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Intravenous diuretics can be administered safely in patients' own homes. This is preferred by nurses and patients, and is more cost-effective than hospital treatment

Intravenous diuretic delivery in the home

In this article...

- Benefits of IV diuretics being delivered at home
- Process of administration
- Challenges in setting up and running the pilot

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Abstract Watson C, Annus C (2013) Intravenous diuretic delivery in the home. *Nursing Times;* 109; 14, 20–21.
The British Heart Foundation is funding a two-year pilot programme at 12 UK sites to assess safe, effective ways for specialist nursing teams to administer intravenous diuretics at home or in day care. Initial findings suggest the service is effective, safe and preferred by patients and carers. It has the potential to reduce inpatient bed days, making significant savings.

Heart failure is a debilitating disease, affecting more than 750,000 people in the UK (Townsend, 2012). This number has been increasing, partly due to an ageing population, but also because of more effective procedures and drugs. People are more likely to survive a heart attack (the most common precursor to heart failure) and go on to live with heart failure in the community. There are more than 25,000 new cases every year (Townsend, 2012).

As the condition progresses, increasing oedema is treated with oral diuretics. These can stop being effective and patients are usually admitted to hospital for treatment with intravenous (IV) diuretics. These cases are estimated to account for 5% of all acute admissions and are expected to rise by over 50% in the next 25 years (National Institute for Health and Clinical Excellence, 2012).

The use of IV diuretics outside hospital has not been evaluated. We believe that, with the right infrastructure and resources, this can be delivered in the home in line with policy and meeting patients' "preferred place of care", especially at the end of life (Department of Health, 2008).

In addition, the IV diuretics service can reduce admissions, support early discharge and provide better, more holistic care.

The new service model

The British Heart Foundation (BHF) is funding a two-year pilot programme at 12 UK sites. This supports specialist nursing teams to assess the safest and most effective ways to administer IV diuretics at home or in a day-care setting as part of existing heart failure services.

A steering group, led by the BHF and an expert panel, has developed guidelines to help sites set up projects, and local steering groups have tailored procedures. These groups typically include a lead heart failure consultant and GP, heart failure specialist nurses, community nurse team leaders, community matrons, local BHF representatives and patient and carer representatives.

The specialist IV diuretic nurses lead the development, management and coordination of the new service. This involves helping to identify patients in hospital and the community who match the inclusion criteria and consent to take part.

Not all patients were suitable; treatment could worsen the condition of those whose renal function was significantly impaired or who were hypotensive. For some participants it is important to have a carer at home with them during treatment because there is a higher risk of hypotension following treatment, increasing the risk of falls. Easy

5 key points

1. A community-based IV diuretic service appears to be clinically effective and safe
2. The service has the potential to significantly reduce hospital admissions and save money
3. Patients and carers overwhelmingly reported that they prefer to be treated at home
4. Providing education and support for patients enables them to manage their condition
5. Supportive clinical leadership and project champions are key to enabling new services to flourish

Patient with heart failure taking part in the pilot to provide IV diuretics in the home

access to a toilet or commode is important as diuretics increase urine output.

Patients are physically assessed before they receive IV diuretics and their physiological response is closely monitored during and after administration. IV diuretics can cause hypotension due to the sudden fluid shift and diuresis. Since diuretics can cause renal impairment in people with kidney disease, a key role of nurses administering the treatment is monitoring renal biochemistry and heart failure medication while liaising with the patient's GP.

Blood is taken daily or on alternate days, depending on individual need. In East Sussex, the biochemistry service at the local hospital fast-tracks these samples so the results usually come back within a few hours. The hospital's peripheral venous access device (PVAD) documentation has been amended for home IV diuretics and provides a framework for the daily assessment of the cannula and site for phlebitis.

The specialist IV diuretics nurse plays a significant role in educating patients about their condition and how to manage it. A patient-held care record includes all documentation about the treatment.

In East Sussex, the heart failure team developed a dosing schedule for use in the community based on hospital protocol. They prefer to use bolus doses in the community for safety reasons, rather than leave the person attached to a pump. Patients are started on an IV dose equivalent to the oral loop diuretic they were taking in hospital and this is adjusted daily according to how they respond.

The specialist nurses also support and educate other staff involved in delivering the patients' care packages and raise awareness of the project.

The project is being evaluated by an external company, Brightpurpose. All pilot sites provide data to help assess its efficacy and what has been learnt. This information is shared with sites at earlier stages to help them establish services more smoothly.

Successes so far

The first interim evaluation of the pilot in June 2012 suggested the treatment is safe, effective and a viable alternative to hospital-based care. This was based on data from the first two sites that went live.

Effectiveness is measured by reduction in oedema and weight, and the maintenance of renal function. Out of the first 18 interventions, involving 16 patients, 12 were successful, three were unsuccessful and required hospital admission and three did not produce enough data for evaluation.

Patients unanimously preferred being treated at home than in hospital. They said they slept and ate better at home, and valued the continuity of care. All said they would choose to be treated at home again.

Both nurses and patients valued the time together to talk through the condition and treatment plan. Patients were more confident in knowing how to manage their condition, when to call for help and who to speak to in an emergency.

BOX 1. **IV DIURETIC SKILLS**

- Cannula insertion and supervision;
- Safe management of IV pumps and equipment
- Assessment skills including recording responses (for example weight and symptoms)
- Monitoring dosage and interpretation of safety parameters (such as blood pressure and renal biochemistry)

Cost effectiveness

Patient numbers at this stage are small. However, a costed business case at one site shows the potential for significant savings.

Those at this site estimate 44 of 629 patients will be admitted to hospital each year for IV diuretics and stay for an average of 9.4 days (Brightpurpose, 2012). An admission for a heart failure patient without complications costs £2,411 so the cost of treating 44 patients is at least £106,084. Based on these figures, the project would save the trust £52,184 a year (Brightpurpose, 2012).

The next stage of our evaluation will include a cost analysis for all sites. This will include sites with a more complex model where the heart failure nurse oversees a mix of staff delivering the service, which has potentially greater savings.

Challenges so far

A major challenge has been developing the service against a backdrop of NHS reform. It has been crucial to communicate with key stakeholders from the outset about how the project supports national policy to support early discharge and reduce unnecessary (and costly) hospital admissions. In addition, having commitment from senior clinical staff to help champion and promote the service has been a key enabling factor for pilot sites.

Considerations around access to drugs have been addressed by good communication and support from GPs and pharmacists. Where regular treatment is anticipated, drugs may be prescribed before they are needed and stored in patients' homes.

Training and maintaining competence in cannulation were issues in the set-up phase where patient numbers were initially small. Solutions have included staff spending time on wards inserting cannulas or with paramedic teams. One site opted to use single butterflies instead. Having back-up support is important, as is developing on-call systems or working with local out-of-hours services.

Developing local protocols and getting these approved can be time-consuming. Attaching protocols to existing nursing or medical therapy guidelines speeds this up. For example, one site added the new IV diuretics protocol to its existing IV antibiotics service procedures.

As with all IV therapies, including those delivered in hospital, some patients experience complications, such as phlebitis. This happened once, and the patient experienced minimal inflammation for one day.

Next steps

There are challenges in sustaining a new service in this economic climate and with NHS reform. Our sites are ensuring the model is part of core services in these ways:

- Lead nurses are rolling out the service to nurse prescribers, so it becomes a part of existing heart failure nurse services;
- Training all community heart failure nurses in IV diuretics skills (Box 1);
- Training staff in other geographical areas to extend the service in future;
- Extending the service to support early discharge for IV diuretics inpatients.

We are trialling day-case IV diuretics for higher-risk patients in our new medical infusions unit at Conquest hospital.

Conclusion

If the project continues to show clinical and cost effectiveness and is preferred by patients, it will support specialist teams to develop best-practice guidelines and protocols. Community IV diuretics services can then be adopted by commissioners and trusts across the UK. **NT**

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