated projects, and its close alignment with policy, the BHF submitted evidence from the earlier phases of the evaluation, resulting in acceptance and publication of the case study, *Home administration of intravenous diuretics to heart failure patients: Increasing productivity and improving quality of care*, by NICE. http://www.nice.org.uk/guidance/cg108/resources/qipp-case-study-home-administration-of-intravenous-diuretics-to-heart-failure-patients2
STRATEGIC ADDED VALUE	The BHF funding and strategic support enabled the 10 sites to focus the necessary resources on developing and establishing home-based IV diuretic services. The evaluated evidence from these projects demonstrates the safety, clinical and cost effectiveness and patient acceptability of community-based delivery of IV diuretics. The successful development of the QIPP case study enables BHF to widen the influence of the pilot, by encouraging other organisations to consider adopting the practice.
EVIDENCE OF SUSTAINABILITY, REPLICATION & FURTHER SERVICE DEVELOPMENT	• Eight of the pilot sites secured funding at the end of the project to embed and sustain the service model. • Two sites have been able to continue delivery of the intervention without additional resources. • As a result of the pilot a number of areas across the UK are implementing and considering introducing this intervention in the community. • There was increasing interest among the pilot sites in the potential for use of subcutaneous diuretics for patients considered unsuitable for IV diuretics or approaching the end of their lives. One project site implemented a subcutaneous diuretics service in conjunction with the IV diuretics service and has since had the services commissioned as a non-oral diuretics service. • There is greater value in being able to offer both IV diuretic and subcutaneous services as it gives more options in terms of patient care and requires less infrastructure input in the community.

PUBLICATIONS/ ABSTRACTS	**Quinn M, Read H.** Nurse-led community diuretics for heart failure patients. British Journal of Cardiac Nursing 2014; 19:1 31-38 **Watson C, Annus C.** Intravenous diuretic delivery in the home. Nursing Practice. Nursing Times 2013; 109;14 20-21 **Watson C, Senior H, Austin J, Blue L, McIntyre H.** Evaluation of a home based intravenous (IV) diuretic pathway for heart failure patients. European Journal of Heart Failure 2013; 15 S1-S5
IMPLEMENTATION GUIDANCE/ CHALLENGES	**Learning points for successful introduction of IV diuretics in the community setting / 10 Reasons to introduce IV diuretics in a community setting.**[7]
TOOLS TO SUPPORT IMPLEMENTATION	The BHF Best Practice Toolkit which includes; a business toolkit www.bhf.org.uk/businesscasetoolkit, protocols, reports, evaluations and service case studies to support setting up a community IV diuretics service and offering a menu based approach within existing HF services. The BHF supports HCPs with funding and resources for training and development through the BHF Alliance membership programme https://www.bhf.org.uk/alliance/
CONTACTS	For further information contact the British Heart Foundation - bhfhi@bhf.org.uk

References

1. National Heart Failure Audit 2013. www.ucl.ac.uk/nicor/audits/heartfailure
2. The British Heart Foundation and Big Lottery Fund heart failure specialist nurse services in England – full report: https://www.bhf.org.uk/publications/about-bhf/g234-heart-failure-nurse-services-in-england---full-final-report-2008

   The British Heart Foundation and Big Lottery Fund heart failure specialist nurse services in England – exec summary: https://www.bhf.org.uk/publications/about-bhf/g235-heart-failure-nurse-services-in-england---executive-summary
3. The British Heart Foundation Cardiovascular Disease Statistics 2014.
4. National Institute for Health and Care Excellence (2010) chronic heart failure: Management of chronic heart failure in adults in primary and secondary care. NICE clinical guideline 108. http://www.nice.org/guidance/cg108
5. Brightpurpose. Evaluation of IV Diuretics Pilot for British Heart Foundation. Final Report. June 2014.
6. Community Intravenous/Subcutaneous Diuretic Service for patients with Heart Failure in Leeds. Leeds Community Healthcare 2011.
7. Brightpurpose. Evaluation of IV Diuretics Pilot for British Heart Foundation. Learning points for successful introduction of IV diuretics in the community setting/10 Reasons to introduce IV diuretics in a community setting. June 2014.

British Heart Foundation

For over 50 years we've pioneered research that's transformed the lives of millions of people living with cardiovascular disease. Our work has been central to the discoveries of vital treatments that are changing the fight against heart disease.

But cardiovascular disease still kills around one in four people in the UK, stealing them away from their families and loved ones.

From babies born with life threatening heart problems, to the many mums, dads and grandparents who survive a heart attack and endure the daily battles of heart failure.

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