Croydon Health Services NHS
NHS Trust

GUIDELINE FOR MANAGEMENT OF PATIENTS WITH AN EXACERBATION OF CARDIAC FAILURE WITH IV/SC FUROSEMIDE IN THE COMMUNITY

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Name and Title of originator/author:	Nicola Gass
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Acknowledgements	Jo Hedgecox Dimitrios Karagkounis Misha Pattani
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EXECUTIVE SUMMARY

This document aims to outline how Community Services will be able to effectively manage people with confirmed heart failure who are symptomatic, by administering IV/SC Furosemide once oral diuretic and adjustment to cardiac medication have been exhausted. Without this, individuals would deteriorate and required an acute admission to hospital. Data from the British Heart Foundation (BHF) shows that IV Furosemide in the community is not only more cost effective it is the preferred place of care of patients (British Heart Foundation, 2015)

Whilst unlicensed for subcutaneous use, SC Furosemide has been widely used for out-of-hospital treatment of Heart Failure patients with good results (Trusts include: Doncaster and Bassetlaw Teaching Hospitals, Scarborough Palliative Care and Heart team, NHS Highlands, Northumbria Healthcare NHS Foundations Trust, Northwest Coast Strategic Networks, York and Scarborough Teaching Hospitals NHS Trust, Harrogate and District NHS Foundation Trust among others). When prescribed, this route will be discussed with the patient/NOK and consent obtained and then recorded in Cerner.

Heart Failure is a complex long term condition associated with fluid accumulating in lower limbs, abdomen, sacral area and lungs resulting in swelling, fluid leakage, development of blisters/wounds, and shortness of breath. In extreme cases, this can lead to respiratory distress, hypoxia and organ failure if not treated (British Heart Foundation, 2021).

It is estimated that 1 million hospital bed days or 5% of all emergency admissions are a due to heart failure (National Institute for Cardiovascular Outcomes Research, 2021). The average cost for each admission is £3796 (BHF, 2015). In Croydon, there were 335 admissions in 2019 costing approximately £1,271,669 and in 2020 there was 252 admissions accounting for £956,592 (Croydon CCG, 2021).

Many people with heart failure have other underlying disease and co – morbidities such as Chronic Kidney Disease or Diabetes (Buddeke et al, 2019). For these people any admission to hospital poses an additional risks such as developing a Hospital Acquired Infection (HAI) accounting for 6.4% of all admissions (NICE, 2014), or delirium which is (estimated to be present in 1 in 3 patients admitted to hospital) or the associated risk of pressure ulcers, and fall risk all of which could increase length stay or worse premature death (NHS England, 2021; NICE, 2019)

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INTRODUCTION

~~Croydon is a joint acute and community trust~~ Croydon is an integrated trust that works in partnership to provide acute and chronic care for its community. Prior to the COVID 19 pandemic Croydon Health Services was starting to move towards a more hospital at home service. The pandemic highlighted the need for an IV diuresis service to co – exist within the Rapid Response team and the Integrated Heart Failure Team

Clinicians in the Integrated Heart Failure Team, Community Geriatrician, Cardiologist, Rapid Response and Complex Care Service will work collaboratively to assess, prescribe, administer IV/SC Furosemide, and monitor patient remotely with Telehealth in order to provide appropriate medical intervention at the patient's home thus reducing the need for an emergency hospital admission.

Heart Failure is a complex long-term condition associated with fluid accumulating in lower limbs, abdomen, sacral area and lungs resulting in swelling, fluid leakage, development of blisters/wounds, and shortness of breath. In extreme cases, this can lead to respiratory distress, hypoxia and organ failure if not treated (British Heart Foundation, 2021).

Many people with heart failure have other underlying disease and co – morbidities for which any admission to hospital poses additional risks such as a Hospital Acquired Infection which has an estimated prevalence of 6.4% of all admissions (NICE, 2014), or the development of delirium which is estimated to be present in 1 in 3 patients admitted to hospital and the associated risk pressure ulcers and falls risk thus increasing the length of stay or worse premature death (NHS England, 2021). With COVID – 19 now in the community people with heart failure are at higher risk of becoming seriously ill with COVID if they were to develop it (BHF, 2021; Public Health England, 2020).

The British Heart Foundation recognises the need for IV diuresis in the community. Data from the BHF and 10 NHS organisations in a community IV service identified that

- 79% of patient did not need a hospital admission
- £3013 per patient saved when compared to a hospital admission (£793 for community IV diuresis compared to £3796 in hospital)
- 63% of patients achieved their target reduction in weight loss or oedema
- 100% of patient and 93% of carers preferred the community based treatment

(British Heart Foundation, 2015)

With the evidence, pointing to the clear benefits of diuresis in the community NHS England have developed *'Guidelines for the administration of Intravenous and Subcutaneous diuretic for heart failure patients in the community setting'.* This has been adapted to meet the needs for Croydon by the Consultant Cardiologist, Community Geriatrician, Integrated Heart failure Nurses, Rapid Response Clinician and Senior Pharmacists.

For individuals who are not responding to oral diuretics and in an exacerbation of fluid overload, they will be assessed, and have bloods taken. If the patients' bloods are not deranged a plan will be put in place to commence IV/SC Furosemide with continuous monitoring of the vital signs (blood pressure, respiratory rate, pulse rate, oxygen saturation and skin temperature) by a telehealth clinician. Without this, individuals would deteriorate to a degree where the only treatment would be an acute hospital admission.

PURPOSE

The purpose of this policy is to support clinicians in the Integrated Heart Failure team, Community Geriatrician, Cardiologist, and the Rapid Response Service who will work collaboratively to assess, prescribe, administer IV/SC Furosemide and monitor vital signs (including weight) via the telehealth service. It will be aimed at those patients in fluid overload who have exceeded their maximum does of oral diuresis with little or no effect being achieved and are not clinically in acute pulmonary oedema.

Inclusion Criteria

- Over 18 years old
- Have a confirmed heart failure diagnosis (Preserved or Reduced ejection fraction)
- Suitable for IV access with a cannula
    - S/C Furosemide – suitable for s/c administration or may not have suitable IV access
- Ability to be weighed safely
- Ability to manage Telehealth equipment independently or with support from carers/family
- Able to consent or best interest decision made
- Able to access toilet facilities safely
- Have fluid retention with peripheral oedema extending above the knee or have a 3kg weight gain above their dry weight
- eGFR >25ml/min and stable for the preceding 2 months(unless direct involvement from specialist cardiology)
- Registered with a Croydon GP

Exclusion Criteria

- Under 18 years old
- In an acute mental health crisis
- Is an IVDU (IV Drug User) (Not an exclusion for S/C furosemide)
- Inability to obtain IV access (Not an exclusion for S/C furosemide)
- Hypotension with a systolic blood pressure below 110mmHg unless discussed with consultant or unstable hypotension
- Symptomatic hypotension
- Not registered with a Croydon GP
- Patient does not consent to treatment

DEFINITIONS

ANNT – Aseptic Non-Touch Technique

Cardiac assessment
This is a detailed cardiac assessment carried out by a trained clinician and will include

- Blood Oxygen Saturation
- Manual Pulse Rate
- Heart Sounds
- Chest Auscultation
- JVP
- Blood Pressure
- Peripheral oedema assessment including sacral/limbs/ascites
- Weight (could be done by telehealth if suitable)

Community Geriatrician
Community Geriatrician who works primarily in the community supporting & overseeing the Rapid Response Team / Complex Care Team / LIFE (Living Independently for Everyone).

eGFR (estimated glomerular filtration)
A test that is used to estimate kidney function calculated from age, sex, and blood creatinine levels (Tidy, 2017)

Heart Failure
Heart failure is when the ability of the heart to maintain the circulation of blood is impaired (NICE 2018)
Chronic heart failure can be classified according to ejection fraction

- Heart Failure with a reduced Ejection Fraction (HFrEF): LVEF ≤ 40%.
- Heart Failure with a mildly reduced ejection fraction (HFmEF): LVEF 41-49%;
- Heart failure with a preserved Ejection Fraction (HFpEF): LVEF ≥ 50%;

(European Society of Cardiology, 2021)

Fluid Overload
When there is more fluid in the system than the heart can effectively cope with. Fluid overload (hypervolemia) occurs when the circulating volume is excessive resulting in fluid building up in the lungs (pulmonary oedema), lower leg, abdomen & sacrum (Knott and Tidy, 2019)

Hospital acquired infection / healthcare-associated infections
Infections that are not present or incubating at the time of admission to a hospital or medical intervention. These are common infections such as catheter-associated urinary tract infections, central line-associated bloodstream infections, surgical site infections, ventilator-associated pneumonia, hospital-acquired pneumonia, and Clostridium difficile infections, MRSA (Monegro, et al, 2020) or COVID.

Independent Non-Medical Prescriber
Independent prescribers are practitioners who have completed an Independent prescribing course (V300) and are responsible and accountable for the assessment of patients who they are treating in a clinical environment providing a clinical management plan including prescribing (NICE, 2021)

Integrated Heart Failure Team
A team of specialist Heart failure nurses working across the borough of Croydon to support/manage patients with diagnosis of heart failure (HFrEF/HFmrEF) who have a Croydon GP. They provide community nurse-led clinics, home visits and support in the acute setting. This includes a dedicated Heart Failure Consultant and Heart failure clinical fellow

Intravenous Administration
Administration of medication into the venous system of a patient. There is a separate trust policy '*policy for the administration of intravenous drugs and fluids via a peripheral cannula or central catheter'* that need to be followed in conjunction with this.

Palliative Care
Palliative care is an approach that aims to improve the quality of life of patients and their families who are facing life-limiting illness such as cardiovascular disease. It offers a support system to help patients live as actively as possible until death through patient cantered care (World Health Organisation, 2020).

Pulmonary Oedema
Pulmonary oedema is an excess of watery fluid in the lungs.
People with sudden onset of pulmonary oedema usually need urgent admission to hospital. Treatment includes oxygen, medicines (to remove the excess fluid) from the lungs (diuretics), and other medicines to help the heart work more effectively. (Harding and Cox, 2018)

Rapid Response
An admission avoidance service available 24 hours a day, 7 days a week. The service provides intensive nursing and therapy interventions to prevent exacerbations and in a crisis. All patients are seen within 2 hours to stop an unnecessary hospital admission. Patients are assessed and a health and/or social package of care is set up to enable the patient to remain at home or they may be admitted to an Intermediate Care bed if they cannot be supported safely at home but do not require admission to hospital.

Patients who require rapid response support and can be diverted from an acute admission
- Have potential to be managed at home with additional support
- Are medically stable
- Do not require inpatient medical care
- Are registered with a Croydon GP
- Aged 18 years and over (Croydon Health Services, 2014)

Subcutaneous Administration
Adminitstration of a medication into the subcutaneous tissues using a suitable needle or cannula.

Symptomatic hypotension
The symptomatic lowering of blood pressure upon standing. Symptoms are usually due to an impaired autonomic response. It is a sustained reduction of systolic blood pressure of at least 20 mmHg or diastolic blood pressure of 10 mmHg, (Freeman et al. 2020).

Remote monitoring (Telehealth)
Remote monitoring system that a patient wears in which data is sent electronically to current health system and a telehealth clinician can monitor patient vital signs (breathing and pulse rate, blood pressure, skin temperature, movement and weight) remotely from the hours 8am – 8pm

Urgent Care Plan
The Urgent Care Plan (UCP) is an NHS service that enables every Londoner to have their care and support wishes digitally shared with healthcare professionals across the capital.
A care plan is created following a conversation between a healthcare professional (such as a doctor or nurse) and the person in their care. The care plan is then created following this conversation using the Urgent Care Plan. As soon as information is saved on the plan, it is visible to all health and care services who use it. This includes the London Ambulance Service, 111 and Out of Hours GP services who may see the person in an emergency. (ucp.onelondon.online, 2022)

VIP
Visual Infusion Phlebitis Score (Appendix C), a tool used for the early identification of phlebitis (Tzols 2014).

RESPONSIBILITIES

Trust Responsibilities

The Chief Executive for Croydon Health Services NHS Trust has overall accountability for the trust and that policies are written in accordance to NHS England guidelines and current legislation

The Medical Director has overall responsibility for Medicines Management in the Trust.

Responsibility of the Doctor/ Non-medical prescriber

It is the responsibility of the prescriber (Doctor / Independent prescriber) to ensure that IV/SC Furosemide is prescribed in accordance with Trust approved medicines guidelines and should be only prescribed once all oral diuretics have been exhausted.

Acute pulmonary oedema should be considered an exclusion criterion for home treatment with intravenous furosemide, and such cases should be managed in an acute hospital setting. In some cases where acute pulmonary oedema is present, admission to hospital may not be appropriate (for example at the end of life, or where a treatment escalation plan states the ceiling of treatment is home based treatments only). In such cases intravenous furosemide may be considered at the discretion of the lead clinician with appropriate discussions regarding anticipatory care being in place

It is the responsibility of the prescriber to ensure intravenous/subcutaneous prescriptions are reviewed regularly at least once every 72 hours along with U&E's on alternate days (or sooner if clinically indicated) and daily weights. The prescription must be changed to an oral route at the earliest clinically appropriate opportunity.

In the case of SC furosemide, the prescriber will discuss the unlicensed route of administration with the patient/NOK to obtain consent and this will be documented in Cerner/EMIS.

To maintain safe management of intravenous/subcutaneous therapies, the prescriber should not be administering the IV/SC furosemide.

The dose of furosemide should be recorded on EMIS under the medication section but marked as "Not Issued" for record purposes.

Any changes to the dosage must be clearly documented by the prescriber on EMIS, recorded on the community medication administration record (MAR) chart and verbally communicated to any team members involved in the administration of the drug.

Responsibility of practitioner administrating IV/SC Furosemide

The administration of the IV/SC furosemide is not to be delivered by the prescriber of the treatment, in order to promote and maintain safe management of intravenous therapies.

It is the responsibility of the nurse administrating the Furosemide to have completed the trust's IV/SC therapy training and be competent in this skill. The nurse is responsible in adhering to the *administration of intravenous drugs and fluids in adults via a peripheral cannula*' policy as well as this ensuring that:

a) That it is essential and safe for Furosemide to be given intravenously or subcutaneously. Practitioners are to complete a full set of observations prior to administration, if BP is below 110mmHg systolic (or lower only

if specified by prescriber) the nurse will need to discuss with prescriber/doctor if administration of Furosemide is still required.
b) For IV furosemide,That an established intravenous line is demonstrably patent when flushed with 0.9% sodium chloride for IV administration using ANTT as stipulated in section 5.3.3 of the policy for '*the administration of intravenous drugs and fluids in adults via a peripheral cannula*'
c) The use of mid-line, central catheter can only be used if discussed and agreed with the clinician responsible for the catheter.
d) That compatibility exists between the infusion fluid and medication, which are to be administered in accordance to MEDUSA
d) The prescription on EMIS must provide clear instruction to the designated practitioner. The prescription must match the dose stated on the MAR chart. Any discrepancies must be queried.
e) The patient can be clearly identified (Name/DOB/Address/NHS Number/Allergies) as stipulated in section 5.2 of the policy for '*the administration of intravenous drugs and fluids in adults via a peripheral cannula*'
f) In the event of a drug reaction the nurse administering needs to administer appropriate immediate and urgent care depending on the nature of the reaction, document clearly, complete a trust incident report, and yellow card.

Practitioners who are administering the IV/SC Furosemide are to review all telehealth data and complete a full Cardio-Respiratory physical assessment during the visit and will need to stay with the patient for a minimum 30 minutes after administration (or 30mins after commencement of administration for SC furosemide). Practitioners from the Rapid Response Hospital at Home team are responsible for ensuring this review and to clearly document outcomes.

When administering IV Furosemide via a peripheral cannula, clinicians are responsible for reviewing the insertion site and document using a Visual Infusion Phlebitis (VIP score) at each visit (appendix C). The cannula should be removed when complications occur or as soon as it is no longer required (Loveday et al, 2014).
Sites for SC administration are restricted in heart failure patients - suitable sites include the upper chest or the upper anterior aspect of the arms and should not include:

1. Oedematous areas
2. bony prominences
3. areas where tissue is damaged as absorption may be reduced.

The site should be changed every 72 hours (or sooner if signs of irritation)

The administration of IV/SC furosemide must be recorded utilising the IV medication administration template on EMIS and community MAR chart.

PROCESS/PROCEDURE /COURSE OF ACTION REQUIRED

Who can be referred?

Adult patients under the care of

- Heart failure team
- Rapid Response Hospital at Home / Virtual Ward (acute hospital referrals will come through this team)
- Complex Care Team

who also demonstrate features of congestive cardiac failure / fluid retention AND where patients are not responding to increased oral diuretics -

(Fluid retention as evidence by peripheral oedema extending above the knee and /or weight gain of > 3kg above dry weight combined with suggestive symptoms and signs of fluid overload. (Criteria appendix D))

Contra-indications	Cautions
- Hypersensitivity to loop diuretics or excipients - Hypovolaemia - Dehydration - Severe hypokalaemia K+ < 3.3mmol/L - Severe hyponatraemia Na+ < 130mmol/L - Comatose or pre-comatose states associated with liver cirrhosis - Anuria or renal failure due to nephrotoxic or hepatotoxic drugs - Addison's disease - Breast feeding - Sympomatic hypotension	- Hypotension <110 mmHg - Prostatic enlargement or impaired micturition - Gout - Diabetes - Hepatic impairment - Renal Impairment - Pregnancy - Pancreatitis/history of pancreatitis - Systemic lupus erythematosus - Hypoparathyroidism - Hypokalaemia

Initiation

- Aim to reduce symptoms of congestion and achieve dry weight (actual / estimated) with lowest achievable dose of diuretic.
- The dose must not be altered for 72h after initiation or dose adjustment, unless authorised by the lead consultant.
- Ensure the following initial assessment have been carried out prior to initiating/increasing/decreasing loop diuretics:

  - Baseline observations
  - Dry Weight
  - Weight history & current weight
  - Cardiovascular system physical assessment
  - Chest physical assessment
  - Ensure the patient is not in acute pulmonary oedema
  - Estimate oral fluid intake and provide advice regarding fluid restriction if appropriate
  - Establish if cannulation can be achieved and infusion site does not display signs of infection
  - Assess if suitable for telehealth/remote monitoring
  - Obtain U&E'S / FBC / LFT / CRP
  - Check medication history/concordance/ blister pack concerns. If oral diuretic or stopped medication is in blister pack, consider options to omit doses. Contact the chemist/ ICN pharmacist for further advice if needed.
  - Consider obtaining a baseline NT-pro BNP if not previously done as prognostic marker (must be ordered by patient's GP).
  - Escalation plan is in place

Oral loop diuretics [furosemide, bumetanide and torasemide (for patients under the HF

team)] must have been initiated and optimized before considering intravenous/subcutaneous furosemide unless authorized by the lead consultant (who must document the reason for this). The dose of oral loop diuretic must be adjusted, particularly after restoration of dry weight, to avoid the risk of renal dysfunction and dehydration.

Thiazide-like diuretics (metolazone, indapamide, bendroflumethiazide) can be used concomitantly with IV/SC furosemide to take advantage of their synergistic effect. Such decision will rest with the doctor / non medical presciber, depending on clinical improvement as well as biochemical and haemodynamic monitoring.

- Commence IV/SC furosemide at the equivalent dose or increase by one dose increment if clinically appropriate, as indicated in the table below, no later than 4pm
- PO diuretics have approximately 50-60% bioavailability with wide interpatient variability vs. IV diuretics which have 100% bioavailability.
- Maximum rate of IV furosemide administration is 4mg/min.
- Dilute if necessary in sodium chloride 0.9%. Glucose solutions are unsuitable.

Table 1. Diuretic equivalent doses (total daily doses)

PO furosemide	PO bumetanide	IV/SC furosemide	Infusion time
40mg	1mg	40mg	15 mins
80mg	2mg	80mg	20 mins
120mg	3mg	120mg	30 mins
160mg	4mg	160mg	40 mins
200mg	5mg	200mg	50 mins
240mg	6mg	240mg	60 mins

Subcutaneous infusion:

Average dose range is 80-120mg over 24 hours however doses as high as 240mg/24 hours may be required in some patients.

- Doses greater than 240mg/24 hour need consultant (palliative or cardiology) advice.
- Doses greater than 240mg/24 hours may need two syringe drivers due to infusion volume.

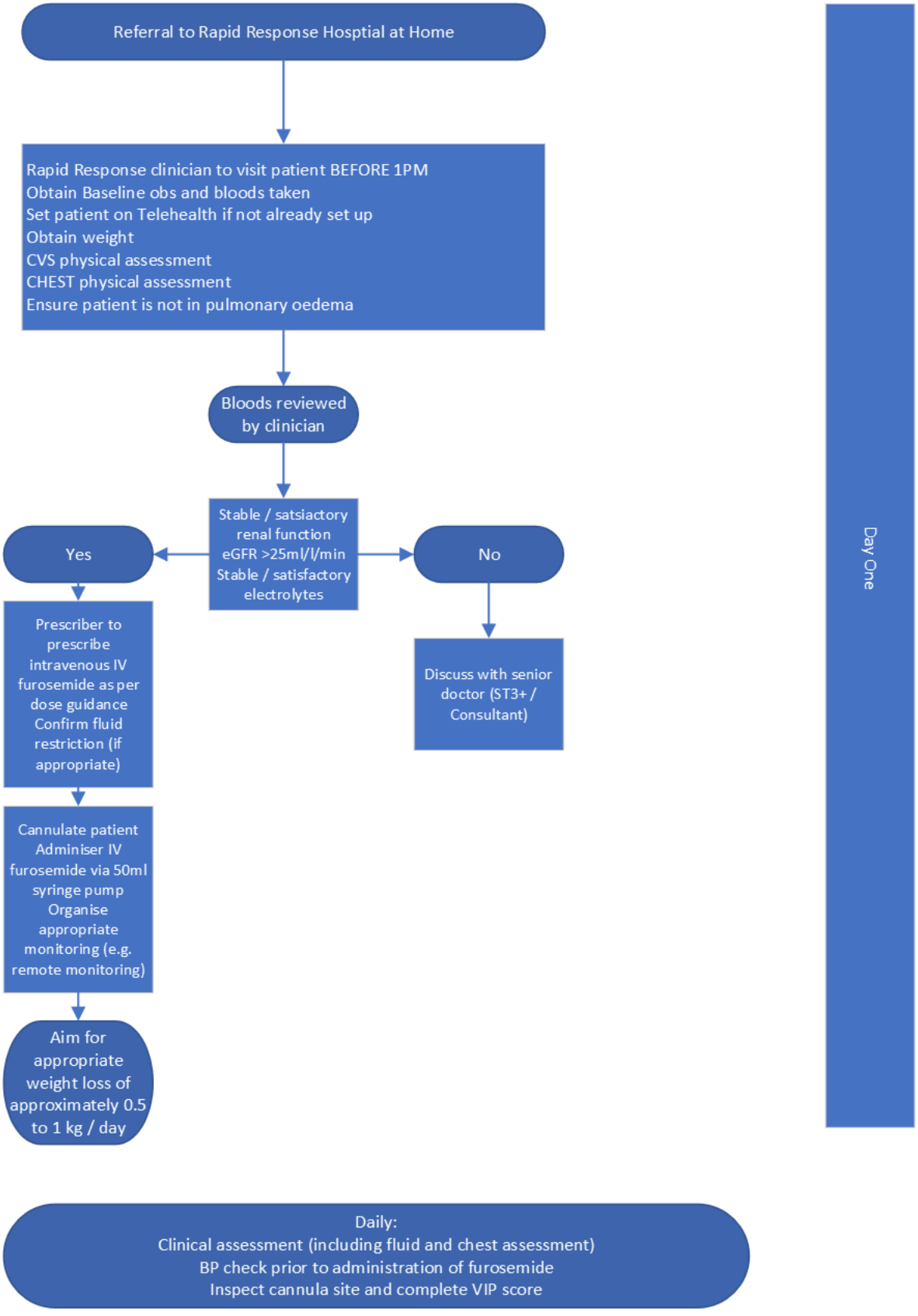
Setting up the syringe driver:

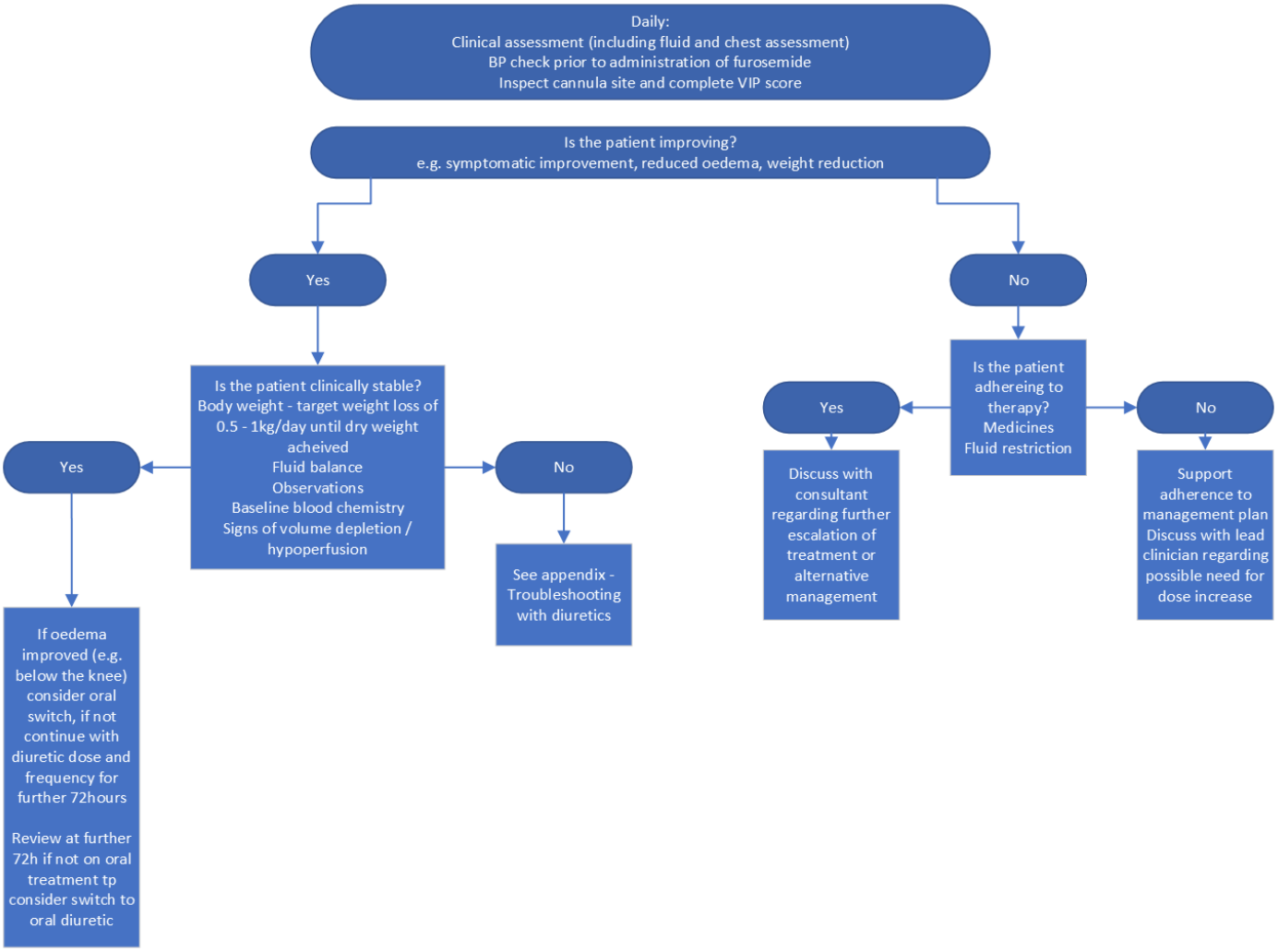
- Follow local policies and procedures for syringe driver and subcutaneous medicines.
- Drug stability – exposure to light may cause degradation and discoloration, the solution should not be used if a yellow colour is present.
- MUST NOT be diluted in glucose solutions

Undesirable Effects:

- Transient pain at site of subcutaneous injection
- Localised skin reactions (swelling, erythema) – occurred in 3/21 cases recalled by health professionals in a recent regional survey
- Headaches, dizziness, fever, weakness, restlessness, blurred vision, deafness (although this is usually after rapid IV injection)

PROCESS


Referral to Rapid Response Hosptial at Home
Rapid Response clinician to visit patient BEFORE 1PM
Obtain Baseline obs and bloods taken
Set patient on Telehealth if not already set up
Obtain weight
CVS physical assessment
CHEST physical assessment
Ensure patient is not in pulmonary oedema
Bloods reviewed by clinician
Stable / satsiactory renal function eGFR >25ml/l/min Stable / satisfactory electrolytes
Yes
No
Prescriber to prescribe intravenous IV furosemide as per dose guidance Confirm fluid restriction (if appropriate)
Discuss with senior doctor (ST3+ / Consultant)
Cannulate patient Administer IV furosemide via 50ml syringe pump Organise appropriate monitoring (e.g. remote monitoring)
Aim for appropriate weight loss of approximately 0.5 to 1 kg / day
Day One
Daily:
Clinical assessment (including fluid and chest assessment)
BP check prior to administration of furosemide
Inspect cannula site and complete VIP score



ESCALATION

Discuss the patient's presentation with the consultant and seek further advice as indicated in Appendix E 'Troubleshooting with IV diuretics' and in the following circumstances:

- Severe peripheral oedema e.g. significant pitting oedema beyond knee level
- Substantial rapid weight gain i.e. 1.5-2kg over 2-3 days
- If poor response or dry weight not achieved after 6 days of increased dose therapy
- Symptoms of breathlessness increased with evidence of pulmonary oedema/effusion

Discharge from RAPID RESPONSE

For ongoing referrals post-discharge from the Rapid Response service the following will be arranged (Appendix D)

- Ongoing self-management plan for patient to follow, including when to seek medical assistance
- Consider need to arrange follow up (for example with Heart Failure Specialist Nursing team or general geriatric medicine clinic) – discuss with lead clinician
- A detailed discharge summary of all interventions given will be emailed to the relevant follow up service. This will include the most recent blood results and full list of current medications.

IMPLICATIONS

Trust

- Financial Implication of both delivering the service at home, as well as impact on hospital admission
- Inappropriate use of resources
- Liability

Patient

- Avoidable hospital admission
- Risk associated with a hospital admission – infection / delirium / fall / deconditioning
- Delayed treatment – worse patient outcome
- Worsening of symptoms – breathlessness, cardiac dysfunction, death

Professional

- Breach of contract
- Liability
- Working outside competence & not in accordance to their professional body

Exceptions

- IV Competency assessment prior to using this policy
- Trained practitioners to utilise this policy – Doctors' & Nurses within the relevant teams
- Cut off time for referrals to rapid response is 12pm to facilitate supply of medication if required that day
- Yearly IV therapy training for all practitioners administering the Furosemide

MONITORING AND COMPLIANCE TRAINING

Element to be monitored	**Lead**	**Tool**	**Frequency**	**Reporting arrangements**	**Acting on recommendations and Lead(s)**	**Change in practice and lessons to be shared**
(What needs Monitoring)	(Who will lead on this aspect of monitoring)	(What tool will be used to monitor/check that everything is working according to this element of the policy)	(How often will we need to monitor)	(Who or what committee will I report the results to for information and action)	(Who will undertake the action planning for deficiencies and recommendations)	(How will changes be implemented and lessons shared)
Admission rates	Nicola Gass & Maria Knopp		6 monthly	Clinical Governance	Nicola Gass & Maria Knopp	
Number of patients receiving IV diuresis	Nicola Gass		6 monthly	Clinical Governance	Nicola Gass	
Staff Competencies	Nicola Gass		Yearly	Learning & Development	Nicola Gass	
Medication safety & supply	Misha Pattani / Dr.Heitz		6 monthly	Medicine management committee	Dr Heitz / Misha Pattani	
Patient outcome's	Grace Williams & Joanne Rungusumy		3 monthly	Clinical governance committee Patient feedback Questionnaires	Grace Williams & Joanne Rungusumy Nicola Gass	

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IV diuretics The BHF's IV diuretics programme delivers intravenous therapies to people with heart failure either in the community or in people's own homes. It is a nurse led programme, which links with wider heart failure care packages. It has been shown to improve patient outcomes and reduce hospital admissions. Where does it help? (the system pathway) Where does it help? (the patient pathway) What type of activity? System redesign. (n.d.). [online] Available at: https://richmondgroupofcharities.org.uk/csdownload?n=105 [Accessed 10 Oct. 2022].

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ASSOCIATED DOCUMENTATION

List documents that relate to this, such as related Trust policies and Procedures.

VERSION HISTORY TABLE

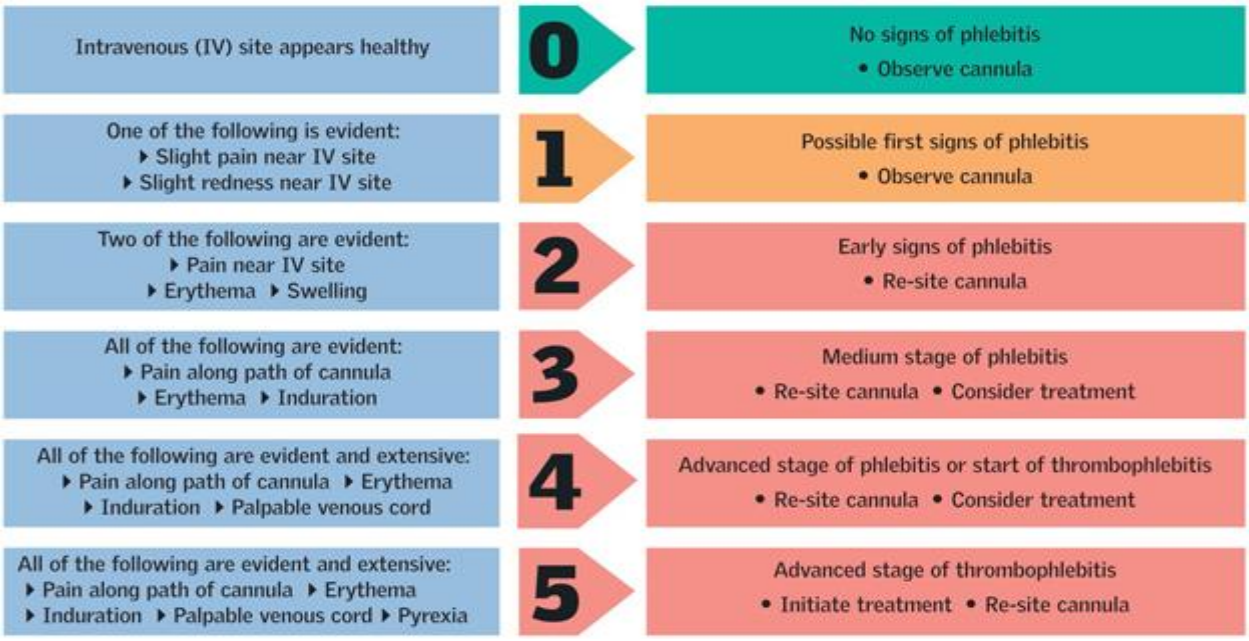
Version	Date	Author	Ratified by	Comment/Reason for change
1.0	August 2023	Nicola Gass	MMC	N/A

APPENDIX B – CONSULTATION TEMPLATE

1.	Procedural Document's Name:	GUIDELINE FOR MANAGEMENT OF PATIENTS WITH AN EXACERBATION OF CARDIAC FAILURE WITH IV FUROSEMIDE IN THE COMMUNITY	
2.	Procedural Document Author:	Joanne Hedgecox, Nicola Gass	
3.	**Group/Committee Consulted**		**Date**
	Medicine Management Committee		July 2023
4	**Name and Title of Key Individuals Consulted**		**Date**
	Joanne Hedgecox Rapid Response Matron		
	Dr. Elizabeth Heitz Community Geriatrician		
	Dimitrios Karagkounis Lead Pharmacist- Acute Medicine		
	Aisling Vaugh Operational Manager Transformation of Adult Community Services		
5	Comments received **MMC comments** -Who is being envisaged to be the prescriber of the Furosemide in the community? If NMP, need to check if this is within their scope of practice and if a PGD is required for governance assurance. The prescribers will be doctors working within the community geriatrics team. It is not envisaged that this will be prescribed by NMPs working within Rapid Response/ Virtual Ward as they will be responsible for administering IV furosemide and we want to ensure a division between the two functions. A PGD will not be appropriate for this type of service -Is it possible to clarify what other medications are expected to have been 'exhausted' before IV Furosemide is considered? I appreciate that the focus here seems to be acute CCF management as opposed to chronic treatment plans pp. 11-		

	12 Clarification of oral diuretic options to be used before and alongside IV furosemide in the community setting added -Is eGFR the appropriate measure here or should CrCl be the measure used? The virtual ward team will be using a combination of CRS Millennium & EMIS. Renal function on both of these systems is reported as eGFR, not CrCl, thus this has been chosen to triage referrals. With regards to monitoring of patients while on IV furosemide, decisions will be based on serum creatinine (see appendix D)

APPENDIX C – The Visual Infusion Phlebitis score (VIP scale)



APPENDIX D – REFERRAL AND DISCHARGE PATHWAY FOR HEART FAILURE PATIENTS REQUIRING OFFLOADING

Rapid Response to ensure patient safe for ongoing intervention
Systolic BP >110mmHg (or patient specfic limit)
Creatinine <25% increase from baseline

↓

Clinical Features of increased congestion and fluid retention:
Increase in weight e.g. 1.5-2kg in 2-3 days
Increase in peripheral or sacral oedema
Worsening ascites
Worsening dysponea
Worsening paroxysmal Noctural Dyspnea (PND) / Orthopnea

↓

Initial assessment:
Body Weight
Fluid balance (intake and output) HR, BP (lying and standing), JVP, O_2 sats
Baseline blood chemistry (serum creatinine, potassium, sodium & eGFR)
Ejection Fraction (if available) Medication Review

↓

No confirmed HF diagnosis
Ensure plasma NT-proBNP, Echo and secondary care HF team follow-up arranged (one stop heart failure)
(Except for palliative patients)

Confirmed HFrEF diagnosis
Record current diuretics/maintenance therapy
Ensure referral back to heart failure team

Confirmed HFpEF diagnosis
Ensure appropriate plan and referral to complex care is made
(Except for palliative patients)

↓

Management plan for off loading by referring medical team**
AIM = Symptom relief, oedema reduction, and achieve dry weight (actual / estimated) by adjusting:
1 Loop diuretic
2 Dose & Frequency
3 Route
4 Duration
***RR Hosptial at Home Consultant will assess and change if necessary*

Referrals are accepted from the acute trusts and community heart failure nurses for patients with a Croydon address, Croydon GP or both only

APPENDIX E – TROUBLESHOOTING WITH IV DIURETICS

Trouble shooting with IV Diuretics	
Target weight loss not achieved	• Ensure patient adhering with medications and is observing fluid restriction of 1.5L on day before increasing diuretics. • Up-titrate dose of diuretics in increments of furosemide 40mgwith a target weight loss of 0.5-1kg per day until dry weight achieved. • • Consider addition of a mineralocorticoid receptor antagonist (MRA) or increasing dose of MRA after discussion with the specialist heart failure team or the Rapid Response consultant team. • *NB. While patients are requiring IV diuretic therapy, Rapid Response will continue to treat and administer medications based on a clear management plan including, frequency and duration.*
Signs of volume depletion and hypoperfusion: • Significant weight loss from dry weight (>1kg) • Rising blood urea (>5mmol/L or >25%) • Symptoms of dizziness e.g. postural hypotension or feeling "dried out"	• Dose reduction should be carried out by 40mg furosemide increments that are in reverse of the up-titration table (see above). Some patients may require smaller dose reductions e.g. 20mg furosemide. • • Review after 72h to assess response to dose reduction. If good response – continue on new dose, but if poor response – refer to escalation section *Do not reduce dose if there is peripheral oedema or JVP elevated. If the patient has a rising blood urea, falling weight and/or symptoms of dizziness/dehydration but peripheral oedema, seek advice from the specialist heart failure team or the consultant geriatrician team.*
Creatinine rise by >30% or eGFR rise by >25% from baseline	• Check for hypovolaemia/dehydration – assess volume status and consider dose reduction as above (as advised by HF team or consultant geriatrician) • Stop all nephrotoxic drugs e.g. non-steroidal anti-inflammatory drugs (NSAIDs), trimethoprim and over-the-counter (OTC) therapies • Consider whether an angiotensin-converting enzyme inhibitor (ACEi) or angiontensin II receptor antagonist (ARB) has been recently started / increased (a 30-50% rise in creatinine is expected and is usually temporary) - may need to return to previous dose of ACEi / ARB if recently increased to allow for offloading, then re-uptitrate after. • Consider if a MRA has been added recently – the dose of the MRA should be halved.
Blood and electrolyte disturbances	*Hypokalaemia (K^+ <3.5mmol/L):* • Monitor renal function daily • Discuss with the specialist heart failure team or Rapid Response consultant to consider uptitrating ACEi/ARB or MRA if BP allows, or prescribing K^+ supplementation. • Uptitration of an MRA may be preferable over the ACEi/ARB if further diuresis is required. *NB.* The serum K^+ level may overestimate total body K^+ stores *Hyponatraemia:* • Consider fluid restriction of 1L • Seek specialist advice if serum sodium falls below 130mmol/L (this is a poor prognostic indicator) *Hypomagnesaemia:* • Refer for specialist advice *Hyperuricaemia/gout:* • Treat gout attacks with colchicine. Avoid NSAIDs. *Increasing fasting blood sugar:* • Review for new diagnosis of diabetes
Asymptomatic hypotension e.g. SBP < 100mmHg	• Continue at current dose of furosemide, if patient is volume overloaded. • May reduce dose if fluid overload is improving
Symptomatic hypotension e.g. SBP < 100mmHg with dizziness, fainting, confusion	*If patient is volume overloaded:* • Consider temporary reduction in BP lowering agents to allow room for off-loading. Also consider time of day drugs are given i.e. move ACEi to the evening and keep diuretic in the morning. *If patient is euvolaemic or volume deplete:* • Reduce dose of diuretics by furosemide 40mg and review after 72h.