

Drug	Indications	Effects	Formulation	Constituents	Dose rate	Volume rate	Instructions
GTN	Acute pulmonary oedema	Venodilation promotes peripheral pooling of blood, decreasing venous return to the heart which reduces preload and ventricular wall stress; arteriolar relaxation reduces systemic vascular resistance and afterload	50mg GTN in 50ml	50mg GTN in 50ml vial (neat)	1-10mg/hour <i>Give 2mg bolus prior to starting at lowest dose</i>	1-10ml/hour	Titrate up but keep SBP >90
Furosemide	Decompensated heart failure	Reduction of sodium and chloride reabsorption in the loop of Henle, decreasing intravascular volume	240mg furosemide in 48ml	240mg furosemide in 24ml amp + 24ml 0.9% saline	5-10 mg/hour <i>Give 40mg IV loading dose prior to starting infusion</i>	1-2ml/hour	Titrate daily to weight loss (aim 1-1.5kg/day loss), fluid balance (1-1.5L/day negative) and clinical results
Aminophylline	Severe COPD exacerbation	Phosphodiesterase isoenzyme inhibition resulting in increased intracellular cAMP/cGMP which causes bronchodilation	500mg aminophylline in 500ml	250mg aminophylline in 10ml amp x2 + 480ml 0.9% saline	<u>Usual</u> 0.5mg/kg/hour <u>Elderly</u> 0.3mg/kg/hour	<u>Usual</u> 0.5 ml/kg/hour <u>Elderly</u> 0.3 ml/kg/hour	Check theophylline level 4-6 hours after starting infusion, then daily (aim 10-20mg/L)
Omeprazole	Haemodynamically unstable upper GI bleed; peptic ulcer at high risk of re-bleed following endoscopy	Inhibition of proton pumps which suppresses gastric acid production	40mg omeprazole in 100ml	40mg omeprazole powder vial + 100ml 5% dextrose	8mg/hour <i>Give 80mg IV loading dose prior to starting infusion</i>	20ml/hour	Continue for 72 hours then change to oral
Heparin	Therapeutic anticoagulation in patients who are at high risk of bleeding or need it to be stopped/restarted quickly e.g. peri-operatively in patient with mechanical heart valve	Natural anticoagulant that potentiates antithrombin (which inactivates factors 2, 9, 10, 11, 12) and inactivates thrombin	25000units heparin sodium in 50ml	25000units heparin 1ml amp + 49ml 0.9% saline	20units/kg/hour <i>Give 5000 unit IV bolus prior to starting infusion</i>	0.04 ml/kg/hour	Check APTT ratio every 4-6 hours >7 = stop for 30min and reduce by 1ml/h (500units/h) 5-7 = reduce by 1ml/h (500units/h) 4-5 = reduce by 0.6ml/h (300units/h) 3-4 = reduce by 0.2ml/h (100units/h) 2.5-3 = reduce by 0.1ml/h (50units/h) 1.5-2.5 = TARGET 1.2-1.4 = increase by 0.4ml/h (200units/h) <1.2 = increase by 0.8ml/h (400units/h)
Fixed-rate insulin infusion	Diabetic ketoacidosis	Increased glycogenesis in liver; increased absorption of glucose into cells	50units Actrapid in 50ml	50units actrapid in 5ml vial + 45ml 0.9% saline	0.1unit/kg/hour (max 15 units/h)	0.1 ml/kg/hour	Check hourly VBG
Variable-rate insulin infusion	Diabetic patients who are nil by mouth				>15mmol/L = 6units/h (6ml/h) 10-15mmol/L = 3units/h (3ml/h) 7-10mmol/L = 2units/h (2ml/h) 4-7mmol/L = 1unit/h (1ml/h) <4mmol/L = suspend infusion	Check hourly capillary glucose and adjust rate accordingly	
Anti-hypertensives							
Labetalol	Aortic dissection	α_1 - and non-selective β -adrenergic blockade resulting in decreased peripheral vascular resistance and blood pressure	200mg labetalol in 200ml	100mg labetalol in 20ml amp x2 + 160ml 0.9% saline	0.5-2 mg/min <i>Start at highest dose for rapid BP control then titrate down</i>	0.5-2ml/min	Titrate to keep SBP 100-120 (suspend infusion if SBP <100)
	Hypertensive emergencies (1 st line)				0.5-2 mg/min <i>Start at lowest dose and titrate up if required for target BP reduction</i>	0.5-2ml/min	-Reduce MAP by 25% within 1 hour -Reduce BP to 160/100-110 over next 2-6 hours -Aim for gradual reduction to normal BP over 24-48 hours
Sodium nitroprusside	Hypertensive emergencies <u>without</u> encephalopathy (2 nd line)	Relaxation of smooth muscle causing vascular dilatation and reduction in blood pressure	50mg sodium nitroprusside in 50ml	50mg sodium nitroprusside powder vial + 50ml 5% dextrose	0.5-8 mcg/kg/min <i>-Start at 0.5-1.5 mcg/kg/min -Titrate up by 0.5 mcg/kg/min every 5mins if required for target BP reduction</i>	0.5-8 μ l/kg/min	-Reduce MAP by 25% within 1 hour -Reduce BP to 160/100-110 over next 2-6 hours -Aim for gradual reduction to normal BP over 24-48 hours
Nicardipine	Hypertensive emergencies (2 nd line)	Calcium channel antagonist which inhibits vascular smooth muscle contraction, reducing blood pressure	10mg nicardipine in 100ml	10mg nicardipine in 10ml amp + 90ml 0.9% saline	2-15 mg/hour <i>-Start at 3-5mg/h -Titrate up by 0.5-1mg/h every 15mins if required for target BP reduction -Gradually reduce dose when target met (maintenance = 2-4mg/h)</i>	20-150 ml/hour	

Catecholamines

Dopamine	Cardiogenic shock (1 st line); septic shock (2 nd line)	Dopaminergic >β₁>α₁ <ul style="list-style-type: none"> • Low dose (1-3mcg/kg/min): dopamine receptor mediated vasodilation of vascular beds increasing <i>organ perfusion</i>, especially kidneys ('renal dose') • Medium dose (3-10mcg/kg/min): β₁-mediated positive inotropic effect increasing <i>cardiac output</i> • High dose (>10mcg/kg/min): α₁-mediated vasoconstriction increasing <i>mean arterial pressure</i> 	200mg dopamine in 50ml	200mg dopamine in 5ml amp + 45ml 0.9% saline	2.5-20 mcg/kg/min -2.5 mcg/kg/min for low dose (fixed rate) -Start at 5 mcg/kg/min for medium dose and titrate in increments of 2.5-5mcg/kg/min	0.625-5 μl/kg/min	Titrate to keep MAP 60-80mmHg
Dobutamine	Heart failure without cardiogenic shock	β₁ + β₂ <ul style="list-style-type: none"> • β₁-mediated positive inotropic and chronotropic effect increasing <i>cardiac output</i> • β₂-mediated vasodilatation and reduced systemic vascular resistance 	250mg dobutamine in 100ml	250mg dobutamine in 20ml amp + 80ml 0.9% saline	2.5-20 mcg/kg/min -Start at 1mcg/kg/min	1-8μl/kg/min	
Noradrenaline <i>via central line only</i>	Septic shock (1 st line); severe cardiogenic shock (SBP<70mmHg)	α₁>β₁ <ul style="list-style-type: none"> • α₁-mediated peripheral vasoconstriction increasing <i>mean arterial pressure</i> • Lesser β₁-mediated positive inotropic and chronotropic effect, increasing <i>cardiac output</i> 	2mg noradrenaline in 50ml	2mg noradrenaline in 20ml + 48ml 5% dextrose	0.05-1 mcg/kg/min -Start at 0.1 mcg/kg/min -Titrate in increments of 0.05-0.1mcg/kg/min	1.25-25 μl/kg/min	