SESLHDMG/130

Medicine Guideline

Subcutaneous furosemide (frusemide) for end stage heartfailure with fluid overload in the dying patient

Areas where Protocol/Guideline applicable	SESLHD Inpatient settings (including Calvary hospital)
Authorised Prescribers:	Specialist Palliative Care Service
Indication for use	For management of refractory congestive cardiac failure and/or pulmonary oedema in end stage cardiac failure, when the oral route is no longer possible and the IV route is not appropriate or desirable.
Clinical condition	Continuing diuretic therapy is crucial to decrease the pulmonary fluid overload in a patient with end-stage heart failure on regular furosemide to minimise exacerbation of breathlessness and other symptoms associated with end stage heart failure.
Proposed Place in Therapy	When oral route for furosemide therapy no longer available and patient in terminal phase of illness.
Adjunctive Therapy	Frequently used in conjunction with opioids for dyspnoea management in end stage heart failure
Contra-indications	Allergy to furosemide or sulphonamides Anuric renal failure
Precautions	Fluid depletion Chronic Kidney Impairment
Important Drug Interactions	• Increased risk of hypokalaemia with corticosteroids, B agonists, theophylline, amphotericin. • Frusemide induced hypokalaemia increases risk of Digoxin toxicity, and other drugs which prolong QT interval. • Increased risk nephrotoxicity with NSAIDS. • Increased risk of Lithium toxicity. • Increased risk hypotension with ACE inhibitors and TCAs. • Increased risk hyponatraemia with carbamazepine.
Dosage (Include dosage adjustment for specific patient groups)	**Intermittent dosing:** initial dose 20mg once or twice daily subcutaneously Note doses greater than 20mg are unsuitable for intermittent dosing due to volume. **Continuous Subcutaneous Infusion (CSCI):** Adjust dose according to clinical response to a maintenance dose of 40 to 250mg daily (maximum 1g daily)

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Dose conversion for oral to subcutaneous route	A ratio of 1:1 between oral and subcutaneous routes should be used
Duration of therapy	As long as required for symptom control where oral or intravenous furosemide is inappropriate.
Prescribing Instructions	On the eMR or eRIC. In the absence of eMM systems, the appropriate paper medication chart may be used
Preparation	Furosemide 20mg/2mL ampoules Furosemide 250mg/ 25mL ampoules
Administration Instructions	Diluent: sodium chloride 0.9% Dilute to a maximum concentration of 10mg/mL: Maximum 190mg in 20mL syringe. Maximum 240mg in 30mL syringe using a Niki Bodyguard Syringe Driver (30mL syringes available from Palliative Care team). In order to administer a larger dose a second syringe driver may be required, or two x 12-hour syringe drivers. Alternatively, the dose can be administered in a 50ml syringe using an appropriate syringe driver.
Medicine compatibility	Furosemide injection is alkaline and there is a high risk of incompatibility when mixed with acidic drugs. Because of this and the lack of compatibility data, **furosemide should not be mixed in the same syringe with any other drugs.**
Adverse effects	• Electrolyte imbalance • Dehydration • Metabolic alkalosis • Orthostatic hypotension • Dizziness • Rash • Tinnitus
Monitoring requirements Safety Effectiveness (state objective criteria)	Monitor level of fluid overload and titrate dose accordingly. Monitor for injection site reactions. If administered via CSCI perform 4 hourly infusion site checks as per Subcutaneous Syringe Driver inpatient management form SES130.021

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Management of Complications	Manage electrolyte imbalances and maintain adequate potassium concentrations. Maintain adequate hydration and manage fluid balance with care. Where nephrotoxicity is evident and liaise with specialty teams regarding dose reduction and or cessation if required.
Basis of Protocol/Guideline: (including sources of evidence, references)	Palliative Care Formulary 7th Ed, 2020 p 67-72 Therapeutic Guidelines – Palliative Care Version 4, 2016 Dickman A, Schneider J. The syringe driver: continuous subcutaneous in palliative care. Oxford University Press; 2016 Domenic, A.S et al, Subcutaneous Furosemide in Heart Failure, JACC: Basic to Translational Science VOL, 3 NO 1, Feb 2018 pp 25 -34
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GOVERNANCE	
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