

Proposal for Community IV Diuretics to Treat Acute Decompensated Heart Failure using a Portable Elastomeric Pump and Point of Care Blood Tests

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BACKGROUND

- Acute decompensation of heart failure (HF) contributes to 5% of emergency admissions with consequent prolonged hospitalisation for intravenous (IV) diuretics¹.
- Our HF specialist nurse-delivered, consultant-led multi-disciplinary ambulatory (outpatient) HF Unit has treated over 1000 HF patients safely and efficaciously with intravenous (IV) diuretics on an outpatient basis².
- However, this strategy can be cumbersome for housebound patients or those with mobility problems.

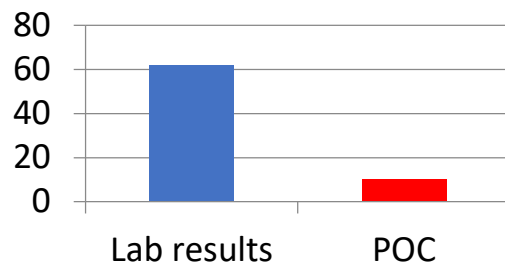
OBJECTIVES

- The objective of my BCS ELP project was to develop a business case for community IV diuretics in Liverpool for the treatment of acute decompensated HF in a community IV hub (for ambulatory HF patients) or at home for housebound patients
- A pilot project was trialled in the Aintree Ambulatory HF Unit to assess safety and efficacy of 2 novel strategies prior to use in community setting
 - an elastomeric portable diuretic infusion pump
 - point of care (POC) blood tests

METHODS

- We piloted the use of point of care (POC) blood tests (renal function, electrolytes) and the use of an elastomeric portable infusion pump (Vygon) in our ambulatory HF unit for bolus furosemide infusion (4 mg/mt).
- Funding (£15000) for use of these was obtained by winning competitive bids from the hospital Dragon's Den.
- Results were analysed and a business case was presented to the hospital and CCG.

Median time (Minutes)



RESULTS

- Use of the elastomeric pump (100 patients-500 administrations) demonstrated safety, efficacy and positive feedback from patients as well as staff.
- 96 patients preferred the new pump which also reduced the need for assistance to walk to the toilet amongst 81% of patients.
- POC blood testing reduced the median time for availability of results from 62 minutes (range 36-250) to 10 minutes ($p < 0.001$) (Fig. 1)
- The portable pump and POC testing will be used to deliver community IV diuretic services which will be supervised by a heart failure consultant and delivered by nurses.
- The model for community IV includes a Community Hub for ambulant patients (staffed by band 7 HF specialist nurse, one Band 5, one HCA) and a home IV diuretic service (delivered by the community IV team). The business case has been approved by the CCG and hospital.

CONCLUSIONS

- Community IV diuretic services for the management of acute decompensated HF using an elastomeric pump and POC tests can ensure delivery of life-saving treatment close to or within HF patients' homes
- This strategy can prevent the need for hospitalisation and is importantly more convenient for patients

REFERENCES

1. Stewart S1, Jenkins A, Buchan S, McGuire A, Capewell S, McMurray JJ. The current cost of heart failure to the National Health Service in the UK. *Eur J Heart Fail.* 2002 Jun;4(3):361-71.
2. Sankaranarayanan R et al. Heart failure specialist nurse-led day case ambulatory management with intravenous diuretics reduces hospitalisations for acute decompensated heart failure irrespective of ejection fraction. *Eur Heart J Suppl.* Sep 2018