Administration of intravenous diuretics in the Chest Pain Assessment Unit

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Tables

Referrals

Advanced Nurse Practitioner – Heart Failure (ANP-HF)/Cardiology Consultant Nurse to liaise with CPAU staff.

Sessions

This can only occur Monday-Friday

Location

Chest Pain Assessment Unit (CPAU)

Utility

Administration of intravenous diuretics in CPAU ensures that suitable patients with fluid overload are managed in a day care facility. This enables them to spend more time at home as well as relieving pressure on hospital beds.

The service can be used:

1. Predominantly for out-patients already known to the Heart Function Clinic and the ANP-HF.
2. It may also be used to facilitate the early discharge of patients with heart failure (patients who have had an initial response to IV diuretics (note section on suitable patients).

Identifying patients with fluid overload due to left ventricular systolic dysfunction (LVSD) suitable for IV diuretic therapy in CPAU

Congestion should not be due to another reversible cause i.e. Furosemide would not be the only treatment required for patients with uncontrolled atrial fibrillation, bradycardia, sepsis, thyroid disease, anaemia, significantly worsening renal function etc.

1. Suitable patients to be identified by a member of the heart failure team.
    i. Documented weight gain associated with peripheral oedema and/or orthopnoea
    ii. Suspicion of gut oedema
    iii. Not attributable to other cause (see above)
    iv. No exclusion criteria (see table 1)
2. The ANP-HF should ensure that reversible causes of cardiac decompensation have been excluded.
3. The patient and carer (if relevant) should be made aware of the aims of treatment, accepts, and is suitable for administration of IV Furosemide as an ambulatory patient in the CPAU.
4. The patient should have social support including someone to drive them to FVRH.
5. Patients need to be sufficiently mobile to go to the toilet in CPAU (note CPAU facilities and staffing).

Table 1

Exclusion criteria (if any exclusion criteria evident discuss with Consultant Cardiologist)
Baseline Creatinine >250
Baseline Sodium <125
Baseline Potassium [K+] < 3.5mmol/l or > 5.5 mmol/l
Systolic blood pressure (BP) <90mmHg
Evidence of acute coronary syndrome or haemodynamically significant arrhythmia
Significant abnormality of liver function (3x normal level of AST or ALT) or low serum protein levels.

Infusion documentation

IV diuretic administration should be directed towards achieving a defined goal, for example the attainment of a target weight, a defined weight loss or specific symptom improvement (efficacy threshold). Routine monitoring of weight/urine output may be used to guide treatment response.

The dose of Furosemide in a continuous infusion will be decided by the prescriber (Doctor or Non Medical Prescriber) according to blood pressure and renal function – see Table 2.

Table 2

Option 1			
Furosemide	120mg	IV	Infusion duration – 2 hours Post infusion observation – 2 hours Total length of stay 4 hours

Option 2			
Furosemide	240mg	IV	Infusion duration – 4 hours Post infusion observation – 2 hours Total length of stay 6 hours

Note: A higher initial diuretic dose may be considered in individual patients in whom effective dosing was known from prior treatment.

Option 1

Continuous infusion:
Assessment: BP ≥85-90 systolic, renal function checked (see Table 1)
Ensure oral diuretics (Furosemide, Bumetanide or Torasemide) have been omitted
Cannulation undertaken

Day 1: Furosemide infusion 120mg over 2 hours
Days 2-4: If diuresis of 1-2 litres or weight loss of 1-2 kg per day continue the initial dose

If diuresis of < 1 kg per day increase by 40mg/day
If diuresis of > 2 kg per day reduce by 40mg/day.

See additional safety thresholds Tables 3 & 4.
Note that if dosage increases, consideration should be given to increasing the administration time.

Day 4: Review/discuss with supervising clinician (maximum dose 240mg/4 hours in CPAU

Continue adjunctive diuretics to enhance diuresis (e.g. Metolazone/Bendroflumethiazide) and Aldosterone Antagonists. Selected patients may require their dose of ACE inhibitor to be reduced.

STOP infusion if:
- Target weight/desired weight loss and symptom improvement achieved (efficacy threshold)
- Safety threshold crossed (see Tables 3 & 4)

Option 2

Continuous infusion:
A higher initial IV diuretic dose may be considered in individual patients in whom effective dosing was known from prior treatment.

Assessment: BP >90 systolic, renal function checked (see Table 1)
Ensure oral diuretics (Furosemide, Bumetanide or Torasemide) have been omitted
Cannulation undertaken

Day 1: Furosemide infusion 240mg over 4 hours
Days 2-4: If diuresis of 1-2 litres or weight loss of 1-2 kg/day continue the initial dose
If diuresis of >2 kg per day reduce by 40mg/day.
See additional safety thresholds Tables 3 & 4.

Day 4: Review/discuss with supervising clinician (maximum dose 240mg/4 hours in CPAU)

Continue adjunctive diuretics to enhance diuresis (e.g. Metolazone/Bendroflumethiazide) and Aldosterone Antagonists

STOP infusion if:
- Target weight/desired weight loss and symptom improvement achieved (efficacy threshold)
- Safety threshold crossed (see Tables 3 & 4)

Monitoring documentation

The following aspects of monitoring should be carried out daily:

1. Symptom response (relief of oedema and/or orthopnoea)
2. Weight response (baseline, target and achieved)
3. BP response
4. Cannula site inspection
5. Renal biochemistry should be carried out daily initially but may be reduced to alternate days

Safety thresholds

Table 3

Consider reducing dose of IV therapy (and discuss with Consultant Cardiologist)
Creatinine >250mmol/l. Consider reduction in ACE I/ARB
Potassium [K+] <3.3mmol/l or >5.5 mmol/l

Table 4

Consider discontinuing IV therapy (and discuss with Consultant Cardiologist or consider admission if)
Creatinine >50% above baseline or >300mmol/l
Potassium [K+] <3.0mmol/l or >6.0 mmol/l
Systolic blood pressure (BP) <85mmHg (if symptomatic)
Evidence of acute coronary syndrome or haemodynamically significant arrhythmia
Significant abnormality of liver function (3x normal level of AST or ALT) or low serum protein levels.

Adjustment to concomitant medication documentation

Oral loop diuretics should be omitted on the days that the patient is attending CPAU for IV diuretic therapy. Changes to baseline medication should be documented.

Treatment outcomes

Successful intervention

Symptom improvement and/or achievement of target and/or dry weight.

Unsuccessful intervention

Refractory oedema, symptoms or abnormal haemodynamic or biochemical parameters.

CPAU staff responsibilities

1. Ensure that oral loop diuretics have not been taken on the morning of admission.
2. Initial and subsequent venepuncture, IV cannulation and care.
3. Liaise with ANP-HF if safety thresholds breached.
4. Post-treatment letter to GP.

ANP-HF responsibilities

1. Ensure that patient has been asked not to take oral loop diuretic on morning of admission to CPAU.
2. Be available for advice as required (e.g. to re-evaluate treatment goals and advise on response to monitoring variable BP, blood chemistry)
3. Be available to review patient and/or provide advice to the CPAU team as required.
4. Ensure there is ongoing communication with the patient and their carer(s) regarding progress and outcome.
5. Ensure there is ongoing communication with colleagues regarding treatment plan, progress and outcome.
6. On completion of IV diuretic schedule, advise regarding dose of oral diuretic to be recommenced.

Guidance compiled by the Heart Failure Team in conjunction with staff from CPAU

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